

# DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

# THORNTREE EAST MIXED-USE DEVELOPMENT

## VARIOUS PORTIONS OF FARM HAAKDOORNBOOM NO.267 JR AND FARM KRUISFONTEIN 259 JR: CITY OF TSHWANE METROPOLITAN MUNICIPALITY

# **REFERENCE: GAUT 002/21-22/E2919**





# SEPTEMBER 2021

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Valumax (SAFDEV SSC (Pty) Ltd)

## **Project Name:**

Proposed Development of the Thorntree East Mixed-Use Development on various portions of Farm Haakdoornboom 267 JR and Kruisfontein 259 JR in the City of Tshwane Metropolitan Municipality

Authority Reference Number: GAUT 002/21-22/E2919

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## **Reviewed and Authorised by:**

Pirate Ncube

## Date:

September 2021

# LIST OFACRONYMS

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.

**COMMENCEMENT-** *means* the start of any physical implementation in furtherance of a listed activity or specified activity, including site preparation and any other action on the site or the physical implementation of a plan, policy, programme or process, but does not include any action required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

**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 interms 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, witht he 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 orsignificance.

**DEVELOPMENT** - This means any physical intervention, excavation, or action, other than those caused by natural forces, which 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
- 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 domesticu se.

**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;
- 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 EMPr 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.

**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, haveadetrimentalimpactonhealthandtheenvironment.

**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 SouthAfrica.

**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 oractivity.

**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 EMPr and Health and Safety Planas per the OHSA.

**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) toproperty.

**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. BACKGROUND INFORMATION

The applicant, Valumax (SAFDEV SSC (Pty) Ltd (hereafter referred to as Valumax), proposes to establish a mixed-use development with the overall objective of developing an integrated settlement which includes various zoning areas. To manage the EIA application, the applicant appointed Nali Sustainability Solutions (NSS) as the independent Environmental Assessment Practitioner (EAP) as required by the EIA Regulations, 2014.

#### 1.1. Property description

The development is proposed to take place on various portions of the farms Haakdoornboom 267 JR and Kruisfontein 259 JR, near Hebron in the City of Tshwane Metropolitan Municipality. **Table 1** lists the farm portions affected by the proposed development, including the size and SG code for each property. All listed properties are owned by the applicant, with the exception of the last two properties for which landowner consent has been obtained and was included in the application for EA.

The current zoning of the site is agricultural with most of the properties either being vacant or spotting limited residential and business uses. Therefore, this will be a green field development to the east of Soshunguve VV and Sushanguve East.

PROPERTY DESCRIPTION	SIZE (Ha)	SG code
Portion 118 Haardoornboom-267 JR	8.5653H	T0JR0000000026700091
Portion 128 Haardoornboom-267 JR	8.5653H	T0JR0000000026700128
Portion 130 Haardoornboom-267 JR	8.5653H	T0JR0000000026700130
Portion 131 Haardoornboom-267 JR	8.5653H	T0JR0000000026700131
Portion 132 Haardoornboom-267 JR	8.5653H	T0JR0000000026700132
Portion 134 Haardoornboom-267 JR	8.5653H	T0JR0000000026700134
Portion 135 Haardoornboom-267 JR	8.5653H	T0JR0000000026700135
Portion 136 Haardoornboom-267 JR	8.5653H	T0JR0000000026700136
Portion 137 Haardoornboom-267 JR	8.5653H	T0JR0000000026700137
Portion 138 Haardoornboom-267 JR	8.5653H	T0JR0000000026700138
Portion 39 Kruisfontein 259 JR	32.7362H	T0JR0000000025900039
Portion 14 Kruisfontein 259 JR	21.4133	T0JR0000000026700014
Portion 168 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700168
Portion 167 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700167
Portion 164 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700164
Portion 163 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700163
Portion 160 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700160
Portion 156 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700156
Portion 155 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700155
Portion 152 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700152
Portion 151 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700151
Portion 166 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700166
Portion 165 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700165
Portion 161 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700161
Portion 153 Haakdoornboom 267 JR	8.5653H	T0JR0000000026700153
Portion 13 Haardoornboom-267 JR	42.8266H	T0JR0000000026700013
Portion 169 Haardoornboom-267 JR	8.5653H	T0JR0000000026700169
Portion 172 Haardoornboom-267 JR	8.5653H	T0JR0000000026700172
Portion 177 Haardoornboom-267 JR	8.5653H	T0JR0000000026700177

## Table 1: Property information

PROPERTY DESCRIPTION	SIZE (Ha)	SG code
Portion 170 Haardoornboom-267 JR	8.5653H	T0JR0000000026700170
Portion 236 Haardoornboom-267 JR	8.5653H	T0JR0000000026700236
Portion 235 Haardoornboom-267 JR	8.5653H	T0JR0000000026700235
Portion 234 Haardoornboom-267 JR	8.5653H	T0JR0000000026700234
Portion 231 Haardoornboom-267 JR	8.5653H	T0JR0000000026700231
Portion 230 Haardoornboom-267 JR	8.5653H	T0JR0000000026700230
Portion 227 Haardoornboom-267 JR	8.5653H	T0JR0000000026700227
Portion 226 Haardoornboom-267 JR	8.5653H	T0JR0000000026700226
Portion 157 Haardoornboom-267 JR	8.5653H	T0JR0000000026700157
Portion 175 Haardoornboom-267 JR	8.5653H	T0JR0000000026700175

#### 1.2. Site location

The proposed development is located on portions of the farms Haakdoornboom 267 JR and Kruisfontein 259 JR to the north of Pretoria, approximately 35 km from Pretoria CBD. The Mabopane highway (R80) and Soutpan Road (M35) bound the proposed development to the west and east respectively. The Kaalplaas spruit and Metsi Metsuane spruit mark the edge of the development to the south and north respectively. The Hebron Road runs though the proposed development from west to east dividing it into two sections namely, Thorntree East North and Thorntree East South.

The following are the central coordinates of the site: 25°34'33.00"S, 28°08'10.00"E. Error! Reference source not found. illustrates the project location.



Figure 1: Locality Map

Soshunguve VV and Sushanguve East are locate west of the proposed project. As mentioned above, the Mabopane highway (R80) and Soutpan Road (M35) bound the proposed development to the west and east respectively.

The proposed development area is located in a mostly rural agricultural holdings setting with small scale farming making up a large part of the activities here. Large sections of the study area have been utilized for agricultural purposes for many years, while some related developments (homesteads, roads, powerlines) have also impacted on the development area.

Pretoria rural is situated to the east of the M35 with areas such as Rosslyn, Akasia and Onderstepoort located south of the proposed development.

#### **1.3.** Proposed land uses

The proposed Thorntree East mixed-use development entails the transformation of approximately 400 ha of agriculturally zoned land to an urban development and higher urban development, predominately affordable housing development which will include all supporting land uses and infrastructure services, such as:

The proposed Thorntree East mixed-use development entails the transformation of approximately 400 ha of vacant land located mostly in Zones 1 and 4 of the Gauteng EMF. The intention is to provide for urban development, predominately affordable housing development which will include all supporting land uses and infrastructure services, such as:

- Water, stormwater and sewage pipelines (upgrading of existing pipelines and construction of new pipelines);
- Roads (upgrading of existing roads and construction of new roads);
- Installation of electrical services
- Residential housing including bonded housing as well as site and services
- Social infrastructure including schools, Parks, Clinic and churches
- Business and commercial use.

### **1.4.** Details of the applicant

SAFDEV SSDC is part of the Valumax Group whose core business is to identify and facilitate the acquisition of well-located land for development and investment purposes, to improve the value of the land through acquiring the necessary land use rights and environmental authorisations, installing the required civil and electrical infrastructure, constructing the top-structures and the marketing and sales of the completed units to end-users (https://www.valumax.co.za/).

Aspect	Details
Applicant	Valumax (SAFDEV SSDC (PTY) Ltd)
Representative	Ferdinand Kerkhoff
Physical Address	78 Mogwane Street, Soshanguve, Thorntree View, Pretoria
Contact number	0827473735
Email address	ferdinand@valumax.co.za
Fax no	0866950239

#### **Table 2**: Details of the applicant



#### Figure 2:Layout Plan

#### 1.5. Details of the EAP

To ensure full compliance with the EIA Regulations (2014) promulgated under section 24 (5) of the National Environmental Management Act, 1998 NEMA (Act No. 107 of 1998) (NEMA), Nali Sustainability Solutions (Pty) Ltd, independent Environmental Assessment Practitioner (EAP) were appointed to manage the application process to obtain the Environmental Authorisation for the proposed project.

Aspect	Details
Name	Nali Sustainability Solutions (Pty) Ltd
Lead EAP	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
Contact details	Tel: 0824517120; Fax: 086 694 1178, Email: <u>ncube.nali@gmail.com</u>
Expertise/experience	More than 28 years' experience in spatial planning, environmental planning &
	management, including Strategic Environmental Assessments, Environmental Impact
	Assessments and reviews, as well as Compliance Monitoring and Reporting. Served in
	the DFA Tribunal, Environmental Advisory Committee, MEC Appeals Advisory Panel.
	Qualified Town Planner with master's in Real Estate and MBA.
Assistant EAP	Ms Candice Dürr
Contact details	Tel: 0743681824 Email: durrenvironmental@gmail.com
Expertise/experience	Over 7 years' experience in the environmental management field with vast experience
	and highly skilled in environmental impact assessment projects. Experienced in
	environmental management programmes, environmental monitoring and auditing and
	holds a BSc (Geography and Zoology) Hons degree in Environmental Management.

#### Table 3: Details of the EAP

## 2. MANAGEMENT OF THE ENVIRONMENTAL IMPACTS

The responsibility for the management of impacts emanating from the development and the implementation of the EMPr resides with Valumax. While external support will be required for the implementation of the project, the ultimate responsibility lies with the holder of authorisation. Below is an illustration in table form of the range of approaches to be undertaken to appropriately mitigate and manage potential environmental impacts that have been identified during the EIA Phase of the project, for the construction and operation phases of project activities.

#### 2.1. Approach to Impact Management

Avoidance	Avoiding activities that could result in adverse impacts on resources or areas considered sensitive.	
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative impacts.	
Preservation	The process of working to protect something valuable so that it is not damaged or destroyed (i.e. environmental resources and local communities' health and safety)	
Minimization	Limiting or reducing the degree, extent, magnitude or duration of adverse impacts through scaling down, relocating, redesigning and/or realigning elements of the project.	
Mitigation	Measures taken to minimize adverse impacts on the environment and social aspects.	
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.	
Rehabilitation	Repairing affected resources to their original state.	
Restoration	Restoring affected resources to an earlier (possibly more stable and productive) state, typically 'background' condition, where identified to be appropriate and reasonable. These resources may include soil and biodiversity.	

#### **Table 4**: Approaches to Impact Management

### 2.2. Summary of the Main Potential Impacts

The nature of these activities has potential impacts which need to be managed to ensure that the environment is not degraded during the construction or operation activities.

### Table 5: Summary of the main potential Impacts

Impact		Description of impact	
Pollution	of	Risk of contamination from runoff and accidental spills of fuels and oils from vehicles,	
surface	and	machinery and improperly stored materials or wastes.	
ground wat	ter		
Wetlands		Destruction of the wetland during construction	
		• Encroachment and disturbance of the flow and functionality of the system.	
		• Extension excavations in the installation of the infrastructure thereby impacting	
		negatively on the ecosystem.	
Fauna	and	• Degradation of the grassland vegetation, and vegetation associated with the	
Flora		wetlands and riparian areas.	
		Loss of habitat and SCC.	
Air Quality		Generation of fugitive dust, odours and fumes from vehicles during construction	
		phase from:	
		<ul> <li>Construction vehicles on site as well as trucks delivering material</li> </ul>	

• Areas cleared as part of excavations.
Emissions from excavation machinery and equipment.
Likely increase in noise pollution due to, among others, the excavations and site
clearing, revving vehicles and staff.
The management of waste during all stages of the project is important to prevent
illegal dumping and pollution of the environment.
Destabilisation of surface geology as a result of excavations. Potential erosion,
degradation and loss of topsoil due to excavation activities as well as stormwater
runoff.
Alteration of topography due to stockpiling of soil and excavations;
Stability of slopes.
Disruption of traffic during construction whereas the operational phase is likely to
generate additional traffic in terms of residents' vehicles.
A construction site can be a dangerous place and thus could result in harm to people
and property and by their nature act as a magnet to the unemployed, resulting in
large numbers of people gathering around the site.

## 3. KEY ASPECTS OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

#### 3.1. Purpose and objectives of the EMPr

An Environmental Management Programme (EMPr) provides measures for the prevention of undue or reasonably avoidable adverse environmental impacts while enhancing the positive environmental benefits of a development. An EMPr bestows a 'Duty of Care' on those who cause, have caused or may cause pollution or degradation of the environment as per Section 28 (1) of NEMA.

The specific objectives for this EMPr include providing:

- details of the applicant;
- details of the EAP
- an outline of the key legal requirements;
- requirements for compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- the key mitigation measures for the management of construction associated impacts;
- details of the roles and responsibilities of parties involved in the implementation of this EMPr;
- the monitoring programme which will enable a review of the success of the EMPr;
- an outline of mitigation measures and environmental specifications to be implemented in order to minimise the extent of the negative environmental impacts while optimizing the beneficial impacts;
- a method of monitoring and auditing environmental management practices during all phases of development;
- propose mechanisms for monitoring compliance with the EMPr and reporting thereon;
- specific time periods within which the measures contemplated in the Environmental Management Programme must be implemented, where appropriate.
- measures for the eradication of invasive alien plant species, where necessary.

### 3.2. Scope of the EMPr

In accordance with the requirements of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014, this EMPr is to be implemented by Valumax as well as any employee, contractor, agent or sub-contractor appointed to act on their behalf in the execution of the Project, in order to ensure environmental compliance onsite. The specifications outlined in this EMPr are thus applicable to all activities undertaken by the applicant as well as appointed contractors and all persons involved in the execution of the works including sub-contractors, the workforce, suppliers and volunteers for the duration of construction, operation and future maintenance.

An Environmental Code of Conduct has also been developed and 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 is limited by the level of adherence to the conditions set forth in the EMPr, the Contractor and Sub-contractors and the incorporation of these requirements the contractual clauses.

# **3.3.** Structure of the EMPr

The three main phases in the EMPr that provide mitigation measures are provided below.

## Table 6: Phases of the Project Life Cycle

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

## 4. MANAGMENT AND MONITORING PROCEDURES

#### 4.1. Roles and Responsibilities

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



**Figure 3: Project Organisational Structure** 

### 4.1.1 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 specialists 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.

#### 4.1.2 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.

### 4.1.3 The Contractor (including sub-contractors)

The Contractor is required to:

- Be fully conversant with the EMPr and all conditions of the Environmental Authorisation (EA), Water Use License (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.

### 4.1.4 Environmental Control Officer

The environmental control officer (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 Gauteng Department of Rural Development (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.

### 4.1.5 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.

### 4.1.6 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.

### 4.2. Compliance and Monitoring Provisions

This section sets out the various tools that are to be used to implement and monitor compliance to the EMPr.

#### 4.2.1 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 maximised.

#### 4.2.2 Monitoring

The specified monitoring requirements will not only to ensure compliance with the specifications in the EMPr, but also any environmental issues and impacts which may not have been identified in the EMPr that are, or could result in, significant environmental impacts for which corrective actions are required.

As part of the contract or work instruction, the developer will stipulate the period and frequency of monitoring required. This will be determined from applicable permits and authorisations from authorities which are to be viewed as supporting annexures to this EMPr.

#### 4.2.3 Documentation and Reporting

This section identifies documentation and actions required for effective monitoring and reporting.

#### Site 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; and
- 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 manifests.

- 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.

#### **Environmental Register**

The ECO will develop a profoma Environmental Register to be used onsite by the contractor. The contractor will ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident.
- Causes of complaint/incident.
- Details of complainant.
- 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.
- Proof of communication with complainant of how the issue has been /is being addressed.

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 requested by the Developer/Authorities.

### Non-Conformance Report

A Non-Conformance Report (NCR) may 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 an 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 adequately address the nonconformance 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.

#### **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 as it is aimed at responding specifically 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 (i.e. manpower) 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.

## **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 inn 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.

As a minimum the following Method Statements will be required to be generated:

- Blasting
- Construction site and office/yard establishment;
- Bridge construction;
- Cement mixing/concrete batching/bentonite mixing;
- Contaminated water;
- Control of dust;

- 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; and
- Stormwater Management.

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

The Developer/Contractor 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.
- Nature of activities on site;
- Adequate warning to passer-by of construction activities.

### 4.2.4 Compliance Requirements and Fines

The EMPr forms part of the Contract Documentation and is thus a legally binding. 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 Contract or fail stores pond adequately to complaints from the public.

Enforcement 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.

#### 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 stockpile 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

#### Table 7: Fines that may be Implemented

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

### 4.2.5 Environmental Code of Conduct

One of the objectives of the EMPr is to ensure that all the workforce, contractors, sub- contractors and construction staff have an understanding of environmental issues and potential impacts of activities on

site. This environmental code of conduct provides the basic rules that should be adhered to. It is the responsibility of the applicant to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

Table 8: Environmental Code of Conduct

#### **ENVIRONMENTAL CODE OF CONDUCT**

ALL PERSONS ON SITE ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT

Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution shall not be tolerated!

#### ENVIRONMENTAL RULES

- Do not waste electricity, water or consumables;
- Only use authorized accesses;
- Do not litter;
- Dispose solid waste to the correct waste containers provided;
- Prevent pollution;
- Use the toilet facilities provided;
- Do not dispose contaminated wastewater to the stormwater or the environment
- Immediately report any spillage from containers, plant or vehicles;
- Do not burn or bury any waste in the site and;
- Do not trespass onto private properties;
- Strictly leave all animals alone. Never tease, catch or set devices to trap or kill any animal.
- Never damage or remove any trees, shrubs or branches unless it forms part of working instructions and authorization has been received where necessary;
- Do not deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area;
- Know the firefighting procedure and locations of firefighting equipment; and know the environmental incident procedures.

# 4.2.6 Key legislation

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

## Table 9: Key legislation

Legislation	Relates to
The Constitution (No 108 of	Bill of Rights.
1996)	Provides for Environmental rights.
Advertising on Roads and Ribbon	Regulates the display of adverts at places visible from public roads.
Development Act, 1940 (Act No.	Also controls the depositing of machinery or refuse, and the
24 of 1940)	construction or laying of structures, near public roads.
National Environmental	Defines the strategic environmental management goals and
Management Act (No 107 of	objectives of the government. Applies through-out the Republic to
1998 [as amended])	the actions of all organs of state that may significantly affect the
	environment.
	Provides for the prohibition, restriction and control of activities
	which are likely to have a detrimental effect on the environment.
	The developer has a duty to care for the environment and to
	institute measures as may be needed to demonstrate such care.
Environment Conservation Act	Prevention of littering by employees and subcontractors
(No 73 of 1989) and Regulations	during construction and the maintenance phases of the
National Heritage Resources Act	No person may, without a permit issued by the responsible
(No 25 of 1999) and Regulations	heritage resources authority destroy, damage, excavate, alter,
	deface or otherwise disturb any archaeological or paleontological
	site. Also, no person may, without a permit, 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.
	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.
National Environmental	Provide for the protection of species and ecosystems that warrant
Management Biodiversity Act	national protection and the sustainable use of indigenous biological
(Act No. 10 of 2004)	resources.
Occupational Health and Safety	Control of dust and noise
Act (No 85 of 1993)	
National Water Act (No 36 of	No activity may take place within a watercourse unless it is authorised
1998) and Regulations	by the Department of Water and Sanitation (DWS). Any area within a
	wetland or riparian zone is therefore excluded from development unless
	authorisation is obtained from the DWS in terms of Section 21 (c) & (i).
National Road Traffic Act (No 93	Provides for road traffic matters which apply uniformly throughout
of 1996)	South Africa
SANS 10102 (Noice Pegulations)	The measurement and rating of environmental poice with respect to
SANS TOTOS (NOISE REGULATIONS)	annovance and to speech communication
	annoyance and to speech communication.

## 5. ENVIRONMENTAL ASPECTS, MITIGATION EASURES AND RESPONSIBILITIES

The EMPr specifies the minimum requirements to be implemented by the applicant in order to minimise 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 until such time that the GDARD or applicable environmental authority has formally absolved the person or developer from the responsibilities in this EMPr.

It is essential that the EMPr requirements are 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 period when the specific action will need to be implemented and the responsibility for such implementation.

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.

## • Action and monitoring Frequency

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

## 5.1. CATEGORY A: PRE-CONSTRUCTION PHASE

## 5.1.1 Authorisations, Permits, Licences and appointments

	ACTIONS AND CONTROLS	KEY INDIC	PERFORMANCE CATOR	RESPONSIBILI TY	MONITORING FREQUENCY
All	necessary permits and licenses must be obtained for the implementation of the activity;	• Al	ll necessary uthorisations,	Proponent/ developer	To be undertaken prior to the start of
~	contractual agreement with the contractors and sub-contractors for the duration of the proposed project;	licenses and permits obtained.	licenses and permits obtained.	constructio Once- off	construction phase. Once- off
~	Tender documents should, where possible, include the use of local communities/ organisations for the supply of services and labour during construction.	• Tł pa	ne EMPr, formed art of the contract.		
~	The contractor must ensure adequate provision in their budgets for the implementation of the EMPr and;	• A be	qualified ECO has een appointed		
~	Before any work commences on site the proponent must appoint an independent Environmental Control Officer (ECO) for the duration of the construction phase. The ECO to ensure that the mitigation/rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.				

## 5.1.2 Preparation of Method Statements

ACTIONS AND CONTROLS	KEY INDICATO	PERFORMANCE R	RESPONSIBILITY	MONITORING FREQUENCY
<ul> <li>Method Statements must be prepared by the contractor as identified in section 3 or requested. These may relate to water and stormwater management requirement traffic requirements, solid waste management requirements, fuel storage and filling ar dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated wat treatment, the storage of hazardous materials, standard emergency procedures, ar biohazard control.</li> <li>The ECO will monitor the implementation of the Statements.</li> </ul>	6 Method prepared	statements	Contractor	As required

# 5.1.3 Site Access and existing services

ACTIONS AND CONTROLS	K	Y PERFORMANCE	RESPONSIBILITY	MONITORING
<ul> <li>Routing</li> <li>The contractor must consider any limitations identified and recommendations made during th environmental studies when deciding on an access route to the construction site.</li> <li>The location of all underground services and servitudes must be identified and confirmed.</li> <li>Various properties may contain French drains as sewage systems and need to be carefull considered before construction commences. Adequate measures to prevent further soil and/o underground water pollution must be implemented and approved by the ECO prior to construction.</li> <li>Choice of access routes should consider minimum disturbance to residents/surroundin development.</li> </ul>		INDICATOR Appropriately located access route No undue environmental pollution from existing sewage services.	Contractor and ECO	FREQUENCY Once-off for each property

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	ACTIONS AND CONTROLS	KE	PERFORMANCE	RESPONSIBILITY	MONITORING
Hau	lage Roads	~	Minimal removal of	Contractor	Once off
~	All roads for construction access must be planned and approved by the Engineer and ECO before construction begins. They must not be created on ad-hoc bases.		vegetation for access routes		
~	The boundaries of the development footprint areas are to be clearly defined. All activities must remain within the defined footprint. The site must be safely fenced prior construction.				
~	Vehicles should be restricted to designated roadways to limit the ecological footprint of the proposed residential development and associated infrastructure development activities.				
$\checkmark$	Roads must follow natural contours to reduce stormwater erosion.				
~	Roads must have as little cut and fill as possible.				
~	Road widths and the radius of curves are to be reduced to the minimum required.				
~	No trees/shrubs/ground cover may be removed or stripped without permission of the Engineer/ECO.				
~	Agreed turning areas for haulage vehicles are to be formalized and used by the Contractor. No turning manoeuvres other than the designated places shall be permitted.				
~	Contractors shall construct formal drainage on all temporary roads in the form of side drains and mitre drains to prevent erosion and point source discharge of run-off.				
~	Scour checks can be constructed from rocks available on site or using driven wooden pegs. Smaller rocks must be placed on the invert of side drain upstream and downstream of the scour checks.				
~	Haulage roads must allow for the natural flow of water where required.				

# 5.1.4 Setting up and management of construction camp

ACTIONS AND CONTROLS		RESPONSIBILITY	MONITORING
	INDICATOR		FREQUENCY
Ablutions	Adequate chemical	equate chemical Contractor ets provided	Ongoing
<ul> <li>Where temporary chemical toilets must be provided by the Engineer.</li> </ul>	toilets provided		
<ul> <li>The construction of "long drop" toilets is forbidden.</li> </ul>			
<ul> <li>Under no circumstances may open areas or the surrounding bush be used as a toilet facility.</li> </ul>			
Provision for Camp Waste Disposal	Masta reguling		
• Bins and / or skips shall be provided at convenient intervals for disposal of waste within the construction camp.	station and waste containers provided		
<ul> <li>Bins should have liner bags for efficient control and safe disposal of waste</li> </ul>			
<ul> <li>Recycling and the provision of separate waste receptacles for different types of waste should be encouraged.</li> </ul>			
Establishing Storage Areas	Secure storage		
General Substance and Materials	areas that do not		
<ul> <li>Choice of location for storage areas must consider prevailing winds, distance to water bodies and general on-site topography.</li> </ul>	neighbouring properties		
<ul> <li>Storage areas must be designated, demarcated, and fenced if necessary.</li> </ul>			
<ul> <li>Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by children / animals etc.</li> </ul>	Bundend and/or secure storage		
<ul> <li>Fire prevention facilities must be present at all storage facilities.</li> </ul>	areas.		
<ul> <li>If electrical equipment for substations is stored on site a fire break will be required around the storage area.</li> </ul>			
Hazardous Substances and Materials- those that are potentially: poisonous, flammable, carcinogenic or toxic. Some examples of hazardous substances / materials: diesel, petroleum, oil, bituminous products cement, solvent based paints.	Visible signage		
✓ Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and	MSDS available		

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AC	TIONS AND CONTROLS	KEY PERFORMANCE INDICATOR	RESPONSIBILITY	MONITORING FREQUENCY
	hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.			
~	Hazardous storage and refuelling areas must be bunded with an impermeable liner to protect groundwater quality. The Contractor shall submit a method statement to the Engineer for approval.			
~	Storage areas containing hazardous substances / materials must be clearly signed.			
~	Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.			
~	Contractors shall submit a method statement and plans for the storage of hazardous materials and emergency procedures.			
M	aterials Management-Sourcing			
~	Contractors shall prepare a source statement (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the Engineer for approval prior to commencement of any work.	Material sourcing statement		
~	Where possible, a signed document from the supplier of natural materials should be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation.	Authorisations		
~	Where materials are barrowed (mined), proof must be provided of authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Minerals and Energy.	obtained		

## 5.1.4 Environmental Training and Awareness

	ACTIONS AND CONTROLS	KEY PERFORMANCE INDICATOR	RESPONSIBILITY	MONITORING FREQUENCY
~	<ul> <li>The EA and EMPr form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language. The induction training will, as a minimum, include the following: <ul> <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> </ul> </li> </ul>	Induction file Training undertaken Proof of toolbox talks conducted on site, including copies of signed registers and toolbox talk.	Contractor ECO SHE Officer	Once-off
~	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.			
~	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.			

## 5.2. CATEGORY B: CONSTRUCTION PHASE

# 5.2.1 Geological stability and soils

	ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING FREQUENCY
~	Water seepage during rainy seasons can be expected in the northern areas of the proposed site. The expected ground conditions for trench- and mass excavations are deemed to be generally "soft" to depths up to approximately 1.2m. Soil conditions over the area under consideration may vary considerably and can only be determined accurately by a Phase 1 geotechnical investigation and it is therefore recommended that such an investigation be undertaken by the applicant before commencement of construction.	Sub-surface drainage system installed. Appropriate stormwater management system installed along the eastern boundary of the	Developer Contractor	Ongoing During design and construction phase
~	Furthermore, the following recommendations are made by the engineer:	property		
<b>&gt; &gt; &gt;</b>	The use of concrete or HDPE or uPVC material for buried pipes is common practice at present in Gauteng and would be suitable for this proposed development. Sub-base and base materials for road foundations are normally imported for municipal roads in Tshwane. Mechanical stabilization of the in-situ material for lower selected layers may be considered for the pavement design, depending on the traffic requirements applicable to the development. Design of foundations, in accordance with an appropriate Code of Practice, is recommended. Recommendations for founding solutions for buildings are provided in the NHBRC Home Building Manual but all foundations designs must be carried out and specified by a professional engineer.	Sensitive area buffer zones as delineated by the specialist during the EIA process must be demarcated. All employees must be made aware that these are no-go zones and are to remain outside these areas.		
~	The appointment of a professional engineer or other approved competent person should be required for the purpose of structural and services design and must be made a prerequisite for building plan approval.	Topsoil stockpiles adequately covered with		
~	The footprint for vertical drilling should remain as small as possible, to limit the disturbance to the receiving environment;	weeds present.		
~	All excavated soil must be stripped and stockpiled within a designated area, in the vicinity of the construction site, outside of the freshwater resources and its 32m buffer zone. Further care must be taken to minimise the amount of material used for backfill which have abrasive surfaces.	Stripping, ripping and backfilling done as per specifications.		
~	Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed residential development and associated			

	ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
				FREQUENCY
	infrastructure development activities.			
~	Stockpiles must be protected from the wind and rain with the use of tarpaulins, where necessary;			
$\checkmark$	It must be ensured that weeds are eradicated from topsoil prior tospoiling;			
$\checkmark$	Litter and general waste must be removed from the soil prior to stockpiling;			
~	All/any erosion and silt control mechanisms need to be regularly maintained for the duration of the construction phase;			
~	All areas disturbed within the freshwater resources should be monitored for erosion and incision;			
~	Any areas compacted as a result of construction activities, where applicable, shall be ripped to a depth of approximately 150mm, using hand-held equipment, prior to being infilled with topsoil.			
~	Where possible, plants should be cut down to ground level instead of being removed completely to stabilise the soil during land-clearing operations;			
~	When excavated areas are backfilled the surface must be level with the surrounding land surface, unless stated otherwise, to minimise soil erosion from the areas when the excavation is complete.			
$\checkmark$	Attenuation of stormwater from the development site is important to reduce the velocity			
~	Attenuation measures during construction include but are not limited to – the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.			
~	Long term attenuation measures are recommended in the design of the development and can include permeable paving; infiltration trenches or swales.			

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## 5.2.2 Fauna and Flora

	ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING		
*	The boundaries of the development footprint areas are to be clearly defined. All activities must remain within the defined footprint. Should vegetation be cleared outside the development footprint; the affected areas should be rehabilitated to the better condition. Removal of vegetation must be restricted to the immediate area for construction. The burning of vegetation cleared or disposal on adjacent land is prohibited. Protected trees and	<ul> <li>Construction area demarcated.</li> <li>No-go areas demarcated</li> <li>Targeted removal</li> </ul>	Contractor	On going		
	species identified by an ecologist or ECO may not be removed or cut without a permit from the relevant provincial Department.	of vegetation in construction areas ✓ Alien vegetation				
~	Sparsely vegetated areas should be cleared first, with densely vegetated areas being cleared last.	<ul> <li>Alter vegetation removed</li> <li>No disturbance of wetland area outside of the construction area.</li> <li>No deliberate killing of fauna</li> <li>Wetland protected</li> <li>Adequate toilets provided</li> </ul>				
~	The removal of indigenous/endemic shrubs and small trees must be kept to a minimum and only be removed if absolutely necessary.		wetland area outside of the	nimum and wetland area outside of the		
~	Vehicles should travel only on designated roadways to limit the ecological footprint of the construction activities. Speed of vehicles should be limited to avoid injury of fauna and allow for sufficient safety margins.					
~	No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered);		<ul> <li>Wetland protected</li> <li>Adequate toilets provided</li> </ul>			
~	All development footprint areas and areas affected by associated infrastructure development should remain to the investigated area and should not encroach onto surrounding environment.					
~	Faunal habitat beyond the demarcated area should not be altered;					
~	All mitigation measures and recommendations should be adhered to ensure the ecology within the site as well as surrounding zone of influence is protected or adequately rehabilitated in order to minimise the deviations from the Present Ecological State.					
~	Particular attention needs to be paid to the wetland in order to ensure development related activities do not encroach unnecessarily and that ongoing functionality of these systems is maintained.					
~	Care must be taken to avoid the introduction of alien plant species on the site and surrounding areas. Where alien plants have been introduced, they must be removed. The					

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	ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
				FREQUENCY
	Contractor must develop an Action Plan for the removal of alien invasive species and submit it to the ECO and Ecologist for approval.			
~	No indiscriminate fires are allowed during the construction phase of the development.			
~	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.			
~	The wetland and associated buffer, except where authorised, must be strictly maintained as a no-go areas. No removal of any fauna and flora from this area of the site must be permitted.			
~	Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground water in the area. Mobile toilets must be provided in order to minimise unauthorised traffic of construction workers outside of the designated areas.			
~	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.			
~	Awareness programme for staff implemented to ensure that 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.			
~	No animals may be hunted, trapped, snared or captured for any purpose. Fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harms remaining faunal species. Dangerous animals should be handled by a competent person.			
~	Should any faunal or floral Species of Conservation Concern (SCC) be encountered within the zone of influence of the proposed linear development, effective relocation of individuals to suitable offset areas must occur.			
~	No construction material should be dumped on site.			
~	No collection of firewood, protected species or medicinal floral species must be allowed by construction personnel.			
~	No painting or marking of vegetation to identify locality or other information shall be allowed, as it will disfigure the natural setting. Marking shall be done by steel stakes with tags, if required.			
<ul> <li>Image: A start of the start of</li></ul>	Avoid translocating topsoil stockpiles from one place to another or importing topsoil from			

	ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	
	other sources that may contain align plant propagules			FREQUENCE
	other sources that may contain allen plant propagules.			
~	Only necessary damage must be caused: for example, unnecessary driving around in the veld should not take place.			
~	Any extensive cleared areas that are no longer or not required for construction activities should be re-seeded with locally sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site to encourage natural vegetation regeneration and limit erosion.			
~	Invasive Alien Plant eradication and control program should be developed.			
~	Indigenous trees currently present on site within the various properties should be kept wherever feasible.			

## 5.2.3 Waste Management

ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
	INDICATOR		FREQUENCY
<ul> <li>It must be ensured that construction related waste or spillage and effluent do not affect the immediate and surrounding habitat boundaries. Preferably, a centralised storage area for waste and recycling area must be created on site. General Waste produced on site includes:</li> </ul>	<ul> <li>Accessible Waste receptacles on site</li> </ul>	Contractor SHE	On-going/ Daily
<ul> <li>Office waste (e.g. food, waste, paper, plastic);</li> </ul>	$\checkmark$ Bins for different		
<ul> <li>Operational waste (clean steel, wood, glass); and</li> </ul>	waste streams provided		
<ul> <li>General domestic waste (food, cardboards, paper, bottles, tins).</li> </ul>	✓ Method statement		
$\checkmark$ Adequate number of general waste receptacles, including bins must be arranged around	available		
the Construction Camp, to collect all domestic refuse, and to minimise littering.	✓ Separated waste		
<ul> <li>Bins must be clearly marked and lined for efficient control and safe disposal of waste.</li> </ul>	on site		
✓ Different waste bins, for different waste streams must be provided to ensure correct waste	<ul> <li>Skips provided</li> </ul>		
separation.	🗸 No burning of		
<ul> <li>A fenced area must be allocated for waste sorting on the site.</li> </ul>	waste on site		
<ul> <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> </ul>	<ul> <li>✓ Waste disposal certificates available</li> </ul>		
<ul> <li>No general waste is to be disposed of at the spoilarea. Under no circumstances is waste to be burnt or buried on site. The excavation and use of rubbish pits on site is forbidden.</li> </ul>			
<ul> <li>Waste bins must be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance.</li> </ul>			
<ul> <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> </ul>			
<ul> <li>All waste must be disposed of at a 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 possible.</li> </ul>			

ACT	ACTIONS AND CONTROLS		RMANCE	RESPONSIBILITY	MONITORING
		INDICATOR			FREQUENCY
~	<b>Hazardous Waste</b> - Hazardous waste produced on site includes Oil and other lubricants, diesel, paints, solvent; Containers that contained chemicals, oils or greases; and Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen).	<ul> <li>Marked hazardous</li> <li>Disposal available</li> </ul>	bins for s waste certificate		
~	Hazardous waste is to be disposed of at a Permitted Hazardous Waste Landfill Site.				
~	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).				
~	A hazardous waste disposal certificate must be obtained from the waste removal				

## 5.2.4 Management of materials and or facilities

ACTIONS AND CONTROLS		RESPONSIBILITY	
<ul> <li>Toilets/ablution facilities- proper and adequate sanitation must be provided to prevent potential for diseases, pollution of soils, water resources. A minimum of one chemical toilet must be provided per 10 persons.</li> <li>Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type. The toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times.</li> <li>Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the ER, EO or ECO.</li> <li>The contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays.</li> </ul>	<ul> <li>Workforce use toilets as provided</li> <li>No complaints received from I&amp;APs</li> <li>No visible or measurable signs pollution of the environment (soils, ground and surface water)</li> </ul>	Contractor EO ECO	Ongoing with weekly monitoring checks.
<ul> <li>Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.</li> </ul>			

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ACT	IONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING	
		INDICATOR		FREQUENCY	
Stoc	kpiles- All stockpiled material must be easily accessible without any environmental damage.	<ul> <li>No visible erosion</li> </ul>	Contractor	Ongoing with	
~	All temporarily stockpiled material must be stockpiled in such a way that the spread of materials is minimised.	scars once construction is completed	EO	weekly monitoring checks.	
~	The stockpiles may only be placed within the demarcated areas the location of which must be approved by the EO or ECO prior to opening up of each phase of development.	<ul> <li>The footprint is confined to the</li> </ul>	200		
~	Stormwater run-off from the stockpile sites and other related areas must be directed into the storm water system that will be designed with the necessary pollution prevention measures such as silt traps. Storm water run-off may not run freely into the immediate and surrounding environments.	<ul> <li>demarcated area.</li> <li>Minimal invasive weed growth</li> </ul>	<ul><li>demarcated area.</li><li>Minimal invasive weed growth</li></ul>		
~	Stockpiles are to be stabilised if signs of erosion are visible. Stockpiles must not be higher than 2.5m to avoid compaction thereby maintaining the soil integrity and chemical composition.	✓ No signs of	is of		
~	Soils from different horizons must be stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material.	sedimentation and erosion			
~	Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the EO, and ECO.				
~	No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles.				
~	Topsoil stockpiles must be clearly demarcated as no-go areas.				

Oils	and chemicals	•	No	pollution of the	Со	ntractor	ongoing	
Oils	and chemicals Prevention of pollution of the environment and transgression of the acts controlling pollution. The contractor must provide method statements for the "handling & storage of oils and chemicals", "fire", and "emergency spills procedures". These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. The specific area may not be close to the riparian and 32m buffer zone at any time. Areas for fuels must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks. Storage areas must display the required safety signs depicting "no smoking", "no naked lights" and "Danger" containers must be clearly marked to indicate contents as well as safety requirements. Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for extended periods of time. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).	•	No env No Duu of act No I&A Me sta pre	pollution of the vironment litigation e to transgression pollution control s complaints from APs thod tements pared	Сон	ntractor	ongoing	
Cem	must be made available to the ECO.							
~	The contractors to provide and maintain a method statement for "cement and concrete batching". The method statement must provide information on storage, washing & disposal of cement, packaging, tools and plant.	~	No	evidence of aminated soil				

~	All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensedfacility.	<ul> <li>Method statement</li> </ul>	Contractor	ongoing
✓	Any spillage that may occur must be removed and immediate remedial action taken.			
~	Cement batching areas must be located away from sensitive areas so that residues are contained away from drainage lines, storm water channels, etc.			
~	Washing of containers, wheelbarrows, spades, picks or any other equipment that has been contaminated with cement or chemicals in the identified watercourses must be strictly prohibited.			

## 5.2.5 Social impacts

ACTI	ONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
		INDICATOR		FREQUENCY
Noise impact -To maintain noise levels below "disturbing" as defined in the national and provincial ✓ Noise Regulations		✓ No complaints from surrounding	Contractor	Monitored daily
~	Site workers must comply with the Provincial noise requirements.	residents and I & A Ps		
~	Noise activities shall only take place during working hours. Work hours must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the EO.	✓ Noise attenuation measures implemented.		

ACTI	ONS AND CONTROLS	K	ey perfor NDICATOR	MANCE	RESPONSIBILITY	MONITORING FREQUENCY
Dust	<b>impact</b> - To minimise dust from the site The contractor must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage (if any)	~	Method available No visible dust pollu	statement signs of tion	Contractor ECO	Monitored daily during dry periods.
•	Regular and effective damping down of working areas (especially during the dry months. periods) must be carried out to avoid dust pollution, impacting on adjacent residential areas and creating dangerous driving conditions on nearby roads.	~	No comp Surroundi and I&APs Damping	laints from ng residents down		
~	When necessary, these working areas should be damped down in the mornings and afternoons, by sprinkling bare areas with water.		undertaken	undertaken		
~	All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to.					
~	Dust nets must be used where the construction site borders the Residential Area.					

ONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
	INDICATOR		FREQUENCY
Visual impact -Minimise the visual impact of construction works.			
The disturbed areas shall be rehabilitated immediately after every section of the road is constructed. Temporary fencing must be put up around all construction sites to limit the public's view.	<ul> <li>Visual impacts minimised with no complaints</li> <li>Temporary</li> </ul>	sual impacts Contractor inimised with complaints ECO	Monitor daily
based on the site's context, its topography and cultural history.	<ul><li>✓ Stockpiles,</li></ul>		
Construction signage should not be obtrusive and should not be seen against the skyline.	signage and lighting not obtrusive to		
Indigenous trees should only be removed where absolutely necessary. The developer must cater for the cost of planting new trees during rehabilitation.	surrounding community.		
The Contractor shall not deface, paint, damage or mark any natural feature (e.g., rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand.	<ul> <li>No visual complaints</li> </ul>		
Construction activities should be restricted to daylight hours as far as possible, to limit the need to bright floodlighting and the potential for sky glow.	received.		
Possible mitigation measures that could be considered are the establishment of dense vegetation at strategic points to screen-off the most visible sections of the roads / construction of berms adjacent to the road/ a combination of berms with vegetation.			
	<ul> <li>al impact -Minimise the visual impact of construction works.</li> <li>The disturbed areas shall be rehabilitated immediately after every section of the road is constructed.</li> <li>Temporary fencing must be put up around all construction sites to limit the public's view.</li> <li>The development should be managed to fit the natural character and quality of the landscape based on the site's context, its topography and cultural history.</li> <li>Material stockpiles must not be higher than 3m.</li> <li>Construction signage should not be obtrusive and should not be seen against the skyline.</li> <li>Indigenous trees should only be removed where absolutely necessary.</li> <li>The developer must cater for the cost of planting new trees during rehabilitation.</li> <li>The Contractor shall not deface, paint, damage or mark any natural feature (e.g., rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand.</li> <li>Construction activities should be restricted to daylight hours as far as possible, to limit the need to bright floodlighting and the potential for sky glow.</li> <li>Possible mitigation measures that could be considered are the establishment of dense vegetation at strategic points to screen-off the most visible sections of the roads / construction of berms with vegetation.</li> </ul>	ONS AND CONTROLS         KEY PERFORMANCE INDICATOR           al impact - Minimise the visual impact of construction works. <ul> <li>Al impact - Minimise the visual impact of construction works.</li> <li>The disturbed areas shall be rehabilitated immediately after every section of the road is constructed.</li> <li>Temporary fencing must be put up around all construction sites to limit the public's view.</li> <li>The development should be managed to fit the natural character and quality of the landscape based on the site's context, its topography and cultural history.</li> </ul> <ul> <li>Material stockpiles must not be higher than 3m.</li> <li>Construction signage should not be obtrusive and should not be seen against the skyline.</li> <li>Indigenous trees should only be removed where absolutely necessary.</li> <li>The developer must cater for the cost of planting new trees during rehabilitation.</li> <li>The Contractor shall not deface, paint, damage or mark any natural feature (e.g., rocks, etc.).</li> <li>No visual complaints received.</li> <li>No visu</li></ul>	ONS AND CONTROLSKEY PERFORMANCE INDICATORRESPONSIBILITYal impact -Minimise the visual impact of construction works.If each state impact state impact of construction works.If each state impact

ACT	IONS AND CONTROLS	k	KEY PERFORMANCE	RESPONSIBILITY	MONITORING FREQUENCY	
<b>Traffic</b> – increase in traffic in the form of construction vehicles and heavy vehicles delivering materials to site and Restricted traffic flow in the vicinity of construction site		~	<ul> <li>✓ Un impeded through-flow of</li> </ul>	Contractor	Daily	
~	Clear construction signs must be displayed along the access road and entrance to the site indicating a presence of construction site and turning of construction vehicles.	~	traffic ✓ Visible signage placed			
~	The access road to be properly positioned and road signage provided to limit conflict with passing vehicular traffic.					
~	No construction vehicles are to be parked along the access road or in such a way as to block movement on any other roads leading to the neighbouring properties.					
~	Construction vehicles and activities must aim to avoid peak hour traffic times (weekdays 7-8am and 5-6pm).					

ACTIONS AND CONTROLS		KEY PERFORMANCE	RESPONSIBILITY	MONITORING	
		INDICATOR		FREQUENCY	
Safe	ty and security -Ensure the safety and security of the public.	<ul> <li>Visible signs placed.</li> </ul>	Contractor	Monitored	Daily
* *	Although regarded as normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even on the application site ifnecessary. With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included).	<ul> <li>No incidences reported</li> <li>Barrier tape/netting erected around excavations</li> </ul>	ECO Site supervisor	and ongoing	
~	Construction vehicles and activities to avoid peak hour traffictimes.				
~	<ul><li>The following actions would assist in management of safety along the road:</li><li>Adequate road marking;</li></ul>	<ul> <li>Emergency procedures available</li> </ul>			
	Allowance for pedestrians and cyclists where necessary;				
	• Erect proper signs indicating the danger of the excavation in and around the site; and	🗸 No detrimental fire			
~	All areas that are excavated to a depth of 1.5 m and more must be marked with barrier tape to reduce the risk of injuries.	hazards			
~	The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.				
~	The contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.				
~	The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.				
~	Fires shall only be permitted in specially designated areas and under controlled circumstances.				

ACTIONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
	INDICATOR		FREQUENCY
Cultural and heritage - Avoid the destruction of the heritage and archaeological resources	<ul> <li>No destruction or</li> </ul>	Contractor	Daily for duration of
All construction workers are to be educated on cultural and heritage resources so as to be able to identify such features should they be unearthed.	damage to discovered cultural	Site supervisor	construction.
Work should be stopped immediately, and the ECO must be informed.	resources.		
The ECO shall follow the correct procedure to barricade such an area and to inform the Developer to appoint a suitably qualified heritage specialist to assess the site.			

#### 5.3. CATEGORY C: POST CONSTRUCTION PHASE

#### 5.3.1 Rehabilitation

ACT	IONS AND CONTROLS	KEY PERFORMANCE	RESPONSIBILITY	MONITORING
		INDICATOR		FREOUENCY
~	All areas with compacted soils should be rehabilitated, stripped or ripped to break the compacted soil surface to approximate natural slope of the proposed development area so as to allow revegetation and erosion control. Access tracks should be limited to the planned access points.	<ul> <li>Rehabilitation plan implemented.</li> <li>Compacted areas ripped and prepared</li> </ul>	Contractor	Immediately following completion of construction
~	Storm water outlets should be designed and constructed so that no concentration of flow takes place off the development.	for seeding.		
~	Improper rehabilitation of the areas affected by development could result in erosion and altered overland flows from the immediate catchment to adversely affecting the hydrology and morphology of the wetland on the site.	<ul> <li>And waste removed from site.</li> <li>Planted indigenous vegetation</li> </ul>		
~	The Developer is responsible for compliance with the provisions for Duty of Care and Remediation of Damage in accordance with Section 28 of National Environmental Management Act (NEMA), Act No.107 of 1998.			
~	All remaining maintenance materials, building rubble and waste are to be removed from the site.			
~	All disturbed surfaces compacted by maintenance activities including the ablutions and loading areas should be ripped to a minimum depth of 30cm to allow organic contaminants to breakdown and promote vegetation establishment.			
~	Rehabilitation or re-vegetation of the disturbed areas must take place during or immediately after construction is complete.			
~	Only appropriate indigenous vegetation should be used for the rehabilitation and revegetation within the disturbed area.			
~	Final rehabilitation must be completed within a period specified by the Project Manager.			
~	All disturbed areas must be successfully rehabilitated within 3 months of completion of the works.			
~	Rehabilitation efforts must ensure that no visible erosion scars remain three months after completion of the contract			
~	Re-seeding must be done on disturbed areas as directed by the ECO.			

## 5.3.2 Site clean-up, and establishment

ACTIONS AND CONTROLS	KEY PERFORMANCE INDICATOR	RESPONSIBILITY	MONITORING FREQUENCY
<ul> <li>Site clearing</li> <li>Removal and proper disposal of waste.</li> <li>No materials to wash into the stormwater system</li> <li>Remove erosion and sediment controls only if all bare soil is sealed, covered or re-vegetated.</li> <li>Decontaminate and collect waste in storage area for off-site recycling or disposal Arrange for final collection and removal of excess and waste materials.</li> </ul>	<ul> <li>No pollution of the stormwater system</li> <li>No waste and litter remaining on site is completed</li> </ul>	Contractor	Immediately on completion of construction
<ul> <li>Vegetation establishment         <ul> <li>-Agreed schedule for regular follow-up watering, weed control, mulch supplements and amenity pruning, if needed.</li> <li>Replace all plant failures within a three-month period afterplanting.</li> <li>Upon completion of construction and rehabilitation the ECO should assess and approve the adequacy of the rehabilitation and ensure that sufficient levels of rehabilitation have been undertaken to allow re-establishment of the necessary vegetation.</li> <li>Rehabilitation works should be monitored until 80 % of vegetation has established</li> </ul> </li> </ul>	<ul> <li>Site successfully rehabilitated</li> <li>Re-vegetation stabilize the soil</li> </ul>	ECO Specialist Contractor	Post construction
<ul> <li>ECO close-out inspection</li> <li>✓ ECO to undertake last inspection of site and sign off that the EMPr has been complied with or identify breaches.</li> <li>✓ Submit to GDARD for approval.</li> </ul>	Last inspection report produced and submitted to GDARD	ECO	Once-off or as required

## 5.3.3 Monitoring and Maintenance

ACTIONS AND CONTROLS	KEY PERFORMANCE INDICATOR	RESPONSIBILITY	MONITORING FREQUENCY
✓ The conditions of the development must be monitored after completion to ensure that erosion is not taking place and that stormwater management measures are working;	Monitoring of completed works must be undertaken	НОА	Post construction
<ul> <li>A maintenance method statement should be developed prior to maintenance works being undertaken.</li> </ul>			
✓ Edge effects, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b and 2 AIP species (as listed in the NEMBA Alien species lists, 2016), in line with the NEMBA Alien and Invasive Species Regulations (2014);			
✓ Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas; and			
<ul> <li>Alien vegetation removed must not remain on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility.</li> </ul>			

## 6. CONCLUSION

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a live day-to-day management document. If continuously reviewed and managed correctly the EMPr will result in successful construction and operation of the proposed development.

The EMPr must inform contractual documentation, so that the contractors are made aware of the potential cost and timing implications for the implementation of the EMPr, thus adequately costing for them.

Further guidance should also be taken on any conditions contained in the Environmental Authorisation, if the project is granted approval, and that the said conditions form part of and are an extension of the EMPr requirements.