

## **DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME**

### **CONSTRUCTION OF A RESIDENTIAL DWELLING UNIT**

**On Portion 39 of the Farm Kalkheuwel 493-JQ**

**Mogale City Local Municipality**

**GAUT 002/22-23/E3517**



**MOSES SELEKE**

**March 2023**

## LIST OF ACRONYMS

BAR	Basic Assessment Report
DW&S	Department of Environmental Affairs
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EAP	Environmental Assessment Practitioner
EIR	Environmental Impact Assessment Report
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
EMS	Environmental Management System
GDARD	Gauteng Department of Agriculture and Rural Development
HIA	Heritage Impact Assessment
HSRA	Health and Safety Risk Assessment
I&AP	Interested and Affected Parties
LOS	Level of Service
NCR	Non Conformance Report
NHBRC	Nation Home Builders Registration Council
OHS	Occupation Health and Safety
PM	Post Meridian
QMS	Quality Management System
SAHRA	SouthAfrican Heritage Resource Agency
SHE	Safety Health and Environment
TES	Traffic Engineering Services
WUL	Water Use License

## GLOSSARY OF TERMS

**ARCHAEOLOGICAL RESOURCES:** This includes (a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures; (b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation; wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

**BUILDING AND DEMOLITION WASTE:** Waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any building structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition.

**CONSTRUCTION PROJECT MANAGEMENT TEAM:** The team consists of a Project Manager as well as a Safety and Health Officer as required in terms of the Occupation Health and Safety Act and an Environmental Control Officer as required in terms of NEMA.

**CONSTRUCTION:** means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

**CONTRACTOR:** Companies and or individual persons appointed on behalf of the Client to undertake activities, as well as their sub-contractors and suppliers.

**CULTURAL SIGNIFICANCE:** This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

**DEVELOPMENT** - This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- Construction, alteration, demolition, removal or change in use of a place or a structure at a

place;

- Carrying out any works on or over or under a place;
- Subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- Constructing or putting up for display signs or boards;
- Any change to the natural or existing condition or topography of land; and
- Any removal or destruction of trees, or removal of vegetation or top soil.

**DEGRADATION:** The lowering of the quality of the environment through human activities e.g. river degradation, soil degradation, atmospheric degradation.

**DOMESTIC WASTE:** Domestic waste means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes generated directly by the consumption of products for domestic use.

**ENVIRONMENT:** In terms of the National Environmental Management Act (NEMA) (No 107 of 1998) Environment means the surroundings within which humans exist and that are made up of:

- The land, water and atmosphere of the earth;
- micro-organisms, plants and animal life;
- any part or combination of (i) or (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing

**EMERGENCY:** An undesired event that results in a probable significant environmental impact and requires the notification of the relevant statutory body such as a local or provincial authority.

**ENVIRONMENTAL ASSESSMENT PRACTITIONER:** The individual responsible for planning, management and coordination of environmental impact assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.

**ENVIRONMENTAL CONTROL OFFICER:** An individual nominated through the Client to be present on site to act on behalf of the Client in matters concerning the implementation and day to day monitoring of the EMP and conditions stipulated by the authorities as prescribed in NEMA

**ENVIRONMENTAL IMPACT:** A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

**ENVIRONMENTAL MANAGEMENT PROGRAMME:** A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or

preventing negative environmental impacts are implemented during the life-cycle of the project. This EMP focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

**FATAL FLAW:** is an issue or conflict (real or perceived) that could result in developments being rejected or stopped.

**GENERAL WASTE:** General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes-

- domestic waste;
- building and demolition waste;
- business waste; and
- inert waste.

**GROUNDWATER:** All subsurface water that fills voids between highly permeable ground strata comprised of sand, gravel, broken rocks, porous rocks, etc. And move under the influence of gravitation.

**HAZARDOUS WASTE:** Hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have detrimental impact on health and the environment.

**HERITAGE RESOURCES:** This means any place or object of cultural significance, including all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

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

**INCIDENT:** An undesired event which may result in a significant environmental impact but can be managed through internal response.

**INTEGRATED ENVIRONMENTAL MANAGEMENT:** is a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity - at local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may

include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).

**INTERESTED AND AFFECTED PARTY** is, for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, an interested and affected party contemplated in Section 24(4)(a)(v), and which includes – a (a) any person, group of persons or organisation interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.

**METHOD STATEMENT:** A method statement is a written submission by the Contractor to the Engineer in response to the specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting a Method Statement. It contains sufficient detail to enable the Engineer to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

**MITIGATION:** Measures designed to avoid, reduce or remedy adverse impacts.

**POLLUTION:** The National Environmental Management Act, No. 107 of 1998 defined pollution to mean any change in the environment caused by – substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

**RECYCLE:** A process where waste is reclaimed for further use, this involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.

**REHABILITATION:** Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before disruption.

**RE-USE:** To utilise articles from the waste stream again for a similar or a different purpose without changing the form of properties of the articles.

**SAFETY, HEALTH AND ENVIRONMENTAL OFFICER:** The SHE officer is a Contractor representative, responsible for the safety, health and environmental aspects on the construction site. The SHE officer will be responsible for the day-to-day monitoring of the EMP and Health and Safety Plans per the OHS Act.

**URBAN AREAS:** mean areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas.

**WASTE:** Waste means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

- that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- which the generator has no further use of for the purposes of production;
- that must be treated or disposed of; or
- that is identified as a waste by the relevant Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—
- a by-product is not considered waste; and
- any portion of waste, once re-used, recycled and recovered, ceases to be waste.

**WATER POLLUTION:** The National Water Act, 36 of 1998 defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it – less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (aa) to the welfare, health or safety of human beings; (bb) to any aquatic or non-aquatic organisms; (cc) to the resource quality; or (dd) to property.

**WETLAND:** means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

**WORKFORCE:** The entire project team including people employed by the Applicant/Client/Developer directly, his Principal Agent or the Contractor, persons involved in activities related to the project, or person present at or visiting the construction area, including permanent contactors and casual labour.

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## 1.0 INTRODUCTION AND BACKGROUND

The applicant, Mr. Moses Seleke, proposes to develop a single dwelling structure located on Portion 39 of the Farm Kalkheuwel 493-JQ, Mogale City Local Municipality.

The site is located within Ward 33 of Mogale City Local Municipality 5. The total area of the site is approximately 14 Hectares (Ha). Approximately 700 m<sup>2</sup> of the entire site is earmarked for the footprint of the proposed house. Figure 1 below indicates the location of the site.



Figure 1: Locality Map

The proposed layout has been guided by the development constraints and opportunities presented by the site. Included among these were the shape of the land, nature of adjacent land uses, the need for efficiency in land allocation in relation to infrastructure services, specialist and engineering recommendations, the areas of ecological sensitivity and geological constraints, as well as future roads. However, the Environmental Impact Assessment (EIA) and associated specialists studies will inform the final layout.

The aim of this Environmental Management Programme (EMPr) is to serve as a management tool that will be used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of the project are prevented and that the positive benefits of the projects are enhanced.

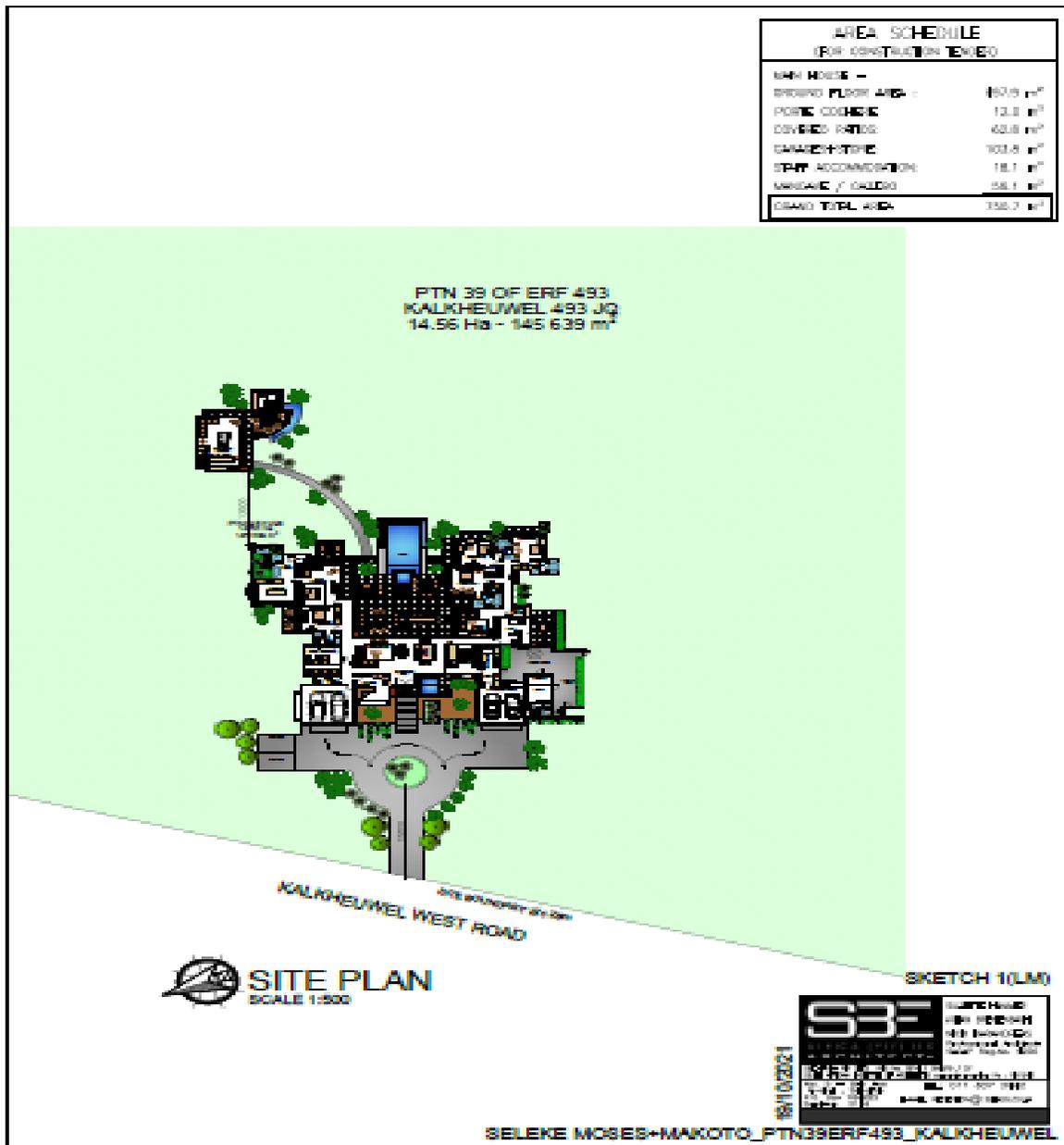


Figure 2: Proposed Layout Plan

## 1.1 Details of the applicant

**Table 1: Details of the applicant**

Aspect	Details		
Project applicant:	Moses Seleke		
Responsible position	Property owner		
Contact person:	Moses Seleke		
Physical address:	646 WF Nkomo Street Proclamation Hill Pretoria West		
Postal code:		Cell	083 730 0193
Telephone:	012 326 1545	Fax	
Email	Lekoba77@icloud.com		

## 1.2 Details of the EAP

**Table 2: Details of the Environmental Assessment Practitioner**

Aspect	Details
Name	Nali Sustainability Solutions (Pty) Ltd
Representative	Mr Pirate Ncube
Physical Address	65 Country Club Drive, Irene Farm Villages, Centurion
Postal Address	P Bag X1, Stand 1829, Irene Farm Villages, Centurion, 0045
Other contact details	Tel: 0824517120; Fax: 086 694 1178 Email: <a href="mailto:ncube.nali@gmail.com">ncube.nali@gmail.com</a> or <a href="mailto:pirate.ncube@mail.com">pirate.ncube@mail.com</a>
Expertise/experience	Vast experience in environmental and land use management. More than 24 years' experience in spatial planning, environmental planning and management encompassing Strategic Environmental Assessments, Environmental Impact Assessments and reviews, Environmental Management Plans, and Environmental Compliance Monitoring as well as Project Management. Served/s in various decision making bodies including the DFA Tribunal, Environmental Advisory Committee, MEC Appeals Advisory Panel. Qualified Town Planner (honours) with Masters in Real Estate and an MBA.
Registration	EAPASA 2020/1681

## 2.0 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

### 2.1 Purpose of the EMPr

An Environmental Management Programme (EMPr) provides management mechanisms/methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development. The EMPr derives from the provisions of the National Environmental Management Act (Act No. 107 of 1998, (NEMA)(as amended), and bestows a 'Duty of Care' on those who cause, have caused or may in future cause

pollution or degradation of the environment as per Section 28 (1) of NEMA.

## **2.2 Objectives of the EMPr**

The EMPr provides recommended measures and guidelines for environmental monitoring throughout the construction and the operational phase of the activity. The specific objectives for this EMPr include, among others:

- Provision of the details of the applicant;
- The outline of the legal requirements;
- Identifies the regulatory and policy stipulations applicable to the activity;
- The mitigation measures for construction associated impacts and key measures to be implemented in the operational phase of the project;
- Specification of roles and responsibilities of parties in the implementation of this EMPr;
- Identifying construction activities that might have detrimental impacts on the environment;
- To identify measures that could optimize beneficial impacts;
- To establish a method of monitoring and auditing environmental management practices during all phases of development;
- Mechanisms for monitoring compliance with the EMPr and reporting thereon;
- Specifying time periods within which the measures contemplated in the Environmental Management Programme must be implemented.

## **2.3 Applicable Documentation**

Some of the documentation required to undertake the Project to be read in conjunction with the EMPr include:

- Environmental Impact Assessment for the proposed Nature Extension 13 Township.
- Environmental Authorisation from the Gauteng Department of Agriculture and Rural Development (GDARD).
- All other approvals required for the activity.

## **2.4 Scope of the EMPr**

In accordance with the requirements of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014, and the requirements of the GDARD this EMPr is to be implemented by the Developer/applicant as well as any employee, contractor, agent or sub-contractor appointed to act on behalf of the Developer in the execution of the Project, in order to ensure environmental compliance onsite. Thus the specifications outlined in this EMPr are applicable to all activities undertaken by the Developer as well as appointed contractors and all persons involved in the execution of the works.

An Environmental Code of Conduct has also been developed that provides a simplified set of rules that should be adhered to by all persons involved with the project at all times. This is to be displayed at strategic points to ensure constant environmental awareness.

The effectiveness of the EMPr depends on the level of compliance with conditions and measures in the EMPr by the applicant. It is further assumed that compliance with the EMPr will be monitored and audited as set out in this EMPr and contractual clauses.

## 2.5 Structure of the EMPr

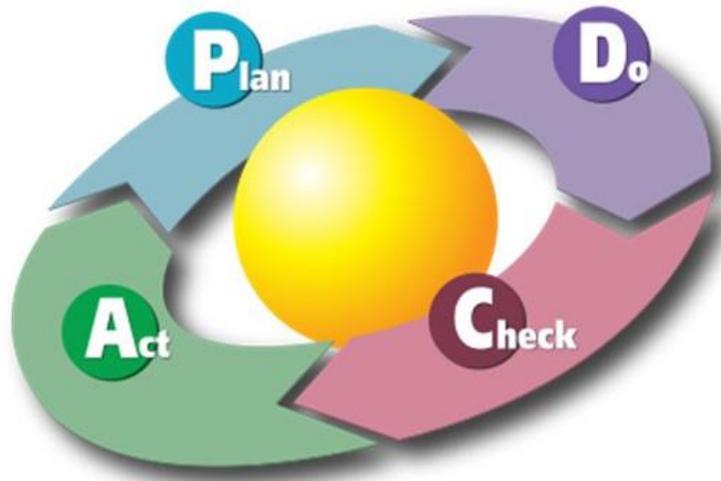
The three main phases in the EMPr that provide mitigations and management measures are provided below.

**Table 3: Phases of the Project Life-Cycle**

Category	Phase	Description
Category A	Pre-Construction	This section provides guidelines on pre-construction activities including site establishment and clearance; environmental induction and training & awareness.
Category B	Construction	This section will provide guidelines on construction methods and considerations
Category C	Rehabilitation	This section of the EMPr provides management principles for the rehabilitation phase of the Development. This will include best practice, procedures and responsibilities as required for various associated activities.

## 2.6 EMPr as a live document

The EMPr is a dynamic document which will be updated on a continuous basis to ensure environmental best practices. Any amendments to be made, must be submitted to the GDARD for approval in accordance with the Regulations. The approach adopted for this EMPr is derived from the Deming Cycle (Figure 3), a cycle of continuous improvement that entails the reiterative actions of plan, do, check, act, and then return to the planning phase.



**Figure 3: Deming Cycle of Continuing Improvement**

### **2.6.1 Plan**

Project-specific planning for the proposed project involves consideration of the legal triggers, the specifics of the proposed development, and the nature of the receiving environment. This provides a starting point for targeted environmental management objectives. Environmental performance indicators are then determined with measurable targets prescribed to monitor the environmental performance of the project. Achieving the targets depends on compliance with this EMPr and the legislative requirements that underpin it.

### **2.6.2 Do**

Throughout the development's life-span, the developer will be required to develop and maintain a Quality Management System—designed to ensure that best management practices are implemented on day-to-day management. Such a QMS should at least include the following information:

- Location and extent of associated infrastructure;
- Associated activities, such as the transportation of people and equipment;
- Resources and experience required (staffing);
- Materials and equipment to be used;
- Management actions;
- Human resources used;
- Construction-monitoring activities;
- Emergency/disaster incident and reaction procedures; and
- Rehabilitation procedures for the impacted environment.

These topics will be cross-linked into the contracts related to the development of the project.

### **2.6.3 Check**

A system of assessing monitoring results has been developed to check the environmental management performance. Continuous assessment facilitates proactive management of the environmental issues. Mitigation measures can then be successfully implemented on an ongoing basis to keep environmental indicators within their target thresholds. Moreover, the assessment system also enables the assessment of the efficiency of the EMPr. Regular auditing of environmental performance is prescribed to prove and preserve accountability.

### **2.6.4 Act**

The assessments and monitoring of the results and findings of the regular audits must be documented within a reporting system. Precautionary mitigation measures and corrective actions will be prescribed and instructions will be given in order to implement these in the field. The findings of monitoring and auditing programmes can also be used to update the EMPr. Although the EMPr is a project-specific document, it is dynamic and should be updated regularly to address the changing circumstances of the scheme.

### 3.0 MANAGMENT AND MONITORING PROCEDURES

#### 3.1 Organisational Structure and Responsibility

The figure below provides an indication of the organizational and team structure for the Project.

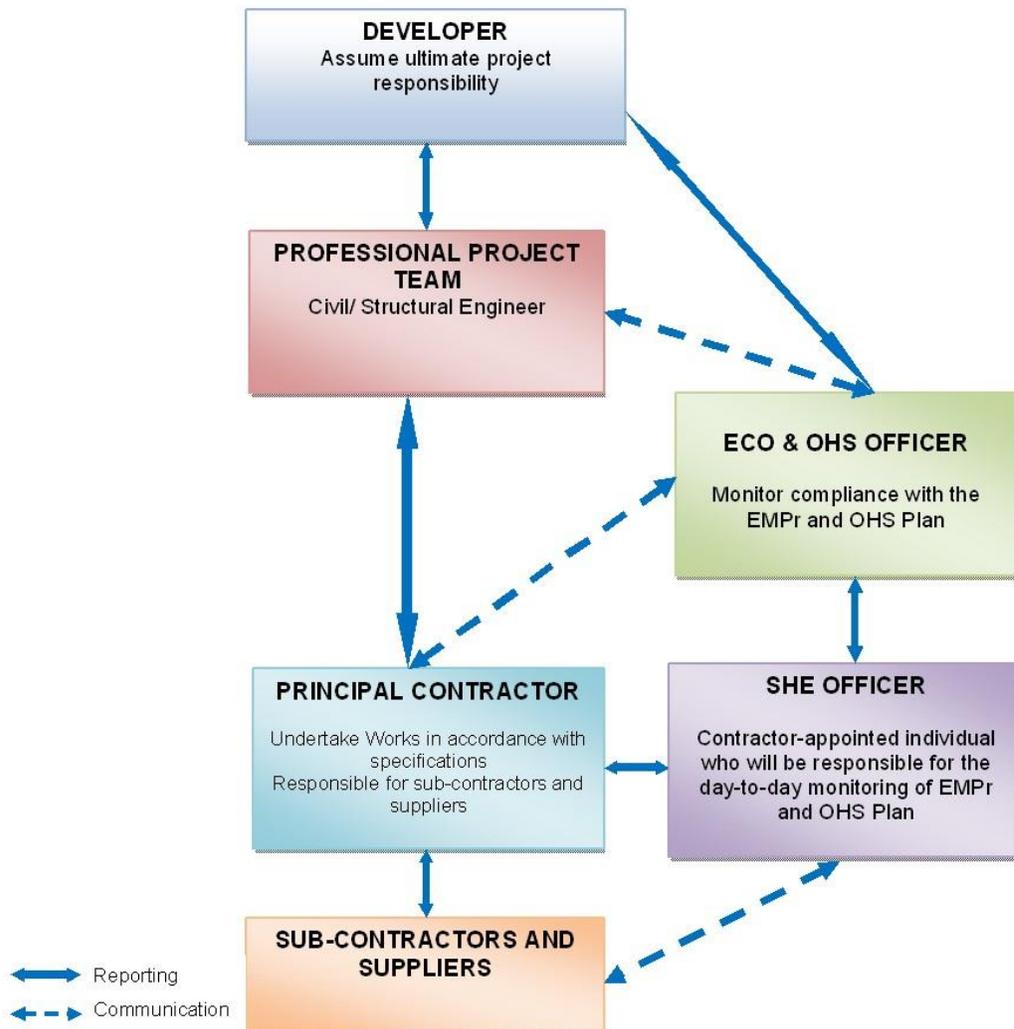


Figure 4: Project Organisational Structure

#### 3.2 The Developer

The Developer is ultimately responsible for ensuring compliance with the environmental specification and upholding the environmental commitment to 100% compliance with all National, Provincial and local legislation that relates to management of this environment. Briefly, the Developer will:

- Appoint specialist and assembly construction team;
- May on the recommendation of the Engineer and/or Environmental Officer order the Contractor to suspend any or all works on site if the Contractor or his Sub-Contractor/Supplier fails to comply with the said specifications; and
- Maintain control of all activities pertaining to the project.

### **3.3 The Engineer**

The Engineer will:

- Enforce the environmental specifications on site;
- Monitor compliance with the requirements of the specification;
- Assess the Contractor's environmental performance in consultation with the Environmental Officer from which a brief monthly statement of environmental performance is drawn up for record purposes and to be reported to project meetings; and
- Ensure the documentation, in conjunction with the Contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video record.

### **3.4 The Contractor (including sub-contractors)**

The Contractor is required to:

- Be fully conversant with the EMPr and all conditions of the EA, WUL ,etc.;
- Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the Contract Document.
- Supply method statements timeously for all activities requiring special attention as specified and / or requested by the Developer, Environmental Officer and/or Engineer during the duration of the Contract.
- Be conversant with the requirements of this environmental specification/ EMPr. Brief all his/her staff about the requirements of the environmental specification;
- Comply with requirements of the Environmental Officer in terms of this specification and the project specification, as applicable, within the time period specified.
- Ensure any Sub-Contractors/Suppliers who are utilized within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The Contractor will be held responsible for non-compliance on their behalf.
- Bear the cost of any delays, with no extension of time granted, should he or his Sub-Contractors/Suppliers contravene the said specifications such that the Engineer orders a suspension of work. The suspension will be enforced until such time as the offending party(ies), procedure, or equipment is corrected.
- Bear the costs of any damages / compensation resulting from non-adherence to the said specifications or written site instructions.
- Comply with all applicable legislation.
- Ensure that he informs the Engineer timeously of any foreseeable activities which will

require input from the Environmental Officer.

- The Contractor will conduct all activities in a manner that minimizes disturbance to the natural environment as well as directly affected residents and the public in general.

### **3.5 Environmental Control Officer**

The ECO will:

- Be fully conversant with the EMPr;
- Be familiar with the recommendations and mitigation measures of the associated EMPr for the project;
- Monitor the implementation of the EMPr during the construction and rehabilitation phases;
- Ensure site protection measures are implemented on site;
- Monitor that the Principal Contractor, sub-contractors, construction teams and the Developer are in compliance with the EMPr at all times during the construction and rehabilitation phases of the project;
- Monitor all site activities monthly for compliance.
- Conduct monthly audits of the site according to the EMPr, and report findings to the Developer/Contractor;
- Attend monthly site meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions. These monthly reports are to be submitted to the Developer and GDARD; and
- Conduct once-off training with the Contract or on the EMPr and general environmental awareness.

It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of the Developer and the SHE Officer.

### **3.6 Occupational Health and Safety Officer**

The OHS Officer will be responsible for undertaking of the following:

- Compilation of a comprehensive project Health and Safety Risk Assessment(HSRA)
- Compilation of health and safety specifications based on risks identified;
- Reviewing and approval of health and safety plan(s) submitted by appointed Principal Contractor(s);
- Conducting monthly health and safety inspections and compiling monthly OHS reports;
- Conducting monthly health and safety audits with audit reports;
- Assisting the Developer/Contractor in the investigation of major accident/incidents;
- Monitoring of site activities for compliance to the Occupational Health and Safety Act (OHSA)and Regulations;

- Establishment and monitoring of project health and safety file;
- Monitoring the Principal Contractor(s') health and safety performance; and
- Preparation of project close-out reports and submission of project files to the Client.

### **3.7 Safety, Health and Environmental (SHE) Officer**

The Safety, Health and Environmental Officer will:

- Be fully conversant with the EMPr;
- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of Method Statements together with the Principal Contractor that will specify how potential environmental impacts in line with the requirements of the EMPr will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMPr are achieved;
- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the Contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum ,as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMPr;
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMPr;
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions issued by the ECO is available on request; and
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
  - Public involvement /complaints.
  - Health and safety incidents.
  - Incidents involving hazardous materials stored on site.
  - Non-compliance incidents.

### **3.8 Training and Environmental Awareness**

It is important to ensure that the Contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. Training needs should be identified based on the available and existing capacity of site personnel (including the Contractors and Sub-contractors) to undertake the required EMPr management actions and monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the Contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

Training will be done in a verbal format. The training will be a once-off event; however the Contractor should make provision for weekly training or Toolbox Talks. In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This ensures that environmental accidents are minimised and environmental compliance maximized.

### **3.9 Monitoring**

A monitoring programme will be in place not only to ensure compliance with the EMPr through the contract/work instruction specifications, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective actions required. The applicant will cause and or carry out the internal audits.

As part of the contract or work instruction, Before the Wind Investment will stipulate the period and frequency of monitoring required. This will be determined from applicable permits and authorisations from authorities. The Project Manager will ensure that monitoring is carried out.

### **3.10 Reporting Procedures**

#### **3.10.1 Documentation**

The following documentation must be kept on site in order to record compliance with the EMPr:

- An Environmental File which includes:
  - Copy of the EMPr;
  - Copy of the Environmental Authorisation;
  - Copy of all other licenses/permits;
  - Copy of all rehabilitation plans;
  - Copy of the Stormwater Management Plan;
  - Copy of relevant legislation;
  - Environmental Policy of the Main Contractor;
  - Environmental Method statements compiled by the Contractor;
  - Non-conformance Reports;
- Environmental register, which shall include:

- Communications Register—including records of Complaints, and, minutes and attendance registers of all environmental meetings.
- Monitoring Results—including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR).
- Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
- Waste Documentation such as Sewerage Disposal Receipts;
- Material Safety Data Sheets for all hazardous substances;
- Dust suppression register;
- Water Quality Monitoring reports(if necessary);
- Written Corrective Action Instructions; and
- Notification of Emergencies and Incidents.

### **3.10.2 Environmental Register**

The Developer will put in place an Environmental Register. The contractor will ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident.
- Causes of complaint/incident.
- Party/parties responsible for causing complaint/incident.
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident.
- Time frames and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

The above records will form an integral part of the Contractors' Records. These records will be kept with the EMPr, and will be made available for scrutiny if so requested by the Developer.

### **3.10.3 Non-Conformance Report**

A Non-Conformance Report (NCR) will be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the Contractor in writing. Preceding the issuing of an NCR, the Contractor must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately

escalated to the level of a NCR. The following information should be recorded in the NCR:

- Details of non-conformance;
- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects.
- Nature of the risk.
- Actions agreed to by all parties following consultation to address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account.
- Agreed timeframe by which the actions documented in the NCR must be carried out.
- ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and Contractor should sign the Close-Out portion of the Non- Conformance Form and file it with the contract documentation.

#### **3.10.4 Environmental Emergency Response**

The Contractor's environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions/incidents that could cause environmental impacts. Such incidents may include:

- Accidental discharges to water (i.e. into the watercourse) and land;
- Accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan and is aimed at responding to environmental incidents and must ensure and include the following:

- Construction employees shall be adequately trained in terms of incidents and emergency situations;
- Details of the organization and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) shall be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor and their sub-contractor(s) must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

### 3.10.5 Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements should be developed for each set of tasks.

A Method Statement details how and when a process will be carried out, detailing possible dangers/risks, and the methods of control required.

- Type of construction activity;
- Timing and location of the activity;
- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to/from site;
- How equipment/material will be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/or specifications for impact prevention/containment;
- Methodology for environmental monitoring;
- Emergency/disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in on-compliance of the approved Method Statements. The Contractor shall keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

The following is a list of Method Statements that may be required:

- Bunding;
- Blasting
- Construction site and office/yard establishment;
- Cement mixing/concrete batching/bentonite mixing;
- Dust management;
- Environmental awareness course(s);
- Environmental monitoring;
- Erosion control;
- Fire, hazardous and/or poisonous substances;
- Fuels and fuel spills (may form part of the item above);
- Storage, handling and decanting of diesel (may form part of the item above);
- Personnel, public and animal safety;
- Rehabilitation of modified environment(s);
- Solid and liquid waste management;

- Sources of materials (including MSDSs);
- Top-soil management;
- Stormwater Management; and
- Wash areas.

### **3.10.6 Public Communication and Liaison with I&APs**

The Developer must ensure that the adjacent landowners are informed and updated throughout the construction phases.

Sufficient signage should be erected around the site (including at the entrance), informing the public of the construction activities taking place. The sign boards should include the following information:

- The name of the Contractor.
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

## **4.0 COMPLIANCE WITH ENVIRONMENTAL SPECIFICATION**

The EMPr forms part of the Contract Documentation and is thus a legally binding document. It is also necessary for the Contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of this Act an individual responsible for environmental damage must pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the *Polluter Pays Principle*. Section 28 of the NEMA embodies the polluter pays principle.

The Contract is deemed not to have complied with the Environmental Specification/EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul / access roads;
- Environmental damage ensues due to negligence;
- The Contractor ignores or fails to comply with corrective or other instructions issued by the Developer, ECO or Engineer within a specified time; and
- The Contractor fails to respond adequately to complaints from the public.

Application of a penalty clause will apply for incidents of non-compliance. The contractor will be allowed one offense and a written warning will be issued by the Environmental Officer. Failure to rectify the offense within one (1) working week of the issue of the warning or a repeat offence will result in a fine. This fine will be issued by the Environmental Officer. The penalty imposed will be per incident. Unless stated otherwise in the project specification, the penalties that may be imposed per incident are defined below.

**Table 4: Fines that may be Implemented**

Offence	Amount
Failure to demarcate working areas	R 10000
Working outside of the demarcated areas	R 30000
Failure to strip topsoil with intact vegetation	R 50000
Failure to stockpile topsoil correctly	R 30000
Failure to stock pile materials in designated areas	R 10000
Failure to take measures to control dust dispersion onsite	R 10000
Washing of vehicles onsite	R 10000
Pollution of water bodies and/or groundwater	R 20000
Failure to implement stormwater management provisions during construction	R 20000
Failure to control stormwater runoff	R 30000
Downstream erosion	R 30000
Failure to provide adequate sanitation	R 10000
Failure to erect temporary fences around trenches	R 10000
Failure to provide adequate waste disposal facilities and services	R 50000
Failure to reinstate disturbed areas within the specified time-frame	R 30000
Any other contravention of the project specific specification	R 10000

Such fines will be paid by the Contract or to the Developer and will be used in rehabilitation and/or landscaping.

The Developer is responsible for the implementation of the EMPr and for compliance monitoring of the EMPr. The EMPr will be made binding on all contractors (including sub-contractors) operating on the site and will be included with the Contract. Non-Compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

## **5.0 CONFORMANCE WITH THE APPLICABLE ISO STANDARDS ENVIRONMENTAL MANAGEMENT SYSTEM**

The ISO Environmental Management System (EMS) is the internationally recognised standard for the environmental management of organisations. It prescribes controls for those activities that have an effect on the environment. These include the use of natural resources, handling and treatment of waste, energy consumption, water resource management and so forth.

All the requirements in ISO standards are intended to be incorporated into any EMS. The extent of the application will depend on factors such as the environmental policy of the organisation, the nature of its activities, products and services, the location and the conditions in which it functions. The ISO family addresses various aspects of environmental management. It provides practical

tools for companies and organisations looking to identify and control their environmental impact and constantly improve their environmental performance. The aim of the ISO standard is to achieve continuous improvement through the cycle outlined in Figure 5.

Although not prescribed for the proposed activity, the Standards provide a set of tools that can assist the applicant in meeting non-prescribed environmental obligations.



Figure 5: ISO EMS Cycle of Continuous Improvement

## 6.0 ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMP is to ensure that the workforce, contractors, sub-contractors and construction staff have an understanding of environmental issues and potential impacts that may arise from site activities. This environmental code of conduct provides the basic rules that should be strictly adhered to. It is the responsibility of the Contractor to ensure that site personnel understands and adhere to the Code of Conduct.

**Table 5: Environmental Code of Conduct**

<b>ENVIRONMENTAL CODE OF CONDUCT</b>	
<p><b>ALL PERSONS ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT</b>                      Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution shall not be tolerated!</p>	
<p><b>ENVIRONMENTAL RULES</b></p> <ul style="list-style-type: none"> <li>• Only use authorised accesses;</li> <li>• Do not litter;</li> <li>• Dispose solid waste to the correct waste containers provided;</li> <li>• Prevent pollution;</li> <li>• Use the toilet facilities provided;</li> <li>• Do not dispose contaminated waste water into the storm water or the environment</li> <li>• Immediately report any spillage from containers, plant or vehicles;</li> <li>• Do not burn or bury any waste on the site and;</li> <li>• Do not trespass onto private properties;</li> <li>• Do not waste electricity, water or consumables;</li> <li>• Strictly leave all animals alone. Never tease, catch or set devices to trap or kill any animal.</li> <li>• Never damage or remove any trees, shrubs or branches unless it forms part of working instructions and authorization has been received where necessary;</li> <li>• Do not deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area;</li> <li>• Know the firefighting procedure and locations of firefighting equipment; and</li> <li>• Know the environmental incident procedures.</li> </ul>	

## 7.0 ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS

The following is a summary of the environmental legislation applicable to the proposed project

**Table 6: Applicable Legislation**

Legislation	Sections	Relates to
The Constitution (No 108 of 1996)	Chapter 2	Bill of Rights.
	Section 24	Environmental rights.
National Environmental Management Act (No 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment.
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.

	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
Environment Conservation Act (No 73 of 1989) and Regulations	Sections 19 and 19 A	Prevention of littering by employees and subcontractors during construction and the maintenance phases of the proposed project
National Heritage Resources Act (No 25 of 1999) and Regulations	Section 32	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 34	No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. Grave is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
	Section 35	This section provides for Heritage Impact Assessments (HIAs), which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during the HIA process. The Heritage Impact Assessment (HIA) will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA.
National Environmental Management Biodiversity Act (Act No. 10 of 2004)		Provide for the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
Occupational Health and Safety Act (No 85 of 1993)	Section 8	Control of dust
	Section 9	Control of noise

Occupational Health and Safety Act-Major Hazard Installation Regulations (GN R692, July 2001)	Sections 5 and 6	Control of offensive odours
National Water Act (No 36 of 1998) and Regulations	Section 19	General duties of employers to their employees
	Section 20	General duties of employers and self employed persons to persons other than their employees
National Road Traffic Act (No 93 of 1996)		Road safety.
Town Planning and Townships Ordinance 15 of 1986		Town Planning.
SANS 10103 (Noise Regulations)		The measurement and rating of environmental noise with respect to annoyance and to speech communication.

## 8.0 DETAILED ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr specifies the minimum requirements to be implemented by the Developer as per the scope of works and scope of the environmental authorisation, in order to minimise and manage the potential environmental impacts and ensure sound environmental management practices. It also provides the framework for environmental monitoring throughout the construction and operational phases.

The provisions of this EMPr are binding on the Developer during the life of the project. The EMPr must be binding on Cavaleros Group or any authority to which responsibility for the construction activities has been delegated to, until such time that the Gauteng Department of Agriculture and Rural Development (GDARD) or applicable environmental authority has formally absolved the Developer from its responsibilities in terms of this EMPr.

It is essential that the EMPr requirements be carefully studied, understood, implemented, and adhered to at all time. To simplify the EMPr requirements, each aspect related to the EMPr has been addressed in the table below. Each action within the EMPr is supported by the priority of when the specific action will need to be implemented. Each of these aspects is briefly described below for ease of reference.

- **Environmental Measures, Actions and Controls**

This section indicates the actions required to either prevent and/or minimise the potential

impacts on the environment that is associated with the project.

- **Responsibility**

This section indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr.

- **Monitoring Frequency**

This section indicates when the actions for that specific aspect must be implemented and/or monitored.

## 8.1 CATEGORY A: PRE-CONSTRUCTION PHASE

ACTIONS AND CONTROLS	RESPONSIBILITY	MONITORING FREQUENCY
<b>Authorisations, Permits and Licences</b>		
All necessary authorisations, permits and licenses must be obtained by the Developer as part of the implementation of the activity	Developer	Once-off
<b>Appointment of Contractor</b>		
The Developer must ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The Contractor must make adequate provision in their budgets for the implementation of the EMPr.	Developer	Once-off
The Principal Contractor (including sub-contractors and suppliers) must comply with the relevant provisions of the EMPr, applicable environmental legislation, by-laws and associated regulations promulgated in terms of these laws.		
Tender documents should include statements to include the use of local communities or local community organisations where possible in supplying services and labour for construction purposes.		
Local labourers should employed for construction work.		
<b>Preparation of Method Statements</b>		
Method Statements must be submitted by the Contractor to the SHE Officer and must be adhered to by the Contractor and Project Engineer. These relate to water and stormwater management requirements, traffic requirements, solid waste management requirements, fuel storage and filling and dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated water treatment, the storage of hazardous materials, standard emergency procedures, and biohazard control.	Contractor	Once-off
The ECO will monitor the implementation of the Statements. All copies of the statements and plans must be submitted to the appointed ECO.		
<b>Appointment of ECO</b>		
An Independent ECO must be appointed by the holder of the Environmental Authorisation at their cost to monitor the implementation of the EMPr.		
The nomination of the ECO must be given, in writing, at least fourteen days before the start of any work, clearly setting out reasons for the nomination, and with sufficient detail to enable the		

<p>developer to make a decision. The developer will, within seven days of receiving the request, approve, reject or call for more information on the nomination.</p>	<p>Developer</p>	<p>Once-off</p>
<p>Once appointed the ECO and must undertake monthly site inspections and provide monthly audit reports for the duration of the construction and rehabilitation phases. Each audit report must contain the results of the full audit. These audit results report on whether the response to the audit item is favourable, un-favourable or not applicable. Not applicable answers are for those aspects of the construction that have not yet started or are not applicable to the contract being considered. Graphs must be produced for each stage of the EMPr; general requirements, requirements during construction and post construction activities. Each of the aspects within each stage is allocated a percentage score. The percentage score is the percentage of favourable items against the total number of applicable items. The higher the score, the better the compliance. Complete compliance will result in a 100% score.</p>	<p>ECO</p>	<p>Once-off/Monthly</p>
<p><b>Environmental Training and Awareness</b></p>		
<p>Construction staff must be adequately educated by the ECO, and the SHE Officer about the provisions included in the EMPr and general environmentally friendly practice.</p>		
<p>The EA and EMPr forms part of the formal site induction for all contractors, sub-contractors and casual labourers. The induction training will, as a minimum, include the following:</p> <ul style="list-style-type: none"> <li>• The importance of conformance with all environmental policies;</li> <li>• The environmental impacts, actual or potential, of their work activities;</li> <li>• The environmental benefits of improved personal performance;</li> <li>• Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the Consultant’s environmental management systems, including emergency preparedness and response requirements; and</li> <li>• The mitigation measures required to be implemented when carrying out their work activities.</li> </ul>	<p>ECO</p>	<p>Once-off</p>
<p>All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.</p>	<p>SHE Officer</p>	<p>Once-off</p>
<p>The Contractor is expected to have “tool box” talks. These talks must be in accordance with the risks and trends associated with the project. Proof of these talks must be kept onsite.</p>	<p>SHE Officer</p>	<p>Weekly</p>

**8.2 CATEGORY B: CONSTRUCTION PHASE**

ACTIONS AND CONTROLS	RESPONSIBILITY	MONITORING FREQUENCY
<b>Geological Stability and Earthworks</b>		
<ul style="list-style-type: none"> <li>• All site disturbances must be limited to the areas where structures will be constructed.</li> <li>• Where the natural ground slope exceeds a slope angle of 1:6, the fill should be constructed on the surface benched into suitable in-situ material.</li> <li>• The fill slopes to be based on the Geotechnical Engineers’ recommendations to ensure stability.</li> <li>• Large excavations for the contractor lay down area, storage areas or waste areas are not permitted.</li> <li>• No development, except as approved, may take place within the 1:100 flood line of the drainage feature.</li> <li>• Blasting                             <ul style="list-style-type: none"> <li>- Rocky substrates, Aquifers etc. are considered to be sensitive areas, thus Blasting must be restricted to gas blasting only.</li> <li>- Due to the extensive residential development around the development, blasting should be kept to a very low intensity and where necessary gas blasting should be considered.</li> </ul> </li> </ul>	Engineer Contractor	Ongoing
<b>Health and Safety</b>		
<ul style="list-style-type: none"> <li>• The Contractor must adhere to the prescriptions of the relevant health and safety legislation and standards. The Contractor must familiarise himself and his employees with the contents of the aforementioned legislation.</li> <li>• First Aid contents must be available at all times.</li> <li>• The Contractor must implement adequate and mandatory safety precautions relating to all aspects of construction. Such safety measures and work procedures/instructions must be communicated to construction workers.</li> <li>• The wearing of Personal Protective Equipment (PPE) on site is mandatory for all personnel and construction team members. Minimum requirements must include the wearing of an approved safety helmet, safety boots, safety eyewear, safety reflective jackets and dust masks, ear plugs, etc. where appropriate.</li> <li>• PPE signs must be erected on site at the areas where it is required and the integrity and availability</li> </ul>	Contractor	Once-off

<p>of the signs must be maintained.</p> <ul style="list-style-type: none"> <li>• No one must be allowed on site unless they are wearing approved safety equipment.</li> <li>• Casual visitors must be required to sign a register at the security checkpoint and undergo a site induction by the SHE Officer. The responsible person must then be contacted before the visitor is allowed access to site. No unauthorised visitors are to be allowed onsite.</li> <li>• Workers’ right to refuse work in unsafe conditions must be respected.</li> <li>• All personnel must be trained in basic site safety procedures.</li> <li>• The Contractor must design, test/exercise appropriate emergency preparedness programmes (plans, schedules, procedures and methods) for addressing environmental accidents, incidents and events such as spills of fuel, oil or lubricants; fires etc.</li> </ul>		
<p><b>Site Management</b></p>		
<p><b>Site Establishment</b></p>		
<ul style="list-style-type: none"> <li>• Prior to the establishment of the site camp/office, the Contractor will produce a site layout plan showing the positions of all equipment storage, waste stockpiling, fuel storage areas and other infrastructure for approval of the ECO and SHE Officer.</li> <li>• The construction area must be clearly demarcated on the layout plan, and all other areas (in particular the wetland and associated buffer) must be considered no-go areas for the construction personnel.</li> <li>• Adequate signage must be placed in the area where construction will take place informing the public of the activities taking place.</li> <li>• The site must be secured and manned on a 24 hour basis.</li> <li>• The Contractor must take responsibility for the site to conform to all contractual aspects and environmental standards applicable.</li> <li>• The Contractor must provide adequate refuse bins that must be cleaned/emptied and the waste removed from site on a regular basis.</li> <li>• The construction camp must be kept in an orderly state at all times.</li> <li>• Vegetation removed for the site establishment is to be kept to a minimum. No trees are to be removed, if possible, with the exception of alien weeds and invader plants.</li> <li>• The construction camp is to be located a minimum horizontal distance of 100 m from the wetland</li> </ul>	<p>Contractor</p>	<p>Once-off</p>

<p>above the 1:100 year floodline.</p> <ul style="list-style-type: none"> <li>The Contractor must ensure that drainage on the camp site is such to prevent standing water and/or sheet erosion from taking place.</li> </ul>		
<b>Ablution/Sanitation</b>		
<ul style="list-style-type: none"> <li>A minimum of one chemical toilet must be provided per 10 persons.</li> <li>The chemical toilets must be strategically placed (easily accessible to workers, preferably no more than a 300 m from the work face) and will not be situated within any water course, or within the wetland or associated buffer.</li> <li>Chemical toilets must be secure, clean and functional throughout the construction period.</li> <li>All ablution activities must take place in these facilities, and the waste material must be stored and disposed of at the registered waste disposal site or collected by a suitable waste contractor on a regular basis.</li> <li>The Contractor must ensure that toilets are cleaned or emptied regularly and that no spillage occurs during routine maintenance.</li> <li>All temporary/portable toilets must be secured to the ground to prevent them from toppling due to wind or any other cause.</li> <li>Unauthorised dumping/spilling of waste from toilets into the environment and burying of waste are strictly prohibited.</li> </ul>	Contractor	Daily
<b>Access</b>		
<ul style="list-style-type: none"> <li>Access to the construction site must be via the approved access route off Olifantsfontein Road. Strict access control to be implemented.</li> <li>The wetland area must be maintained as a no-go zone - No vehicles may drive onto the retained wetland or other sensitive sites.</li> <li>Steep gradients must be avoided as much as possible.</li> <li>All no-go areas will be indicated as such with warning signs in all relevant languages.</li> <li>Adequate drainage and erosion protection in the form of cut-off berms or trenches must be provided around the sites and where necessary.</li> <li>No vendors or other similar traders must be allowed on the site</li> </ul>	Contractor	On-going
<b>Fires</b>		

<ul style="list-style-type: none"> <li>• Fire fighting measures such as fire extinguishers must be located on site.</li> <li>• The work force must be made aware of fire prevention and fire fighting measures.</li> <li>• No open fires shall be allowed on site under any circumstances.</li> <li>• The contractor should have fire-fighting equipment available on all vehicles working on site, especially during the winter months.</li> </ul>	Contractor	Daily
<b>Vehicle Maintenance Yard</b>		
<ul style="list-style-type: none"> <li>• Heavy machinery and construction vehicles are to be stored in a vehicle maintenance yard which must be illustrated on the construction camp layout map.</li> <li>• A dedicated maintenance area must be demarcated with an impermeable surface leading to an oil-water separator. No vehicle may be extensively repaired in any place other than in the dedicated maintenance yard.</li> <li>• Washing of vehicles is prohibited on site or at the Construction Camp and Vehicle Maintenance Yard.</li> </ul>	Contractor	Ongoing
<b>Traffic Access</b>		
<ul style="list-style-type: none"> <li>• Access will be gained from Oliefantsfontein Road and will bisect the property into the erven mentioned above.</li> <li>• The developer carries out the proposed road upgrades to mitigate the impacts of the development traffic.</li> <li>• It is very important that existing access roads be used where at all possible. Existing access tracks must first be upgraded rather than constructing new tracks.</li> <li>• The contractor needs to properly mark all access roads. Markers shall show the direction of travel to which the road leads.</li> <li>• Roads not to be used shall be marked with a “NO ENTRY” sign.</li> <li>• All speed limits must be strictly adhered to at all times.</li> <li>• No new roads must be constructed across any drainage line unless absolutely necessary.</li> <li>• If there are high volumes of construction traffic along site access roads, dust prevention measures must be implemented to reduce dust creation and travel into adjacent areas.</li> </ul>	<b>Contractor/</b> ECO	Once-off
<b>Construction site and activities</b>		
<b>General and Hazardous Substances and Materials</b>		

<ul style="list-style-type: none"> <li>• Storage areas must not be within 100m of the edge of the buffer around the wetland.</li> <li>• Storage areas must be designated, demarcated and fenced.</li> <li>• Storage areas should be secured, under lock and key, so as to minimise the risk of crime.</li> <li>• Fire prevention facilities must be present at all storage facilities.</li> <li>• Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume. Such a facility must be on an impervious surface. The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc., must be stored there in. Drip trays, a thin concrete slab or a facility with PVC lining, must be installed in such storage areas with a view to prevent soil and water pollution.</li> <li>• Any water that collects in the bund must not be allowed to stand and must be removed immediately.</li> <li>• All fuel storage tanks and associated facilities must be designed and installed in accordance with the relevant oil industry standards, SANS codes and other relevant requirements.</li> <li>• Symbolic safety signs depicting No Smoking, No Naked Flames and Danger are to be prominently displayed in and around the fuel storage area.</li> <li>• The capacity of the tank must be clearly displayed and the product contained within the tank clearly identified.</li> <li>• Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks must be sealed and stored in an area where the ground has been protected.</li> <li>• If fuel is dispensed from 200 litre drums, the proper dispensing equipment must be used. The drum must not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank must be stored in a waterproof container when not in use.</li> <li>• All waste fuel and chemical contaminated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site.</li> <li>• Storage sites will be provided with bunds to contain any spilled liquids and materials. These storage facilities (including any tanks) must be on an impermeable surface that is protected from</li> </ul>		
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<p>the ingress of stormwater from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.</p> <ul style="list-style-type: none"> <li>• Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible, the available MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or spillages.</li> <li>• Staff dealing with these materials/substances must be aware of their potential impacts and follow the appropriate safety measures.</li> <li>• A suitable Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at licensed landfill sites designed to handle hazardous waste. Appropriate weigh bills must be provided for all hazardous waste being disposed of.</li> <li>• The Contractor must ensure that his staff are made aware of the health risks associated with any hazardous substances used and have been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</li> <li>• Cement/concrete must not be mixed directly on the ground. Dagga boards, mixing trays and impermeable sumps must be used at all mixing and supply points. Unused cement bags are to be stored so as not to be affected by rain or runoff events.</li> <li>• The washing of concrete trucks onsite is prohibited.</li> <li>• Used cement bags must be stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags must be disposed of on a regular basis via the solid waste management system, and must not be used for any other purpose.</li> </ul> <p>All visible remains of excess concrete must be physically removed on completion of the plaster or concrete pour section and disposed of. Washing the remains into the ground is not acceptable as groundwater contamination could occur.</p> <ul style="list-style-type: none"> <li>• No paint products may be disposed of on site.</li> <li>• Care should be taken of the storage thresholds contained in the EIA Regulations (2014) Listing Notices as well as the Waste Management Activities contained in Category A and B.</li> <li>• The Contractor must maintain a record of the sourcing of all materials used during construction.</li> </ul>		
<p><b>Spills, Incidents and Pollution Control</b></p>		

<ul style="list-style-type: none"> <li>• Any spillage, which may occur, must be investigated and immediate action must be taken according to the requirements of the Spill Contingency Plan. This must also be reported to the ECO and SHE Officer.</li> <li>• In the case of a spill of hydrocarbons, chemicals or bituminous material in the Construction Camp or on the construction site/bunding area, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimize pollution risk and reduce bunding capacity.</li> <li>• Should a pollution incident occur on site the Contractor must:             <ul style="list-style-type: none"> <li>- Implement reasonable measures immediately to contain and minimise the impacts of the incident;</li> <li>- Notify all persons whose health may be affected by the incident;</li> <li>- Undertake cleanup procedures immediately;</li> <li>- Notify the Contractor of the incident immediately who will advise the employee as to the measures that should be implemented;</li> <li>- Record the incident in the Environmental Incident Register; and</li> <li>- Implement measures to prevent similar incidents from occurring in the future.</li> </ul> </li> <li>• Concrete mixing must be confined to as few areas as possible and ad hoc mixing is to be avoided. Areas where concrete was mixed must be cleaned up after use. Concrete mixing is to be undertaken on an impervious surface.</li> <li>• Soil and construction material stockpiles are to be bermed to prevent leachate and polluted runoff</li> </ul>	<p>Contractor SHE Officer</p>	<p>Ongoing</p>
<p><b>Heritage</b></p>		
<ul style="list-style-type: none"> <li>• If an artefact onsite is uncovered, work in the immediate vicinity must be stopped immediately.</li> <li>• The contractor must take reasonable precautions to prevent any person from removing or damaging any such article and must immediately, upon discovery thereof, inform the Construction Engineer of such discovery who in turn must contact a registered archaeologist.</li> <li>• Work may only resume once clearance is given in writing by the archaeologist.</li> </ul>	<p>Contractor</p>	<p>Ongoing</p>
<p><b>Noise</b></p>		
<ul style="list-style-type: none"> <li>• Adequate signage must erected to signal the start of construction activities.</li> <li>• All construction vehicles and equipment are to be kept in good repair</li> <li>• Where possible, stationary noisy equipment (for example compressors, generators etc. must be</li> </ul>		

<p>encapsulated in acoustic covers, screens or sheds. Portable acoustic shields must be used in the case where noisy equipment is not stationary (for example drills, angle grinders, chipping hammers).</p> <ul style="list-style-type: none"> <li>• Construction activities, and particularly the noisy ones, are to be contained to reasonable hours during the day and early evening. Machines in intermittent use must be shutdown in the intervening periods between work or throttled down to a minimum.</li> <li>• In general, operations must meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).</li> <li>• Construction staff working in areas where the 8-hour ambient noise levels exceed 75 dBA must wear ear protection equipment.</li> <li>• Noise levels must be kept within acceptable limits. All noise and sounds generated must adhere to SANS 10103 specifications for maximum allowable noise levels for central business districts. No pure tone sirens or hooters may be utilised except where required in terms of SANS standards or in emergencies.</li> <li>• Noisy operations must be combined so that they occur where possible at the same time.</li> <li>• Noise from labourers must be controlled.</li> <li>• Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from site.</li> <li>• The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible, labour must be transported to and from the site by the Contractor or his sub- contractors by the contractors own transport.</li> <li>• Construction activities are to be contained to reasonable hours during normal working hours.</li> <li>• Neighbours are to be given at least three days warning prior to any blasting, piling or other 'noisy' activities.</li> <li>• No vendors or similar informal traders must be allowed to trade on the site.</li> </ul>	Contractor	Ongoing
<b>Air Quality</b>		

<b>Pollution Management and Odour Control</b>		
<ul style="list-style-type: none"> <li>• Any oil containing equipment or containers must be managed in a manner to avoid oil exposure to atmosphere to limit evaporation of volatiles to atmosphere.</li> <li>• Odours from chemical toilets and waste must be managed. Removal and disposal of litter and debris must be undertaken during periods of high ventilation. Chemical toilets must be cleared and cleaned at least weekly.</li> <li>• No fires are to be allowed onsite.</li> <li>• Vehicles must be maintained to avoid excessive emissions and smoke. Similarly equipment must be serviced.</li> </ul>	Contractor	Daily
<b>Dust Control</b>		
<ul style="list-style-type: none"> <li>• Dust track-on from disturbed areas to paved road surfaces should be avoided by making use of one of the following measures:                             <ul style="list-style-type: none"> <li>- Road sweeping.</li> <li>- Chemical dust suppression of disturbed areas to reduce the amount of dust which can be lifted by the wheels of trucks.</li> <li>- Wet suppression to the roads using a light spray.</li> <li>- The washing down of the wheels of trucks before they exit only paved road surfaces.</li> </ul> </li> <li>• If water is abstracted from a water resource for dust suppression, a Water Use Licence/General Authorisation must be obtained from the Department of Water Affairs. Dust liberated to atmosphere should not reduce the visibility for private vehicles making use of the road passing by the site.</li> <li>• All construction vehicles and equipment are to be kept in good repair.</li> <li>• Speed limits of a maximum of 40km/h are to be implemented on site and enforced by the Contractor.</li> <li>• Shade cloth fencing is to be used to reduced dust aggravation</li> <li>• Construction activities are to be contained to reasonable hours during the day avoiding periods of sunrise and sunset.</li> <li>• In areas where there is a large potential for dust liberation (high wind days) wet suppression using a light spray should be applied to the areas in question.</li> </ul>	Contractor/ECO	ongoing

<ul style="list-style-type: none"> <li>• A dust suppression register as well as a complaints register needs to be kept.</li> <li>• All complaints received need to be investigated with remedial action taken communicated to the affected party within 14 days</li> </ul>		
<b>Spoil, Top soil and Erosion</b>		
<b>Topsoil</b>		
<ul style="list-style-type: none"> <li>• The Contractor must strip and stockpile all soil within the work area for subsequent use at a later stage.</li> <li>• Top soil removed must be stockpiled in a designated area.</li> <li>• Stockpiles must be located outside of the retained wetland buffer. Stockpiles must be protected from wind and rain with the use of tarpaulins where necessary. The Engineer is to use his discretion in this regard.</li> <li>• Efforts must be taken to ensure that stock piles do not erode and cause siltation into the wetland and buffer.</li> <li>• Top soil must be kept separate from overburden and must not be used for in filling.</li> <li>• Weeds must be eradicated from top soil prior to spoiling.</li> <li>• The Contractor must exercise suitable precautions with the storage, handling and transport of all materials that could adversely affect the environment. If pollution of any surface or groundwater occurs, it must immediately be reported to GDARD and appropriate mitigation measures must be employed.</li> </ul>	Contractor	ongoing
<b>Spoil</b>		
<ul style="list-style-type: none"> <li>• Litter and general waste is to be removed from the soil and spoiling before stock piling.</li> <li>• Spoil sites will be shaped to fit the natural topography.</li> <li>• Spoil sites may receive a minimum of 75 mm topsoil and be grassed with a recommended indigenous seed mixture by a qualified ecologist.</li> <li>• Slopes must not exceed a vertical: horizontal ratio of 1:3.</li> </ul>	Contractor	ongoing
<b>Soil Erosion and Sedimentation</b>		
<ul style="list-style-type: none"> <li>• Soil erosion must be prevented at all times, i.e. pre, during and post construction. Suitable erosion control measures must be implemented in areas sensitive to erosion such as near water supply points and edges of slopes. These measures must include:</li> </ul>		

<ul style="list-style-type: none"> <li>• Phased construction activities must take place to ensure the removal of vegetation, only as it becomes necessary for work to proceed. This enables erosion and sedimentation to be minimised and centralised in relatively small areas easier to control and to stabilize. Top soil storage must be as brief as possible and storage must occur in a bunded area away from water courses as described above.</li> <li>• Vegetative Cover – vegetation reinforces soil and holds it in place thereby reducing erosion. Temporary or permanent vegetation must be planted on all bare soil immediately after any ground disturbance. The prompt rehabilitation of exposed soil areas with indigenous vegetation will ensure that soil is protected from the elements. The unnecessary removal of vegetation especially on steep areas must be prevented. Taking necessary precautions in terms of design, construction and earthworks, cuts and fills must be taken. Soil stockpiles must be vegetated or covered to reduce soil loss as a result of wind or water to prevent erosion and sedimentation. Disturbed areas must be rehabilitated as soon as possible.             <ul style="list-style-type: none"> <li>- Seeding, anchored mulch, wool binders or erosion control fabrics must be used to provide surface protection and stabilisation until vegetation is established.</li> <li>- The suitable use of sand bags or Hessian sheets must be used to stabilise bare soil.</li> <li>- The suitable use of geo-textiles, turf blankets or mats must be used as slope protection for exposed slopes.</li> <li>- Proper drainage controls such as culverts and cut-off trenches must be used to ensure proper management of surface water runoff to prevent erosion and sedimentation.</li> <li>- Construction vehicles must remain on designated demarcated areas.</li> <li>- Work areas must be clearly defined and demarcated to avoid unnecessary disturbance of areas outside the maintenance area.</li> </ul> </li> <li>• Constant cognisance of the inherent high erosion risk potential of all soils and sites on the property must be taken and appropriate control and preventative measure put in place.</li> </ul>		
<b>Site Establishment, Management and Erosion Control</b>		
<ul style="list-style-type: none"> <li>• The spoil site must not be within the wetland or associated buffer.</li> <li>• A signboard must be placed in the area where spoiling activities such as clearing and infilling will take place informing the public of the activities taking place.</li> <li>• The Contractor must take responsibility for the site to conform to all contractual aspects and environmental standards applicable.</li> </ul>		

<ul style="list-style-type: none"> <li>• The spoil site must be cleared of all inert waste, rubble, foundations and litter.</li> <li>• Top soil must be separated from over burden and spoiled separately.</li> <li>• No large rocks or building rubble is permitted to be spoiled at these sites. If building rubble is to be spoiled, a waste management licence as per the requirements of the National Environmental Management Waste Act will be required.</li> <li>• Dumping of any other material, including litter is prohibited.</li> <li>• Spoil site should not be located within the 1:100 year flood line.</li> <li>• Litter and general waste is to be removed from the soil and spoiling before stockpiling.</li> <li>• Spoil sites will be shaped to fit the natural topography.</li> <li>• Spoil sites must receive a minimum of 75mm top soil and be grassed with the recommended seed mixture.</li> </ul>		
<b>Rehabilitation and Maintenance</b>		
<ul style="list-style-type: none"> <li>• A period of one year must be allowed for following practical completion, unless otherwise specified.</li> <li>• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.</li> <li>• Delay the re-introduction of spoil material to all rehabilitation areas until an acceptable level of re-vegetation has been reached. Fencing may be used, or the area may be covered by branches.</li> <li>• Re-vegetation must match the vegetation type which previously existed, unless otherwise indicated in the Contract or specified by the ECO.</li> <li>• Base the new carrying capacity of rehabilitated land on the status quo rather than the regional estimate.</li> <li>• Water all transplanted, planted and grassed areas.</li> <li>• Watering must commence and continue immediately after the seeds have germinated and growth begins.</li> <li>• Mow lawns regularly to a height of 50mm above ground level. This promotes adequate coverage.</li> <li>• Prune trees and shrubs at the end of winter so as to stimulate growth. Avoid pruning during the growing season as this stunts growth.</li> <li>• A minimum grass cover of 80% is required, and individual plants must be strong and healthy growers at the end of the Maintenance Period.</li> </ul>	<p>Contractor /Controlling body/Developer</p>	<p>Post construction</p>

<ul style="list-style-type: none"> <li>• In sodding, acceptable cover entails that 100% cover is attained by the specified vegetation.</li> <li>• Bare areas that show no specified vegetation growth after three months of the Rehabilitation Work are to be spread with additional topsoil, ripped to a depth of 100 mm and re-planted, re-sodded, re-hand sown or re- hydro seeded.</li> <li>• Control weeds by means of extraction, cutting or other approved methods.</li> <li>• For planted areas that have failed to establish, replace plants with the same species as originally specified. The same species as originally specified must be used unless otherwise specified by the ECO.</li> </ul>		
<p><b>Waste Management</b></p>		
<p style="text-align: center;"><b>General Waste</b></p>		
<ul style="list-style-type: none"> <li>• Adequate general waste receptacles, including bins must be arranged around the Construction Camp, on site to collect all domestic refuse, and to minimise littering.</li> <li>• Bins must be clearly marked and lined for efficient control and safe disposal of waste.</li> <li>• Different waste bins, for different waste streams must be provided to ensure correct waste separation.</li> <li>• A fenced area must be allocated for waste sorting and disposal on the site.</li> <li>• General waste produced on site is to be collected in skips for disposal at a registered landfill site. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site.</li> <li>• No general waste is to be disposed of at the spoil area.</li> <li>• Under no circumstances is waste to be burnt or buried on site. The excavation and use of rubbish pits on site is forbidden.</li> <li>• Waste bins must be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance.</li> <li>• All general waste must be removed from the construction areas on a daily basis and disposed of in suitable waste receptacles at the Construction Camp.</li> <li>• The Contractor must ensure that all general waste is disposed of at an appropriately licensed waste disposal facility. Through exploring practical means for reducing, reusing and recycling waste generated in undertaking the activity, the Contractor must dispose of the minimum amount of waste</li> </ul>	<p>Contractor</p>	<p>Daily</p>

possible.		
<b>Hazardous Waste</b>		
<ul style="list-style-type: none"> <li>• Hazardous waste produced on site includes:                             <ul style="list-style-type: none"> <li>- Oil and other lubricants, diesel, paints, solvent;</li> <li>- Containers that contained chemicals, oils or greases; and</li> <li>- Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen).</li> </ul> </li> <li>• Hazardous waste is to be disposed of at a Permitted Hazardous Waste Landfill Site. The ECO must be informed of where waste is or will be disposed of.</li> <li>• Hazardous waste bins must be clearly marked and stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid).</li> <li>• A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal.</li> </ul>	Contractor	Daily
<b>Waste water</b>		
<ul style="list-style-type: none"> <li>• All waste water generated at the proposed development must be disposed of in a suitable manner so as not to cause any surface or subsurface water pollution or health hazard. Waste water including cement- contaminated water must not enter any water course and must be managed by the site manager to ensure that the existing water resources on and off site are not polluted by activities emanating from the above development.</li> <li>• Contaminated waste water including cement-contaminated water must not enter any water course and must be managed by the Contractor to ensure that the existing water resources on and off site are not polluted by activities emanating from the above development.</li> <li>• Used oil and wastewater must be disposed of to a ROSE registered facility. An SDC is to be obtained by the Contractor.</li> </ul>	Contractor	Daily
<b>Water Management</b>		
<b>Water Pollution Management (including ground water and soil contamination)</b>		
<ul style="list-style-type: none"> <li>• The flow direction of any surface water runoff must be established prior to disturbing any area.</li> <li>• The stockpiling of soil or any other material must not be allowed near a water course or water body in order to prevent pollution or impede surface runoff;</li> </ul>		

<ul style="list-style-type: none"> <li>• Every effort must be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site.</li> <li>• Dirty water originating from maintenance activities is to be contained and disposed of correctly, to prevent the contamination of soil and/or any water courses.</li> <li>• Bathing or washing of clothes, equipment or machinery within any watercourse or within the wetland is prohibited.</li> <li>• Erosion and loss of soil must be prevented by minimising the construction areas exposed to surface water runoff.</li> <li>• Bare areas are to be rehabilitated as soon as the areas become available or after use.</li> <li>• All water consumption on site must be recorded on a daily basis.</li> <li>• The abstraction of water from any water resource for construction purposes and/or dust suppression must not be permitted without a water use licence/general authorisation from the Department of Water Affairs.</li> </ul>		
<b>Wetland Management</b>		
<b>Fauna, Flora and Ecology</b>		
<ul style="list-style-type: none"> <li>• Removing of vegetation must be restricted to the immediate area for construction and as instructed by Site Manager.</li> <li>• The cleared vegetation must be disposed of to a suitable disposal site. The burning of vegetation cleared or disposal to adjacent site is prohibited.</li> <li>• Protected trees and species identified by an ecologist or ECO may not be removed or cut without a permit from the relevant provincial Department.</li> <li>• Care must be taken to avoid the introduction of alien plant species on the site and surrounding areas.</li> <li>• Where alien plants have been introduced on to the site during clearing and infilling, they must be removed. The Contractor must develop an Action Plan for the removal of alien invasive species and submit it to the ECO and Ecologist for approval.</li> <li>• Invader species and weeds must be removed and disposed of in accordance with existing legislation (Conservation of Agricultural Resource Act (No.43 of 1983) on a regular basis.</li> <li>• The removal of indigenous/endemic shrubs and small trees must be kept to a minimum and only be</li> </ul>	Contractor/ECO	ongoing

<p>removed if absolutely necessary.</p> <ul style="list-style-type: none"> <li>• Close site supervision must be maintained during construction.</li> <li>• The wetland and associated 32m buffer must be strictly maintained as a no-go area, and no removal of any fauna and flora from this area of the site must be permitted.</li> <li>• Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area. Mobile toilets must be provided in order to minimise unauthorised traffic of construction workers outside of the designated areas.</li> <li>• All temporary stockpile areas including litter and dumped material and rubble must be removed in completion of construction. All alien invasive species should be removed from the site to prevent further invasion.</li> <li>• Educational programmes for the contractors’ staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes and other dangerous animals on site. In particular, construction workers are to go through on-going refresher courses to ensure that snakes are not killed or injured when found.</li> <li>• No animal may be hunted, trapped, snared or captured for any purpose. Fences and boundaries should be patrolled weekly in order to locate and remove snares/traps.</li> <li>• Speed of vehicles should be limited to avoid injury of fauna and allow for sufficient safety margins.</li> <li>• Dangerous animals should be handled by a competent person.</li> <li>• Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harms remaining faunal species.</li> <li>• No animals should be intentionally killed or destroyed and poaching should not be permitted on the site.</li> </ul>		
<b>Ecologically sensitive areas</b>		
<ul style="list-style-type: none"> <li>• The wetlands should be effectively rehabilitated and incorporated into the layout of the proposed development so that their habitat integrity and ecological service provision potential can be increased.</li> </ul>	Developer	Once-off
<b>Vegetation Clearance</b>		
<ul style="list-style-type: none"> <li>• It is recommended that a contractor should comply with the following parameters:             <ul style="list-style-type: none"> <li>- The contractor or ecologist appointed by the contractor must have the necessary knowledge to</li> </ul> </li> </ul>	Contractor	Daily

<p>be able to identify protected species as well as species not interfering with the operation of the line due to their height and growth rate.</p> <ul style="list-style-type: none"> <li>- The contractor must also be able to identify declared weeds and alien species that can be totally eradicated.</li> <li>- Only vegetation that could potentially threaten the development in terms of clearance and fire risk must be cleared.</li> </ul>		
<p><b>Stormwater Management</b></p>		
<ul style="list-style-type: none"> <li>• Stormwater control is to be included in the design of the urban development. A formal stormwater control plan for both construction and operation must be compiled prior to the onset of construction and approved by the City of Johannesburg.</li> <li>• Soft engineering to be used in the creation of stormwater retention features.</li> <li>• Such stormwater retention features are to be placed within the stipulated buffer (not in the wetland), as close to the outer edge of the buffer area as possible. The Stormwater Management Plan must be implemented to ensure proper management of stormwater on the site during and after construction to ensure that pollutants and sediment are not released into any water resources.</li> <li>• Designs for the buildings and site development in general must avoid concentration of stormwater runoff both spatially and in time and may be required to provide for on-site attenuation of stormwater runoff to limit peak flows to pre-development levels.</li> <li>• Detailed plans to control and prevent erosion by water must be agreed between the contractor and approved ECO prior to the commencement of any works, including site clearance, on any portion of the site.</li> <li>• Removal of vegetation cover must be carried out with care and attention to the effect, whether temporary or long-term, that this removal will have on erosion potential.</li> <li>• Precautions must be taken at all times on building sites to contain soil erosion and prevent any eroded material from being removed from the site.</li> <li>• Landscaping and re-vegetation of areas not occupied by buildings or paving must be programmed to proceed immediately after building works have been completed, or have reached a stage where newly established ground cover is not at risk from the construction works.</li> <li>• On-site stormwater control systems, such as swales, berms, soil fences and attenuation ponds are</li> </ul>	<p><i>Developer</i></p> <p><i>Contractor</i></p> <p>Engineer</p>	<p><i>Once-off</i></p> <p><i>ongoing</i></p> <p>Daily</p>

<p>to be constructed before any construction commences on the site. As construction progresses, the stormwater control measures are to be monitored and adjusted to ensure complete erosion and pollution control at all times.</p> <ul style="list-style-type: none"> <li>• Earthworks on sites are to be kept to a minimum. Where embankments have to be formed, stabilization and erosion control measures must be implemented immediately.</li> <li>• Stormwater must not be allowed to pond in close proximity to existing building foundations.</li> <li>• Prior to any physical work proceeding on site, a stormwater control plan (SCP) detailing the proposed stormwater control measures are to be formulated. No work is to be undertaken without an approved SCP.</li> <li>• The SCP must describe what control measures are to be implemented before and during the construction period, as well as the final stormwater control measures required for the site on completion of site development. Plans must indicate who is responsible for the design of the control measures and who is, or will be, designated as the responsible person on site during each stage of the implementation of the control measures.</li> <li>• SCPs must show that all the provisions, regulations and guidelines contained in this document have been taken into account.</li> <li>• In the event of a failure to adequately implement the approved stormwater control plan, the contractor must be responsible for making good all consequential environmental damage at his own cost. The developer is therefore advised to ensure that all members of the professional team and contractors are competent to undertake the development work and are adequately insured.</li> <li>• No materials, fluids or substances are allowed to enter the stormwater system that could have a detrimental effect on the flora, fauna and aquatic life in the water courses and wetlands. Regular monitoring of the sites should be undertaken.</li> <li>• Any site that is required to store any substances that could be regarded as hazardous in terms of water pollution must notify the Municipalities and must take measures to ensure spillages of the substance(s) can be adequately contained to prevent contamination of the water resources within the development area.</li> <li>• No stormwater, wash water, or wastewater may be directed towards any permanent water body or wetland without the installation of suitable filtration system to prevent pollution, including silt,</li> </ul>		
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from entering such water body.		
<b>Traffic and Safety</b>		
<b>Lane Closures</b>		
<ul style="list-style-type: none"> <li>• Temporary loading and off-loading areas and holding of construction vehicles must be designed prior to construction activities to ensure that the most preferable access and haulage routes has been identified.</li> <li>• Road signs for all lane closures to be done in accordance to the South African Road Traffic Signs Manual (SARTSM, 1999).</li> <li>• Construction routes must be clearly defined.</li> <li>• Disruption to the peak traffic periods 06h00 – 9h00 and 15h00 – 18h00 to be minimised or if possible avoided.</li> </ul>	Contractor	Daily
<b>Pedestrian Protection</b>		
<ul style="list-style-type: none"> <li>• Pedestrians to be protected from construction activities at all times.</li> <li>• Pedestrian conflict with site access and construction vehicles to be managed by traffic officer.</li> <li>• The construction site camp must remain fenced for the entire construction period.</li> </ul>	Contractor	Daily
<b>Maintenance Vehicles</b>		
<ul style="list-style-type: none"> <li>• Holding of all maintenance vehicles to be controlled tonsense that through traffics along Olifantsfontein Road is not unnecessarily impeded.</li> <li>• Vehicles and equipment must be serviced regularly to avoid the contamination of the area from oil and hydraulic fluid leaks etc.</li> <li>• Machinery or equipment used on site must not constitute a pollution hazard in respect of the above substances. The Constructor must order such equipment to be repaired or withdraw from use if they consider the equipment or machinery to be polluting and irreparable.</li> <li>• Suitably covered receptacles must be available at all times and conveniently placed for the disposal of waste. All used oils, grease or hydraulic fluids must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.</li> <li>• All speed limits must be adhered to.</li> </ul>	Contractor	ongoing
<b>Road Maintenance</b>		

<ul style="list-style-type: none"> <li>Contractors must ensure that any damage to the pedestrian walkway or holding areas are maintained in good condition by attending to any damages (e.g. road signs or storm water damage etc.) as soon as these develop.</li> <li>If necessary, staff must be employed to clean surfaced roads adjacent to construction sites where materials have spilt.</li> <li>All temporary road signs to be removed and pavement reinstated at completion of works.</li> <li>All covered road signs to be reinstated.</li> </ul>	Contractor	Ongoing
<b>Social Considerations</b>		
<ul style="list-style-type: none"> <li>Working hours are restricted to 07:00 – 17:00 during weekdays and 08:00-13:00 over weekends if necessary. Should work be required after these hours, the ECO must be notified and any person who resides in close proximity to the site and who may be impacted upon by the disturbance should also be notified.</li> <li>All neighbouring landowners and those that are disturbed due to construction activities are to be notified of construction activities.</li> </ul>	Contractor	Ongoing
<b>Reporting and Record Keeping</b>		
<b>Complaints Register</b>		
<ul style="list-style-type: none"> <li>Complaints received must be registered and recorded by the contractor and also brought to the attention of the contractor. Both parties will respond accordingly. The following information must be recorded in the case of any complaint/incident:                         <ul style="list-style-type: none"> <li>Time, date and nature of complaint;</li> <li>Response and investigation undertaken; and</li> <li>Corrective and preventative actions taken and by whom.</li> </ul> </li> <li>All complaints received will be investigated and a response is to be given to the complainant within 7 days.</li> </ul>	Contractor	Ongoing
<b>Environmental Incident Register</b>		
<ul style="list-style-type: none"> <li>All environmental incidents occurring on the site will need to be recorded in an Environmental Incident Book and brought to the attention of the ECO. The following information must be provided:                         <ul style="list-style-type: none"> <li>Time, date and nature of complaint</li> </ul> </li> </ul>	Contractor	Ongoing



<b>Monitoring and Maintenance</b>		
<ul style="list-style-type: none"> <li>• The conditions of the development must be monitored for a period of one year after the development is complete to ensure that:                             <ul style="list-style-type: none"> <li>- Erosion is not taking place;</li> <li>- The stormwater runoff measures are working;</li> <li>- An Environmental Complaints Register should be kept detailing complaints received, date, response and action taken;</li> <li>- Any maintenance where intrusive works are necessary should adhere to the mitigation measures put in place in the EMPr; and</li> <li>- Where such measures are impractical due to the nature, duration and extent of maintenance works, a maintenance method statement should be developed prior to maintenance works being undertaken.</li> </ul> </li> <li>• Where such measures are impractical due to the nature, duration and extent of maintenance works, a maintenance method statement should be developed prior to maintenance works being undertaken.</li> <li>• Decommissioning to be guided by the EMPr</li> <li>• Final rehabilitation to be monitored by an ECO according to the stipulations of the EMPr</li> </ul>	<p>Developer/co ntrolling body/ municipality</p>	<p>Post construction / ongoing</p>
<b>Monitoring and Maintenance of wetland area</b>		
<ul style="list-style-type: none"> <li>• During the operational phase, the wetland area must be kept free of any physical disturbance, with the exception of low intensity recreational activities such as the establishment of walking paths, etc.</li> <li>• The wetland area should not be subject to mowing, except on the boundary of the site, as detailed below.</li> <li>• Periodic ecological maintenance of the wetland area may be required every few years in order to prevent the formation of overly-moribund growth.</li> </ul>	<p>Body corporate or similar</p>	<p>Ongoing during Operational phase</p>

## 9.0 CONCLUSION

The EMPr should be seen as a day-to-day management document which sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed development. The EMPr is a “live document”, and if continuously reviewed and managed correctly can result in successful construction and operation of the development.

All attempts should be made to have this EMPr available, as part of any contractual documentation, so that the contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for them.

Further, guidance should also be taken from conditions contained in the Environmental Authorisation, if the project is granted approval, and that these GDARD conditions must be incorporated into the final EMPr.