EXIGENT

MAY 2023

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

Construction of the Proposed Residential Development and Related Infrastructure: Derdepoortpark Extension 44 on Portions 426 and 679 of the Farm Derdepoort 326-JR, City of Tshwane (COT) Metropolitan Municipality.

Prepared for:

Zotec Developments (Pty) Ltd.

A SYSTEMS APPROACH
APPLIED TO YOUR REQUIREMENTS

Details of the Environmental Assessment Practitioner (EAP) who prepared the Environmental Management Programme (EMPRr)

NAME	HIGHEST QUALIFICATION	PROFESSIONAL AFFILIATIONS / TITLE	EXPERIENCE IN ENVIRONMENTAL MANAGEMENT
Jacolette Adam	MSc LLM (Environmental Law)	• Certified with the South African Council for Natural Scientific Professions (400088/02) • EAPASA Registered	22 years
Franciska Snyman	BSc Hons	• Environmental Control officer and environmental consultant • IAIASA registration pending	5 years

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

GLOSSARY

Alien vegetation	Means all undesirable vegetation, defined as but not limited to, all declared category 1 and category 2 plants in terms of the Conservation of Agricultural Resources Act (43 of 1983) (CARA) amended regulations 15 and 16 as promulgated in March 2001.
Client	Zotec Developments (Pty) Ltd.
Construction activity	Refers to any action taken by the Contractor, his subcontractors, suppliers or personnel in undertaking the construction work.
Contaminated water	Means water contaminated by the client's activities, e.g. polluted water from building rubble, waste spillage etc
Environment	The '*environment*' is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of- *(i) the land, water and atmosphere of the earth;* *(ii) micro-organisms, plant and animal life;* *(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and* *(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing*
Environmental Impact	The change to the environment resulting from an environmental aspect (an activity) on the environment, whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity**.**
Fence	A physical barrier in the form of posts and barbed wire or any other concrete construction ('palisade'- type fencing included) constructed with the purpose of keeping humans and animals within or out of defined boundaries.
General Waste	Domestic, commercial and non-hazardous waste.
Non-compliance	Failure to comply with the requirements of the EMP.
Pollution	Any change in the environment caused by substances, radioactive or otherwise, 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.
Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Pollution Incident	Any incident that may cause or has caused damage to or the contamination of the natural environment
Potentially hazardous substance	Is a substance, which can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act (Act No. 85 of 1993).
Solid waste	All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Storm water	Rainfall run-off from the site.
Vegetation rehabilitation	Refers to the re-establishment of locally indigenous vegetation with a similar species composition to that which naturally occurs in the area.
Waste water	Water containing cement washings, oil, fuel or other contaminants.

ABBREVIATIONS AND ACRONYMS

CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CMA	Catchment Management Agencies
DAFF	Department of Agriculture, Forestry and Fisheries
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
I&APs	Interested and Affected Parties
IWWMP	Integrated Water and Waste Management Plan
MSDS	Materials Safety Data Sheet
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NWA	National Water Act (Act 36 of 1998)
OHSA	Occupational Health and Safety Act
PPE	Personal Protective Equipment
TOPS	Threatened or Protected Species – NEMBA
uPVC	unplasticied Polyvinyl Chloride

1. PROJECT BACKGROUND

Zotec Developments (Pty) Ltd is proposing a residential development (to be known as Derdepoortpark Extension 44) with a density of 120 units per hectares on Portions 426 and 679 of the Farm Derdepoort 326-JR, approximately 7.935 ha in extent. The application is for the clearing of indigenous vegetation, the construction of external infrastructure within 500 m of a wetland system, construction of stormwater infrastructure within 32 m of a watercourse, and the construction of the residential development. Figure 1 below provides the location of the proposed residential development, including the sensitivities of the site.

2. PROJECT LOCALITY

The proposed project includes the development of a residential estate, including all auxiliary infrastructure (such as roads, water, sewer and stormwater connections infrastructure) located on portion 426 and portion 679 of the Farm Derdepoort 326-JR, City of Tshwane, Gauteng. The stormwater runoff generated from upstream catchments will be cut off by a boundary service located in Intaba Street. A new 1500mm ø stormwater outlet structure is planned for the drainage of the upstream catchments and will be constructed within 32m the Moretele River, on the Remainder of Portion 23 of the Farm Derdepoort 326_JR. The development is proposed within the quarter degree grid cell 2528CB, quaternary catchment A23A, with the centre point geographical coordinates of the proposed reservoir site situated at:

Table 2-1. Centre point geographical coordinates of proposed residential development.

AREA	GEOGRAPHICAL COORDINATES	
	Degree	Decimal minutes
South	25	41.280
East	28	17.664

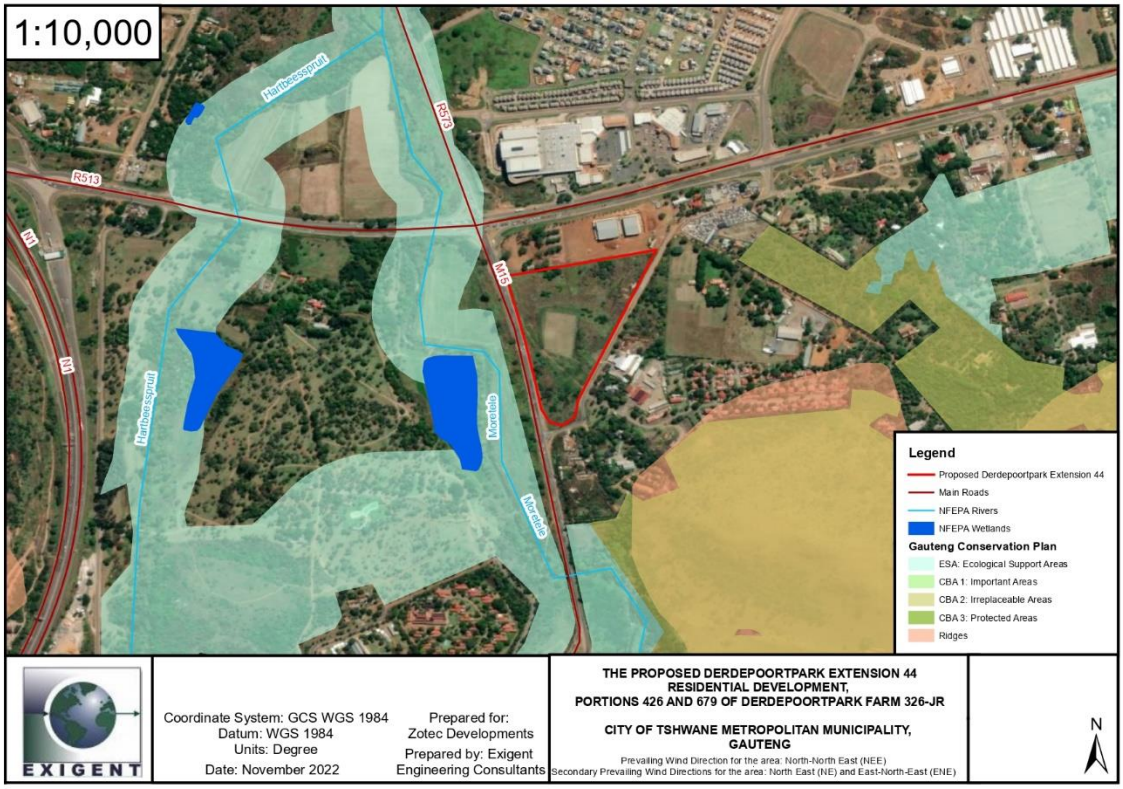

Figure 2-1. Locality of the proposed residential development.

3. ENVIRONMENTAL LEGISLATION

All legislation applicable to the development must be strictly enforced. The Applicant and all contractors must be acquainted with the relevant environmental legislation, including provincial and local government regulations, which are in place to ensure the protection of the environment.

This EMPr has been compiled in accordance with the provisions of the Constitution of South Africa and the principles of Integrated Environmental Management. It is the responsibility of the Applicant to ensure that all operations related to the proposed residential development are in line with environmental legislation during construction and operation.

4. PURPOSE OF THE EMPR

The EMPr is a management tool that outlines environmental management strategies to ensure the Project's environmental commitments and objectives are met. The EMPr will be used during the proposed construction period for the services.

The EMPr outlines:

- Key environmental issues associated with construction and operation of the development;
- Management measures to minimise construction and operational impacts;
- Monitoring to be undertaken during construction and the operational phase;
- Environmental accountabilities; and
- legislative requirements which must be met by the Company.

The applicant must take into consideration that this EMPr will be amended during the environmental authorisation proses and must be amended as required over the duration of the construction or in line with changes in legislation.

The objective of this EMPr is to measure, record and demonstrate ongoing compliance with relevant legislation through implementation of the specified mitigation measures.

5. SCOPE OF THE EMPR

The EMPr provides environmental management that aims to mitigate the impact of the construction phase on the biophysical environment, whilst taking into consideration the potential social and economic impacts of the proposed upgrade. The main components of the management during the construction and operational phase of a project include the following:

- Dust management during construction;
- Erosion and sedimentation;

- Hazardous and non-hazardous waste management on site;
- Stormwater control and management;
- Ambient noise levels;
- Litter and waste pollution;
- Site operations and facilities;
- Watercourse protection;
- Environmental sensitive zones and protection thereof;
- Sourcing, excavating and dumping of soil material;
- Noise and vibration control;
- Sewer spillages mitigation; and
- Environmental awareness training.

Site specific management includes the following:

- Eradication and management of exotic vegetation of all construction and installation areas
- Careful and conscientious work practices when working outside the site boundary
- Rehabilitation of all areas affected by external upgrades and installations.

6. AIMS OF THIS DOCUMENT

The purpose of this EMPr is to ensure that the impacts of all the phases of the project on the environment are kept to a minimum, to ensure continued monitoring of the construction phase and to ensure the involvement of interested and affected parties (I&APs) in a meaningful way.

7. ENVIRONMENTAL AWARENESS TRAINING

The Contractor must ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr.

The presentation must be conducted, as far as possible, in the employees' language of choice.

As a minimum, training must include:

- Explanation of the importance of complying with the EMPr.
- Identification of sensitive environmental systems.
- Discussion of the potential environmental impacts of construction activities.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their duties.
- Explanation of the specifics of this EMPr.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

The contractor must keep records of all environmental training sessions, including names, dates and the information presented.

8. ENVIRONMENTAL ACCOUNTABILITIES

8.1. Responsibility matrix and reporting structure

During operation, all instructions and official communications regarding environmental matters must follow the organisational structure shown in Figure 8-1. The organisational structure identifies and defines the authorities' structure, and the communication structure for the various parties involved in the construction and operation of the proposed residential development.

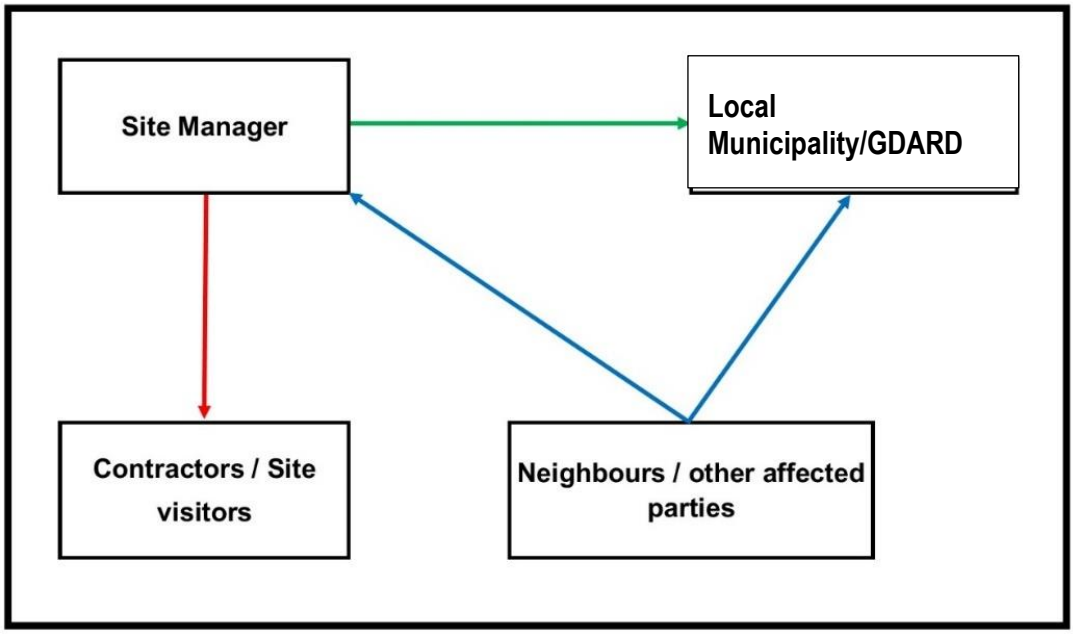

Figure 8-1. Organisational/reporting structure for implementation of the EMPr

9. ENVIRONMENTAL ROLES

Environmental accountabilities for this construction EMPr are as follows:

Table 9-1: Environmental Accountabilities

ROLE	ACCOUNTABILITY
Applicant / District Municipality	• Ensure that the conditions within the EMPr are met. • Implementation of the EMPr. • Submission of any substantial changes, updates or amendments to the EMPr to GDARD for approval.

ROLE	ACCOUNTABILITY
	• Ensuring that the provisions of the EMPr are binding on all Contractors operating on the site during the life of the project. • Including a performance-based requirement in all Contract Documents. • Ensuring that environmental site inspections and monthly audit reports are compiled during construction to establish how well the Contractor is complying with the EMPr. The monthly environmental audit reports must be submitted to GDARD. • Ensuring that compliance/non-compliance records are kept in good order and made available on request by the authorities. • Complying with all applicable environmental legislation, regulations and guidelines, and ensuring that Contractors undertake responsibility to do the same. • Being committed to the principles contained within NEMA, including the prevention of pollution and sustainable development.
Project Engineer and Resident Engineer	• Ensuring that the provisions of the EMPr are binding on all Contractors operating on the site during the construction of the project and that a performance-based requirement is included in all contracts. • Including the approved EMPr as part of the contract documents. • Ensuring that the Contractor(s) and Sub-contractor(s) are conversant with the requirements of the EMPr and that all members of staff on site have attended an environmental awareness-training course presented by the ECO. • Compiling preliminary construction site layout plans prior to construction commencing. • Approving final construction site layout plans in conjunction with the Environmental Manager. • Ensuring that the Contractor(s) complies with the EMPr and, if not, ensure that the Contractor(s) bears the costs of damages/compensation resulting from non-compliance with the EMPr. • If necessary, on the recommendation of the Environmental Manager or Environmental Compliance Officer (ECO), instructing the Contractor(s) to suspend any or all works on site, if the Contractor(s) or his/her Sub-contractors/suppliers fail to comply with the EMPr. • Ensuring that the Contractor(s) conducts all activities in a manner that minimises disturbance to the project area, local communities and road users and that complaints and queries by members of the public at the site office, are forwarded to the RE. • Liaison with stakeholders including landowners and land users, utility providers[1], neighbours, and relevant authorities. This must be done in association with the Contractor (and the ECO where necessary).

1 The Project Engineer is to ensure liaison with utility operators regarding safety requirements for work within utility servitudes or crossing utilities.

ROLE	ACCOUNTABILITY
	• Ensuring that a register of complaints and queries by members of the public is maintained at the site office and the actions taken in response to these complaints are recorded. • Liaising directly with the Environmental Manager in terms of environmental issues and maintaining close channels of communication with the Environmental Manager regarding foreseeable activities that may require environmental input. • On behalf of the Employer, reviewing any substantial changes, updates or amendments to the EMPr prior to its submission to GDARD for approval. • On behalf of the Employer, ensuring that the Environmental Manager keeps the compliance/non-compliance records in good order and makes them available on request to the authorities. • Ensuring that all EMPr-related instructions from the RE to the Contractor are recorded in the site diary. • Having available on request a copy of the EMPr at the construction site at all times and ensuring that all staff, Contractors and Sub-contractors are familiar with or made aware of the contents of the EMPr. • Complying with all applicable environmental legislation, regulations and guidelines, and ensuring that Contractors undertake responsibility to do the same. • Ensuring that an environmental close out report is obtained from the Environmental Manager prior to awarding the Certificate of Completion to the Contractor(s).
Site Manager	• Be familiar with the recommendations and mitigation measures of this EMPr and implement these measures. • Ensure that all employees and contractors adhere to the EMPr. • Advise on environmental management issues. • Monitor site activities on a daily basis for compliance. • Rectify transgressions through the implementation of corrective action. • Ensure that environmental inspections/audits are conducted as per the requirements of the EA. • Inform and educate all employees about the environmental risks associated with the various activities undertaken and highlight those activities which must be avoided in order to minimise significant impacts to the environment. • Maintain an environmental register which keeps a record of all incidents which occur on the site. These incidents include: • Public involvement/complaints. • Health and safety incidents. • Hazardous materials stored on site. • Non-compliance incidents.
Contractor/ Site visitors	• Ensure implementation of the EMPr. • Inform and educate all employees/contractors/site visitors about the environmental risks associated with the various activities undertaken at the site and highlight those activities which must be avoided in order to minimise significant impacts to the environment.

ROLE	ACCOUNTABILITY
	• Should employees/contractors/site visitors require clarity on any aspect of the EMPr, they must contact the Site Manager for advice.
Environmental Control Officer (ECO)	• Demarcate all sensitive areas which will be impacted upon by the development footprint. • Demarcate the pipeline infrastructure along the environmentally approved layout to limit deviation of the infrastructure. • Conduct a monthly site visit to monitor the construction activities in terms of the approved EMP and ensure authorisation conditions are adhered to. • Compile a monthly audit report in which all finding will be recorded, non-compliance highlighted, mitigation measures suggested, and recommendations included. • The monthly audit report must be submitted to GDARD.
Authorities / GDARD	• Review reports submitted as and when required. • Conduct site visit and/or investigation after incident.
Neighbours / I&APS	• Report incidents. • Report nuisance activities during construction phase.

10. PROPOSED CONSTRUCTION TIMEFRAMES

The preliminary proposed construction timeframes are indicated in Table 10-1.

Table 10-1. Proposed timeframe of activities during construction phase.

ACTIVITY	PROPOSED TIMEFRAME	LOCATION	SPECIFIC ACTIVITIES
Site preparation	To be confirmed	On-site	To be confirmed
Construction of the external infrastructure	To be confirmed	On-site	To be confirmed
Construction of the internal infrastructure	To be confirmed	On-site	To be confirmed
Construction of the residential units	To be confirmed	On-site	To be confirmed
Final construction activities and rehabilitation	To be confirmed	On-site	To be confirmed

11. REPORTING

A filing system must be established and must be maintained throughout the lifespan of the activities. The Site Manager is solely responsible for the upkeep and management of the EMPr file. A hardcopy of all documentation must be filed, while electronic copies must be maintained in a dedicated electronic folder with regular back-ups being made. The maintenance and filling of, electronic and hard copies must be the responsibility of the Site Manager and must remain current and up-to-date. The filing system must be updated, and relevant documents added as required. The EMPr file must be made available at all times on request by GDARD, DWS or other relevant authorities.

A monitoring programme must be implemented for the duration of the construction and operational phase.

This programme must include:

- Daily incident logs are to be compiled by the Site Manager.
- All significant incidents must be reported to the District Municipality within 24 hours of occurrence and kept in the EMPr file controlled by the Site Manager. The daily incident logs must contain the following:
    - The date and time of the incident.

- Description of the incident.
- The name of the person responsible.
- The incident must be listed as significant or minor.
- Remedial or corrective action taken to mitigate the incident.
- Record of repeat minor offences by the same employee/contractor.

- The Site Manager must keep a photographic record of any damage to areas outside the demarcated site area. The date, time of damage, type of damage and reasons for the damage must be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage must be directed to the Site Manager for appraisal.

The Site Manager must be held liable for all unnecessary damage to the environment. A register must be kept of all complaints from the surrounding community/businesses. All complaints/claims must be handled immediately to ensure timeous rectification by the responsible party.

The Site Manager must cover relevant details with regard to:

- Construction procedures and location of the construction site.
- Start date and duration of the procedure.
- Materials, equipment and labour to be used.
- How materials, equipment and labour would be moved to and from the site as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure.
- Emergency procedures in case of any reasonably potential accident/incident which would occur during the procedure.
- Compliance/non-compliance with the EMPr specification and motivation if non-compliant.

12. ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 12-1. Environmental aspects and related actions for the proposed residential development.

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
1. Pre-construction phase									
1.1. Aspect: Ecosystems and habitats									
1.1.1. Protection of riparian area									
1.1.1.1.	Ensure ecosystems and habitats are protected during construction	Identify and mark large, established, indigenous trees that are not to be removed.	Preserve flora on site	Site to be inspected.	Once-off	ECO	✓		
1.1.1.2.		No large trees within areas associated with the project footprint may be removed from the ground, whether alien species or not, unless permitted by the ECO, and approvals from the relevant authorities have been obtained.	Preserve flora on site	Site to be inspected.	Once-off	ECO Contractor Project engineer	✓	✓	
1.1.1.3.		A search and rescue operation is undertaken prior to construction to find	Preserve riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected. All relevant permits must be	Once-off	ECO (Ecologist)	✓		

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		any Red Data or Protected species or any other species of conservation concern that has a high probability to occur within the project footprint.		required prior the commencement of construction should plants be identified					
1.1.1.4.		Where necessary, a suitably qualified ecologist must be appointed to aid with the above-mentioned tasks.	Preserve riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected	Once-off		✓		
1.1.1.5.		All sensitive areas likely to be intersected by the project must be identified, demarcated, photographed and clearly marked prior to any construction works.	Preserve riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Once-off	ECO	✓		
1.1.1.7.		A detailed contingency document must be provided by the appointed contractor prior to the construction phase of the proposed development.	Preserve riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Once-off	Contractor Project engineer	✓		

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
1.2. Aspect: Site layout									
1.2.1. Safe working environment									
1.2.1.1.	Ensure safe working and healthy environment and prevention of injuries of workers on site.	The plan must show the positions and extent of the known permanent and temporary site structures and infrastructure as listed below	Ensuring all construction camp activities are outside of riparian areas.	Site to be inspected. Plan to be provided to the ECO, Engineer and be kept in Site file	Once-off	Contractor	✓		
		Site access (including entry and exit points) and haul routes							
		Contractor camp(s) including material storage yards and site office. Additionally any on-site storage facilities of fuel and hazardous substances.							
		Security requirements (including temporary and permanent fencing, and lighting).							
		Concrete batching areas.							

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		Essential services (permanent and temporary water, electricity, and sewage) including sanitary provisions during construction							
		Vehicle and equipment storage areas.							
		Wash bays.							
		Storm water control measures.							
		Excavations and trenches.							
		Stockpile/laydown areas.							
		Spoil areas.							
		Waste management including waste storage and disposal sites.							
		Areas where vegetation will need to be cleared.							
		Features and plants to be conserved.							
1.2.1.2.	Ensure safety of the surrounding Estates/properties	The principal contractor is to provide a detailed security plan	Minimum impact on surrounding landowners/tenants	Site to be inspected.	Continuous	Contractor	✓		

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		aimed towards ensuring the safety of the adjacent estates.							
1.2.1.3		No construction workers/vehicles will be permitted to access the construction footprint directly from the Baviaanspoort Road.	Minimum impact on surrounding landowners/tenants	Site to be inspected.	Continuous	Contractor	✓		
1.2.1.4		Eating areas and sanitary facilities are to be located within the development footprint outside of the sensitive areas.	Minimum impact on surrounding landowners/tenants	Site to be inspected.	Continuous	Contractor	✓		
1.2.1.5		No construction workers are to be permitted to wander past the boundaries of the demarcated/cordoned-off construction footprint.	Minimum impact on surrounding landowners/tenants	Site to be inspected.	Continuous	Contractor	✓		
1.2.1.6.	Ensure safe working and healthy environment	Ensure that all sewage infrastructure is optimally positioned to avoid damage from flooding. As a minimum these should	Minimum impact of infrastructure on sensitive areas	Site to be inspected.	Continuous	Contractor	✓		

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		be positioned beyond the 1:20 year floodline.							
2. Construction phase									
2.1. Aspect: Ecosystem and habitats									
2.1.1. Protection of sensitive Ecosystems and habitats									
2.1.1.1.	Ensure sensitive ecosystems and habitats are protected during construction	All rubble, litter and any other type of waste must be removed from areas within the construction servitude and regular monitoring of this is required on site.	Improve habitat quality in all areas	Site to be inspected.	Continuous	Contractor		✓	
2.1.1.2.		All infrastructure must be erected within the site boundaries.	Limiting construction footprint	Site to be inspected.	Continuous	Contractor		✓	
2.1.1.3.		Where infrastructure is located outside of the site boundaries, necessary action must be taken in order to relocate the infrastructure into the site boundaries.	Limiting construction footprint	Site to be inspected.	Continuous	Contractor		✓	
2.1.1.4.		Ensure, as far as possible, that the construction footprint	Preservation of riparian habitat in construction footprint of stormwater	Site to be inspected.	Continuous	ECO Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		avoids encroaching past areas authorized for construction	outlet and stormwater pipe						
2.1.1.5.		Any excavations and/or construction activities should be carried out preferably during the winter months (i.e. April to September). All activities must be restricted to the demarcated working areas and completed in a timeous manner.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	
2.1.1.6.		Existing infrastructure and haul roads must be used as far as possible.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	
2.1.1.7.		Infrastructure must be designed in such a way that flows are not impeded or cause erosion.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Engineer	✓	✓	
2.1.1.9.		All construction areas are to be demarcated and cordoned-off.	Limiting construction footprint. The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO Contractor Developer	✓	✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.2. Clearance of vegetation									
2.1.2.1.	Ensure sensitive ecosystems and habitats are protected during construction	Clearance of indigenous vegetation must be kept to a minimum.	Limiting construction footprint. The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO		✓	
2.1.2.2.		Where clearing is required outside of earthwork/construction areas, vegetation must be brush-cut rather than cleared to speed re-establishment following site closure;	The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO		✓	
2.1.2.3.		No areas outside the final footprint may be cleared. Strict management during construction phase to limit the extent of the footprint of the impact. Should the ECO confirm that clearing of indigenous vegetation is unavoidable, plant material must be transplanted where practical and possible.	The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.2.4.		Progress of vegetation establishment must be monitored regularly by ECO, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability.	The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO		✓	✓
2.1.2.5.		No indigenous vegetation is to be collected or utilized for firewood.	The preservation of the vegetation site.	Site to be inspected.	Continuous	Contractor	✓	✓	✓
2.1.2.6.		Trees and shrubs must be inspected before they are cleared for the presence of epiphytic orchids. Any orchids found must be rescued by relocating them to similar habitats outside of the construction footprint.	The preservation of the vegetation site.	Site to be inspected.	Continuous	ECO		✓	
2.1.2.7.		Vegetation clearing must take place in a phased manner in order to retain vegetation cover for as long as possible.	The preservation of the vegetation site.	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.2.8.		All indigenous plant material removed from the cleared areas must be stockpiled for mulching. All remaining vegetation must be removed and disposed of at a registered landfill site.	The preservation of the vegetation site.	Site to be inspected.	Continuous	Contractor		✓	
2.1.3. Control of alien and invasive plant species (AIS)									
2.1.3.1.	Ensure ecosystems and habitats are protected during construction	All AIS must be removed. The ECO must do regular follow-ups to ensure no alien invasive plants are located within the development footprint.	Improvement of the quality of the natural resources	Site to be inspected.	Continuous	ECO Contractor		✓	
2.1.3.2.		Bare surfaces must be grassed as soon as possible after construction to minimise time of exposure. Locally occurring, indigenous grasses must be used. Alien invasive grasses such as *Pennisetum clandestinum* (Kikuyu) are not to be used.	Improvement of the quality of the natural resources	Site to be inspected.	Continuous	ECO Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.3.3.		If necessary, a Rehabilitation and monitoring programme may be compiled for the project and must be strictly applied to all construction areas and servitudes. This rehabilitation plans must be implemented by best practice principles.	Improvement of the quality of the natural resources	Site to be inspected. MSDS for controls must be available in the site file.	Continuous	ECO Contractor		✓	✓
2.1.3.4.		All alien invasive plants control work should only be undertaken by a competent contractor;	Improvement of the quality of the natural resources	Site to be inspected.	Continuous	ECO Contractor		✓	✓
2.1.3.4		The rehabilitation and monitoring of the area where construction / installations of infrastructure has been completed must be untaken during all phases of the proposed development.	Improvement of the quality of the natural resources Improved landscaping	Site to be inspected.	Continuous	ECO Contractor	✓	✓	✓
2.1.4. Herbicide and pesticide limitation									

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.4.1.	Ensure sensitive ecosystems and habitats are protected during construction	No herbicides are allowed to be used on indigenous vegetation, particularly within proximity to undeveloped/open areas.	The preservation of natural resources on site	Site to be inspected.	Continuous	Contractor		✓	
2.1.4.2.		Registered herbicides must strictly be applied to alien invasive vegetation only.	The preservation of natural resources on site	Site to be inspected. MSDS for controls must be available in the site file.	Continuous	ECO Contractor		✓	
2.1.4.3.		Pesticides are not to be used during the construction or operational phase of the development.	The preservation of natural resources on site	Site to be inspected.	Continuous	ECO Contractor Developer		✓	✓
2.1.4.4.		General spraying of herbicides and pesticides must be prohibited.	The preservation of natural resources on site	Site to be inspected. MSDS for controls must be available in the site file.	Continuous	ECO Contractor		✓	
2.1.5. Protection of the systems									
2.1.5.1.		Concrete encasement and other drainage protection measures must be used where the structural integrity	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
	Ensure ecosystems and habitats are protected during construction	of the drainage infrastructure is compromised.							
2.1.5.2.		As far as possible, indigenous plants or natural features must not be disturbed, destroyed or removed.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	
2.1.5.3.		No material storage or laydown areas are permitted under trees.	The preservation of natural features	Site to be inspected.	Continuous	Contractor		✓	
2.1.5.4.		No physical damage may be caused to any aspect of any watercourse, other than that necessary to complete the works as specified and in accordance with the accepted method statement.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	
2.1.5.5.		The existing drainage systems and must be repaired where applicable with additional drainage or increased capacity so as to accommodate normal, as well as flood conditions.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.1.5.6.		The extent and duration of the hydrological disruption must be minimized.	Preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe	Site to be inspected.	Continuous	Contractor		✓	
2.1.5.8		Silt traps must be installed within the development site boundary during construction period to prevent soil and debris from entering the stormwater system and affecting downstream areas. ;	The preservation of associated downstream catchments / siltation prevention	Site to be inspected	Continuous	Contractor		✓	
2.1.5.9		Small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion; erosion control structures must be put in place where soil may be prone to erosion;	Erosion control	Site to be inspected	Continuous	Contractor		✓	
2.1.5.9		"Trench-breakers", which are in-trench barriers, should be	Erosion control / siltation prevention						

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		installed within any trench excavations to intercept and minimise the accumulation of surface runoff water from upslope areas running down the trenches;							
2.2. Aspect: Construction within riparian area for the purpose of stormwater upgrade and installation									
2.2.1. Protection of riparian areas									
2.2.1.1	Ensure sensitive ecosystems and habitats are protected during construction	When working within the riparian area of the Moretele River, it must be ensured that protection measures are put in place by clearly demarcating work areas and keeping the surrounding areas separate from allowable footprint.	The preservation of riparian areas and protection of existing vegetation	Site to be inspected.	Continuous	Contractor		✓	
2.2.1.2		Where construction in sensitive areas is unavoidable, the development footprint must be kept to minimum.	The preservation of watercourse and riparian areas	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.2.1.3.		Unnecessary compaction and impacts on soils must be avoided.	The preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe.	Site to be inspected.	Continuous	Contractor		✓	
2.2.1.4.		Care must however be taken to avoid additional disturbance during the implementation of these measures.	The preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe.	Site to be inspected.	Continuous	Contractor		✓	
2.2.1.5.		Construction activities within the riparian area and all associated buffers must take place during the dry season, where possible.	The preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe.	Site to be inspected.	Continuous	Contractor		✓	
2.2.1.6.		No construction is to occur outside the designated servitude width.	The preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe.	Site to be inspected.	Continuous	Contractor		✓	
2.2.1.7.		No rubble may be temporarily stockpiled or dumped within the riparian area.	The preservation of riparian habitat in construction footprint of stormwater outlet and stormwater pipe.	Site to be inspected.	Continuous	Contractor		✓	
2.3. Aspect: Erosion and sedimentation control									

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.3.1.	Ensure ecosystems and habitats are protected during construction	Both temporary and permanent soil erosion control measures must be used during the construction and operation phases.	Erosion control and prevention	Site to be inspected.	Continuous	Contractor		✓	
2.3.2.		Any 'sods' of vegetation removed during clearing activities should be replanted.	The preservation of vegetated areas	Site to be inspected.	Continuous	Contractor		✓	
2.3.3.		Where necessary, an approved local indigenous grass seed mixture should be applied in conjunction with the sods.	The prevention of soil erosion and spread of AIS's	Site to be inspected.	Continuous	Contractor		✓	
2.3.4.		Checks must be carried out at regular intervals to identify areas where erosion is occurring, and remedial action must be taken.	Erosion control and prevention	Site to be inspected.	Continuous	Contractor		✓	
2.3.5.		Grass should be watered on a regular basis (naturally and artificially) until the vegetation has established and	Erosion control and prevention	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		adequate cover is achieved.							
2.3.6.		Incorporate adequate erosion management measures to limit erosion and associated sedimentation of downstream catchments; management measures may include berms, silt fences, hessian curtains and stormwater diversion away from areas susceptible to erosion.	The preservation of downstream areas	Site to be inspected.	Continuous	Contractor		✓	
2.3.7.		Excavated material and large sediment loads must be prevented from entering water resources and other sensitive areas.	Limited erosion Limited dust Limited sedimentation	Site to be inspected.	Continuous	Contractor		✓	
2.3.9.		Excavated soils must be placed on the upslope side, minimizing the risk of erosion and excess sediment entering	Limited erosion Limited dust Limited sedimentation	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		stormwater systems and associated freshwater ecosystems.							
2.3.10.		Rehabilitation is to take place immediately after construction on any particular section of the infrastructure by using topsoil that was removed and stockpiled for use in rehabilitation.	Limited erosion Limited dust Limited sedimentation	Site to be inspected.	Continuous	Contractor		✓	
2.4. Aspect: Site Support Facilities									
2.4.1. General Management Measures									
2.4.1.1.	Ensure a work environment that is safe and fair for all workers	Respect workers right to refuse to work in unsafe and unhealthy environment.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.1.2.		All work must be carried out under strict supervision and according to best practice.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.1.3.		Management must identify training requirements for the various work areas and undertake training	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		of employees and contract workers in the respective areas.							
2.4.1.4.		Local labour must be used to ensure the affected community get the most benefit from the job opportunities.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.1.5.		Training must be provided to local labourers in order to perform more specialised jobs.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.2. Ablution facilities									
2.4.2.1.	Ensure a work environment that is safe and fair for all workers	Workers must be provided with suitable ablution facilities.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.2.2.		Ablution facilities must be serviced regularly and service slips must be kept in the site file.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.2.3.		The Contractor is responsible for the erection and maintenance of adequate ablution facilities and for	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		enforcing the use of these facilities.							
2.4.2.4.		The Contractor must be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the Applicant.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.2.5.		Separate toilet facilities must be provided for males and females on site.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.2.6.		All ablutions are to be located as far away from the wetland and buffer areas as possible.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.3. Fire prevention and control									
2.4.3.1.	Ensure a work environment that is safe and fair for all workers	Fire prevention talks must be held.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.3.2.		Ensure adequate firefighting equipment on site.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.3.3.		Ensure that all workers on site know the proper procedure in	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		the incidence of a fire on site.							
2.4.3.4.		Smoking must not be permitted in those areas considered a fire hazard.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.3.5.		Designated smoking areas must be provided within the site camp.	No complaints from workers	Site to be inspected.	Continuous	Contractor		✓	
2.4.4. Operation of the construction site									
2.4.4.1	To ensure that the site cause least disturbance to environment and any I&APs	Lighting and noise disturbance or any other form of disturbance on the person living lawfully in the vicinity must be kept to a minimum.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.4.2	Designated areas	Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas	No complaints from workers No incidents/complaints from I&APs	Site to be inspected.	Continuous	Contractor		✓	
2.4.5. Stockpiling									

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.4.5.1.	To ensure minimum visual impairment. As well as to manage dust and sedimentation	Soil stockpiling areas must follow environmentally sensitive practices.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Stockpiling must remain within the construction boundaries.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Where stockpiling has occurred outside of the site boundaries, immediate action must be taken for the effective relocation of the stockpiles into the site boundaries.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		The careful positioning of soil piles, and runoff control, and planting of some vegetative cover after completion (indigenous groundcover, grasses etc.) must limit the extent of erosion occurring on the site.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.4.5.1.		No construction materials are to be stockpiled or dumped in wetland and buffer areas.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Material stockpiles or stacks must be stable and well secured to prevent collapse of the stockpile and possible injury to workers or local residents.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Stripped topsoil must be stockpiled in areas agreed with by the Site Manager for later use in re-vegetation and must be adequately protected. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. The depth of the soil may vary and due to this reason the top 300 mm of soil must be removed and preserved as topsoil.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.4.5.1.		During earthworks, the top 50 cm of the topsoil must be removed and stockpiled during the construction period. This soil is to be replaced once activities have been completed. This is to maintain the existing seed bed and soil profiles as best as possible.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Stockpiles must be convex and no more than 2 m high. Stockpiles must be shaped so that no surface water ponding can take place.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Topsoil stockpiles must not be subject to compaction greater than 1 500 kg/m2 and must not be pushed by a bulldozer for more than 50m.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.4.5.1.		Topsoil stockpiles must be monitored regularly to identify any alien plants. If any occur, they must be removed before they germinate to prevent contamination of the indigenous seed bank.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.5.1.		Any potential large sediment loads (i.e. stockpiles) must be contained by covering them.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.6. Stormwater management									
2.4.6.1.	To minimise the impact of stormwater runoff on the receiving environment	Temporary stormwater management plan must be in place and structures must be accordingly used during construction.	Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.6.2.		Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated immediately.	Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.4.6.3.		All major and minor systems within road reserves must be a closed system in the form of pipe or box culverts. All townships have an underground pipe connection to a municipal stormwater network..	Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.6.4.		Concentrated flows through buffer zones should be avoided through diffuse flow discharges, and runoff entering the buffer zone. should not exceed 1.5m/sec to enhance the pollutant removal performance of buffers	Limited erosion Pollution prevention	Site to be inspected.	Continuous	Contractor		✓	
2.4.6.5.		Suitably-designed stormwater structures (e.g. gabion/Reno mattresses) for large discharge points should be used to dissipate and control energy of temporary stormwater runoff	Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		before entering watercourses.							
2.4.7. Dust suppression measures									
2.4.7.1.	To ensure minimum visual impairment and dust related health risks.	Dust suppression measures must be implemented such as regular watering.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.8. Vehicles									
2.4.9.1.	Limit pollution due to vehicle movement.	All mechanical equipment must be in good working order and adhere to relevant noise requirements of the Road Traffic Act.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.9.2.		Safety measures that generate noise, including reverse gear alarms, must be adjusted to minimise noise.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.4.9.3.		The vehicles must be in good working order and all leaks such as oil leaks must be repaired immediately.	No incidents/complaints from I&APs Limited erosion Limited dust	Site to be inspected.	Continuous	Contractor		✓	
2.5. Aspect: Waste management measures									

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.1. Sewage spillages									
2.5.1.1.	To prevent or minimize the incidents and impact of potential sewage spillages	Should a sewage spillage occur, it must be reported to the relevant departments immediately.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü
2.5.1.2.		Where contamination of the soil occurs, soil must be immediately removed to prevent further contamination.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü
2.5.1.3.		Should faulty infrastructure be identified, it must be replaced immediately after discovery. This must form part of a maintenance plan set forth by the Municipality.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü
2.5.1.4.		Records of all sewage spillages must be kept.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.1.5.		An emergency preparedness plan must be in place for instances where spills occur that can be harmful to people or the receiving environment.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü
2.5.1.6.		No sewage waste is to be buried or left as is.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	ü
2.5.1.7.		Preventative measures must be undertaken during the construction of the infrastructure, securing all joints for minimum spillage occurrences.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2. Hazardous substances									
2.5.2.1.	To ensure no waste poses health threats or causes pollution	Mark all spillage containment areas and containers clearly as such.	No incidents/complaints from I&APs Preservation of the wetland area	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.2.2.		All spills must be immediately cleaned up and treated accordingly as per the predefined hazardous spill protocol.	No incidents/complaints from I&APs Preservation of riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.3.		Hazardous waste (oils, effluent from corrosion protection activities) must be disposed of at registered landfill site.	No incidents/complaints from I&APs Preservation of riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.4.		MSDS's must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of leakage.	No incidents/complaints from I&APs Preservation of riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.5.		Extra care must be taken to prevent any potentially hazardous substances from entering stormwater systems and associated riparian	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		area during rainfall events.							
2.5.2.6.		The use of all chemicals and potentially hazardous substances must take place on a tray or an impermeable surface, away from riparian areas.	No incidents/complaints from I&APs Preservation of riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.7.		In the event of the spilling of chemicals and potentially hazardous substances, this must be addressed immediately and reported to the ECO and the relevant authority.	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.8.		Preventive measures must be undertaken during the construction of the infrastructures, securing all joints for minimum spillage occurrences.	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.2.9		Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed	No incidents/complaints from I&APs Preservation of the riparian area and groundwater	Site to be inspected.	Continuous	Contractor		✓	
2.5.2.10		Spill kits must be available in the event of a hydrocarbon or chemical spill.	No incidents/complaints from I&APs Preservation of the riparian area and groundwater	Site to be inspected.	Continuous	Contractor		✓	
2.5.3. General Waste									
2.5.3.1.	Limit pollution due to construction works	Construction waste must be taken to the closest general waste landfill site.	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.3.2.		All rubble, litter and any other type of waste must be removed from the development footprint and areas directly adjacent to the construction areas and regular monitoring of core ecological areas must be undertaken.	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.3.3.		All waste and materials used during the construction phase must be removed; no waste is to be buried or burned or left in the conservation area.	No incidents/complaints from I&APs Preservation of the riparian area	Site to be inspected.	Continuous	Contractor		✓	
2.5.4. Groundwater contamination									
2.5.4.1.	Limit groundwater pollution due construction works and associated activities	If construction machinery or equipment is used during the construction works, they are not to be re-fuelled or washed on site.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.4.2.		Precautions must be taken to prevent refuse from spreading from or on the site by placing dustbins strategically at the site.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.4.3.		Drip trays must be used to collect used oil, lubricants, etc. during maintenance. Drip trays must be provided for all stationary plant.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.4.4.		Washing of equipment must be restricted to urgent maintenance requirements only and must not occur near a watercourse.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.5. Cement and concrete batching									
2.5.5.1.	Limit groundwater and river pollution due construction works and associated activities	Concrete mixing directly on the ground must not be allowed and must take place on impermeable surfaces in dedicated areas to the satisfaction of the Site Manager and ECO.	No spillages /incidents or complaint	Site to be inspected.	Continuous	ECO Contractor		✓	
2.5.5.2.		The concrete batching activities must be located in an area of low environmental sensitivity to be identified by the Site Manager and ECO.	No spillages /incidents or complaint	Site to be inspected.	Continuous	ECO Contractor		✓	
2.5.5.3.		All runoff from batching areas must be strictly controlled and cement-contaminated water must be collected, stored and disposed of	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		at a registered landfill site authorised to deal with these substances.							
2.5.5.4.		Contaminated water storage facilities must not be allowed to overflow and appropriate protection from rain and flooding must be implemented. The storage facilities must be completely closed systems such as JoJo tanks, with adequate capacities.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.5.5.		Unused cement bags must be stored out of the rain where runoff won't affect them. Used / empty cement bags must be collected and stored in weatherproof containers to prevent wind-blown cement dust and water contamination.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
2.5.5.6.		Used cement bags must not be used for any other purpose and must be disposed of on a regular basis at a registered landfill site.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.5.7.		All excess concrete must be removed from site on completion of concrete works and disposed of at a registered landfill site. Washing of the excess concrete into the ground must not be allowed.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
2.5.5.8.		All excess aggregate must be removed.	No spillages /incidents or complaint	Site to be inspected.	Continuous	Contractor		✓	
3. Post-construction and rehabilitation									
3.1. Aspect: Finishing of site after construction									
3.1.1. Restoration of the surrounding land									
3.1.1.1.	Ensure successful rehabilitation and operation of the infrastructure installation	All temporary facilities and waste materials must be removed.	Clean site policy	Site to be inspected.	Continuous	ECO Contractor		✓	
3.1.1.2.		Rehabilitation of the natural vegetation of the excavated areas must be done immediately after the	Limited erosion Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
		upgrade of the infrastructure at any point in order to prevent dust generated by the excavation activities from dispersing. The rehabilitation and construction must run simultaneously.							
3.1.1.3.		For landscaping, soils must be reinstated in reverse order to ensure correct drainage and rehabilitation, if there is not enough topsoil present at the site it must be imported.	Limited erosion Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓
3.1.1.4.		All temporary stockpile areas, litter and dumped material and rubble must be removed on completion of construction.	Limited erosion Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
3.1.1.5.		All riverbeds impacted during construction must be restored as close to its original profile prior to construction with the use of a rehabilitation plan.	Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓
3.1.1.6.		Locally occurring indigenous grasses must be used during rehabilitation.	Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓
3.1.1.7.		Alien invasive grasses such as *Pennisetum clandestinum* (Kikuyu) must not be used.	Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓
3.1.1.8.		Landscaped areas around the proposed development must be planted with indigenous (preferably using endemic or local species from the area) grasses, forbs, shrubs and trees, which are water wise and require minimal horticultural practices.	Successful rehabilitation of areas disturbed during construction	Site to be inspected.	Continuous	ECO Contractor			✓

Nr.	Objectives	Mitigation Measures	Target/Standard	Indicator	Frequency	Responsibility	Phase applicable		
							Prior to construction	Construction	Operational/ rehabilitation
3.1.1.9		An emergency preparedness plan must be in place prior to the commissioning of the operational phase for instances where spills occur that can be harmful to people or the receiving environment.	Minimise the impact of the proposed works on the riparian areas.	Site to be inspected.	Continuous	ECO Contractor			✓