



**GA Environment**



## **BRYANSTON EXT. 3B – ENVIRONMENTAL MANAGEMENT PROGRAMME**

BASIC ASSESSMENT PROCESS FOR THE PROPOSED BRYANSTON EXT. 3B HOUSING PROJECT AS PART OF THE RAPID LAND RELEASE PROGRAMME FOR THE GAUTENG DEPARTMENT OF HUMAN SETTLEMENTS, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY

**JULY 2021**



**GAUTENG PROVINCE**  
HUMAN SETTLEMENTS  
REPUBLIC OF SOUTH AFRICA

**ENVIRONMENTAL MANAGEMENT PROGRAMME  
FOR THE  
PROPOSED BRYANSTON EXT. 3B HOUSING PROJECT AS PART OF THE BASIC ASSESSMENT FOR THE  
RAPID LAND RELEASE PROGRAMME FOR THE GAUTENG DEPARTMENT OF HUMAN SETTLEMENTS, CITY  
OF JOHANNESBURG METROPOLITAN MUNICIPALITY**

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**PROJECT INFORMATION**

|   |  |
|---|--|
| <b>Title:</b>                                 | Environmental Management Programme for the proposed Bryanston Ext. 3b Housing Project as part of the Basic Assessment for the Rapid Land Release Programme for the Gauteng Department of Human Settlements, City of Johannesburg Metropolitan Municipality |
| <b>Competent Authority:</b>                   | Gauteng Department of Agriculture and Rural Development (GDARD)  |
| <b>GDARD Reference No.:</b>                   | To be issued   |
| <b>Applicant:</b>                             | Gauteng Department of Human Settlements  |
| <b>Environmental Assessment Practitioner:</b> | GA Environment (Pty) Ltd.  |
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| <b>Date:</b>                                  | 07 July 2021   |

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**ABBREVIATIONS**

|         |  |
|---------|--|
| CA      | Competent Authority  |
| CBA     | Critical Biodiversity Area   |
| CE      | Consulting Engineer  |
| EA      | Environmental Authorisation  |
| EAP     | Environmental Assessment Practitioner                                |
| EAR     | Environmental Audit Report   |
| ECA     | Environmental Conservation Act No. 73 of 1989                        |
| ECO     | Environmental Control Officer  |
| EIA     | Environmental Impact Assessment                                      |
| EMPr    | Environmental Management Programme                                   |
| EO      | Environmental Officer  |
| ERAP    | Emergency Response Action Plan                                       |
| RE      | Resident Engineer  |
| ESR     | Environmental Site Representative                                    |
| GDARD   | Gauteng Department of Agriculture and Rural Development              |
| GDHS    | Gauteng Department of Human Settlements                              |
| HCS     | Hazardous chemical Substance   |
| MSDS    | Material Safety Data Sheet   |
| NEMA    | National Environmental Management Act (Act 107 of 1998)              |
| NEM:BA  | National Environmental Management: Biodiversity Act (Act 10 of 2004) |
| NFEPA   | National Freshwater Ecosystem Protected Area                         |
| PM      | Project Manager  |
| RI&AP's | Registered Interested and affected parties                           |
| RLRP    | Rapid Land Release Programme   |
| SANBI   | South African National Biodiversity Institute                        |

## DEFINITIONS

**Aspect** - Element of an organisation's activities, products or services that can interact with the environment.

**Auditing** - A systematic, documented, periodic and objective evaluation of how well the Environmental Management Programme (EMPr) is being implemented and is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems, while keeping track of their compliance with the Environmental Authorization.

**Clearing of vegetation** - Clearing refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g. fire- breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated.

**Contractor** - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

**Corrective (or remedial) action** - Response required in addressing an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

**Degradation** - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

**Developer** - Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the EA (Environmental Authorisation) and EMPr.

**Environment** - The surroundings within which humans exist and that are made up of land, water and atmosphere of the earth, micro-organisms, plant and animal life: or any part or combination of the two and the interrelationships among them, the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental Impact Assessment (EIA)** - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

**Environmental Management System (EMS)** - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Organisation for Standardisation.



**Environmental Policy** – A statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

**Habitat** - A habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

**Hazardous substance** - is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

**Impact** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time, space, magnitude and intensity.

**Indigenous species** - Flora and Fauna species that are naturally found in an area.

**Infrastructure** - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage, etc.

**Integrated Environmental Management**- This is a philosophy used in the assessment of and management of the environment, during all actions, plans, activities, etc. that could affect the environment. Its aim is to ensure sustainability.

**Method statement** - means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

**Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts. Actions that limit, stop or reverse the magnitude and/or rate of long-term effect on the environment.

**Natural environment** - Encompasses all living and non-living things occurring naturally on Earth or some region thereof. It is an environment that encompasses the interaction of all living species. Climate, weather, and natural resources that affect human survival and economic activity.

**Policy** - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people or an organisation's values and goals.

**Process** - Development usually happens through a process - a number of planned steps or stages.

**Resources** - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

**Slope**- means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units.

**Solid waste**- means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

**Spoil**- means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works.

**Topsoil**- means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil.

**Works**- means the works to be executed in terms of the Contract.

### LEGISLATIVE REQUIREMENTS FOR AN EMPr

The table below provides the Requirements for an Environmental Management Programme (EMPr) in terms of the 2014 EIA Regulations (Appendix 4) with reference to the relevant sections of this report or where these requirements are addressed.

| Section   | Content   | Reference in report |
|---|---|---------------------|
| An EMPr must comply with section 24N of NEMA and include- |   |                     |
| 1(a)  | Details of<br>(i) the EAP who prepared the EMPr; and<br>(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;  | Section 2           |
| 1(b)  | A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;  | Section 6           |
| 1(c)  | A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;  | Section 1.2         |
| 1(d)  | A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-<br>(i) planning and design;<br>(ii) pre-construction activities;<br>(iii) construction activities;<br>(iv) rehabilitation of the environment after construction and where applicable post closure; and<br>(v) where relevant, operation activities;   | Section 7           |
| 1(e)  | A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);  | Section 7           |
| 1(f)  | A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to –<br>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;<br>(ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable; | Section 7           |
| 1(g)  | The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);   | Section 7           |
| 1(h)  | The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);  | Section 7           |

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|      |   |                 |
|------|---|-----------------|
| 1(i) | An indication of the persons who will be responsible for the implementation of the impact management actions;   | Section 7       |
| 1(j) | The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;  | Section 7       |
| 1(k) | The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);   | Section 7 and 8 |
| 1(l) | A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;   | Section 8       |
| 1(m) | An environmental awareness plan describing the manner in which-<br>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and<br>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and | Section 1.6     |
| 1(n) | Any specific information that may be required by the competent authority.   |                 |

**UNDERTAKING TO IMPLEMENT THE EMPr**

**Undertaking by the Principal Contractor**

I ..... acting on behalf of the **Contractor**, hereby indicate that I have read through the EMPr and understand the measures required to be implemented in terms of the EMPr. I hereby undertake to implement these measures and carry out my duties as specified herein.

Signed on ..... at .....

.....  
Contractor’s Environmental  
Representative

.....  
Witness (1)

.....  
Witness (2)

**Undertaking by the Environmental Control Officer**

I ..... the Environmental Control Officer appointed by GDHS hereby indicate that I have read through the EMPr, and understand the measures required to be implemented in terms of the EMPr and hereby undertake to fulfil my duties as specified herein.

Signed on ..... at .....

.....  
Contractor’s Environmental  
Representative

.....  
Witness (1)

.....  
Witness (2)

**THE SIGNING OF THIS DOCUMENT IS CRUCIAL AS IT BINDS THE CONTRACTOR TO THE CONTENTS OF THE EMPr IMPLEMENTATION THEREOF**

## 1. INTRODUCTION

### 1.1 Project background

The Gauteng Department of Human Settlements (GDHS) is proposing to construct affordable housing in Bryanston Ext. 3 (Bryanston Ext.3B hereafter) which is located within the City of Johannesburg Metropolitan Municipality. The proposed housing project is part of the Gauteng Rapid Land Release Programme (RLRP) which was launched by the Premier of Gauteng Province, Mr David Makhura. The RLRP is a component of the broader land reform programme in the Province and the Republic of South Africa and is aimed at unlocking economic value through the release of land to qualifying individuals. Subsequent to the Gauteng Province; Executive Committee Approval on the 16<sup>th</sup> of May 2018, the Gauteng Department of Human Settlements is leading the Land Availability Stream (LAS), of the Rapid Land Release Programme (RLRP) to identify suitable sites for release to qualifying beneficiaries for use as:

- Serviced Sites for Self-build under the Finance Linked Individual Subsidy Programme (FLISP);
- Agricultural Sites;
- Commercial Buildings; and
- Multi-Storey Buildings.

The programme mainly aims to identify land parcels that are currently vacant, owned by either the National, Provincial or Local Government and can be allocated to qualifying beneficiaries for the development of human settlements and/or for agricultural purposes. Specific to the housing component of the RLRP, the GDHS will be involved primarily in the provision of serviced stands or completed housing to suitable beneficiaries.

The key aims of the RLRP are as follows:

- to ensure that unused land is released for either housing or agricultural activities; and
- to address the housing backlog in the Gauteng Province while catering for social and economic development.

The proposed Bryanston Ext. 3B housing project which will be discussed in this document is one of several RLRP projects proposed in the Gauteng Province. At the time of the compilation of this Report, the proposed Bryanston Ext.3B project will entail the following key in fracture:

- Approximately 184 affordable housing units;
- Support services for the development (i.e. bulk water, electricity, sewer, etc.) will also be constructed.

The Bryanston Ext. 3B site is located approximately 30km north of the Johannesburg CBD within Ward 104 of the City of Johannesburg Metropolitan Municipality. The co-ordinates of the approximate centre point of the site are 27°58'55.6"S; 26° 4' 4.6 "E. The site is located within the boundaries of the Ferndale Valley Arboretum and is bounded by Spruce Street to the North, the broader Ferndale Valley Arboretum to the east and south and Cork Avenue to the west. Direct access to the site is available from the site gate along Cork Avenue. Refer to the site's locality in **Figure 1**.

The project site occupies an area of 1.36Ha and comprises of the following erven in Bryanston Ext. 3 which are represented in **Figure 1**:

- Erf 3975;
- Erf 3976;
- Erf 3977; and
- Erf 3978.



Figure 1: Project site locality (Google Earth and Project Team)

## 1.2 Key site sensitivities

- **Critical Biodiversity Area:** The study area is located within a Critical Biodiversity Area (CBA) as presented in **Figure 2**. CBAs are areas that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Conservation of the bouldered rocky outcrop and associated woodland within the west of the study area is recommended. The bouldered rocky outcrop and woodland vegetation units provide habitat for a fair diversity of indigenous trees species, and is of high floral ecological importance.



Figure 2: Critical Biodiversity Area Map for site

- *Avifaunal Sensitivities:* The most notable observation was of the African Finfoot at two locations along the river system. The availability of food, the fast-flowing water flanked by thick riparian vegetation and overhanging trees provides the ideal habitat for the African Finfoot - a scenario that is unique to an urban environment and as such the importance of this site cannot be overstated.
- No tree species protected under the National Forest Act (Act No. 84 of 1998) or Threatened or Protected Species (TOPS) floral species as provided for in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) were encountered within the study area during the field assessment.
- No threatened or protected faunal species occur on site
- The riparian delineation indicated that the proposed project footprint encroaches into the riparian zone. Furthermore, no species of conservational concern were collected during the assessment. Refer to **Figure 3**.



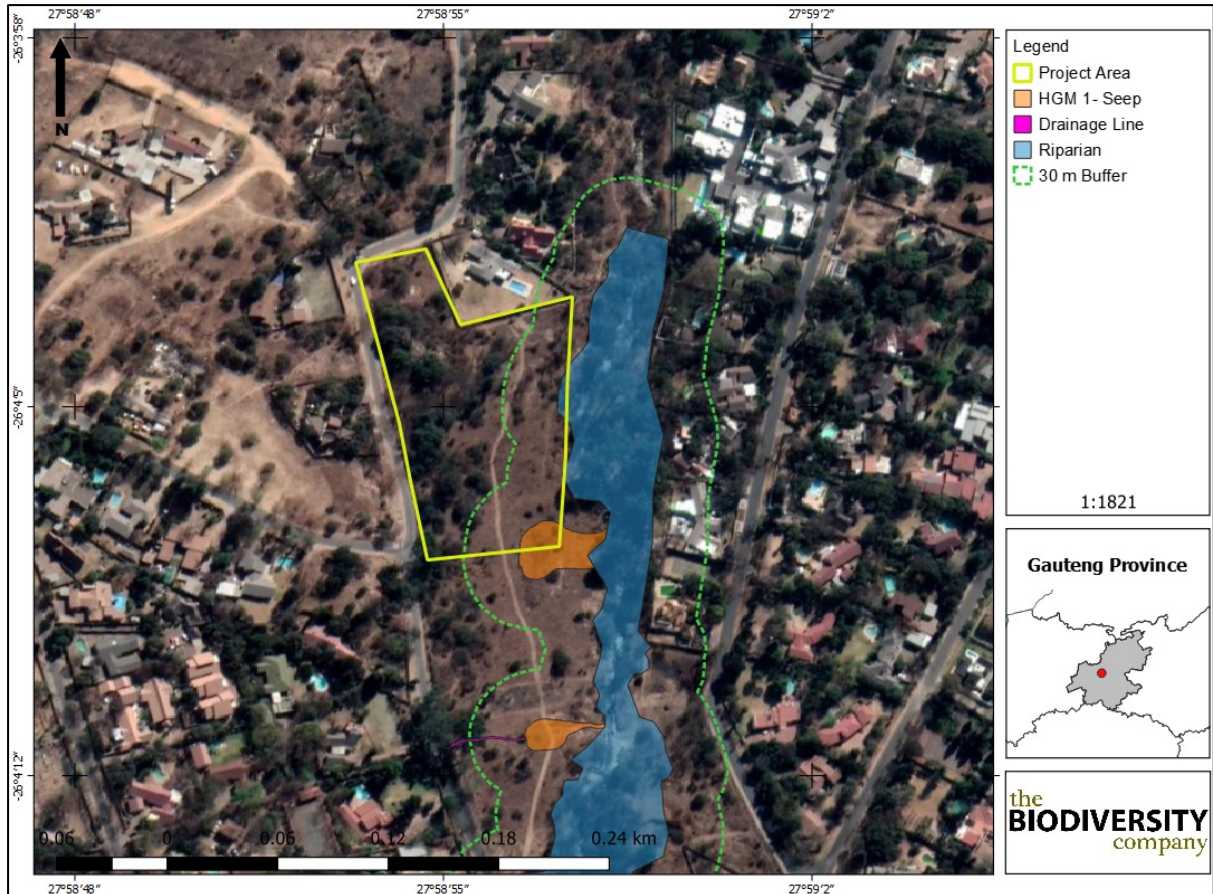


Figure 3: Site Hydrological sensitivities

The summary of site sensitivities is presented in Figure 5.

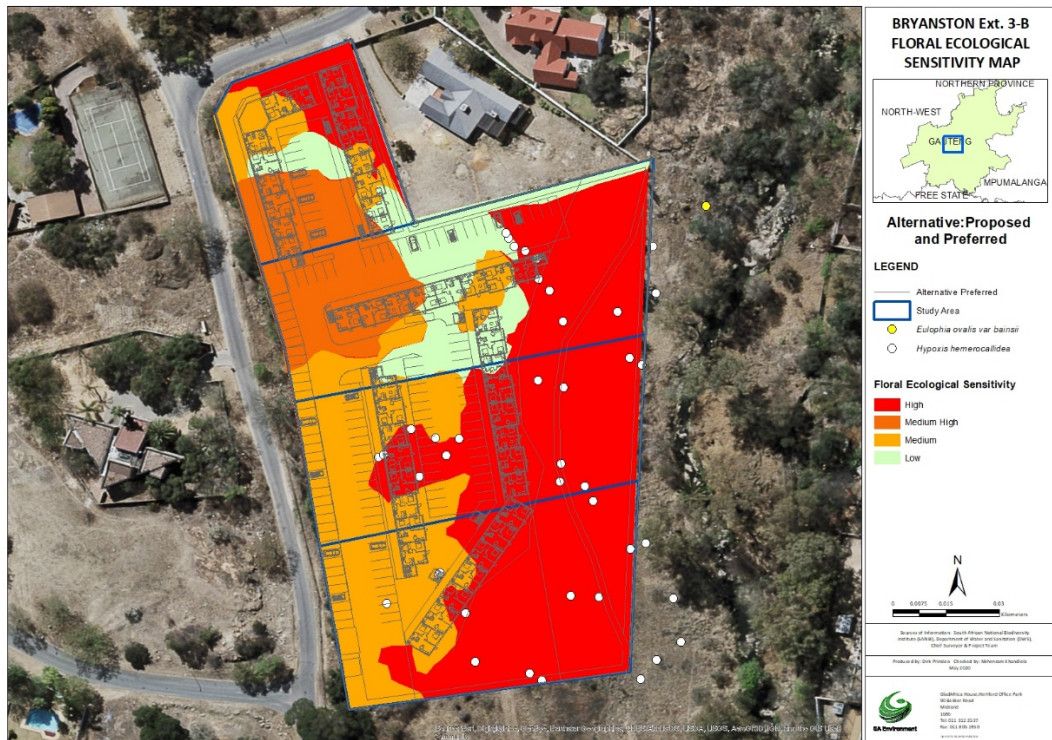


Figure 4: Proposed and preferred layout plan showing ecological sensitivities

### 1.3 Purpose and objectives the document

This EMPr is the main output of the Basic Assessment process and has been compiled in accordance with the requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) legislation and Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992).

The purpose of this EMPr is to provide a framework within which the environmental risks and liabilities identified during the Basic Assessment process are managed for the duration of the project lifecycle. This document further provides mitigation measures to ensure legal compliance and environmental best practice during the construction of the proposed project.

The EMPr has the following key objectives:

- To ensure compliance of the with applicable environmental legislation;
- To communicate environmental expectations and requirements of the project;
- To ensure that the roles and responsibilities of the various parties involved in the implementation of the EMPr are clearly outlined;
- To reduce adverse environmental impacts as a result of the project activities; and
- To ensure continuous improvement in terms of the environmental performance of the project.

## 2. PREPARATION OF THIS EMPr

In accordance with the Regulation 13 of the EIA Regulations (GN R982 of 2014) as amended, the proponent is required to appoint an independent registered Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) process for any activities regulated in terms of the NEMA. As such, GDHS appointed GA Environment (Pty) Ltd an independent consulting firm to undertake the Basic Assessment process. Both GA Environment and associated specialist are not subsidiaries of the proponent or have vested interested in the proposed activity. The details of the project proponent and EAP are provided below:

This section of the Scoping Report provides the particulars of the key stakeholders associated with the project. These details are outlined in **Table 4** below.

Table 1: Application details

| Applicant's representative   | Environmental Assessment Practitioner  | Competent Authority Representative   |
|--|--|--|
| <b>Name: Shingai Mpinyuri</b><br><b>Designation:</b> Project Director: Rapid Land Release Programme Planning and Property Management | <b>Name: Nkhensani Khandhela</b><br><b>Designation:</b> Environmental Assessment Practitioner<br><b>Address:</b> GladAfrica House, Hertford Office Park, 90 Bekker Road, Midrand, 1686 | To be included subsequent to the submission of the Application for Environmental Authorisation |

|   |  |  |
|---|--|--|
| <p><b>Contact Details:</b><br/> <i>withheld for confidentiality.<br/> The information will however<br/> be included in the Application<br/> for Environmental<br/> Authorisation which will be<br/> submitted to GDARD.</i></p> | <p><b>Tel:</b> 011 312 2537<br/> <b>Fax:</b> 011 805 1950<br/> <b>Email:</b><br/> <a href="mailto:environment@gaenvironment.com">environment@gaenvironment.com</a></p> |  |
|---|--|--|

This EMPr was prepared by **Nkhensani Khandhela**, an Environmental Assessment Practitioner (EAP) employed by GA Environment (Pty) Ltd. Nkhensani holds a Master of Science Degree (in Geography) from the University of KwaZulu Natal. She is an Environmental Scientist with 23 years of experience. She is registered as a Professional Natural Scientist (Environmental Scientist). Nkhensani has over the past 18 years specialised in Integrated Environmental Management (IEM), Scoping & Environmental Impact Assessments (EIAs), Waste licence and Environmental Authorisation applications. Nkhensani has undertaken and managed numerous projects in her fields of expertise for public sector, private sector and industry, and has developed a track record of professional excellence in the field.

### 3. KEY APPLICABLE LEGISLATION

The management and mitigation of the environmental impacts during construction is governed by environmental legislation. It is of utmost importance that this project is constructed in compliance with all relevant environmental legislation whether; National, Provincial and/or Local. This EMPr has thus been compiled as per the requirements of *Appendix 6* of the NEMA EIA Regulations 2014, as amended and in terms of Section 24N of the NEMA.

It is understood that any development during its various phases is a dynamic activity within a dynamic environment. The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principles of this document:

- Constitution of the Republic of South Africa (Act No. 108 of 1996);
- National Environmental Management Act (Act No. 107 of 1998);
- National Environmental Management: Biodiversity Act (Act 10 of 2004);
- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act, 1998 (Act No. 36 of 1998); and
- Occupational Health and Safety Act (Act No. 85 of 1993);

In addition to the above, other provincial and municipal legislation by relevant to the proposed development must also be adhered to.

### 4. ROLES AND RESPONSIBILITIES

In order to ensure the sound development and effective implementation of the EMPr, it is necessary to identify and define the responsibilities and authority of the various personnel and organisations

that will be involved in the project. The following key roles must be provided for during the implementation of the EMPr:

- Authorities;
- Developer/ Proponent;
- Consulting Engineers (CE);
- Engineer's Representative (ER);
- Environmental Officers (EO);
- Environmental Site Representative (ESR);
- Environmental Control Officer (ECO);
- Project Manager (PM);
- Contractors (C); and
- Environmental Assessment Practitioner (EAP).

The functions and responsibilities of these role players are outlined in **Table 1**.

*Table 2: Functions and Responsibilities of the Project Team*

| FUNCTION   | RESPONSIBILITY  |
|--|---|
| <p><b>DEVELOPER/PROPONENT</b></p> <p><i>Gauteng Department of Human Settlements (GDHS)</i></p> | <p>GDHS will be the project proponent for all components of the work related to the project. GDHS is therefore accountable for ensuring compliance with the EMPr and all legal requirements related to the project. The proponent is also responsible for the appointment and management of the rest of the project team.</p>   |
| <p><b>PRINCIPAL CONTRACTOR</b></p> <p><i>To be appointed by GDHS</i></p>                       | <p>The Principal Contractor is responsible for the implementation and compliance with the requirements of the EMPr and conditions of the EA's (where applicable), contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMPr, through inductions and training.</p> <p>The Contractor is also required, where specified, to provide Method Statements setting out how the management actions contained in this EMPr of the EA will be implemented.</p> |
| <p><b>CONSULTING ENGINEER</b></p> <p><i>GladAfrica Consulting Engineers</i></p>                | <p>The Consulting Engineer (CE) is contracted by the developer to design and specify the project engineering aspects. Generally, the engineer runs the works contract and oversee the overall implementation of the project as well as the compliance of the EMPr and incorporate any environmental consideration recommended in this EMPr into the design. The CE may also fulfil the role of PM on the proponent's behalf (see PM).</p>   |

| FUNCTION   | RESPONSIBILITY  |
|--|---|
| <p><b>PROJECT MANAGER</b></p> <p><i>To be appointed by GDHS (The Project Manager for the planning phases of the project was GladAfrica Project Managers. The Project Manager to carry out the responsibilities in the adjacent column will be appointed by GDHS)</i></p> | <p>The Project Manager (PM) has overall responsibility for managing the project, Contractors, and Consultants and for ensuring that the environmental management requirements are met. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMPr in accordance with an agreed warning procedure.</p>   |
| <p><b>ENVIRONMENTAL CONTROL OFFICER</b></p> <p><i>To be appointed by GDHS</i></p>  | <p>The Environmental Control Officer (ECO) is an independent person responsible for monitoring and implementation of the EMPr and environmental licences/authorisation (where applicable). This will be through frequent environmental audits, however the frequency at which the ECO will be required to conduct audits will depend on the conditions of the Environmental Authorisation (where applicable) or the nature of the development/ sensitivity of the environment.</p> <p><u><i>Other responsibilities of the ECO may include the following, depending on the nature of the appointment:</i></u></p> <ul style="list-style-type: none"> <li>• Authority to stop any works until the matter is resolved if, in his/her opinion, there is or may be a serious threat to or impact on the environment; caused directly by the Contractor's actions or activities during the construction phase.</li> <li>• Submit environmental audit reports to the relevant project team and Competent Authority to keep abreast of compliance on site. Report any environmental incidents/ accidents on site and follow appropriate corrective actions.</li> <li>• Liaise with the relevant authorities and the project team, as and when required. The ECO must communicate and inform the developer and CE of any changes to environmental conditions as required by relevant authoritative bodies.</li> <li>• Ensure that the registration and updating of all relevant EMPr documentation is carried out. Review all environmental related method statements.</li> <li>• Undertake to conduct an induction and an environmental awareness training for the key staff on site.</li> <li>• Advise the Contractor on preventative measures as well as corrective action measures to eliminate the cause of the non-conformance incidents.</li> </ul> |
| <p><b>ENVIRONMENTAL SITE REPRESENTATIVE</b></p> <p><i>To be appointed by Principal Contractor</i></p>  | <p>The Environmental Site Representative (ESR) is employed by the Contractor as his / her environmental representative to monitor, review and verify compliance with the EMPr and other Environmental Authorisations on a day-to-day basis on site.</p>   |

| FUNCTION  | RESPONSIBILITY   |
|---|--|
|   | <p>The site representative needs to work closely with the ECO to manage the environmental impacts on site. They will also be responsible for maintaining all records in relation to the EMPr requirements on site.</p> <p><i>NOTE: It is possible that the Health and Safety representative on site can also fulfil this role</i></p>  |
| <p><b>ENVIRONMENTAL OFFICER</b></p> <p><i>Developer's Environmental Representative</i></p>                                      | <p>The Environmental Officer (EO) is employed by the Developer, i.e. GDHS, to fulfil the following responsibilities, <i>inter alia</i>:</p> <ul style="list-style-type: none"> <li>• Aiding the Contractor to comply with all the project environmental requirements, objectives and targets;</li> <li>• Facilitating environmental activities and environmental awareness training of all personnel on site, and</li> <li>• Implementing the internal or Developer's Environmental Management Systems (EMS).</li> </ul> <p>This individual also works closely with the ESR and ECO.</p>   |
| <p><b>Competent Authority</b></p> <p><i>Department of Agriculture and Rural Development (GDARD)</i></p>                         | <p>The Competent Authority (CA) will be responsible for approving the EMPr and issuing of the Environmental Authorisation (if applicable). Once the project has been approved, the competent authorities will be accountable for ensuring that the Developer complies with the conditions of the Environmental Authorisation and requirements stipulated in this EMPr and other environmental legislations. This will be achieved by reviewing audit reports submitted by the Environmental Control Officer. and conducting regular site visits should the need for this arise.</p> <p><i>Other authorities may also be involved in the reviewing and approval process of this EMPr.</i></p>   |
| <p><b>ENVIRONMENTAL ASSESSMENT PRACTITIONER</b></p> <p><i>GA Environment (Appointed by GladAfrica Consulting Engineers)</i></p> | <p>The definition of an Environmental Assessment Practitioner (EAP) in Section 1 of NEMA is <i>"the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations"</i>.</p> <p>The Environmental Assessment Practitioner is generally responsible for undertaking environmental processes necessary to authorise the project activities proposed. The Developer can also appoint the Environmental Assessment Practitioner to act an Environmental Control Officer during the implementation or construction phase of the project.</p> |

## 5. OPERATIONAL CONTROLS

The operations that are associated with the identified environmental aspects must be consistent with the objectives and conditions of the EMPr. The typical operational controls that must be put in place for a construction site are as follows:

### 5.1 Environmental-related method statements

Environmental-related method statements are written submissions to the Engineer by the Contractor, in collaboration with environmental personnel involved in the project. The method statements set out the plant, materials, labour and method that the Contractor proposes using to carry out an activity (identified by the Engineer) to address specific requirements and ultimately this EMPr.

All method statements, including those which may be required as ad-hoc or emergency construction method statements, must be submitted for approval prior to the commencement of any activity. Any changes to the method of works must be reflected by amendments to the original approved method statement and re-approved on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMPr.

Typical environmental method statements that may be required for a construction development at the discretion of the ECO include:

- Removal of indigenous vegetation;
- Water Resources Management;
- Removal of alien vegetation;
- Dust Control;
- Concrete mixing and management;
- Management of Fire;
- Handling and storage of oils and chemicals;
- Management of accidental spills;
- Management of contaminated materials;
- Solid waste management;
- Management and storage of reusable materials; and
- Site refuelling of construction vehicles and plant on site.

### 5.2 Emergency preparedness

In the event of emergency, the following elements must present and easily accessible on site for the management of such emergency:

#### 5.2.1 *Emergency contact details*

The Contractor must ensure that the numbers of the following persons are displayed at a prominent place on site at all times:

- The local Police Stations;
- The nearest Ambulance/hospital;
- Resident Engineer, project Manager and Representative of the Contractor; and
- Representative of the Developer.

These details, which must be updated should the need arise.

### 5.2.2 *Spill kits and first aid*

The Contractor must ensure that spill kits, first-aid and associated equipment are present onsite and easily accessible for the potential occurrence of hazardous and/or material spills. The staff should be trained in the use thereof.

## 5.3 Environmental training and awareness

Prior to commencement of site establishment and construction activities, all the teams involved in work on the project are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr. The importance of the environmental awareness training is to also ensure all workers understand the risks involved as well as how to adequately implement mitigation measures. The education/awareness programme should be aimed at all levels of management and construction workers within the Contractor's team. All new employees arriving on site shall undergo environmental awareness programme.

It is recommended that the environmental awareness training be undertaken by the ESR and the programme must include:

- Induction of all personnel in a language and method most suitable; and
- Signing of an attendance register and declaration of ensuring environmental protection. Proof of the induction must be kept.

Indicative topics that may be included/ covered in the environmental induction:

- What is the environment and why must it be protected?
- What are the environmental sensitivities of the area in which activities are being undertaken?
- How construction activities can adversely impact of the environment;
- What are the mitigation measures for adverse impacts?
- What is the social responsibility of all site employees during construction?
- How should environmental incidents be recorded?

*Awareness posters and pamphlets must also be provided to create environmental awareness throughout the site.*

Refresher environmental awareness training must be conducted and when the need arises.

### 5.3.1 *Toolbox talks*

The Environmental Site Representative must also ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc.

It is also recommended that the toolbox talks are conducted in an interactive way as to ensure the employees understand the content and purpose of the EMPr requirements. The Contractor shall keep records of the environmental subjects discussed in the toolbox talk sessions. Signed registers documenting all employees' attendance must also be kept on record.



#### 5.4 Site documentation

The following is a list of some examples of documentation that should be kept on site and made available to the ECO and/or any other relevant parties on request:

- This EMPr;
- The Project's Environmental Authorisation obtained from GDARD;
- Site daily diary;
- Site instruction book;
- A Complaints register;
- Incident register;
- Copies of environmental audit reports;
- Proof of environmental training undertaken by the Contractor and the ECO;
- Schedules for environmental audits;
- Minutes of project meetings;
- Agreements;
- Non-compliance and corrective action reports; and
- Method statements signed by the Contractor, the ECO and Engineer.

#### 5.5 Communication procedures

- Site instructions: The site instruction journal entries will be used for the recording of instructions as they relate to implementation of the EMPr, and/or any work orders given by the Engineer.
- Site Meetings: A clear channel of communication and coordination between the Developer and the Contractor is very crucial in any construction project. One way of ensuring this is through regular site meetings. The purpose of the meetings will be to discuss general progress of construction. Some of the environmental aspects to be discussed in the meeting shall include:
  - *Efforts to lower the environmental, social and health risks involved;*
  - *Discuss and resolve non-conformance to environmental legislation / policies or the EMPr; and*
  - *Report on environmental performance of the construction works.*

#### 5.6 Other general guidelines

The following measures provide guideline solutions to frequently anticipated issues on most development activities.

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds etc. are ultimately the responsibility of the applicant / developer as per Section 28 of NEMA, 1998 (as amended) which discusses 'Duty of Care and remediation of environmental change'.
- The study area must be clearly defined and surveyed according to the proposed activities. All workforce members and other construction personnel are not to go beyond the defined footprint.
- The Contractors must adhere to agreed and approved access points and no-go areas.

- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damages are to be repaired as soon as practically possible.
- Landowners of the site and adjacent properties and/or mast owners must be informed of the starting and completion dates of the construction activities.
- The Contractor must adhere to all conditions of contract including this EMPr.
- All private and public manmade structures near the project site must be protected against damage at all times and any damage must be rectified by no later than 7 days after occurrence.
- Proper documentation and record keeping of all complaints and actions taken must be kept at the site office.
- Regular site inspections and good control over the site activities should be undertaken.
- A positive attitude towards environmental management by all site personnel must be motivated through regular and effective awareness and training sessions.
- Social issues in terms of safety for human life, on employees should be encouraged. All construction areas and activities should be cordoned off.

## **6. PROJECT PHASES AND ASSOCIATED ACTIVITIES**

### **6.1 Pre-construction phase**

The 'pre-construction phase' refers to the period leading up to and prior to the commencement of the construction activities and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the onset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction of activities phase and must be mitigated through the contingency plans identified in the pre-construction phase.

### **6.2 Construction phase**

The 'construction' section refers to all construction activities associated with the construction of the housing. This phase will include the clearance of vegetation for the proposed development and support infrastructure.

### **6.3 Rehabilitation and demobilisation phase**

A proper rehabilitation procedure must be followed, immediately after construction activities and prior to demobilisation. The objective of rehabilitating the site would be to re-instate the affected areas to a similar or better condition to the current environment. This phase will include the rehabilitation of areas disturbed by construction works and removal and disposal of all construction equipment and rubble.

## **7. ENVIRONMENTAL CONTROLS AND MANAGEMENT PROGRAMME IMPLEMENTATION**

The point of departure for this EMPr is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction activities.

This section describes the potential environmental impacts which may result from the identified aspects, the objectives of mitigating these impacts as well as the targets used to measure the level of environmental compliance.

The tables for the construction activities consists of seven parts which are included as key requirements of EMPr as defined in the NEMA EIA Regulations 2014. The tables below present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria / targets and timeframes are specified.

**7.1 General planning and administrative considerations (A)**

| PHASE OF DEVELOPMENT: PRE-CONSTRUCTION   |   |  |  |                     |   |
|--|---|--|--|---------------------|---|
| POTENTIAL IMPACTS  | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY   |
| <b>A1 ENVIRONMENTAL AUTHORISATIONS AND DOCUMENTATION</b>   |   |  |  |                     |   |
| <p><b>a. Construction commencing without all required environmental permits and authorisations</b></p> | <p>i. A copy of the Environmental Authorisation and this EMPr and other developer environmental obligations shall be kept on site during the construction phase.</p> <p>ii. Copies of all other project permits must be acquired and kept on site.</p>  | <ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the planning stages of the project.</li> <li>Obtain all required environmental authorisations/ permits prior to construction activities.</li> </ul> | <ul style="list-style-type: none"> <li>No fines due to unauthorised activities or absence of authorisations.</li> <li>Compliance with Authorisations and Permits conditions</li> </ul> | Once-off            | <ul style="list-style-type: none"> <li>Developer</li> <li>EO</li> <li>Contractor</li> <li>ESR</li> <li>ECO</li> </ul> |
| <b>A2 ENVIRONMENTAL SITE DOCUMENTATION AND RECORDS</b>   |   |  |  |                     |   |
| <p><b>a. Inadequate environmental documentation or records on site</b></p>                             | <p>i. The following documents must be prepared must also be kept on site</p> <ul style="list-style-type: none"> <li>Copy of this EMPr along with a signed declaration of understanding of the contents of the EMPr</li> <li>Site daily diary / instruction book / incident reports;</li> <li>Copies of Environmental Audit Reports</li> <li>A Complaints register</li> <li>Proof of Environmental training undertaken by the ECO</li> <li>Proof of Environmental training undertaken by the Contractor</li> <li>Schedules for environmental audits</li> <li>Non-compliance and corrective action reports compiled by the Contractor</li> <li>Method statements signed by the Contractor and approved by the Eco and the Engineer</li> </ul> | <ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the planning stages of the project.</li> <li>Document and file all environmental related information about the project.</li> </ul>                  | <ul style="list-style-type: none"> <li>Environmental file that is up to date, with all the relevant environmental documentation.</li> </ul>  | Ongoing             | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> </ul>                                |

| PHASE OF DEVELOPMENT: PRE-CONSTRUCTION  |   |  |  |                     |  |
|---|---|--|--|---------------------|--|
| POTENTIAL IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
| <b>A3 ENVIRONMENTAL REPRESENTATIVE ON SITE</b>  |   |  |  |                     |  |
| <p><b>a. Inadequate implementation and monitoring of environmental requirements on site</b></p> | <p>i. An independent ECO must be appointed to monitor and to provide environmental advisory services on site.</p> <p>ii. Appoint a suitably qualified ESR to manage daily environmental issues on site.</p>   | <ul style="list-style-type: none"> <li>No construction activities must commence without an ESR on site.</li> <li>Official appointment of ESR on site.</li> </ul> | <ul style="list-style-type: none"> <li>Monthly environmental audits.</li> <li>Weekly/daily environmental inspection checklists.</li> </ul> | Ongoing             | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |
| <b>A4 SITE ESTABLISHMENT</b>  |   |  |  |                     |  |
| <p><b>a. Unnecessary environmental degradation and removal of natural vegetation</b></p>        | <p>i. The contractors must provide and maintain a Site layout indicating the proposed location of all key infrastructure which are:</p> <ul style="list-style-type: none"> <li>Ablution facilities</li> <li>Eating areas</li> <li>Smoking area</li> <li>Waste storage areas</li> <li>Working areas</li> <li>Cement storage and concrete mixing areas (where applicable)</li> <li>Stockpile areas for topsoil and cleared vegetation</li> <li>Parking area</li> </ul> <p>ii. The following infrastructure should not be permitted on site:</p> <ul style="list-style-type: none"> <li>Vehicle washing areas</li> <li>Hazardous material storage areas with the exception of cement storage areas where applicable</li> <li>Cooking Areas</li> </ul> <p>iii. Working footprint and area to be cleared should be limited to the access road, vehicle turning point and working area.</p> | <ul style="list-style-type: none"> <li>Ensure no unnecessary degradation of the environment adjacent to authorised project footprint</li> </ul>                  | <ul style="list-style-type: none"> <li>No vegetation cleared or disturbed outside the working footprint</li> </ul>                         | Once off            | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> </ul>             |

| PHASE OF DEVELOPMENT: PRE-CONSTRUCTION   |  |   |   |                     |   |
|--|--|---|---|---------------------|---|
| POTENTIAL IMPACTS  | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY   |
|  | iv. Prior to the commencement of project activities, the site layout must be agreed upon by GDHS, the ECO and the Engineer. The locations of key infrastructure such as toilets, eating and smoking areas, bins, stockpile areas, etc.   |   |   |                     |   |
| <b>A5 EXISTING SERVICES AND INFRASTRUCTURE</b>   |  |   |   |                     |   |
| a. <b>Damage to existing infrastructure</b><br><br>b. <b>Disruption in the provision of services in the vicinity of working area</b> | i. The Contractor shall ensure that measures to protect existing services (e.g. access roads, powerlines and other masts) are not damaged as a result of the construction activities.<br><br>ii. Where infrastructure is damaged, the landowner and relevant service provider must be notified within 24 hours.<br><br>iii. The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.<br><br>iv. A time limit for the repairs must be stipulated by the RE in consultation with the Contractor and the affected service provider. | <ul style="list-style-type: none"> <li>Avoiding impact on surrounding services such as access roads and surrounding masts</li> <li>All services providers with services in the vicinity of the site must be notified prior to construction</li> </ul> | <ul style="list-style-type: none"> <li>No impacts of services and infrastructure within the vicinity of the site</li> </ul>   | Ongoing             | <ul style="list-style-type: none"> <li>Contractor</li> <li>Developer</li> <li>RE</li> <li>ESR</li> <li>ECO</li> </ul> |
| <b>A6 ENVIRONMENTAL AWARENESS TRAINING AND INDUCTION</b>   |  |   |   |                     |   |
| a. <b>Inadequate training and awareness about environmental protection</b>   | i. The ECO/EO must undertake an initial environmental induction during the site establishment for all key site staff.<br><br>ii. Environmental induction/ training shall be repeated by the ESR and extended in the weekly Toolbox Talks. This should also include awareness programmes (i.e. emergency and use of spill kits etc).<br><br>iii. Proof of all environmental training and awareness undertaken must be kept on site, both training material used and attendance registers.   | <ul style="list-style-type: none"> <li>Raise awareness about the importance of environmental protection including EMPr and authorisation condition</li> </ul>   | <ul style="list-style-type: none"> <li>Records of environmental training and awareness programmes</li> <li>Reduce and manage potential Environmental impacts</li> </ul> | Weekly              | <ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>ESR</li> <li>EO</li> </ul>                    |

| PHASE OF DEVELOPMENT: PRE-CONSTRUCTION |   |                       |                            |                     |                   |
|--|---|-----------------------|----------------------------|---------------------|-------------------|
| POTENTIAL IMPACTS                      | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|  | <ul style="list-style-type: none"> <li>iv. It is the Contractor’s responsibility to provide ongoing environmental training to ensure that all staff have sufficient understanding to pass this information onto the construction staff.</li> <li>v. Use of environmental awareness posters on site where necessary, especially for the protection of the certain plant species around the working area.</li> <li>vi. The Contractor must ensure that all subcontractors are informed of the importance of the adherence to the EMPr and their labourers are also inducted.</li> </ul> |                       |                            |                     |                   |

## 7.2 Construction phase (B)

| PHASE OF DEVELOPMENT: CONSTRUCTION   |   |   |   |                     |  |
|--|---|---|---|---------------------|--|
| IMPACTS  | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
| <b>B1 WASTE MANAGEMENT</b>   |   |   |   |                     |  |
| <p><b>a. Pollution and environmental degradation</b></p> <p><b>b. Decrease in the aesthetic quality of the environment</b></p> | <p>i. Adequate refuse bins must be provided.</p> <p>ii. Bins must be emptied at least once a week or as and when the need arises.</p> <p>iii. Overspill of the bin should not occur, and neither should waste be allowed to lie on the ground near the bin or anywhere else on site.</p> <p>iv. Proof of safe disposal must be obtained from the service provider and kept in the environmental file.</p> <p>v. A waste disposal management plan for the removal of vegetation must be compiled</p> <p>vi. The contractor must provide labourers with plastic bags or other containers to allow for the storage of litter during the clean-up of the construction site on a daily basis. These areas must then be inspected by the contractor or his / her ESR to ensure compliance with this requirement.</p> <p><b><u>Ablution facilities:</u></b></p> <p>i. Adequate chemical toilets for the staff on site must be provided.</p> <p>ii. Under no circumstances should pit toilets be constructed on site.</p> <p>iii. Under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities.</p> <p>iv. The location of all toilets must be approved by the ECO and must not be located on areas that are already disturbed on site.</p> | <ul style="list-style-type: none"> <li>Minimise unwarranted environmental damage outside the footprint</li> <li>Maintain a clean and healthy working environment</li> <li>Control potential influx of vermin and flies and rats</li> <li>Minimise potential of diseases onsite and influence the health of the employees</li> </ul> | <ul style="list-style-type: none"> <li>No signs of pollution</li> <li>No complaints received from the landowners / I&amp;AP's/ other mast owners</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |



| PHASE OF DEVELOPMENT: CONSTRUCTION                     |  |  |   |                     |  |
|--|--|--|---|---------------------|--|
| IMPACTS  | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|  | v. Chemical toilets must be emptied / serviced on a regular basis to prevent them overflowing.<br>vi. Waste from chemical toilets must be disposed of in a license disposal facility. Proof of this must be obtained from the service provider and made available during the environmental audits.<br><br><u>Eating Areas:</u><br>i. The Contractor must, in conjunction with the ECO, designate restricted eating areas for eating during normal working hours.<br>ii. Under no circumstance should informal food traders be allowed on site.<br>iii. Open fires must not be permitted anywhere on site.<br>iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. |  |   |                     |  |
| <b>B5 DUST AND AIR QUALITY MANAGEMENT</b>              |  |  |   |                     |  |
| a. <b>Dust generation from construction activities</b> | i. The Contractor must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of any licenses or permits required.<br>ii. The construction site must be watered during dry and windy conditions to control dust fallout. Preferably grey water or other dust suppressant substances must be used.<br>iii. Dust production must be controlled by regular watering of access roads and roads and working areas, should the need arise.   | <ul style="list-style-type: none"> <li>Reduce dust fall out at construction site</li> <li>Minimise loss of valuable soil material</li> </ul> | <ul style="list-style-type: none"> <li>No visible signs of dust around the site</li> <li>No complaints from I&amp;As regarding dust</li> <li>No incidences reported to ECO</li> <li>No visible evidence of dust contamination on the surrounding environment</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |   |   |   |                     |  |
|---|---|---|---|---------------------|--|
| IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|   | <ul style="list-style-type: none"> <li>iv. Construction vehicles must adhere to low speeds to avoid the generation of dust on the construction site</li> <li>v. All vehicles transporting material that can be blown off (e.g. soil, rubble, etc.) must be covered with a tarpaulin, and adhere to speed limits on public roads</li> <li>vi. Excessive dust conditions must be reported to the ECO.</li> <li>vii. A continuous dust monitoring process needs to be undertaken during construction.</li> <li>viii. Speed restriction of no more than 10km/h must be implemented for all construction vehicles within the construction site</li> <li>ix. All construction vehicles must be maintained to avoid adverse impacts on air quality as a result of a lack of maintenance</li> </ul>                                       |   | <ul style="list-style-type: none"> <li>• Method statements adhered to</li> </ul>  |                     |  |
| <b>B6 NOISE MANAGEMENT</b>  |   |   |   |                     |  |
| <p><b>a. Nuisance factor to surrounding landowners, communities and fauna</b></p> | <ul style="list-style-type: none"> <li>i. All construction vehicles must be in a good working order to reduce possible noise pollution.</li> <li>ii. Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc.</li> <li>iii. The Contractor must inform all I&amp;APs in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the neighbouring residents.</li> <li>iv. All construction activities must be limited to daylight hours which are between 06:00 and 18:00 in the summer months and between 07:00 and 17:00 in the winter months unless otherwise stated in the environmental authorization and or as agreed with the</li> </ul> | <ul style="list-style-type: none"> <li>• Effectively manage noisy activities emanating from construction activities.</li> </ul> | <ul style="list-style-type: none"> <li>• No complaints from site staff and landowners about noise from site.</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• ESR</li> <li>• ECO</li> <li>• EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |   |   |   |                     |  |
|---|---|---|---|---------------------|--|
| IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|   | landowner or as stipulated in other guiding documents by the Municipality or other key stakeholders.<br>v. Blasting must not take place on site under any circumstances. <ul style="list-style-type: none"> <li>All adjacent residents must be notified of the intention to undertake the initial blasting at least 07 working days in advance</li> <li>Only soft blasting must be undertaken</li> </ul>  |   |   |                     |  |
| <b>B7 CEMENT STORAGE AND CONCRETE HANDLING</b>  |   |   |   |                     |  |
| <b>a. Contamination of the soil and runoff from concrete mixing</b>                                   | i. Mixing of concrete must only be permitted on site in designated and disturbed areas approved by the ECO<br>ii. Under no circumstances should concrete be mixed directly on the ground but on an adequate liner<br>iii. Cement bags must be stored in a designated and secure area on site. Empty cement bags must be placed in litter bins<br>iv. All concrete spillages must be cleaned immediately   | <ul style="list-style-type: none"> <li>Maintain noise levels below “disturbing” as defined in the National Noise Regulations</li> <li>Minimise the nuisance factor of the development</li> </ul>              | <ul style="list-style-type: none"> <li>No complaints from surrounding landowners or I&amp;AP’s</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |
| <b>B8 STOCKPILE AND SOIL MANAGEMENT</b>   |   |   |   |                     |  |
| <b>a. Sedimentation and erosion</b><br><br><b>b. Soil loss</b><br><br><b>c. Stormwater Management</b> | i. Stockpiles of any material only be placed within demarcated areas which will not create nuisances to adjacent mast owner by blocking access roads, access to masts, etc.<br>ii. The stockpiles must not be located within 100m from the edge of the watercourse or riparian area<br>iii. All stockpiles must be covered to prevent wind and water erosion during seasons when wind or rainfall is prevalent<br>iv. Stormwater runoff from any stockpile sites and other related areas must be contained as far as possible | <ul style="list-style-type: none"> <li>Minimise scaring of the soil surface and land features</li> <li>Minimise disturbance and loss of soil</li> <li>Minimise contamination of stormwater run-off</li> </ul> | <ul style="list-style-type: none"> <li>No visible erosion scars once construction is completed</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION |   |                       |                            |                     |                   |
|------------------------------------|---|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | <ul style="list-style-type: none"> <li>v. Stormwater must be discharged via many smaller outlets rather than few larger ones to spread out flows</li> <li>vi. Infiltration of all stormwater runoff generated by the proposed development should be maximised as far as practically possible</li> <li>vii. The central collection and concentration of stormwater must be minimised as far as practically possible</li> <li>viii. Stockpiles are to be stabilised if signs of erosion are visible</li> <li>ix. Topsoil stockpile must be separated to allow for reuse of the soil for rehabilitation</li> <li>x. Topsoil stockpiles must be clearly demarcated as no-go areas. Although it is noted that there is minimal topsoil on site, this must be conserved for rehabilitation purposes</li> <li>xi. Topsoil stockpiles should not be higher than 2.5 meters to avoid compaction, while the slopes of the stockpiles should not be steeper than 1 vertical to 1.5 meters horizontally</li> <li>xii. Topsoil stockpiles must be monitored for invasive vegetation growth. Contractors must remediate as and when required in consultation with the ECO</li> <li>xiii. To reduce the loss of soil by erosion, the contractor must ensure that disturbance on site is kept to a minimum and in areas agreed upon with the ECO</li> <li>xiv. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed</li> </ul> <p><b><u>Stormwater Management:</u></b></p> |                       |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |   |  |   |                     |  |
|---|---|--|---|---------------------|--|
| IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|   | <ul style="list-style-type: none"> <li>i. The proposed access road must be designed with a crossfall slope of 2% directing stormwater to a v drain which eventually daylight (channel or discharge in a manner that does not cause erosion) to the open grassland</li> <li>ii. Stormwater must be managed such that the stormwater from the site does not erode the surrounding area</li> <li>iii. Stormwater runoff from any stockpile sites and other related areas must be contained as far as possible. Erosion/sediment control measures must be placed around the stockpiles to limit sediment runoff from stockpiles</li> <li>iv. Stormwater must be discharged via many smaller outlets rather than few larger ones to spread out flows</li> <li>v. The use of point source discharge outlets must be avoided or minimised in favour of infiltration systems</li> <li>vi. The central collection and concentration of stormwater must be minimised as far as practically possible.</li> </ul> |  |   |                     |  |
| <b>B9 HANDLING OF HAZARDOUS GOODS AND SUBSTANCES</b>                            |   |  |   |                     |  |
| <p><b>a. Potential spillage of hazardous substance into the environment</b></p> | <ul style="list-style-type: none"> <li>i. Should there be storage of hydrocarbons on site, the Contractor must provide method statements for the “handling &amp; storage of oils and chemicals” (where these will be kept on site) and “accidental spills management”</li> <li>ii. All chemicals kept on site must be clearly labelled and stored with MSDS to prevent leakage or incidental spills</li> </ul>  | <ul style="list-style-type: none"> <li>• Prevention of pollution of the environment</li> <li>• Ensure hazardous substances are transported, used and disposed in a responsible manner</li> </ul> | <ul style="list-style-type: none"> <li>• No pollution of the environment</li> <li>• No litigation due to transgression of pollution control acts</li> <li>• Method statements as set out by the contractor adhered to.</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• ESR</li> <li>• ECO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION |  |   |  |                     |  |
|------------------------------------|--|---|--|---------------------|--|
| IMPACTS                            | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|                                    | <ul style="list-style-type: none"> <li>iii. Leaking equipment must be repaired immediately or be removed from site to facilitate repair</li> <li>iv. Drip trays must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended. The drip trays must be large enough to catch any hydrocarbons that may leak from the vehicle while standing.</li> <li>v. Where possible and practical all maintenance of vehicles and equipment must not be done on site</li> <li>vi. Leaking equipment must be repaired immediately or be removed from site for repair</li> <li>vii. Spill kits must be obtained from reputable service providers and restocked once any material within the kit has been depleted</li> <li>viii. Contaminated material or spilled hazardous substances must be removed by service provider or by the Contractor to a licenced facility. Proof of all removal (i.e. waste manifest) must be kept by the Contractor.</li> <li>ix. Labourer must be trained on how to use the spill kits</li> <li>x. A record must be kept of all spills and the corrective action taken.</li> <li>xi. Records of monitoring and measurement of hazardous substances must be kept.</li> </ul> |   |  |                     |  |
| <b>B10 FIRE MANAGEMENT</b>         |  |   |  |                     |  |
| <b>a. Accidental fires</b>         | <ul style="list-style-type: none"> <li>i. The Contractor must provide smoking areas for construction workers</li> <li>ii. Fire extinguishers and an outdoor ashtray or similar suitable container must be provided in all smoking areas</li> <li>iii. Under no circumstances should fires be lit on site</li> </ul>  | <ul style="list-style-type: none"> <li>• Minimise risk of veld fires and loss of natural habitat</li> </ul> | <ul style="list-style-type: none"> <li>• No veld fires started by the contractor's workforce</li> <li>• No claims from landowners for</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• ECO</li> <li>• ESR</li> <li>• Contractor</li> <li>• EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |   |   |  |                     |   |
|---|---|---|--|---------------------|---|
| IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY   |
|   | <ul style="list-style-type: none"> <li>iv. Serviced fire extinguishers must be kept at the smoking area. At least one serviced fire extinguisher should be available on site at all times</li> <li>v. All site personnel in senior positions and who will be on site on a full-time basis must be trained on the usage of fire extinguishers</li> <li>vi. The Contractor to ensure that no person smokes in any place in which a flammable liquid is used or stored</li> <li>vii. The contractor must further affix a suitable and conspicuous no smoking sign notice at all entrances to areas prone to fire</li> <li>viii. No flammable material, including cotton waste, paper, cleaning rags or similar material should be stored with flammable liquids</li> <li>ix. Fire breaks should be clearly demarcated to prevent proliferation of fire during possible incident</li> </ul> | <ul style="list-style-type: none"> <li>• Maintain safety on site and the community in general</li> </ul>  | <ul style="list-style-type: none"> <li>damages due to veld fires</li> <li>• Method statement adhered to</li> </ul>                                   |                     |   |
| <b>B11 FAUNA MANAGEMENT</b>   |   |   |  |                     |   |
| <ul style="list-style-type: none"> <li>a. <b>Loss of fauna due to habitat destruction</b></li> <li>b. <b>Disturbance of birds &amp; displacement effects</b></li> <li>c. <b>Intentional and unintentional killing of animals on site</b></li> </ul> | <p><b>Fauna Specialist Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>i. No activities are to commence within the wetlands and buffers (100m buffer) until the necessary authorisations are obtained under the National Water Act (NWA) and NEMA.</li> <li>ii. No activities should take place in areas designated as highly sensitive (NO-GO AREAS) as per Plan 5.</li> <li>iii. Commence with primary excavation and earth-moving activities during the dry season as far as possible when bird populations are likely to be lower (most migrant species will be absent and birds are unlikely to have chicks or fledglings).</li> <li>iv. Implement a Fauna Monitoring Plan as per Table 7 in Faunal Specialist Report.</li> </ul>  | <ul style="list-style-type: none"> <li>• Minimise disturbance to animals and their habitats</li> <li>• Minimise interruption of breeding patterns of birds</li> </ul> | <ul style="list-style-type: none"> <li>• No complaints from any I&amp;AP</li> <li>• No evidence of killing or poaching of animals on site</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• ESR</li> <li>• ECO</li> <li>• EO</li> <li>• Faunal/ Avifaunal Specialist (where applicable)</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION |  |                       |                            |                     |                   |
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| IMPACTS                            | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | <p><b>AVI-Fauna Specialist Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>i. Important to note that disturbance by proposed project will have dire consequences for African Finfoot population in close proximity and impact cannot be mitigated fully. Disturbance is inevitable with the construction of the Bryanston Ext. 3B Housing development.</li> <li>ii. Additional Avi-fauna mitigation measures include: The recommendations of the ecological specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas are concerned.</li> <li>iii. Conduct an avifaunal inspection prior to the construction phase of this project. Should nests or breeding locations, pertaining to Red List and other more common species, be identified during the inspection, mitigation must be implemented to ensure that this impact is reduced to negligible levels.</li> </ul> <p><b>General Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>i. Ensure that all construction personnel are provided with appropriate training in ecological awareness, as appropriate to their work activities</li> <li>ii. Make use of existing access roads as much as possible to reduce the vegetation clearance</li> <li>iii. Off-road driving must be prohibited</li> <li>iv. No intentional killing or poaching of any animals may be allowed on site and it must be a condition of employment that any employee caught poaching must be disciplined accordingly.</li> </ul> |                       |                            |                     |                   |



| PHASE OF DEVELOPMENT: CONSTRUCTION   |   |  |  |                     |  |
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| IMPACTS  | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|  | <ul style="list-style-type: none"> <li>v. Where a snake is encountered on site and must be removed, a specialist must be called in to safely relocate the snake</li> <li>vi. All construction activities must be limited to daylight hours.</li> <li>vii. Construction activity is restricted to the immediate footprint of the infrastructure.</li> </ul>  |  |  |                     |  |
| B12 FLORA MANAGEMENT   |   |  |  |                     |  |
| <ul style="list-style-type: none"> <li>a. <b>Loss and fragmentation of intact vegetation cover and floral species diversity</b></li> <li>b. <b>Introduction of alien invasive plants</b></li> <li>c. <b>Erosion and soil compaction</b></li> </ul> | <p><b>Flora Specialist mitigation measures:</b></p> <ul style="list-style-type: none"> <li>i. Where possible, preservation of the bouldered rocky outcrop and woodland vegetation units should be considered and incorporated into the open space. The extent of the watercourse and associated 30-meter buffer zone as recommended by the wetland specialist should also be taken into account when developing the project layout.</li> <li>ii. In planning the project, habitat connectivity between the residential units in the form of green spaces and the surrounding natural areas should be considered.</li> <li>iii. The amount of vegetation cleared for construction purposes should be limited to only what is required.</li> <li>iv. Site camps and other temporary infrastructure are to be placed within areas that are already disturbed or transformed.</li> <li>v. Access to the development area should be from the main road to the north or east of the study area and not through open space areas. No open space areas beyond the approved development footprint area,</li> </ul> | <ul style="list-style-type: none"> <li>• Minimal disturbance to vegetation where such vegetation does not interfere with construction</li> <li>• Minimise scarring of the soil surface and land features</li> <li>• Removal of alien plant species to encourage indigenous plant growth</li> </ul> | <ul style="list-style-type: none"> <li>• No litigation due to removal of vegetation without necessary permission</li> <li>• No visible erosion scars once construction is completed</li> <li>• The footprint has not exceeded the agreed boundaries</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• ESR</li> <li>• ECO</li> <li>• EO</li> <li>• Ecological Specialist (where applicable)</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION |   |                       |                            |                     |                   |
|------------------------------------|---|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | <p>including the Bryanston River and associated buffer zones may be accessed by construction personnel or construction vehicles and should be treated as a No-Go zone.</p> <p>vi. All sensitive areas, including high sensitivity vegetation units outside of the development footprint should be clearly indicated on site and be off limits for construction vehicles and workers.</p> <p>vii. Construction vehicles should be restricted to travelling only on designated roadways, to limit the ecological footprint of the proposed development activities, and no new roads through natural vegetation may be constructed.</p> <p>viii. Edge effects from construction activities, such as erosion and alien floral species proliferation and spread, should be managed throughout the development, to prevent impacts on the open space area, especially further proliferation of alien species.</p> <p>ix. No littering or dumping of waste and construction material within natural areas to be excluded from the development footprint areas may be allowed. All excess material must be removed from the construction areas once works has been completed.</p> <p>x. Alien plant proliferation within disturbed areas should be controlled through the implementation of an ongoing monitoring and eradication programme for all invasive and weed plant species occurring within the study area, with specific emphasis on the eradication of NEMBA Category 1b invasive species.</p> |                       |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION |   |                       |                            |                     |                   |
|------------------------------------|---|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | <ul style="list-style-type: none"> <li>xi. Eradication of <i>Campuloclinium macrocephalum</i> should take place within the open space area regardless of whether the project proceeds or not.</li> <li>xii. Any disturbed and compacted areas outside of the immediate development footprint areas must be ripped, reprofiled and revegetated with an indigenous grass species mixture upon completion of construction works. Only indigenous plant species naturally growing within the region (refer to Appendix B) should be used for this purpose (GDARD 2014).</li> <li>xiii. As part of the landscaping for the residential units, if considered, it is strongly recommended that an indigenous species approach be implemented, which will also impact positively on management, water use and sustainability of any landscaped areas. Such an approach will also improve habitat provision for indigenous faunal species.</li> <li>xiv. The use of indigenous <i>Cynodon dactylon</i> lawn, if considered, is recommended instead of <i>Pennisetum clandestinum</i> (Kikuyu) or <i>Dactyloctenium australe</i> (LM) lawn. Mowed veldgrass instead of monospecific lawn may also be considered.</li> <li>xv. Floral SCC present within the study should ideally be conserved in situ.</li> <li>xvi. During the planning and surveying phase of surface infrastructure, any floral SCC that may be potentially affected by surface infrastructure (such as <i>Hypoxis hemerocallidea</i>) must be marked and where possible, relocated to suitable, similar open space habitat in the surrounding area. Relevant permits must be applied for from local authorities,</li> </ul> |                       |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION |   |                       |                            |                     |                   |
|------------------------------------|---|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | <p>depending on the status of the species, prior to the construction phase.</p> <p>xvii. Should any floral SCC not encountered during the field assessment be noted within the study area, these species should be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist, after the authorities have been notified.</p> <p>xviii. No collection of floral SCC or medicinal floral species may be allowed by construction personal or future residents of the proposed housing units.</p> <p>xix. Edge effect management needs to be implemented to ensure no further degradation and potential loss of floral SCC outside of the proposed project footprint area.</p> <p>xx. <b>Floral monitoring:</b> Floral monitoring activities should include assessments of the vegetation condition of the Bryanston River bordering the study area to the east as per the recommended frequencies.</p> <p>Additional mitigation measures include:</p> <p>xxi. The development footprint area must be kept as small as possible. This can be achieved through adequate planning and demarcation of infrastructure areas and areas required for construction activities.</p> <p>xxii. Construction workers must not remove flora or collect seed from any plants outside the areas on which vegetation clearing has not been planned.</p> <p>xxiii. Under no circumstances should chemicals be used in the removal of plant species</p> <p>xxiv. Only indigenous plants must be used in the rehabilitation of disturbed areas</p> |                       |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION                        |   |   |  |                     |  |
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| IMPACTS   | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|   | xxv. At least one serviced fire extinguisher should be available on site at all times and all site personnel in senior positions and who will be on site on a full-time basis must be trained on the usage of fire extinguishers<br>xxvi. All construction vehicles and equipment as well as construction material should be free of plant material<br>xxvii. Prevention of erosion, and where necessary rehabilitation of eroded areas<br>xxviii. Rehabilitation of disturbed vegetation as soon as undertaken as soon as construction has ended in the area that has been disturbed<br>xxix. No collection of plant material should be allowed by operational personnel |   |  |                     |  |
| <b>B13 MANAGEMENT OF HERITAGE RESOURCES AND ARTEFACTS</b> |   |   |  |                     |  |
| a. <b>Damage or loss of valuable heritage resources</b>   | i. Should any historically significant finds (e.g. artefacts, human remains or sites of cultural or archaeological importance) be uncovered, work must cease and the Provincial Heritage Resources Agency as well as the local South African Police Service (SAPS) must be notified of the find. Work in the area can only be resumed once the site has been completely investigated by Heritage Agency as well as SAPS has given permission to the Developer/ Contractor to resume activities.<br>ii. The Contractor must be trained to recognise any heritage features<br>iii. Artefacts may not be removed under any circumstances                                     | <ul style="list-style-type: none"> <li>Avoid damage to heritage resources</li> <li>Report all finds of human remains or other heritage resources</li> <li>Implement chance find procedures in case where possible heritage finds area made</li> </ul> | <ul style="list-style-type: none"> <li>Limited or no damage to heritage resources</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> <li>Heritage Specialist (If rewired)</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |  |  |   |                     |   |
|---|--|--|---|---------------------|---|
| IMPACTS   | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY   |
| <b>B14 MANAGEMENT OF NO-GO / SENSITIVE AREAS</b>  |  |  |   |                     |   |
| <p><b>a. Environmental impacts outside working areas</b></p>  | <p>i. All construction activities must be demarcated at the start of construction and maintained accordingly during the construction phase</p> <p>ii. The Contractor must communicate the importance of specific working methods in sensitive areas close to the site, e.g. identified endangered plant species, in close proximity to other masts / infrastructure</p> <p>iii. Mark and/ or demarcate all sensitive sites</p>   | <ul style="list-style-type: none"> <li>Minimise unnecessary impacts outside the working footprint</li> </ul>   | <ul style="list-style-type: none"> <li>Containment of footprint</li> <li>No impacts on sensitive areas</li> <li>No complaints from other mast owner(s)</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> <li>RE</li> </ul>        |
| <b>B16 MANAGEMENT OF SOCIO ECONOMIC IMPACTS</b>   |  |  |   |                     |   |
| <p><b>a. Enhance the Positive Economic Impacts during the Construction Phase</b></p> <p><b>b. Reduce the Potential Negative Impacts on Traffic and Road Infrastructure</b></p> <p><b>c. Reduce Nuisance Impacts (Noise, Dust, Littering) Related to Construction Activities</b></p> | <p>Socio-Economic Impact Assessment mitigation measures:</p> <p>i. Establish a forum between the local Residents Association(s) and the main contractor and meet every second month basis to discuss socio-economic issues and project progress</p> <p>ii. Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, as well as to limit any risks of accidents.</p> <p>iii. Construction vehicles should adhere to the speed levels.</p> <p>iv. Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded.</p> <p>v. Local roads surrounding the site should be upgraded to ensure that heavy vehicles can deliver the required equipment and materials and to limit the negative intrusions and traffic congestions.</p> | <ul style="list-style-type: none"> <li>To ensure that communities in the vicinity of the facility are involved in the project and are able to improve their economic conditions through the acquisition of employment</li> </ul> | <ul style="list-style-type: none"> <li>The local community benefits from the employment opportunities created during the construction phase</li> </ul>            | Ongoing             | <ul style="list-style-type: none"> <li>Developer</li> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION  |  |                       |                            |                     |                   |
|---|--|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS   | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
| <p><b>d. Reduce Negative Impacts on Community Safety</b></p> <p><b>e. Improve the Performance of the FLISP Programme to Increase Access to Low Cost Housing</b></p> <p><b>f. Reduce Potential Negative Impacts on Local Infrastructure</b></p> <p><b>g. Reduce impact on Social Cohesion and Sense of Place</b></p> | <ul style="list-style-type: none"> <li>vi. Source material and goods locally as far as possible to limit transportation of these over long distances</li> <li>vii. All adjacent landowners must be informed of the commencement of construction activities at least 30 days prior to commencement or as otherwise stated in the Environmental Authorisation.</li> <li>viii. Adjacent land owners must be informed timeously, at least 7 days of any planned service stoppages in their areas.</li> <li>ix. As far as possible and based on the Developers' required skills for the construction of the proposed infrastructure, locals must be employed on the project in consultation with the Ward Councillor.</li> <li>x. Construction workers should be confined to the construction area as far as possible and should be easily identified.</li> <li>xi. Construction activities should keep to normal working hours e.g. 7 am until 5 pm.</li> <li>xii. Noise should be kept to the minimum.</li> <li>xiii. The construction area should be fenced to avoid unauthorised entry by animals or children.</li> <li>xiv. Construction vehicles should adhere to the speed levels.</li> <li>xv. Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded.</li> <li>xvi. Source material and goods locally as far as possible to limit transportation of these over long distances</li> <li>xvii. Dust suppression methods should be implemented on-site if and where required</li> </ul> |                       |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION |  |                       |                            |                     |                   |
|------------------------------------|--|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | xviii. On-site construction workers should always be supervised.<br>xix. Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays.<br>xx. Property owners surrounding the construction areas should be informed of the construction schedules and activities.<br>xxi. Security on-site should be active prior to the construction period.<br>xxii. Workers conduct should be guided by a code of conduct to be developed by the contractors.<br>xxiii. The construction areas should be fenced to avoid unauthorised entry by animals or children<br>xxiv. Facilitate the speedy repair of streetlights between Col and residents.<br>xxv. Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, damage to the road surfaces, as well as to limit any risks of accidents.<br>xxvi. The development should implement safety and security features as part of the development e.g. access control, security guards patrolling the area, and the placement of security cameras at strategic places.<br>xxvii. Lighting as security measure at night should be implemented as part of the development<br>xxviii. Sub-letting as part of this development should not be allowed to ensure that the quality of life of the residents in the area remain high. |                       |                            |                     |                   |



| PHASE OF DEVELOPMENT: CONSTRUCTION  |   |   |   |                     |  |
|-------------------------------------|---|---|---|---------------------|--|
| IMPACTS                             | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS  | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|                                     | xxix. The local policing services should respond effectively to any criminal activities, but should further focus on street crimes, assaults, and robberies<br><br>xxx. Facilitate the speedy repair of streetlights between Col and residents<br><br>xxxi. Designing of walls, roofs and buildings should be done in such a manner to blend in with the natural environment.<br><br>xxxii. Lighting issues should receive the attention it deserves to avoid any light pollution at night but still ensure that safety requirements are met.   |   |   |                     |  |
| B17 WATER RESOURCES MANAGEMENT      |   |   |   |                     |  |
| a. <b>Impact on Water Resources</b> | i. An attenuation pond must be constructed between the recommended buffer zone and the proposed development to attenuate stormwater and to assimilate toxicants. A bioretention component must be incorporated into this pond to assist with assimilation of contaminants. Water from this attenuation pond must be diffusely redistributed into the river system to the east<br><br>ii. It is recommended that the buffer zone of 30 m be adhered to.<br><br>iii. Sediment traps must be installed together with erosion monitoring in and around the project area.<br><br>iv. The proposed development must be undertaken during the dry season.<br><br>v. Off-site equipment vehicle fuelling and maintenance, storage in bunded area.<br><br>vi. No on-site fabrication.<br><br>vii. Oil spill kits must be available onsite<br><br>viii. Equipment & vehicle inspections daily | <ul style="list-style-type: none"> <li>To ensure that water resources are not impacted negatively.</li> </ul> | The focus of mitigation measures should be to reduce the significance of potential impacts associated with the residential development and thereby to: <ul style="list-style-type: none"> <li>Prevent the unnecessary destruction of, and fragmentation, of the watercourses (including the riparian area); and</li> <li>Prevent the loss water resources and associated ecosystem services.</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>Contractor</li> <li>ESR</li> <li>ECO</li> <li>EO</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION                                       |  |   |  |                     |  |
|--|--|---|--|---------------------|--|
| IMPACTS  | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES   | MEASURABLE OUTCOME TARGETS   | FREQUENCY OF ACTION | RESPONSIBLE PARTY  |
|  | <ul style="list-style-type: none"> <li>ix. A proper stormwater management plan must be incorporated, which includes various attenuation ponds that not only diffusely releases flows into the river system, but also assimilates toxicants by means of bioretention.</li> <li>x. Strict rules must be incorporated to residents regarding the disposal of refuse, dirty water and washing cars within the property.</li> </ul>   |   |  |                     |  |
| <b>B18 TRAFFIC MANAGEMENT</b>  |  |   |  |                     |  |
| <p><b>a. Disruption of access routes and daily movement patterns</b></p> | <ul style="list-style-type: none"> <li>i. There must be an erection of signage warning motorists about the presence of construction vehicles</li> <li>ii. Construction activities must be limited to daytime hours</li> <li>iii. Construction vehicles travelling on public roads must adhere to speed limits</li> <li>iv. Construction vehicles must not dispose of soil or other material on roads. Where this occurs, the material must immediately be removed before the end of the working day</li> </ul> | <ul style="list-style-type: none"> <li>• To ensure that public roads around the site are safe and the flow of traffic is not disrupted</li> </ul>   | <ul style="list-style-type: none"> <li>• No incidents of reported vehicle/pedestrian accidents</li> <li>• Adequate signage and alternative routes for traffic to flow</li> </ul> | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• ECO</li> <li>• EO</li> <li>• ESR</li> </ul>           |
| <b>B19 MANAGEMENT OF HEALTH AND SAFETY IMPACTS</b>                       |  |   |  |                     |  |
|  | <p><i>Detailed Health and Safety issues will be addressed in reports compiled by the the Health and Safety Officer</i></p> <ul style="list-style-type: none"> <li>i. Contractor must appoint a Health and Safety Officer for the construction phase of the project</li> </ul>  | <ul style="list-style-type: none"> <li>• To ensure safety of employees, site visitors as well as surrounding landowners</li> <li>• Minimise the potential for impacts associated</li> </ul> | <ul style="list-style-type: none"> <li>• No complaints from surrounding landowners and communities</li> </ul>  | Daily               | <ul style="list-style-type: none"> <li>• Contractor</li> <li>• Health and Safety personnel</li> <li>• ESR</li> </ul> |

| PHASE OF DEVELOPMENT: CONSTRUCTION |   |  |                            |                     |                   |
|------------------------------------|---|--|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES   | MANAGEMENT OBJECTIVES  | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | ii. The Contractor must ensure compliance with the applicable Covid-19 regulations at the time of construction or any other communicable disease managed at pandemic level.<br>iii. Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project<br>iv. With the exception of the project team members, no persons should be allowed to enter the construction site area<br>v. The site and crew are to be managed in strict accordance with the OHS Act<br>vi. The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc.<br>vii. The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site<br>viii. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site | with loss of human lives and risk of injuries<br><br>• Reduce the likelihood of the occurrence of traffic accidents as result of the presence of construction vehicles |                            |                     |                   |

| PHASE OF DEVELOPMENT: CONSTRUCTION |  |                       |                            |                     |                   |
|------------------------------------|--|-----------------------|----------------------------|---------------------|-------------------|
| IMPACTS                            | MITIGATION MEASURES  | MANAGEMENT OBJECTIVES | MEASURABLE OUTCOME TARGETS | FREQUENCY OF ACTION | RESPONSIBLE PARTY |
|                                    | ix. A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction |                       |                            |                     |                   |

Where applicable, the mitigation measures for the construction phase will be carried forward to other phases. In addition, the following specific measures presented in the table below will also apply.

### 7.3 Demobilising and rehabilitation phase (C)

| ENVIRONMENTAL IMPACTS  | MITIGATION MEASURES  | FREQUENCY OF ACTION   | OBJECTIVES  | RESPONSIBLE PARTY |
|--|--|---|---|-------------------|
| 1. Proliferation of exotic vegetation and weeds in disturbed areas | <ul style="list-style-type: none"> <li>All exotic flora and weeds to be eradicated in an environmentally friendly manner</li> </ul>  | <ul style="list-style-type: none"> <li>Monthly for the first year after rehabilitation.</li> </ul>  | To ensure that indigenous plants are well established | Developer & EO    |
| 2. Damage to plants established as part of rehabilitation          | <ul style="list-style-type: none"> <li>All areas under rehabilitation must be cordoned off as no-go areas. If necessary, these areas should be fenced off</li> <li>The survival rate of plant species established as part of rehabilitation must be monitored and replanted where necessary</li> </ul> | <ul style="list-style-type: none"> <li>Weekly for the first two months after establishment and after that, monthly for the first year after construction</li> </ul> | To ensure that indigenous plants are well established | Developer & EO    |
| 3. Soil erosion  | <ul style="list-style-type: none"> <li>All areas that have been eroded by construction activities must be rehabilitated accordingly</li> </ul>   | <ul style="list-style-type: none"> <li>Monthly for the first year after construction. Frequency must be increased during the rainy season</li> </ul>                | To ensure there are no visible erosion scars          | Developer & EO    |

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## 7. REPORTING, MONITORING AND REVIEWING

To ensure continuous improvement in terms of the environmental performance of the project, the site must be audited and monitored against the EMPr requirements. The EMPr must also be reviewed to ensure its applicability. This is detailed in subsequent sections.

### 7.1 Reporting on EMPr compliance

In order to ensure sufficient levels of compliance with the EMPr, regular environmental monitoring has to be undertaken and the results of the monitoring be reported on a regular basis. In order to control the reporting on the EMPr Compliance, it is imperative that the following be borne in mind:

- Typical report description;
- Document control procedures;
- System for documenting environmental training; and
- Frequency of reports.

Each of these are briefly discussed below:

#### 7.1.1 Typical report description

A typical report used to indicate the level of environmental compliance on the project must adhere to **Appendix 7** of NEMA EIA Regulations, 2014, as amended, which must include the following

(a) details of the—

- (i) independent person who prepared the environmental audit report; and
- (ii) expertise of the independent person that compiled the environmental audit report;

(b) a declaration that the independent auditor is independent in a form as may be specified by the competent authority;

(c) an indication of the scope of, and the purpose for which, the environmental audit report was prepared;

(d) a description of the methodology adopted in preparing the environmental audit report;

(e) an indication of the ability of the EMPr, and where applicable, to—

- (i) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis;*
- (ii) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and*
- (iii) ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan;*

(f) a description of any assumptions made, and any uncertainties or gaps in knowledge;

(g) a description of any consultation process that was undertaken during the course of carrying out the environmental audit report;

(h) a summary and copies of any comments that were received during any consultation process; and

(i) any other information requested by the competent authority.

In addition to the above, the **Environmental Audit Report** must include the following

- Project Background Information;

- Terms of Reference of various project team members;
- Scope of audit and the audit period;
- Objectives of the Environmental Audit;
- Methods used for undertaking of Compliance Audits;
- Roles and Responsibilities of different parties involved in ensuring the compliance of the EMPr;
- Summary of main findings;
- Checklist used for checking compliance;
- Photographs of observations of audit; and
- Any other documents deemed important to support the audit findings.

#### *7.1.2 Document control procedures*

To ensure the Environmental Auditing Reports are of good quality, these must undergo an internal review prior to submission to relevant parties. An indication of the document history indicating as a minimum the revision number and date as well as the names and signatures of the compiler, reviewer and approver must be provided.

#### *7.1.3 System for documenting environmental training*

The Developer, Project Manager, Contractors and subcontractors must develop a system for documenting environmental monitoring, training and reporting. This system must as a minimum include the following:

- Plans on relevant parties to train and the frequency of training to ensure that all parties; working on the site/providing services are aware of the necessity to adhere to the EMPr;
- An indication of items to be discussed in typical training sessions; and
- Typical documents/material to be used for training and proof of the undertaking of training.

#### *7.1.4 Frequency of audit reports*

The reports compiled to record the findings of the audit must be provided at frequencies required by the Department of Environmental Affairs (DEA), where stated, or by GDHS. Copies of the Audit Reports must be provided to DEA where required.

### **7.2 Monitoring of the EMPr**

In order to ensure that the EMPr is being correctly implemented and remains relevant to site activities, the following must be undertaken:

#### *7.2.1 Environmental auditing*

Internal Audits as well as External Audits (where required by the DEA Competent Authority) of the EMPr must be undertaken at the periods and according to procedures outlined below unless GDARD includes other conditions:

- Internal Audits - these must be undertaken at periods and according to procedures prescribed by the Developer/Project Manager (if applicable). Records associated with this auditing must be kept. The Contractor shall undertake their own Internal Audits and must communicate their procedure to the ECO. All Internal Audits must also be aligned to the GDHS' audit process

in terms of internal environmental policy requirements. Where required, the DEA will also be provided with copies of all audit reports.

- ***External Audits*** – if required by the DEA, these must be undertaken by a suitably qualified and experienced Environmental Control Officer (ECO). Similar to the Internal Audits, these must entail the checking of Environmental Compliance based on the EMPr and the Environmental Authorisations as well as any other requirements including environmental best practice. All External Audits must also be aligned to the GDHS' audit process in terms of internal environmental policy requirements. In order to undertake the external audits, the ECO must adopt the following methods and approaches as a minimum:
  - Review of background information to acquaint the ECO with various aspects of the project;
  - Document review;
  - Observations during site walkabout. Photographs must be undertaken during the walkabout;
  - Interviews and Questioning (open-ended questions will be asked); and
  - Completion of checklists to report and discuss the findings of each of the areas within the construction site.

Audit reports will be compiled and submitted to the relevant parties within the project. These must include the GDHS as the Project Developer, the Project Manager and the Contractor.

#### *7.2.2 Corrective actions*

The Contractor must compile an Environmental Action Plan to ensure that the non-compliances are addressed and ensure that the issues are addressed within a certain target date set by the ECO. The Contractor must ensure that corrective actions arising as a result of non-compliances are undertaken and recorded accordingly. These records must be kept for review by the ECO and/or any other party with authority to undertake this exercise.

### **7.3 Review of the EMPr**

The EMPr must be reviewed by and with the Project Team, should the need arise. The discussion of this item must preferably be led by the ECO. The frequency of the review of the EMPr must be decided between the ECO and GDHS. All records of this review must be kept by the ECO on behalf of the Project Manager and GDHS.

Any amendments to the EMPr must be communicated to the Project Team by the ECO. Proof of the communication must be kept.

#### *7.3.1 Amendment of the EMPr (where required)*

The NEMA EIA Regulations, December 2014, as amended regulate the procedures and criteria for the submission and consideration of the EMPr including its content. It must be noted that the EMPr is a living document that can be amended should the need for this arise. The amendment must however be undertaken according to the EIA Regulations that will be relevant at the time of the required amendment. It must be noted that the NEMA EIA Regulations 2014 (Sections 34-37) (which

were applicable during the compilation of this EMPr) introduce a defined process with regard the amendment of the EMPr as outlined below:

- **First amendment** applies to the amendment of the EMPr as a result of audit findings.
- **Second amendment** pertains to an amendment of a specific impact management action of an EMPr.
- **Third amendment** gives opportunity to the holder of the EA to amend the EMPr, and also requires the involvement of the Competent Authority (CA) and the undertaking of Public Participation (PP).

It is important that the Developer and the Contractor follow these defined processes during the implementation phase as deviating from this process is regarded as a non- conformance.

In terms of the NEMA EIA Regulations 34, Government Notice No 982, of Government Gazette No 40772, Developers must ensure compliance with the conditions of the EMPr by undertaking an Environmental Audit in a structured and systematic manner. This audit must provide for recommendations regarding the need to amend the EMPr, and where applicable the Closure Plan. It is a requirement of the environmental compliance audit process that risks to the environment are identified and these possible risks should be taken into account during the planning and construction phase of the development. These risks are presented in this EMPr. The implementation of this EMPr, through the appointed Contractor, remains the responsibility of the Developer, i.e. GDHS.

## 8. REFERENCES

DEAT (Department of Environmental Affairs and Tourism), 1992. Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs, Pretoria.

DEAT (Department of Environmental Affairs and Tourism), 2004. Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Field and Form. 2020. Floral Impact Assessment for the Proposed Bryanston 3B Housing Development to Support the Basic Assessment and Water Use Licence Application Process, Bryanston, Gauteng Province.