

ANDEON X47 RESIDENTIAL TOWNSHIP
PROPOSED RESIDENTIAL TOWNSHIP ON PORTION 183
(A PORTION OF PORTION 179) OF THE FARM ZANDFONTEIN 317-JR
CITY OF TSHWANE METROPOLITAN MUNICIPALITY

GAUT 002/21-22/E3018

ENVIRONMENTAL MANAGEMENT PROGRAMME

MARCH 2022

COMPILED BY ENVIRONMENTAL ASSESSMENT PRACTITIONER



Contact Person: Ronel Dreyer
Cell: 082 375 2015
Email: roneld@isquare.co.za

FOR APPLICANT



Cosmopolitan Projects Johannesburg (Pty) Ltd

Care of Mr Ian Janse van Rensburg
Cell: 083 413 1329
Email: IanJ@cosmopro.co.z

LIST OF CONTENTS

1. INTRODUCTION

- 1.1 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
- 1.2 DETAILS OF THE PERSON WHO PREPARED THE EMPr
- 1.3 DETAILS OF THE PROPOSED ACTIVITY
- 1.4 DETAILS OF PERSONS RESPONSIBLE FOR IMPLEMENTATION OF EMPr
- 1.5 AGREEMENT & UNDERTAKING OF THE APPLICANT
- 1.6 COMPLIANCE WITH RELEVANT LEGAL REQUIREMENT
 - 1.6.1 *National Environmental Management Act (Act 107 of 1998)*
 - 1.6.2 *The National Heritage Resources Act (Act 25 of 1999)*
 - 1.6.3 *Occupational Health & Safety Act, 1993 (Act Nr 181 of 1993)*
 - 1.6.4 *The National Water Act, 1998 (Act No 36 of 1998)*
- 1.7 PROPOSED MECHANISM FOR COMPLIANCE
- 1.8 NON-COMPLIANCE

2. SPECIFICATIONS APPLICABLE THROUGHOUT ALL PHASES OF PROJECT DEVELOPMENT

- 2.1 ROLES AND RESPONSIBILITIES
- 2.2 ENVIRONMENTAL AND HEALTH TRAINING AND AWARENESS
- 2.3 EMERGENCY PREPAREDNESS
- 2.4 SPILLAGES
- 2.5 FIRE MANAGEMENT

3. DESIGN AND PRE-CONSTRUCTION PHASE

- 3.1 APPROVALS AND CONSENT
 - 3.1.1 *Town Planning*
 - 3.1.2 *Engineering Services Agreement*
- 3.2 DESIGN AND PLANNING REQUIREMENT
 - 3.2.1 *Engineering Services*
 - 3.2.2 *Groundwater*
 - 3.2.3 *Storm Water Management*
 - 3.2.4 *Green Approach*
 - 3.2.5 *Landscape Development Plan*
- 3.3 CONSTRUCTION SITE
- 3.4 APPOINTMENT OF CONTRACTORS

4. CONSTRUCTION PHASE

- 4.1 GENERAL ENVIRONMENTAL REQUIREMENT
- 4.2 GROUNDWATER
- 4.3 EROSION
- 4.4 WASTE MANAGEMENT
 - 4.4.1 *General Waste*
 - 4.4.2 *Construction Waste*
 - 4.4.3 *Sewage*
 - 4.4.4 *Hazardous Waste*
- 4.5 COMMUNITY (LIAISON, SAFETY, SECURITY, NOISE, DUST, ETC.)
 - 4.5.1 *Labourers*
 - 4.5.2 *Noise*
 - 4.5.3 *Dust*
 - 4.5.4 *Other Measure*
- 4.6 SITE CLEARANCE AND LANDSCAPING
 - 4.6.1 *Site Clearance*
 - 4.6.2 *Landscaping*

5. OPERATIONAL PHASE

- 5.1 LANDSCAPING
- 5.2 MONITORING AND RECTIFICATION
- 5.3 STORMWATER MANAGEMENT
- 5.4 WASTE MANAGEMENT
 - 5.4.1 *General Waste*
 - 5.4.2 *Hazardous Waste*
- 5.5 RECOMMENDED GREEN APPROACH
- 5.6 GENERAL
- 5.7 DECOMMISSIONING

Annexures

- Annexure A Township Layout***
- Annexure B Environmental Impact Assessment Table***
- Annexure C Environmental Authorisation (to be attached once available)***

1. INTRODUCTION

Note that this Environmental Management Programme (EMPr) should be read and implemented in conjunction with the following documents attached as annexures.

- ❖ *Environmental Impact Assessment Table*
- ❖ *Environmental Authorisation (once issued)*

This EMPr, once accepted/approved by the Gauteng Department of Agriculture and Rural Development (GDARD) (normally approved as part of the Environmental Authorisation) is a legally binding document and must be adhered to during all phases of project development.

1.1 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

The Environmental Management Programme (EMPr) has the following objectives:

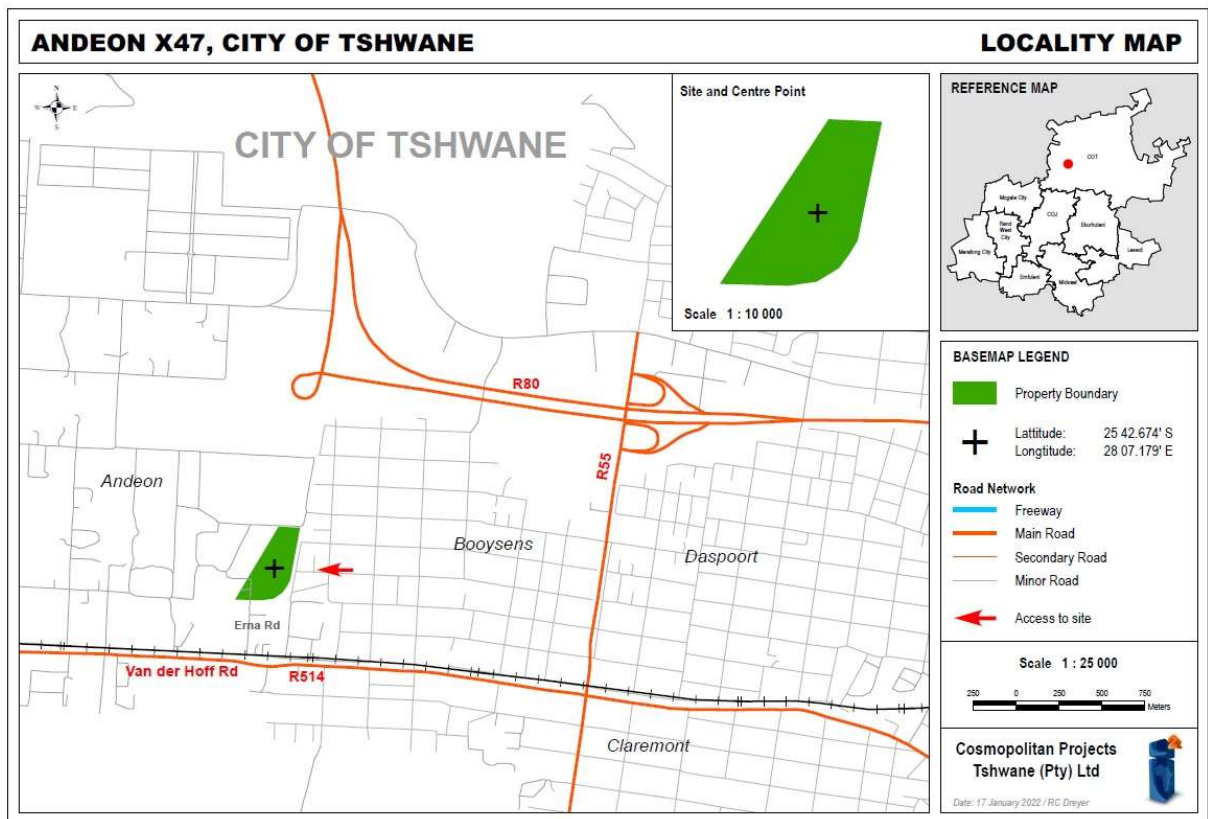
- To state the standards and guidelines which the Applicant will be required to adhere to in terms of environmental legislation;
- To set out the mitigation measures and environmental specifications which the Applicant will be required to implement for the design, construction and implementation phases of the project in order to minimize the extent of environmental impacts, and where possible to improve the condition of the environment;
- To provide guidance regarding the method statements which the Applicant will be required to compile and implement to achieve the environmental specification;
- To define corrective actions which the Applicant must take in the event of non-compliance with the specifications of this EMPr;
- To mitigate potential negative impact associated with the project and ensure optimization of positive impact;
- To prevent long-term or permanent environmental degradation;
- To ensure that the applicant, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- To ensure that communication channels to report on environment related issues are in place.

1.2 DETAILS OF THE PERSON WHO PREPARED THE EMPR

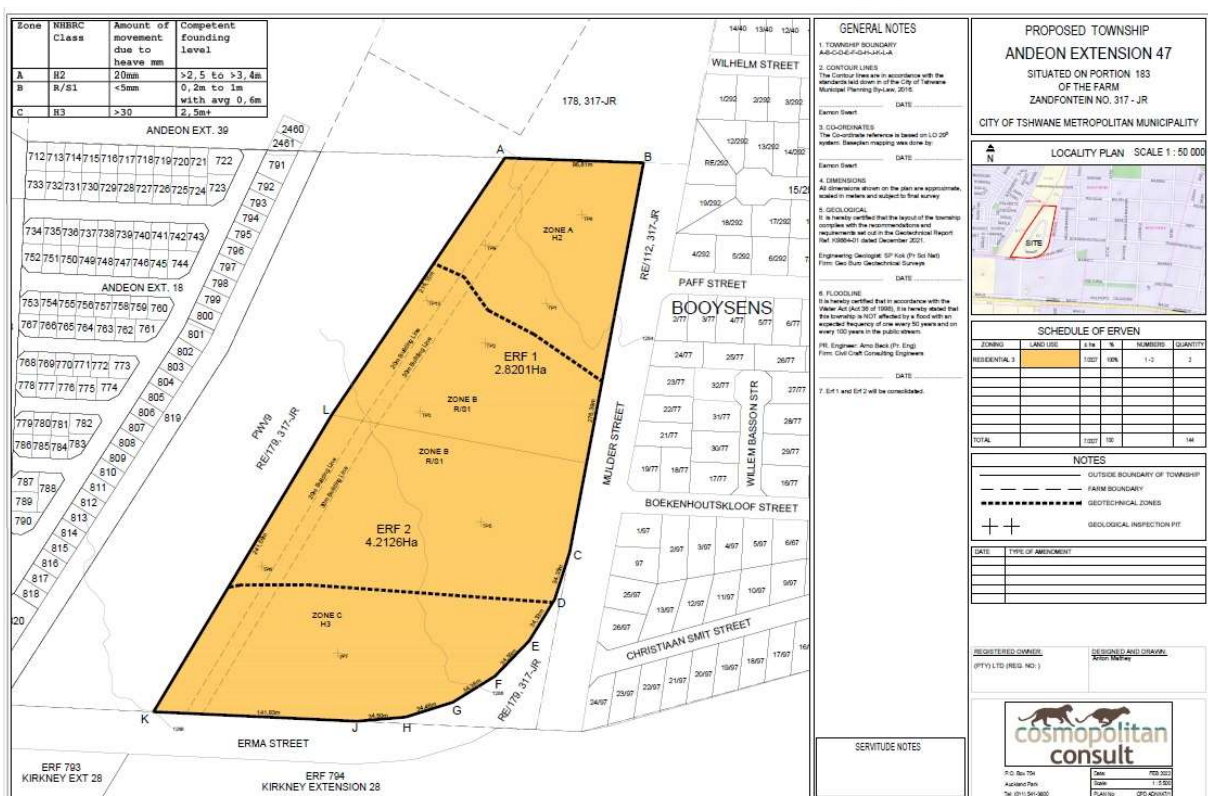
This Environmental Management Programme was prepared by Ms Ronel Dreyer from Isquare Information Systems cc. Contact details are on the cover page of this document and Company Profile and Curriculum Vitae are available on request to roneld@isquare.co.za.

1.3 DETAILS OF THE PROPOSED ACTIVITY

The application involves the establishment of a Residential Township Andeon X47 on Portion 183 (a Portion of Portion 179) of the Farm Zandfontein 317-JR, within the jurisdiction of City of Tshwane Metropolitan Municipality, Gauteng Province. The proposed site of approximately 7 hectares has a current zoning of "Agriculture".



The final site layout must be provided in Appendix A of this EMPr in an appropriate scale. Below is the concept layout which was provided in the application for Environmental Authorisation.



1.4 DETAILS OF PERSONS RESPONSIBLE FOR IMPLEMENTATION OF EMPR

The Applicant of the proposed residential township is:

Cosmopolitan Projects Tshwane (Pty) Ltd
Contact Person: Mr Ian Janse van Rensburg
Tel No: 087 405 3921
Cell: 082 450 6373
Email: lanJ@cosmopro.co.za

This company is ultimately responsible for the implementation of all requirements in terms of this Environmental Management Programme.

1.5 AGREEMENT & UNDERTAKING OF THE APPLICANT

The Applicant must confirm his knowledge and awareness of the content of this Environmental Management Programme as well as his responsibility to comply with relevant legislation pertaining to the nature of the work to be done.

By submitting this signed document to the Gauteng Department of Agricultural and Rural Development prior to construction as per legal requirement, the Applicant confirms his/her knowledge and awareness of the content of this Environmental Management Programme, as well as his responsibility to comply with relevant legislation pertaining to the nature of the work to be done.

Signed on behalf of: _____

Date: _____

Place: _____

Signature: _____

Full Name: _____

Physical Address: _____

Postal Address: _____

Office Telephone Number: _____

Email Address: _____

The Applicant must appoint an Environmental Control Officer (ECO) for the duration of the construction period to ensure that the approved EMP is implemented and enforced where required.

1.6 COMPLIANCE WITH RELEVANT LEGAL REQUIREMENT

Legal requirement directly related to this Environmental Management Programme is summarised below:

1.6.1 National Environmental Management Act (Act 107 of 1998)

An application for Environmental Authorisation was submitted in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.982 of December 2014 as amended. Environmental Authorisation was requested for the following listed activity:

GOVERNMENT NOTICE 983: LISTING NOTICE 1	
Activity Number 27	<i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for — (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i>

GOVERNMENT NOTICE 985: LISTING NOTICE 3	
Activity Number 12	<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i>

In terms of the NEMA legislation, an application for environmental authorisation will be lodged with the **Gauteng Department of Agriculture and Rural Development (GDARD)**.

No activity apart from those specified and approved above, may take place in the absence of approval by GDARD.

1.6.2 The National Heritage Resources Act (Act 25 of 1999)

The township falls within the scope of Section 38 of the National Heritage Resources Act, (NHRA), (Act 25 of 1999) and the applicable activities are:

- the construction of a road, wall, power line, pipeline, canal or similar form of linear development or barrier exceeding 300m in length;
- any development or other activity which will change the character of a site;
- exceeding 5 000m² in extent;
- involving three or more existing erven or subdivisions thereof;
- the re-zoning of a site exceeding 10 000m² in extent.

No obvious cultural heritage resources or graves are present on this relatively small development area.

The subterranean presence of archaeological and/or historical sites, features or artefacts is always a distinct possibility and may only become known when excavations are done during the construction phase. Care should therefore be taken when development commences that if any of these are discovered, construction must immediately be halted and PHRA-G contacted to confirm further actions.

Contact details of the Competent Authority are:

The Provincial Heritage Resources Agency of Gauteng
The Assistant Director: HIA Applications, Ms Tebogo Molokomme (HIA Applications)
Tel 011 355 2545 / 072932 0866
Email: Tebogo.molokomme@gauteng.gov.za

1.6.3 Occupational Health & Safety Act, 1993 (Act Nr 181 of 1993)

The purpose of the Act is “to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith”.

A Safety Officer must be appointed by the applicant and must at all times ensure that the safety and operation of the residential township development complies with the requirements for health and safety as prescribed in the Occupational Health and Safety Act (OHS), 1993 (Act No/181 of 1993), as amended.

1.6.4 The National Water Act, 1998 (Act No 36 of 1998)

The National Water Act (NWA) guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of ‘listed water uses’ encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources. In terms of Section 19 (1) of the National Water Act, Act No 36 of 1998 “An owner of land, a person in control of land or a person who occupies or uses the land on which (a) any activity or process is or performed or undertaken; or (b) any other situation exists which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution of a water resource from occurring, continuing or recurring.”

The Department of Water & Sanitation (DWS) is the administering body in this regard.

No watercourse exists on site or in relative close proximity to the site; therefore the proposed residential township will not require Water Use Authorisation in terms of Section 21 (c) impeding or diverting the flow of water in a watercourse or Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. No water courses are however affected by the proposed development; therefore Water Use Authorisation is not required.

1.7 PROPOSED MECHANISM FOR COMPLIANCE

Refer to the *Environmental Impact Assessment Table* included as Annexure B, which provides a site-specific description and assessment of impacts associated with this project, inclusive of the responsible parties.

Key impacts generally associated with environmental impact resulting from township development during one or more phases of project development are:

During the Design and Pre-Construction Phase

- Impact on groundwater
- Loss of agricultural land
- Impact on cultural-heritage component
- Increased run-off resulting in erosion and a loss of soil

During the Construction Phase

- Impact on the natural system (fauna & flora)
- Increased risk for groundwater pollution
- Increased risk for erosion resulting from construction activities
- Influx of labourers with associated crime, access control, risk for habitat destruction
- Health & safety risk to contractors
- Impacts associated with construction activities such as noise and dust
- Impacts related to chance archaeological findings, graves and/or heritage artifacts

During the Operational Phase

- Continuous risk for groundwater pollution
- Increased run-off resulting in erosion
- Increased pressure on municipal infrastructure

Specifications and conditions are hereby provided to limit and/or prevent impact during all the phases of project development, under the following headings:

- Specifications applicable throughout all Phases of Project Development
- Design & Pre-construction Phase
- Construction Phase
- Operational Phase

1.8 NON-COMPLIANCE

Non-compliance with the specifications of the EMPr constitutes a breach of contract for which the Applicant must be notified accordingly.

The Applicant will be deemed not to have complied with the EMPr if

- there is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and access roads;
- there is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site;
- environmental damage ensued due to negligence;
- construction activities take place outside the defined boundaries of the site;
- the Applicant fails to comply with corrective or other instruction.

2. SPECIFICATIONS APPLICABLE THROUGHOUT ALL PHASES OF PROJECT DEVELOPMENT

2.1 ROLES AND RESPONSIBILITIES

The Applicant will

- be responsible for the overall implementation of the Environmental Management Programme
- ensure that all third parties (i.e. Contractors; suppliers, etc.) comply with the requirements of this EMPr.

Responsibilities include the following measures in terms of Environmental and Health Training and Awareness; Emergency Preparedness; Spillage and Fire Management,

2.2 ENVIRONMENTAL AND HEALTH TRAINING AND AWARENESS

The contractor will ensure that its employees are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations. It is proposed that all employees should have an induction presentation on environmental awareness. Where possible the presentation will be conducted in the language of the employees.

The environmental training should, as a minimum, include the following:

- The importance of conforming with relevant environmental policies, procedures, plans and systems;
- The significant environmental impacts, actual or potential, which could result from their work activities;
- Implementation of spillage containment emergency plan, including the usage of spill containment kit.
- The environmental benefits of improved personal performance;
- The roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures to be implemented when carrying out their work activities;
- The importance of not littering;
- The need to use water sparingly;
- Details of, and encouragement to, minimizing the production of waste and re-use, recover and recycle waste where possible;
- Details regarding archaeological and/or historical sites which may be unearthed during construction as well as the procedures to be followed should these be encountered.

2.3 EMERGENCY PREPAREDNESS

- The Contractor and/or the Applicant must ensure that there will be an appropriate response to unexpected and/or accidental actions or incidents that will cause environmental impacts, throughout the life cycle of the project. Such incidents may include, inter alia:
 - Accidental discharges to water and land;
 - Accidental exposure of employees to hazardous substances;
 - Accidental veld fires;
 - Accidental spillage of hazardous substances;
 - Specific environmental and ecosystem effects from accidental releases or incidents
- Construction and permanent employees shall be adequately trained in terms of incidents and emergency situations.
- An emergency preparedness plan will include details of the organization (manpower) and responsibilities, accountability and liability of personnel.
- The emergency preparedness plan shall include a list of key personnel.
- Details of emergency services (e.g. the fire department, spill clean-up services, etc.) shall be listed.

- Internal and external communication plans, including prescribed reporting procedures shall be listed.
- Actions to be taken in the event of different types of emergencies shall be included.
- All major and minor incidents should be documented and made available to all relevant role players on site.
- Incident management protocols should include considerations for air, groundwater, soil and surface water.
- Spill clean-up kits and absorbent material must be kept on site to assist in immediate clean-up of any hazardous material spillages.
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release shall be listed.
- Training plans, testing exercises, and schedules for effectiveness shall be included.
- The Contractor and the Applicant will comply with the emergency preparedness, and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the National Environmental Management Act, 1998 (Act No 107 of 1998), the National Water Act, 1996 (Act No 36 of 1996) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended, and/or any other relevant legislation.

2.4 SPILLAGES

- In the event of a spillage during the construction phase, the responsibility for spill treatment will be with the Contractor and he will be responsible to arrange for competent assistance to clear the affected area.
- Incident Reporting and Remedy
 - The individual responsible for, or who discovers a hazardous waste spill must report the incident to the Contractor who must immediately involve the Applicant.
 - The immediate response will be to contain the spill. The exact treatment of polluted soil and/or water must be determined in consultation with the Applicant.
 - No person shall be allowed to approach a spill, fire, etc. unless he and/or she is equipped with the personal protective clothing and equipment.
 - The risk involved shall be assessed before anyone approaches the scene of the incident with the emergency preparedness plan.
 - A written report shall be compiled and forwarded to the Environmental Control Officer. The contact details of the relevant official must be confirmed prior to commencement of construction
 - Written record of the corrective and remedial measures decided upon, and the progress achieved therewith over time, must be kept. Such progress reporting will be important for monitoring and auditing purposes. The written reports may be used for training purposes to prevent similar future occurrences.

2.5 FIRE MANAGEMENT

- In case of a fire, the local fire department must immediately be contacted.
- The adjacent land users must be informed and/or involved in case of any fire.
- It must be ensured that the basic fire-fighting equipment is supplied to the site office, kitchen areas, workshop areas and stores.
- Welding gas cutting or cutting of metal will only be allowed inside the working/demarcated areas and with appropriate fire-fighting equipment at hand.
- “No smoking” signs must be placed in visible areas on site.
- No fires may be made for the burning of vegetation and waste.
- No open fires are to be made on site – cooking facilities must be provided to personnel and labourers.
- No firewood may be collected from nearby land.

3. DESIGN AND PRE-CONSTRUCTION PHASE

3.1 APPROVALS AND CONSENT

3.1.1 Town Planning

- No construction may commence in the absence of approval from the municipality.

3.1.2 Engineering Services Agreement

- The Applicant must enter into an Engineering Services Agreement with the City of Tshwane prior to commencement of construction.

3.2 DESIGN AND PLANNING REQUIREMENT

3.2.1 Engineering Services

- Design of Engineering Infrastructure
 - The design standards to be followed for the design of all the civil engineering services must be in accordance with the standards specified in the “Guidelines for Human Settlement Planning and Design” and the “Guidelines for the Provision of Engineering Services and Amenities in Township Development, The Red Book.
 - Standards to which the electrical design must adhere to, include the relevant SABS safety and equipment standards, as well as the NRS 048 Quality of Supply Standard.
- Geotechnical constraints
 - The design engineer must implement the recommendations of the Geotechnical Investigation undertaken by **Geo Buro Geotechnical Surveys** in the design of foundations and construction methods.
- Access and Traffic Requirement
 - All internal roads must comply with the requirement of the Engineering Department of the City of Tshwane Metropolitan Municipality.
 - Specialized heavy vehicles could affect and/or disrupt the traffic flows during the construction phase. During this phase issues of possible increased traffic congestion, temporary impediments on the existing roadway and influence on adjacent developments must be considered.
 - Appropriate signage and traffic measures for the operational phase should be designed and installed at the site to ensure safe and convenient access for passing traffic volumes.
 - All requirement in terms of internal and external road and access upgrades as provided for by the relevant authority must be implemented.

3.2.2 Groundwater

General requirements in terms of risk for pollution of groundwater are the following:

- The quality of groundwater should be protected during all the phases of the development.
- Any measures to reduce the likelihood of accidental spills will reduce the risk of groundwater contamination.
- Contaminated soil and building waste must be removed after construction.
- Storm water from rooftops must be directed away from the storage area and be released as sheet flow to prevent erosion.

3.2.3 Storm Water Management

- Any specific conditions once provided by the City of Tshwane Metropolitan Municipality Roads and Stormwater Division must be adhered to.
- A Stormwater Management Plan must be compiled by a professional consulting engineer that addresses the following:
 - The storm water drainage network system must be kept separate from the waste water (sewage) system.
 - No pollutant or any harmful substance may be allowed to be released into the system via the storm water pipeline. The system must be designed to remove any waste or harmful substances before reaching the wetland system.
 - Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or result in gully erosion in the wetland/drainage areas.
 - A green approach such as Infrastructure and Sustainable Urban Drainage (SUD) principles is proposed to be implemented as far as practical to ensure that the surface areas for driveways and parking areas are permeable to increase infiltration.
 - Sheet flow should be directed into onsite infiltration trenches, filter drains and filter strips rather than gullies and pipes.
 - Severely eroded areas should be stabilised with gabions and/or reno mattresses with sediment trapping material. The careful position of soil piles, and runoff control, during all phases of development, and planting of some vegetative cover after completion (indigenous groundcover, grasses etc.) will limit the extent of erosion occurring on the site.
- General measures to be implemented are the following:
 - Storm water should not be discharged into the working areas and it should be ensured that storm water leaving the footprint of the proposed development footprint areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
 - Water containing pollutants or visible suspended materials should be prevented from entering storm water drains and water resources.
 - The surfacing of driveways and parking areas must be permeable where possible. Green Infrastructure and Sustainable Urban Drainage (SUD) principles should be considered to be implemented as far as practical.
 - All outlet structures must be adequately designed to prevent erosion.

3.2.4 Green Approach

- The collection of storm water from the roofs of the buildings for recycling should be encouraged.
- The separation of waste, temporary storage onsite and removal by recycling companies should be considered the final site layout.
- Construction waste should be sold for recycling purposes.
- It is required that green technologies be incorporated in the design of the on-site buildings (office and guard housing, etc.), i.e.:
 - The architectural design should ensure that proper natural flow of air into and out of the buildings occur deliberately as ventilation.
 - Proper insulation of the ceilings is required, because as much as 50% of heat losses in a building can be attributed to a lack of ceilings and ceiling insulation. This will significantly reduce heating and cooling expenses.
 - Lighting
 - The design of the development must optimize the use of natural light in all components through the correct positioning and sizing of the windows; thereby saving the need to install additional lighting and associated long-term energy use.

- LED bulbs (a light source that is created by a Light Emitting Diode) are recommended instead of ordinary bulbs for all light required for non-security purposes. LEDs, use more than 75% less energy and last 25 times longer than incandescent lighting.
- Day and night sensors will ensure lights do not stay on unnecessarily.
- Water heaters/ geysers
 - Installing a geyser blanket on geysers and hot water storage tanks will reduce the amount of heat lost by the geyser to cold air outside and thus conserves energy.
 - Hot water pipes should also be insulated to prevent heat loss.
- Air Conditioners
 - Energy efficient heaters and air conditioners should be used.
 - The outdoor cooling units must be protected from the sun. They should therefore be placed on the southern side of the buildings.

3.2.5 Landscape Development Plan

A Landscape Development Plan (LDP) must be compiled and approved by the City of Tshwane Metropolitan Municipality Environmental Management and Parks Division. It needs to consider the following:

- All planting should be specified in a planting legend key on the LDP with specifications of species, size, square areas, densities and quantities.
- The LDP must be designed by a suitable qualified landscape architect or technologist. The name and contact details must be provided on the LDP.

3.3 CONSTRUCTION SITE

- The construction site office and storage areas for material and equipment must be restricted and fenced to prevent impacts and human interference to spread further than the site.
- Storage facilities for construction equipment must be provided for within the site.
- Accommodation for labourers must be limited to guarding personnel on the construction site (with labourers transported to and from the residential areas).
- Sufficient ablution and proper cooking facilities must be provided at the construction site.
- On-site storage of petroleum products for construction purposes should be limited.
- Servicing measures of vehicles to be in designated areas with appropriate spill management procedures (spill kits) should be in place.
- Liquid waste (grey water) should be disposed of with sewerage.
- Solid domestic waste should be placed in containers and regularly disposed of via the municipal waste removal system.
- Stringent clean up requirements of the site camp is required (waste concrete, reinforcing rods, waste bags, wire, timber etc.) and disposal at a municipal waste disposal site must be done on a regular basis.

3.4 APPOINTMENT OF CONTRACTORS

- Environmental clauses as referred to in this EMP, should be included in contract documents of all contractors.
- The appointment of contractors with proven track records of sound environmental performance should be given priority.
- The contractor must be aware that all construction waste material generated during and after construction should be disposed of at a permitted landfill site and an agreement letter between the municipality and the contractor should be available on request.
- All recommendations in the EMP are also binding on all contractors, labourers and personnel on site.

4. CONSTRUCTION PHASE

4.1 GENERAL ENVIRONMENTAL REQUIREMENT

- No trees, shrubs or rocks may be disturbed and/or removed, no snares may be placed and no hunting of small fauna species and birds may take place on adjacent land.
- Alien vegetation shall be managed according to the NEMA: Biodiversity Act in terms of the Alien Species Regulations, 2014 as well as in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. The Contractor shall prevent the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading of such plants onto adjacent vacant land as a result of construction activities.
- All storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties.
- During and after construction, storm water control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the unnecessary loss of soil.
- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.) The access road and site surface must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- Construction during the dry months of the year should be considered in order to overcome the problems caused by excessive moisture.
- All storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties.
- During construction, storm water control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into the watercourse.
- Storm water should not be discharged into the working areas and it should be ensured that storm water leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Refer to the requirement in the Stormwater Management Plan supplied under the heading "Design and Pre-Construction Phase".

4.2 GROUNDWATER AND SURFACE WATER

- The Stormwater Management Plan described in Paragraph 3.2.3 must be implemented.
- Site specific mitigation requirements for spills as included in the table in the section "Specification applicable to all Phases of Project Development" must be adhered to.
- Under no circumstances must surface or ground water be polluted.
- Adequate oil containment precautions must be taken.
- A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water and Sanitation will advise in this regard. They must be notified within 24 hours about any incidents during construction or operations that may impact on water resources.
- Small oil spills must be cleaned immediately with an oil spill kit that must at all times be available on site.
- Proper maintenance procedures for vehicles and equipment must be followed.
- Servicing of vehicles may only take place in designated areas with appropriate spill management procedures in place.
- Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement.
- All storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties.
- During and after construction, storm water control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the unnecessary loss of soil.
- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.) The access road and site surface must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must

be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.

- Construction during the dry months of the year should be considered in order to overcome the problems caused by excessive moisture.
- All storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties.
- During and after construction, storm water control measures should be implemented especially around stockpiled soil, excavated areas and trenches.
- Storm water should not be discharged into the working areas and it should be ensured that storm water leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.

4.3 EROSION

- The **Stormwater Management Plan** compiled during the Pre-Construction and Design Phase must be implemented.
- Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- To reduce the risk of erosion, run-off over the exposed areas should be mitigated to reduce the rate and volume of run-off and prevent erosion.
- Construction during the dry months of the year should be considered in order to overcome the problems caused by excessive moisture and prevent soil being washed away.
- Storm water control measures should be implemented especially around stockpiled soil, excavated areas and trenches.
- The Contractor must at all times ensure that cleared areas are effectively stabilised to prevent and control erosion.
- Soil stockpiles should not exceed 2m in height.

4.4 WASTE MANAGEMENT

4.4.1 General Waste

- Littering or illegal dumping of any waste material is prohibited.
- No waste disposal holes may be made on site.
- Under no circumstances should waste be burnt on site.
- Waste separation should be encouraged for recycling purposes.
- Provision must be made for the collection of all general waste materials. Rubbish bags and bins must be provided on the construction site and must be emptied on a regular basis. It is expected that removal of waste will be handled by the municipality; however, if this municipal service cannot be provided, the Contractor must remove the waste to a registered landfill facility.
- Liquid waste (grey water) must be disposed with sewerage.

4.4.2 Construction Waste

- Compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, wire, timber, etc.) and disposal at municipal waste disposal sites must take place.
- Construction waste must be collected and sold for recycling purposes.

4.4.3 Sewage

- Appropriate toilet facilities must be provided. If existing ablution facilities cannot be utilised, then chemical toilets must be supplied and must be provided by a registered company and be serviced on a regular basis.
- No effluent may be dumped in the veld or streams in the macro area.

4.4.4 Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Suitable trained/registered contractors will remove the hazardous waste to a landfill site registered to accept hazardous waste. Record of collection and delivery must be maintained during the construction period.

4.5 COMMUNITY (LIAISON, SAFETY, SECURITY, NOISE, DUST, ETC.)

Reasonable liaison will be maintained with adjacent communities to ensure that the following is effected:

- Feedback on the environmental performance of the project must take place if required.
- A complaints' register needs to be opened and maintained by the Applicant. The register will contain the contract details of the person who made complaints and information regarding the complaint itself, including the date of submission.
- Any conservation authority and/or institution should be allowed reasonable access to the construction site on request and arrangement with the Contractor and/or Applicant.

4.5.1 Labourers

- In order to prevent and/or minimize crime, it is required that only guarding personnel be supplied with controlled serviced accommodation.
- All construction workers will be allowed only for specified day light hours.
- Transport should be made available by the Contractor to labourers from the site after working hours.
- Supervision of labourers must at all times take place.
- No wandering on adjacent properties may be allowed.

4.5.2 Noise

In the unlikely event that noise complaints are made, the following must be implemented:

- Construction activities involving use of the service vehicle, machinery, hammering etc, must be limited to the hours between 7:00 am and 5:30 pm weekdays; 7:00 am and 2:00 pm on Saturdays; no noisy activities may take place on Sundays or Public Holidays.
- Activities that may disrupt neighbours (e.g. delivery trucks, excessively noisy activities etc) must be preceded by notice being given to the affected neighbours at least 24 hours in advance.
- Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers, etc.) must be used as per operating instructions and maintained properly during site operations.

4.5.3 Dust

Watering of construction sites (storage areas, roads, etc.) must take place at least once a day to prevent dust pollution as a result of construction activities.

4.5.4 Other Measures

- All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them.
- The Contractor must implement traffic control measures to prevent congestion of traffic as a result of construction vehicles.

4.6 SITE CLEARANCE AND LANDSCAPING

The following mitigation measures must be implemented at the end of the construction phase whilst there are still the necessary equipment and labourers on site to ensure that the following could effectively be executed.

4.6.1 Site Clearance

- After construction all building material, signs of excess concrete, equipment, houses, temporary ablution facilities, building rubble, refuse and litter must be removed and cleaned up from the construction site.
- Items that can be used again should be recycled. Unusable waste steel and aluminium should be sold to scrap dealers for recycling,

4.6.2 Landscaping

The Landscape Development Plan referred to in Paragraph 3.2.5 must be implemented to provide shade, promote the natural landscape of the macro area and to soften the visual experience of the site.

5. OPERATIONAL PHASE

5.1 LANDSCAPING

- It is proposed to present a list of indigenous plants and shrubs with basic planting methods to new property owners to promote water-saving principles and natural landscaping as part of the marketing material of the township. The compilation of such a list/pamphlet is described as part of the Landscape Rehabilitation and Plant Plan.
- The use of indigenous trees and/or shrubs must be strongly promoted with new property owners.

5.2 MONITORING AND RECTIFICATION

- Any incidents resulting from the structures and/or operation of the sewage infrastructure that could have a detrimental impact on the environment must immediately be investigated and rectification measures must be implemented and monitored accordingly.
- All incidents must be reported to the Environmental Control Officer: Compliance Monitoring & Enforcement of the Department of Water & Sanitation within 24 hours of the occurrence who will advise on emergency procedures to follow.

5.3 STORMWATER MANAGEMENT

The requirements from the Stormwater Management Plan as referred to in Paragraph 3.2.3 must at all times be implemented.

5.4 WASTE MANAGEMENT

5.4.1 General Waste

- Grey water should be used for irrigation purposes.
- Littering or illegal dumping of any waste material is prohibited.
- No waste disposal holes may be made on site.
- Under no circumstances should waste be burnt on site.
- Waste separation should be done for recycling purposes (i.e. paper, cans and plastics):
 - A designated area should be identified for the sorting, temporary storage and collection of waste
 - A specific employee should be trained with this responsibility.

5.4.2 Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorized.
- Suitable trained/registered contractors will remove the hazardous waste to an approved recycling depot and/or landfill site registered to accept hazardous waste.
- Proof of collection and delivery of waste (chain of custody documentation) must be kept on site.

5.5 RECOMMENDED GREEN APPROACH

It is advised that the Applicant commit to the following green approach:

- Continuous implementation of the requirement for energy efficiency provided in Paragraph 3.2.4 of this EMPr.
- The collection of storm water from the roofs of the buildings for recycling should be encouraged.
- Rain harvesting water tanks should be installed for the washing of the parking bays.
- Energy efficient bulbs should be used instead of ordinary bulbs for all light required for non-security purposes.
- Solar panels and/or generators should be fitted as back-up and/or support of municipal electricity supply

It is recommended that the recyclable waste management for the residential township include the following during the operational phase:

- An appropriate area where waste can be sorted and stored for collection must be identified and recycling bins must be provided.
- The site must have a concrete surface and it must be under roof (for protection against rain, storm water runoff and fire).
- The site must be accessible for collection vehicles.
- A dedicated worker must be trained in the recycling of waste (baling; compaction; breaking of glass, etc.) to ensure effective recycling of relevant material.
- This recycling waste area must be regularly cleaned and disinfected.

5.6 GENERAL

- The Applicant must at all times follow acceptable maintenance and operational practices to ensure consistent, effective and safe performance of the infrastructure.
- The Applicant must ensure compliance with relevant legal requirement and industry standard at all times.

5.7 DECOMMISSIONING

Decommissioning is not foreseen in the future. However, should it become applicable, decommissioning must take place in compliance with the relevant environmental legislative requirement applicable at that time.

Annexure A Township Layout

(Final approved layout to be attached once available)

Annexure B Environmental Impact Assessment Table

EVALUATION METHOD FOLLOWED

The nature and extent of expected negative impacts are described directly under the heading for each impact.

Below this description for each impact, a table has been designed to facilitate evaluation of the expected negative impact in terms of significance (intensity), extent, duration, probability and significance after mitigation.

The numerical values have the following values:

Impact Severity before Mitigation (significance / intensity) relates to the potential severity of the proposed project on the specific environmental component without any mitigation and is being evaluated and rated on a scale from 0 to 4 where the following values apply:

0 = no impact; 1= low impact; 2 = medium impact; 3 = significant impact; 4 = severe impact

The extent of the expected negative impact refers to the spatial effect of the impact, measures as local or regional or national.

The duration of the expected negative impact is supplied as either “temporary” - 0-3 years (generally during construction) or “permanent”.

The probability that the expected negative impact would occur if not mitigated is rated as “low”, “medium” or “high”.

The negative impacts are also evaluated in terms of the effectiveness with which it could be mitigated: “Severity of Impact after Mitigation” is rated on a scale from 0 to 4, with a severe impact after mitigation receiving a rating of 4 (and can therefore influence the viability of the project) and no impact after mitigation receiving a rating of 0.

PLANNING & DESIGN PHASE

IMPACT DESCRIPTION: DIRECT IMPACT	PROPOSED MITIGATION (DETAIL SUPPLIED IN EMPr)	RESPONSIBLE PERSON
Loss of Open Space The development will result in a permanent loss of open space in the development. Open space in residential areas enhances the value of residential properties. Open space captures precipitation and reduces stormwater management costs. Parks and natural areas can be used for recreation purposes and accommodate wildlife habitat (and can provide connectivity between other green others to allow for faunal migration etc.) with associated aesthetic benefits to surrounding residents	The permanent loss of open space cannot really be mitigated.	Developer

Impact Description	Impact Severity before mitigation (0 - 4)	Extent Local / Regional / National	Duration Temporary / Permanent	Probability <i>Probability it would occur if not mitigated: low / medium / high</i>	Severity of Impact After Mitigation
Loss of open space	3	Local	Permanent	High	2

IMPACT DESCRIPTION: INDIRECT IMPACT	PROPOSED MITIGATION (DETAIL SUPPLIED IN EMPr)	RESPONSIBLE PERSON
Disregard of legislation requirements could result in negative environmental impact and costly non-compliance actions by authorities.	Ensure compliance with relevant legislation and legal standards as described in Paragraph 1.6 of the EMPr.	Developer Consulting Engineers Town Planners Environmental Control Officer

Impact Description	Impact Severity before mitigation (0 - 4)	Extent Local / Regional / National	Duration Temporary / Permanent	Probability <i>Probability it would occur if not mitigated: low / medium / high</i>	Severity of Impact After Mitigation
Disregard of legislative requirement	3	Local	Permanent	High	1

CONSTRUCTION PHASE

IMPACT DESCRIPTION: DIRECT IMPACT	PROPOSED MITIGATION (DETAIL SUPPLIED IN EMPR)	RESPONSIBLE PERSON
<p>Loss of Faunal Habitats</p> <p>Alteration of the vegetation of the proposed site will directly, and indirectly, impact on the smaller sedentary species (insects, arachnids, reptiles, amphibians and mammals) adapted to their ground dwelling habitats. Larger, more agile species (birds and mammals) will try and re-locate in suitable habitats away from the construction activities.</p>	<ul style="list-style-type: none"> During the construction phase, workers must be limited to areas under construction and access to natural undeveloped areas must be strictly regulated, preventing uncontrolled hunting, poaching and gathering of firewood and medicinal plants. During the construction activities, wherever possible, work should be restricted to one area at a time. This will give smaller birds, mammals, reptiles and amphibians an opportunity to move into undisturbed areas close to their natural habitat. Construction activities should be limited to the daylight hours preventing disturbances to the nocturnal activities of certain species and nearby human populations. This will also minimise disturbances to sensitive and secretive species. 	<p>Contractor Environmental Control Officer</p>
<p>Alien Vegetation</p> <p>Alien species poses a huge threat to the natural environment due to their competitive nature that leads to the displacement of natural indigenous species (plants and animals), and also due to their excessive use of ground water.</p>	<ul style="list-style-type: none"> All alien vegetation should be eradicated within the development. The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used and the long-term effects thereof. Application shall be under the direct supervision of a qualified technician. Where herbicides are used to clear vegetation, selective and biodegradable herbicides registered for the specific species should be used. General spraying and the use of non-selective herbicides (e.g. Roundup, Mamba should be prohibited at all times). 	<p>Contractor Environmental Control Officer</p>
<p>Impact on cultural heritage environment – should be considered in context that no obvious heritage resources of significance had been identified on the site</p>	<ul style="list-style-type: none"> PHRA-G must immediately be alerted in case evidence of artefacts, paleontological fossils, additional graves or other heritage resources are discovered during the course of the development. All development activities must be halted and PHRA-G would probably require that an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) be appointed to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from PHRA-G to conduct the mitigation measures. 	<p>Contractor Environmental Control Officer</p>
<p>Increased risk for spillages – associated with construction activities, maintenance and repair of vehicles, etc.</p>	<p>Strict measures must be implemented:</p> <ul style="list-style-type: none"> Emergency incident reporting and remedial measures must be in place Adequate oil containment precautions must be taken. A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water & Sanitation will advise in this regard. Small oil spills must be cleaned immediately with an oil spill kit. 	<p>Contractor Environmental Control Officer SHE Officer</p>

	<ul style="list-style-type: none"> On-site storage of petroleum products must be limited. Proper maintenance procedures for vehicles and equipment must be followed. Servicing of vehicles may only take place in designated areas. Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement. Measures to contain accidental spills must be readily available on site (spill kits). All hazardous substance spills must be reported to the Contractor and the ECO, recorded and investigated. 	
Increased risk for soil, groundwater and surface water pollution result mostly from poor waste management.	<p>Waste management measures are provided in the EMP in terms of:</p> <ul style="list-style-type: none"> <u>General household waste</u> (i.e. strict control over labourers; no burning or burying of waste; provision of dustbin and garbage bags; regular removal preferably by municipal waste removal; etc) <u>Construction waste</u> (i.e. stringent daily clean-up and either disposal at registered waste site or preferably sold for recycling purposes) <u>Sewage waste</u> (labourers to be provided with proper ablution facilities- either municipal or chemical toilets provided and serviced by a reputable outside company; no effluent to be dumped on adjacent land) <u>Hazardous waste</u> (i.e. oil contaminated waste to be moved to registered hazardous waste landfill site; adequate storage and labelling of hazardous materials on site). Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapour or any combination thereof. 	Contractor Environmental Control Officer
Increased risk for erosion.	<p>Management measures provided in the EMP include</p> <ul style="list-style-type: none"> All vehicle movement must be along the existing lines or tracks. Construction during the dry months of the year should be considered in order to overcome the problems caused by excessive moisture. All storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties. Storm water control measures should be implemented especially around stockpiled soil, excavated areas and trenches. 	Contractor Environmental Control Officer

Community impact is evident in noise as a result of construction activities; risk of safety during excavations; dust created by construction vehicles; etc.	Management measures provided in the EMP include: <ul style="list-style-type: none"> • <u>Noise</u> (restricted working hours; control of labourers (communication, music and broadcasts); construction vehicles to be fitted with noise reduction measures) • <u>Safety</u> (all excavated areas to be clearly marked with barrier tape) • <u>Dust pollution</u> (regular watering of construction site) 	Contractor Environmental Control Officer
---	---	---

Impact Description	Impact Severity Degree (0 - 4)	Extent Local / Regional / National	Duration Temporary / Permanent	Probability <i>Probability it would occur if not mitigated: low / medium / high</i>	Severity of Impact After Mitigation
Loss of Faunal Habitats	4	Local	Permanent	Medium	2
Alien infestation	2	Local	Temporary	High	1
Cultural Heritage	1	Local	Temporary	Medium	0
Risk for spillages	3	Local	Temporary	High	1
Groundwater pollution	3	Local	Temporary	High	1
Risk for erosion	2	Local	Temporary	High	0
Community impact	1	Local	Temporary	Medium	0

IMPACT DESCRIPTION: INDIRECT IMPACT	PROPOSED MITIGATION (DETAIL SUPPLIED IN EMP)	RESPONSIBLE PERSON
Congestion of traffic can take place as a result of construction vehicles entering and leaving the construction site.	The Contractor must provide for traffic control measures during peak hours when relevant.	Traffic Engineer Contractor
Community impact – an increased risk of crime can result from increased working force in the area	Strict measures in terms of control of labourers must be implemented: <ul style="list-style-type: none"> • Transport to and from the construction site must be provided. • Only guarding personnel to be accommodated overnight. • Labourers should at all time be supervised. 	Contractor Environmental Control Officer

Impact Description	Impact Severity Degree (0 - 4)	Extent Local / Regional / National	Duration Temporary / Permanent	Probability <i>Probability it would occur if not mitigated: low / medium / high</i>	Severity of Impact After Mitigation
Congestion of traffic	2	Local	Temporary	High	1
Community Impact	3	Local	Temporary	Medium	1

Annexure C Environmental Authorisation

(To be attached once available)