ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for

THE PROPOSED ELOFFSPARK MIXED USE HOUSING DEVELOPMENT WITHIN CITY OF TSHWANE, GAUTENG PROVINCE.

Draft Basic Assessment Report

June 2018

COMPILED BY:
Envirolution Consulting (Pty) Ltd
PO Box 1898
Sunninghill
2157
Tel: (0861) 44 44 99
Fax: (0861) 62 62 22
E-mail: info@envirolution.co.za
Website: www.envirolution.co.za

PREPARED FOR:
Nompilo Occupational Health Services
PO Box 2 Noordwyk
1687
Tel: 083 653 4002
Email: bmbonyana@gmail.com

TABLE OF CONTENTS

APPENDICES

ACRONYMS & ABBREVIATIONS

EA	Environmental Authorisation
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, design alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Environment: 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 well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, insert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: As per National Environmental Management: Waste Act means-

a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or
b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems were where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and

(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Waste: means any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to of the National Environmental Management: Waste Amendment Act 2014.

1. PROJECT DETAILS

1.1 Background

Envirolution Consulting was appointed by Triviron Project Management (Pty) Ltd on behalf of Housing Development Agency (HDA) to undertake a Basic Assessment process for the proposed Eloffspark Mixed Use Development within the City of Tshwane Metropolitan Municipality (refer to Figure 1). The proposed development footprint of the site is approximately 19 hectares (ha) and is located on Remaining Extent of Farm Eloffspark 772 JR immediately east of the R101 (Mainsfield Avenue), and south of Franzina Street. Various land uses including residential units, medical facility, day care centre, library, community multipurpose hall, plaza and police offices are proposed, and will be referred to as "Mixed Used Development" in this report.

The site is located about 4.5 km north of the Pretoria CBD in the City of Tshwane Municipality in the township of Eloffsdal. The site falls within Region 3 (Ward 53). The site is currently being used for various purposes by a trucking company, car dealership and a plant nursery.

The HDA proposed to establish the mixed use housing development on an approximate total developable area of 19 ha that is the site extent. The proposed development of the Eloffspark 772 JR as a project will contribute to the development of an integrated human settlement project as an inner-city property.

The proposed development will entail:

- Commercial buildings that are grouped in a central commercial hub.
- No mixed use buildings.
- Basement or first floor parking in commercial and specific buildings only.
- Buildings are orientated north facing.
- More than 4 storeys.
- Commercial, social, affordable and students accommodation are separate and in designated zones.

Green zones:

- Green zones are centralised on traffic nodes throughout the estate and are communal.
- Green zones each have individual character.

Community amenities:

- Medical facility.
- Day care centre.
- Community hall.
- Sub Branch Police Station.
- Post Office

Commercial amenities:

- Office space to let
- Private medical suites
- Estate agents

- Estate management office

The proposed development bodes well with the objectives for sustainable human settlements as the development will promote different housing typologies for various income categories. The proposed development is also close to a rail and road (BRT) transportation.

The proposed development will cater to residents living in informal settlements and create liveable residential units that will be part of infrastructure investment; this will create a reduction in informal settlement, for people who live there will move to the affordable housing units proposed.

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. The purpose of this document is to provide management responses that will ensure that the impacts of the development are minimised. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

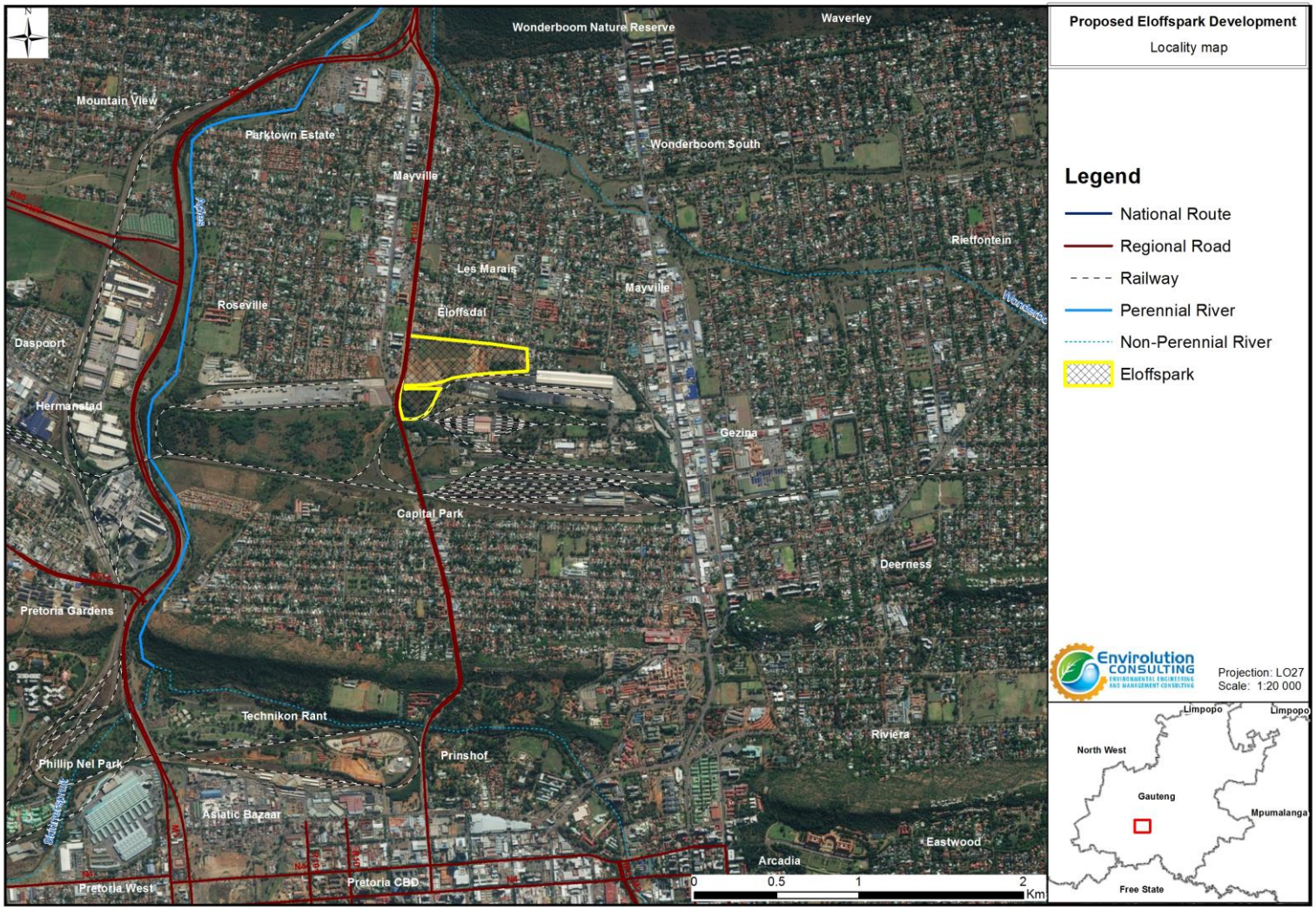

Figure 1: Locality map showing the proposed developable area for the Eloffspark mixed used developments.

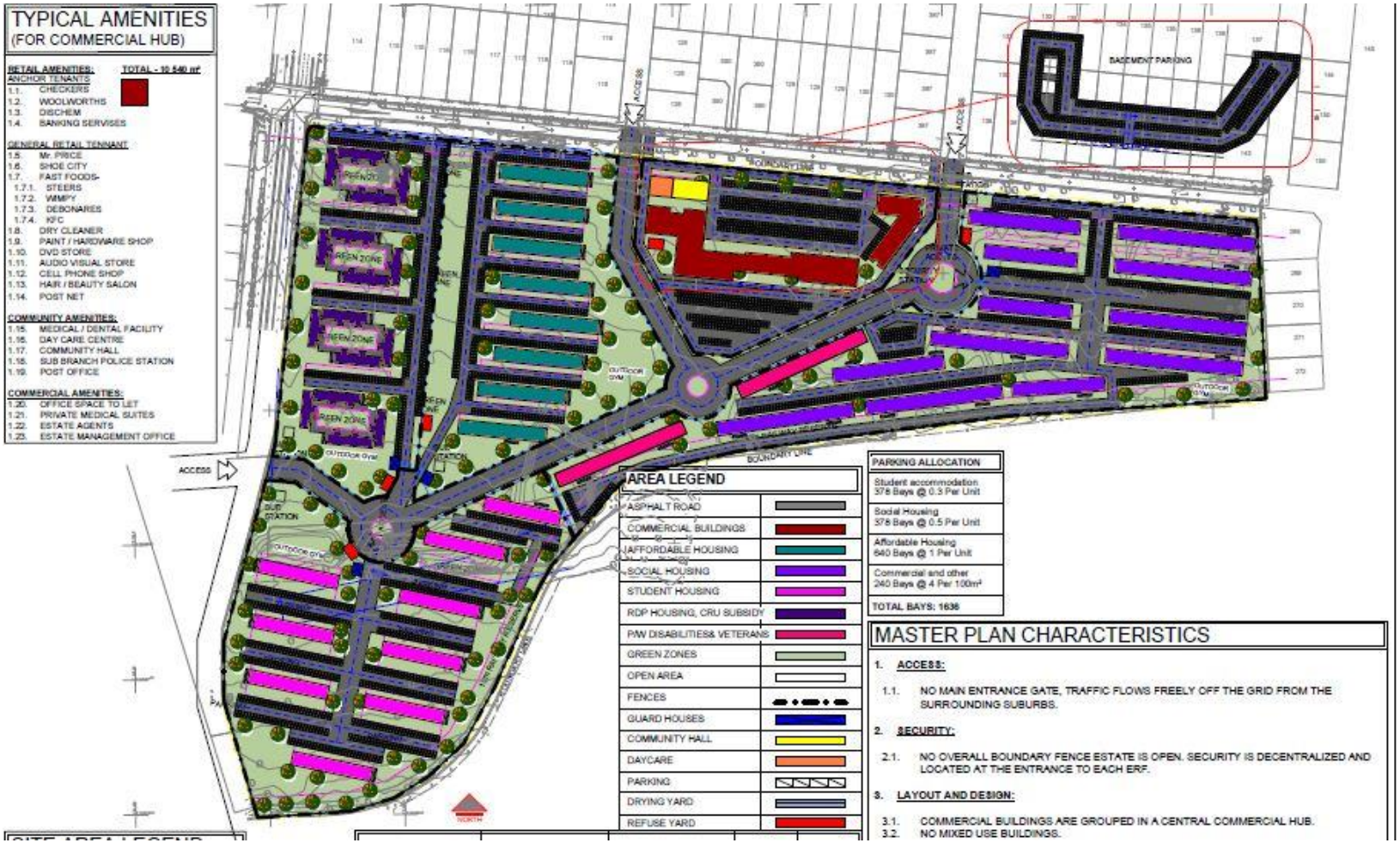

Figure 2: Layou out design of proposed mixed use housing development.

1.2 Findings of the Basic Assessment

Wetland/Riparian Classification and Delineation:

According to the site assessment conducted by the wetland specialist on 20 April 2018, it reflected open grassland dominated by *Urochloa mosambicensis* and *Bothriochloa insculpta* and patches of *Heteropogon contortus*, *Hyparrhenia* hirta, *Cynodon dactylon* and *Panicum coloratum*. These grass species are not associated with wetlands although *Urochloa* and *Bothriochloa* like to grow on clay soils where water accumulated following precipitation events. However, even though the site visit was conducted at a time when good seasonal rain had fallen for some months, no sedges were recorded on the site. The weed *Arundo donax* grew in dense stands on parts of the site. This reed may sometimes be confused with *Phragmites australis* which indicates permanent wetland conditions. However, it is not hydrophilic at all and occurs in disturbed areas not associated with increased soil moisture.

As such, No wetlands are identified in the region of the study site (Gauteng Conservation Plan, Version 3.3 (GDARD, 2011) (Figure xx). No soil or vegetation indicators for wetland conditions were recorded during the site assessment.

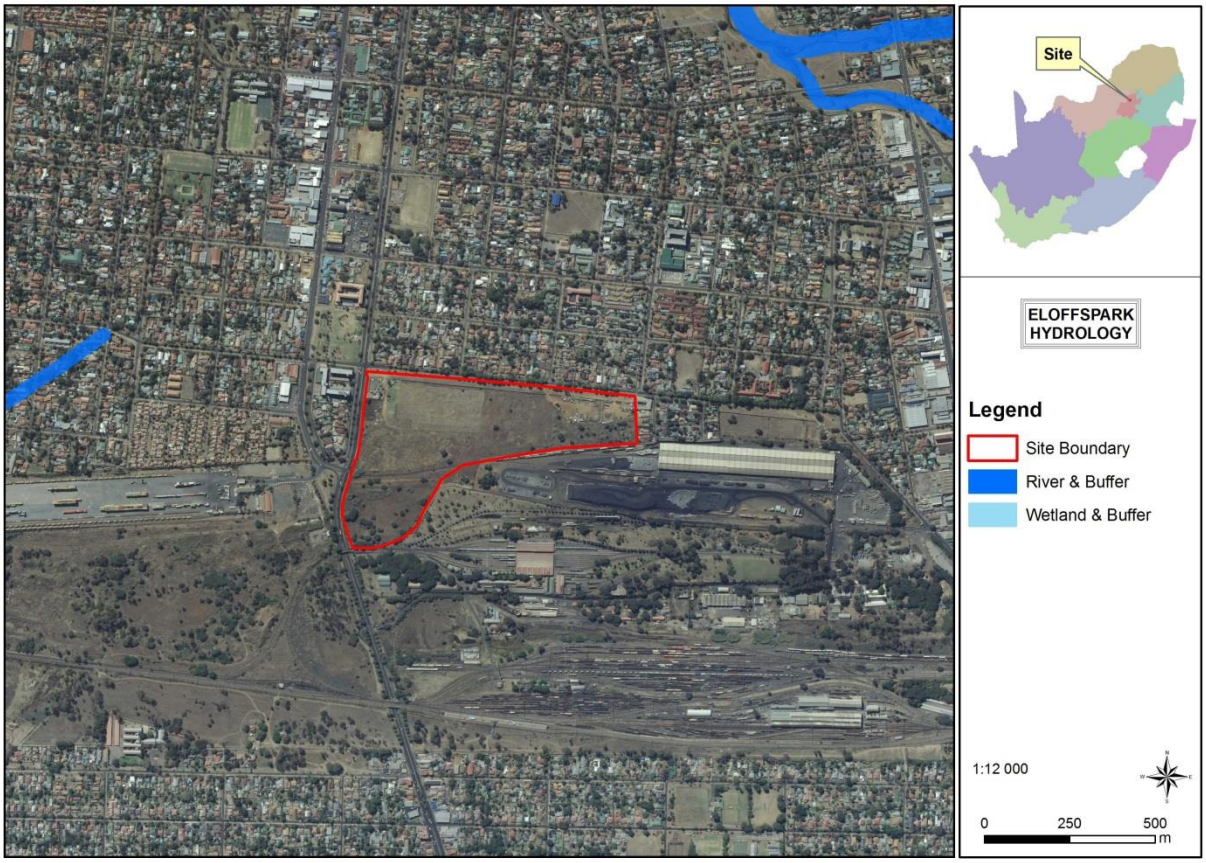

Figure 3: Regional hydrology

Vegetation Assessment:

As per the vegetation assessment, the site falls within the Moot Plains Bushveld vegetation type which comprises open to closed, low, often thorny savanna dominated by various species of *Vachellia* and *Senegalia* in the bottomlands and plains as well as woodlands of varying height and density on the lower hillsides. This vegetation is classified as *Vulnerable*. The site does not fall within a listed ecosystem.

The whole site was historically disturbed which resulted in vegetation that is modified from the reference state of Moot Plains Bushveld. No natural or semi-natural Moot Plains Bushveld was recorded. The vegetation on the site was broadly grouped as follows:

- Severely modified and degraded;
- Secondary grassland; and
- Wooded grassland dominated by invasive alien tree species.

Due to historic disturbances on the site, the vegetation present was classified as being mostly in a poor ecological condition with no potential to conserve good condition, natural vegetation. No plant species of conservation concern were recorded, and none are expected to occur.

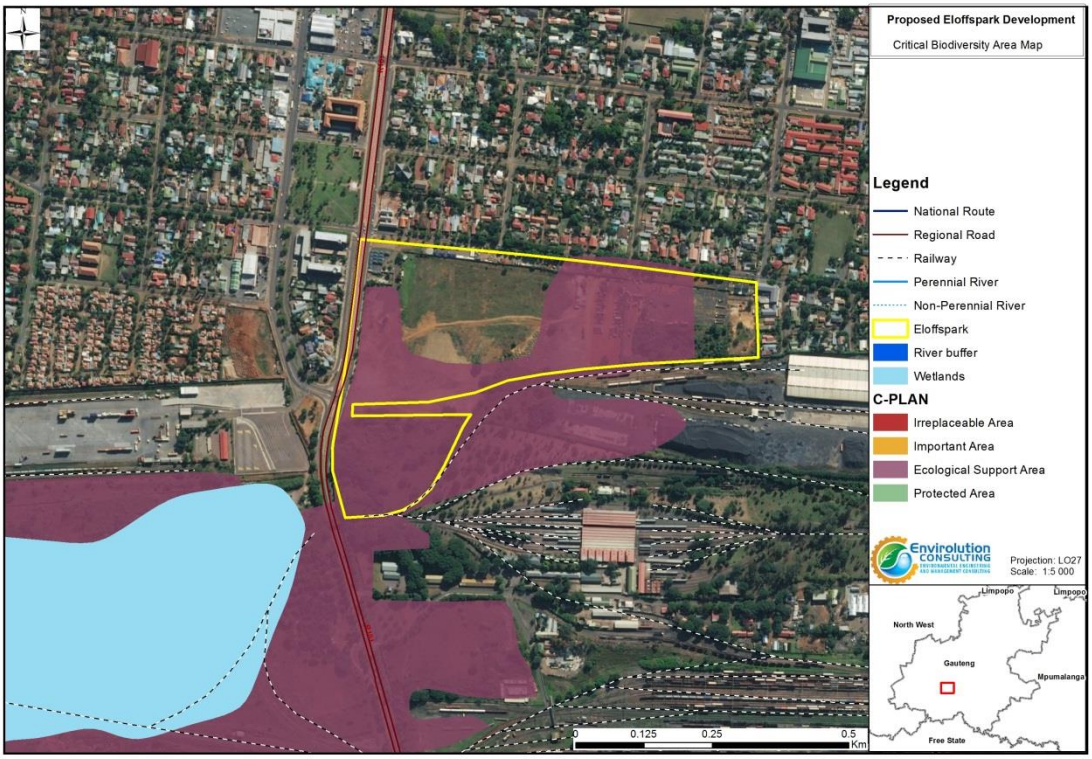

Figure 4: The site falls within an Ecological Support Area of the Gauteng Conservation Plan

According to the Gauteng Conservation Plan (version 3.3), the majority of the site and its surroundings are situated in an ESA (Figure xx). ESA's are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical

biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration.

Figure 5: Habitat characterisation map delineating areas or relatively intact, moderately disturbed and no habitat remaining.

Secondary or planted grassland

The vegetation on the northern boundary of the site comprised grassland with a few individuals of the thorny *Vachellia karroo* (sweet thorn). The land was either historically sown with pasture grasses or pioneer grassland species recolonised disturbed or fallow lands. However, due to constant disturbances the grassland remained in a pioneer to secondary grassland state.

The grassland comprised patches of the dominant species, with the pioneer (and good grazing grass) *Urochloa mosambicensis* (bushveld signal grass) being the most dominant. Other dominant species include *Botriochloa insculpta* (pinhole grass), *Heteropogon contortus* (spear grass), *Hyparrhenia hirta* (thatch grass) and *Cynodon dactylon* (couch grass). The forb diversity was depauperate including only *Conyza podocephala*, Felicia *muricata*, *Indigofera daleoides* and weeds such as *Tagetes minuta* (*khakibush*), *Zinnea peruviana* (*wildejakobregop*) and *Campuloclinium macrocephalum* (pom-pom weed). The grassland has some function as open space, however, it is not conservation worthy and classified as being in a fair to poor ecological state.

Habitat Characterisation

During the April 2018 field survey, the project area was traversed on foot and faunal habitats delineated based on the following:

- Degree of anthropogenic disturbance; and
- State of vegetation community i.e. indigenous vegetation vs. alien invasive vegetation or devoid of vegetation

Three habitat categories were identified:

- Areas devoid of faunal habitat comprised approximately 5.1 hectares or 27.2% of the site. These areas were comprised of the office areas, trucks yards and other cleared areas;
- Moderately disturbed areas comprised 5.7 hectares or 30.0% of the site. These habitats were comprised of areas that had previously been disturbed where some revegetation had occurred. The vegetation in these areas was composed of a large number of alien invasive & pioneer plant species. These areas provide very limited habitat for faunal species; and

Intact areas comprised approximately 8.0 hectares or 42.5% of the site broken up into 3 disjointed areas. Although by no means unimpacted, these represented areas where some remnant of the indigenous vegetation cover & community remained. These areas also appeared to be less utilised by the people on the site. Due to the fragmented nature of these sites, and the high degree of anthropogenic disturbance surrounding these areas they are not expected to house diverse faunal communities; however, these are the only portions of the Eloffspark site that can be expected to retain some faunal diversity albeit of small, inconspicuous species that are tolerant to human disturbance.

Overview of historic vegetation type

The site is situated within the Savanna biome of South Africa and in specific within the Central Bushveld Bioregion. The Savanna biome is the largest biome in southern Africa, occupying over one-third of the surface area of the country (Mucina & Rutherford, 2006). It is characterised by a grassy ground layer and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as Shrubveld, where it is dense, as Woodland, and the intermediate stages are commonly known as Bushveld (Mucina & Rutherford, 2006).

The Central Bushveld Bioregion (a bioregion is a vegetation organisation level between that of vegetation type and biome) comprises several vegetation types. The site falls within the Moot Plains Bushveld vegetation type which comprises open to closed, low, often thorny savanna dominated by various species of Vachellia and Senegalia in the bottomlands and plains as well as woodlands of varying height and density on the lower hillsides. The herbaceous layer is dominated by grasses (Mucina and Rutherford, 2006). Any disturbances to the vegetation on the site and surrounds could modify the site vegetation from this reference state. The Moot Plains Bushveld is transformed mainly by cultivation and urban and built-up areas, however, infestation by alien plants including Cereus jamacaru, Eucalyptus species, Jacaranda mimosifolia, Lantana camara, Melia azedarach and

Schinus species contribute to the degradation of this vegetation type which is classified as being Vulnerable to further transformation of its original extent (Mucina and Rutherford, 2006).

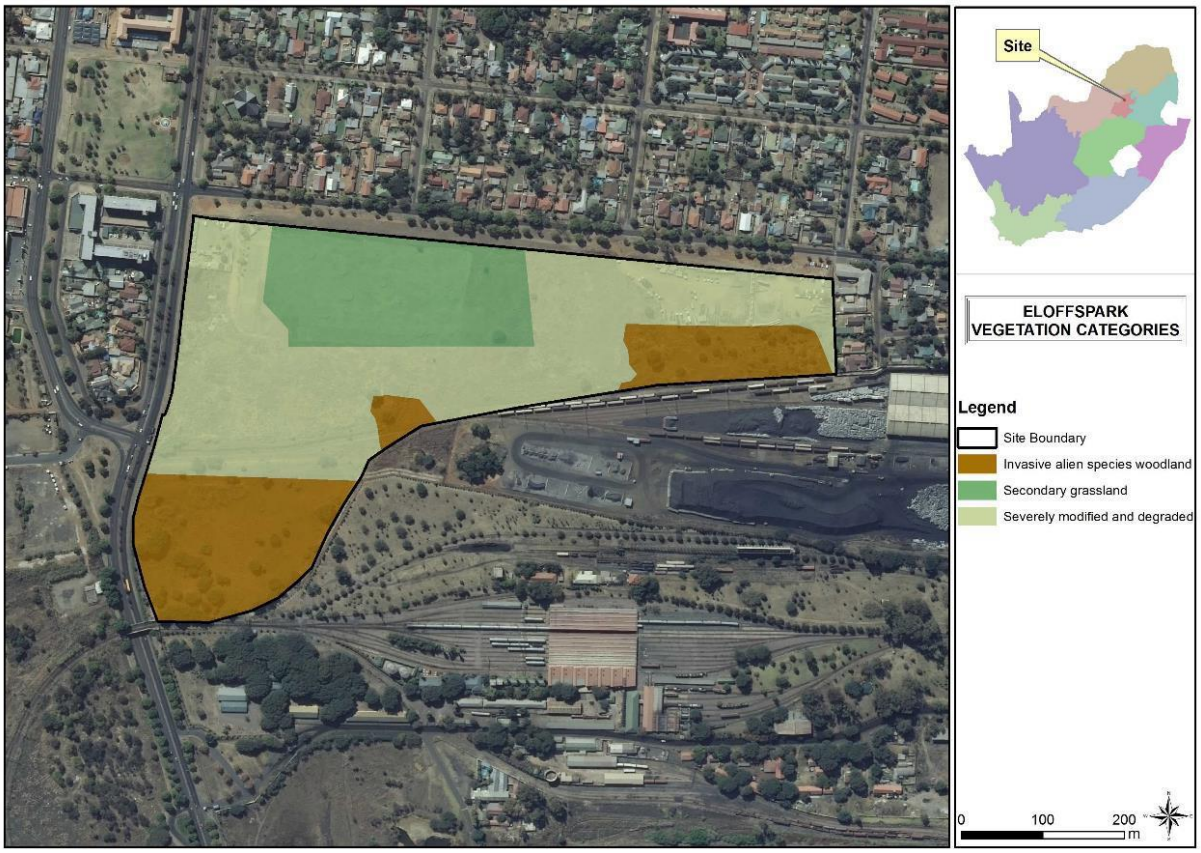

Figure 6: Vegetation groups recorded on site.

Vegetation Survey Overview

The vegetation that could be impacted on by the proposed development on the site are grouped into three broad vegetation associations Each broad vegetation grouping is discussed below and geographically represented in **Figure 3.**

1. Modified (mowed lawns and buildings and invasive tree stands);
2. Secondary *Hyparrhenia hirta* grassland; and
3. Moist grassland.

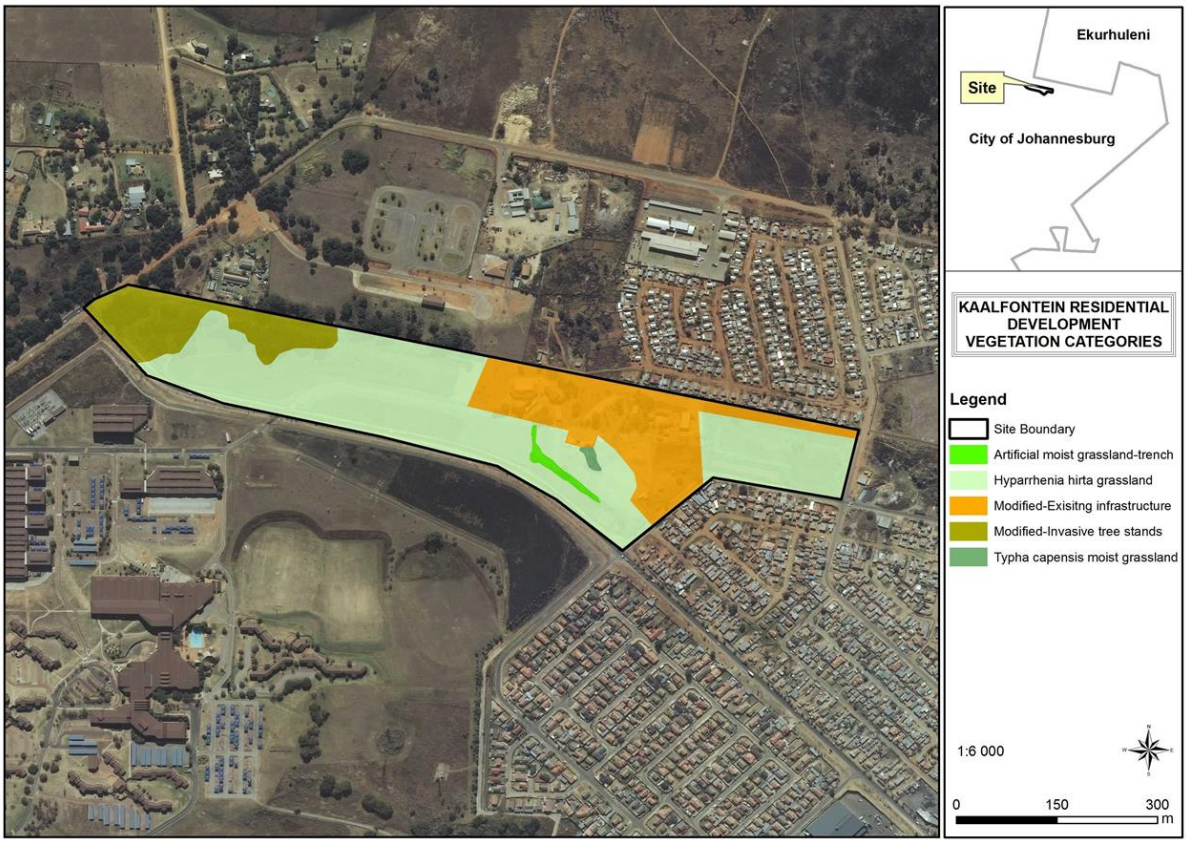

Figure 7: Vegetation associations on site

Vegetation Assessment conclusions

Due to historic disturbances on the site, the vegetation present was classified as being mostly in a poor ecological condition with no potential to conserve good condition, natural vegetation. No plant species of conservation concern were recorded, and none are expected to occur.

The vegetation does play a role in groundwater recharge and therefore it is recommended that the development plan include open spaces (indigenous gardens) and incorporate permeable paving. The removal of the invasive alien plant species from the site will have a positive impact as it will reduce the number of seeds spreading from the site. This positive impact should be monitored to prevent re-infestation during the operational phase.

Fauna assessment:

Portions of the project area are classified as ESAs based on the Gauteng C-Plan 3.3. Although these ESAs connect with and support CBAs situated to the north and south of the site, there has already been extensive habitat fragmentation which has occurred in the form of roads and railway lines. Based on the results of this assessment 3 faunal habitat categories were identified:

- Areas devoid of faunal habitat were comprised of truck yards, offices and cleared areas;

- Moderately disturbed areas comprised 30% of the site. The vegetation in these areas was composed of a large number of alien invasive and pioneer plant species. These areas provide very limited habitat for faunal species
- Intact areas comprised approximately 42.5% of the site broken up into 3 disjointed areas. Although by no means unimpacted, these represented areas where some remnant of the indigenous vegetation cover & community remained. These areas also appeared to be less utilised by the people on the site. Due to the fragmented nature of these sites, and the high degree of anthropogenic disturbance surrounding these areas they are not expected to house diverse faunal communities; however, these are the only portions of the Eloffspark site that can be expected to retain some faunal diversity albeit of small, inconspicuous species that are tolerant to human disturbance.

Three (3) mammal species of conservation concern were rated as moderately likely to occur on the site. The remainder of the mammal, bird and herpetofaunal (reptile & amphibian) species of conservation concern that could potentially occur on the site were rated as having a very low or low likelihood of occurrence. The significance of further loss of faunal habitat was rated as highly significant prior to implementation of mitigation measures. This was primarily attributed to the moderate likelihood of 3 mammal species of conservation concern in the project area. Mitigation measures for this impact include raising awareness of the potential presence of these species on the site. Should any species of conservation concern be recorded during vegetation clearing and construction an accredited specialist should be contacted to assist with the rescue and relocation of these species. The significance of the loss of ESA habitat was rated as having a low significance. This was attributed to the degraded and fragmented nature of these habitats resulting in reduced ecological importance.

Heritage assessment:

From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the proposed conditions. Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Traffic Impact Assessment:

From the traffic impact investigation the proposed development and the resultant increase in traffic due to the development can be accommodated on the surrounding road network subject to the following road upgrading:

- Franzina Street and Wergele Avenue:
  - Due to space constraints, this intersection should be converted into a mini-circle

- Franzina Street and Avril Street;
  - Due to space constraints, this intersection should be converted into a mini-circle

- Franzina Street and 5th Avenue;
  - Due to space constraints, this intersection should be converted into a mini-circle

- Traffic signal optimisation must be investigated further along Mansfield Avenue to ensure smooth traffic operations and little disruption to the bus service;

- Walkways must be provided for along the frontage of this development. It would be prudent for these walkways to be extended to connect to bus/taxi drop-off points. As such it is proposed that a 1.8m walkway be implemented along Franzina Street from Mansfield Avenue to 5th Avenue;
- Bus/Taxi bays must be provided at all access points along Franzina Street;
- The access point at Mansfield and Paul Kruger must be implemented in a manner that enables future developments to utilise the same and not be restricted to service one development. Permission for the relaxation of this requirement can be sought from the City in light of the restrictions in the implementation of any future roads inside this property as a result of the railway yard.

In view of the traffic impact investigation and discussion in the report, it is recommended that the proposed Eloffspark student accommodation development be approved from a Traffic Engineering point of view, subject to the developer implementing the upgrading proposals summarised above.

2. AIMS AND OBJECTIVES THE EMPR

The purpose of this Construction EMPr is to provide an easily interpreted reference document that ensures that the project environmental commitments, safeguards and mitigation measures from the environmental planning documents, project approvals, and Scope of Works are implemented. It aims to minimise impacts associated with the construction phase of the development on the environment are kept to a minimum. This includes ensuring that the mitigation measures described in the Basic Assessment Report (if required) are implemented, to ensure continued monitoring of the construction phase and to ensure the involvement of interested and affected parties (IA&Ps) in a meaningful way.

The objectives for the EMPr are:

- To develop, implement and maintain effective management systems for the environmental aspects of the maintenance works;
- To document details of environmental protection infrastructure and controls so that they are able to provide long term protection for the natural environment;
- To ensure compliance with relevant legislation (National, Provincial and Local), regulatory requirements and environmental documents;
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects;
- To ensure that all Environmental Management considerations are implemented during the operational and maintenance phases of the project.

The EMPr has been developed based on the findings of the on site assessment undertaken by Envirolution and the following specialist studies undertaken during the basic assessment process of this project. All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

2.1 Project Team

This draft Environmental Management Programme was compiled by:

Company Name:	Envirolution Consulting (Pty) Ltd
Contact person:	Thabang Sekele
Postal Address:	P.O.Box 1898, Sunninghill, 2157
Telephone Number:	0861 44 44 99
Fax Number:	0861 62 62 22
Email:	thabang@envirolution.co.za

Expertise of Environmental Practitioner that prepared the EMPr

Thabang Sekele, the principle author of this Basic Assessment forms part of the project team and acts as the Project Manager for all phases of the project. Thabang holds a BA (Environmental Management) from the University of South Africa. Thabang has three years' experience as an Environmental Assessment Practitioner and his key focus is on strategic environmental assessment and advice; management and co-ordination of

environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance. Thabang is currently an Environmental Assessment Practitioner at Envirolution Consulting (Pty) Ltd.

Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Inputs to compile this EMPr was received from the following specialists:

- Wetland- Antoinette Bootsman of Limosella Consulting
- Vegetation – Antoinette Eyssel of Dimela EcoConsulting
- Fauna – Peter Kimberg Iggdrasil Scientific Services
- Heritage – Dr Johan van Schalkwyk of Johan Heritage Consultant

3. APPLICABLE LEGISLATION

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This EMPr will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to the proposed development.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all "actions" that they approve must be economically, socially and environmentally sustainable. It further states that "people and their needs" must be at the forefront of "its concern" and their interests must be served equitably. The intent of this EMPr is to ensure that the developer conducts all its activities related to the operation and maintenance of this parking in accordance with the provisions of the NEMA, and has taken into account the provisions of the Constitution and the principles of Integrated Environmental Management.

Key environmental legislations that are applicable to the project are outlined in Table 1.

.

Table 1: List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	National		
National Environmental Management Act (Act No. 107 of 1998)	» NEMA requires, inter alia, that: o Development must be socially, environmentally, and economically sustainable." o Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied." o A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions." » EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. » In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development	» In terms of sections 24(2) and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R983 and R985; a Basic Assessment process is required to be undertaken for the proposed project.
National Environmental Management Act (Act No. 107 of 1998)	» A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. » In terms of the Duty of Care provision in S28(1) the project proponent must ensure that	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development	» While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the EIA Phase.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.		» The implementation of mitigation measures are included as part of the Draft EMPr and will continue to apply throughout the life cycle of the project.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	» The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. » In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. » Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unlit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented.	» National Department of Environmental Affairs (hazardous waste) » Gauteng Department of Agriculture and Resource Development (general waste)	» In terms of GNR921, no waste license is required for the project » Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the applicable EMPr, as well as in accordance with the relevant Norms and Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	» S18, S19 and S20 of the Act allow certain areas to be declared and managed as “priority areas”.	» National Department of Environmental Affairs	» Reporting in terms of compliance to GNR831 will be required.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	» Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.	» Local Municipality	» While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. The Air Emissions Authority (AEL) may require the compilation of a dust management plan.
National Water Act (Act No. 36 of 1998)	» Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. » In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	» National Department of Water Affairs » Gauteng Department of Agriculture and Resource Development	» the proposed development requires a Water Use License as per the following regulations: • Section 21(c): impeding or diverting the flow of water in a watercourse and; • Section 21 (i): altering the bed, banks, course or characteristics of a watercourse. » Requirements set by S19 will apply throughout the life-cycle of the project.
Environment Conservation Act (Act No. 73 of 1989)	» National Noise Control Regulations (GN R154 dated 10 January 1992)	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development » Local Authorities	There is no requirement for a noise permit in terms of the legislation.
National Heritage Resources Act (Act No. 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including: » The construction of a road, powerline, pipeline, canal or other similar linear development or barrier exceeding 300 m in	» South African Heritage Resources Agency	» The proposed development exceeds5 000 m2 in extent » Heritage Assessment has been undertaken as part of this Basic Assessment (refer to **Appendix G3**). » Due to the density of the urban

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. » Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.		development in the region, it is very unlikely that any sites or features dating to the pre-colonial history of the region would still exist in the study area. However, isolated objects such as Stone Age artefacts might be exposed in areas close to stream beds. » Some smaller, informal burial sites occur in the larger region, but would not be impacted on by the proposed development. » Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003).	» Wetlands and other critical Biodiversity areas are regulated under the NEM:BA. Activities that fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures	» National Department of Environmental Affairs	» Ecologist specialists were appointed to determine any critical biodiversity areas. No permitting requirements were triggered by the activities.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds	» Department of Agriculture, Forestry and Fisheries (DAFF)	» An alien species management plan to be included in the requirements of the EMPr.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	and Invaders in South Africa are categorised according to one of the following categories: » Category 1 plants: are prohibited and must be controlled. » Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. » Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.		
Provincial			
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	» The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the Province. In addition 'Ecological Support Areas' (ESAs), mainly around riparian areas and other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of biodiversity in sensitive areas and requires	» Gauteng Department of Agriculture and Resource Development	On the study site, the sections associated with the watercourse are classified while the rest of the areas remain unclassified. The areas associated with the watercourse are classified as Ecological Support Areas

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	sensitive management where incorporated into C-Plan 3.		

4. PHASES OF THE PROJECT

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

The EMPr deals with the following phases as detailed below:

5.1 The Planning and Design Phase

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the plant responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, actions plans for the planning and design phase have been identified together with monitoring requirements (refer to Table 2).

5.2 The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and soil pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

5.3 Rehabilitation Phase

This phase will involve restoring the land impacted during the construction phase back to its original state. This process will mainly on rectifying the negative impacts that have been caused during construction by the removing pollution or contaminants and other dangerous substances, removal of contaminating waste material, removal of alien plant species and improvement of the soil.

5.4 The Operational Phase

The proposed development will require maintenance work when needed throughout the operation phase. During this operation phase, the storm water infrastructure maybe completely silted up and over grown. Proper cleaning and re-shaping of the up and downstream channel will have to take place. By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

5. ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase. The stakeholders are discussed below.

6.1 Developer

- The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr.
- Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated.
- The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr.
- The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.
- The developer must ensure to appoint an independent Environmental Control Officer (ECO to monitor and audit the implementation of the EMPr and environmental authorisation.
- The ECO must have the appropriate experience and qualifications to undertake the necessary tasks
- The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.
- The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.
- Submit an environmental audit report to the relevant competent authority (GDARD).

6.2 Contractor and Service Providers:

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr.
- Thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear.
- Ensuring that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.
- Ensuring adherence to the environmental management specifications.
- Ensuring that Method Statements are submitted to the Site Manager, and ECO, for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMPr.
- Ensuring that any instructions (whether verbal or written) issued by the site Manager, project manager or site engineer, ECO, in terms of the EMPr are adhered to.

- Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- Ensuring that an incident registers is kept in the site office, which lists all transgressions issued by the ECO.
- Ensuring that a register of all public complaints is maintained.
- Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).
- He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.

6.3 The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Assisting in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Reviewing the Contractor's construction Method Statements.
- Monthly site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr, the EA and approved Method Statements at all times.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Auditing the implementation of the EMPr and compliance with the EA on a monthly basis.
- Compiling a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer and the authorising authority.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

a) Liaison with Authorities

The ECO will be responsible for liaising with the Gauteng Department of Agriculture and Rural Development (GDARD). The ECO must submit monthly environmental audit reports to the authorities. These audit reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the

non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1**) is to be kept on a continual basis.

b) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

6.4 Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

6.5 Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to. The ELO should ideally also be a senior and respected member of the construction crew.

The ELO will be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register. This register must be presented at each EMC meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the ELO must keep a register of complaints from any community members on environmental issues. Finally, the ELO will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

6. ENVIRONMENTAL MANAGEMENT PROGRAM (EMPr)

The following table forms the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

Table 2: Planning and Design Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Appointment and Duties of ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	Developer	Once-Off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-Off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-Off
	Report on environmental compliance at the monthly site meetings	ECO, ELO	As necessary
	An Environmental Completion Statement will be prepared by the ECO for submission to developer indicating completion of the project and compliance with the EMP and conditions. This statement will be prepared after the final audit during the rehabilitation phase.	ECO	Once-Off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel. He should be fluent in the languages of the employees.	Contractor	Once-Off
Design of structures	• Confirm the presence of dispersive soils and ensure appropriate design		

	of structures • Stormwater design should include effective attenuation to prevent further erosion • Litter traps should be installed to contribute to pollution control	Developer	Once-Off
Limit the footprint of construction as far as possible, thereby reducing compaction and destruction of natural vegetation	• Plan construction activities to have the smallest possible footprint • Demarcate the construction footprint prior to commencement of construction and ensure that all workers and contractors are aware that access beyond the demarcated areas are not allowed • Ensure that a copy of this and other applicable documents are available on site and that all workers and contractors are aware of it. Implementation thereof should be monitored by the appointed Environmental Officer (EO) or Environmental Control officer (ECO)	Developer, ECO, ELO	Once-Off
Training for Site Personnel	All Contractor teams involved in construction work are to be required to undergo some form of environmental induction on their obligations towards environmental controls and methodologies in terms of this EMP, prior to commencing of the works.	Developer, ECO	Once-Off
	• The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; o What is meant by "Environment" o Why the environment needs to be protected and conserved o How construction activities can impact on the environment o What can be done to mitigate against such impacts o Awareness of emergency and spills response provisions o Social responsibility during construction phase • It is the Contractor's responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient	Contractor	Continuous

	understanding to pass this information onto the construction staff. • Training should be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary. • Use should be made of environmental awareness posters on site. • The need for a "clean site" policy also needs to be explained to the workers. • Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.		
	Environmental inductions may take the form of onsite talks and demonstrations by the Contractor and the ECO. Induction report will be signed by the Contractor as well as the Employee undergoing Induction, and records kept for auditing purposes and copies given to the ECO for filing. The education / awareness programme should be aimed at all levels of management and staff within the Contractor's team, and particularly labour drawn from surrounding communities	ELO, ECO, Contractor	Continuous
Record Keeping	It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with related documents and other records related to this EMPr.	Developer, Contractor	As necessary
	All specialists reports (Heritage, Vegetation, and Wetland Delineation and Rehabilitation and Monitoring Plan) EMPr	Developer, Contractor	Continuous

	The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, the Water Use License from the Department of Water Affairs (DWS) licence and other monitoring programs.	Contractor, Developer	Continuous
	All records related to the implementation of this management plan (e.g. site instruction book, ECO reports, induction records, method statements, must be kept together in an office where it is safe and can be retrieved easily.	Developer, Contractor, ELO	As necessary
	All relevant records should be kept for a minimum of two years after construction and should at any time be available for scrutiny by any relevant authorities or stakeholder.	Developer, Contractor	As necessary
Avoid or rescue and relocate protected species	Any Protected plants noted, if any must be removed by a suitably qualified specialist and replanted in suitable habitat. (Note, these plants may only be removed with the permission of the provincial authority and as provided for in the Record of Decision). Their survival must be monitored for at least two growing seasons after relocation.	Contractor, RE, ECO	Once off
Permits and Permissions	The Developer shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, updating the Department of Water Affairs (DWA) licence and obtaining biodiversity permits, etc.	Contractor, Developer	Once off
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted unless	Contractor, RE, ECO	Continuous .

	required by the contract and with the permission of the RE.		
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.	Contractor	Continuous
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Effective communication mechanisms	• Undertake negotiations with affected landowners and agree on landowner-specific conditions for construction and maintenance • Implement a grievance mechanism procedure for the public <u>Visible safety barriers (with nets or tape) must be erected along the route to ensure that no harm is brought to the public and animals.</u>	Contractor, ELO	Once - Off
Method Statements	The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include: • Logistics for the Environmental Awareness Training Course • Location and Layout of Construction camp • Construction procedures • Solid and Hazardous Waste Management • Drainage and Storm water planning • Dust Control • Stockpiling area • Vegetation removal • Materials and equipment to be used	Contractor	As necessary

	• Getting the equipment to and from the site • How the equipment material will be moved while on site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation (if required) • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble • General and Hazardous waste management on site • The storage provisions for the materials and/or equipment • The proposed construction procedure designed to implement the relevant Environmental Specifications • Other information deemed necessary by the RE and/or ECO. Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.		
	Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.	Contractor, RE, ECO	Continuous

	The Contractor shall carry out the activities in accordance with the approved Method Statement.	Contractor, RE. ECO	Continuous
	Under certain circumstances, the RE may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.	Contractor, RE	Continuous
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMPr specifications.	Contractor, Developer	Continuous

Table 3: Pre - Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Site Establishment	The contractor shall establish his construction camp, office/s and any other infrastructure as per the agreed site layout plan in a manner that does not adversely affect the environment.	Contractor, ECO	Once-Off
	The contractor shall submit a method statement for site clearance for approval by the RE in consultation with the ECO. Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp site before the main workforce move onto site.	RE, Contractor, ECO	Once-Off
	The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities to the satisfaction of the Project Manager. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities.	Contractor, ECO	Continuous
	Safe drinking water for human consumption shall be available at the site offices and at other convenient locations on site. All water used on site must be taken from a legal source and comply with the recognised standards for potable and other uses.	Contractor, ECO	Continuous
	No fires on site will be allowed. Activities which may pose a risk of fire must be identified and suitable measures must be put in place to prevent any possible damage by fire. Contractors must inform the staff of the risk of fires and fire prevention and emergency procedures in the event of a fire. Fire fighting equipment shall be supplied by the Contractor at suitable locations	Contractor, ECO	Continuous
	The construction camp must preferably be positioned where it will not visually impact on adjacent landowners and should not be located in an environmentally sensitive area	Contractor, ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
	Invasive alien plant species should be treated in an appropriate manner.	ELO and Contractor	Continuous
	Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction.	ELO and Contractor	Continuous

Table 4: Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Limit the construction footprint and related impacts	• Only cross watercourses at designated points • Crossings to be undertaken with only one vehicle that have the minimum footprint as decided on during planning • Limit the removal of indigenous vegetation around the construction footprint • Limit compaction by not working in wet conditions and limiting vehicular access • Do not permit vehicular or pedestrian access into natural areas or into seasonally wet areas during and immediately after rainy periods, until such a time that the soil has dried out (DAWF, 2005) • Watercourse boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete • Only necessary traffic should be allowed within these demarcated areas • Limit clearing of vegetation between servitude and construction camps • Contractors should refrain from impacting areas beyond the demarcated construction area • Minimise disturbance and loss of soil • The contractor must avoid traffic or storing of equipment and material in vegetated areas that will not be cleared	Contractor, ELO, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
Prevention of pollution on soil	• The contractors must provide and maintain a method statement for "cement and concrete batching". The method statement must provide information on proposed location, storage, washing & disposal of cement, packaging, tools and plant storage • Cement should only be mixed within mixing trays. Washing and cleaning of equipment should also be done within a bermed area, in order to trap any cement or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase • The mixing of concrete should only be done at specifically selected sites on mortar boards or similar structures to contain run-off into drainage lines and natural vegetation • Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas • These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall • In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately and corrective action taken • All equipment should be parked overnight and/or fuelled at least 500 meters from a watercourse • Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. • Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. • Remove all construction equipment and material on completion of construction • No water should be abstracted from any river / wetland • Run-off from the camp site must not discharge into neighbours' properties or into adjacent wetlands, rivers or streams	Contractor, ELO, ECO	As necessary
	• Management of on-site water use and prevent stormwater or contaminated water directly entering the watercourse • Management of point discharges		

Activity / issue	Action required	Responsible party	Frequency
Preventing spread of alien invasive plants	• Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils • Alien invasive species that were identified within servitudes should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils • Manual removal methods are preferred to chemical control	Contractor, ELO, ECO	As necessary
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	Contractor , ELO,	Continuous
Hazardous materials storage	Materials storage areas will not be allowed in close proximity to ecologically sensitive areas	Contractor	Continuous
	Storage of materials as described above may not be within the 1:100 flood line, watercourses or associated buffer areas	Contractor, ECO	Continuous
	The areas around fuel tanks are to be bunded in accordance with SANS 1089:1999: Part 1	ELO, Contractor	Once off
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers and all relevant Material Safety Data Sheets (MSDSs) shall be available on site	Contractor	Continuous
	In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs (DWA) must be informed immediately and corrective action taken	Contractor	Continuous
	The relevant emergency procedures relevant to particular chemicals used on site, as per the MSDSs and suppliers guidelines, will be followed in the event of an emergency	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The contractor shall prevent discharge of any pollutants such as cement, asphalt, concrete, lime, chemicals, fuels and oils into any water sources and adequate storm water control measures will be implemented where these substances are handled	Contractor	Continuous
Handling and disposal of contaminated water	No discharge of pollutants such as cement, concrete, lime, chemicals, fuels or oils will be allowed into any water resource	ELO, Contractor	Continuous
	Only above ground temporary storage tanks will be allowed on site	ELO, Contractor	Continuous
	Contaminated or potentially contaminated water should not be discharged into the watercourse on site	ELO, Contractor	Continuous
Lighting	Working hours shall generally be restricted to daylight hours	ELO, Contractor	Continuous
	If working hours are required outside of daylight hours, the contractor shall provide notification by completing the Night work Application three days in advance of the work taking place.	ELO, Contractor	Continuous
	Security lights shall be directed from the perimeter wall towards the centre of the camp with a down angle	ELO, Contractor	Continuous
Waste management	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	ELO, Contractor	Weekly
	All building rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily

Activity / issue	Action required	Responsible party	Frequency
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of an approved at dumping site as approved by the Council.	ELO, Contractor	Monitor daily - weekly
Storm water Management	No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains	Contractor, ELO, ECO	Continuous
	Storm water at the construction crew camp must be managed so as to reduce the silt loads into the ecological environment. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion	Contractor, ELO, ECO	Continuous
	The site must be managed in a manner that prevent pollution of drains, the watercourse on site or groundwater, due to suspended solids, silt or chemicals	Contractor, ELO, ECO	Continuous
	No stockpiles or construction materials may be stored or placed in close proximity to storm water drains.	Contractor, ELO, ECO	Continuous
	Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.	Contractor, ELO, ECO	Continuous
Noise management	Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.	Developer, Contractor	Monitor daily
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Unnecessary horning of construction vehicles should not be allowed on site.	ECO, ELO, Contractor	Continuous
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary

Activity / issue	Action required	Responsible party	Frequency
	No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, ELO, Contractor	Continuous
Air Pollution	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, ELO	As necessary
	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may toxic pollutants of high concentration be released into the air.	ECO, ELO	As necessary
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches as these are prone to wind erosion.	ELO, Contractor	Continuous
Crime, safety and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Continuous
	Ensure that only suitably qualified personnel use construction vehicles	Contractors	Continuous
	Ensure that the contact details of the police or security company and ambulance services are available on site	Contractor	Continuous
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Continuous
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Ensure that the handling of equipment and materials is supervised and adequately instructed.	ELO, Contractor	Continuous
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	ELO, Contractor	Continuous
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	ELO, Contractor	As necessary
	The security fence around the development site must be completed before construction commences internally.	ELO, Contractor	Once-off
	Security fence is to be inspected daily to ensure no illegal entry points are created.	ELO, Contractor	Daily
	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.	Contractor	Continuous
	The contractor must supply his own security arrangements for the construction camp within the framework of the EMPr.	Contractor, ELO	Continuous
	Equipment and materials must be handled by staff that have been supervised and adequately trained.	Contractor, ELO	Continuous
	Staff must be regularly updated about the safety procedures.	Contractor, ELO	Continuous
	Emergency facilities must be available and adequately supplied for use by staff and customers.	Contractor, ELO	Continuous
	Ensure that the handling of equipments and materials is supervised and adequately instructed.	Contractor, ELO	Continuous
	Limit access to the construction crew camp only to the workforce.	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence.	Contractor, ELO	Once-off, monitor daily
Excavation	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation	Contractor, ELO, ECO	As necessary
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundance of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	As necessary
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Continuous
	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.	ECO, Contractor	As necessary
Destruction of heritage resources	Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.	ELO, Contractor	As necessary
	Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible	ECO, Contractor	As necessary
	Under no circumstances shall archaeological artefacts be removed, destroyed or interfered	ELO, Contractor	Continuous
	Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency	ECO, Contractor	As necessary
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Remove spoil material from the area once the trench has been filled	Contractor	Continuous
	Remove vegetation and topsoil and stockpile separately from subsoil prior to excavation of the cable trench.	ELO, Contractor	Continuous
	Revegetate disturbed ground in the working area by seeding and spreading of vegetation that has been removed from the trench at the start of construction.	ELO, Contractor	Continuous
Traffic impact	The proposed main gate should be wide enough to to accommodate exit and entry manoeuvring by vehicle. Two lanes should be provided for the vehicles entering the resident, with one allocated to the residents and another to visitors.	Developer, Contractor	Continuous
	Pedestrian gates should be provided at all the access facilities in the proposed development..	Developer, Contractor	Continuous
	During day time, designate responsibility to some construction crew to guide traffic (traffic controllers) during construction to residences living along the access roads that will be affected during construction.	Contractor, ELO	Continuous
Completion of Construction	The ECO must ensure that all construction equipment and all foreign material are removed on completion of construction	Developer	As necessary
	After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use	Contractor, ELO	Once off
	After construction of the pedestrian bridges, Should erosion occur, Indigenous hydrophytes (e.g. reeds) should be established on the banks of the river as this could help stabilise the banks and limit sedimentation.	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	On completion of construction activities, monitoring should be done in order to record compliance with the targets set out in the EMP and to highlight any areas where further action are required in terms of rehabilitation or routine monitoring	ECO	Once off

Table 5: Rehabilitation Phase: Environmental Management Programme for the proposed project

Activity	Action required	Responsible Party	Frequency
Revegetation	• Stripping of vegetation for construction must occur in a phased manner and must be restricted to the excavation footprint to reduce the risk of erosion during times of precipitation • Where soils are removed, the topsoil and subsoil must be stockpiled separately in low heaps (Topsoil are deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas) • After construction, compacted areas should be ripped and topsoil replaced from the areas where it was removed. Areas within the construction footprint can be re-vegetated using the sods that were removed prior to construction. The sods should be placed level, or slightly deeper than surrounding vegetation, on ripped soils. Against slopes, the sods should be pegged to ensure that it does not wash away before the roots establish • A suitable grass mixture must be spread by hand along the extent of the slopes. • The seed mixture may be purchased in the required amounts from for example Thabakholo Environmental Solutions or alternatively, Grassland Biomosome from Sakata Seeds can be purchased. • Seeds must be thorough mixed before applying. • The seeds must be applied according to the required rates. • Application rates can be increased in areas that are unfavourable or steep, but no more than double the recommendations. • Seeds can be mixed with a spreading agent such as river sand, bran or finely sifted kraal to ensure even distribution. • Manure or agricultural lime and granular fertiliser mix can be applied prior to reseeding. • Once complete, the seeded area must be watered and patted down gently.	Contractor, ELO,ECO	• Immediately after construction • At any time during the operational phase of the stormwater infrastructure, or when maintenance activities might have destroyed natural vegetation • As and when monitoring indicate degradation of vegetation along the servitude

Activity	Action required	Responsible Party	Frequency
	• Indigenous vegetation removed from the area must be applied over the seeded area as mulch. • Badly damaged areas should be fenced in to allow for rehabilitation to take place without further impacts on these areas • All rehabilitated areas must be monitored for the presence of exotic and alien plant species during rehabilitation • All disturbed areas will requiring rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas • Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation (Teixeira-Leite, 2009)		
Soil Compaction	• Areas where soil has been compacted should be ripped to encourage vegetation growth • Do not rip and / or scarify areas under wet conditions, as the soil will not break up and compaction will be worsened • Do not permit vehicular or pedestrian access into natural areas or into seasonally wet areas during and immediately after rainy periods, until such a time that the soil has dried out (DAWF, 2005) • Rip and / or scarify all disturbed (and other specified) areas of the construction site, including temporary access routes and roads, compacted during the execution of the Works. (DWAF, 2005)	Contractor, ELO,ECO	• Immediately after a construction phase • At any time during operational phase of the transmission line, when maintenance activities might have resulted in pollution
Spread of Alien Invasive Species	• Appointment of alien plant working group / assign this duty to specific staff • Alien invasive species that were identified within the servitudes should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils or to downstream areas	Contractor, ELO,ECO	• During and after construction phases

Activity	Action required	Responsible Party	Frequency
	• All alien seedlings and saplings must be removed as they become evident for the duration of construction • Manual / mechanical removal is preferred to chemical control • If herbicide must be used it should be registered for aquatic use • Acquire the necessary equipment for removal and control • Planned sequence of areas to be cleared of invasive plants • A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the removal procedures • All construction vehicles and equipment, as well as construction material should be free of plant material. Equipment and vehicles should be thoroughly cleaned other prior to access on to the construction site.		

Table 6: Operational Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Prevention of pollution	During maintenance, activities should be limited to the areas where maintenance has to be undertaken.	Developer	Continuous
	The developer must ensure that all construction equipment and material are removed on completion of construction	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Removal of vegetation during maintenance should be limited to the area of operation only.	Developer	As necessary
Establishment of Alien Plant species	• Alien invasive species that are identified within the construction footprint should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils • Category 1 species, according to the CARA legislation eg *Solonum mauritianum* .should be targeted first, while the larger trees should be selectively thinned out to allow light to penetrate the canopy to facilitate the germination of indigenous species. • All cleared vegetation, especially trees, should be removed from the system to ensure the free flow of the stream without any obstacles which will exacerbate flooding events. • Appointment of alien plant working group / assign this duty to specific staff • Treatment methods should be in alignment with the National Working for Water Herbicide policy. • Acquire the necessary equipment for removal and control • Planned sequence of areas to be cleared of invasive plants • A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the removal procedures • Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils • Manual removal methods are preferred to chemical control	Developer	Continuous

7. MONITORING PROGRAMME

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (once issued). Where this is not clearly dictated, the developer will determine and stipulate the frequency of monitoring required in consultation with the relevant authority. The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.
- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

7.1 Method of Monitoring

The independent ECO will ensure compliance with the EMPr, and will conduct monitoring activities. The ECO will undertake site inspections on a monthly basis or as specified in the environmental authorisation once issued. The ECO will report all non-compliances to the Site Manager and submit such reports to GDARD.

7.2 Environmental Monitoring Committee

Due to the proximity of the storm water upgrade in relation to the sensitive environment an Environmental Monitoring Committee must be established. The Environmental Monitoring Committee must include representatives from the local community

7.3 Non Conformance Report

All supervisory stuff and ECO must be provided a means to be able to submit a non conformance report to the site manager. The Non conformance report will describe in detail, the cause and effect of any environmental

non-conformance by the contractor. Records of penalties may be required by the Authorities within 48 hours. The non conformance report will be updated upon completion of the corrective measures indicated on the finding sheet. The report must indicate that remediation measures have been implemented timeously and that the non-conformance can be closed out to the satisfaction of the site manager and ECO.

7.4 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to GDARD and presented to the Environmental Monitoring Committee as deemed practical or with the Final audit report. The report should include details of the activities undertaken in the reporting period, any non-conformances or incidences recorded, corrective action required and details of these non-conformances or incidents which have been closed out.

7.5 Internal Audits and Reporting

Internal audits must be undertaken by the developer. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr. Findings of the audit must be made available to the external auditor and Environmental Monitoring Committee.

7.6 Final Audit Report

A final environmental report must be compiled by the ECO and submitted to GDARD and Environmental Monitoring Committee upon completion of construction and rehabilitation activities within 30 days of completion of construction phase (i.e. within 30 days of the site handover) and within 30 days of completion of rehabilitation activities). This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance of the environmental authorisation conditions) once issued and the requirements of the EMPr.

8. CONCLUSION

The significance levels of the majority of identified negative impacts for all alternatives investigated can generally be reduced to acceptable levels by implementing the recommended mitigation measures. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor should thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	**Env. Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page of ….	……

COMPLAINT RAISED BY:

CAPACITY OF COMPLAINANT:

COMPLAINT RECORDED BY:

COMPLAINT:

PROPOSED REMEDIAL ACTION:

ECO: _____ Date: _____

NOTES BY ECO:

ECO: _____ Date: _____ Site Manager: _____ Date: _____