

# ENVIRONMENTAL MANAGEMENT PROGRAMME

## THE PROPOSED DEVELOPMENT OF TOWNSHIP ON THE REMAINDER OF THE FARM FOURIESTRUST 2525 DISTRICT WITHIN THE MANGAUNG METROPOLITAN MUNICIPALITY, FREE STATE PROVINCE

**November 2016**

**Prepared For:**

RTJ Properties (Pty) Ltd

**Prepared By:**

**THIKHO CONSULTING AND PROJECTS**

**Postal Address:** PO Box 32568, Braamfontein, 2017

**Email:** [thikhocp@gmail.com](mailto:thikhocp@gmail.com)

**Tel:** +2776 4800 802 / +2781 865 7653

**Fax:** 086 613 1063



**Thikho Consulting And Projects**  
keeping harmony in the change

## Table of contents

1. INTRODUCTION .....	6
2. DETAILS OF EAP .....	6
3. PROJECT DESCRIPTION .....	7
4. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME .....	8
5. IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME.....	12
5.1 Roles and Responsibilities .....	12
5.1.1. Contractor .....	12
5.1.2. The Environmental Control Officer .....	12
6. ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES .....	13
6.1. Pre-construction phase .....	13
5.1.3. Commissioning of Tender.....	13
5.1.4. Appointment of Environmental Control Officer (ECO) .....	13
5.1.5. Establishment of complaints register .....	14
5.1.6. Inspections .....	14
5.1.7. Record keeping .....	14
6.2. Construction Phase.....	15
5.1.8. Site Establishment.....	15
5.1.9. Environmental Induction and Training .....	15
5.1.10. Material handling and storage.....	16
5.1.11. Movement of Construction Vehicles and Personnel .....	17
5.1.12. Vegetation .....	17
5.1.13. Fauna and Avifauna .....	19
5.1.14. Soil and Water pollution .....	20
5.1.15. Air Pollution / Dust Generation .....	21
5.1.16. Noise Pollution.....	22
5.1.17. Traffic .....	22

## Environmental Management Programme

---

5.1.18.	Safety and Security .....	23
5.1.19.	Visual .....	24
5.1.20.	Agriculture .....	25
5.1.21.	Heritage.....	25
5.1.22.	Waste (including Hazardous) Management .....	27
5.1.23.	Stormwater Management .....	28
5.1.24.	Fire .....	28
5.1.25.	Erosion .....	29
5.1.26.	Concrete Mixing .....	30
5.1.27.	Site Closure and Rehabilitation.....	30
6.3.	Operational Phase .....	32
5.1.28.	Storm water management.....	32
5.1.29.	Waste generation and disposal .....	32
5.1.30.	Visual impacts.....	32
5.1.31.	Environmental complaint register to be maintained .....	32
5.1.32.	Traffic and Road Maintenance.....	32
7.	Environmental Monitoring.....	33
8.	Environmental Audit.....	33
9.	Document Control.....	33
10.	General.....	33

### ACRONYMS

BAR	Basic Assessment Report
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEO	Contractor Control Officer
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme Report
HAS	Hazardous Substance Act (Act 15 OF 1973)
HIA	Heritage Impact Assessment
NEMA	National Environmental Management Act
NEMWA	National Environmental Management Waste Act (Act 36 of 2008)
NEMAQA	National Environmental Air Quality Act
NEMBA	National Environmental Biodiversity Act (Act 59 of 1999)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
OHSA	Occupational Health and Safety Act (Act of 85 of 1993)
SACNASP	South African Council of Natural Scientist Profession
SAHRA	South African Heritage Resources Agency
WULA	Water Use Licence Application

## List of Figures

Figure 1: Locality map .....	8
------------------------------	---

## List of Tables

Table 1: Relevant Environmental Legislation .....	9
---	---

## 1. INTRODUCTION

Thikho Consulting and Projects (Pty) Ltd has been appointed by RTJ Properties (Pty) Ltd to compile an Environmental Management Programme (EMPr) which forms part of the Assessment for the proposed development of residential units in Bloemfontein, with the jurisdiction of Mangaung Metropolitan Municipality. The aim of the EMPr is to provide mitigation measures and management principles to be implemented during the construction phase of the project. The EMPr will provide precautionary measures that will ensure that environmental degradation is minimized and pollution is prevented, and where it cannot be prevented, it is reduced and mitigated. This EMPr is a living document that guides the project activities throughout the lifecycle of the project and was developed as a legal requirements of the Environmental Impact Assessment (EIA) Regulations of December 2014 as well as the National Environmental Management Act, 1998 (Act 107 of 1998).

## 2. DETAILS OF EAP

**EAP:** Thikho Consulting and Projects

**Contact Person:** Khuliso Mudau

**Contact Details:** thikhocp@gmail.com

**Profession:** Environmental Consultant

**Role in Project:** EAP

**Experience:** 5 years

**Qualifications:** BSc (Hon) Environmental and Water Science

**Membership:** SACNASP

**Summary of Project Related Experience:**

- Environmental Impact Assessment process for the proposed development of the Vryheid Network Strengthening within the jurisdiction of Swellendam Local Municipality, Western Cape.
- Environmental Impact Assessment for the proposed Tubatse Strengthening Phase 1-Senakangwedi B Integration Substation and associated infrastructure.
- Environmental Management Plan and Eskom characterization for the upgrading of Eskom distribution lines in Gauteng.
- Environmental Management Programme for the proposed Eskom Juno-Gromis 400kV power line in the Northern and Western Cape Provinces.
- Environmental risk assessment review for the Anglo American: New Largo Project for Eskom.
- Environmental risk assessment review for the Universal Coal: Kangala Project for Eskom.

## Environmental Management Programme

---

- External Audit of Environmental Management Plan and Water Use License external audits for the construction of the Rand Water B19 pipeline.
- Basic Assessment for the proposed decommissioning of the Eskom Verwoedburg Substation.
- Basic Assessment for the proposed deviation of the Westgate Randfontein 10km 132kV servitude.
- Basic Assessment for the proposed Eskom 88kV power line from the existing Tweedracht substation to the existing SAR Kameel–SAR Kleinfontein power line.
- Basic Assessment for the proposed Eskom Calcined Products substation and loop in loop out lines.
- Construction Environmental Management Plan for the construction of the Eskom Simmerpan MTS and refurbishment of the 275kV power line.
- Construction Environmental Management Programmes for the proposed Transnet Orex Feeder substations (Aries, Garona, Helios, Juno) within the Northern and Western Cape provinces.
- Environmental Impact Assessment for the proposed !Kheis Solar One Concentrated Solar Power plant.
- Environmental Control Officer for the construction of the Eskom 400kV transmission lines between Aries and Nieuwehoop Substations.
- Environmental Control Officer for the construction of the Lulamisa Brynorth 88kV power line in Gauteng.

### 3. PROJECT DESCRIPTION

The proposed project involves the development of a residential estate on the remainder of the Farm Fouriustrust 2525 District. The size of the proposed development is 15,6960ha. The proposed residence will contain house stands, a business complex, admin block and a park.

The proposed development will be located on the remainder of the Farm Fouriustrust 2525 District within the Mangaung Metropolitan Municipality, Bloemfontein, Free State Province. See locality map below

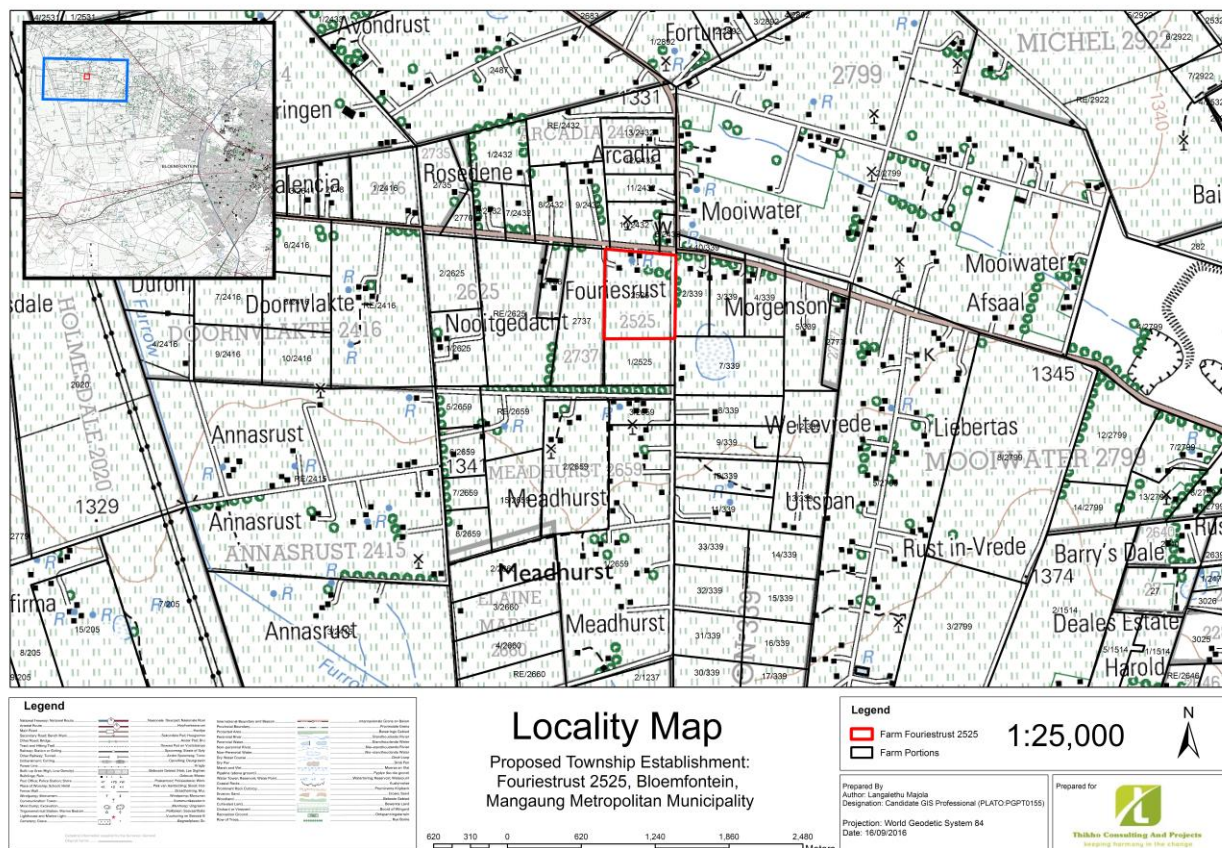


Figure 1: Locality map

## 4. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The purpose of compiling this EMPr is to describe the methodology for the management, rehabilitation and monitoring of potential negative environmental impacts and how positive impacts can be maximized.

This EMPr aims to provide the necessary protection of potentially sensitive areas and provide environmental responsibility and a management framework, within which all future construction and operation will occur.

During the basis assessment process, various impacts were identified and mitigation and management measures proposed for these impacts. The EMPr will remain in force during the lifespan of the project and will be a subject updates.

The following are the objectives of the EMPr:

- The Environmental Management Plan will guide the pre-construction, construction and operation phases of the proposed project.
- Ensure that the activity is undertaken in compliance with environmental legislation and policies.



## Environmental Management Programme

- Provide detail mitigation measures, schedule and criteria for assessing the success of the EMP; which will enable review of the success of the EMP and the provision of such information to the relevant decision-makers;
- Provide detailed monitoring programmes to ensure compliance;
- Provide input and strategies for environmental quality control and risk management;
- Show the methodology for implementation of environmental restoration/rehabilitation,
- The mitigation and management measures described in the Environmental Management Plan will be incorporated into the contract agreements with the contractors to ensure their environmental compliance.

**Table 1: Relevant Environmental Legislation**

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act 107 of 1998)	NEMA principles and Objectives have been taken into consideration in respect of: the identification of environmental impacts, the assessment of their significance and need to mitigate; public consultation processes followed as part of the Basic Assessment.	Department of Environmental Affairs	1998
2014 EIA Regulations	The proposed development comprises listed development activities under Listing notices 1 and 3 of the EIA Regulations.	Department of Environmental Affairs	2014
National Water Act, 1998 (Act 36 of 1998)	The Act ensures protection of water resources.  A wetland was noted in proximity to the proposed development, therefore the requirements of the Act would apply.	Department of Water Affairs	1998
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	To provide for control over the utilization of the natural	Department of Agriculture	1983

## Environmental Management Programme

1983)	<p>agricultural resources in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>The site has been used for agricultural purposes.</p>		
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)	<p>The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection.</p> <p>Listed invasive alien species in the Regulations promulgated in terms of this Act that may occur on the property must be controlled / eradicated as specified.</p>	Department of Environmental Affairs	2004
National Heritage Resources Act, 1999 (Act 25 of 1999)	<p>The Act legislates the necessity for cultural and heritage impact assessments in areas earmarked for development, which exceed 0.5ha. The Act makes provision for potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures.</p> <p>There are several graves on the proposed property.</p>	South African Heritage Resources Agency	1999
Townships Ordinance, 1969 (Ordinance Number 9 of 1969)	Townships ordinance, 1969 (ordinance number 9 of 1969) in order to establish the proposed	Mangaung Metropolitan Municipality	1969

## Environmental Management Programme

	township		
National Environmental Management: Air Quality Act, Act 39 of 2004	The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air and to prevent pollution of air and ecological degradation. The Act makes provision for measures to control dust, noise and offensive odours.	Department of Environmental Affairs	2004
National Dust Control Regulation, 2013	It provides for the management and control of dust.	Department of Environmental Affairs	2013
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	Provides for the management of waste.  The proposed development will generate waste during the construction phase as well as the operational phase.	Department of Environmental Affairs	2008
The Constitution of South Africa, 1996 (Act No. 108 of 1996)	The Constitution provides for an environmental right, Section 24 of the Bill of Rights.  "Everyone has the right -  a) To an environment that is not harmful to their health or well-being; and  b) To have the environment protected,  for the benefit of present and future generations, through reasonable legislative and other measures that -  • Prevent pollution and ecological degradation;	National Government	1996

	<ul style="list-style-type: none"> <li>•Promote conservation; and</li> <li>•Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>		
--	---	--	--

## 5. IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

A hard copy of the EMPr will be kept on site during construction and will be made available to any member of the public and authorities for review. This EMPr will also be kept by the applicant during the operational phase of the project, either as hard copy or electronic and be made available to any member of the public for review. All copies of the EMPr will contain the latest version of the document together with all amendments.

The Environmental Management Plan is a dynamic document that will be updated when necessary and used to guide decisions regarding the potential impacts. Regular audits will be carried out to ensure that the mitigation and management measures are being implemented as recommended or as required by the legislation.

### 5.1 Roles and Responsibilities

#### 5.1.1. Contractor

- To provide all supervision during the execution of the project.
- To appoint a competent Contractor Environmental Officer (CEO).
- To implement the projects as per the approved project plan.
- To fulfil all requirements (including environmental obligations) as per the appointment contract.
- To ensure that his project team is environmentally trained/inducted about the risks and management of those risks associated with the different construction activities.
- Report all environmental incidents.
- Ensures compliance with conditions of the EMPr and other environmental legislations.

#### 5.1.2. The Environmental Control Officer

A suitable qualified Environmental Control Officer (ECO) will be responsible to undertake site evaluation, monitoring and implementation of the EMPr. The ECO will conduct regular site visits and audits to ensure the success of the EMPr.

The ECO must:

- Know the contents and implications of the environmental report, and monitor the implementation of the findings using the EMP.
- Act as a guide, advisor and consultant to the contractor and client on environment issues during construction.
- Ensure that emergency numbers exist for reporting incidents and resolving any problems rapidly.
- Update the EMPr as necessary, and inform the relevant parties of the changes.
- Induct/train the contractor and site staff with the contents of the EMPr and the conditions of the Environmental Authorisation (EA). Records of training/induction dates, details of attendees and discussion points shall be kept by the ECO.
- Report progress made on a monthly basis to the project manager. These reports shall be available at all times, on site or in project file and on request by any person who may be interested in or affected by the project, including authorities and external auditors.

## **6. ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES**

These guidelines will form the basis for environmental management on site. The Environmental Control Officer will ensure that any modifications are communicated, explained to and discussed with all affected parties (i.e. the authorities, contractor, the proponent and any directly affected party who requests this information).

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

#### ***5.1.3. Commissioning of Tender***

The successful tendering contractors will be made aware of the contents and the requirements of this EMPr prior to the commencement of work. An ECO should be appointed and the details of the ECO must be provided to the Free State Provincial Department of Environmental Affairs.

#### ***5.1.4. Appointment of Environmental Control Officer (ECO)***

The ECO will fulfil the responsibility of assuring that environmental performance is achieved by the developer and its contractors during all phases of the project. It is the responsibility

of the ECO to audit compliance with the conditions set out in this EMPr, and assist with the implementation of mitigation measures. Any complaints, concerns or incidents reported in the logbook will also be monitored. Feedback of the findings, changes to this document as well as all reported incidents will be reported to the project manager on a monthly basis. These reports will also be forwarded to the Free State Department of Environmental Affairs. Any findings or non-compliance will be highlighted, and the measures to rectify the issue stated.

#### ***5.1.5. Establishment of complaints register***

A complaints register is to be established and kept onsite to address complaints in a timely manner, which will be reported to the project manager.

#### ***5.1.6. Inspections***

Periodic inspections will be performed by the ECO. These will consist of formal reviews of conformance against policies and procedures stated in this document. Inspections will occur on a monthly basis (or as required). Supervisors in all work areas will conduct performance and compliance reviews, using the EMP as guideline to ensure compliance.

#### ***5.1.7. Record keeping***

Documents to be maintained by the designated representative/ site agent and are to include:

- Training records
- Inspection records
- Records of non-conformance and corrective action
- Records of all complaints, concerns or issues and corrective action
- Environmental Management Plan
- All incidents reports

## 6.2. Construction Phase

### 5.1.8. Site Establishment

<b>Potential Impact:</b> Damage to natural environment
<b>Applicable Legislation:</b> OSH Act
<b>Objective:</b> To ensure minimal disturbance to the environment during site establishment
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> Well-designed site plan
<b>Monitoring Frequency:</b> Prior to site establishment
<ul style="list-style-type: none"> <li>• <b>Mitigation measures:</b></li> <li>• Construction camps on the site will be required to be established in appropriate locations prior to the commencement of construction, preferably within already disturbed areas. After completion of the contract, these areas have to be rehabilitated.</li> <li>• Site plan of the proposed camp site should be prepared by the contractor prior to the commencement of construction activities.</li> <li>• The site plan must include but not limited to: <ul style="list-style-type: none"> <li>○ Access road (including entry and exit points).</li> <li>○ All material and equipment storage areas including storage areas for hazardous substances.</li> <li>○ Site offices and other structures.</li> <li>○ Security/Fencing.</li> <li>○ Storm water control measures.</li> <li>○ Eating/resting area.</li> <li>○ Ablution facilities.</li> <li>○ Waste Management facilities.</li> </ul> </li> <li>• Water for human consumption should be available at the site offices and at other convenient locations on site.</li> <li>• Should there be no other ablution facilities available, chemical toilets must be supplied (1 per 11persons) and must be regularly cleaned and maintained by the contractor. .</li> <li>• The contractor should arrange for regular emptying of toilets and will be entirely responsible for enforcing their use and for maintenance.</li> <li>• The ablution facilities must be outside a 100m distance of watercourses</li> </ul>

### 5.1.9. Environmental Induction and Training

## Environmental Management Programme

<b>Potential Impact:</b> soil and water pollution, safety hazard
<b>Applicable Legislation:</b> OSH Act, Building Regulations
<b>Objective:</b> To ensure that all site personnel receive environmental awareness training.
<b>Responsibility:</b> Contractor, CEO
<b>Monitoring Criteria:</b> Training records
<b>Performance Indicator:</b> Good understanding of environmental principles and awareness
<b>Monitoring Frequency:</b> Prior construction and throughout the project
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• The CEO shall arrange for Environmental Awareness Training programs for the personnel on site and the team with the contents of this EMPr.</li> <li>• Proof of attendance as well as the content material of training must be kept.</li> </ul>

### 5.1.10. Material handling and storage

<b>Potential Impact:</b> soil and water pollution, safety hazard
<b>Applicable Legislation:</b> OSH Act, Building Regulations
<b>Objective:</b> To ensure safe handling, storage use and disposal of hazardous substances.
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, incident report
<b>Performance Indicator:</b> No spillages or incidents
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Appropriate PPE shall be provided to all staff and special PPE shall be provided for those handling hazardous substances. The contractor must comply with the OHS Act and Construction Regulations</li> <li>• All hazardous materials will be stored in a secured, designated area with restricted entry.</li> <li>• Storage of hazardous products shall only be in suitable containers.</li> <li>• Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure as well as Material Safety Data Sheets (MSDS).</li> <li>• Fuel must be stored in appropriate storage tanks or in bowsers.</li> <li>• The tanks/ bowsers shall be situated on a smooth impermeable surface (concrete) with a bund wall. The impermeable lining shall extend to the crest of the bund and the volume</li> </ul>



## Environmental Management Programme

inside the bund shall be 110% of the total capacity of all the storage tanks/ bowsters
<ul style="list-style-type: none"> <li>Gas welding cylinders and LPG cylinders should be stored in a secure, well-ventilated area.</li> <li>Sufficient fire fighting equipment in event of an accident must be readily available on site as well as at the site office.</li> <li>No smoking will be allowed where fuel is stored and used.</li> </ul>

### 5.1.11. Movement of Construction Vehicles and Personnel

<b>Potential Impact:</b> Damage to sensitive areas, erosion and compaction of soil
<b>Applicable Legislation:</b> NEMBA, CARA
<b>Objective:</b> To prevent damage to environment
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No complaints from adjacent landowners
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>The access route shown on the site plan must be used at all times</li> <li>No illegal use of private roads during construction.</li> <li>Upon completion of the project all roads shall be repaired to their original state.</li> <li>No roads shall be cut through sensitive areas.</li> <li>Soil stabilisation measures should be implemented especially on steep slopes.</li> <li>Rehabilitation of disturbed areas immediately following road construction should be done.</li> <li>All construction personnel and equipment remain within the demarcated construction sites at all times.</li> <li>Access to the site must be restricted to authorised personnel only.</li> <li>Should construction personnel and/or equipment wish to move outside the boundaries of the site, written permission from the ECO must be obtained.</li> <li>No machinery, personnel, material, or equipment is allowed on sensitive or 'No-Go' areas during the course of the project.</li> </ul>

### 5.1.12. Vegetation

<b>Potential Impact:</b> Damage to vegetation
---

<b>Applicable Legislation:</b> NEMBA, CARA
<b>Objective:</b> To prevent damage to vegetation and sensitive environment
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No disturbance of protected flora, minimal disturbance of vegetation
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Demarcate the construction footprint and ensure that all activities remain within the defined footprint area.</li> <li>• Only vegetation directly affected by the development may be cleared.</li> <li>• No endemic flora and fauna species will be deliberately destroyed or permanent alienated from their natural habitat during construction.</li> <li>• Only vegetation falling in directly in demarcated in operational area should be removed where necessary.</li> <li>• No exotic/invasive plants are to be planted on common ground of the site. No vegetation will be removed without prior permission from ECO.</li> <li>• Trees that are not to be cleared should be marked beforehand with danger tape. The ECO must be given a chance to mark vegetation that is to be conserved before the contractor begins clearing the site.</li> <li>• No open fires are permitted within naturally vegetated areas.</li> <li>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction /earthworks in that area.</li> <li>• Care must be taken that unnecessary clearance of vegetation does not take place. Where possible, natural vegetation must be retained or pruned.</li> <li>• Establishment of extensive alien species will be monitored.</li> <li>• Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping.</li> <li>• Stockpiles of vegetation are only to be located in areas approved by the ECO, and may not exceed 2m in height. Methods of stacking must take cognisance of the possible creation of a fire hazard.</li> <li>• Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas.</li> <li>• Alien vegetation re-growth must be controlled throughout the entire site during the construction period.</li> <li>• Construction time must be kept to a minimum followed by speedy rehabilitation to restore habitat and biodiversity integrity where required.</li> </ul>

## Environmental Management Programme

- No uncontrolled collection of firewood may be allowed on the property and surroundings.
- No open fires are allowed outside designated cooking areas.
- Adequate fire fighting equipment must be available onsite at all times and at least one person present on the site must be trained in the use thereof.
- The cleared vegetation should not be burned, but taken to the nearest available municipal disposal site or made available for use in a controlled manner.
- The removal and clearing of vegetation will not be allowed until an approval is obtained from the ECO.
- Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grass species adapted to the local environmental conditions.

### **5.1.13. Fauna and Avifauna**

<b>Potential Impact:</b> Damage to fauna and avifauna
<b>Applicable Legislation:</b> NEMBA
<b>Objective:</b> To prevent damage to faunal communities
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> Observation
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• No hunting, harming or capturing of any of the animals on the site must be allowed. This must be enforced during construction as well as the operational phase.</li> <li>• Speed limit will be enforced on the construction vehicles and these vehicles will only make use of designated roads.</li> <li>• No littering by construction workers is permitted as this may affect fauna on and around site.</li> <li>• Adequate fire fighting equipment must be available onsite at all times and at least one person present on the site must be trained in the use thereof.</li> <li>• No poison should be used to control any animals without the input of an ecologist/zoologist.</li> <li>• Under no circumstances shall any animals (Stock or game) be handled, killed or be interfered with by the Contractor, his employees, his subcontractors or his subcontractors' employees.</li> </ul>

## Environmental Management Programme

- No domesticated animals will be allowed on site.
- Any open excavations must be inspected early morning prior to the daily construction activities. Any amphibians and small mammals or any other fauna species found should be removed and released in suitable habitats away from construction activities. The open excavations should be back-filled as soon as possible.
- Records of any injured or deaths of fauna within the construction site must be kept by the ECO.
- Open fires must not be allowed on the construction site. A natural fire regime must be implemented for all conserved open grasslands.

### 5.1.14. Soil and Water pollution

<b>Potential Impact:</b> Pollution of soil and water resources
<b>Applicable Legislation:</b> NEMA, CARA
<b>Objective:</b> To prevent pollution to soil and water resources
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, incident report
<b>Performance Indicator:</b> No soil and water pollution
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Waste bins (with secure lids) for hazardous waste and general waste must be provided at the site camp.</li> <li>• Vehicles and machinery must be in good working order and must be regularly inspected for any leaks.</li> <li>• If a vehicle or machinery is leaking pollutants it must be removed from site and taken to an appropriate location for repairs.</li> <li>• Repairs to vehicles/ machinery should not take place in outside of the designated areas allocated for such activities, except in emergencies.</li> <li>• Drip trays must be utilized for vehicle/ machinery maintenance on site, where there is a risk of fuel/ oil/ lubricant spillage.</li> <li>• Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilizes fuel/ lubricant.</li> <li>• A spill kit to neutralize/treat spills of fuel/ oil/ lubricants must be available on site.</li> <li>• Soil contaminated by spilled oil/ fuel/ lubricant must be excavated and disposed of in the hazardous waste bin.</li> <li>• Refueling of vehicles/ machinery should not take place outside of the designated areas</li> </ul>

- unless strictly necessary. Where refuelling must occur, drip trays should be utilized.
- Vehicles and machinery must be kept in the site camp when not in use.
  - Chemical toilets should be kept at the site camp. Toilets must be regularly serviced and emptied and the waste disposed of at a licensed waste water treatment site.
  - Cement batching (if required) must take place on an impermeable surface sufficiently large to catch all cement slurry/ run-off. Cement waste must be disposed of in the appropriate waste bin.
  - No release of any substance i.e. cement, oil, that could be toxic.
  - Place the construction camp or any depot for any substance which causes or is likely to cause pollution outside of sensitive areas including the steep slopes.
  - Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid / hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately.
  - Domestic waste must be removed through the services of a waste contractor and a municipal waste site must be used for disposal.
  -

#### 5.1.15. Air Pollution / Dust Generation

<b>Potential Impact:</b> Dust generation and air pollution
<b>Applicable Legislation:</b> NEMAQA
<b>Objective:</b> To prevent air pollution
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No dust generation
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Speed limits of 30km/h must be enforced in all areas, including public roads and private property to limit the levels of dust pollution.</li> <li>• Dust must be suppressed on access roads and construction sites by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off.</li> <li>• All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks.</li> </ul>

## Environmental Management Programme

- All construction activities should be restricted to normal construction working hours.
- All vehicles exhausts systems should be in working order to limit air pollution.

### 5.1.16. Noise Pollution

<b>Potential Impact:</b> Noise pollution
<b>Applicable Legislation:</b> NEMA
<b>Objective:</b> To prevent noise pollution
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No noise pollution, no complaints from neighbours
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Speed limits of 30km/h must be enforced in all areas, including public roads and private property to limit the levels of dust pollution.</li> <li>• Dust must be suppressed on access roads and construction sites by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off.</li> <li>• All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks.</li> <li>• All construction activities should be restricted to normal construction working hours.</li> <li>• All vehicles exhausts systems should be in working order to limit air pollution.</li> </ul>

### 5.1.17. Traffic

<b>Potential Impact:</b> Impact on traffic
<b>Applicable Legislation:</b> NRTA, Municipal by-laws
<b>Objective:</b> To manage traffic
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No complaints from neighbours

**Monitoring Frequency:** Daily throughout

**Mitigation measures:**

- Proper traffic calming/ speed control should be implemented in attempt to manage the influx of vehicles and prevent accidents from occurring.
- The hiring of flagman to assist in directing vehicular traffic in a suitable manner.
- Regular maintenance of the access road should be implemented to ensure road stays in good condition.
- Sections of the Abrahamskraal road must be upgraded before operational phase.

### 5.1.18. Safety and Security

**Potential Impact:** Harm to people and property, Increase in crime

**Applicable Legislation:** OHS Act

**Objective:** To ensure safety and security to people

**Responsibility:** Contractor, ECO, CEO

**Monitoring Criteria:** Observation

**Performance Indicator:** No incidents

**Monitoring Frequency:** Daily throughout

**Mitigation measures:**

- The provisions of the OHS Act should be implemented at all times.
- Security must be appointed during the construction phase of the development to help prevent crime/theft from the proposed construction site and surrounding properties.
- Signs should be erected on all entrance gates indicating that no temporary jobs are available, thereby limiting opportunistic labourers and crime.
- All structures that are vulnerable to high winds must be secured (including scaffolds and toilets).
- All manhole openings are to be covered and clearly demarcated with danger tape.
- The contractor is to ensure traffic safety at all times, and shall implement road safety precautions for this purpose when works are undertaken on or near public roads.
- Necessary personal protective equipment (PPE) and safety gear appropriate to the task being undertaken is to be provided to all site personnel (e.g. hard hats, safety boots, masks etc.).
- All vehicles and equipment used on site must be operated by appropriately trained and / or licensed
- An environmental awareness training programme for all staff members shall be put in place by the contractor. Before commencing with any work, all staff members shall be

- appropriately briefed about the EMPr and relevant occupational health and safety issues.
- All construction workers shall be issued with ID badges and clearly identifiable uniforms.
  - Emergency procedures must be produced and communicated to all the employees on site. This will ensure that accidents are responded to appropriately and the impacts thereof are minimized.
  - Adequate emergency facilities must be provided for the treatment of any emergency on the site.
  - Emergency contact numbers are to be displayed conspicuously at prominent locations around the construction site and the construction crew camps at all times.
  - The contractor must have a basic spill control kit available at the construction site and offices.
  - Excavations must not be left open for longer than 14 days where at all possible.
  - Excavations must be barricaded/ fenced of at all times.

#### **5.1.19. Visual**

<b>Potential Impact:</b> Visual intrusion
<b>Applicable Legislation:</b> NEMA, NEMWA
<b>Objective:</b> To reduce visual intrusion
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> Clean site, no complaints
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Demarcate sensitive areas and no-go areas with danger tape to prevent disturbance during construction.</li> <li>• Plan construction times in such a manner to have the least impact on surrounding properties.</li> <li>• Keep disturbed areas to a minimum.</li> <li>• No clearing of land to take place outside the demarcated footprints.</li> <li>• Minimise waste generation on the construction site and recycle waste where possible.</li> <li>• Reduce and control dust through the use of approved dust suspension techniques as and when required.</li> <li>• Rehabilitate all disturbed areas in accordance with the Method Statement.</li> </ul>



## Environmental Management Programme

- Maintain access roads to prevent scouring and erosion, especially after rains.
- Storage facilities and other temporary structures on site must be located such that they have as little visual impact on local residents as possible.
- Soil excavated (if any) must not be stockpiled above 2m.
- All temporary structures erected on site for the purposes of the project's construction phase will be removed from site upon completion of the project.
- Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.
- The site must be clean and tidy at all times

### 5.1.20. Agriculture

<b>Potential Impact:</b> Loss of arable land
<b>Applicable Legislation:</b> CARA
<b>Objective:</b> To reduce impact on agricultural land
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
• <b>Performance Indicator:</b> No encroachment into agricultural crops, no complaints
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• The development must be contained within the site, either by a wall or fence structure so that no access to adjacent properties can take place.</li> <li>• Dust generation must be minimized as it reduces the quality of grazing grasses on adjacent properties.</li> <li>• Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities (not to be disposed of within the natural environment).</li> <li>• Any contaminated soil must be removed and the affected area rehabilitated immediately.</li> <li>• The implementation of an alien invasive control plan must form part of the construction and operational EMP for the development.</li> </ul>

### 5.1.21. Heritage

<b>Potential Impact:</b> Destruction of sites of archaeological and heritage significance.
<b>Applicable Legislation:</b> NHRA

## Environmental Management Programme

<b>Objective:</b> To reduce impact on heritage resources, to preserve heritage, cultural and archaeological sites
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No destruction of or damage to known archaeological sites, Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist, communication with SAHRA
<b>Monitoring Frequency:</b> Daily throughout
<p><b>Mitigation measures:</b></p> <ul style="list-style-type: none"> <li>• Firstly and mostly preferred is to fence the graves and compile a management plan to ensure their continuous conservation. This should be completed by a heritage specialist, and is done when graves are not in direct jeopardy by the proposed development.</li> <li>• The second and last option is Phase-2 mitigation (relocation of graves). This procedure entails social consultation and application of permits for those older than 60 years and unknown graves, while those less than 60 years of age, authorisation should be requested with respective departments. Further to this recommendation, the developer should ensure that the descendant of the graves are sought, and notified about this proposed development which might have an impact (directly or indirectly) on their graves.</li> <li>• No stone robbing or removal of any material is allowed. Any disturbance or alteration on this graveyard would be illegal and punishable by law. Furthermore, the developer should maintain a reasonable buffer zone around the identified graveyards (approximately 25 metres).</li> <li>• No dumping of construction material is allowed within this buffer zone and no alteration or damage on this site (buffer) may occur.</li> <li>• If the developer aims to demolish some of the features of the noted buildings or structures, it is strictly recommended that a second phase heritage impact assessment is conducted by a heritage specialist. This should be done before the commencement of the proposed development, and it will entail proper documentation of these structures, as well as application for the permit to demolish (or renovate) with the FSPHRA as stipulated by the legislature.</li> <li>• Alternatively, these structures can be integrated into the proposed development, in such instances, the developer will have to plan around these structures and include them in the layout plan. The current occupants of these houses are of important in the planning of the project. Conversely, the views of the occupants of these houses are crucial in planning for the potential resettlement plan.</li> <li>• Should any archaeological material be unearthed accidentally during the course of construction, SAHRA should be alerted immediately and construction activities be</li> </ul>

- stopped within a radius of at least 10m of such indicator. The area should then be demarcated by a danger tape. Accordingly, a professional archaeologist or SAHRA officer should be contacted immediately. In the meantime, it is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- It is mandatory to report any incident of human remains encountered to the South African Police Services, SAHRA staff member and professional archaeologist. Any measure to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law.
  -

#### **5.1.22. Waste (including Hazardous) Management**

<b>Potential Impact:</b> Visual impact, pollution
<b>Applicable Legislation:</b> NEMWA
<b>Objective:</b> To ensure proper waste and incident management on site
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, waste records, incident register
<b>Performance Indicator:</b> Waste management facilities on site, waste records
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Waste must be separated site.</li> <li>• Clearly labelled refuse bins must be provided at the construction site.</li> <li>• All waste must be transported and disposed of at a registered waste disposal site. Proof of safe disposal must be kept on site.</li> <li>• No waste may be disposed or buried on site.</li> <li>• Waste bins must be emptied regularly such that they do not overflow.</li> <li>• All construction waste must be discarded at a registered waste management facility / landfill site.</li> <li>• The Contractor will maintain 'good housekeeping' practices and ensure that all work sites and construction camp are kept tidy and litter free.</li> <li>• Hazardous waste must be collected in hazardous bins and disposed of at a registered hazardous waste landfill. Proof of disposal must be kept on site.</li> <li>• Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is minimised.</li> <li>• The contractor must prevent potential oil spills during construction.</li> <li>• Fuels, oils, hydraulic fluids, etc. must be stored in properly contained areas so as to</li> </ul>

## Environmental Management Programme

minimize accidental spillage.

- Drip trays must be placed under stationary vehicles.
- All spills must be reported to the ECO within 24 hours.
- A spill kit must be available on site at all times.
- Any accidental spills must be corrected immediately and recorded in the incidents register.

### **5.1.23. Stormwater Management**

<b>Potential Impact:</b> Impact on water resources
<b>Applicable Legislation:</b> NWA
<b>Objective:</b> To reduce negative impact on water resources.
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, site plan
<b>Performance Indicator:</b> No erosion or siltation
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Stormwater containing pollutants must not run-off into natural areas.</li> <li>• Stormwater shall be diverted from the construction works.</li> <li>• Steps must be taken to ensure that storm water does not lead to excessive levels of silt downstream.</li> <li>• Necessary storm water control mechanisms shall be employed to ensure the sustainability of all the structures.</li> <li>• Effort shall be made to ensure that storm water leaving the construction site is not contaminated or polluted.</li> </ul>

### **5.1.24. Fire**

<b>Potential Impact:</b> destroying of equipment and natural environment
<b>Applicable Legislation:</b> OHS Act
<b>Objective:</b> To reduce potential of fire breakout
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, site plan
<b>Performance Indicator:</b> No erosion or siltation
<b>Monitoring Frequency:</b> Daily throughout

**Mitigation measures:**

- Contractor must make sure that there is supervision for all fires that are used in the construction camp.
- Smoking should be prohibited in the vicinity of flammable substances.
- Fire-fighting equipment must be available on site, in particular where flammable substances are stored.
- Fire-fighting equipment and emergency plans must be in place prior to the construction phase.
- The contractor will plan and implement a fire prevention programs and develop a contingency plan in the event of any fire (Fire Management Plan)
- No refuse or waste may be burnt on site. The contractor will be responsible for all damages caused by the outbreak of a fire originating from a site where work is undertaken. Damage to adjacent properties will be to his account.
- The contractor is to provide cooking areas where fire risks will be minimized and controllable.

**5.1.25. Erosion**

<b>Potential Impact:</b> impact on soil
<b>Applicable Legislation:</b> CARA, NWA
<b>Objective:</b> To prevent erosion
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No evidence of erosion
<b>Monitoring Frequency:</b> Daily throughout
<p><b>Mitigation measures:</b></p> <ul style="list-style-type: none"> <li>• The contractor must protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage works</li> <li>• Prior to construction, all topsoil (top 300mm as a minimum) must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner so as to retain vegetation cover for as long as possible.</li> <li>• Stockpiled topsoil should not be compacted and should be replaced as the final soil layer.</li> <li>• Suitable measures should be employed to protect stockpiled soil from erosion. Such measures may include erosion berms, vegetation cover etc.).</li> <li>• Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter.</li> </ul>

## Environmental Management Programme

- Soil must not be stockpiled on drainage lines or near watercourses.
- Soils must be protected from invasive alien vegetation. If found, these must be mechanically removed from stockpiles.
- No soil may be imported onto site.
- The contractor must attend to the drainage of the camp to avoid standing water and or sheet erosion.

### 5.1.26. Concrete Mixing

<b>Potential Impact:</b> Soil and water pollution
<b>Applicable Legislation:</b> NEMA, NWA, NEMWA
<b>Objective:</b> To prevent pollution
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation
<b>Performance Indicator:</b> No evidence of spills
<b>Monitoring Frequency:</b> Daily throughout
<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>• Pre-mix concrete shall be the preferred option where possible.</li> <li>• The batching / mixing area must be properly designated and indicated on the site plan and it will be kept neat and clean at all times.</li> <li>• No batching / mixing activities will occur on a permeable surface.</li> <li>• Where concrete has been mixed, especially in the natural environment, all residues must be removed and disposed of in an environmentally responsible manner approved by the ECO.</li> <li>• Unused cement should not be left to dry on the ground. If proper housekeeping rules are complied with, most impacts should not affect the environment.</li> </ul>

### 5.1.27. Site Closure and Rehabilitation

<b>Potential Impact:</b> Land degradation
<b>Applicable Legislation:</b> NEMA
<b>Objective:</b> To prevent land degradation
<b>Responsibility:</b> Contractor, ECO, CEO
<b>Monitoring Criteria:</b> Observation, rehabilitation plan
<b>Performance Indicator:</b> No evidence of erosion, successful rehabilitation, vegetation

regrowth

**Monitoring Frequency:** On completion of construction

**Mitigation measures:**

- A site rehabilitation plan must be developed and kept on site during construction.
- All temporary structures and equipment used for construction activities must be removed upon completion of the project.
- All disturbed areas must be fully rehabilitated and protected from erosion.
- All waste and excess material shall be removed from the site upon completion of the work. Such material shall be disposed of at a registered waste facility.
- No waste or any materials shall be buried on the site.
- Re-seeding shall be done on disturbed areas in consultation with the ECO.
- Clearing of alien plants from the site must be implemented upon completion of works.
- Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grass species adapted to the local environmental conditions.

### **6.3. Operational Phase**

#### ***5.1.28. Storm water management***

- It is recommended that a proper storm water drainage system must be ensured on the site during operational phase. The storm water drainage system will assist in to preventing soil erosion on site.
- The contractors will be responsible to ensure that the storm water drainage system is maintained.
- Storm water should not be allowed to discharge onto bare soil but must be diverted to the surrounding grasslands or to the landscaped gardens during the operational phase.

#### ***5.1.29. Waste generation and disposal***

- The solid waste generated during the operational phase will be removed in a continuous and efficient manner to the satisfaction of the local municipality.
- No solid waste should be dumped on the site.
- In the event of leakage or incident occurring that leads to hazardous waste being discarded on the site, a professional company to be appointed to remove and clean up the waste as quickly as possible.

#### ***5.1.30. Visual impacts***

- To reduce visual impacts it is recommended that natural indigenous vegetation be used against the access roadsides and ground fillings to assist with stabilizing the roadsides and to limit soil erosion.
- Plants and adequate landscaping will also limit the visual impact of the development.

#### ***5.1.31. Environmental complaint register to be maintained***

- The environmental complaint register must be maintained during the operational phase.

#### ***5.1.32. Traffic and Road Maintenance***

- Access roads to be maintained with an acceptable surface, free of erosion and without surface water ponding.



- Proper traffic calming/ speed control should be implemented in attempt to manage the influx of vehicles and prevent accidents from occurring.
- Regular maintenance of the access road should be implemented to ensure road stays in good condition.

## **7. Environmental Monitoring**

Regular monitoring of all the environmental management measures and components shall be carried out by the ECO. Visual inspections on erosion and physical pollution shall be carried out on a regular basis. Dust will be generated during the construction phase and this must be monitored and dust suppression measures implemented. Monthly monitoring reports will be compiled and submitted to the project manager.

## **8. Environmental Audit**

Monthly environmental audits shall be conducted to determine compliance with the conditions of the EMPr and EA. These audits will ensure that the relevant authorities are kept informed about progress with the project and that they are given assurance that the project is implemented as prescribed by them. Audits will also ensure that any environmental contraventions/non-compliances are reported to the provincial Department of Environmental Affairs and corrected by the responsible parties. It is the responsibility of the ECO to report any non-compliance. The ECO will be responsible for the undertaking of these audits.

## **9. Document Control**

A copy of the EMPr and the EA will be made available on site at all times. The EMPr as well as the EA will be used for referral as the project progresses and will be provided to any member of the public or authority should they want.

## **10. General**

This EMPr will be accepted by the applicant and its appointed representatives such as engineers, contractors, architects and project managers. All conditions and recommendations will be implemented and the necessary records kept for `referral.

## Environmental Management Programme

---