Buffalo City Municipality

Proposed Potsdam Low-cost Housing Development: Environmental Impact Assessment (EIA)

Final Environmental Impact Report
# PROPOSED POTSDAM LOW-COST HOUSING DEVELOPMENT
## FINAL ENVIRONMENTAL IMPACT REPORT (EIR)

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ACRONYMS

BCM Buffalo City Municipality
EAP Environmental Assessment Practitioner
ECA Environment Conservation Act
EIA Environmental Impact Assessment
EMP Environmental Management Plan
DEDEA Department of Economic Development and Environmental Affairs
I&AP Interested and Affected Party
NEMA National Environmental Management Act
NWA National Water Act
SAHRA South African Heritage Resources Agency
SDF Spatial Development Framework
TOPS Threatened or Protected Species

Potsdam_EIR_Final_DP VF April 2010
1 INTRODUCTION

Buffalo City Municipality (BCM) is proposing to establish a low-cost housing development called Potsdam Unit V (Southern Portion) in East London. Arcus GIBB (Pty) Ltd was appointed by BCM as independent environmental practitioners to undertake an application for environmental authorisation in the form of a Scoping and EIA for the proposed development. The EIA conforms to the July 2006 Environmental Impact Assessment (EIA) Regulations as promulgated in terms of the National Environmental Management Act (Act 107 of 1998).

1.1 Purpose of Report

This report represents the Final Environmental Impact Report (EIR) and has been prepared in accordance with the EIA Regulations published in Government Notice No. R 385. These regulations fall under Section 24(5) read with Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The NEMA Section 24(5) stipulates that "listed activities" (i.e. those activities that have been recognised as having a detrimental effect on the environment) require environmental authorisation from the competent authority.

See Table 1 for a summary of the listed activities associated with the project that require environmental authorisation.

Table 1: listed activities associated with the project.

<table>
<thead>
<tr>
<th>Government Notice.</th>
<th>Activity Number</th>
<th>Listed Activity</th>
<th>Project Activity</th>
<th>EIA Requirements</th>
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<td>No. R. 387; 21 April 2006</td>
<td>2</td>
<td>Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.</td>
<td>The development of an area larger than 20 hectares.</td>
<td>Full EIA</td>
</tr>
<tr>
<td>No. R. 386; 21 April 2006</td>
<td>1(k)</td>
<td>The construction of facilities or infrastructure, including associated structures or infrastructure, for the bulk transportation of sewage and water, including storm water, in pipelines with: (i) an internal diameter of 0.36 metres or more; (ii) a peak throughput of 120 litres per second or more.</td>
<td>The site will generate increased amounts of storm water that will need to be attenuated on site.</td>
<td>Basic Assessment</td>
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<td>No. R. 386; 21 April 2006</td>
<td>12</td>
<td>The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of the Section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. R. 386; 21 April 2006</td>
<td>15</td>
<td>The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.</td>
<td>The construction of internal access roads.</td>
<td>Basic Assessment</td>
</tr>
</tbody>
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The transformation of undeveloped, vacant or derelict land to –
(a) establish infill development covering an area of 5 hectares or more, but less than 20 hectares;
(b) residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.

The site is to be subdivided into individually owned plots.

Given the listed activities in Table 1 above, a full EIA process has been followed. Furthermore, all of the activities in Table 1 have been assessed in this report.

1.2 EIA Process

The EIA process is controlled through Regulations published under Government Notice No. R. 385, R. 386 and R.387 and associated guidelines promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998).

Three phases in the EIA process are typically recognized as follows:

- Application Phase;
- Scoping Phase; and
- EIA Phase.

1.2.1 Application Phase

The Application Phase consists of completing the appropriate application form by the EAP and the proponent and the subsequent submission and registration of the project with the competent authority. An application form was completed and submitted to DEDEA, East London office. The application has been accepted and registered.

(a) Details of Case Officer handling application

Name: Mr Thabani Sigabi

Address: Department of Economic Development and Environmental Affairs
Kentia House
Palm Square
Bonza Rd
Beacon Bay
East London
5241

Tel: 043 707 4007
Fax: 043 748 2097
E-mail: thabani.sigabi@deaet.ecape.gov.za
(b) Registration Number of Application

The Department of Economic Development and Environmental Affairs (DEDEA) registered the project with reference number AR/7/F/2/5/08.

1.2.2 Scoping Phase

The Scoping Phase aimed to identify the key environmental issues associated with the project, in part through public consultation; consider project alternatives; and provide focus for the EIA Phase. During the Scoping Phase, as per Regulation, a draft Scoping Report was compiled that was subject to a 30-day comment period by Interested and Affected Parties (I&APs). Thereafter, the draft Scoping Report was finalised into the final Scoping Report that was submitted to DEDEA on 21 May 2008. An acknowledgement and acceptance of the final Scoping Report was received on 27 May 2009.

1.2.3 EIA Phase

The EIA phase determines the significance of the impact of the proposed activity on the surrounding environment. During the EIA phase, an Environmental Impact Report (EIR) is produced by Arcus GIBB and submitted to DEDEA. The EIR (this report) provides an assessment of all the identified key issues and associated impacts from the Scoping Phase as well as a description of appropriate mitigation measures. All environmental impacts are assessed both before and after mitigation to determine:

- The significance of the impact despite mitigation; and
- The effectiveness of the proposed mitigation measures.

As in the Scoping Phase the public participation process continues to ensure that all (I&APs) are informed of the proposed activity and, provided an opportunity to comment.

(a) Environmental Impact Report

The aim of the EIR is to document the outcome of the EIA Phase and includes the following:

- Details and expertise of the Environmental Assessment Practitioner (EAP) undertaking the EIA as well as the applicant’s details;
- A description of the legislation and guidelines applicable to the proposed activity;
- The location of and a detailed description of the proposed activity;
- A description of the need and desirability for the project;
- A description and assessment of feasible and reasonable alternatives;
- A description of the receiving environment;
- Documentation of the Public Participation Process and a register of Interested and Affected Parties;
- A summary of the findings/recommendations of any required specialists
- A description of environmental issues and impacts associated with the project proposal and alternatives;
- A description of the methodology used in the assessment of impacts;
- An assessment of each impact and a description of appropriate mitigation measures;
Details of any assumptions, uncertainties or gaps in knowledge;
An environmental impact statement that includes an opinion on the authorisation of the proposed activity a summary of the findings, and an assessment of the positive and negative impacts;
A draft Environmental Management Plan (EMP) (see Appendix H);
Copies of any specialist reports; and
Any other information required by the authorities.

The public review period has now elapsed and the Final EIR has been submitted to DEDEA for their approval.
2 DETAILS OF THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

This chapter is intended to provide details on the organisation and the Environmental Assessment Practitioners (EAPs) that undertook the Scoping and EIA.

2.1 Environmental Consulting Company

2.1.1 Arcus GIBB (PTY) LTD.

Arcus GIBB
Environmental Services
GIBB House, 9 Pearce Street, Berea, East London
P O Box 19844, Tecoma, 5214

Tel: +27 43 706 3600
Fax: +27 43 706 3647
Website: www.gibb.co.za

Arcus GIBB (Pty) Ltd is a multi-disciplinary engineering and environmental consulting company whose environmental division comprises 43 individuals of which 23 are Environmental Assessment Practitioners. The environmental division has undertaken over 100 Environmental Impact Assessments for development projects within South Africa. ARCUS GIBB has a comprehensive ISO 9001:2000 Quality Management System. As such all documentation is professionally reviewed.

2.2 Details of EAP’s that prepared the EIA Report

Name: Mr Darrin Petzer

Address: PO BOX 19844
EAST LONDON
5214

Tel: 043 706 3687
Fax: 043 706 3647
E-mail: dpetzer@gibb.co.za

Mr Darrin Petzer holds a BSc Honours in Geography as well as a Bachelor of Science Degree in Environmental Science and Geography. Darrin has been involved in environmental consulting and Geographical Information Systems (GIS) for the past nine months. Please refer to Appendix A for a detailed CV.
Name: Mr Brendon Steytler

Address: PO BOX 19844
EAST LONDON
5214

Tel: 043 706 3644
Fax: 043 706 3600
E-mail: bsteytler@gibb.co.za

Mr Brendon Steytler is a registered Professional Environmental Scientist with the South African Council for Natural Scientific Professions (Pr.Sci.Nat. No. 400304/06). Brendon Steytler holds a Masters Degree in Environment and Development as well as a Bachelor of Science Degree in Agriculture. Brendon has been involved in environmental consulting for the last seven years and has undertaken numerous EIAs. Please refer to Appendix A for a detailed CV.

2.3 Details of Proponent

Buffalo City Municipality (BCM)
BCM Planning & Economic Development
Contact Person: Albie Meiring
PO Box 81
East London
5200
Tel: (043) 705 2266
Fax: (043) 743 5266
E-mail: AlbieM@buffalocity.gov.za
3 LEGISLATION AND POLICY GUIDELINES CONSIDERED

3.1 The Constitution of South Africa (Act 108 of 1996)

The legal reference source for environmental law in South Africa is found in the Constitution of the Republic of South Africa, Act 108 of 1996. All environmental aspects should be interpreted within the context of the Constitution. The Constitution has enhanced the status of the environment by virtue of the fact that environmental rights have been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management. An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1)(e) to (g)).

3.2 The National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act (Act 107 of 1998) commonly known as “NEMA” is South Africa’s overarching framework for environmental legislation. The object of NEMA is to provide for operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of state.

It sets out a number of principles that aim to give effect to the environmental policy of South Africa. These principles are designed to, amongst others, serve as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other law concerned with the protection or management of the environment.

The principles include a number of internationally recognised environmental law norms and some principles specific to South Africa, i.e. the:

- Preventive principle;
- Precautionary principle;
- Polluter pays principle; and
- Equitable access for the previously disadvantaged to ensure human well-being.

Chapter 5 of NEMA is designed to promote integrated environmental management. Environmental management must place people and their needs at the forefront of its concerns, and serve their physical, psychological, developmental, cultural and social interests equitably. Development must be socially, environmentally and economically sustainable. Sustainable development therefore requires the consideration of all relevant factors including:

- The avoidance, or minimisation and remediation, of disturbance of ecosystems and loss of biological diversity;
- The avoidance, or minimisation and remediation, of pollution and degradation of the environment;
- The avoidance, or minimisation and remediation, of disturbance of landscapes and sites that constitute the nation’s cultural heritage;
• That waste is avoided, or, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
• That the use and exploitation of non-renewable natural resources should be undertaken responsibly and equitably;
• That the development, use and exploitation of renewable resources and the ecosystem of which they are part should not exceed the level beyond which their integrity is jeopardised;
• The application of a risk-averse and cautious approach; and
• That negative impacts on the environment and on people’s environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

Regulations promulgated under NEMA include the Environmental Impact Assessment regulations published under Government Notice No. 385 for those activities that require environmental authorisation by means of a Basic Assessment Process or an Environmental Impact Assessment (EIA) Process.

3.2.1 EIA Guidelines published under NEMA

The following guidelines have been considered in the production of this Scoping Report:


3.3 Environment Conservation Act 73 of 1989

The objectives of the Environment Conservation Act 73 of 1989 (“ECA”) are to provide for the effective protection and controlled utilization of the environment. Following the enactment of NEMA, a number of the powers of the Act have either been repealed or assigned to the provinces. These include the EIA Regulations for activities that were regarded as detrimental to the environment and were published under Government Notice Regulation 1182 of 05 September 1997, as amended. New EIA Regulations have been promulgated under Section 24(5) of NEMA and are published under Government Notices No. 385, 386 and 387.
3.4 BCM Spatial Development Framework

The Spatial Development Plan for Buffalo City Municipality was approved in 2002. The Buffalo City Spatial Development framework has the status of a statutory plan, and serves to guide and inform all decisions made by the Municipal council on spatial development and land use management in the area to which it applies (Buffalo City Municipality, Spatial Development Framework 2003).

The proposed site for the development of the Potsdam Unit V (Southern Portion) is located within an area that is already set aside and subdivided for low-cost housing. BCM, in line with the SDF, has identified Potsdam Unit V as an area that can be used for high-density settlement.

3.5 Buffalo City Implementation Plan

The Potsdam Unit V low-cost housing development is in line with the Buffalo City Implementation Plan. The Potsdam low-cost housing development will redress the number of informal settlements and address the housing shortage within the BCM area. The development of the Potsdam Unit V will accommodate previously disadvantaged individuals who cannot afford houses and is expected to create employment opportunities in both the construction and operational phases.
4 DESCRIPTION OF PROPOSED ACTIVITY & ALTERNATIVES

4.1 Location of the proposed activity

The area known as Potsdam Unit V is located to the west of Mdantsane NU15 and Fort Jackson Industrial area and south of the N2 National Road joining East London to King Williamstown. Potsdam Unit V is located on erven 2569, 2876, 3183, 3481, 3814, 4145, 4473, and 4723. Access to the site is on the existing tarred road joining Potsdam south to the Mdantsane NU15. The proposed development is surrounded by residential development on the northern side and an industrial development to the east. To the south and west, the land is vacant, however, the urban edge is located along the edge of the existing townships. See Figure 1 below for the locality of the project site.

Figure 1: Proposed project site for Potsdam Unit V housing development.
4.1.1 Ownership, Responsibilities and Zoning

BCM is both the landowner of the proposed site and the proponent and applicant for environmental authorisation. The total area of the proposed site is approximately 168.77 Ha. The land is currently undeveloped and zoned as “undetermined” but earmarked for residential township establishment.

4.2 Description of Proposed Activity

The proposed activity is the establishment of a low-cost housing development called Potsdam Unit V involving the construction of 3904 low-cost housing units as well as associated infrastructure, bulk services, and social and economic facilities. As the area is close to existing infrastructure it should be easily integrated into the bulk service infrastructure. With regard to services, running water will be supplied, either to each stand or to RDP standards every 200 meters. It is expected that electricity will be supplied from the existing supply and water-borne sewage will feed into the BCM reticulation system.

The area known as Potsdam Unit V was originally planned in 1994 and was approved in terms of the Ciskei Ordinance 15 of 1997. BCM is now proposing the amendment to the existing approved plans of Potsdam Unit V, because presently the existing layout plans are uneconomical in terms of service provision. Therefore BCM, in line with the SDF, has identified Potsdam Unit V as an area that can be used for a higher density settlement. The densification would not only provide much needed housing, but also enable the area to be serviced more economically.

4.3 Need and Desirability of Proposed Activity

The area known as Potsdam Unit V was originally planned in 1994 and was approved in terms of the Ciskei Ordinance 15 of 1997. BCM is now proposing the amendment to the existing approved plans of Potsdam Unit V, because presently the existing layout plans are uneconomical in terms of service provision. Therefore BCM, in line with the SDF, has identified Potsdam Unit V as an area that can be used for a higher density settlement. The densification would not only provide much needed housing, but also enable the area to be serviced more economically. The development falls within the urban edge as defined in the SDF (BCM, 2003).

Furthermore, in the BCM area of jurisdiction there is a need or demand for low-cost housing (particularly in the project area) to accommodate previously disadvantaged individuals who cannot afford houses. This low-cost housing development will, in terms of the Buffalo City Implementation Plan redress the number of informal settlements, address the current housing shortage, and could potentially create employment opportunities in both the construction and operational phases. Also, land currently lying vacant and under constant threat of land invasion and illegal dumping, will be put to residential use.
4.4 Potential Alternatives

The applicant requests exemption from having to assess alternatives, because Buffalo City Municipality (BCM) in line with the SDF has already set aside and subdivided the site for low-cost housing. BCM, in line with the SDF, has identified Potsdam Unit V as an area that can be used for a high-density settlement. The low-cost housing development would not only provide much needed housing, social services and community facilities, but also enable the area to be serviced more economically.

This low-cost housing development will, in terms of the Buffalo City Implementation Plan redress the number of informal settlements and address the housing shortage within the BCM area; it will accommodate previously disadvantaged individuals who cannot afford houses; and it will create employment opportunities in both the construction and operational phases.

4.4.1 No-go Alternative

The No-go Alternative would mean that the proposed Potsdam Unit V low-cost housing development would not be constructed at the proposed site and the land would remain vacant. Vacant land may result in informal settlement development; illegal dumping; vegetation clearing for firewood; and alien plant invasion. Despite this, the no-go alternative is still assessed in Section 10.3 of the Environmental Impact Statement.
5  PUBLIC PARTICIPATION PROCESS

The EIA Regulations specify that a public participation process must be conducted as an integral part of the EIA. The public participation followed the process stipulated in Section 56 of the 2006 EIA Regulations. This chapter outlines the public participation process followed.

5.1 Notification of Interested and Affected Parties (I&AP’s)

Section 56 of the EIA Regulations outlines the requirements for the notification of all potential I&AP’s. These requirements typically include the following:

- Giving notification to:
  - The landowners and occupiers of the project site and those within 100m of the project site and alternative sites, or those directly influenced by the activity under consideration;
  - The municipality that has jurisdiction over the area;
  - The municipal councillors of the affected wards; and
  - Any organ of state having jurisdiction in respect of any aspect of the activity.
- Placing an advertisement in a local and a provincial newspaper; and
- Fixing a notice board at a conspicuous place on all alternative sites.

5.1.1 Notification of Landowners, Authorities, and Organs of State

At the commencement of the EIA, Arcus GIBB notified and obtained written consent from Buffalo City Municipality (BCM), the landowner of the project site, (See Appendix B for a copy of the landowner consent form).

Surrounding landowners and occupiers of land within 100 metres of the proposed project site were notified by hand delivered letters of the applicant’s intention to submit an application to the competent authority (See Appendix G for copies of the letter).

In addition written notification via registered mail was sent to the Authorities and Organs of State that have jurisdiction over the activity as well as the relevant Ward Councillor (See Appendix C for the I&AP Register and Appendix G for copies of the letter).

5.1.2 Newspaper Advertisement

A newspaper advertisement detailing information about the project and the EIA process that has since been finalised, as well as calling for the registration of I&AP’s, was placed on 6th December 2008 in the Daily Dispatch, the regional newspaper for the Border area. The advertisement provided I&APs 28 days to register and to submit their comments in writing to Arcus GIBB. The closing date for registration was therefore Friday 4th January 2009. See Appendix D for a copy of the newspaper advertisement.
5.1.3 Notice Board

An A2 size notice board detailing information about the project and the EIA process was erected on site at a recognised public area on 27th October 2008.

Figure 2: Notice board erected on site

5.1.4 Background Information Document

At commencement of the project a Background Information Document (BID) was prepared and sent to I&APs that provided a summary of the details of the proposed project as well as the EIA process that was to follow (See Appendix E).

5.2 Public Meeting

As the proposed activity was limited in extent and very little interest was received from the public, a public meeting was not deemed necessary. Instead, the I&APs were consulted individually.

5.3 Register of Interested and Affected Parties (I&AP’s)

As per the requirements of Regulation 57 of Government Notice No. R 385, a register of I&AP’s has been maintained and updated throughout this project. Kindly refer to Appendix C for a copy of the register.

5.4 Comments Register

Kindly refer to Appendix F for a copy of the Comments Register. The key issues have been documented in Section 8 of this document.
5.5 Public review of the draft Scoping Report

The draft Scoping Report was made available to I&AP’s for a 30-day comment period. Kindly refer to Appendix F for a copy of the Comments Register.

5.6 Public Review of the Environmental Impact Report

This Environmental Impact Report (EIR) was made available to registered I&AP’s for a 40-day comment period, beginning on 08 March 2010 and ending on 17 April 2010. All comments received from I&AP’s during this public review period have been included in the Final EIR that has been submitted to DEDEA.
6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

6.1 Introduction

This chapter provides a description of the receiving environment within the study area. This description has not been informed by any specialist studies undertaken for this assessment but includes information attained from various literature sources and is described at a level deemed appropriate for a Scoping study. Additional detailed information will unfold in the EIA phase. Three components to the environment are recognised:

- Physical Environment;
- Biological Environment; and
- Socio-Economic Environment; and
- Built Environment

Only those elements of the environment that have a direct bearing on the impact assessment process of the project are discussed. The severity of the potential impacts is largely determined by the state of the receiving environment. For example, the construction of a housing development in a pristine wetland habitat would have far more significant ecological impacts than the construction of a housing development in a residential area.

6.2 Physical Environment

6.2.1 Climate

The Mdantsane/Potsdam area generally has a warm temperate climate. The project area falls into the Cfb climate group as described by Schulze (Kopke 1988). This group includes those regions that are subtropical, with all months having at least 60mm of rain and temperatures between 10 - 22.2 °C. Temperatures are not extreme with an average annual temperature of 18.5 °C; maximum mean daily temperature of 23 °C and a minimum mean daily temperature of 14°C. The project area falls within the summer rainfall area, with the majority of rain falling within the months of October to March. The average annual rainfall for the area is approximately 600 to 650 mm per year. Humidity in the area averages between 65% and 72% during the year. Wind is predominantly north-easterly and south westerly in summer and south-westerly and westerly in winter. Winds occasionally reach gale force. In late summer, there are occasional north or north westerly, warm "berg winds".

6.2.2 Topography

The proposed site is characterised by a central ridge and two watercourses with associated perpendicular drainage lines branching towards the site. The majority of the site has a gentle gradient, however parts of the site are defined as steep (gradient > 5 %) in light of the earthworks required to level plots. Surfaces steeper than 5 % are however mostly associated with the drainage lines which, according to the BCM Spatial Development Framework, are no-development Zones and therefore do not pose a problem. Very steep slopes are located along the southern watercourse, south
of the site. Should on-site storm water management be inadequate these steep slopes may become unstable and highly eroded due to the flow of water from the site on a path towards the watercourse.

![Figure 3: On-site topography](image)

### 6.2.3 Geology and Soils

(a) Geology

The Mdantsane and Potsdam area is largely underlain with sedimentary rocks of the lower Beaufort series, consisting mainly of sandstones, mudstones and siltstones, with Karoo dolerite also running in sheets along the northern edge of the study area (Mdantsane/Potsdam Development Plan, 1998).

(b) Soils

The area is covered by two main soil types:

- **Red Dolerite Soils** – these soils are deep, fertile and suitable for various types of agriculture depending on the gradient. The soil is highly porous, tough and well formed, with relatively high clay contents that could have implications for foundations when building.
- **Grey Sandy Loams** – these soils are generally not well developed, with a depth that varies from very shallow to relatively deep depending on the slope and moisture. The clay contents are much lower than the red dolerite soils. The grey sandy loam soils are susceptible to erosion.
6.2.4 Hydrology

The proposed site is characterised by a ridge running through the centre of the area with a number of small streams and valleys running perpendicular to the ridge. There are two watercourses that drain from the centre of the site southwards, creating two small valleys that divide the land into three parts. Drainage is along the two main watercourses draining towards the south into the Buffalo River (Figure 3).

6.3 Biological Environment

The proposed site has no preservation worthy plants or animals located on it. The area has been impacted by the surrounding human settlements in the form of grazing, dumping of waste, and the informal settlement of land to the west and east of the proposed site. The site is surrounded on three sides by residential and industrial developments that have a negative impact on the natural environment (Figure 3).

According to the Mdantsane/Potsdam Development Plan, the Potsdam area is divided into areas of acacia savannah and riverine forest or sub-tropical thicket vegetations. The acacia savannah that is dominated by *Acacia karoo* (thorn trees) tends to become invaded by other woody species so there is a succession to bush clump thicket and then dry thicket, moist thicket and ultimately riverine forest.

Although the site has been considerably degraded (Mdantsane/Potsdam Development Plan, 1998), there are still a few areas considered as being ecologically significant. Thicket vegetation, worthy of protection from clearing, exists along the on-site drainage lines. The remaining vegetation may act as a habitat for the remaining fauna. Vegetation along drainage lines may also serve as corridors for the movement of indigenous fauna within the vicinity of the project site to the two watercourses.

6.4 Socio-Economic Environment

The areas of Mdantsane and Potsdam are areas with high population densities. The area to the east of the proposed site is heavily populated. According to the Mdantsane/Potsdam Development Plan (1998) the population numbers of the Mdantsane and Potsdam areas is approximately 230 000. Taking into account a moderately aggressive population growth rate of 4% over the past 9 years, the population of Mdantsane and Potsdam could be placed at approximately 340 456 persons (Mdantsane/Potsdam Development Plan, 1998).

The overall population of BCM is estimated to be 1 202 000 people (BCM SDF, 2003). Of this 41% of the population is aged 19 or below. The relatively young population in BCM indicates the need to provide not only basic physical facilities, such as housing, schools and social facilities, but also work opportunities (BCM SDF, 2003).

Mdantsane and Potsdam have an unemployment rate of 42%. This is higher than BCM’s rate of 38%, but marginally better than the Eastern Cape Province as a whole with a rate of 48.5% (BCM SDF, 2003). Approximately 70% of the households in BCM earn less than R1 500.00 per month (IDP Review 2005/2006). These figures show
that levels of affluence within BCM are low, which in turn has a major impact on the ability to afford housing and social facilities. This will have to be taken into consideration when planning new residential developments.

6.5 Built Environment

The built environment surrounding the proposed development area ranges from high-density low-income housing and informal rural type settlements to large industrial developments. Developments located adjacent to the proposed settlement are low cost townships, with limited infrastructure that only meets RDP Standards. Social facilities within the area are lacking, with the nearest school being located some 10km from the site.

6.5.1 Bulk Infrastructure

The existing area of Potsdam South and Mdantsane NU15 are serviced with bulk infrastructure, with erven in both areas having access to onsite water, sanitation and electricity.

(a) Water

Water is currently supplied to the zoned urban area of Mdantsane and Potsdam. The Damspot reservoirs are sufficient to supply the proposed development and the water pressure head available in these reservoirs is adequate to supply water at the minimum required pressures. The construction of a storage reservoir on Erf 1433 with the capacity of 3.2Ml is proposed. A 300mm diameter pipe, which is already in place, will transfer water from the Damspot reservoirs to the proposed storage reservoir. The units that aren't within the 5m head of the reservoir will be supplied directly from the 300mm pipe.

(b) Sewerage

The existing bulk infrastructure is inadequate to carry the load of a further waterborne sewerage reticulation system, although the existing pump station is adequate to pump the effluent produced by the proposed development. The sewer line which presently cuts through the northern portion of the proposed site will be insufficient to carry the proposed load. This will have to be abandoned and replaced by a 160mm diameter pipe to carry the extra load. It is also proposed that a further sump be constructed next to the existing sumps in order for the pumps to function properly under increased effluent.

Furthermore at least one pump station will have to be installed along the southern side of the northern portion of the development to pump sewerage to the existing pump station. The Potsdam Waste Water Treatment Works will service the proposed development and has available capacity (2Ml of the 9Ml total).

(c) Electricity

The Impekweni substation, which is located near the proposed site, will have insufficient capacity to supply the development. It will have to be relocated to the area south of the development, as well as increasing its capacity. This will help in alleviating current constraints in the areas of Mdantsane Zone 17, 18 and Potsdam
Village. A servitude area of 150m x 150m will have to be allowed for the new substation.

Furthermore, with the relocation of the Impekweni substation, an additional injection substation has been proposed westwards, in the vicinity of the Walter Sisulu University campus.

6.5.2 Social Services

(a) Educational Facilities

Currently there is one school within the Potsdam South Area. Mdanstane NU15 has a number of schools that service this heavily populated area. The new Potsdam Unit P has a number of proposed school sites that will provide facilities for new residential erven of Potsdam Unit P. The proposed development of Potsdam Unit V will therefore only have to provide school facilities to cater for the proposed new residential erven in Potsdam Unit V.

(b) Health Facilities

There are currently only two health facilities located in Mdanstane NU15 that service the community. There is a need for the provision of an additional Health Care Site within the proposed development of Potsdam Unit V, not only to provide a service to the new development but also to provide health care service to both Potsdam South and Potsdam Unit P.

(c) Community Hall

There are number of community facilities located within Mdanstane NU15, but there is a need for the provision of community facilities such as community halls within Potsdam Unit V to provide a much needed facility for not only the new community but also the existing community of Potsdam South.

(d) Social and Economic Facilities

The surrounding residential areas have a number of social facilities such as churches and pre-schools that provide a service to the surrounding neighbourhoods. Residential neighbourhoods also have economic facilities that provide a service and employment to the surrounding population. Therefore, there is no need to provide additional social and economic facilities within Potsdam Unit V for the surrounding area.
7 METHODOLOGY IN ASSESSING IMPACTS

7.1 Introduction

This chapter outlines the generic methodology that will be followed when evaluating impacts. This generic methodology will be used when assessing the significance of the impacts related to the key issues and impacts raised in Section 8 Environmental Issues and Impacts.

7.2 Methodology

7.2.1 Significance of Impact

This should be described as follows:

**High:** Where it could have a no-go implication for the project irrespective of any possible mitigation.

**Medium:** Where the impact could have a moderate influence on the environment, which would require modification of the project design or alternative mitigation.

**Low:** Where the impact would have little influence on the environment and would not require the project design to be significantly accommodated.

**None:** Where the impact would have no influence on the environment and would not require the project design to be accommodated at all.

The significance of the impact should be determined through the following criteria:

(a) Nature of Impact

This includes a brief description of how the proposed activity will impact on the environment. This should be stated as:

- Positive (a benefit),
- Negative (a cost) or
- Neutral.

(b) Extent

This refers to the geographic area on which the activity will have an influence and can include the following extents:

- Project site – the immediate location of the activity;
- Study area – the proposed area and its immediate environs within a 5 km radius of the activity;
- Catchment – area of land from which rainfall drains into a river;
- Local – Local Municipality;
• District;
• Regional – Province;
• National – Country; or
• International

(c) Duration

This refers to the expected timeframe of an impact and can be expressed as:
• Short term (0 – 5 years);
• Medium (5 – 15 years);
• Long term (15 – 40 years, but where the impact ceases after operation); or
• Permanent (over 40 years and resulting in a permanent and lasting change that will always be there).

(d) Likelihood

This considers the likelihood of the impact occurring and should be described as:
• Unlikely (where the impact is unlikely to occur);
• Likely (where there is a good probability, < 50 % chance, that the impact will occur);
• Highly likely (where it is most likely, 50-90 % chance, that the impact will occur); or
• Definite (where the impact will occur, > 90 % chance of occurring, regardless of any prevention measures).

(e) Severity Scale

The severity is used to evaluate how severe negative impacts would be on the environment, and is described as follows:
• Very high (an irreversible and permanent change that cannot be mitigated);
• High (long term impacts that could be mitigated, however this mitigation would be difficult, expensive or time consuming);
• Medium (medium term impacts that could be mitigated);
• Low (short term impacts with mitigation being very easy, cheap, less time consuming or not necessary); or
• No effect (no impact by the proposed development).

(f) Beneficial Scale

The beneficial scale is used to evaluate how beneficial positive impacts would be on the environment, and is described as follows:
• Very High (a permanent and very substantial benefit with no real alternative to achieving this benefit);
• High (a long term impact with substantial benefit, and alternative ways of achieving this benefit being difficult, expensive or time consuming);
• Medium (a medium term impact of benefit with other ways of achieving this benefit being difficult, expensive and time consuming);
• Low (a short term impact and negligible benefit with other ways of optimising the benefits being easier, cheaper and quicker); or
• No effect (no impact by the proposed development).
7.2.2 Degree of confidence

It is also necessary to indicate the degree of confidence with which one has predicted the significance of an impact, based on the availability of information and specialist knowledge. For this reason, a ‘degree of confidence’ scale has been provided to enable the reader to determine the certainty of the assessment of significance:

- **High** - More than 90% sure of a particular fact.
- **Medium** - Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
- **Low** - Over 40% sure of a particular fact or of the likelihood of an impact occurring.
- **Unsure** - Less than 40% sure of a particular fact or of the likelihood of an impact occurring.

7.2.3 Other Aspects

Other aspects that should be taken into consideration are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented;
- All impacts should be evaluated for the full life cycle of the proposed development including construction and operational phases;
- The impact evaluation should take into account the cumulative effects of other activities which have occurred or are in the process of occurring within the study area; and
- Legal requirements (a list of the specific legal and permit requirements that could be relevant to the proposed project should be identified).

7.2.4 Mitigation and monitoring

Where negative impacts are identified, mitigation measures (ways of reducing impacts) should be set and where positive impacts are identified, ways of enhancing these impacts should also be mentioned. Where no mitigation is feasible, this should be stated and the reasons given. Quantifiable standards against which the effectiveness of the mitigation can be measured should be set. This may include input into monitoring and management programmes.
8 ISSUES AND IMPACT ASSESSMENT

This chapter provides an assessment of the impacts (including cumulative) associated with each issue and further includes mitigation measures to be implemented to reduce the significance of negative impacts.

8.1 Issue: Municipal Capacity

8.1.1 Issue

In an attempt to meet housing shortages within the BCM significant stress has been applied to municipal services such as bulk water supply, bulk sewerage and electrification. According to the engineering report the Damspot reservoirs are sufficient to supply the proposed township development with water. The water pressure head in these reservoirs is also adequate to supply water at the minimum required pressures. The construction of a storage reservoir on Erf 1433 with the capacity of 3.2Ml is proposed. A 300mm diameter pipe, which is already in place, will transfer water from the Damspot reservoirs to the proposed storage reservoir (Bigen Africa Services, 2010).

In order to supply the development with full waterborne sanitation the current bulk infrastructure needs to be upgraded. An additional pump station will be required to pump the effluent to the existing pump station.

Where electrification is concerned, it has been established that the Impekweni substation will have insufficient capacity to supply the proposed development. It is proposed that the existing Impekweni substation be relocated to an area south of the development. Furthermore, a new injection substation will need to be constructed westwards (Bigen Africa, 2010).

Table 2: Issues surrounding the Municipalities capacity to meet service requirements

<table>
<thead>
<tr>
<th>-issue:</th>
<th>MUNICIPAL CAPACITY</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Impact</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bulk Water</td>
<td>Bulk Sewerage</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
<td>Local</td>
</tr>
<tr>
<td>Duration</td>
<td>Long Term</td>
<td>Long Term</td>
</tr>
<tr>
<td>Probability</td>
<td>Highly Likely</td>
<td>Highly Likely</td>
</tr>
<tr>
<td>Degree to which impact cannot be reversed</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

1 A resource for which no reasonable substitute exists, such as Red Data species and their habitat requirements
8.1.2 Recommended Mitigation

Bulk Sewerage
- It is advised that the proposed outfall sewers and pump station be constructed to collect effluent and pump it to the existing pump station; and
- Upgraded bulk sewerage infrastructure to be in place prior to occupation of houses.

Bulk Water
- Construction of storage reservoir on Erf 1433.

Bulk Electricity
- Relocation of existing Impekweni substation to an area south of the development. Construction of new injection substation westwards.

8.2 Issue: Soil Loss and Erosion

8.2.1 Issue

During construction, the clearing and removal of vegetation, the digging of structure foundations, and earthworks may expose soils to wind and rain and could result in localised erosion. Furthermore, soils will be stockpiled during construction and could become vulnerable to erosion. The channelling of storm water may lead to the formation of gullies. The engineering report identified steep slopes along the streams, varying from a 3% to 8% gradient. These slopes are to be regarded as areas sensitive to erosion.

Table 3: Impacts surrounding soil loss and erosion

<table>
<thead>
<tr>
<th>ISSUE:</th>
<th>SOIL LOSS AND EROSION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project Phase</td>
</tr>
<tr>
<td>Impact</td>
<td>Erosion</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Site</td>
</tr>
<tr>
<td>Duration</td>
<td>Short Term</td>
</tr>
</tbody>
</table>
### ISSUE: SOIL LOSS AND EROSION

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Construction and Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>Erosion</td>
</tr>
<tr>
<td>Probability</td>
<td>Likely</td>
</tr>
<tr>
<td>Degree to which impact cannot be reversed</td>
<td>Low</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
<td>Low</td>
</tr>
<tr>
<td>Confidence level</td>
<td>High</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Medium (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

#### 8.2.2 Recommended Mitigation

**Construction**
- Removal of vegetation to take place only within demarcated construction site. Non-essential removal of vegetation to be avoided;
- No work is to be conducted within 30 metres of all drainage lines;
- No construction within 15 metres of the vegetation associated with the southern most water course, where practical;
- Formal runoff prevention to be implemented on steep slopes. These could be in the form of beams, netting, barriers constructed out of topsoil or flatter road surfaces; and
- No development on slopes with a gradient > 16% (Figure 5) (BCM, 2005).

**Operation**
- Surfaced roads to be considered on steep slopes (gradient > 5%); and
- Velocity of runoff on roads and drains to be kept to a minimum. Flatter road surfaces and energy dissipaters could achieve this.

#### 8.3 Issue: Ground and Surface Water Quality

**8.3.1 Issue**

In the short term, surface and ground water may be impacted by construction activities, such as the contamination from fuels, cement, oils and other liquid waste. A potential impact on water quality may also arise from the risk of soil erosion and poor management during the construction phase. There are two watercourses on site. Any surface water contamination may enter these watercourses and impact on the aquatic ecology of the system. These watercourses therefore need to be clearly indicated as “No-development Zones”. During the operation phase, all wastewater must enter the municipal sewer system. Good environmental management practices must be followed to prevent potential contamination of water resources.
Table 4: Impacts surrounding ground and surface water quality

<table>
<thead>
<tr>
<th>ISSUE: GROUND AND SURFACE WATER QUALITY</th>
<th>Construction and Operation</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Impact</td>
<td></td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
</tr>
<tr>
<td>Duration</td>
<td>Short Term</td>
</tr>
<tr>
<td>Probability</td>
<td>Likely</td>
</tr>
<tr>
<td>Degree to which impact cannot be reversed</td>
<td>Low</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
<td>Low</td>
</tr>
<tr>
<td>Confidence level</td>
<td>High</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

8.3.2 Recommended Mitigation

The following measures should be adhered to in order to limit the impact of the construction phase on the quality of water in the area:

Construction
- No construction camps within 50 m of drainage line and standing water source;
- No water abstraction for construction from streams;
- No mixing of concrete to occur within 50 m of water course;
- Appropriate containment structures to be provided;
- No construction activities to occur in any wetlands;
- No concrete batching to occur directly on the ground;
- All fuel storage to be appropriately bunded;
- Plant to have drip trays to contain any potential leakages of fuels and oils; and
- Ablutions for construction workers.

Operation
- All sewerage to be transported within the municipal sewer systems; and
- Pump stations to have backup facilities and 24 hour emergency storage.
8.4 Issue: Potential Flooding

8.4.1 Issue

If managed correctly the construction activities onsite are unlikely to increase the potential for flooding in the area. However, the impact on lower lying areas should be verified. Once complete, the development will cause an increase in hard standing areas, such as roads, houses, roofs, etc. This will result in an increase in the volumes of storm water, which may lead to localised flooding. It is planned that the proposed development will direct storm water off-site thereby minimising the potential for flooding. However this is based on the assumption that storm water management is adequately addressed in the design.

Table 5: Impacts surrounding flooding

<table>
<thead>
<tr>
<th>ISSUE:</th>
<th>FLOOD POTENTIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Impact</td>
</tr>
<tr>
<td>Nature</td>
<td>Loss of property</td>
</tr>
<tr>
<td>Extent</td>
<td>Catchment</td>
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<td>Duration</td>
<td>Long Term</td>
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<td>Probability</td>
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<td>Degree to which impact cannot be reversed</td>
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<td>Degree to which Impact may cause irreplaceable loss of resources</td>
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<td>Confidence level</td>
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<td>Significance Pre Mitigation</td>
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<td>Significance Post Mitigation</td>
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<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

8.4.2 Recommended Mitigation

- On-site measures to attenuate peak flood discharge. This could be achieved through on-site water detention, grass-line swales, storm water infiltration systems, undulation, landscaping or a combination of the aforementioned;
- No construction within 15 metres of vegetation associated with the southern most water course, where practical (Figure 4);
- No development within 100 year flood line boundary (Figure 6); and
- No construction within 30 metres of drainage lines (Figure 4).
8.5 Issue: Air Quality

8.5.1 Issue

The clearing of vegetation in preparation for construction exposes the soil to dust which increases the Particulate Matter concentration in the atmosphere. PM is documented as contributing to respiratory tract infections, especially in rural areas much like the proposed site. Furthermore, heavy construction vehicles will be required during construction of the development. This could impact on air quality by pollution through exhaust emissions, as well as dust created by vehicles and the construction plant.

Table 6: Impacts surrounding the quality of air

<table>
<thead>
<tr>
<th>ISSUE: AIR QUALITY</th>
<th>Project Phase</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Impact</td>
<td>Atmopsheric pollution</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Regional</td>
<td>Local</td>
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<tr>
<td>Duration</td>
<td>Long Term</td>
<td>Short Term</td>
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<td>Likely</td>
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<tr>
<td>Degree to which impact cannot be reversed</td>
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<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

8.5.2 Recommended Mitigation

- Vegetated areas should not be cleared prematurely and exposed soil surfaces should be monitored, so not to further contribute to dust levels;
- Unnecessary clearing of vegetation to be avoided at all times;
- Dust suppression strategies should be implemented; and
- All plant to be of good condition with acceptable smoke emissions.

8.6 Issue: Biodiversity

8.6.1 Issue
The site has already undergone transformation from its perceived natural state. With regards to flora, there are no known red data species or significant indigenous vegetation on-site or within the project area, however upon when clearing commences these may be revealed. There will be limited habitat destruction, however it is believed that few mammals and reptiles may be impacted, particularly those that are nesting at the time. The site is currently used for grazing and is regularly burnt which has impacted on biodiversity. Habitat fragmentation is likely, but the impact should not be as severe due to the degraded nature of the site.

The two watercourses on site are identified by the BCM Spatial Development Framework as no-development Zones. The many drainage lines are highly vegetated and connect the upper reaches of this small catchment with the Bridledrift Dam. These areas can therefore be considered as areas of special conservation value. The development could impact on the biodiversity of this no-development Zone as well as ecosystem functioning of the watercourses, particularly during the construction phase if the EMP and mitigation measures are not implemented correctly.

Therefore, the only areas of concern with regards to biodiversity are the drainage lines and associated thicket vegetation. The vegetation within and around these lines is important in flood attenuation and serves as an ecological corridor for fauna wishing to use the Bridledrift Dam as a water source.

Table 7: Impacts on Biodiversity

<table>
<thead>
<tr>
<th>ISSUE: BIODIVERSITY</th>
<th>Project Phase</th>
<th>Construction and Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>Impacts to Vegetation Types of Conservation Importance</td>
<td>Vegetation Impacts</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (Direct &amp; Indirect)</td>
<td>Negative (Direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Site</td>
<td>Site</td>
</tr>
<tr>
<td>Duration</td>
<td>Long Term</td>
<td>Long Term</td>
</tr>
<tr>
<td>Probability</td>
<td>Likely</td>
<td>Definite</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
<td>Not Replaceable</td>
<td>Moderately Replaceable</td>
</tr>
<tr>
<td>Confidence level</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Low (-ve)</td>
<td>Medium (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

Table 8: Impacts on Biodiversity (continued)
<table>
<thead>
<tr>
<th>Impact</th>
<th>Disturbance to Resident Fauna</th>
<th>Habitat Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Site</td>
<td>Site</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium Term</td>
<td>Medium Term</td>
</tr>
<tr>
<td>Probability</td>
<td>Likely</td>
<td>Likely</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Not reversible</td>
<td>Not Reversible</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
<td>Not Replaceable</td>
<td>Not Replaceable</td>
</tr>
<tr>
<td>Confidence level</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Low (-ve)</td>
<td>Medium (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Moderately Mitigated</td>
<td>Not Easily Mitigated</td>
</tr>
</tbody>
</table>

### 8.6.2 Recommended Mitigation

- Construction is not to take place within 15 metres of any vegetation that is located within or along the southern most water course, where practical (Figure 4);
- No construction to take place within 30 metres of drainage lines (Figure 4); and
- Thicket vegetation within the drainage lines is not to be cleared (Figure 4).

### 8.7 Issue: Employment

#### 8.7.1 Issue

The construction of the proposed development is likely to provide short term employment for casual labourers in the surrounding residential areas of Mdantsane. This may lead to increased skills development through contractor training. This is a positive impact of the project on employment in the surrounding area.

<table>
<thead>
<tr>
<th>ISSUE: Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue</td>
</tr>
</tbody>
</table>

Table 9: Issues surrounding Employment

<table>
<thead>
<tr>
<th>ISSUE:</th>
<th>EMPLOYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Job Creation</td>
</tr>
<tr>
<td><strong>Project Phase</strong></td>
<td>Construction Workers</td>
</tr>
<tr>
<td>Impact</td>
<td></td>
</tr>
<tr>
<td>Nature</td>
<td>Positive (direct and indirect)</td>
</tr>
<tr>
<td>Extent</td>
<td>Regional</td>
</tr>
<tr>
<td>Duration</td>
<td>Short Term</td>
</tr>
</tbody>
</table>
### 8.7.2 Recommended Mitigation

- Contractors should be encouraged to source labour from surrounding areas; and
- External construction workers should be housed in secure camp and are to abide by rules of the EMP to prevent public disruption (i.e. Spread of HIV/AIDS, crime, public disturbance).

### 8.8 Issue: Land Use

#### 8.8.1 Issue

The proposed development will result in a change in land use, with some loss of grazing taking place. However, it will impact positively on the current housing shortage within the BCM area because it will aim to address the number of informal settlements as well as providing housing to previously disadvantaged individuals who cannot afford houses. It is expected that 3904 new units will be built, providing as many families with housing. In total 19 520 people will benefit from the project (5 persons per unit).

#### Table 10: Impacts surrounding the establishment of Housing

<table>
<thead>
<tr>
<th>ISSUE: Land Use</th>
<th>LAND USE</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Provision of Housing</td>
<td>Community Upliftment</td>
</tr>
<tr>
<td>Impact Nature</td>
<td>Positive (direct)</td>
<td>Positive (direct and indirect)</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
<td>Local</td>
</tr>
<tr>
<td>Duration</td>
<td>Long Term</td>
<td>Long Term</td>
</tr>
<tr>
<td>ISSUE:</td>
<td>LAND USE</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Project Phase</td>
<td>Construction and Operation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Provision of Housing</th>
<th>Community Upliftment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>Definite</td>
<td>Probable</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreparable loss of resources</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Confidence level</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Medium (+ve)</td>
<td>Low (+ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>High (+ve)</td>
<td>Medium (+ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Table 11: Impacts surrounding the change of land use

<table>
<thead>
<tr>
<th>ISSUE:</th>
<th>LAND USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Loss of Grazing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Nature</th>
<th>Extent</th>
<th>Duration</th>
<th>Probability</th>
<th>Degree of Irreversibility</th>
<th>Degree to which Impact may cause irreparable loss of resources</th>
<th>Confidence level</th>
<th>Significance Pre Mitigation</th>
<th>Significance Post Mitigation</th>
<th>Degree of Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Extent</td>
<td>Site</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>Long Term</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Probability</td>
<td>Highly likely</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Low</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree to which Impact may cause irreparable loss of resources</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence level</td>
<td>Medium</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

8.9 Issue: Visual and Noise

8.9.1 Issue

The proposed development will impact on the environment both visually and through limited noise pollution. The project site is currently adjacent to a residential and
industrial area and therefore the construction of the development will disturb the landscape to a limited extent.

Noise levels are expected to rise during the construction phase of the development. Construction activities that cause noise include vehicle trafficking, generator noise, pressure hammers and construction worker’s voices, etc. These noise levels are not assessed to be a nuisance to adjacent residents and communities.

Table 12: Noise and Visual Impacts

<table>
<thead>
<tr>
<th>ISSUES:</th>
<th>NOISE AND VISUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Noise</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
</tr>
<tr>
<td>Probability</td>
<td>Highly Probable</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Medium</td>
</tr>
<tr>
<td>Degree to which Impact may cause irrepeaceble loss of resources</td>
<td>Medium</td>
</tr>
<tr>
<td>Confidence level</td>
<td>Medium</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

8.9.2 Recommended Mitigation

Noise
- Designated working hours;
- Silencers on plant, construction vehicles and equipment; and
- Location of construction workers camp.

Visual
- Ensure site is maintained in a cleanly fashion;
- Construction completed on time;
- Site vegetation correctly according to rehabilitation guidelines stated in the EMP; and
- Construction waste is not to enter the biophysical or socio-economic environment. Contractors to produce waste management plans to mitigate potential impacts.
8.10 Issue: Health and Safety

8.10.1 Issue

The proposed development has minimal potential to create a health and safety risk for neighbouring residents from the community. The construction of the development does pose a health and safety risk to construction workers. This can be mitigated with the correct implementation of a health and safety plan to be developed by the contractor.

Table 13: Safety Impacts

<table>
<thead>
<tr>
<th>ISSUE: Project Phase</th>
<th>SAFETY Construction Workers</th>
<th>SAFETY Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Nature</td>
<td>Negative (direct)</td>
<td>Negative (direct and indirect)</td>
</tr>
<tr>
<td>Extent Site</td>
<td></td>
<td>Local</td>
</tr>
<tr>
<td>Duration Short term</td>
<td></td>
<td>Short term</td>
</tr>
<tr>
<td>Probability Highly Probable</td>
<td></td>
<td>Probable</td>
</tr>
<tr>
<td>Degree of Irreversibility Low</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources Low</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Confidence level Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Significance Pre Mitigation Medium (-ve)</td>
<td>Low (-ve)</td>
<td></td>
</tr>
<tr>
<td>Significance Post Mitigation Low (-ve)</td>
<td>Low (-ve)</td>
<td></td>
</tr>
<tr>
<td>Degree of Mitigation Easily Mitigated</td>
<td>Easily Mitigated</td>
<td></td>
</tr>
</tbody>
</table>

8.10.2 Recommended Mitigation

Public
- Site demarcated and access to public is to be prohibited;
- Safety and informative signage to be erected;
- Off-site movement of construction vehicles to adhere to rules of the road; and
- Pedestrians have the right of way.

Construction Workers
- To adhere to on-site Health and Safety guidelines; and
- A health and safety plan is to be developed and implemented as soon as land clearing commences.
8.11 Issue: Solid Waste Pollution

8.11.1 Issue

The construction phase of the development is likely to generate waste from clearing of vegetation, builder's rubble, general construction refuse and minor hazardous waste including paint tins, cleaning acids, asphalt's and oils. The development could therefore impact on the environment by generating solid waste pollution. The contractor and developer should ensure that all the waste generated by the development is appropriately disposed of at the recommended waste disposal sites close to the area. During the operations phase, Municipal waste management will service the proposed residential area. The Berlin Regional Waste Disposal Site is nearby the proposed development and has sufficient capacity to deal with waste produced at Potsdam Unit V.

Table 14: Impacts surrounding Solid Waste

<table>
<thead>
<tr>
<th>ISSUE:</th>
<th>SOLID WASTE POLLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Phase</td>
<td>Construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Construction Waste</td>
</tr>
<tr>
<td>Nature</td>
<td>Negative (direct)</td>
</tr>
<tr>
<td>Extent</td>
<td>Regional</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
</tr>
<tr>
<td>Probability</td>
<td>Highly Probable</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
<td>Medium</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreparable loss of resources</td>
<td>Low</td>
</tr>
<tr>
<td>Confidence level</td>
<td>Medium</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
<td>Medium (-ve)</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
<td>Low (-ve)</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
<td>Easily Mitigated</td>
</tr>
</tbody>
</table>

8.11.2 Recommended Mitigation

Construction Waste
- To be removed from site promptly and deposited at permitted landfill site;
- No construction waste should enter the surrounding environment; and
- No cleared vegetation to be burnt on-site.

General Waste
- Waste to be collected regularly by municipality and deposited at permitted landfill site;
- BCM to develop a formal waste collection strategy;
• Roads design to cater for refuse collection trucks; and
• No waste should enter the surrounding environment.

8.12 Issue: Heritage Resources

8.12.1 Issue

No features of cultural, historical or heritage significance or buildings/structures/graves greater than 60 years old were identified at the project site during the site visit. Therefore the proposed development should not impact on the heritage resources of the area.

Table 15: Impacts on Heritage Resources

<table>
<thead>
<tr>
<th>ISSUE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HERITAGE</td>
</tr>
<tr>
<td>Project Phase</td>
</tr>
<tr>
<td>Impact</td>
</tr>
<tr>
<td>Nature</td>
</tr>
<tr>
<td>Extent</td>
</tr>
<tr>
<td>Duration</td>
</tr>
<tr>
<td>Probability</td>
</tr>
<tr>
<td>Degree of Irreversibility</td>
</tr>
<tr>
<td>Degree to which Impact may cause irreplaceable loss of resources</td>
</tr>
<tr>
<td>Confidence level</td>
</tr>
<tr>
<td>Significance Pre Mitigation</td>
</tr>
<tr>
<td>Significance Post Mitigation</td>
</tr>
<tr>
<td>Degree of Mitigation</td>
</tr>
</tbody>
</table>

8.12.2 Recommended Mitigation

No heritage resources were identified on site and therefore no mitigation measures are required. Should any artefacts, graves or features that may be of heritage value be excavated during the construction phase, work must stop and the heritage agency is to be notified immediately. Work may only commence once approval is given from the heritage agency.
8.13 Cumulative Impacts

The following cumulative impacts could be associated with a development of this nature.

8.13.1 Watercourses

The drainage lines connect the catchments with the Bridledrift Dam, on the Buffalo River. On-site pollution could entail far more significant impacts that only on-site pollution. The Buffalo River is already in a polluted state (RHP, 2004). Pollution from the development could be additive and cumulatively affect the water quality of the Buffalo River.

Table 16: Cumulative impacts with regards to the two watercourses

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>IMPACT</th>
<th>SIGNIFICANCE POST MITIGATION</th>
<th>INTERACTION OPPORTUNITY</th>
<th>SIGNIFICANCE OF CUMULATIVE IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watercourses</td>
<td>Siltation</td>
<td>Low (-ve)</td>
<td>Possibility of interaction during the construction phase if erosion is permitted and disposal of construction waste is not controlled and allowed to enter drainage lines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pollution of surface water</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction waste</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The on-site drainage lines connect the catchments with the Bridledrift dam, supplying water via the aforementioned watercourses. Any form of pollution of the dam could result in significant health impacts, regionally. However, the impacts are easily mitigated and therefore the significance of the cumulative impact remains Low (-ve).

8.13.2 Social

A development of this nature will cumulatively impact on the number of informal settlements, address the current housing shortage and will also create jobs throughout the construction and operation phases. It is essential to weigh the negative versus the positive impacts to obtain an overall cumulative social impact.

Table 17: Cumulative impacts on society

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>IMPACT</th>
<th>SIGNIFICANCE POST MITIGATION</th>
<th>INTERACTION OPPORTUNITY</th>
<th>SIGNIFICANCE OF CUMULATIVE IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>Provision of Jobs</td>
<td>Low (+ve)</td>
<td>It is highly likely that these impacts will interact during either the construction phase, the operational phase or both.</td>
<td>Due to the location of the site it is not anticipated that the cumulative impact will be significant. Rather it is expected that the significance of the impact will be Medium (+ve).</td>
</tr>
<tr>
<td></td>
<td>Provision of Housing</td>
<td>High (+ve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community Upliftment</td>
<td>Low (+ve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Workers</td>
<td>Low (-ve)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9 ASSUMPTIONS AND KNOWLEDGE GAPS

The following assumptions and knowledge gaps have an influence on the assessment of the impacts in the EIA:

- Site investigations and consultation with the community did not provide any evidence of sensitive heritage resources. It is therefore assumed that the site does not contain any resources of heritage value. However, there may be sensitive heritage resources subsurface which will only be discovered once excavations commence. Should this be the case the correct procedure would be to contact the responsible provincial and national heritage authorities; and
- The heritage agency was notified at commencement of the EIA and no further feedback was obtained.
10 ENVIRONMENTAL IMPACT STATEMENT

10.1 Need and Desirability

The proposed site has been identified as an area for high density development, according to the BCM Spatial Development Framework. Furthermore, there is a need for the development of low-cost housing specifically within the project area. The development can therefore meet the need to accommodate previously disadvantaged individuals who cannot afford to purchase houses of their own.

The Potsdam Unit V development will, in terms of the Buffalo City Implementation Plan, redress the number of informal settlements, address the current housing shortage, and create employment opportunities in both the construction and operational phases.

10.2 Positive and Negative Impacts

The Scoping and EIA phases of this project have not identified any fatal flaws which should prevent the project from proceeding.

Positive direct impacts include job creation and community upliftment. Furthermore, the development will address the shortage of formal housing in the Mdantsane area.

Positive indirect impacts include utilising the 'undetermined' open area of land for the betterment of the community, instead of leaving it vacant and at the mercy of land invaders, therefore creating future problems for the Biophysical and Socio-economic environment.

Post mitigation negative impacts discussed in this report are all rated as Low Significance. The most significant impacts could be on the watercourses and downstream water quality.

10.3 Alternatives

The applicant requested and obtained an exemption from having to assess alternatives, because Buffalo City Municipality (BCM) in line with the SDF has previously set aside and subdivided the site for low-cost housing. The low-cost housing development would not only provide much needed housing, social services and community facilities, but also enable the area to be serviced more economically.

The No-Go alternative will contribute nothing to enhancing the lives of the people who would have benefited from the development. The site is currently used for grazing and any other illegal/detrimental activities. It is burnt regularly, exposing the soil to erosion and endangering the health of the watercourses, the Bridledrift dam and the Buffalo River. Illegal informal housing has been established within the south eastern corner of the proposed site. The lack of waterborne sanitation associated with this
informal housing places further pressure on the natural environment and may further decrease the state of the nearby watercourses.

10.4 EAP’s Opinion on Authorisation of Activity

Given the low significance of the negative impacts of the project and the positive impacts associated with a development of this nature, it is the EAP’s opinion that BCM be allowed to develop the land parcel according to the design considered in this EIA. Development should however be conducted in accordance with the recommendations given in this EIAR.

10.5 Recommendations

The following Recommendations are deemed necessary by the EAP and should be included as conditions in an Environmental Authorisation for the Potsdam Unit V low cost housing development:

- In terms of design, surfaced roads should be enforced on steeper slopes;
- Construction within 30 metres of all designated drainage lines should be prohibited (Figure 4);
- The removal of thicket vegetation along designated drainage lines is to be prevented;
- Construction should not commence within 15 metres of the vegetation associated with the southern most watercourse, where practical (Figure 4);
- No development to take place within 100 year flood line boundary (Figure 6);
- Any sites of heritage significance discovered during the construction phase to be reported to the responsible heritage authority and all work in the vicinity of the find must stop. Work may only recommence on approval of the authority;
- No occupation of houses to take place until the required sewerage infrastructure and pump station is in place;
- The draft EMP for the construction phase must be completed with DEDEA’s conditions and requirements and signed by BCM, and the relevant contractor as implementing agents; and
- The EMP should be audited by a suitably qualified EAP. Audits should be undertaken, at least, on a monthly basis.
Figure 4: No-development Zones

Figure 5: Slope analysis
Figure 6: 100 year flood line layout
11 CONCLUSION

This report details the findings of the Final Environmental Impact Assessment Report (EIAR) undertaken as part of the legislated EIA process for the proposed Potsdam Unit V development.

This Final EIAR will be submitted to the Department of Economic Development and Environmental Affairs for review and approval. Registered I&AP’s will be further notified upon DEDEA’s decision which will be distributed to all registered I&AP’s on receipt of the Environmental Authorisation, should one be granted.
REFERENCES


DEAT, 2002: Scoping, Integrated Environmental Management, Information Series 2, Department of Environmental Affairs and Tourism (DEAT), Pretoria.


Pemro Community Consultants, 2007: Potsdam: Extensions 3,6,7, and 9 – Amendment to Existing Layout Plans, East London.


APPENDIX A

CVS OF ENVIRONMENTAL ASSESSMENT PRACTITIONERS
APPENDIX B

COPY OF THE APPLICATION FORM & LANDOWNERS CONSENT
APPENDIX C

I&AP REGISTER
APPENDIX D
COPY OF NEWSPAPER ADVERT
APPENDIX F

COMMENTS REGISTER
APPENDIX G

I&AP CORRESPONDENCE
APPENDIX H

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME
APPENDIX I

DOCUMENT CONTROL SHEET
**DOCUMENT CONTROL SHEET**  
*(FORM IP180/B)*

**CLIENT** : Buffalo City Municipality (BCM)  
**PROJECT NAME** : Potsdam Housing EIA  
**PROJECT No.** : J28058  
**TITLE OF DOCUMENT** : Proposed Potsdam Low-cost Housing Development: Final EIAR  
**ELECTRONIC LOCATION** : P:\J28058_Potsdam_Housing_EIA\Tasks\Reports\EIR\Final

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**ARCUS GIBB (Pty) Ltd**

- **Website** : www.arcusgibb.co.za  
- **Postal Address** : PO BOX 19844  
- **Physical Address** : 9 Pearce Street, Berea  
- **Contact Person** : Brendon Steytler  
- **Email Address** : bsteytler@gibb.co.za  
- **Telephone No.** : 043 706 3607  
- **Fax No.** : 043 706 3647