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## DRAFT BASIC ASSESSMENT REPORT: BHAMBAYI PHASE 1 EXTENSION HOUSING PROJECT (PAT MARSHAL HOUSING), PHOENIX, KWAZULU-NATAL

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*November 2016*

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# DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BHAMBAYI PHASE 1 EXTENSION HOUSING PROJECT, PHOENIX, KZN

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# **EXECUTIVE SUMMARY**

## **Project Description**

The proposed project will involve the provision of low cost housing and municipal services for approximately 482 Residential units. This will include the development of new houses, 1 commercial stand, a Crèche, a Public Park and associated road/services infrastructure. The development site is located within a significantly disturbed and transformed landscape characterized by existing dense human settlements comprising both informal and semi-formal houses.

The housing project comprises of two parcels of land within Bhambayi Phase 1 (erf 259) and adjacent land (erf 315). Although erf 315 is shown as a public place, it will be permanently closed and allocated for housing. The vacant land, erf 259 within Phase 1 was also zoned as a school site. However there are currently many schools in the area and the land was therefore agreed to be used for housing.

## **Project Motivation**

The Department of Human Settlements both nationally and provincially have a mandate to deliver adequate housing. In terms of section 26 of the Constitution of the Republic of South Africa of 1996, “everyone has a right of access to adequate housing”. Furthermore, in terms of section 26(2), the state must take reasonable legislative and other measures within its available resources to realize this progressive right. [http://www.durban.gov.za/City\\_Services/housing/Presentations/Provincial%20Dept%20of%20Human%20Settlements.pdf](http://www.durban.gov.za/City_Services/housing/Presentations/Provincial%20Dept%20of%20Human%20Settlements.pdf)

The KZN Department of Human Settlements facilitate and actively participate in housing delivery and the creation of sustainable human settlements in the eThekweni Municipality area with a view to ensure that all citizens of Durban have access to housing.

There is therefore a need to supply housing opportunities which includes secure tenure, basic services and support in achieving incremental housing improvement in living environments with requisite social, economic and physical infrastructure. By providing housing to families in need, this will firstly meet some of the backlog for this area and secondly reduce negative impacts on the environment. Through this project the municipality will be able to create a sustainable human settlement.

## Alternatives

The table below summarises the alternatives investigated:

<b>Type of Alternative</b>	<b>Description</b>
<b>Site Alternative</b>	<p>With regard to the Bhambayi Phase 1 Housing Project (Pat Marshal Housing), there is little scope for feasible site alternatives as this project involves the provision of housing within an already identified vacant area. It is therefore not feasible to look at alternatives outside of this area as the people within this ward are desperately requiring housing. With limited land available for housing, the proposed site as shown in <b>Figure 2</b> (Erf 315 and 259) is the most preferred Site Alternative (S1) for the proposed project.</p> <p>The Town Planners have indicated that no layout alternatives were looked at due to time and budget constraints.</p> <p>Note: eThekweni Municipality originally looked at two sites with this area Site A and Site B. Site A was ruled out early in the process due to the associated wetland impacts as shown in <b>Appendix D1</b> and was therefore not further assessed.</p>
<b>Layout Alternative</b>	<p>No alternatives have been investigated. However, the engineers and town planners considered the findings of the environmental investigations and designed the proposed site accordingly (i.e. avoiding the sensitive areas as far as possible).</p>
<b>Technology Alternatives</b>	<p>No alternatives have been investigated, but the most appropriate materials will be used during the construction of the facility and the best practicable equipment will be sourced for use in the housing development.</p>
<b>No-Go Option</b>	<p>The “no-go” alternative is the option of not establishing any houses.</p> <p>This will ultimately ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the authorities decline the application, the ‘No-Go’ option will be followed and the status quo of the site will remain. As a result, the proposed preferred site alternative will remain vacant. With the No-Go alternative being followed, eThekweni Municipality will not be able to meet their strategic goal to provide housing. Families that were previously displaced will continue to live in overcrowded, densely populated areas placing further strain on infrastructure, resulting in negative impacts on the environment.</p>

## Environmental Legal Requirements

In terms of NEMA and the associated EIA Regulations 2014, environmental authorisation must be obtained from the relevant decision-making authority, the KZN DEDTEA. This must be done prior to the commencement of certain listed activities that may result in potential negative impacts on the environment. The proposed Pat Marshal housing development involves the following listed activities, as per Government Notice No. R. 983 and 985:

**Table1: Listed activities**

<b>Indicate the number and date of the relevant notice:</b>	<b>Activity No (s) (in terms of the relevant or notice) :</b>	<b>Describe each listed activity as per the project description (and not as per wording of the relevant Government Notice)<sup>1</sup>:</b>
<b>Listing Notice 1 GNR No. 983</b>	<b>24</b>	The proposed housing development will include the construction of associated infrastructure, including roads. The width of the roads will be 10.5m and 8m in some places as shown in the Facility Illustration (Appendix C)
<b>Listing Notice 1 GNR No. 983</b>	<b>27</b>	Site clearance for the proposed housing development may include the clearance of more than 1 ha of indigenous vegetation.
<b>Listing Notice 3 GNR No. 985</b>	<b>4</b>	The proposed housing development will include the construction/development of associated infrastructure, including roads. The width of the roads will be 10.5m and 8m in some places as shown in the Facility Illustration ( <b>Appendix C</b> ). The proposed project is also located within a Critical Biodiversity Area (CBA). Refer to <b>Appendix A</b> for the Maps showing the CBA's.
<b>Listing Notice 3 GNR No. 985</b>	<b>12</b>	Site clearance for the proposed housing development may include the clearance of more than 300 square metres of indigenous vegetation within a Critical Biodiversity Area (CBA). Refer to <b>Appendix A</b> for the Maps showing the CBA's.

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<sup>1</sup> Please note that this description should not be a repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description, i.e. describe the components of the desired development

On the western boundary of the site is a small tributary river system. The construction of the houses and associated infrastructure will have “NO” impact on the bed, bank, course and characteristics of the tributary, as the project footprint will remain outside the 32m buffer of the watercourse.

The proposed project will however be within 500m of a wetland, and in terms of the National Water Act (Act No 36 of 1998) [NWA], a Water Use License Application (WULA) is required, this is a legislative process governed by the Department of Water and Sanitation (DWS) for the authorisation of all water uses defined in section 21 of the NWA.

**Table 2: Water Uses triggered in terms of Section 21 of the National Water Act**

Activity No	Description
<b>Section 21 (c)</b>	Impeding and diverting the flow of water in a watercourse
<b>Section 21 (i)</b>	Altering the bed, bank, course or characteristics of a watercourse

**Impact Assessment**

**IMPACT SUMMARY**

Impact	Pre-mitigation: Significance	Post-mitigation: Significance
<b>CONSTRUCTION PHASE</b>		
<b>Direct Impacts</b>		
Contamination of soil from leaks/spillages	Low - negative	Very low - negative
Contamination/Pollution of groundwater from leaks/spillages of either hydrocarbons waste or waste water.	Moderate - negative	Very low - negative
Contamination/Pollution of surface water from leaks/spillages of either hydrocarbons waste or waste water.	Moderate - negative	Very low - negative
Increased noise generation from construction activities.	Very low - negative	Very low - negative
Increased job opportunities	Very Low - positive	Very Low - positive
Increased air emissions from construction activities.	Low - negative	Very low - negative
<b>Indirect impacts</b>		
Soil Erosion and Sedimentation of water resources as a result of construction activities	Low - negative	Very low - negative
Loss of vegetation	Very low - negative	Very low - negative
Loss of fauna as a result of clearance.	Very low - negative	Very low - negative
Siltation/Sedimentation in storm water pipelines	Very low - negative	Very low - negative

Impact on heritage sites and artefacts	Low - negative	Very low - negative
<b>Cumulative Impacts</b>		
Colonization of alien vegetation as a result of stockpiling and clearance of vegetation	Low - negative	Very low - negative
Increased dust emissions as a result of construction activities	Very low - negative	Very low - negative
Reduced terrestrial functioning	Very low - negative	Very low - negative
Increased flooding and runoff due to soil compaction	Very low - negative	Very low - negative
<b>OPERATIONAL PHASE</b>		
<b>Direct Impacts</b>		
Contamination/Pollution of groundwater	Moderate - negative	Very low - negative
Contamination/Pollution of surface water	Moderate - negative	Very low - negative
Increased noise generation from everyday vehicular use	Low - negative	Very low - negative
Impact on fauna as a result of fishing hunting etc.	Low - negative	Very low - negative
Increased job opportunities	Very Low - positive	Low - positive
Reduced water quality as a result of illegal dumping in the watercourse	Low - negative	Very low - negative
<b>Indirect impacts</b>		
Soil Erosion as a result of poor rehabilitation	Moderate - negative	Very low - negative
Siltation/Sedimentation in storm water pipelines	Low - negative	Very low - negative
Management of all waste material on site	Moderate - negative	Very low - negative
<b>Cumulative Impacts</b>		
Increase in alien vegetation as result of poor rehabilitation	Moderate - negative	Very low - negative
<b>DECOMMISSIONING PHASE</b>		
<b>Direct Impacts</b>		
Increased heavy vehicle traffic during site closure and rehabilitation	Very low - negative	Very low - negative
Increased noise generation from heavy vehicles during site closure and rehabilitation	Low - negative	Very low - negative
Contamination of soil	Low - negative	Very low - negative
Contamination/Pollution of surface water	Low - negative	Very low - negative
Contamination/Pollution of groundwater	Low - negative	Very low - negative
Job creation	Very Low - positive	Low - positive
<b>Indirect Impacts</b>		
Soil Erosion	Low - negative	Very low - negative
Loss of vegetation	Low - negative	Very low - negative

Siltation/Sedimentation in stormwater pipelines	Low - negative	Very low - negative
<b>Cumulative</b>		
Increase dust emissions	Low - negative	Very low - negative
Increase in alien vegetation	Very low - negative	Very low - negative
Reduced terrestrial functioning	Low - negative	Very low - negative
Acceleration of climate change due to loss of vegetation	Low - negative	Very low - negative
Increased flooding and runoff on site	Very low - negative	Very low - negative

**Key:**

Significance	
-49 to -66	Very high - negative
-37 to -48	High - negative
-25 to -36	Moderate - negative
-13 to -24	Low - negative
0 to -12	Very low - negative
0 to 12	Very Low - positive
13 to 24	Low - positive
25 to 36	Moderate - positive
37 to 48	High - positive
49 to 66	Very high - positive

## **Conclusion**

It is the EAPs opinion that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for.

Given the low significance of potential impacts associated with the Preferred Alternative, as well as the site already having been disturbed and maintained by eThekweni Municipality as a recreational and park area for the local surrounding community. It is recommended that this site be considered for this development as the preferred alternative. This alternative will have the least impact on the sensitive surrounding environments, including the wetland ecosystems. The preferred option has taken into account the recommend buffer zones that are in place when developing a project within 32-meters of a water course.

The development site is also located within a significantly disturbed and transformed landscape characterized by existing dense human settlement comprising both informal and semi-formal houses. One small tributary river system was identified as occurring within the development site. The tributary was delineated (riparian habitat) and assessed in terms of baseline condition and ecological importance & sensitivity of the resources. It was found to be in a highly degraded (seriously modified) state as a result of the combination of catchment impacts on hydrology and water quality (sediment & pollutants) as well as on site disturbances associated with housing development in the area, including aspects such as dense alien plant infestations, river bank erosion and channel incision and solid waste dumping.

The current land use in the project area is mainly in the form of dense residential housing infrastructure, with houses comprising a mix of formal, semi-formal and informal dwellings. A network of tarred and dirt roads provide access to the individual residences. Housing density is high to very high, with very little remaining untransformed/natural habitat. Associated with dense settlement of this nature and the apparent lack of service delivery, is the prevalence of solid waste dumped within watercourses and riparian habitat.

In addition to this many families in the Bhambayi area have also been displaced as a result of disasters in the area (e.g. Flooding) and require houses urgently.

There is therefore a need to supply housing opportunities which includes secure tenure, basic services and support in achieving incremental housing improvement in living environments with requisite social, economic and physical infrastructure. By providing housing to families in need, this will firstly meet some of the backlog for this area and secondly reduce negative impacts on the environment. Through this project the municipality will be able to create a sustainable human settlement.

# 1 INTRODUCTION

eThekwini Municipality Housing (eThekwini) propose to construct approximately 482 low cost houses for the Bhambayi Phase 1 Extension Housing Project (Pat Marshal Housing) situated in Phoenix, Kwa-Zulu Natal.

GIBB (Pty) Ltd were appointed as the independent Environmental Assessment Practitioner (EAP) by eThekwini to undertake a Basic Assessment (BA) for the proposed project.

The KwaZulu - Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA) as the competent authority for the project, confirmed that the proposed project triggers 'listed activities' in Government Notice R983 (GNR 983), and as such a BA, in terms of the National Environmental Management Act, 1998 (No.107 of 1998) [NEMA] will be required before activities can commence. The Basic Assessment Report (BAR) will be prepared in accordance with the requirements for Government Notice R983, Environmental Impact Assessment (EIA) Regulations, 2014.

This report therefore presents the findings of the Basic Environmental Assessment and associated specialist studies (Wetland and Heritage Impact Assessments and a Geotechnical Assessment).

## 1.1 Details of the Applicant

Table 1: Details of the Applicant

Name of Applicant	Physical Address	Relevant Numbers
Mr Kamal Maharaj eThekwini Municipality: Housing	17 Doveside Place, Canehaven Road, Phoenix, 4068	Tel: 031 311 2484 Cell: 0834615125 Fax: 031 505 4195 E-mail: Kamal.Maharaj@durban.gov.za

## 1.2 Details of the Environmental Assessment Practitioner and Specialists

The tables below provide a summary of the Environmental Assessment Practitioners and Specialists involved in the basic assessment process. Please refer to **Appendix H** for relevant experience of the EAP and specialist.

Table 2: Details of the EAP

<b>Business name of EAP:</b>	GIBB (Pty) Ltd		
<b>Physical address:</b>	1st Floor, Norfolk House, 54 Norfolk Terrace, Westville, 3630		
<b>Postal address:</b>	PO Box 1365, Westville		
<b>Postal code:</b>	3620	<b>Cell:</b>	071 355 87 81
<b>Telephone:</b>	031 267 8560	<b>Fax:</b>	031 266 3310
<b>E-mail:</b>	kwiles@gibb.co.za		

**Table 3: Names and Expertise of representatives of the EAP**

<b>Name of representative of the EAP</b>	<b>Education qualifications</b>	<b>Professional affiliations</b>	<b>Experience at environmental assessments (yrs)</b>
Elisabeth Nortje	BSc Honours	IAIAsa	12
Katherine Wiles	BSc Honours	Cert. Nat. Sci. IAIAsa	6
Charl Kruger	BSc	IAIAsa	2

**Table 4: Details of the Specialists**

<b>Name of specialist</b>	<b>Education qualifications</b>	<b>Field of expertise</b>	<b>Section/ s contributed to in this basic assessment report</b>	<b>Title of specialist report/ s as attached in Appendix D</b>
Douglas Malcolm Macfarlane	BSc (Agric)	Wetland Specialist	3, 5 and 6	Eco-Pulse (Bhambayi Extension Phase 1 Development: Aquatic Assessment)
Adam Teixeira-Leite	Bsc Hons Envs: Honours degree in Environmental Science (wetland ecology and management)	Wetland Specialist	3, 5 and 6	Eco-Pulse (Bhambayi Extension Phase 1 Development: Aquatic Assessment)
Ross Van Deventer	MSc: (Environmental Science)	Wetland Specialist	3, 5 and 6	Eco-Pulse (Bhambayi Extension Phase 1 Development: Aquatic Assessment)
Len van Schalkwyk	MA Archaeology, BA Honours Archaeology	Heritage Specialist	3, 5 and 6	Bhambayi Extension Phase 1 Development HIA exemption application 5 August 2014
Elizabeth Wahl	BA Honours African Studies Archaeology and Sociology majors, Currently completing an MPhil in the Conservation of the Built Environment	Heritage Specialist	3, 5 and 6	Bhambayi Extension Phase 1 Development HIA exemption application 5 August 2014

## 2 ACTIVITY INFORMATION

### 2.1 Description of Project

#### 2.1.1 Project Title

Proposed Construction of low cost houses for the Bhambayi Phase 1 Extension Housing Project (Pat Marshal Housing).

<b>Province</b>	Kwa-Zulu Natal
<b>District Municipality</b>	eThekwini Municipality
<b>Local Municipality</b>	eThekwini Municipality
<b>Ward Number(s)</b>	52 and 57
<b>Farm name and number</b>	Erf 259 and 315 (Public Place) of the Farm Bhambayi No. 17267
<b>SG Code</b>	Erf 259 SG Code: N0FT06970000025900000 Erf 315 SG Code: N0FT06970000031500000

#### 2.1.2 Project Description

The Proposed Project is located in Inanda about 20km from Durban Central and south of Phoenix, eThekwini Municipality, KwaZulu-Natal.

The proposed project will involve the provision of low cost housing and municipal services for approximately 482 Residential units. This will include the development of new houses, 1 commercial stand, a Crèche, a Public Park and associated road/services infrastructure as shown in **Appendix C**. The development site is located within a significantly disturbed and transformed landscape characterized by existing dense human settlements comprising both informal and semi-formal houses.

The housing project comprises of two parcels of land within Bhambayi Phase 1 (erf 259) and adjacent land (erf 315) (Refer to **Figure 1** below). Although erf 315 is shown as a public place, it will be permanently closed and allocated for housing. The vacant land, erf 259 within Phase 1 was also zoned as a school site. However there are currently many schools in the area and the land was therefore agreed to be used for housing.

Overall the project objective is to provide a long term solution to housing challenges experienced in the area, and to accommodate the excess families living on the adjacent parcel of land. Alternate high density housing typologies will be used for the development to attain higher yields and provide further housing to those that currently do not have houses.

**BHAMBAYI No.17267**

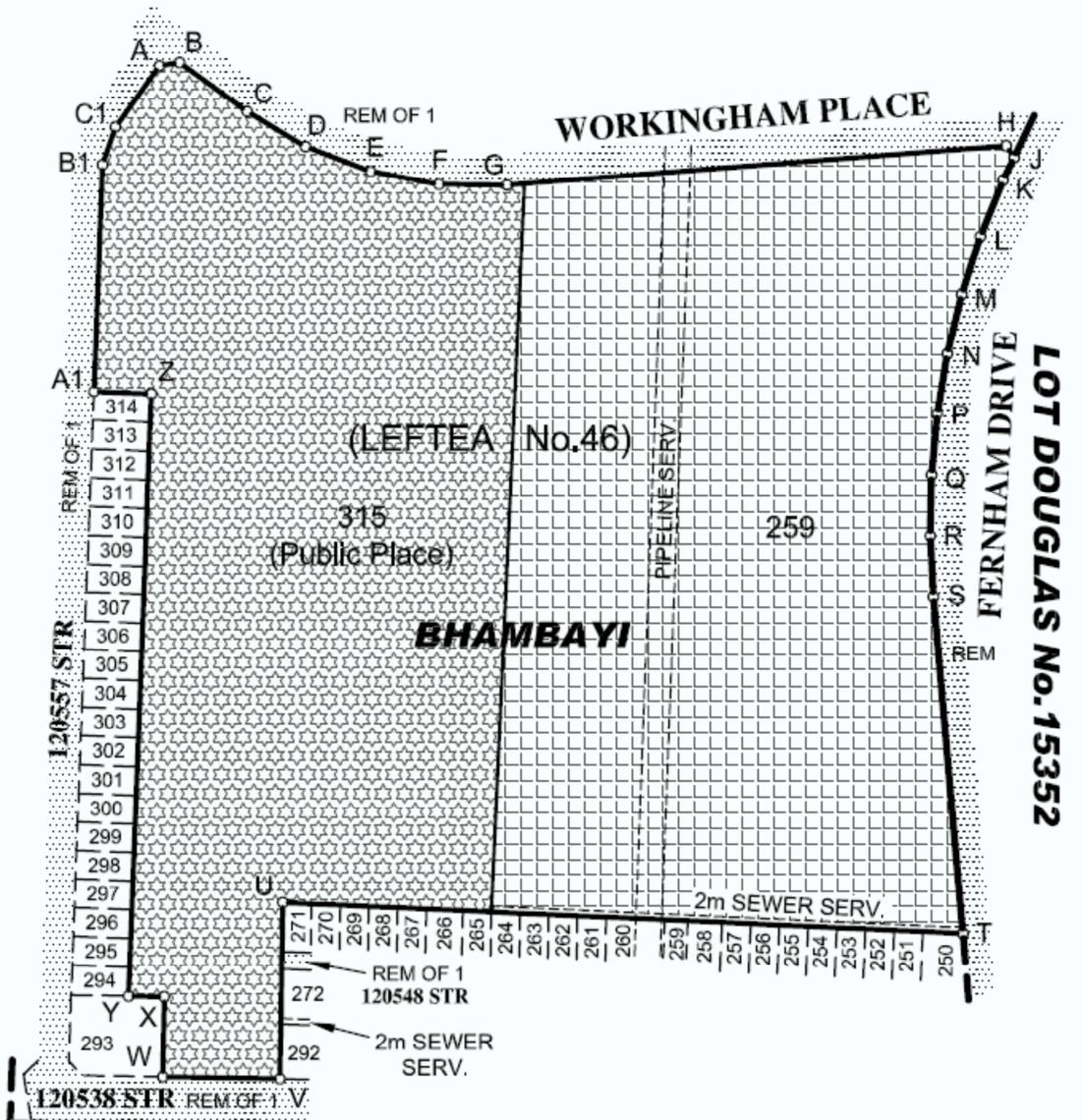


Figure 1: Showing the parcels of land required for the proposed housing project

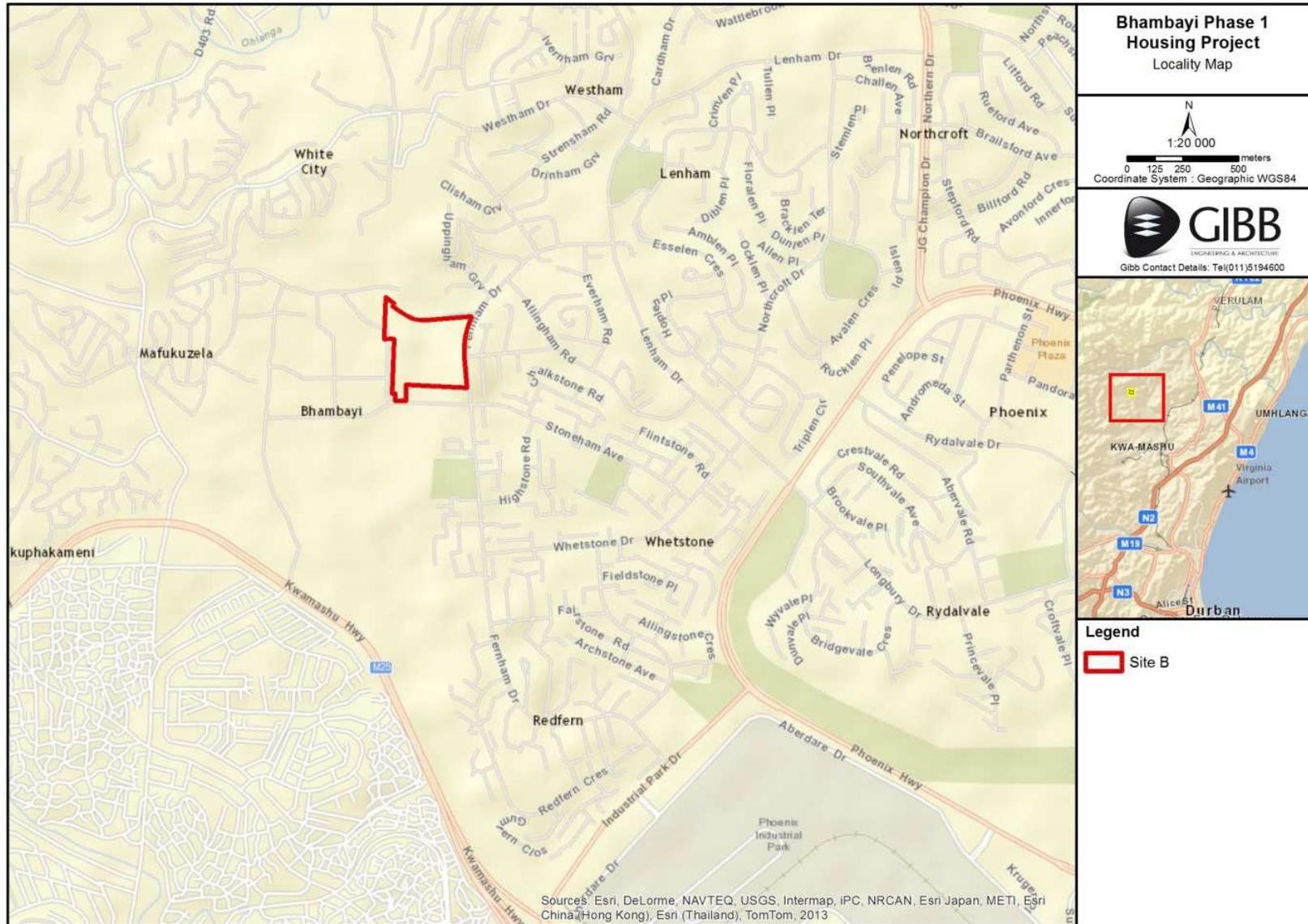


Figure 2: Showing the proposed location of the Bhambayi Phase 1 Extension Housing Project.

### 2.1.3 Site Description and Layout

The site is located approximately one kilometre north east of the M25 highway and adjoins the suburb of Phoenix. Approximate latitude and longitude co-ordinates plot this site as 29°42'6.09" (South) and 30°58'49.81" (East), respectively.

The site is also bound to the north and east by Workingham Road, and Fernham Road, respectively, and to the west and south by existing residential properties within Phoenix itself. Refer to **Table 5** or more details on the surrounding environment.

**Table 5: Site Description using Cardinal points**

North	To the North of the site we find the settlement of Westham.
East	To the East of the site we find the community of Lenham and Northcroft.
South	To the South of the site we find the community of Bhambayi.
West	To the West of the site we find the community of Langalibalele and the drainage line further discussed below.

Observations on site indicate that the site has been infilled levelled and an existing drainage line re-canalised in places prior to the investigation for use as a sports field/recreational area. The drainage channel traverses the site from the north-western corner of the site to the south-western site limit.

### 2.1.4 Site Access

The current concept indicates a main north-south local access road which is accommodated in a 25.4m road reserve. The width of the reserve is to accommodate a linear open space over an existing pipeline servitude and to split the vehicle lane either side (Refer to **Appendix C**). Presently the access to the site is via either Workingham or Fernham Road and an unnamed earthen track which forms a wide loop through the central to northern portions of the site.

### 2.1.5 Physical Size of the Activity

The Site Area of Erven 315 and 259 is 3.8366 Ha and 4.0765 Ha respectively, with a total area of approximately 7.9131 Ha.

### 2.1.6 Solid waste management

The solid waste generated on site during the construction phase will be stored in skips by the appointed contractor. An appointed waste contractor will thereafter remove the waste to the closest registered land fill site. Small amounts of hazardous waste will be generated during the construction phase (e.g. oily rags etc.); these will be disposed of in marked bins and moved to a registered landfill.

During the operation phase, the community living in the settlement will generate general household waste which will be serviced by eThekweni Waste Collection services. Illegal dumping may occur and will need to be monitored by the municipality.

#### **2.1.7 Liquid effluent**

The activity will not produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system.

Owing to a combination of unfavourable clayey subsoils of low assessed permeability perched, groundwater seepage activity and the density of RDP housing generally in a peri-urban context, the use of a Ventilated Improved Pit (VIP) toilet and/or septic tank and soakaway system are expected to greatly increase the potential for unhygienic operations with allied social problems. For this reason, the disposal of sewage by on-site percolation systems such as a VIP or soakaway is not to be considered.

For the purpose of this project, provision for disposal of sewage into a waterborne facility will be facilitated.

#### **2.1.8 Emissions into the atmosphere**

Dust and vehicle emissions will be generated during the construction phase as a result of trucks transporting construction material and other earth moving machinery. The emissions will, however, have short term impacts on the immediate surrounding areas and thus the authorisation of such emissions will not be required.

There will be no emissions generated during the operation phase other than from everyday residential activities.

#### **2.1.9 Generation of noise**

Noise will result from the movement of vehicles, trucks and other associated machinery used during the construction phase. However, the noise associated with construction activities will be of short term, localised and will only last during the construction phase of the project.

There will be no noise generated during the operational phase, other than from everyday residential activities.

#### **2.1.10 Water Use**

The construction contractors will be responsible for the sustainable use of water. No water will be used from the small tributary.

## 2.2 Project Motivation

The Department of Human Settlements both nationally and provincially have a mandate to deliver adequate housing. In terms of section 26 of the Constitution of the Republic of South Africa of 1996, “everyone has a right of access to adequate housing”. Furthermore, in terms of section 26(2), the state must take reasonable legislative and other measures within its available resources to realize this progressive right. [http://www.durban.gov.za/City\\_Services/housing/Presentations/Provincial%20Dept%20of%20Human%20Settlements.pdf](http://www.durban.gov.za/City_Services/housing/Presentations/Provincial%20Dept%20of%20Human%20Settlements.pdf)

The KZN Department of Human Settlements facilitate and actively participate in housing delivery and the creation of sustainable human settlements in the eThekweni Municipality area with a view to ensure that all citizens of Durban have access to housing.

The Minister of Human Settlements (Hon Lindiwe Sisulu) in her budget speech 2014 announced that 1,5million housing opportunities will be delivered within the next 5 years. **Table 6** below indicates the housing targets vs. what has been achieved within eThekweni Municipality. This clearly shows the gap and the associated need for housing within the municipality.

**Table 6: eThekweni Municipality Housing Targets**

(Taken from [www.durban.gov.za/city\\_services/housing/pages/default.aspx](http://www.durban.gov.za/city_services/housing/pages/default.aspx))

Years	Target	Achieved
2011/2012	5 000	3389
2012/2013	7 200	4181
2013/2014	7 300	6809
2014/2015	7500	5516
2015/2016	4630	1936

The current land use in the project area is mainly in the form of dense residential housing infrastructure, with houses comprising a mix of formal, semi-formal and informal dwellings. A network of tarred and dirt roads provide access to the individual residences. Housing density is high to very high, with very little remaining untransformed/natural habitat. Associated with dense settlement of this nature and the apparent lack of service delivery, is the prevalence of solid waste dumped within watercourses and riparian habitat.

In addition to this many families in the Bhambayi area have also been displaced as a result of disasters in the area (e.g. Flooding) and require houses urgently.

There is therefore a need to supply housing opportunities which includes secure tenure, basic services and support in achieving incremental housing improvement in living environments with requisite social, economic and physical infrastructure. By providing housing to families in need, this will firstly meet some of the backlog for this area and

secondly reduce negative impacts on the environment. Through this project the municipality will be able to create a sustainable human settlement.

### 2.2.1 Need and desirability of the activity

eThekwini is seeing the rapid influx of people from rural areas, few of whom have the means to build or buy formal houses in the city. The main need and desirability of the project is therefore to provide a long term housing solution to the current housing shortages that are being experienced in the Bhambayi area.

### 2.2.2 Socio-economic value of the activity

What is the expected capital value of the activity on completion?	<b>R 95 Million</b>	
What is the expected yearly income that will be generated by or as a result of the activity?	<b>N/A</b>	
Will the activity contribute to service infrastructure?	<b>YES</b> <b>X</b>	<b>NO</b>
Is the activity a public amenity?	<b>YES</b> <b>X</b>	<b>NO</b>
How many new employment opportunities will be created in the development phase of the activity?	<b>30%</b>	
What is the expected value of the employment opportunities during the development phase?	<b>N/A</b>	
What percentage of this will accrue to previously disadvantaged individuals?	<b>100%</b>	
How many permanent new employment opportunities will be created during the operational phase of the activity?	<b>N/A</b>	
What is the expected current value of the employment opportunities during the first 10 years?	<b>R 95 Million</b>	
What percentage of this will accrue to previously disadvantaged individuals?	<b>N/A</b>	

### 2.3 Feasible and Reasonable Alternatives

In terms of the EIA regulations, attention needs to be given to all possible alternatives. The assessment of alternatives allows different approaches and ways of meeting the need, purpose and objectives of a proposed activity. Alternatives may include location or route alternatives, site alternatives design/layout alternatives, activity alternatives and processes or technology alternatives, etc.

Table 7: Project Alternatives

Type of Alternative	Description
<p><b>Site Alternative</b></p>	<p>With regard to the Bhambayi Phase 1 Housing Project (Pat Marshal Housing), there is little scope for feasible site alternatives as this project involves the provision of housing within an already identified vacant area. It is therefore not feasible to look at alternatives outside of this area as the people within this ward are desperately requiring housing. With limited land available for housing, the proposed site as shown in <b>Figure 2</b> (Erf 315 and 259) is the most preferred Site Alternative (S1) for the proposed project.</p> <p>The Town Planners have indicated that no layout alternatives were looked at due to time and budget constraints.</p> <p>Note: eThekweni Municipality originally looked at two sites with this area Site A and Site B. Site A was ruled out early in the process due to the associated wetland impacts as shown in <b>Appendix D1</b> and was therefore not further assessed.</p>
<p><b>Layout Alternative</b></p>	<p>No alternatives have been investigated. However, the engineers and town planners considered the findings of the environmental investigations and designed the proposed site accordingly (i.e. avoiding the sensitive areas as far as possible).</p>
<p><b>Technology Alternatives</b></p>	<p>No alternatives have been investigated, but the most appropriate materials will be used during the construction of the facility and the best practicable equipment will be sourced for use in the housing development.</p>
<p><b>No-Go Option</b></p>	<p>The “no-go” alternative is the option of not establishing any houses.</p> <p>This will ultimately ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the authorities decline the application, the ‘No-Go’ option will be followed and the status quo of the site will remain. As a result, the proposed preferred site alternative will remain vacant.</p> <p>With the No-Go alternative being followed, eThekweni Municipality will not be able to meet their strategic goal to provide housing. Families that were previously displaced will continue to live in overcrowded, densely populated areas</p>

	placing further strain on infrastructure, resulting in negative impacts on the environment.
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## 2.4 Activity Position

### 2.4.1 Site alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>Bhambayi Phase 1 Housing Project Alternative 1 (Preferred Site – <i>Only available site</i>)</p> <p>The preferred site is located approximately one kilometre north east of the M25 highway and adjoins the suburb of Phoenix.</p> <p>The site has been in filled levelled and an existing drainage line re-canalised in places prior to the investigation for use as a sports field/recreational area. The drainage channel traverses the site from the north-western corner of the site to the south-western site limit.</p> <p>The current modified landscape is relatively flat-lying, with a slight slope aspect to the south.</p>	29° 42' 6.09"	30° 58' 49.81"
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
NA		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
NA		

## 2.5 Environmental Legal Requirements

### 2.5.1 Environmental Impact Assessment

In terms of NEMA and the associated EIA Regulations 2014, environmental authorisation must be obtained from the relevant decision-making authority, the KZN DEDTEA. This must be done prior to the commencement of certain listed activities that may result in potential negative impacts on the environment. The proposed Pat Marshal housing development involves the following listed activities, as per Government Notice No. R. 983 and 985:

Table 8: Listed activities

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant or notice) :	Describe each listed activity as per the project description (and not as per wording of the relevant Government Notice) <sup>2</sup> :
Listing Notice 1 GNR No. 983	24	The proposed housing development will include the construction of associated infrastructure, including roads. The width of the roads will be 10.5m and 8m in some places as shown in the Facility Illustration (Appendix C)
Listing Notice 1 GNR No. 983	27	Site clearance for the proposed housing development may include the clearance of more than 1 ha of indigenous vegetation.
Listing Notice 3 GNR No. 985	4	The proposed housing development will include the construction/development of associated infrastructure, including roads. The width of the roads will be 10.5m and 8m in some places as shown in the Facility Illustration ( <b>Appendix C</b> ). The proposed project is also located within a Critical Biodiversity Area (CBA). Refer to <b>Appendix A</b> for the Maps showing the CBA's.
Listing Notice 3 GNR No. 985	12	Site clearance for the proposed housing development may include the clearance of more than 300 square metres of indigenous vegetation within a Critical Biodiversity Area (CBA). Refer to <b>Appendix A</b> for the Maps showing the CBA's.

### 2.5.2 Water Use Licence

On the western boundary of the site is a small tributary river system. The construction of the houses and associated infrastructure will have "NO" impact on the bed, bank, course and characteristics of the tributary, as the project footprint will remain outside the 32m buffer of the watercourse.

The proposed project will however be within 500m of a wetland, and in terms of the National Water Act (Act No 36 of 1998) [NWA], a Water Use License Application (WULA) is required, this is a legislative process governed by the Department of Water and Sanitation

<sup>2</sup> Please note that this description should not be a repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description, i.e. describe the components of the desired development

(DWS) for the authorisation of all water uses defined in section 21 of the NWA (Refer to **Table 9** below for the associated triggers).

**Table 9: Water Uses triggered in terms of Section 21 of the National Water Act**

Activity No	Description
Section 21 (c)	Impeding and diverting the flow of water in a watercourse
Section 21 (i)	Altering the bed, bank, course or characteristics of a watercourse

**2.5.3 Applicable Legislation, Policies and/or Guidelines**

LEGISLATION	APPLICABILITY TO THE PROJECT
The Constitution of the Republic of South Africa, Section 24 and 26 (Environmental Right):	<p>1) Everyone has the right</p> <p>a) to an environment that is not harmful to their health or well-being; and</p> <p>b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</p> <ul style="list-style-type: none"> <li>i) prevent pollution and ecological degradation;</li> <li>ii) promote conservation; and</li> <li>iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul> <p>In terms of section 26 of the Constitution of the Republic of South Africa of 1996, “everyone has a right of access to adequate housing”. Furthermore, in terms of section 26(2), the state must take reasonable legislative and other measures within its available resources to realize this progressive right.</p> <p>The provisions of the constitution need to be supported. By undertaking an EA for the proposed project, these provisions will be addressed.</p>
National Environmental Management Act, 1998 (Act no. 107 of 1998) (NEMA) and EIA Regulations, 2014.	NEMA is the key environmental management legislation and states in section 2(4)(k) that “the environment is held in public trust for the people, the beneficial use of resources must serve the public interest and the environment must be

LEGISLATION	APPLICABILITY TO THE PROJECT
	<p>protected as the people’s common heritage” thereby paving the way for an EIA process to assess developments that may have a harmful impact on the environment.</p> <p>Section 28 of NEMA ensures that environmental screening is incorporated into each activity, although it is not formally termed as such. Section 28 (1) imposes a duty which requires that:</p> <p>“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment”.</p> <p>The EIA regulations describe the EIA process to be followed including the public participation process, and the listed activities that may have a harmful impact on the environment and must be assessed. For the purpose of this project a BA and associated specialist studies will be undertaken.</p>
<p>National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008) (NEM:WA)</p>	<p>This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. Also to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities.</p> <p>Although none of the proposed activities are likely to trigger activities in terms of the Waste Act, waste will still be generated on site and needs to be managed accordingly. By undertaking this BA and associated EMPr, certain mitigation measures will be implemented to reduce potential impacts of</p>

LEGISLATION	APPLICABILITY TO THE PROJECT
	waste generation in all its forms.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004); (NEM:AQA)	<p>Crucially, in terms of section 21 of the NEM: AQA the relevant authority may promulgate a list of activities which result in atmospheric emissions which are reasonably believed to have a significant detrimental effect on the environment. No person may conduct an activity so listed without a provisional atmospheric emission licence (AEL).</p> <p>An AEL will not be required for the Bhambayi Phase1 Housing project.</p>
National Water Act, 1998 (Act no. 36 of 1998) (NWA)	<p>This Act provides for the protection and management of water resources. A Water Use License Application (WULA) is made to authorise water use activities pertaining to the altering of the bed, bank, course and characteristics of the watercourse and for Impeding and diverting the flow of water in a watercourse (where applicable).</p> <p>A WULA will need to be commissioned for the project.</p>
National Heritage Resources Act, 1999 (Act No. 25 of 1999); (NHRA)	<p>The NHRA serves to introduce an integrated and interactive system for the identification, assessment and management of the heritage resources of South Africa. The NHRA promotes good governance and the empowerment of civil society to preserve their heritage for future generations, and states the principles of heritage resource management while making provision for legislation protecting national heritage</p> <p>The potential impact to heritage resources through implementation of the proposed Bhambayi Phase1 Housing Project is very low. No heritage resources were identified within the proposed spheres of the activity. It is therefore advised that Bhambayi Phase1 Housing project undertake a Heritage Exemption Application.</p>
National Environmental Management: Biodiversity	The Biodiversity Act provides for the management and protection of the country's biodiversity within

LEGISLATION	APPLICABILITY TO THE PROJECT
<p>Act, 2004 (Act no. 10 of 2004) (NEM:BA)</p>	<p>the framework established by NEMA. It provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources, and equity in bio-prospecting.</p> <p>The site is highly modified and there will not be any animals other than birds, snakes and rodents. At the time of the site visit a few locally common bird species were observed. No large mammal species, rare or threatened species were observed during the site visit and are highly unlikely to be found on site.</p>
<p>Occupational Health and Safety Act, 1993 (Act no. 85 of 1993) (OHSA)</p>	<p>While consideration for management of health and safety falls outside the purpose of this document, there are a number of overlaps and synergies that are relevant in terms of environmental management.</p> <p>The OHS Act imposes various duties on employers to ensure the health and safety of their employees, including taking steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the health and safety of their employees, providing the necessary information, instructions, training and supervision, as well as not permitting any employee to do any work or to produce, process, use, store, handle or transport any article or substance or to operate any plant or machinery unless the precautionary measures have been taken. In addition, there is a veritable myriad of regulations promulgated under the OHS Act which may have relevance to the depot project, in regard to safe working conditions in that context. They include the General Administrative Regulations, General Safety Regulations, Construction Regulations and the Environmental Regulations for Workplaces.</p> <p>eThekwini needs to consider general duties of employers to their employees with regards to Health and Safety on site during construction. eThekwini also needs to consider general duties of employers and self-employed persons to persons other than their employees.</p>

LEGISLATION	APPLICABILITY TO THE PROJECT
Municipal Bylaws	<p>The eThekweni Municipality may have certain requirements in terms of bylaws and trade permits, and a few of these may be applicable to this project, namely the following:</p> <ul style="list-style-type: none"> <li>• Disaster Management Bylaws;</li> <li>• Electricity Supply Bylaws;</li> <li>• Environmental Health;</li> <li>• Keeping of Animals;</li> <li>• Nuisances;</li> <li>• Solid Waste Bylaws;</li> <li>• Storm Water Management Bylaws; and Water Services Bylaws.</li> </ul> <p>The Bhambayi Phase1 Housing project needs to consider the above during the implementation of the project.</p>

## **3 DESCRIPTION OF THE RECEIVING ENVIRONMENT**

### **3.1 Biophysical Environment**

#### **3.1.1 Climate**

The proposed site is located in Durban within the coastal belt in northern KwaZulu-Natal. The region experiences a warm, humid sub-tropical climate, with most rainfall being experienced during the summer months (November to March). Few dry months occur and very little, or no frost occurs in winter. Rainfall is seasonal and the highest rainfall is typically experienced over December and January of any year. The mean annual precipitation for Durban is moderate at 759mm/annum. Average daily temperatures range from 22°C in winter (July) to 28°C in summer (February) (\*Eco-pulse, 2014).

\*Source of information on climate: Bhambayi Extension Phase 1 Development: Aquatic Assessment (Eco-pulse, 2014).

#### **3.1.2 Topography, Geology and Soils**

The landscape is characterized by moderately flat valley bottom landscape. According to the Council of Geoscience's Geological Map, the site is underlain by Dwyka Tillite (glacial deposits) and shale bedrock of the Pietermaritzburg Formation which has been intruded by dolerite. The soil cover comprises a mantle of colluvium (sandy silt/silty clay) which overlies residual shale/tillite (silty clay), capped frequently by fill materials (silty sand with concrete fragments). Organic-rich colluvial and wet alluvial soils are encountered in the low-lying areas in the vicinity of drainage lines (GEOSURE, 2014).

\*Source of information on geology/soils: Geotechnical Report for the Proposed Phase1 Extension of the Bhambayi Housing Project (GEOSURE, 2014).

#### **3.1.3 Hydrology**

According to (Eco-pulse, 2014), "the project area falls within the DWA Quaternary catchment U20M and includes a number of small rivers and streams that are tributaries of the Shembe River and drain the region in a south-easterly direction. Groundwater seepage activity was noted at perched levels, indicating a perched water table that is generally consistent with the weakly drained valley head/bottom topographies (GEOSURE, 2014). These small stream and rivers later reach the large uMgeni River, a perennial river system and strategically important water resource for eThekweni and KZN that discharges into the Indian Ocean" (Eco-pulse, 2014).

\*Source of information on hydrology: Geotechnical Report for the Proposed Phase1 Extension of the Bhambayi Housing Project (GEOSURE, 2014) and Bhambayi Extension Phase 1 Development: Aquatic Assessment (Eco-pulse, 2014).

### **3.1.4 Biodiversity**

#### (a) Flora

“The site falls within the Indian Ocean Coastal Belt bioregion (Mucina & Rutherford, 2006). While biomes and bioregions are valuable as they describe broad ecological patterns, they provide limited information on the actual species that are expected to be found in an area. Knowing which vegetation type an area belongs to provides an indication of the floral composition that would be found if the assessment site was in a pristine condition, which can then be compared to the observed floral list and so provide an indication of the ecological integrity of the assessment site. Ezemvelo’s KZN Wildlife Provincial Vegetation Map (EKZWNW, 2012) indicates that the majority of the targeted area comprises KZN KwaZulu-Natal Coastal Belt Grassland, which is Critically Endangered in terms of conservation/threat status. Riverine and wetland areas are not shown at the mapping scale of the KZN vegetation map, although the vegetation type typically associated with wetlands and riverine areas would be Subtropical Alluvial Vegetation (Endangered EN status).” (Eco-pulse, 2014).

#### (b) Fauna

No local biodiversity conservation priorities were flagged for the study area which is considered a transformed environment. Due to the nature of the site and that it is within an existing highly densified residential area, no fauna are likely to be found on site. Only birds, mice and snakes would be restricted within the riparian areas.

\*Source of information on Biodiversity: Bhambayi Extension Phase 1 Development: Aquatic Assessment (Eco-pulse, 2014).

## **3.2 Social Environment**

### **3.2.1 Demographics**

#### (a) Level of unemployment:

KwaZulu-Natal has the second largest provincial economy in South Africa after Gauteng. With a total area of 94 361 square kilometres, KwaZulu-Natal is the country's third-smallest province, taking up 7,7 percent of South Africa's land area, and is home to the largest percentage (20,6) of the population an estimated 9.9-million people. It contributes R206,8-billion or 16,5 percent towards the country's Gross Domestic Product (GDP).

With these stats KZN still has an unemployment rate of 25.2%. The unemployment rate reached its peak in 2003 reaching 34.2% from 20.8% in 2000. From 2004 onwards the rate of unemployment receded to reach 19.9% in 2010. The same pattern is observed amongst the youth albeit with a higher unemployment rate. In the past decade youth unemployment rate grew by an annual average of 37.2%. This represents potential priority areas for sustainable investment, employment creation and skills development by the DBSA, government as well as private sector.

Unemployment has been identified as one of the major structural constraints within the Province and contributes to high levels of poverty and income inequality, which deteriorates the overall quality of life of the people of the Province. High unemployment results in high dependency ratios, with many more people relying on fewer wage earners. This has resulted in the phenomenon of a large number of working households living near or below the poverty line. Currently an unequally large proportion of the population of KZN relies on grants and related forms of welfare as a source of income.

(b) Economic profile of local municipality:

KwaZulu-Natal has the second largest provincial economy in South Africa after Gauteng. With a total area of 94 361 square kilometres, KwaZulu-Natal is the country's third-smallest province, taking up 7,7 percent of South Africa's land area, and is home to the largest percentage (20,6) of the population - an estimated 9.9-million people. It contributes R206,8-billion or 16,5 percent towards the country's Gross Domestic Product (GDP).

KwaZulu-Natal's manufacturing sector is the second largest in the country, after Gauteng province. It is a key sector in the provincial economy, growing at a stable and steady rate, generating 20 percent of provincial employment. Positioned as Africa's global trade gateway, KwaZulu-Natal is poised to become an international player in the global economy as a leading trade and investment destination.

The country's two largest and busiest ports in Africa, Durban and Richards Bay, are located on the KwaZulu-Natal coastline and these cities are also the major focal points of industrial investment. Durban has 5 000 commercial vessels passing through its port every year where 26 million tons of cargo with a value of R50 billion are handled. Richards Bay on the other hand has 57 percent of South African port cargo by volume and 14 percent by value.

KwaZulu-Natal's Gross Domestic Product (GDP) is made up from diverse economic sources which together comprise 13 percent of the country's GDP while its economy is predominantly driven by its gateway status into and out of Southern Africa. This has encouraged a strong concentration of manufacturing investment, 21,5 percent of the GDP is made up of manufacturing compared with 19 percent of the GDP for South Africa. KwaZulu-Natal's transport and communications sector at 15 percent is larger than at national level where the sector contributes 10 percent. KwaZulu-Natal has modern and well-developed logistics and financial sectors with one of the fastest growing provincial economies at an average growth rate of 4,3 percent per annum.

(c) Level of education:

The KZN Education Department announcement in Durban on the 6 January 2015 is that just under 70 percent of Grade 12's in the province passed their 2014 National Senior Certificate. This is a drop of almost 8 percentage points compared to 2013. The province recorded the biggest fall in its Matric pass rate of all the provinces.

### 3.2.2 Land use character of surrounding area

Land use in the area and catchment is mainly in the form of dense residential housing infrastructure, with houses comprising a mix of formal, semi-formal and informal dwellings. A network of tarred and dirt roads provide access to the individual residences. Housing density is high to very high, with very little remaining untransformed/natural habitat. Associated with dense settlement of this nature and the apparent lack of service delivery, is the prevalence of solid waste dumped within watercourses and riparian habitat. Leaking sewer systems are also prevalent in the project area. Alien/exotic vegetation and weeds have replaced the majority of indigenous wetland/riparian vegetation.

**Table 10: Summary of Land uses within 500m of the site**

Natural area X	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station <sup>H</sup>
Medium density residential X	School X	Landfill or waste treatment site
High density residential X	Tertiary education facility	Plantation
Informal residential X	Church	Agriculture
Retail commercial & warehousing X	Old age home	River, stream or wetland X
Light industrial	Sewage treatment plant	Nature conservation area
Medium industrial	Train station or shunting yard <sup>N</sup>	Mountain, koppie or ridge
Heavy industrial	Railway line	Museum
Power station	Major road (4 lanes or more)	Historical building
Office/consulting room	Airport	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

### 3.2.3 Cultural Heritage

The proposed development site comprises a much modified landscape due to human settlement, illegal dumping and sand mining. There were no signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site. No building structures older than 60 years will be affected in anyway. The Heritage specialist have indicated that development proceed with no further heritage mitigation and have submitted this report to Amafa aKwaZulu-Natali in fulfilment of the requirements of the National Heritage Resources Act.

If however any items or artefacts deemed to have any significant importance during the construction phase of the project, the necessary actions as outlined within the Environmental Management Plan Report (EMPr) for this project must be implemented. (Refer to Appendix F for the EMPr).

Refer to **Appendix D2** for the full Heritage Impact Assessment.

## 4 BASIC ASSESSMENT PROCESS

### 4.1 Approach to the BA Process

A Basic Assessment (BA) is an effective environmental planning tool. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The BA process for this project complies with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) [NEMA] and the NEMA EIA Regulations, 2014. The guiding principles of a BA Process are listed below.

### 4.2 Guiding Principles for a BA Process

The BA Process must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with Interested and Affected Parties (I&APs) representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should finally be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

The eight guiding principles that govern the entire process of BA Process are as follows:

- **Participation:** An appropriate and timely access to the process for all interested parties.
- **Transparency:** All assessment decisions and their basis should be open and accessible.
- **Certainty:** The process and timing of the assessment should be agreed in advanced and followed by all participants.
- **Accountability:** The decision-makers are responsible to all parties for their action and decisions under the assessment process.
- **Credibility:** Assessment is undertaken with professionalism and objectivity.
- **Cost-effectiveness:** The assessment process and its outcomes will ensure environmental protection at the least cost to the society.
- **Flexibility:** The assessment process should be able to adapt to deal efficiently with any proposal and decision making situation.
- **Practicality:** The information and outputs provided by the assessment process are readily usable in decision making and planning.

A BA process is considered as a project management tool for collecting and analysing information on the environmental effects of a project. As such, it is used to:

- Identify potential environmental impacts;
- Examine the significance of environmental implications;
- Assess whether impacts can be mitigated;
- Recommend preventive and corrective mitigating measures;
- Inform decision makers and concerned parties about the environmental implications; and
- Advise whether development should go ahead.

The Public Participation Process forms an integral part of the Basic Assessment Process and is discussed in greater detail in **Section 4.4** of this BAR.

### **4.3 BA Technical Process**

This section provides a summary of the technical process that has been followed to date for this BA process.

#### **4.3.1 Application for Authorisation**

The EIA application form was submitted to the KZN EDTEA on 29 September 2016. The project was subsequently registered and KZN EDTEA issued the project with reference number **DM/0027/2016**. Refer to **Appendix J** for the Application Form and the KZN EDTEA acknowledgement of receipt of the application.

#### **4.3.2 Information Gathering**

Early in the BA process, the technical specialists identified the information that would be required for the impact assessment and the relevant data was obtained. In addition, the specialists sourced available information about the receiving environment from reliable sources, I&APs, previous documented studies in the area.

#### **4.3.3 Specialist Studies**

The following specialist studies have been undertaken for the BA process:

- Wetland Aquatic Assessment
- Heritage Impact Assessment
- Geotechnical Assessment

### **4.4 Public Participation Process**

The principles of NEMA govern many aspects of the BA process, including consultation with I&APs. These principles include the provision of sufficient and transparent information to I&APs on an ongoing basis, to allow them to comment; and ensuring the participation of historically disadvantaged individuals, including women, the disabled and the youth.

The principal objective of public participation is thus to inform and enrich decision-making.

#### **4.4.1 Identification of Interested and Affected Parties**

I&APs representing the following sectors of society have been identified (see **Appendix E1** for a complete preliminary I&AP distribution list):

- Provincial Authorities;
- Local Authorities;
- Ward Councillors;
- Adjacent Landowners.

#### **4.4.2 Public Announcement of the Project**

I&APs were informed of the project and were requested to register and send their comments to GIBB in the following manner (see Appendix E for public announcement documentation):

- Publication of media advertisement in the Metro ezaseGagasini.
- On-site notices detailing the proposed development, the BA process and invitation to register and comment, were placed on and around the site; and
- Distribution of letters by email to I&APs identified in **Section 4.4.1** above.

#### **4.4.3 Database of Registered and Affected Parties**

A preliminary database was compiled for this project and will be updated as the public participation process progresses. All I&APs who register will be included within this database (refer to **Appendix E1**).

#### **4.4.4 Basic Assessment Report (BAR) for Public Review**

A period of 30 calendar days (**11 November 2016 – 12 December 2016**) is allowed to the State Departments, and the general public for the review and commenting phase of the Draft BAR. The availability of the Draft BAR will be announced by means of public notice (refer to **Section 4.4.2** above) and personal letters to all identified stakeholders on the distribution list.

Comments that will be received during public review of the Draft BAR, will be captured in a Comments & Response Report and will be attached to the Final BAR in **Appendix E5**.

## 5 *IMPACT ASSESSMENT*

### 5.1 *Impact Identification and Assessment Methodology*

The assessment criteria must clearly identify the environmental impacts of the proposed development. The environmental impacts identified will be quantified and the significance of the impacts assessed according to the criteria set out below. The EAP must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the EAP must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/her professional expertise and experience.

#### 5.1.1 **Assessment Procedure: Proposed Impact Assessment Methodology**

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed development.

For each of the main project phases the existing and potential future impacts and benefits (associated only with the proposed development) were described using the criteria listed in the Impact Assessment Methodology below and attached in **Appendix F**. This was done in accordance with Government Notice R.982, promulgated in terms of Section 24 of the NEMA and the criteria drawn from the IEM Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the DEAT (April 1998). The assignment of ratings has been undertaken based on past experience of the EIA team, as well as through research. Subsequently, mitigation measures have been identified and considered for each impact and the assessment repeated in order to determine the significance of the residual impacts (the impact remaining after the mitigation measure has been implemented). Please refer to the tables below for the impact assessment.

**IMPACT ASSESSMENT METHODOLOGY**

Duration		Extent		Irreplaceable Resources		Severity		Probability		Consequence = (Duration+Extent+Irr) x Severity		Significance		Confidence
1	Temporary	1	Footprint	1	Yes	-3	High - negative	0	Improbable	-25 to -33	Extremely detrimental	-49 to -66	Very high - negative	Low
2	Short term	2	Site	0	No	-2	Moderate - negative	1	Probable	-19 to -24	Highly detrimental	-37 to -48	High - negative	Medium
3	Medium term	3	Local			-1	Low -negative	2	Definite	-13 to -18	Moderately detrimental	-25 to -36	Moderate - negative	High
4	Long term	4	Regional			0	Negligible			-7 to -12	Slightly detrimental	-13 to -24	Low - negative	
		5	National			1	low -positive			0 to -6	Negligible	0 to -12	Very low - negative	
		6	International			2	moderate - positive							
						3	high - positive			0 to 6	Negligible	0 to 12	Very Low - positive	
										7 to 12	Slightly beneficial	13 to 24	Low - positive	
										13 to 18	Moderately beneficial	25 to 36	Moderate - positive	
										19 to 24	Highly beneficial	37 to 48	High - positive	
										25 to 33	Extremely beneficial	49 to 66	Very high - positive	

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the effect of the impact related to the proposed development
	Negative	
Extent	Footprint	The impact only affects the area in which the proposed activity will occur
	Site	The impact will affect only the development area
	Local	The impact affects the development area and adjacent properties
	Regional	The effect of the impact extends beyond municipal boundaries
	National	The effect of the impact extends beyond more than 2 regional/ provincial boundaries
	International	The effect of the impact extends beyond country borders
Duration	Temporary	The duration of the activity associated with the impact will last 0-6 months
	Short term	The duration of the activity associated with the impact will last 6-18 months
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years
	Long term	The duration of the activity associated with the impact will last more than 5 years
Severity	low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected
	moderate	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected
	high	Where natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.
Potential for impact on irreplaceable resources	No	No irreplaceable resources will be impacted.
	Yes	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental	A combination of extent, duration, intensity and the potential for impact on irreplaceable resources
	Highly detrimental	
	Moderately detrimental	
	Slightly detrimental	
	Negligible	
	Slightly beneficial	
	Moderately beneficial	
	Highly beneficial	
Extremely beneficial		
Probability (the likelihood of the impact occurring)	Improbable	It is highly unlikely or less than 50 % likely that an impact will occur.
	Probable	It is between 50 and 70 % certain that the impact will occur.
	Definite	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance	Very high - negative	A function of Consequence and Probability
	High - negative	
	Moderate - negative	
	Low - negative	
	Very low	
	Low - positive	
	Moderate - positive	
	High - positive	
Very high - positive		

## 5.2 Impact Identification and Assessment of the proposed Activity

The impacts identified and assessed in accordance with the procedure outlined in Section 5.1 above has been tabulated below in Error! Reference source not found..

For the purpose of assessing impacts of the proposed development, the project has been divided into three phases from which impacting activities has been identified, namely:

- Construction Phase
- Operational Phase
- Decommissioning Phase

**Table 11: Impact Assessment Table: Bhambayi Phase 1 Extension (Pat Marshal) Housing Project**

	Pre-mitigation:		Post-mitigation:
Impact	Significance	Recommended Mitigation	Significance
<b>CONSTRUCTION PHASE</b>			
<b>Direct Impacts</b>			
Contamination of soil from leaks/spillages of hydrocarbons from machinery used during construction phase.	<b>Low - negative</b>	1. Topsoil to be adequately stockpiled on site and protected from contamination and windblown pollution. Make sure the soil is protected from leaks/spills.	<b>Very low - negative</b>
Contamination/Pollution of groundwater from leaks/spillages of either hydrocarbons, waste or waste water as a result of construction activities.	<b>Moderate - negative</b>	1. Provide drip-trays / or use other methods to reduce leaking of standing machinery/plant. 2. The machinery on site is not to be refuelled or serviced near natural areas. 3. Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately. 4. Provide solid waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal. 5. Ensure that any rubbish generated during construction as well as from employees (litter) is regularly cleared from the site, in particular from streams and wetlands. 6. Cement batching boards should be used and cement-based products/wash not to be disposed of into the natural environment. 7. Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where	<b>Very low - negative</b>

		<p>construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.</p> <p>8. The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered during construction.</p> <p>9. Construction materials liable to spillage need to be stored in appropriate containment structures (e.g. drip-trays or concrete bunded areas).</p> <p>10. Design and implement an appropriate drainage system to divert uncontaminated surface water around or away from the construction site and coal storage area.</p> <p>11. Appropriate methods should be employed to prevent wash of any contaminated materials..</p>	
<p>Contamination/Pollution of surface water from leaks/spillages of either hydrocarbons, waste or waste water as a result of construction activities</p>	<p><b>Moderate - negative</b></p>	<p>1. Provide drip-trays / or use other methods to reduce leaking of standing machinery/plant.</p> <p>2. The machinery on site is not to be refuelled or serviced near natural areas.</p> <p>3. Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately.</p> <p>4. Provide solid waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal.</p> <p>5. Ensure that any rubbish generated during construction as well as from employees (litter) is regularly cleared from the site, in particular from streams and wetlands.</p> <p>6. Cement batching boards should be used and cement-based products/wash not to be disposed of into the natural environment.</p> <p>7. Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.</p> <p>8. The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered during construction.</p>	<p><b>Very low - negative</b></p>

		<p>9. Construction materials liable to spillage need to be stored in appropriate containment structures (e.g. drip-trays or concrete bunded areas).</p> <p>10. Design and implement an appropriate drainage system to divert uncontaminated surface water around or away from the construction site and coal storage area.</p> <p>11. Appropriate methods should be employed to prevent wash of any contaminated materials.</p>	
Increased noise generation from construction activities.	<b>Very low - negative</b>	<p>1. Limit the amount of construction vehicles on site.</p> <p>2. Maintain construction vehicles and machinery in good working order to reduce the noise on site</p> <p>3. Equipment should be fitted with noise reduction devices.</p>	<b>Very low - negative</b>
Increased job opportunities	<b>Very Low - positive</b>	<p>1. Meet the requirements of the government policies for procurement and employment, as are applicable to local government, to take care of and avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere.</p>	<b>Low - positive</b>
Increased air emissions from construction activities.	<b>Low - negative</b>	<p>1. Control the amount of construction vehicles on site.</p> <p>2. Exposed soil must be dampened and or covered to prevent wind action from causing dust plumes.</p> <p>3. Machinery and vehicles must be in good working conditions so as to emit minimal air pollution.</p>	<b>Very low - negative</b>
<b>Indirect impacts</b>			
Soil Erosion and Sedimentation of water resources as a result of construction activities	<b>Low - negative</b>	<p>1. Implementation and maintenance of a storm water management system to prevent runoff and formation of gully erosion on site.</p> <p>2. Adequate levelling and compaction during construction activities.</p> <p>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</p> <p>4. Minimise erosion and drainage problems by avoiding tracks crossing contours at right angles, thereby avoiding steep slopes.</p> <p>5. Berms and drainage channels should be constructed at regular intervals that will divert the flow of water away from the excavation ditch into storm water systems or adjacent vegetation to minimise surface flow and hence rill and sheet erosion of the exposed soils.</p>	<b>Very low - negative</b>

Loss of vegetation as a result of site clearance	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Limit the removal of vegetation to the construction/site footprint.</li> <li>2. Have a search and rescue operation on site of all the vegetation.</li> <li>3. Remove the invasive Category 1, 2 and 3 species.</li> <li>4. Limit the removal of vegetation to the construction footprint. Remove all invasive species on site.</li> <li>5. Ensure employees have been educated in minimizing environmental impacts.</li> <li>6. No bulldozers must be used in bush clearing.</li> <li>7. Avoid indigenous vegetation where possible.</li> </ol>	<b>Very low - negative</b>
Loss of fauna as a result of site clearance.	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Where rare fauna (vertebrate and invertebrate) stands to be lost, every effort should be made to minimise the impact.</li> <li>2. Prohibit / control access to portions of the property that is to remain undeveloped; and ensure that animals are not impacted on (e.g. illegal poaching)</li> <li>3. Clear the site in a logical sequence and manner that allows mobile species to escape.</li> <li>4. Maintain any habitat corridors effectively.</li> </ol>	<b>Very low - negative</b>
Siltation/Sedimentation in storm water pipelines	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the disturbance generated by construction vehicles on site, reducing dust emissions.</li> <li>2. Adequate levelling and compaction during construction activities so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Sedimentation control devices, such as berms, must be temporarily installed in order to prevent sedimentation.</li> <li>5. Soil storage areas must be located further than 50 meters from any water body or water source.</li> </ol>	<b>Very low - negative</b>
Impact on heritage sites and artefacts	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. AMAFA should be contacted if any graves are identified during earth moving activities and all development should cease until further notice.</li> <li>2. No structures other than sixty years are allowed to be demolished, altered or destroyed without a permit from AMAFA.</li> </ol>	<b>Very low - negative</b>
<b>Cumulative Impacts</b>			
Colonization of alien vegetation as a result of stockpiling and clearance of vegetation	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Control exotic weeds and invaders that might establish within the project site.</li> <li>2. Alien plants that have been cleared from the site must be removed and disposed of at a nearby landfill site.</li> </ol>	<b>Very low - negative</b>

Increased dust emissions as a result of construction activities	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the turbulence produced from construction vehicles on the roads by limiting the amount of vehicles on site.</li> <li>2. Adequate levelling and compaction during construction activities so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Areas that have been stripped of vegetation and soil stockpiles must be dampened periodically to avoid excessive dust.</li> </ol>	<b>Very low - negative</b>
Reduced terrestrial functioning	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the turbulence produced from construction vehicles on site by controlling the amount vehicles on site.</li> <li>2. Adequate levelling and compaction during construction activities so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Clearing of vegetation to site specific only, so not to reduce habitats.</li> </ol>	<b>Very low - negative</b>
Increased flooding and runoff due to soil compaction	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Develop, implement and apply mitigation measures to effectively suppress airborne dust at site <ul style="list-style-type: none"> <li>• Minimise the surface area of exposed soil and fine materials to wind erosion</li> <li>• Damp / wet down trafficked areas with water, and where appropriate, apply suitable additives to reduce the application frequency and use of water</li> <li>• Undertake regular audits to monitor any significant dust emissions.</li> </ul> </li> <li>2. Keep surrounding vegetation to protect the site.</li> </ol>	<b>Very low - negative</b>

**OPERATIONAL PHASE**

**Direct Impacts**

Contamination/Pollution of groundwater	<b>Moderate - negative</b>	<ol style="list-style-type: none"> <li>1. Provide drip-trays / or use other methods to reduce leaking of standing machinery/plant.</li> <li>2. The machinery on site is not to be refuelled or serviced near natural areas.</li> <li>3. Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately.</li> <li>4. Provide solid waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal.</li> <li>5. Ensure that any rubbish generated during construction as well as from employees (litter)</li> </ol>	<b>Very low - negative</b>
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		<p>is regularly cleared from the site, in particular from streams and wetlands.</p> <p>6. Cement batching boards should be used and cement-based products/wash not to be disposed of into the natural environment.</p> <p>7. Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.</p> <p>8. The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered during construction.</p> <p>9. Construction materials liable to spillage need to be stored in appropriate containment structures (e.g. drip-trays or concrete bunded areas).</p> <p>10. Design and implement an appropriate drainage system to divert uncontaminated surface water around or away from the construction site and coal storage area.</p> <p>11. Appropriate methods should be employed to prevent wash of any contaminated materials.</p>	
Contamination/Pollution of surface water	<b>Moderate - negative</b>	<p>1. Provide drip-trays / or use other methods to reduce leaking of standing machinery/plant.</p> <p>2. The machinery on site is not to be refuelled or serviced near natural areas.</p> <p>3. Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately.</p> <p>4. Provide solid waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal.</p> <p>5. Ensure that any rubbish generated during construction as well as from employees (litter) is regularly cleared from the site, in particular from streams and wetlands.</p> <p>6. Cement batching boards should be used and cement-based products/wash not to be disposed of into the natural environment.</p> <p>7. Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Waste from chemical</p>	<b>Very low - negative</b>

		<p>toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.</p> <p>8. The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered during construction.</p> <p>9. Construction materials liable to spillage need to be stored in appropriate containment structures (e.g. drip-trays or concrete bunded areas).</p> <p>10. Design and implement an appropriate drainage system to divert uncontaminated surface water around or away from the construction site and coal storage area.</p> <p>11. Appropriate methods should be employed to prevent wash of any contaminated materials.</p>	
Increased noise generation from everyday vehicular use	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Limit the amount of construction vehicles on site.</li> <li>2. Maintain construction vehicles and machinery in good working order to reduce the noise on site</li> <li>3. Equipment should be fitted with noise reduction devices.</li> </ol>	<b>Very low - negative</b>
Impact on fauna as a result of fishing hunting etc.	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Where rare fauna (vertebrate and invertebrate) stands to be lost, every effort should be made to minimise the impact.</li> <li>2. Prohibit / control access to portions of the property that is to remain undeveloped; and ensure that animals are not impacted on (e.g. illegal poaching)</li> <li>3. Clear the site in a logical sequence and manner that allows mobile species to escape.</li> <li>4. Maintain any habitat corridors effectively.</li> </ol>	<b>Very low - negative</b>
Increased job opportunities	<b>Very Low - positive</b>	<ol style="list-style-type: none"> <li>1. Meet the requirements of the government policies for procurement and employment, as are applicable to local government, to take care of and avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere.</li> </ol>	<b>Low - positive</b>
Reduced water quality as a result of illegal dumping in the watercourse	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Monitor water quality of those tributaries the project crosses.</li> <li>2. Monitor there is no spillages in the tributaries.</li> <li>3. Make sure the banks on the tributaries are stable.</li> <li>4. Make sure the contractor has a plan in place if a spillage occurs on site.</li> </ol>	<b>Very low - negative</b>
<b>Indirect impacts</b>			

Soil Erosion as a result of poor rehabilitation	<b>Moderate - negative</b>	<ol style="list-style-type: none"> <li>1. Implementation and maintenance of a storm water management system to prevent runoff and formation of gully erosion on site.</li> <li>2. Adequate levelling and compaction during construction activities.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Minimise erosion and drainage problems by avoiding tracks crossing contours at right angles, thereby avoiding steep slopes.</li> <li>5. Berms and drainage channels should be constructed at regular intervals that will divert the flow of water away from the excavation ditch into storm water systems or adjacent vegetation to minimise surface flow and hence rill and sheet erosion of the exposed soils.</li> </ol>	<b>Very low - negative</b>
Siltation/Sedimentation in storm water pipelines	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the disturbance generated by construction vehicles on site, reducing dust emissions.</li> <li>2. Adequate levelling and compaction during construction activities so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Sedimentation control devices, such as berms, must be temporarily installed in order to prevent sedimentation.</li> <li>5. Soil storage areas must be located further than 50 meters from any water body or water source.</li> </ol>	<b>Very low - negative</b>
Management of all waste material on site	<b>Moderate - negative</b>	<ol style="list-style-type: none"> <li>1. Identify disposal sites for the various categories of waste likely to be generated on site.</li> <li>2. Make sure general cleanliness on site</li> <li>3. Reduce, recycling and reuse of waste must occur whenever possible.</li> <li>4. Recycling bins must be separate and clearly marked according to material</li> <li>5. Waste must be stored safely away from employees' and residents' exposure.</li> <li>6. Construction debris is not to be buried on site.</li> <li>7. No burning of waste will occur on site, unless to remove alien seeds from storage sites.</li> </ol> <p>2.</p>	<b>Very low - negative</b>
<b>Cumulative Impacts</b>			
Increase in alien vegetation as result of poor rehabilitation	<b>Moderate - negative</b>	<ol style="list-style-type: none"> <li>1. Control exotic weeds and invaders that might establish within the project site.</li> <li>2. Alien plants that have been cleared from the site must be removed and disposed of at a</li> </ol>	<b>Very low - negative</b>

		nearby landfill site.	
<b>DECOMMISSIONING PHASE</b>			
<b>Direct Impacts</b>			
Increased heavy vehicle traffic during site closure and rehabilitation	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Limit/Restrict access on site.</li> <li>2. Implement speed control measures in close proximity to the access point and on site to reduce the erosion on site.</li> </ol>	<b>Very low - negative</b>
Increased noise generation from heavy vehicles during site closure and rehabilitation	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Keep surrounding vegetation, especially larger trees and shrubs, to create a screen reducing visibility from public help reduce the noise on site.</li> <li>2. Ensure machinery is maintained and kept in good working order.</li> <li>3. Equipment should be fitted with noise reduction devices.</li> </ol>	<b>Very low - negative</b>
Contamination of soil	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Source of contamination will be dug up through decommissioning activities and dumped in a legal landfill site, thereby minimizing further mobilization of contaminants.</li> </ol>	<b>Very low - negative</b>
Contamination/Pollution of surface water	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. The site must be correctly covered to prevent pollution of surface runoff and to reduce erosion on site.</li> <li>2. Ensure regular surface water monitoring on the site</li> </ol>	<b>Very low - negative</b>
Contamination/Pollution of groundwater	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. There must be no spills or leaks from vehicles/machinery/ablution facilities and all waste disposal facilities must be lined by impermeable materials to prevent seepage into ground water.</li> <li>2. Installation of groundwater monitoring boreholes to monitor migration and concentration of pollution plumes, on site.</li> <li>3. The site must be correctly covered and seeded to prevent pollution of surface runoff and to reduce groundwater contamination. As well as reducing soil erosion.</li> </ol>	<b>Very low - negative</b>
Job creation	<b>Very Low - positive</b>	<ol style="list-style-type: none"> <li>1. Meet the requirements of the government policies for procurement and employment, as are applicable to local government, to take care of and avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere.</li> </ol>	<b>Low - positive</b>
<b>Indirect Impacts</b>			
Soil Erosion	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Implementation and maintenance of a storm water management system to prevent runoff and formation of gully erosion (e.g. storm water berms and channels).</li> <li>2. Adequate levelling and compaction during operational and decommissioning activities.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> </ol>	<b>Very low - negative</b>

Loss of vegetation	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Limit the removal of vegetation to the site footprint.</li> <li>2. Have a search and rescue operation on site.</li> <li>3. Remove the invasive Category 1, 2 and 3 species.</li> </ol>	<b>Very low - negative</b>
Siltation/Sedimentation in storm water pipelines	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the turbulence produced from construction vehicles on site, limit the access on site.</li> <li>2. Adequate levelling and compaction during operational and decommissioning phases so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> </ol>	<b>Very low - negative</b>
<b>Cumulative</b>			
Increase dust emissions	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the turbulence on site produced from the construction vehicles, by limiting the access on site.</li> <li>2. Adequate levelling and compaction during the decommissioning phases so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> <li>4. Dampening of exposed soils to reduce the spread of dust on site.</li> </ol>	<b>Very low - negative</b>
Increase in alien vegetation	<b>Very low - negative</b>	<ol style="list-style-type: none"> <li>1. Control exotic weeds and invaders that might establish on the re-vegetated areas, to allow the landscape vegetation to properly establish</li> <li>2. Make use of indigenous species for rehabilitation.</li> </ol>	<b>Very low - negative</b>
Reduced terrestrial functioning	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Reduce the dust turbulence produced on site from the heavy construction vehicles, by limiting the access and wetting the roads.</li> <li>2. Adequate levelling and compaction during decommissioning phase so to reduce the wind blow pollution.</li> <li>3. Adequate stockpiling of topsoil, away from prevalent winds and high gradient slopes.</li> </ol>	<b>Very low - negative</b>
Acceleration of climate change due to loss of vegetation	<b>Low - negative</b>	<ol style="list-style-type: none"> <li>1. Adequate levelling and compaction during construction activities so to reduce the wind blow pollution.</li> <li>2. Once area on site is cleared a rehab plan should be in place to restore the natural environment.</li> <li>3. Remove invasive species from site and plant indigenous species on site.</li> <li>4. Clearing to site specific only, so not to reduce habitats.</li> </ol>	<b>Very low - negative</b>

<p>Increased flooding and runoff on site</p>	<p><b>Very low - negative</b></p>	<p>1. Develop, implement and apply mitigation measures to effectively suppress airborne dust at site</p> <ul style="list-style-type: none"> <li>• Minimise the surface area of exposed soil and fine materials to wind erosion</li> <li>• Damp / wet down trafficked areas with water, and where appropriate, apply suitable additives to reduce the application frequency and use of water</li> <li>• Undertake regular audits to monitor any significant dust emissions.</li> </ul> <p>2. Keep surrounding vegetation to protect the river banks.</p>	<p><b>Very low - negative</b></p>
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## 6 CONCLUSIONS AND RECOMMENDATIONS

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 6.1 Environmental Impact Statement

It is the opinion of the EAPs that should the project proceed, impacts on the receiving natural areas can be minimised through the careful adherence to suggested mitigation measures.

Given the low significance of potential impacts associated with the Preferred Alternative, as well as the site already having been disturbed and maintained by eThekweni Municipality as a recreational and park area for the local surrounding community. It is recommended that this site be considered for this development as the preferred alternative. This alternative will have the least impact on the sensitive surrounding environments, including the wetland ecosystems. The preferred option has taken into account the recommend buffer zones that are in place when developing a project within 32-meters of a water course.

The development site is also located within a significantly disturbed and transformed landscape characterized by existing dense human settlement comprising both informal and semi-formal houses. One small tributary river system was identified as occurring within the development site. The tributary was delineated (riparian habitat) and assessed in terms of baseline condition and ecological importance & sensitivity of the resources. It was found to be in a highly degraded (seriously modified) state as a result of the combination of catchment impacts on hydrology and water quality (sediment & pollutants) as well as on site disturbances associated with housing development in the area, including aspects such as dense alien plant infestations, river bank erosion and channel incision and solid waste dumping.

The current land use in the project area is mainly in the form of dense residential housing infrastructure, with houses comprising a mix of formal, semi-formal and informal dwellings. A network of tarred and dirt roads provide access to the individual residences. Housing density is high to very high, with very little remaining untransformed/natural habitat. Associated with dense settlement of this nature and the apparent lack of service delivery, is the prevalence of solid waste dumped within watercourses and riparian habitat.

In addition to this many families in the Bhambayi area have also been displaced as a result of disasters in the area (e.g. Flooding) and require houses urgently.

There is therefore a need to supply housing opportunities which includes secure tenure, basic services and support in achieving incremental housing improvement in living environments with requisite social, economic and physical infrastructure. By providing housing to families in need, this will firstly meet some of the backlog for this area and

secondly reduce negative impacts on the environment. Through this project the municipality will be able to create a sustainable human settlement.

**Key:**

Significance	
-49 to -66	Very high - negative
-37 to -48	High - negative
-25 to -36	Moderate - negative
-13 to -24	Low - negative
0 to -12	Very low - negative
0 to 12	Very Low - positive
13 to 24	Low - positive
25 to 36	Moderate - positive
37 to 48	High - positive
49 to 66	Very high - positive

Table 12: GIBB Impact Assessment Summary

**IMPACT SUMMARY**

Impact	Pre-mitigation:	Post-mitigation:
	Significance	Significance
<b>CONSTRUCTION PHASE</b>		
<b>Direct Impacts</b>		
Contamination of soil from leaks/spillages	Low - negative	Very low - negative
Contamination/Pollution of groundwater from leaks/spillages of either hydrocarbons waste or waste water.	Moderate - negative	Very low - negative
Contamination/Pollution of surface water from leaks/spillages of either hydrocarbons waste or waste water.	Moderate - negative	Very low - negative
Increased noise generation from construction activities.	Very low - negative	Very low - negative
Increased job opportunities	Very Low - positive	Very Low - positive
Increased air emissions from construction activities.	Low - negative	Very low - negative
<b>Indirect impacts</b>		

Soil Erosion and Sedimentation of water resources as a result of construction activities	Low - negative	Very low - negative
Loss of vegetation	Very low - negative	Very low - negative
Loss of fauna as a result of clearance.	Very low - negative	Very low - negative
Siltation/Sedimentation in storm water pipelines	Very low - negative	Very low - negative
Impact on heritage sites and artefacts	Low - negative	Very low - negative
<b>Cumulative Impacts</b>		
Colonization of alien vegetation as a result of stockpiling and clearance of vegetation	Low - negative	Very low - negative
Increased dust emissions as a result of construction activities	Very low - negative	Very low - negative
Reduced terrestrial functioning	Very low - negative	Very low - negative
Increased flooding and runoff due to soil compaction	Very low - negative	Very low - negative
<b>OPERATIONAL PHASE</b>		
<b>Direct Impacts</b>		
Contamination/Pollution of groundwater	Moderate - negative	Very low - negative
Contamination/Pollution of surface water	Moderate - negative	Very low - negative
Increased noise generation from everyday vehicular use	Low - negative	Very low - negative
Impact on fauna as a result of fishing hunting etc.	Low - negative	Very low - negative
Increased job opportunities	Very Low - positive	Low - positive
Reduced water quality as a result of illegal dumping in the watercourse	Low - negative	Very low - negative
<b>Indirect impacts</b>		
Soil Erosion as a result of poor rehabilitation	Moderate - negative	Very low - negative
Siltation/Sedimentation in storm water pipelines	Low - negative	Very low - negative
Management of all waste material on site	Moderate - negative	Very low - negative
<b>Cumulative Impacts</b>		
Increase in alien vegetation as result of poor rehabilitation	Moderate - negative	Very low - negative
<b>DECOMMISSIONING PHASE</b>		
<b>Direct Impacts</b>		
Increased heavy vehicle traffic during site closure and rehabilitation	Very low - negative	Very low - negative
Increased noise generation from heavy vehicles during site closure and rehabilitation	Low - negative	Very low - negative
Contamination of soil	Low - negative	Very low - negative
Contamination/Pollution of surface water	Low - negative	Very low - negative

Contamination/Pollution of groundwater	Low - negative	Very low - negative
Job creation	Very Low - positive	Low - positive
<b>Indirect Impacts</b>		
Soil Erosion	Low - negative	Very low - negative
Loss of vegetation	Low - negative	Very low - negative
Siltation/Sedimentation in stormwater pipelines	Low - negative	Very low - negative
<b>Cumulative</b>		
Increase dust emissions	Low - negative	Very low - negative
Increase in alien vegetation	Very low - negative	Very low - negative
Reduced terrestrial functioning	Low - negative	Very low - negative
Acceleration of climate change due to loss of vegetation	Low - negative	Very low - negative
Increased flooding and runoff on site	Very low - negative	Very low - negative

## 6.2 EAP's Recommendation

It is the EAPs opinion that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for.

Having assessed all the potential environmental impacts associated with the proposed development, it is the opinion of the EAP that the project is issued with a positive Environmental Authorisation from KZN EDTEA for the following reasons:

- A project-specific Draft Environmental Management Programme (EMPr) has been compiled according to (but not limited to) the impacts and mitigation measures included in this assessment. A more detailed EMPr must be submitted prior to the tender stage, including conditions of the EA to the KZN EDTEA for approval.
- The need and desirability of the project is driven by the fact that some families and communities in this area do not have access to a housing that meets the basic standards.
- The proposed development will also contribute to provide various employment opportunities to the local people during the construction phase.
- The EMPr is a legally binding document and the mitigation measures stipulated within the document and Basic Assessment Report will be implemented by the appointed contractor;
- An independent Environmental Control Officer (ECO) will need to be appointed to manage the implementation of the EMPr during the construction phase.
- A Water Use Licence will also be undertaken for impeding and diverting the watercourses (wetlands) during the construction. The Water Use Licence Application (WULA) will need to be submitted to DWS in the KZN region for approval prior to the commencement of construction.

### **Wetland Recommendations:**

The careful management of potential development impacts through the application of the recommendations made in this report should reduce impacts to the ecosystems and surrounding environment to relatively low significance levels and improve the status quo.

The recommended management objective for the river systems should be to **improve the present condition and ecological functioning of these systems** (to at least a D PES category). In order to achieve this objective, a proactive approach to planning and aquatic conservation has been recommended for this development project. As part of this process, potential impacts to aquatic ecosystems were identified and impact significance rated, indicating that potential impacts are likely to range from a low significance to medium significance. The primary concerns for the development project range from water pollution impacts to altered river/wetland habitat, morphology & functioning. Water pollution and sedimentation impacts are considered particular significant in light of the connectivity of the rivers to downstream areas.

The careful management of potential development impacts through the application of the recommendations made in this report should reduce impacts to aquatic ecosystems to

relatively low significance levels and improve the status quo. Key mitigation and management measures include:

- Implementation of buffer zone/ setback requirements for aquatic ecosystems;
- Focus on management of storm water and erosion control for construction & operation phases;
- The implementation of a range of practical on-site mitigation and management measures and guidelines to deal with site-based issues during the construction and operational phases of the project; and
- Recommendations to rehabilitate degraded watercourses in the project area to improve the status quo and to limit residual impacts during the operational phase of the development project.

**Heritage Recommendations:**

- We recommend that the development proceed with no further heritage mitigation and have submitted this report to Amafa aKwaZulu-Natali in fulfilment of the requirements of the National Heritage Resources Act

For additional and more comprehensive environmental measures, please refer to the Environmental Management Programme in **Appendix G**.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process are included as **Appendix H**.

Katherine Wiles

\_\_\_\_\_  
NAME OF EAP

\*electronically signed\*

\_\_\_\_\_  
SIGNATURE OF EAP

\_\_\_\_11/11/2016\_\_\_\_  
DATE

## APPENDICES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information

## Appendix A: Site Maps

## Appendix B: Photographs

## Appendix C: Facility Illustration(s)

## Appendix D: Specialist Reports

## Appendix E: Public Participation

## Appendix F: Impact Assessment

## **Appendix G: Environmental Management Programme (EMPr)**

## Appendix H: Details of EAP and expertise

## **Appendix I: Specialist's declaration of interest**

## Appendix J: Other Information

**DOCUMENT CONTROL**

FORM IP180\_B



**CLIENT** : eThekweni Municipality: Housing  
**PROJECT NAME** : Bhambayi Phase 1 Extension Housing Project (Pat Marshal Housing)      **PROJECT No.** : J33194  
**TITLE OF DOCUMENT** : Draft Basic Assessment Report for the Bhambayi Phase 1 Extension Housing Project  
**ELECTRONIC LOCATION** : P:\3230 - Environmental\J33194 - Bhambayi Phase 1 Extension Housing EIA\Reports\BA Report\J33194\_Bhambayi Phase 1 Housing\_DBAR\_Final\_2016 11 10.docx

**Approved By****Reviewed By****Prepared By**

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DATE <b>11 November 2016</b>	SIGNATURE 	SIGNATURE 	SIGNATURE 

**Prepared by****Prepared By****Prepared By**

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DATE	SIGNATURE	SIGNATURE	SIGNATURE

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