

# **UPDATED ENVIRONMENTAL MANAGEMENT PROGRAMME**

## **FOR THE CONSTRUCTION OF ACACIA VILLA ESTATE ON 105 BLUE HILLS AGRICULTURAL HOLDINGS, FOR OMEIDA 405CC, GAUTENG PROVINCE.**

**GDENV REFERENCE: GAUT 002/18-19/E0036 &  
GAUT 006/24-25/E0017**

**Author: Sinnah Mhlongo**

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**Client: OMEIDA 426CC**

**Address: 546 16th Road, Constantia Park, Block 2, First Floor, Randjespark, 1682**

**Email: [shonie@scprojects.co.za](mailto:shonie@scprojects.co.za) / [admin@scprojects.co.za](mailto:admin@scprojects.co.za)**

**Tel: 011 026 2560**

**Cell: 079 614 8298**

**Fax: 086 552 0171**

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| Contents                                                                    | Page      |
|-----------------------------------------------------------------------------|-----------|
| <b>INFORMATION REQUIRED BY THE COMPETENT AUTHORITY .....</b>                | <b>1</b>  |
| <b>1. DETAILS OF THE EAP .....</b>                                          | <b>3</b>  |
| <b>1.1 Expertise of the EAP .....</b>                                       | <b>3</b>  |
| 1.1.1 EAPASA Registered EAP .....                                           | 3         |
| <b>2. INTRODUCTION .....</b>                                                | <b>5</b>  |
| 2.1 Project Background .....                                                | 5         |
| 2.2 Objective of Environmental Management Plan .....                        | 5         |
| <b>3. PROPOSED ACTIVITY .....</b>                                           | <b>6</b>  |
| 3.1 Description of Proposed Activity .....                                  | 6         |
| 3.2 Project Location .....                                                  | 7         |
| 3.3 The Principal Contractor's Environmental Liaison Officer (PC ELO) ..... | 7         |
| <b>4. PLANNING AND DESIGN.....</b>                                          | <b>9</b>  |
| 4.1 Contractor Requirements .....                                           | 9         |
| 4.2 The Environmental Control Officer (ECO) .....                           | 9         |
| 4.3 Environmental Awareness Training / Induction.....                       | 10        |
| 4.4 Compliance Monitoring and Corrective Action .....                       | 11        |
| 4.5 Reporting and Review.....                                               | 12        |
| 4.6 Site Documentation.....                                                 | 12        |
| 4.7 Emergency Preparedness .....                                            | 12        |
| 4.8 Waste Management.....                                                   | 13        |
| 4.9 Storm Water Management.....                                             | 13        |
| 4.10 Sensitive Areas.....                                                   | 13        |
| <b>5. SITE ESTABLISHMENT .....</b>                                          | <b>14</b> |
| 5.1 Contractor's Camp .....                                                 | 14        |
| 5.2 Complaints Registers .....                                              | 14        |
| 5.3 Provision of Services.....                                              | 14        |
| <b>6. RECOMMENDATIONS FOR ENVIRONMENTAL MANAGEMENT .....</b>                | <b>15</b> |
| 6.1 Method Statements .....                                                 | 15        |
| 6.2 EMPr Management Objectives .....                                        | 16        |
| <b>7. SUMMARY OF IMPACTS ASSOCIATED WITH THE PROPOSED ACTIVITY .....</b>    | <b>17</b> |
| <b>8. MITIGATION GUIDELINES.....</b>                                        | <b>19</b> |
| 8.1 Environmental Management Programme .....                                | 19        |
| <b>9. EMERGENCY PROCEDURES .....</b>                                        | <b>56</b> |
| 9.1 First aid procedures.....                                               | 56        |
| 9.2 Spills of fuels and hazardous substances .....                          | 56        |
| 9.3 Emergency advisory procedure .....                                      | 56        |
| 9.4 Fire precautions .....                                                  | 56        |
| <b>10 FINAL CLEAN UP AND CLOSE OF CONSTRUCTION .....</b>                    | <b>57</b> |

|                                              |           |
|----------------------------------------------|-----------|
| <b>11 ENVIRONMENTAL MONITORING .....</b>     | <b>58</b> |
| <b>11.1 Auditing .....</b>                   | <b>58</b> |
| <b>11.2 Site Meetings .....</b>              | <b>58</b> |
| <b>12 NON-COMPLIANCE.....</b>                | <b>59</b> |
| <b>12.1 Individual transgressions.....</b>   | <b>59</b> |
| <b>12.2 Contractors Transgressions .....</b> | <b>60</b> |
| 12.2.1 Offences and Penalties .....          | 60        |
| <b>13 CONCLUSION.....</b>                    | <b>61</b> |

### **List of Figures**

|                                                              |    |
|--------------------------------------------------------------|----|
| Figure 1: Acacia Villa Estate Locality Map .....             | 7  |
| Figure 2: Fines Table due to Individual transgressions.....  | 60 |
| Figure 3: Fine Table due to contractor's Transgression ..... | 61 |

### **List of Tables:**

|                                                                           |    |
|---------------------------------------------------------------------------|----|
| Table 1: Details of EAP .....                                             | 3  |
| Table 2: Project Location Details .....                                   | 7  |
| Table 3: Responsibilities.....                                            | 8  |
| Table 4: Environmental Management Programme and Mitigation Measures ..... | 20 |

|  |                                                                                                                                                                                                                                                              | DOCUMENT CONTROL SHEET                |                                                                                       |             |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-------------|
| Revision 01                                                                       | <b>NAME OF REPORT</b><br><br><b>UPDATED ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)</b><br>UPDATED ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE CONSTRUCTION OF ACACIA VILLA ESTATE ON 105 BLUE HILLS AGRICULTURAL HOLDINGS, FOR OMEIDA 405CC, GAUTENG PROVINCE. |                                       |                                                                                       |             |
| COMPILED BY:                                                                      | <b>NAME</b>                                                                                                                                                                                                                                                  | <b>DESIGNATION</b>                    | <b>SIGNATURE</b>                                                                      | <b>DATE</b> |
|                                                                                   | Ms Sinnah Mhlongo                                                                                                                                                                                                                                            | Environmental Consultant              |    | May 2025    |
| REVIEWED BY                                                                       | Mrs. Shonisani Selahle                                                                                                                                                                                                                                       | Environmental Assessment Practitioner |    | May 2025    |
| APPROVED BY                                                                       | Mrs. Pretty Mshandukani                                                                                                                                                                                                                                      | Client                                |  | May 2025    |

**Abbreviations:**

|        |                                        |
|--------|----------------------------------------|
| C      | Contractor                             |
| DEO    | Designated Environmental Officer       |
| EA     | Environmental Authorisation            |
| EAP    | Environmental Assessment Practitioner  |
| ECO    | Environmental Control Officer          |
| EIA    | Environmental Impact Assessment        |
| EMPr   | Environmental Management Programme     |
| ESS    | Environmental Scoping Phase            |
| I&APs  | Interested and/or Affected Parties     |
| PC ELO | Environmental Liaison Officer          |
| MSDS   | Material Safety Data Sheets            |
| PC     | Principal Contractor                   |
| PM     | Project Manager                        |
| SAHRA  | South African Heritage Resource Agency |
| SM     | Site Manager                           |
| SO     | Safety Officer                         |

## INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

The Environmental Impact Assessment (EIA) Regulations, promulgated in terms of the National Environmental Management Act (Act no. 107 of 1998 as amended) dated 8th of December 2014. In terms of Appendix 4(1) of the EIA Regulations 2014 as amended, an Environmental Management Programme (EMPr) must contain the information that is necessary for the competent authority to consider and come to a decision on the application and must include –

| <b>Content of Environmental Management Programme (EMPr)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| (1) An EMPr must comply with section 24N of the Act and include-<br>(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.                                                                                                                                                                                                                                                                                                                                                  | Chapter 1      |
| (b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;                                                                                                                                                                                                                                                                                                                                                                                                                                   | Chapters 2 & 3 |
| (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 should be avoided, including buffers;                                                                                                                                                                                                                                                                                                                | Chapter 3      |
| (d) a description of the impact management outcomes, 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 in the case of a closure activity, closure; and<br>(v) where relevant, operation activities;             | Chapter 8      |
| (f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) 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; and<br>(iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity; | Chapter 8      |
| (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Chapter 8      |
| (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Chapter 8      |
| (i) an indication of the persons who will be responsible for the implementation of the impact management actions;                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Chapter 8      |

| <b>Content of Environmental Management Programme (EMPr)</b>                                                                                                                                                                                                                                       |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;                                                                                                                                                                                | Chapter 8      |
| (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);                                                                                                                                                                                     | Chapter 8      |
| (l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;                                                                                                                                                                                 | Chapter 8      |
| (m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and | Chapter 5      |
| (n) any specific information that may be required by the competent authority.                                                                                                                                                                                                                     | Not applicable |

## 1. DETAILS OF THE EAP

Table 1: Details of EAP

|                                                   |                                                                                                                                           |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the Environmental Assessment Practitioner | Shonisani Selahle                                                                                                                         |
| Tel No:                                           | 011 026 2560                                                                                                                              |
| Fax No:                                           | 086 685 9567                                                                                                                              |
| Email:                                            | <a href="mailto:shonie@scprojects.co.za">shonie@scprojects.co.za</a> / <a href="mailto:admin@scprojects.co.za">admin@scprojects.co.za</a> |

### 1.1 Expertise of the EAP

#### 1.1.1 EAPASA Registered EAP

##### Qualifications

- Tshwane University of Technology, N. Diploma Geology – 2010
- University of South Africa, BSc Honors, Environmental Management - 2025
- NOSA, Implementation of ISO 45001:2018 & ISO 14001:2015

##### Summary of the EAP's experience

Shonisani Selahle is an Environmental Consultant with more than 15 years of experience in applying the principles of Integrated Environmental Management and Environmental Legislation to several development projects and initiatives in Southern Africa. She has coordinated and managed several diverse projects and programs related to the Environment and Waste within both the public and private sectors for national and international companies. She has a great understanding of relevant legislation about environment management (NEMA, ECA, NWA, MPRDA, etc)

##### Curriculum Vitae Shonisani Selahle

- Ability to carry out international environmental legislation research to interpret and incorporate it in proposals/EIAs/BAs
- Understanding and implementation of World Bank Guidelines and Equator Principles into EIA reports
- Technicalities of EIA Guidelines (Pre-consultation; Exemption of Environmental Authorisation, Environmental Screening Studies, Feasibility Studies, Fatal Flaw Studies, Basic Assessment, EIA, Scoping, EIA Public Participation and Appeals)
- Ability to undertake Environmental Authorisation Amendments (Minor and Substantive) Application
- Ability to carry out Occupational Health and Safety Compliance Monitoring and Audits in terms of the Occupational Health and Safety Act and Construction Regulations
- Ability to do EIA Reports independently and incorporate specialist input into reports.
- Ability to compile Environmental Management Plans
- Ability to coordinate Public Participation from call to register to compile issues and response Reports.

- Ability to undertake EIA's/BAs for Renewable energy projects.
- Ability to carry out Environmental Control Officer (ECO) duties (site inspection and site/client auditing) and work independently.
- Ability to liaise with clients and authorities.
- Ability to undertake site rehabilitation using Bio-remediation methods for contaminated sites,
- Ability to carry out Occupational Health and Safety Audits,
- Ability to apply Construction Health and Safety Permits with swift responses from the Department of Employment and Labour
- Ability to implement ISO 45001:2018 and ISO 18001:2015 standards per project description for companies.

## **2. INTRODUCTION**

Selahle Consultancy and Projects (Pty) Ltd has been appointed as an independent Environmental Control Officer by OMEIDA 426cc. This appointment was to undertake Environmental Monitoring and Auditing construction activities in Acacia Villa Estate on Portions 105 Blue Hills Agricultural Holdings, in Midrand, Gauteng Province. The development falls within the jurisdiction of the City of Johannesburg Metropolitan Municipality. The principal contractor appointed to undertake construction activities is MShandukani Holdings (Pty) Ltd.

Seedcracker Environmental Consulting CC was appointed an independent Environmental Assessment Practitioner to conduct the Basic Assessment Process, including the compilation of a construction environmental management programme, for the proposed construction activities, and the Environmental Authorisation was granted on the 30th of August 2018.

The Project triggered Listed Activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the EIA Regulations, 2014 (amended in 2017). This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992).

### **2.1 Project Background**

Omeida Trading 405cc was the previous holder of the Environmental Authorisation granted by the Gauteng Department of Environment (GDEnv) on 30 August 2018. In July 2022, the company was sold to new developers, who bought the company with its Company name to continue with the trading. The construction of the Acacia Villa Estate commenced during the same month. However, activities occurred within the wetland and its buffer zone without a Water use license, as required under Condition 3.4 of the approved Environmental Authorisation. As a result, the Department of Water and Sanitation has requested the submission of an updated Environmental Management Programme (EMPr), replacing the version approved during the Environmental Authorisation (EA) phase. This updated EMPr will be submitted alongside the required technical documents to support the ongoing Water Use Licence Application.

### **2.2 Objective of Environmental Management Plan**

Integrated Environmental Management (IEM) is a key instrument of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended [NEMA]. NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an EMPr.

The EMPr is a detailed plan for the implementation of the mitigation measures to minimise the negative environmental impacts. The EMPr for this project includes a construction environmental monitoring plan specifying how the construction of the project is to be carried out. The EMPr also includes the actions required for the Post-Construction Phase (Operation and Maintenance Phase) to ensure that all potential environmental impacts are managed for the duration of the project's life cycle and will ensure environmental good practice.

The provisions of this EMPr are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. If any conflict occurs between the terms of the EMPr and the project specifications or Environmental Approval, the terms herein shall be subordinate.

This EMPr is read in conjunction with the approved Wetland Rehabilitation Plan that was approved by the Gauteng Department of Environment (GDEnv) on 29 October 2024.

### **3. PROPOSED ACTIVITY**

#### **3.1 Description of Proposed Activity**

Omeida Trading 426 CC (applicant) proposed to establish a township on Blue Hill Holdings 105 for a medium-density residential development that accommodates 101 units and one Clubhouse. The total size of Holdings 105 and 106 combined is 5.7305 hectares.

The construction activities for the Acacia Villa Estate commenced in July 2022 and concluded in September 2024. During the construction phase, it was discovered that Omeida Trading had failed to comply with the conditions outlined in the granted Environmental Authorisation and the approved Environmental Management Plan. This led to several non-compliance issues, with one of the most significant being the commencement of construction activities without obtaining a water use license from the Department of Water and Sanitation. This oversight was particularly critical due to the presence of a wetland within the property, which was adversely impacted by the construction activities.

Currently, the water use license application is in progress and has reached the final stage of its approval process. The Department of Water and Sanitation has requested the submission of technical documents and studies conducted throughout the project's lifecycle. Additionally, an updated Environmental Management Programme (EMPr), reflecting the findings of these studies, is required to address the impacts observed and ensure compliance with environmental regulations.

### 3.2 Project Location

The project site is located on the southwestern corner of Acacia and Mimosa Roads, Midrand, City of Johannesburg Metropolitan Municipality. See Figure 1 and Table 2 below for the location of the project.



Figure 1: Acacia Villa Estate Locality Map

Table 2: Project Location Details

| Summary of the Project Location |                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Project Location</b>         | Holdings 105 of Blue Hills Agricultural Holdings, City of Johannesburg Metropolitan Municipality. |
| <b>Coordinates</b>              | Latitude: 25°57'29.68"S<br>Longitude: 28° 5'24.17"E                                               |
| <b>SG Digit Code (s)</b>        | T0JR00000000039700000                                                                             |

### 3.3 The Principal Contractor's Environmental Liaison Officer (PC ELO)

The PC ELO will be appointed by the Contractor to implement the EMPr and monitor activities on site daily. The PC ELO will be the ECO's representative on the site and will report back on all audit trips. The PC ELO must report any major incidents immediately to the ECO.

Table 3: Responsibilities

| Responsibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Function                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Overall management of the project and EMPr implementation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Project Manager (PM)                                             |
| <ul style="list-style-type: none"> <li>Oversee site works, liaison with Contractor (PC ELO), PM and ECO</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Senior Site Supervisor/<br>Contract Manager (CM)                 |
| <ul style="list-style-type: none"> <li>Implementation of EMPr, and monitoring of compliance with the requirements of the EMPr.</li> <li>Maintains close communication with the PC ELO, and oversees the PC ELO's environmental control, remediation and rehabilitation actions (including checking that the complaints register and register of environmental incidents are being maintained by the PC ELO).</li> <li>Environmental awareness training of the contractor and select main construction staff</li> <li>Settlement of damage claims and completion of Damage Release Forms</li> </ul>                                                                                                                                                                                                                                                                       | Environmental Control Officer (ECO) – Appointed by the proponent |
| <ul style="list-style-type: none"> <li>Ensures the implementation and compliance with recommendations and conditions of the EMPr; Appoints a dedicated person (PC ELO) to work with ECO</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Contractor (PC)                                                  |
| <ul style="list-style-type: none"> <li>Monitoring of compliance with EMPr, environmental control of site actions, adjusting of environmental quality of works performed by construction staff, remediation and rehabilitation work.</li> <li>Reports back to the ECO through compilation of regular site inspection reports.</li> <li>Ensures compliance of construction activities with relevant environmental legislation.</li> <li>Maintains the complaints register that is kept on-site.</li> <li>Keeps record of all environmental incidents and ensures that corrective action is taken.</li> <li>Compiles method statements from the project specific EMPr.</li> <li>Environmental awareness training of all staff.</li> <li>Day-to-day management of landowner requirements and landowner liaison; ensures all landowner special conditions are met.</li> </ul> | Contractor-appointed<br>Environmental Liaison Officer (PC ELO)   |

## **4. PLANNING AND DESIGN**

### **4.1 Contractor Requirements**

The contractor acts as the applicant's agent on site and is bound to the EMPr conditions through his/her contract with the developer. The contractor is responsible for ensuring that he/she adheres to all the conditions of the EMPr. The contractor must thoroughly familiarise him/herself with the EMPr requirements before coming onto the site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure that he/she has provided a sufficient budget for complying with all EMPr conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMP.

### **4.2 The Environmental Control Officer (ECO)**

The Environmental Control Officer (ECO) must be an independent environmental consultant appointed by the applicant or contractor to act as the applicant or contractor representative, to monitor and review the on-site environmental management and implementation of this EMPr by the Contractor.

The ECO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development.

The ECO's duties will include the following:

- Assisting the developer in ensuring that any necessary environmental authorisations and permits have been obtained.
- Maintaining open and direct lines of communication between the applicant, project engineers, Contractor and Environmental Control Officer (ECO), with regard to environmental matters.
- Appointing specialists (botanists, ecological ecologists, etc.) as required to advise the ECO.
- Reporting on environmental issues at construction site meetings.
- Reviewing and approving the Contractor's construction method statements.
- Regular site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr, the ROD and approved method statements at all times, monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Assisting the Contractor in finding environmentally responsible solutions to problems.

- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto the site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr.
- Auditing the implementation of the EMPr and compliance with the ROD on a monthly basis.
- Undertaking a continual review of the EMPr and recommending additions and/or changes to the document to the developer and contractor for discussion.
- Keeping a photographic record of progress on site from an environmental perspective. This can be conducted in conjunction with the ESO as the ESO will be the person who will be onsite at all times and can therefore take photographic records weekly. The ECO would need to check and ensure that the ESO understands the task at hand.
- Recommending additional environmental protection measures, should this be necessary.
- Providing report back on any environmental issues at site meetings.

The ECO has the right to enter the site and carry out monitoring and auditing based on prior arrangement with the landowner/s and subject to compliance with health and safety requirements applicable to the site (e.g., wearing of safety boots and protective headgear).

### **4.3 Environmental Awareness Training / Induction**

The ECO will be responsible for putting an Environmental Awareness Training Programme in place, for all staff members. Before commencing any work, all staff members shall be briefed about the Environmental Code of Conduct. After being briefed about the contents of the Environmental Code of Conduct, staff members shall sign an Environmental Training register as proof of their training.

The presentation shall be conducted, as far as possible, in the employees' language of choice. As a minimum, training should include:

- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- The significant environmental impacts, actual or potential, as a result of their work activities.
- The importance of not littering.
- The need to use water sparingly.
- Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.
- Details regarding fauna and flora, and the procedures to be followed should there be encountered during the construction phase

Recommended Environmental “**Rules of Conduct**” for site personnel are provided below.

The following list represents the basic **Do’s and Don’ts** towards environmental awareness, which all participants in this project to consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

**ALL new site personnel must attend environmental induction training.**

**DO:**

- Use the toilet facilities provided – report dirty or full facilities
- Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away. (Littering is an offence.)
- Report all fuel or oil spills immediately & stop the spill from continuing.
- Report an incident where actual or potential environmental harm is or may be caused. this is regardless of whether you have been involved in the incident or if you observe others causing it.
- Confine work and storage of equipment within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Drive on designated routes only.
- Prevent excessive dust and noise.

**DO NOT:**

- Allow cement or cement bags to blow around.
- Allow waste, litter, oils or foreign materials to remain on-site
- Litter or leave food lying around
- Waste or contaminated water
- Do not throw oil, petrol, diesel, concrete or rubbish on the ground
- Remove or damage vegetation without direct instruction.
- Make any fires.
- Injure, trap, feed or harm any animals – this includes birds, frogs, snakes, lizards etc.
- Enter any fenced-off or marked area.

#### **4.4 Compliance Monitoring and Corrective Action**

Non-compliance with the conditions of the EMPr must be viewed as a breach of the appointment contract for which the construction contractors will be held liable. The appointed contractor is in non-compliance with the EMPr if:

- There is evidence of contravention of the EMPr, or the Method Statements developed by the contractor within the boundaries of the construction site or areas of contractor responsibility.
- Construction-related activities take place outside the defined boundaries of the site.
- Environmental damage occurs due to negligence/laziness/blatant disregard for the environment.

- The contractor fails to comply with corrective or other instructions issued by the ECO within an agreed time frame; or
- The contractor fails to respond adequately to complaints from the public or authorities.

The applicant and the construction contractors are liable for any construction rehabilitation costs associated with their non-compliance with the EMPr. This rehabilitation will be undertaken to the satisfaction of the ECO and the GDEnv.

#### **4.5 Reporting and Review**

The EMPr reporting and documentation requirements must be based on best environmental practice principles. ECO reports must be regularly reviewed by the Contractor and the Project Manager. The contents of this EMPr must be discussed at monthly or weekly project meetings with all contractor's project managers. The construction contractors must be contractually obliged to fulfil any reasonable recommendations, and the implementation of these actions will be assessed in the ECO audits.

#### **4.6 Site Documentation**

The following is the list of documentation that must be kept within the contractors' offices on-site and must be made available to the ECO and/or any regulating body on request.

- A copy of this Environmental Management Programme (EMPr);
- Declarations of understanding by the Applicant, Project Manager, Contractors, and designated Environmental Officer.
- Environmental Method statements.
- ECO approval of method statements.
- Incident reports and registers.
- Complaints register.
- Site Establishment Plan.
- Copies of ECO reports.
- Copies of DEO reports (internal management and monitoring – daily/weekly checklists).
- Awareness training material (toolbox talks, inductions, etc.).
- Service receipts for chemical toilets and waste; and
- Records of all remediation/rehabilitation activities.

#### **4.7 Emergency Preparedness**

The contractor shall develop an emergency response plan to ensure that there will be an appropriate response to unexpected or accidental actions or unforeseen incidents that will cause environmental impacts during the construction period. Such activities may include, inter alia:

- Accidental fires.
- Accidental spillage of hazardous substances.

The contractor and sub-contractors shall comply with the emergency preparedness incident reporting requirements that must be developed before construction.

#### **4.8 Waste Management**

During the construction phase, the Contractor must ensure to make provision for the appropriate removal of waste from the site to a permitted waste disposal facility. The accumulation of construction waste materials must be avoided as far as possible.

A Waste Disposal Management Plan (DMP) must be compiled and produced. This plan should specify where all the different waste streams would be stored on-site, as well as the mode of transportation of all hazardous waste to a registered landfill site. The DMP should also indicate how most waste would be recovered by means of Recycling, Reusing, and Recovering prior to it being disposed of at landfill sites.

#### **4.9 Storm Water Management**

- A Registered Engineer must draft a stormwater management plan before construction commences.
- Wherever possible, the stormwater must be allowed to soak into the land in the area on which the water has been discharged.
- The stormwater system, especially the discharge points, must be inspected and damaged areas must be repaired if required.
- Discharge points must be inspected for blockages of any kind; these must be removed timeously to ensure the efficient operation of the stormwater management system.
- The Contractor should ensure that waste or refuse must not access the stormwater infrastructure.
- Where silt traps have been incorporated as part of the stormwater management system these must be maintained as per the engineer's requirements; the maintenance crew must be informed as to the correct procedure, in terms of the engineer's specifications, how the silt trap is to be maintained.

All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately.

#### **4.10 Sensitive Areas**

A Channelled Valley Bottom Wetland was identified within the southern portion of the study area. Based on the findings of the aquatic study, the outstanding construction and operational activities related to the Housing development are assessed as having a "Low" risk significance to the Channelled valley bottom wetland as well as the aquatic ecology of the associated unnamed stream (tributary), provided that all mitigation measures outlined in this EMP are implemented. These

measures are essential to prevent edge effects and cumulative impacts on the freshwater ecosystems within the proposed development and the investigation area.

## **5. SITE ESTABLISHMENT**

### **5.1 Contractor's Camp**

- A Water Use License must be obtained prior to the commencement of construction.
- A working servitude must be established and marked on site, the servitude must be kept to a minimum and be demarcated by means of tape or mesh.
- Plan access roads in such a way as to minimise impact on the wetland area, i.e., One access road in and out of the study area.
- Plan construction camps must be placed outside of the wetland and its associated buffer zones.
- Plan construction activities within the wetland area, to take place during the dry winter months.
- The construction camp must preferably be located away from surrounding residential areas to minimise visual and noise impacts, all moveable materials and associated accessories must be stored overnight in the camp.
- The camp needs to be fenced with a lockable with access control for security purposes. No staff should be accommodated at the site camp except the overnight security guard. Proper facilities for him should however be provided.

### **5.2 Complaints Registers**

A complaint register must be always kept at the construction camp and all complaints, issues and concerns shall be recorded in the register. All issues, concerns and complaints should also be incorporated in the feedback report and submitted to the competent authority (GDEnv).

Where complaints require corrective actions and/or measures, this must be communicated urgently to the relevant parties to ensure that the complainant is satisfied. All registered and identified Interested and Affected Parties (I&APs) should be notified prior to construction commencement.

### **5.3 Provision of Services**

Chemical toilets should be provided for construction workers prior to construction commencement of any construction activities. These must be regularly maintained and emptied as and when required, at least weekly. The toilets must be located within walking distance of the work staff and an average of one (1) toilet per five (5) workers must be provided.

## 6. RECOMMENDATIONS FOR ENVIRONMENTAL MANAGEMENT

### 6.1 Method Statements

A method statement must be completed by the Contractor, for each activity requiring a method statement, as specified in this EMP or as requested by the ECO. A method statement is a document that details the way a work task or process is to be completed. The method statement should outline the hazards involved in the task and include a step-by-step guide on how to implement the action in a safe manner, that reduces the overall risk to people and the environment. The method statement must also detail the control measures and remediation activities to ensure the safety of persons who are affected by the task or process, as well as the environment.

The method statement must identify the risks associated with the various work stages at hand. Steps to reduce the potential risk associated with these stages must then be determined and included in the method statement. The sequential steps and actions to be followed by the persons carrying out the works must be written down and signed by the responsible party.

The method statement shall cover applicable details with regard to:

- Construction procedures,
- Materials and equipment to be used,
- Getting the equipment to and from the site,
- How the equipment/ material will be moved and where it will be stored while on site,
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur, timing and location of activities, and any other information deemed necessary by the Engineer and ECO.

The method statement should be written by a person who is competent in the tasks to be undertaken and how these can be effectively communicated. The contractor shall not commence an activity until all required method statements have been approved by the ECO. Such approval should not unreasonably be withheld.

All control measures detailed in the method statement must be the subject of "toolbox" talks before the initiation of work. By explaining these important measures during the "toolbox" talk, everyone involved will have a clear understanding of how to carry out the work, as well as the safe work method sequences and equipment required.

Approved method statements must be readily available on-site, preferably in the contractor's camp. The location of the approved method statements must be communicated to all relevant personnel. The contractor shall carry out the works in accordance with the approved method statements as they apply to the work in progress.

The contractor should produce the following method statements as a minimum:

- Site establishment
- Stockpiling of materials

- Site Dust Management
- Crew Camps and construction lay-down areas
- Solid Waste Management
- Sourcing, excavating, transporting and dumping of fill and spoil material
- Hazardous Material Management
- Hydrocarbon Management
- Surface Water Management
- Site Clearing and Topsoil Management
- Noise and Vibration Management
- Cement and Concrete Batching
- Pollution Control
- Site Access and Traffic Management
- Incident and Emergency Response Management

Additional method statements must be developed (or revised) if the need therefore is identified during the construction phase of the project.

The Contractor must abide by these approved method statements, and any activity covered by a method statement shall not commence until the ECO has approved the method statement. The method statement must be submitted to the ECO two (2) weeks prior to the intended date of commencement of the activity.

## 6.2 EMPr Management Objectives

This EMPr serves to ensure a pro-active rather than re-active approach to environmental performance; by addressing potential negative environmental impacts before they occur. This will limit the corrective measures needed during the construction phase of the project. Therefore, this EMPr aims to provide management measures that must be implemented by Developers/Proponents, Project Managers, Engineers, and Contractors alike, to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document for the project team to add or improve on issues that might be considered left out or not relevant to the project.

The following tables form the core mitigation measures appropriate to the pre-construction and construction phases. The tables present the objectives to be achieved and the management actions that need to be implemented to mitigate the negative impacts and enhance the benefits of the project.

The “*pre-construction*” section of this EMPr, refers to the period leading up to and prior to the commencement of construction activities. This is to ensure proactive environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur

during the construction phase and must be mitigated through the contingency plans identified during the pre-construction phase.

The “*construction*” section refers to all construction and its operation-related activities that will occur within the approved areas and access roads until the project is completed. The bulk of environmental impacts will have an immediate effect during the “*construction*” phase (e.g. noise, dust, and destruction of vegetation). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts prior to, or as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

## 7. SUMMARY OF IMPACTS ASSOCIATED WITH THE PROPOSED ACTIVITY

| Impact                                                         | Before mitigation    | After mitigation |
|----------------------------------------------------------------|----------------------|------------------|
| Dust                                                           | Very High            | Medium           |
| Surface water                                                  | Medium               | Low              |
| Hydrological yield                                             | Medium               | Low              |
| Domestic waste                                                 | Low                  | Low              |
| Construction waste                                             | Medium               | Low              |
| Hazardous waste                                                | Low                  | Low              |
| Loss of topsoil                                                | Medium               | Low              |
| Sedimentation                                                  | High                 | Low              |
| Traffic                                                        | Medium               | Low              |
| Traffic disruptions                                            | Medium               | Low              |
| Groundwater quality                                            | High                 | Low              |
| Stormwater runoff                                              | Medium               | Low              |
| Soil erosion                                                   | Medium               | Low              |
| Fauna and flora                                                | High                 | Low              |
| Loss of ecological function                                    | High                 | Low              |
| Alien invasive species                                         | Medium               | Low              |
| Hydrology                                                      | Low                  | Low              |
| Noise pollution                                                | Low                  | Low              |
| Land degradation                                               | Medium               | Low              |
| Employment creation                                            | High (High Positive) | High (Positive)  |
| Crime and safety                                               | Low                  | Low              |
| The unearthing of Paleontological and archaeological artifacts | Low                  | Low              |
| Flooding and ponding                                           | High                 | Low              |
| Minimise vegetation clearing                                   | Medium               | Low              |

| Impact                                                      | Before mitigation | After mitigation  |
|-------------------------------------------------------------|-------------------|-------------------|
| Protection of Species of Conservation Concern               | High              | Low               |
| Promote Ecological Resilience                               | Medium            | Low               |
| Land use and Land management practices                      | Medium            | Low               |
| Diversion surface water for dry working conditions on site. | Medium            | Low               |
| Surface water quality                                       | High              | Low               |
| <b>Operational Phase</b>                                    |                   |                   |
| Increase in stormwater flow                                 | Medium            | Low               |
| Disconnection of river from wetland                         | High              | Low               |
| Increase in water flow                                      | High              | Low               |
| Alien invasive species proliferation                        | Medium            | Low               |
| Impact on hydrological system                               | High              | Low               |
| Rehabilitation                                              | Very High         | High (positive)   |
| Unearthing of Paleontological and archaeological artifacts  | Low               | Low               |
| Abstraction of Groundwater                                  | Medium            | Medium (Positive) |
| Infiltration of domestic wastewater                         | Medium            | Low               |
| Re-vegetation                                               | High              | High (Positive)   |

1. Vegetation removal must be as minimal as possible. All bare surface areas must be re-vegetated to mimic the natural hydrological Yield as much as possible.
2. A drainage system will need to be installed to redirect water away from the construction site.
3. Ensure regular inspection of earthmoving vehicles to prevent fuel spillages. Storage of construction material should comply with required regulations for storage of construction material to prevent any infiltration of contaminated waste into the groundwater system. Any vehicle that will be found with a leak must be removed from the site immediately.
4. The design and implementation of the temporary stream diversion should consider the environmental impacts. To reduce the impact on aquatic habitats, various structures must be installed to mimic and protect the existing stream environment.
5. Ensure regular inspection of earthmoving vehicles to prevent fuel spillages.
6. Storage of construction material should comply with required regulations for storage of construction material to prevent any infiltration of contaminated waste into the groundwater system.
7. Groundwater Monitoring boreholes should be installed upstream, midpoint and downstream of the site to monitor quality and water level.
8. A surface water quality monitoring plan must be implemented to monitor quality and ensure no contamination occurs within the site.

9. Vegetation removal must be as minimal as possible.
10. All bare surface areas must be re-vegetated using indigenous or non-invasive vegetation to mimic the natural hydrological Yield as much as possible.
11. Boreholes must be pumped and recovered according to the prescribed borehole management recommendations. Boreholes to be installed with automatic switch that will go off when the groundwater level is below recommended critical level.
12. Re-vegetation activities are encouraged during reduce rainfall impact, reduce surface water velocities, enhance infiltration, trap sediments.

## **8. MITIGATION GUIDELINES**

### **8.1 Environmental Management Programme**

Mitigation guidelines are addressed through four phases namely the Pre-construction (Site Establishment) Phase; the Construction Phase (and associated rehabilitation of affected environment) and the Operational Phase (Post-Construction) and Closure Phase.

A set of prescribed impact management outcomes and associated actions have been identified. Holders of Environmental Authorisations (EAs), ECOs, and Contractors are responsible for ensuring that these outcomes and actions are implemented for all projects, as a minimum requirement. This is done to mitigate the impact of any impacts identified for the proposed development.

Before starting the activity, both the contractor and the EA holder must sign and date each page of the completed template. The method statements, which are prepared and agreed to by the holder of the EA, must be appended as well. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA.

Each phase of the development and operation of the proposed infrastructure has specific issues unique to that period. The impact is identified, and a brief description is given. The four phases of the development are then identified and addressed below.

Table 4: Environmental Management Programme and Mitigation Measures

| IMPACT                             | MITIGATION ACTION REQUIRED                                                                                                                                                                         | RESPONSIBLE PERSON | FREQUENCY                     |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|
| <b>PRE-CONSTRUCTION PHASE</b>      |                                                                                                                                                                                                    |                    |                               |
| <b>Site Preparation Activities</b> | <ul style="list-style-type: none"> <li>▪ Appoint an Environmental Control Officer</li> </ul>                                                                                                       | Proponent          | Once Off                      |
|                                    | <ul style="list-style-type: none"> <li>▪ Water use License must be completed and received prior to commencement of construction</li> </ul>                                                         | PC                 | Once Off                      |
|                                    | <ul style="list-style-type: none"> <li>▪ The PC must draw up method statements for relevant construction activities.</li> </ul>                                                                    | PC                 | As required                   |
|                                    | <ul style="list-style-type: none"> <li>▪ The PM and ECO must approve all of the method statements before they become operational.</li> </ul>                                                       | PM & ECO           | As required                   |
|                                    | <ul style="list-style-type: none"> <li>▪ A working servitude must be established and marked on site. The servitude must be kept to a minimum and be demarcated by means of tape or mesh</li> </ul> | PC                 | Throughout, Monitored monthly |
|                                    | <ul style="list-style-type: none"> <li>▪ The PC must ensure compliance with the conditions of the EMPr.</li> </ul>                                                                                 | PC                 | Throughout, Monitored monthly |
|                                    | <ul style="list-style-type: none"> <li>▪ Plan access roads in such a way as to minimise impact on the wetland area, i.e., One access road in and out of the study area</li> </ul>                  | PC/ Engineer       | Throughout, Monitored monthly |
|                                    | <ul style="list-style-type: none"> <li>▪ Plan construction activities that necessitate a wetland crossing to only cross at one designated point</li> </ul>                                         | PC & ECO           | Throughout, Monitored monthly |
|                                    | <ul style="list-style-type: none"> <li>▪ Plan construction camps to be placed outside of the wetland and its associated buffer zone</li> </ul>                                                     | PC & ECO           | Throughout, Monitored monthly |
|                                    | <ul style="list-style-type: none"> <li>▪ Plan construction activities within the wetland area, to take place during the drier winter months if possible</li> </ul>                                 | PC                 | Throughout, Monitored monthly |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RESPONSIBLE PERSON | FREQUENCY                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|
|        | <ul style="list-style-type: none"> <li>Plan construction activities to have the smallest possible footprint.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                 | PC                 | Throughout, Monitored monthly |
|        | <ul style="list-style-type: none"> <li>Consider the various construction methods and select whichever method(s) that will have the least impact on the wetland area</li> </ul>                                                                                                                                                                                                                                                                                                          | ECO                | Throughout, Monitored monthly |
|        | <ul style="list-style-type: none"> <li>The establishment and use of Borrow-pit areas are not permitted within wetland areas or within wetland buffer zone areas. The borrow-pit areas should also not impact on the hydrology of wetland areas through increased run-off or dissection of geo-hydrological pathways feeding the wetlands. Effective rehabilitation of the borrow-pit areas must be implemented as soon as they are finished</li> </ul>                                  | PC & ECO           | Throughout, Monitored monthly |
|        | <ul style="list-style-type: none"> <li>Stormwater outflows should not enter directly into a wetland. The velocity of water that may reach wetlands should be slowed before it is intercepted by virgin soils using a siltation and erosion control structure. The plans and specification for this structure should be forwarded to the approving authorities for approval.</li> </ul>                                                                                                  | Engineer           | Throughout, Monitored monthly |
|        | <ul style="list-style-type: none"> <li>During the excavation and refilling of open trenches, care must be taken in regard to soil handling. The topsoil must be set aside separately from the subsoils. In particular, the topsoil from the wettest area near the rivers must be carefully lifted and set down with its content of wetland plants kept intact and alive. The soils must be returned in reverse sequence so that the topsoil will be the last to be replaced.</li> </ul> | PC                 | Throughout, Monitored monthly |

| IMPACT                           | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                      | RESPONSIBLE PERSON | FREQUENCY                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|
|                                  | <ul style="list-style-type: none"> <li>All no-go areas on site must be properly fenced off / demarcated and signage placed before the onset of construction.</li> </ul>                                                                                                                                                                                                                                                         | PC                 | Throughout, Monitored monthly |
|                                  | <ul style="list-style-type: none"> <li>Records of compliance / non-compliance with the conditions of the EMPr must be kept on-site and be available on request. A copy of these records must be made available to the provincial department on request throughout the project execution.</li> </ul>                                                                                                                             | PC                 | Throughout, Monitored monthly |
|                                  | <ul style="list-style-type: none"> <li>All unskilled labourers must be drawn from the local market as far as possible, and use must be made of local semiskilled and skilled personnel where possible.</li> </ul>                                                                                                                                                                                                               |                    | Once off                      |
| <b>Construction Site Signage</b> | <ul style="list-style-type: none"> <li>Construction site signage and warning signs must be erected where necessary informing the public of the construction area. Safety signage where required must also be erected.</li> </ul>                                                                                                                                                                                                | PC                 | Monitored Monthly             |
| <b>Site Access</b>               | <ul style="list-style-type: none"> <li>Existing roads and services must be utilised. No unauthorised access is permitted.</li> <li>Access roads for earthmoving equipment must be clearly designated and positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage.</li> </ul> | PC                 | Monitored Monthly             |
| <b>Water Supply</b>              | <ul style="list-style-type: none"> <li>Groundwater may be used as a water supply for construction activities since the property has two boreholes. However, the water cannot be used for human consumption.</li> </ul>                                                                                                                                                                                                          | PC                 | Monitored Monthly             |

| IMPACT                                        | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                    | RESPONSIBLE PERSON | FREQUENCY            |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|
| Method statements                             | <ul style="list-style-type: none"> <li>All activities which require method statements may only commence once the method statements have been approved by the engineer.</li> </ul>                                                                                                                                                             | PC & Engineer      | Monitored Bi-Weekly  |
| Emergencies, non-compliance and communication | <ul style="list-style-type: none"> <li>The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin Contamination of natural water resources from spills; contamination of soils from spills; and fire.</li> </ul> | PC & Engineer      | As and when required |
| Site and vegetation Clearing                  | <ul style="list-style-type: none"> <li>Vegetation removal must be as minimum as possible. All bare surface areas must be re-vegetated to mimic the natural hydrological Yield as much as possible.</li> </ul>                                                                                                                                 | PC /ECO            | Monitored Monthly    |
|                                               | <ul style="list-style-type: none"> <li>The area to be cleared must be clearly demarcated and this footprint strictly maintained. The footprint of clearance should not exceed the required footprint. The designated area is required where cleared vegetation is to be stockpiled until removal.</li> </ul>                                  |                    | Monitored Monthly    |
|                                               | <ul style="list-style-type: none"> <li>Stripped topsoil must be stockpiled for reuse where possible (i.e. for post-construction rehabilitation).</li> </ul>                                                                                                                                                                                   |                    | Monitored Monthly    |
|                                               | <ul style="list-style-type: none"> <li>Spoil (including excavated subsoils and topsoil) that is removed from the site must be stockpiled in a designated area and removed to an approved spoil site.</li> </ul>                                                                                                                               |                    | Monitored Monthly    |
|                                               | <ul style="list-style-type: none"> <li>All removed plant material (i.e., trees) must be disposed of at a suitable waste site. No burning of plant material removed from the construction site is allowed.</li> </ul>                                                                                                                          |                    | Monitored Monthly    |
|                                               | <ul style="list-style-type: none"> <li>Alien invasive vegetation is to be removed and controlled on the construction site.</li> </ul>                                                                                                                                                                                                         |                    | Monitored Bi-Weekly  |

| IMPACT                    | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESPONSIBLE PERSON | FREQUENCY        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|
| <b>CONSTRUCTION PHASE</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                  |
| <b>Oil and chemicals</b>  | <ul style="list-style-type: none"> <li>▪ The contractor must provide method statements for the “handling &amp; storage of oils and chemicals”, “fire”, and “emergency spills procedures”.</li> <li>▪ These substances must be confined to specific and secured areas within the contractor’s camp, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</li> <li>▪ Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended and drip trays must be utilised.</li> <li>▪ Spill kits must be available on-site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practices (sunsorb is a recommended product that is environmentally friendly).</li> <li>▪ All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils and drenched spill kit material).</li> </ul> | PC                 | Once Off/Monthly |

| IMPACT                                                                           | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESPONSIBLE PERSON | FREQUENCY       |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|
| <b>Cement</b>                                                                    | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for “cement and concrete batching”. The method statement must provide information on proposed storage, washing &amp; disposal of cement, packaging, tools and plant</li> <li>▪ The mixing of concrete shall only be done at specifically selected sites on mortar boards or similar structures to contain run-off into, drainage lines, streams and natural vegetation.</li> <li>▪ Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays.</li> <li>▪ All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed commercial facility.</li> <li>▪ Any spillage that may occur must be investigated and immediate remedial action shall be taken.</li> <li>▪ The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste to a registered landfill site.</li> <li>▪ Cement batching areas must be located in consultation with the RE to ensure residues are contained and that the proposed location does not fall within sensitive areas such as wetland buffer zones, drainage lines, stormwater channels, etc.</li> </ul> | PC                 | Monitored Daily |
| <b>DANGEROUS AND TOXIC MATERIALS</b><br><b>(Provision of storage facilities)</b> | <ul style="list-style-type: none"> <li>▪ Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PC                 | Monitored Daily |

| IMPACT                                | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RESPONSIBLE PERSON | FREQUENCY             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------|
|                                       | <ul style="list-style-type: none"> <li>▪ Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction.</li> <li>▪ In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately.</li> <li>▪ Storage areas shall display the required safety signs depicting “no smoking”, No Naked lights” and “Danger” containers shall be clearly marked to indicate contents as well as safety requirements.</li> <li>▪ The contractor shall supply a method statement for the storage of hazardous materials at tender stage.</li> <li>▪ Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS’s must be updated as required.</li> </ul> |                    |                       |
| <b>Bulk storage of fuels and oils</b> | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for “Diesel tanks and refuelling procedures”.</li> <li>▪ Bulk fuel storage tanks on the site shall be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. The filler tap must be inside the bunded area where possible and that the bund wall must not have a tap or valve.</li> <li>▪ A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                             | PC                 | Once off, as required |

| IMPACT                                      | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | RESPONSIBLE PERSON | FREQUENCY               |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------|
|                                             | <ul style="list-style-type: none"> <li>▪ Environmental Authorisation is required for volumes greater than 80 000 litres.</li> <li>▪ Bulk fuel storage tanks shall be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e., they must be located away from water courses).</li> <li>▪ Bulk fuel storage tanks shall be placed so that they are out of the way of traffic so that the risk of the tanks being ruptured or damaged by vehicles is minimised.</li> <li>▪ Bulk fuel storage should be covered during the rainy season.</li> </ul> |                    |                         |
| <b>Use of dangerous and toxic materials</b> | <ul style="list-style-type: none"> <li>▪ The contractor shall keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur.</li> <li>▪ The contractor shall set up a procedure for dealing with spills/ fire, a record must be kept of all spills and the corrective action taken.</li> </ul>                                                                                                                                                                                                                                                   | PC                 | Monitor Daily           |
| <b>Eating areas and camp followers</b>      | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for "Crew camps and construction laydown areas".</li> <li>▪ The Contractor shall, in conjunction with the EO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned daily.</li> <li>▪ No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the RE and EO.</li> </ul>                                        | PC                 | Once off, monitor daily |

| IMPACT                                 | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | RESPONSIBLE PERSON | FREQUENCY            |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|
|                                        | <ul style="list-style-type: none"> <li>▪ The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</li> <li>▪ Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractor's discretion facilities can be made available within the designated eating area.</li> <li>▪ Litter (even if originating outside the camp) and concrete bags etc. must be picked up daily and put into suitably closed bins.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                      |
| <b>Toilets and ablution facilities</b> | <ul style="list-style-type: none"> <li>▪ The contractor will be responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet shall be provided per 5 persons.</li> <li>▪ Sanitary arrangements shall be to the satisfaction of the local authority. Toilets shall be of the chemical type. The contractor must keep the toilets in a clean, neat and hygienic condition. The contractor shall supply toilet paper at all toilets at all times. Toilet paper dispensers must be provided in all toilets.</li> <li>▪ Toilets provided by the contractor must be easily accessible and a maximum of 50m from the working area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the RE, EO.</li> <li>▪ The contractor (who must use a reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using a reputable toilet-servicing company) shall ensure that all toilets are</li> </ul> | PC/EO              | As and when required |

| IMPACT                  | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RESPONSIBLE PERSON | FREQUENCY |
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|                         | <p>cleaned and emptied before the builders' or other public holidays.</p> <ul style="list-style-type: none"> <li>▪ Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |           |
| <b>Waste management</b> | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on the proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes.</li> <li>▪ Waste must be separated into recyclable and non-recyclable waste, and shall be separated as follows: <ul style="list-style-type: none"> <li>- Hazardous waste: including (but not limited to) old oil, paint, etc,</li> <li>- General waste: including (but not limited to) construction rubble,</li> <li>- Reusable construction material.</li> <li>- Recyclable waste shall preferably be deposited in separate bins. The contractor is advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. and "Consol" collect glass for recycling.</li> </ul> </li> <li>▪ Any illegal dumping of waste will not be tolerated, this action will result in a fine and if required further legal action will be taken. This aspect will be closely monitored and reported on; proof of legal dumping must be kept on-site and produced on request.</li> </ul> | PC / EO            | Daily     |

| IMPACT      | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | RESPONSIBLE PERSON | FREQUENCY |
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|             | <ul style="list-style-type: none"> <li>▪ Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that vermin are not attracted. Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, waste, rubbish, debris and builder's waste generated on the site. Subcontractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP.</li> <li>▪ All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to retain proof of such.</li> </ul> |                    |           |
| <b>Dust</b> | <ul style="list-style-type: none"> <li>▪ The contractors 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 the licenses acquired for such usage.</li> <li>▪ Potable water may not be used as a means of dust suppression, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression.</li> <li>▪ The construction camp must be watered during dry and windy conditions to control dust fallout. Dust production must be</li> </ul>                                                                                                  | PC/ EO             | Daily     |

| IMPACT                                             | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RESPONSIBLE PERSON | FREQUENCY |
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|                                                    | <p>controlled by regular watering of roads and works area, should the need arise. (NB: Concrete dust is toxic and damages soil properties. Therefore, watering to prevent dust spread must not be done where concrete dust has fallen, or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust.)</p> <ul style="list-style-type: none"> <li>▪ In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression. At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project.</li> <li>▪ All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to. Regular monitoring of dust fallout must be carried out and the records kept on site. Baseline dust measures must be sampled and approved by the RE prior to the commencement of construction activities.</li> </ul> |                    |           |
| <b>Workshop equipment, maintenance and storage</b> | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for “workshop maintenance and cleaning of plant”.</li> <li>▪ No maintenance and washing of vehicles and equipment may take place on site. A suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PC/ EO             | Daily     |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RESPONSIBLE PERSON | FREQUENCY |
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|        | <p>done on site. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site.</p> <ul style="list-style-type: none"> <li>▪ Construction vehicle storage yards must be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the EO or RE. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. Sunsborb</li> <li>▪ A method statement is required from the Contractor, tendering for the project to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage.</li> <li>▪ The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. The Contractor must ensure that the senior and the other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. The following shall apply: All contaminated soil/yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bioremediation can be done. A specialist Contractor shall be used for the bioremediation of contaminated soil where the required remediation material and expertise is not available on site.</li> </ul> |                    |           |

| IMPACT            | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RESPONSIBLE PERSON | FREQUENCY            |
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| <b>Noise</b>      | <ul style="list-style-type: none"> <li>▪ In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as “disturbing”. Noise levels during construction must therefore be kept within 7dB of the baseline data.</li> <li>▪ All construction vehicles must be in a good working order to reduce possible noise pollution.</li> <li>▪ Work hours during the construction phase shall be strictly enforced unless permission is given. Permission shall not be granted without consultation with the local residents and businesses by the EO.</li> <li>▪ Noise reduction is essential, and Contractors shall endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement.</li> <li>▪ Noisy activities shall take place only during working hours. The EO must inform the residents of houses and businesses adjacent to the development 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 adjacent sites. These activities could include but are not limited to, blasting, piling, use of pneumatic jackhammers and compressors, bulk demolitions, etc.</li> </ul> | PC/ EO             | As and when required |
| <b>Crew camps</b> | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for “Crew camps and construction laydown areas”. Accommodation for members of the workforce will not be permitted on site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PC/ EO             | Daily                |

| IMPACT       | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | RESPONSIBLE PERSON | FREQUENCY |
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|              | <ul style="list-style-type: none"> <li>▪ Dedicated wash areas must be situated 100m away from watercourses. The contractor's camp shall be monitored for dust fallout and dust suppression applied as required. This may include the laying of gravel; the use of grey water can be considered as an option if the required permits have been acquired.</li> <li>▪ The contractor's camp, offices and storage facilities must be located within the site boundaries. No person shall be allowed to stay on neighbouring sites. The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis. These areas shall then be inspected by the contractor or his/her ESO to ensure compliance with this requirement.</li> <li>▪ The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period.</li> </ul> |                    |           |
| <b>Fires</b> | <ul style="list-style-type: none"> <li>▪ The contractors must provide and maintain a method statement for</li> <li>▪ "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised</li> <li>▪ No burning of waste is permitted on-site.</li> <li>▪ Fires will only be permitted in designated facilities specifically constructed for this purpose within fenced Contractor's camps.. Wood, charcoal or anthracite are the only fuels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PC/ EO             | Daily     |

| IMPACT                 | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | RESPONSIBLE PERSON | FREQUENCY |
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|                        | <p>permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose.</p> <ul style="list-style-type: none"> <li>Fires in the designated areas must be small in scale so as to prevent excessive smoke from being released into the atmosphere. Heavy smoke must not be released into the air.</li> <li>No wood is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                        |                    |           |
| <b>Heritage</b>        | <ul style="list-style-type: none"> <li>In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local Council should they come across any findings of heritage resources within 24 hours if the area has been removed.</li> <li>Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found shall cease immediately and the South African Heritage Resources Agency shall be notified within 24 hours.</li> <li>Under no circumstances shall archaeological artefacts be removed, destroyed or interfered.</li> <li>Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South Africa Heritage Resources Agency on the appropriate provincial heritage resource agency.</li> </ul> | PC / EO            | Daily     |
| <b>Sensitive areas</b> | <ul style="list-style-type: none"> <li>A Channelled Valley Bottom Wetland has been identified in the southern portion of the study area. Based on the findings of the freshwater resource assessment, the construction and</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PC / EO            | Daily     |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | RESPONSIBLE PERSON | FREQUENCY |
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|        | <p>operation of the proposed development is deemed a low-risk activity, provided that no development takes place within the delineated wetland or its prescribed buffer zone. Accordingly, the wetland system and its maximum buffer zone have been formally excluded from all development activities and must be clearly demarcated and protected throughout the project lifecycle.</p> <ul style="list-style-type: none"> <li>▪ All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction.</li> <li>▪ No-go areas must be demarcated with fencing/warning tape and signs before any construction activities commence.</li> <li>▪ No other development must occur within the 30-meter wetland buffer.</li> <li>▪ A water use license must be obtained from the department of water and Sanitation for any activities occurring within the Wetland.</li> <li>▪ The edge of the wetland must be demarcated in the field with pegs or poles that will last for the duration of the construction phase colour coded as follows: <ul style="list-style-type: none"> <li>- RED (indicating the edge of the wetland).</li> <li>- ORANGE (indicating the edge of the buffer zone).</li> </ul> </li> <li>▪ Temporary destruction of wetlands for civil services: <ul style="list-style-type: none"> <li>- While some removal of vegetation is an inevitable part of the construction, it is</li> </ul> </li> </ul> |                    |           |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RESPONSIBLE PERSON | FREQUENCY |
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|        | <p>recommended that this is kept to the minimum possible. Access to riparian areas should also be restricted by identifying the minimum number of access roads to the site and delineating the work corridor prior to construction activities.</p> <ul style="list-style-type: none"> <li>- Under no circumstances should construction workers be allowed to clear indigenous vegetation for firewood or any other purpose. Areas where vegetation has been cleared for construction that would after construction not be covered in concrete should be replanted with indigenous vegetation upon completion of construction. Rhodes grass (Chloris Gayana) is an excellent soil stabiliser.</li> <li>- Only use access roads as designated during the planning phase.</li> <li>- Only cross watercourses at designated points</li> <li>- Limit compaction by not working in wet conditions and limiting vehicular access.</li> <li>- Restrict vehicular and pedestrian access to natural or seasonally wet areas during and shortly after rainfall events. Access may only resume once the soil has sufficiently dried to prevent compaction, erosion, or habitat disturbance .</li> </ul> |                    |           |

| IMPACT                         | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RESPONSIBLE PERSON | FREQUENCY                  |
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|                                | <ul style="list-style-type: none"> <li>- The wetland boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground-disturbing activities are complete.</li> <li>- Only necessary traffic should be allowed within the demarcated areas.</li> <li>- Demarcate each construction footprint, before the contractors commence with construction.</li> <li>- Contractors should refrain from impacting areas beyond the demarcated construction area.</li> </ul> <p>The contractor must avoid traffic or storing equipment and material in vegetated areas that will not be cleared. The contractor should ensure that there is a storage on site where all equipment will be stored.</p> |                    |                            |
| <b>Access route/haul roads</b> | <ul style="list-style-type: none"> <li>▪ Existing roads and services must be utilised. No unauthorised access is permitted.</li> <li>▪ Any damage or degradation must be investigated, and fines must be issued and the affected areas must be immediately rehabilitated.</li> <li>▪ Access roads for earthmoving equipment must be clearly designated and positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage.</li> </ul>                                                                                                                                                                             | PC/ EO             | As required, monitor daily |

| IMPACT                            | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESPONSIBLE PERSON | FREQUENCY |
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| <b>Crime, safety and security</b> | <ul style="list-style-type: none"> <li>▪ No site staff, other than security personnel and skeleton staff shall be housed on site. Security personnel and skeleton staff shall be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, and facilities for cooking and heating so that open fires are not necessary.</li> <li>▪ A boundary fence will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled to restrict unauthorised personnel from entering the site. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on-site at all times.</li> <li>▪ The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations.</li> <li>▪ The contractor shall ensure that all emergency procedures are in place</li> <li>▪ Prior to commencing work. Emergency procedures shall include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.</li> <li>▪ The contractor shall 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.</li> </ul> | PC / EO            | Daily     |

| IMPACT               | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | RESPONSIBLE PERSON | FREQUENCY            |
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|                      | <ul style="list-style-type: none"> <li>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, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.</li> </ul>                                                                                                                                                 |                    |                      |
| <b>Visual impact</b> | <ul style="list-style-type: none"> <li>Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas.</li> <li>Landscaping must enhance the aesthetic appeal of the development.</li> <li>Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill.</li> </ul>                                                                                                                                                                                    | PC/ Landscaper     | Daily                |
| <b>Geotechnical</b>  | <ul style="list-style-type: none"> <li>As per the Geotechnical investigation report the following were recommended: <ul style="list-style-type: none"> <li>Modified Normal reinforced strip footing foundation: This is therefore recommended as a possible foundation design for the proposed development. Where In-situ reconstruction or ripping is done at an average depth of 0.80m below surface with an allowable soil bearing pressure of 319kPa.</li> <li>Proper compaction should be adhered to while back filling the trenches and foundations</li> </ul> </li> </ul> | PC                 | As and when required |

| IMPACT              | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | RESPONSIBLE PERSON | FREQUENCY |
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|                     | <p>with appropriate engineered fill and should be compacted to 95% MOD AASHTO at 150mm.</p> <ul style="list-style-type: none"> <li>- Site drainage and plumbing/service precautions must be taken into consideration. Site drainage should be design in such a way that water is channelled away from buildings into a suitable storm water drainage system to avoid structural distress over a period of time.</li> <li>- For the weak water seepage encountered on-site, damp-proof membrane should be used to prevent groundwater water f infiltrating; such an impermeable layer can assist as a sealing layer.</li> </ul> <p>Regular checks on the quality and compaction of the backfill to the terraces should be made during construction.</p> |                    |           |
| <b>Geohydrology</b> | <ul style="list-style-type: none"> <li>▪ The shallow groundwater system more susceptible to contamination inflow during construction. Spillages of diesel from earthmoving machinery or construction material is likely to infiltrate the ground and ultimately enter the groundwater system. Therefore, regular inspection of earthmoving vehicles to prevent fuel spillages is recommended.</li> <li>▪ Storage of construction material should comply with required regulations for storage of construction material to prevent any infiltration of contaminated waste into groundwater system.</li> </ul>                                                                                                                                           | PC/EO              |           |

| IMPACT                      | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RESPONSIBLE PERSON | FREQUENCY |
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|                             | <ul style="list-style-type: none"> <li>▪ Vegetation removal must be as minimum as possible. All bare surface areas must be re-vegetated in order to mimic the natural hydrological Yield as much as possible.</li> <li>▪ The surface water may be diverted for dry working conditions. The natural surface water flow will be affected. The design and implementation of the temporary stream diversion should consider the environmental impacts. To reduce the impact on aquatic habitants, various structures must be installed to mimic and protect existing stream environment.</li> <li>▪ Material from construction flowing into surface water bodies and upstream outbursts and overflow, which may pose a threat and risk to surface water quality, therefore, Surface water quality monitoring plan must be implemented to monitor quality and ensure no contamination occurs within the site.</li> <li>▪ Continuous groundwater and surface water monitoring is recommended upstream and downstream of the site to monitor quality and water level.</li> </ul> |                    |           |
| <b>Flood line</b>           | <ul style="list-style-type: none"> <li>▪ Based on the flood line report it is recommended that high-resolution survey data be conducted as a means of using a more representative topographic data for routing flood waters in a hydraulic model with improved confidence. An alternative recommendation is to construct a flood protection structure or explore an alternative of canalising the stream in the areas upstream of the property</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | PC                 | Once off  |
| <b>Aquatic Biodiversity</b> | <ul style="list-style-type: none"> <li>▪ Exposed soil, including topsoil, must be safeguarded throughout the construction phase using an appropriate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PC/ EO             | Daily     |

| IMPACT                   | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RESPONSIBLE PERSON | FREQUENCY                              |
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|                          | <p>geotextile material (e.g., Geojute or hessian sheeting) to prevent erosion and sedimentation of the freshwater ecosystem.</p> <ul style="list-style-type: none"> <li>▪ Th Applicant must incorporate Sustainable Drainage Systems (SuDS) principles into the design of the proposed development to manage stormwater during the operational phase. The use of SuDS features, such as bioswales alongside attenuation ponds, will help mitigate significant impacts on the wetlands' hydrological functioning.</li> <li>▪ The Swales must be vegetated with indigenous wetland or riparian plant species to enhance water quality through natural filtration, including the trapping of hydrocarbons from road runoff, prior to discharge into adjacent wetlands.</li> <li>▪ The design must incorporate swales or equivalent stormwater attenuation features to promote diffuse flow into the designated setback areas</li> <li>▪ All stormwater management must align with Sustainable Drainage Systems (SuDS) principles.</li> </ul> |                    |                                        |
| <b>OPERATIONAL PHASE</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                                        |
| <b>Geohydrology</b>      | <ul style="list-style-type: none"> <li>▪ In the event the residents rely on groundwater for domestic use, unmonitored abstraction of groundwater is likely to impact negatively on the groundwater table, therefore, Aquifer testing should be conducted to establish suitable yields on the borehole to prevent excessive pumping and to regulate critical water levels.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | PC                 | As and when is required, monitor daily |

| IMPACT                       | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | RESPONSIBLE PERSON | FREQUENCY                                |
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|                              | <ul style="list-style-type: none"> <li>Groundwater quality monitoring should be conducted on a quarterly basis to ensure no contamination occurs within the site. The integrity of the domestic wastewater structures must be regularly inspected to prevent against infiltration of domestic wastewater into groundwater system.</li> <li>Re-vegetation activities are encouraged during reduce rainfall impact, reduce surface water velocities, enhance infiltration, trap sediments.</li> <li>boreholes must be pumped and recovered according to the prescribed borehole management recommendations. Boreholes to be installed with automatic switch that will go off when the groundwater level is below recommended critical level.</li> </ul>                                                                  |                    |                                          |
| <b>Stormwater Management</b> | <ul style="list-style-type: none"> <li>An attenuation dam will be constructed to store and gradually release stormwater to reduce the risk of flooding. The attenuation dam is of approximately 1305m<sup>3</sup> storage is to cater for stormwater events up to the 1:100 year.</li> <li>No waste or refuse must be allowed to access the storm water infrastructure.</li> <li>Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged. The storm water system, especially the discharge points, must be inspected and damaged areas must be repaired if required. Discharge points must be inspected for blockages of any kind; these must be removed timeously to ensure the efficient operation of the storm water management system.</li> </ul> | PC/ Applicant      | As and when required, monitor seasonally |

| IMPACT                     | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                           | RESPONSIBLE PERSON | FREQUENCY            |
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|                            | <ul style="list-style-type: none"> <li>For all maintenance undertaken, reference must be made to recommendations in the approved storm water management plan.</li> <li>All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately.</li> </ul>                                                                              |                    |                      |
| <b>Air pollution</b>       | <ul style="list-style-type: none"> <li>All forms of dust/air pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions</li> <li>Under no circumstances may heavy smoke be released into the air.</li> </ul>                                           | PC/ Applicant      | Daily                |
| <b>Light pollution</b>     | <ul style="list-style-type: none"> <li>All illuminated signage must be in accordance with the South African Manual for Outdoor Advertising Control (SAMOAC).</li> <li>Security lights are to be angled downwards to avoid disturbance to adjoining residents and businesses. Illumination of the buildings must take into account the possible distraction glare might have on motorists.</li> </ul> | PC/ Applicant      | Daily                |
| <b>Noise Pollution</b>     | <ul style="list-style-type: none"> <li>Noise levels shall be kept within acceptable limits, these are determined in terms of the relevant local by laws</li> </ul>                                                                                                                                                                                                                                   | PC/ Applicant      | Daily                |
| <b>Safety and Security</b> | <ul style="list-style-type: none"> <li>Boundary wall must be regularly inspected and maintained to prevent any damage. All fencing on site must be maintained and regularly monitored for repair.</li> <li>Maintenance work must not be the cause of environmental damage. Any environmental damage caused must be investigated and mitigated immediately.</li> </ul>                                | PC/ Applicant      | As and when required |

| IMPACT                       | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RESPONSIBLE PERSON | FREQUENCY                                  |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------|
|                              | <ul style="list-style-type: none"> <li>Where Electric fences are installed, these must be monitored to ensure that animals have not been trapped. If animal fatalities have occurred these must be investigated and the services of a qualified specialist (bird, reptile, etc) must be employed to implement the correct management action to prevent further fatalities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                            |
| <b>Traffic management</b>    | <ul style="list-style-type: none"> <li>It must be ensured that a backlog of traffic does not develop at access points during peak hours, through the implementation of an efficient and effective access control systems.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PC/ Applicant      | Monitored continually                      |
| <b>Landscape maintenance</b> | <ul style="list-style-type: none"> <li>All alien invasive plant species must be removed for disposal at a registered organic waste transfer facility.</li> <li>Cut and fill slopes shall be shaped and trimmed to approximate the natural condition and contours as closely as possible. Cut and fill slopes shall be left as rough as possible and shall be shaped to contain ridge that would facilitate the accumulation of topsoil Prior to revegetation, the Contractor shall ensure that the area is clear of any building materials and other foreign debris.</li> <li>All visible weeds shall be removed from the area before replacing topsoil</li> <li>Compacted soil shall be ripped along the contour and hand trimmed. Topsoil shall then be spread evenly over the surface. The final prepared ground surface shall be furrowed to follow the natural contours of the land and not smooth.</li> </ul> | PC/ Applicant      | As and when required<br>Monitor seasonally |

| IMPACT                                                                                      | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RESPONSIBLE PERSON | FREQUENCY                                                                         |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------|
| <b>Infrastructure maintenance</b>                                                           | <ul style="list-style-type: none"> <li>All buildings must be maintained in accordance with engineer's specifications.</li> <li>In case of emergency sewage leaks, effluent must not be discharged into any water course, vlei, naturally vegetated areas or water bodies.</li> <li>All taps must be regularly inspected for leaks and washers or valves replaced as required.</li> <li>Inspect the development for burst, blocked or leaking water pipes and repair as required.</li> </ul> | PC/ Applicant      | As and when Required Monitor as part of a monthly Maintenance inspection/schedule |
| <b>Upgrades and renovations</b>                                                             | <ul style="list-style-type: none"> <li>Where civil contractors or works are required within the development for upgrading and renovation activities the planning and construction EMP must be implemented.</li> </ul>                                                                                                                                                                                                                                                                       | PC/Applicant       | As and when required                                                              |
| <b>Operation of the stormwater infrastructure and service infrastructure</b>                | <ul style="list-style-type: none"> <li>Conduct regular maintenance to prevent system failures.</li> <li>Develop and implement an emergency response plan for potential emergencies.</li> <li>Restrict vehicle movement during maintenance and repairs to existing roadways only, avoiding any unnecessary disturbance within the freshwater ecosystem.</li> </ul>                                                                                                                           | PC/Applicant       | As and when required                                                              |
| <b>Increased impermeable surfaces in the vicinity of the watercourse and the catchment.</b> | <ul style="list-style-type: none"> <li>A stormwater management plan must be integrated into the design of the development.</li> <li>The discharge of stormwater into the freshwater environment must be managed to prevent further bank incision or erosion and should be released in a diffused manner.</li> </ul>                                                                                                                                                                         | PC/Applicant       | As and when required                                                              |

| IMPACT                                                                               | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESPONSIBLE PERSON                     | FREQUENCY                                             |
|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                                                                                      | <ul style="list-style-type: none"> <li>It is strongly recommended that the principles of Sustainable Urban Drainage Systems (SUDs) be incorporated into the stormwater management plan for the development.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                                                       |
| <b>REHABILITATION</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |                                                       |
| <b>Area within the boundary of the property cleared of vegetation on the wetland</b> | <ul style="list-style-type: none"> <li>The wetland area inside the boundary of the property must be properly demarcated to prevent further degradation and impacts as per the condition of the EA.</li> <li>To begin rehabilitation of the area, all remnants of foreign debris should be removed from the site. These include plants, and construction rubble &amp; debris.</li> <li>All rubble and debris on site are to be collected and removed from the site and disposed of at a licensed waste disposal site. The ECO must be provided proof of disposal in the form of an invoice from the contractor, or a weighbridge notice from the relevant disposal site.</li> <li>Alien invasive species that are identified within the servitudes should be removed prior to construction-related soil disturbances. This will prevent seed from spreading into disturbed soils.</li> <li>Manual/mechanical removal is preferred to chemical control. If herbicide must be used it should be registered for aquatic use.</li> <li>Compacted soil should be ripped to a depth of more than 150 mm.</li> <li>The final prepared surface should not be smooth but furrowed to follow the natural contours of the land.</li> </ul> | PC/ Ecological Specialist with SACNASP | To take place as required in the Rehabilitation phase |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RESPONSIBLE PERSON | FREQUENCY |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
|        | <ul style="list-style-type: none"> <li>▪ Restrict vehicular and pedestrian access to natural or seasonally wet areas during and shortly after rainfall events. Access may only resume once the soil has sufficiently dried to prevent compaction, erosion, or habitat disturbance.</li> <li>▪ Reshape and reprofile the wetlands in order to achieve a natural topography.</li> <li>▪ Implement erosion control measures within newly worked, bare areas in order to prevent the loss of topsoil due to wind and water erosion. These areas may be covered with geotextiles.</li> <li>▪ Do not remove temporary erosion protection materials until the vegetation cover has re-established.</li> <li>▪ Additional wetland plants required for rehabilitation purposes must be sourced from a local nursery which breeds plants from the region.</li> <li>▪ Water plants immediately after they are planted and regularly for the first week to aid in establishment.</li> <li>▪ Areas where minimal disturbances took place, can be ripped and allowed to naturally re-vegetate (take note that this excludes sloped areas).</li> <li>▪ Re-vegetation must be monitored to ensure that alien invasive plant species do not colonise the disturbed areas.</li> <li>▪ Revegetation must take place in winter (between June and August). This will allow the plants to establish before flood events. Regular watering of revegetated areas is required prior to spring rainfall.</li> </ul> |                    |           |

| IMPACT                                                                                         | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | RESPONSIBLE PERSON                     | FREQUENCY                                             |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                                                                                                | <ul style="list-style-type: none"> <li>Revegetation, including floral species selection and positioning as well as planting method, must be overseen by a suitably qualified landscaper or rehabilitation specialist.</li> <li></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |                                                       |
| <b>Ditch dug just Outside the Boundary of The Property, for Stormwater Drains Construction</b> | <ul style="list-style-type: none"> <li>Following construction of the stormwater drains, remove all alien invasive species within the construction works footprint.</li> <li>Implement temporary stormwater management measures, to diffuse flow during construction of the permanent stormwater measures, where necessary.</li> <li>Construction of the stormwater drains should be immediately followed by rehabilitation.</li> <li>Soils excavated in the wetland should be stored in sequence and not in the wetland perimeter.</li> <li>Only excavate to the required width and depth, with shoring to prevent slumping of the saturated material.</li> <li>Stockpiled in heaps must be a maximum of 2 metres and protected from erosion and loss of any form of contamination.</li> <li>To stabilise culvert installations, it is necessary to place a pioneer layer of permeable material (e.g. rockfill) over the bed of the excavation, or alternatively, install a suitable geogrid layer.</li> <li>Refill the dug excavation with the stockpiled wetland soils in the order it was excavated with topsoil at the top.</li> <li>If necessary, backfill can be supplemented by organic brought purchased or from distant locations.</li> </ul> | PC/ Ecological Specialist with SACNASP | To take place as required in the Rehabilitation phase |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | RESPONSIBLE PERSON | FREQUENCY |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
|        | <ul style="list-style-type: none"> <li>▪ Reshape and reprofile the wetlands in order to achieve a natural topography.</li> <li>▪ It is imperative that the reinstatement of a more natural hydrological regime is achieved prior to revegetation, as the wetland species assemblages which will be used to revegetate the wetland areas are dependent on the hydrological regime of the wetlands.</li> <li>▪ Following excavation (ditch) backfill compaction, the compacted areas should be ripped or scarified, and topsoil must be replaced from the areas where it was removed so that impacted areas can be re-vegetated. Note that ripping or scarifying soils which are saturated with water is ineffective and should be avoided.</li> <li>▪ Redistribute stockpiled topsoil across the disturbed area of the wetland.</li> <li>▪ Do not remove temporary erosion protection materials until the vegetation cover has re-established.</li> <li>▪ Revegetate the wetlands with the indigenous wetland species as listed below as soon as possible after the application of topsoil and stabilizing of soils.</li> <li>▪ Plugs may be obtained from adjacent habitats of similar plant composition. However, if plugs are sourced from adjacent habitat, care must be taken so as not to result in the excessive disturbance of the surrounding areas. An ECO must oversee the removal of plugs from adjacent areas.</li> </ul> |                    |           |

| IMPACT                                                                    | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | RESPONSIBLE PERSON                     | FREQUENCY                                             |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                                                                           | <ul style="list-style-type: none"> <li>Re-vegetation must be monitored to ensure that alien invasive plant species do not colonise the disturbed areas.</li> <li>Revegetation must take place in winter (between June and August). This will allow the plants to establish before flood events. Regular watering of revegetated areas is required prior to spring rainfall.</li> <li>Revegetation, including floral species selection and positioning as well as planting method, must be overseen by a suitably qualified landscaper or rehabilitation specialist.</li> <li>Ideally, the rehabilitated area, especially along the wetland areas, must be fenced off to prevent vehicle and pedestrian traffic and trampling.</li> <li>Revegetation, including floral species selection and positioning as well as planting method, must be overseen by a suitably qualified landscaper or rehabilitation specialist.</li> </ul> |                                        |                                                       |
| <b>Area impacted by excavator in private property and along main road</b> | <ul style="list-style-type: none"> <li>To begin rehabilitation of the area, all remnants of foreign debris should be removed from the site. These include plants, and construction rubble &amp; debris.</li> <li>All rubble and debris on site is to be collected and removed from the site and disposed of at a licensed waste disposal site. The ECO must be provided proof of disposal in the form of an invoice from the contractor, or a weighbridge notice from the relevant disposal site.</li> <li>The area where the excavator travelled has minimal disturbances and therefore should be manually ripped/scarified to level the disturbed area and erosion</li> </ul>                                                                                                                                                                                                                                                  | PC/ Ecological Specialist with SACNASP | To take place as required in the Rehabilitation phase |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | RESPONSIBLE PERSON | FREQUENCY |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
|        | <p>channels that have formed. The area should then be allowed to naturally re-vegetate (take note because the area is a slope it cannot be ripped to depths over 100mm).</p> <ul style="list-style-type: none"> <li>▪ Additional organic topsoil may be sourced to level and support plant growth. after the application of topsoil and stabilizing of soil, erosion control measures should be installed.</li> <li>▪ Along the slope of the disturbed area (including on private property where the excavator travelled), implement erosion control measures (e.g. covering disturbed, bare areas with geotextiles, straw bales, brush packing, mulch etc.) in order to prevent erosion and sedimentation of wetland areas.</li> <li>▪ Erosion control measures must be implemented with guidance from the ECO.</li> <li>▪ Downstream of the slope next to the road where there have been disturbances on the wetland, reshape and reprofile in order to achieve a natural topography and hydrology of the wetland.</li> <li>▪ Plugs may be obtained from adjacent habitats of similar plant composition. However, if plugs are sourced from adjacent habitats, care must be taken so as not to result in the excessive disturbance of the surrounding areas. An ECO must oversee the removal of plugs from adjacent areas.</li> </ul> <p>1. Additional wetland plants required for rehabilitation purposes must be sourced from a local nursery which breeds plants from the region.</p> |                    |           |

| IMPACT                                        | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | RESPONSIBLE PERSON                     | FREQUENCY                                             |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                                               | 2. The construction site and surroundings must be checked by the ECO for alien and invasive species and alien species noted must be removed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                                       |
| <b>The excavation of the attenuation pond</b> | <ul style="list-style-type: none"> <li>▪ To begin rehabilitation of the area, all remnants of foreign debris should be removed from the site. These include plants, and construction rubble &amp; debris.</li> <li>▪ All rubble and debris on site are to be collected and removed from site and disposed of at a licensed waste disposal site. The ECO must be provided proof of disposal in the form of an invoice from the contractor, or a weighbridge notice from the relevant disposal site.</li> <li>▪ For the purposes of erosion control, install temporary silt fences or biodegradable erosion control blankets on slopes around the attenuation pond to prevent soil loss while vegetation is established.</li> <li>▪ Roughen the surface of bare soils in the vicinity of the pond to reduce runoff velocity and promote infiltration. Apply organic mulches like straw or wood chips to protect the soil and retain moisture, promoting seed germination.</li> </ul> <p><b><u>Revegetation Actions</u></b></p> <ul style="list-style-type: none"> <li>▪ The area disturbed by during the excavation/construction of the attenuation pond must be levelled and topography reinstated to allow stormwater management flow and maintain wetland flow as much as possible.</li> </ul> | PC/ Ecological Specialist with SACNASP | To take place as required in the Rehabilitation phase |

| IMPACT | MITIGATION ACTION REQUIRED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | RESPONSIBLE PERSON | FREQUENCY |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
|        | <ul style="list-style-type: none"> <li>▪ Establish a vegetated buffer zone around the attenuation pond using indigenous grass and shrub species to reduce runoff into the wetland and pond. This will also act as a filtration system for pollutants and excess nutrients.</li> <li>▪ Plugs may be obtained from adjacent habitats of similar plant composition. However, if plugs are sourced from adjacent habitat, care must be taken so as not to result in the excessive disturbance of the surrounding areas. An ECO must oversee the removal of plugs from adjacent areas.</li> <li>▪ Additional wetland plants required for rehabilitation purposes must be sourced from a local nursery which breeds plants from the region.</li> <li>▪ The construction site and surroundings must be checked by the ECO for alien and invasive species and alien species noted must be removed.</li> </ul> |                    |           |

## **9. EMERGENCY PROCEDURES**

### **9.1 First aid procedures**

Contractors must provide and maintain a suitable first aid kit on the site and must ensure that a qualified first aid practitioner is present during working hours, in accordance with the Occupational Health and Safety Act (85 of 1993). They must also ensure that their staff know and can carry out the procedures for dealing with accidents and must clearly define the emergency procedures to be followed for obtaining medical treatment and assistance in the event of serious injury.

### **9.2 Spills of fuels and hazardous substances**

Contractors must keep the necessary materials and equipment on-site to deal with ground spills of any hazardous materials present. They must set up a procedure for dealing with such spills, which must be approved by the PM and ECO and must include a provision to notify the PM of any spills. In the event of soil contamination caused by the spillage of hazardous substances onto the ground, the source of the spillage must be isolated, and the spillage must be contained. Contaminated soil must also be removed or in the case of a larger spill, an absorbent material must be applied. Contaminated soils that have been removed must be stored in a skip and disposed of at an approved dump site. The treatment of the contaminated soil and the areas of contamination must be undertaken to the satisfaction of the ECO and RE.

The clean-up of spills and any damage caused by a spill will be for the relevant contractors' account.

### **9.3 Emergency advisory procedure**

Contractors must ensure that there is an emergency advisory procedure on site before commencing any operations that may endanger the lives of any personnel on site, or Contractors must also ensure that all personnel are familiar with all emergency procedures to be followed. It must be ensured that lists of all emergency numbers and contact people are regularly updated, and that numbers and names are posted at relevant locations at all times.

### **9.4 Fire precautions**

Cookers and heaters used on-site should be devices which have been specifically designed for those purposes. Smoking should be permitted on the site at the discretion of the PM and ECO and the contractors must ensure that all personnel are aware of the fire risk and the need to extinguish cigarettes before disposal. Wherever work involves welding, gas cutting or cutting of metal, firefighting equipment must be immediately available. A suitably qualified fire watch should also be in attendance.

Contractors must appoint a member of their staff to be responsible for the installation and inspection of fire extinguishers. The PM and ECO must receive copies of the inspection reports. A map should be drawn up to indicate the locations of fire extinguishers and they should be clearly visible and demarcated in accordance with legislation. Contractors must also supply site offices, kitchen areas, workshop areas, stores of fuel and hazardous materials, and any other areas identified by the ECO, with fire extinguishers.

No smoking will be permitted on the site except for within designated areas. Suitable firefighting equipment must be readily available in this area. The contractor will be requested to remove any person from the site who is found lighting a fire or smoking outside of the designated smoking area. Cigarettes must be properly extinguished before disposal. Cigarettes must be disposed of in bins provided on-site and must not be thrown onto the ground. Fires for heating, cooking or disposal of any material will not be permitted. Heating and cooking will only be allowed on a gas cooker within a designated area of the site camp. Purpose-built “braai “areas may be permitted within the site camp and must be well-maintained. Suitable firefighting equipment must be readily available. Welding, gas cutting, cutting of metal, and heat curing will be permitted within specifically designated and adequately marked areas on the site. These areas, as well as any other areas where on-site welding, gas cutting, or cutting of metal is unavoidable, must have the sites are to be approved by the RE and the ECO.

All “hot” work areas must have an operational fire extinguisher readily at hand. The Contractor must ensure that all staff undergo training on the use of a fire extinguisher when needed. All fire extinguishers must be inspected on a monthly basis to ensure that the devices will work properly if needed.

## **10 FINAL CLEAN UP AND CLOSE OF CONSTRUCTION**

When construction is complete, there will be a final construction cleanup phase that will involve the removal of all infrastructure not necessary for operations and final reclamation of all areas disturbed during construction that will not be used during operations.

- All disturbed areas will be cleaned and freed from any residue. All wastes will be disposed of appropriately
- The ECO will inspect the areas to make sure all the activities have been performed according to the environmental technical specifications in the EMP.
- According to the evaluation performed, the necessary actions will be implemented to comply with the EMPs regarding the disturbed areas.

## **11 ENVIRONMENTAL MONITORING**

### **11.1 Auditing**

A monitoring programme will be implemented for the duration of the construction phase of the development. The ECO will be responsible for liaising with the construction team and the approving authorities if so required. The ECO must submit monthly environmental audit reports to the applicant and contractor. These audit reports must contain the following information:

- Description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance.
- Establishing a baseline through the taking of photographs of identified environmental aspects and potential impact sites prior to construction
- Weekly monitoring during the first month of construction where after monthly audits will be conducted by the Environmental Control Officer for the remainder of the construction phase to ensure compliance to the EMPr conditions, and where necessary make recommendations for corrective action. These audits can be conducted randomly and do not require prior arrangement with the Project Coordinator.
- Compilation of an audit report with a rating of compliance with the EMPr. The ECO shall keep a photographic record of any damage to areas outside the demarcated site and construction area.
- A register shall be kept of all complaints from the Landowner or community. All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

### **11.2 Site Meetings**

A fortnightly site meeting should be held for the duration of the construction period. Provision must be made in the agenda of each site meeting for Environmental Management issues to be discussed to facilitate the transfer of information and to update all parties on the environmental compliance aspects of the project as a whole. The ECO is to be present a summary report at such meetings.

These meetings are to be attended by the ECO, Project Manager or Engineers representative, Contractor and a representative of each of the sub-contractors working on site at the time. At such meetings environmental queries must be resolved, agreed actions planned with dates of the actions and compliance / non-compliance by the Contractor to be noted. If required, penalties and remedial actions must also be tabled and planned. Frequency of meetings may be altered by the ECO, based on the nature of the works taking place on site at any time, and the level of compliance with the EMPr by the Contractors.

Issues relating to complaints or comments received from the public shall also be discussed at these meetings. Minutes of the meetings shall be prepared by the RE and copied to all attendees before the next meeting.

## 12 NON-COMPLIANCE

The EMPr will be binding on all contractors operating on the site and must be included within the Contractual Clauses. The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the homeowner or applicant to impose a penalty.

### 12.1 Individual transgressions

It is recommended that the engineers/contractors institute fines for the following less serious violations and any others determined during the course of work as detailed below:

- Littering on site.
- Lighting of illegal fires on site.
- Persistent or un-repaired fuel and oil leaks.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to heritage objects on site.
- Urination and defecation anywhere except at designated facilities.
- Unauthorised camp establishment (including stockpiling, storage, etc.).
- Hydrocarbons / hazardous material: negligent spills/leaks and insufficient storage.
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance.
- Late method statements or failure to submit method statements.
- Insufficient solid waste management (including clean-up of litter, unauthorised dumping etc.).
- Erosion due to negligence / non-performance.
- Excessive cement / concrete spillage/contamination
- Insufficient fire control and unauthorised fires.
- Non-induction of staff.

The Project Manager/Engineer should use these as a guide and use his/her own judgement in determining the issues of non-compliance and the severity of the contravention and thus the value of the spot fine:

|                                                                                            |             |
|--------------------------------------------------------------------------------------------|-------------|
| An individual entering the defined No Go boundaries of the site;                           | R500 – 150  |
| An individual driving a vehicle into the defined No Go boundaries of the site;             | R300 – 1500 |
| An individual driving any earthmoving plant into the defined No Go boundaries of the site; | R500 – 3000 |
| A plant operator ignoring a verbal warning to have an oil leak from machinery repaired;    | R100 – 300  |
| An individual littering on site;                                                           | R50 – 300   |
| An individual not making use of the ablution facilities;                                   | R50 – 200   |
| An individual spilling fuels (non use of funnels/pumps etc);                               | R100 – 500  |
| An individual eating outside of the defined eating area;                                   | R50 – 200   |
| Smoking on site other than in the designated site camp;                                    | R50 – 200   |

Figure 2: Fines Table due to Individual transgressions

These fines should be revised when the construction phase commences to ensure relevance. For each subsequent similar offence committed by the same individual, the fine should be doubled in value to a maximum value of R5,000. The Project Manager/Engineer will not collect the fines from individuals, but will rather inform the Contractor of the contravention, the individual's identity and the amount of the fine. The fine will be deducted from the Contractor's monthly certificate, or the Project Manager/Engineer will issue a variation order, to the value of the fine, for the Contractor to undertake activities that would in some way enhance the state of the environment or the site. It will be the Contractor's responsibility to reclaim such fines from the guilty individuals. These fines do not preclude any prosecution under any other law.

## 12.2 Contractors Transgressions

### 12.2.1 Offences and Penalties

The Project Manager/Engineer, in consultation with the ECO, may also issue penalties directly to the Contractor for general non-compliance with the EMP. The following serves as a guide for such penalties in certain situations. Any avoidable non-compliance with the conditions of the EMP shall be considered sufficient ground for the imposition of a penalty. Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- Entrance into no-go areas.
- Unauthorised damage to natural vegetation.
- Stockpiling, hazardous chemical storage in no go areas.
- Hydrocarbons / hazardous material: negligent spills / leaks and insufficient storage.
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance.
- Insufficient solid waste management (including clean-up of litter, unauthorised dumping etc.).
- Erosion due to negligence / non-performance.

- Excessive cement / concrete spillage / contamination'
- Insufficient fire control and unauthorised fires.
- Preventable damage to water courses or pollution of waterbodies; and
- Non-induction of staff.

|                                                     |             |
|-----------------------------------------------------|-------------|
| Excessive litter on the site or in the site camp;   | 500 – 2000  |
| Water wastage or water contamination;               | 500 – 4000  |
| Spillage of fuels on site;                          | 500 – 4000  |
| Inadequate provision of waste bins and toilets;     | 500 – 2000  |
| The non provision of eating areas;                  | 500 – 1000  |
| Unnecessary dust generation and inadequate control; | 500 – 3000  |
| Unnecessary noise generation;                       | 500 – 3000  |
| Non provision of hydrocarbon fuel absorbents;       | 1000 – 3000 |
| Inadequate erosion controls and prevention;         | 500 – 4000  |

Figure 3: Fine Table due to contractor's Transgression

The issuing of a penalty will usually be preceded by a verbal warning by the ECO, during which a time frame for rectifying the situation, as well as the penalty to be implemented should this not be done within the time frame, will be agreed on. The value of the penalty will depend on the seriousness of the contravention, and thus the Project Manager/Engineer must use his/her judgement in determining the value of the penalty. In addition to penalties, the Project Manager/Engineer has the power to remove from Site any person who is in contravention of the EMPr, and if necessary, the Project Manager/Engineer can suspend the relevant part or all of the works, as required. Note that penalties can be issued over and above costs that are incurred for the repair or rehabilitation of any environmental damage caused by the Contractor and all the parties over which they have responsibility. In this regard costs incurred by the Contractor in repairing or rehabilitating any environmental damage caused by non-compliance with the EMPr cannot be claimed in the Contract Bill, nor can any extension of time be claimed for such works.

Penalty amounts should be deducted from Certificate payments made to the Contractor. These funds must be kept separately and donated to a non-profit organisation that works in the environmental or conservation field. The Project Management Team must collectively nominate such an organisation collectively.

## 13 CONCLUSION

The environmental biophysical, and social impacts of the project have been assessed to be spread through the project life. Both positive and negative project-related impacts have been identified but it has been concluded that all the negative impacts could be mitigated to acceptable levels through the implementation of the mitigation measures contained within this EMPr.