ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

For

THE PROPOSED WILDEALSKLOOF MIXED USE DEVELOPMENT IN BLOEMFONTEIN, FREE STATE PROVINCE

DESTEA Ref. No:EMS/9(i)(ii), 13,14,19,23,28(i),15,25,12(b)(ii)(iv)/18/19
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ACRONYMS & ABBREVIATIONS

DESTEA:	Department of Economic Small Business Development Tourism and Environment Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
SHE	Safety Health and Environmental Officer
EMPr	Environmental Management Programme
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
WUL	Water Use Licence

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.

Topsoil: means that layer of soil covering the earth and which provides a suitable environment for the germination of seed allows the penetration of water, is a source of micro-organisms, plant nutrients and in some cases seed, and of a depth of up to 0,3m. Topsoil (top 300mm as a minimum) must be temporarily stockpiled separately from subsoil or rocky material (the topsoil contains both the seedbed and nutrient supply necessary for plant growth - if mixed with subsoil layers the usefulness of the topsoil for rehabilitation will be lost) Topsoil shall be stripped from all areas to be utilized during construction period and where permanent structures and access is required

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. INTRODUCTION AND BACKGROUND

3.1 Background of the Project

The Developer, Ideal Consulting, proposes to develop an all-inclusive socio economic mixed use Development to the North of the Bloemfontein CBD. Tenure options will range from fully subsidised, to higher income residential units. Approximately 8 769 residential units are planned. The proposed Development will be known as the Wildealskloof.

The Wildealskloof Mixed Use Development entails the construction of the following land uses:

- Single residential units;
- A lifestyle estate with stands between 900m2 and 1000m2;
- Multi storey / RDP / FLIPS / Social units (total of approximately 8 769 units);
- A community centre / public library;
- Educational facilities (e.g. crèche, primary and secondary school) including boarding facilities;
- Retail and related small businesses e.g. fuelling station;
- Regional Shopping Centre;
- Medical facilities including a hospital/clinic;
- Hotel and Spa;
- Industrial and office facilities;
- Religious facilities e.g. churches;
- Retirement Village;
- Parks;
- Memorial Parks (cemetery) of approximately 16 ha; and
- Open Space Conservation areas.

The project planning is currently at Preliminary Sub divisional Plan stage, which has as far as possible accommodated ecological sensitivities, wetland sensitivities and heritage sensitivities identified on the site. Two provisional layout alternatives were presented in the Scoping Stage of the EIA and they are being considered in this environmental impact assessment for investigation. These included layout Alternative 1 and layout Alternative 2. The two layouts are described in detail in section 3.4.2. Refer to Appendix B for the A3 Conceptual layout Designs. The proposed township will be developed in twenty one (21) phases refer to Appendix A of the main report for the overview of the 21 phased Development In addition to the abovementioned land uses the following associated infrastructure is required.

3.3.1 Infrastructure required

No internal bulk infrastructure is currently in place on site. A preliminary design report was compiled by Civil Consult Consulting engineers addressing the bulk services for the Development and submitted to MMM. The engineering Bulk Services Report is included under Appendix F1.

Access Roads

The concept of integrated planning requires the Development of settlements that are physically and functionally integrated with the immediate area as well as broader linkages to facilities, where mobility is promoted. The layouts aim to address this need as far as possible. Access to the study area will be provided from Road S1066 and Road R700.

Internal Access Roads

The proposed township will be served by a network of surfaced Class U4 and Class U5 roads. These roads will all comprise of one lane per direction. The road reserve widths for the roads varies between 13.0m, 16.0m, 20m and wider, as illustrated in the township layout appended in **Annexure A.**

Storm water drainage

No formal municipal storm water services are available in the vicinity of the proposed Development The proposed Development has two major drainage patterns with the majority of the proposed Development drainage from South to North and the Eastern part of the proposed drainage from South East to North West towards the existing watercourse intersecting the proposed Development The proposed will increase the area of impervious surfaces within the storm water catchment area, causing changes in the quantity of storm water run-off. This will increase the risk of erosion, localised flooding and watercourse turbidity and sedimentation. Storm water run-off generated by the proposed Development will be handled by means of concrete channels, attenuation dams, storm water box culverts, storm water pipes and road surface drainage. Surface drainage will be accepted via kerb-grid inlets.

Storm water run-off generated by the proposed Development will be discharged into one of the two watercourses intersecting the proposed Development In order to ensure that storm water runoff from the proposed Development is properly managed, the following must be exercised.

- Avoid or minimise the risk of erosion caused by rainfall from new impervious surfaces
- Prevent sedimentation and turbidity of the watercourse

- Ensure that post Development storm water infiltration and run off rates have no more of the off-site impact Development rates
- Minimise the risk of localised flooding caused by increased storm water runoff from impervious surfaces

The storm water system will be designed for a 1:25 year flood return and a run off coefficient of 80% (C=0.8) will be allowed for the proposed Development Storm water will be attenuated where possible to minimise the increase in storm water run-off generated by the proposed Development The storm water outlet structures will be equipped with energy dissipaters to minimise the possibility of erosion at the point of discharge.

Bulk Water Supply

The existing water reticulation pipeline located inside of portion 1/26360 approximately 700m south west of the south western corner of the proposed site is insufficient to service the proposed Development Nonetheless the proposed Development has been included in the Water Master plan for the MMM, as the Development will be constructed in 21 phases and so will the bulk water supply be provided in the phases of each Development phase until the entire Development is completed and in due course the entire Development will be serviced; The proposed activity will not use groundwater during construction or during the operational phase of the activity. For more details please refer to Section 8 of the Bulk services report included within Appendix F1 of this report.

Bulk Sewer Infrastructure

External Sewer Infrastructure

There are three existing Waste Water Treatment Works (WWTW) in the area located within 12km from the edge of the Development; however they are insufficient to service the proposed Development Following consultation with the MMM, a new Regional WWTW is envisaged to be constructed for the Proposed Development (the capacity of this new Regional WWTW will have to be confirmed by the Mangaung Metropolitan Municipality). This WWTW is proposed to be constructed north east of the Proposed Development, just outside the Development boundary. The relevant way leave process (National, Provincial or Municipal) will have to be followed for work done within road reserves. The construction of a new regional WWW is outside the scope of this EIA.

Internal Sewer Infrastructure

Complete water borne sewage reticulation (WWTW) will be installed for the Proposed Development It is proposed to construct a new Sewage Pump Station in the north western corner of the Proposed Development Sewage from each erf will drain to the proposed sewage reticulation from where it will gravitate to either the proposed Sewage Pump Station or the proposed Regional WWTW.

A grey water system is also proposed for the Proposed Development This will be utilised for irrigation of the Proposed Development For further details please refer to the bulk services report attached within Appendix F1

Bulk Electricity Supply

Centlec, a Municipal utility, is responsible for providing electricity in Mangaung. Centlec has undertaken a detailed network expansion plan for the ability to supply the growth in demand of the Northern suburbs. This Development forms part of the Development plan. A solar power is being

Considered as well on site to provide electricity for lighting of public open spaces and it is further envisaged that electricity to the majority of houses will be supplied by solar power. The base load will not form part of the solar initiatives but rather be a mechanism to reduce the peak loads.

Solid Waste Management

Approximately 3 707.48m^3 of solid waste is estimated to be generated by the Development on a weekly basis. Solid waste management services are to be provided by the MMM, in accordance with the national Domestic Waste Collection Standards. This will include regular weekly removal of domestic refuse. For details refer to the bulk services report.

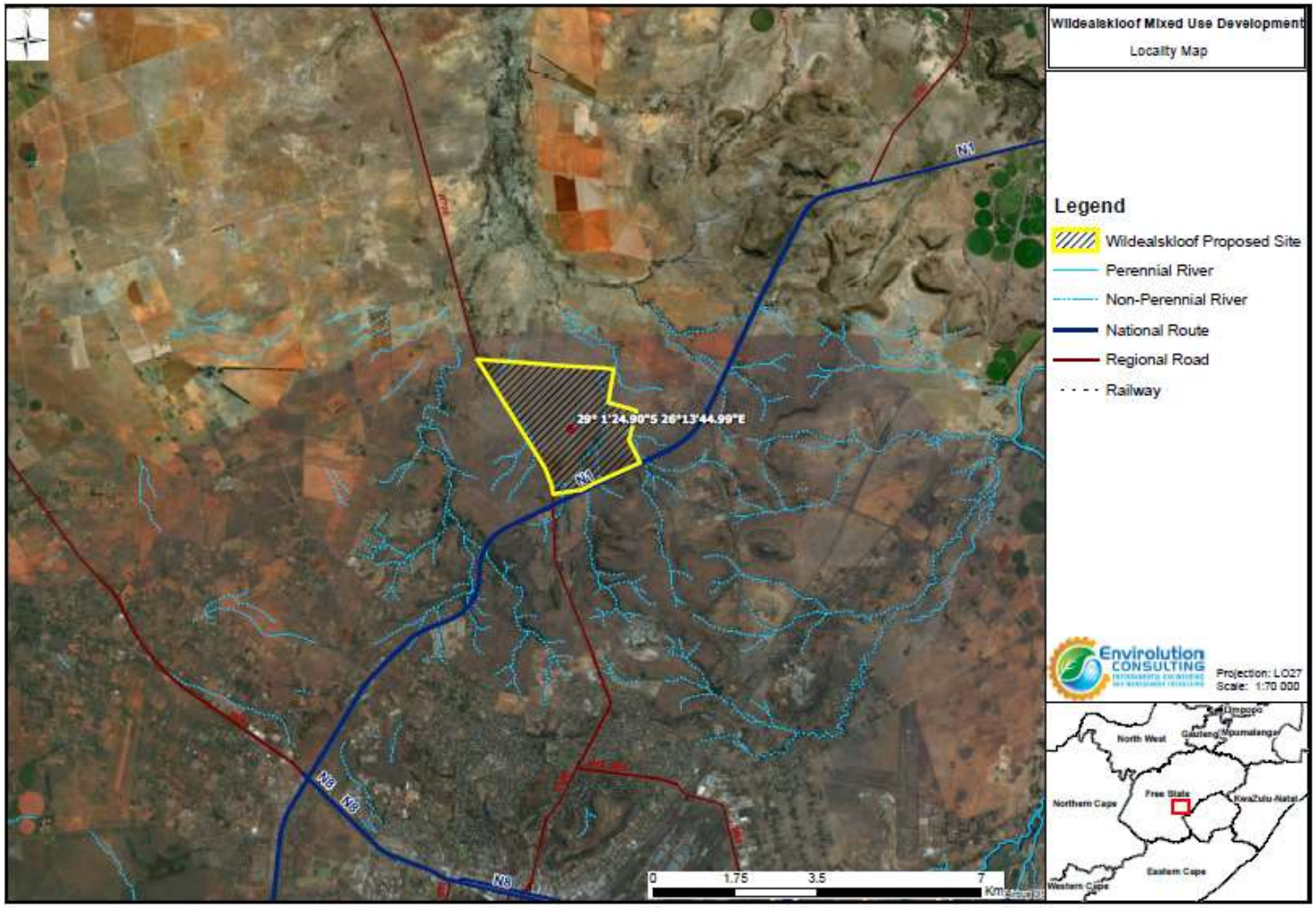

Figure 1: Locality Map.

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, the main contractors and the 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-compliance and will be dealt with accordingly.

Aims and objectives the EMPr

The purpose of this 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 and ensure they kept to a minimum. This includes ensuring that the mitigation measures described in the Environmental Impact 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 all phases of the Development;
- To document details of environmental protection 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 construction, rehabilitation, 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 scoping and EIA process process of this project:

Table 1: Details of specialist

Study	Specialist	Appendix D
Soils and Agriculture	Johann Lanz (SACNASP Reg. no. 400268/12) University of Stellenbosch University	Appendix D1
Avifauna Assessment	Andrew McKechnie SACNASP # 400205/05	Appendix D2
Fauna Assessment	I, Jacobus Casparus Petrus van Wyk of Limosella Consulting	Appendix D3
Heritage Assessment	Johnny van Schalkwyk-Heritage Consultant	Appendix D4
Paleontology Assessment	Doctor Cindy Heidi (PSSA)	Appendix D5
Social Impact Assessment	Ingrid Snyman of Batho Earth	Appendix D6
Socio-Economic Assessment	An Kritzinger' of iAfrica	Appendix D7
Visual Assessment	Mr. Mader van den Berg of Skets Architects and Planning	Appendix D8
Vegetation Assessment	Michelle Pretorius (Pr. Sci. Nat No 400003) of Dimela Eco Consult	Appendix D9
Wetland Assessment	Antoinette Bootsma (Pr.Sci.Nat. No. 400222-09 – Botanical and Ecological Science) of Limosella Consulting	Appendix D10
Geotechnical	Wessel Badenhorst of Road Lab	Appendix D11

Assessment	Consulting	
Traffic Assessment	Louis Du Toit of Mariteng Consulting	Appendix D12

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. PREPARATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

This draft Environmental Management Programme was compiled by:

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Expertise of Environmental Practitioner that prepared the EMPr

Ms Jubilee Bubala the principle author of this EMPr holds a Master's of Science degree from the Witwatersrand University. She has 6 years of experience consulting in the environmental field. Her 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; and devSHEping and implementing ISO 14001:2004. Jubilee has been a project scientist for various EIA's in South Africa and Southern Africa. Jubilee is currently a Project Manager and Environmental Scientist at Envirolution (refer to curriculum vitae attached within **Appendix F** of the Environmental Impact Assessment Report (EIAR).

3. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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 National, 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 developement

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 on the page overleaf

3.1. The National Environmental Management: Water Act, 1998 (Act No. 36 of 1998)

Water use in South Africa is controlled by the NWA. The executive authority is the Department of Water and Sanitation (DWS). The NWA recognizes that water is a scarce and unevenly distributed national resource in South Africa. Its provisions are aimed at achieving sustainable and equitable use of water to the benefit of all users and to ensure protection of the aquatic ecosystems associated with South Africa's water resources. The provisions of the Act are aimed at discouraging pollution and wastage of water resources. In terms of the Act, a land user, occupier or owner of land where an activity that causes or has the potential to cause pollution of a water resource has a duty to take measures to prevent pollution from occurring. If these measures are not taken, the responsible authority may do whatever is necessary to prevent the pollution or remedy its effects, and to recover all reasonable costs from the responsible party. Section 21 of the NWA specifies a number of water uses. These water uses require authorization in terms of Section 22 (1) of the Act, unless they are listed in Schedule 1 of the NWA, are an existing lawful use, fall under a General Authorization issued in terms of Section 39 or if the responsible authority waives the need for a licence.

Legal requirements for this project:

Section 21*: There is a watercourse on site which will be impacted on by the Development In this regard the Developer will trigger some listed activities under Section 21 of the act, in which case an integrated Water Use Licence Applications (WULAs) would need to be prepared and submitted to the Department of Water and Sanitation for authorisation prior to Development*

Section 19: Of specific importance to this application is Section 19 of the National Water Act, 1998 (Act No. 36 of 1998), which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

Legal requirements for this project:

In terms of Section 19, the Developer 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.

3.2 National Environmental Management: Biodiversity Act 2004 (Act 10 of 2004)

The National Environmental Management Biodiversity Act) NEMBA (Act 10 of 2004); NEMBA Chapter 4 and 5 are important to this project, in terms of the following Regulations:

- National List Of Ecosystems that are threatened and in need of protection (Published under Government Notice 1002 in Government Gazette 34809 of 9 December 2012)
- Publication Of Lists Of Critically Endangered, Endangered, Vulnerable And Protected Species (Published under Government Notice R151 in Government Gazette 29657 of 23 February 2007)
- Threatened Or Protected Species Regulations (Published under Government Notice R152 in Government Gazette 29657 of 23 February 2007)
- Alien And Invasive Species Regulations (Published under Government Notice R598 in Government Gazette 37885 of 1 August 2014).
- Publication Of National List Of Invasive Species (Published under Government Notice R507 in Government Gazette 36683 of 19 July 20130.

Legal requirements for this project:

- *According to the National Biodiversity Assessment (NBA) database, the study area is not affected by formally or informally protected areas*
- *The Developer will be required to eradicate and control alien vegetation within the study area as well as the ongoing control and prevention of spread of alien species that may proliferate during operational of the project should it takes place.*

2.1.6 National Forests Act (Act No 84 of 1998)

An updated list of protected tree species was published under section 12(1) (d) of the National Forests Act (Act No 84 of 1998) on 8 September 2017. In terms of section 15(1) of the National Forests Act, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an Developer and subject to such period and conditions as may be stipulated.

Forests: Prohibits the destruction of indigenous trees in any natural forest without a licence.

Legal Requirements

A vegetation survey has been undertaken as part of this EIA to confirm the boundaries of the forest areas on the proposed site as per the Department of Agriculture, Forestry and Fisheries (DAFF) request. The isolated hill is characterised by a well-devSHEped tree and shrub layer, with dense woody vegetation present particularly along its eastern slopes.

3.3 Notice of the List of Protected Tree Species under the National Forests Act, 1998 (GN R 716, 7 September 2012)

Government Notice 716 provides a schedule listing all protected tree species in South Africa. In terms of section 15 (1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence granted by the Minister to an Developer and subject to such period and conditions as may be stipulated. The published list includes Wild olive *Olea europaea subsp. africana trees*, a provincially protected species, which is found in high abundance on the site on the isolated hill located in the south western corner of the Development site

Legal requirements

Wild olive and any other protected species as listed in GN R 716 will require permits from DAFF before removal, damage or destruction.

3.4 Free State Province Nature Conservation Ordinance 8 of 1969

The Free State Nature Conservation Ordinance (FSNCO) provides for the listing of certain Protected plant species, as per Schedule 6, whereby a permit to pick, donate, sell, import, export or remove such species, as well as other indigenous plants, is required, except under certain conditions..

Legal requirements

An ecological study was undertaken and several protected species were found to be present which will require a permit from DESTEA for removal

3.5 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.

Legal Requirements

An ecological study was undertaken and several wetlands were found to be present recommendations on the project. The Developer will be required to adhere to the mitigation measures included in the requirements of the EMPr.

3.6 National Heritage Resources Act (Act No 25 of 1999)

South Africa's unique and non-renewable archaeological and paleontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, Section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. The National Heritage Resources Act (Act No. 25 of 1999, Section 38) provides guidelines for Cultural Resources Management and prospective Developments:

"38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a Development categorised as :)

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear Development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any Development or other activity which will change the character of a site:

(i) exceeding 5 000 m^2 in extent; or (ii) involving three or more existing erven or subdivisions thereof; or (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority; (d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of Development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a Development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development

And:

"38 (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(c) an assessment of the impact of the development on such heritage resources;

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) if heritage resources will be adversely affected by the proposed development the consideration of alternatives; and

(g) plans for mitigation of any adverse effects during and after the completion of the proposed development."

Legal requirements for this project:

The proposed development triggers the requirement for an HIA in terms of the NHRA, and paleontological and archaeological studies have therefore been completed as part of the EIA. The HIA field survey has confirmed Archaeological sites as follows:

- An informal burial place containing approximately 10 graves marked by stone cairns.
- A low density scatter of MSA stone tools and flakes was identified at the eastern foot of the hill located in the south-western corner of the study area.
- At least twenty structures identified as sangars occur on the western side of the hill, with a few located on the eastern side

Should graves be required to be relocated or any of the identified heritage material to be disturbed, a permit from PHRA/SAHRA as well as other institutions will be required-However this is outside the scope of this EIA. The developer will ensure compliance with the NHRA requirements

SAHRA has been notified of the proposed project as per the requirement of the National Resources Heritage Act.

3.5 The National Environmental Management Waste Act 2008 (Act 59 of 2008)

The National Environmental Management Waste Act (NEMWA) reforms the law regulating waste management in order to protect health and the environment providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable developpment; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

Legal requirements for this project:

In terms of GNR921, no waste license is required for the project. No waste license activities are applicable to this project. The Developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards during construction and operational phases.

3.6 Hazardous Substances Act (Act No. 15 of 1973)

This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitizing, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.

- Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance;
- Group IV: any electronic product;
- Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.

Legal requirements for this project:

The developerwill be required to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.

3.7 The Occupational Health and Safety Act 1993 (No 85 of 1993)

The Occupational Health and Safety Act make provision in regulation Section 8 for the general duties of employers to their employees. Section 9 of the Regulations makes provision for general duties of employers and self-employed persons to persons other than their employees.

Legal requirements for this project:

While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the public

3.8 The National Environmental Management: Air Quality Act 2004 (No 39 of 2004)

National Environmental Management: Air Quality Act (NEM: AQA) which provides for the control of dust, noise and offensive odors.

- S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas".
- Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.
- The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.

Legal requirements for this project:

While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan during the construction phase of the project for dust management.

3.9 Environment Conservation Act (Act No. 73 of 1989)

National Noise Control Regulations (GN R154 dated 10 January 1992)

Legal requirements for this project

There is no requirement for a noise permit in terms of the legislation. However the act finds applicability in ensuring construction noise is bSHEw the legislated 85 decibels

3.10 Conservation of Agricultural Resources Act (Act No 43 of 1983)

Prohibition of the spreading of weeds (S5)

Classification of categories of weeds & invader plants & restrictions in terms of where these species may occur - Regulation 15 of GN R1048 and Regulation 598 GN 37885 of NEM: BA (Act No. 10 of 2004)

This Act will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be devSHEped and implemented. In addition, a weed control and management plan must be implemented.

3.11 Promotion of Access to Information Act, 2000 (Act No 2 of 2000)

Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.

Legal requirements for this project:

No permitting is required the act finds applicability during the public participation process phase of the scoping and environmental impact assessment

3.12 National Development Plan 2030

The National Development Plan (NDP) offers a long-term perspective for Development in the country. The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realize these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

- The planning is that the NDP and its proposals are to be implemented in the right order over the next 17 years. Three phases have been identified.
- Government has already started a process to align the long term plans of departments with the NDP and to identify areas where policy change is required to ensure consistency and coherence.

- The NDP is a plan for the whole country. Government will engage with all sectors to understand how they are contributing to implementation, and particularly to identify any obstacles to them fulfilling their role effectively.
- The Plan will shape budget allocation over the next 17 years.
- The Plan identifies the task of improving the quality of public services as critical to achieving transformation. This will require provinces to focus on identifying and overcoming the obstacles to achieving improved outcomes, including the need to strengthen the ability of local government to fulfil its Development role.

Legal requirements

Provisions of housing infrastructure and job opportunities (such as the Wildealkloof project) are in support of the NDP.

3.13 Municipal Systems Act, No 32 of 2000

Legislation requires each municipality to develop a plan for the development of its area of jurisdiction. Such a plan, in terms of the law, should be holistic and integrated in its approach and content. According to the Municipal Systems Act, No 32 of 2000, the IDP is the principal strategic planning instrument which guides and informs all planning, budgeting, investment, development, management and implementation processes in the municipality. In terms of Chapter 5 of Municipal System Act, 2000 (Act 32 of 2000), a municipal council is expected to annually review their IDP in accordance with an assessment of its performance measures and to the extent that changing circumstances so demands, the municipality may also amend its IDP in accordance with a prescribed process. This plan identifies 'broad spatial planning categories' for all land in the Mangaung Metropolitan Municipality, as well as various structuring elements that are critical to the future development and restructuring of the Mangaung Metropolitan Municipality. In accordance to the Council Resolution CNL 57A.13-28/04/2015 the IDP has been reviewed and adopted by council. This includes the review and adoption of the SDF as chapter 5 of the IDP. In terms of the Integrated development Plan, the land on which the Wildealskloof Mixed Use development is proposed is now included in the urban edge earmarked for neighborhood development subject to the developers conducting the necessary investigations regarding the availability of all required municipal services, including a comprehensive traffic impact study, investigating the traffic capacity.

Legal requirements for this project:

The developer will be required to submit a township establishment application to the requirements of the Municipality.

3.14 MMM Spatial Development Framework (SDF) (2016)

The Spatial Development Framework (SDF) of Mangaung Metropolitan Municipality (2016) has included the site within its planned urban edge. This is different to the previous SDF (2013) that excluded the site which indicates a planned expansion to the northern regions of Bloemfontein. It can be argued that the development is in accordance with the macro framework policy of the Mangaung Metropolitan Municipality

3.15 Additional notable legislation

Other applicable legislation includes:

- National Road Traffic Act (Act No. 93 of 1996); and
- Subdivision of Agricultural Land Act (Act 70 of 1970)

3.16 Policy Guidelines

The following Guideline documents have been considered in the preparation of this report:

3.17 Additional notable legislation

Other applicable legislation includes:

- National Road Traffic Act (Act No. 93 of 1996); and
- Subdivision of Agricultural Land Act (Act 70 of 1970)

3.18 Policy Guidelines

The following Guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.

4. DESCRIPTION OF THE IMPACTS

Following the specialist studies undertaken on site and EAPs assessment the following environmental impacts were identified which could potentially result from the proposed mixed use development on of the Farm Olrig No. 1710 & Portion 4 of the Farm Wildealskloof No. 1205, Bloemfontein.

- Visual impacts;
- Impacts on heritage resources;
- Impacts on Paleontological resources
- Traffic impacts;
- Impact on soils and Agriculture
- Impact on wetland
- Ecological (Flora, Fauna and Avifauna) impacts;
- Socio-economic impacts;

Impact on the Wetland

During the site visits, four wetland areas were recorded on the study site. The watercourses can be classified as one non-perennial ephemeral river, two non-perennial episodic streams (drainage lines) and one very small depressional pan wetland.

The episodic streams are very small and no clear channel could be discerned. The episodic streams also lacked woody species and were dominated by grasses similar to the adjacent terrestrial grasses with some additional species such as Brachiaria eruciformis, Panicum coloratum and Pennisetum sphacelatum. The site visit was conducted after heavy rains and no water flow was seen in these streams. Thus these small episodic streams are not likely to contribute greatly to stream flow regulation or conveyance of water.

The ephemeral stream located in the north eastern corner runs through to the south east and western corner of the study site. It is dominated by dense woody riparian vegetation. The stream flows from south to north were it flows into the Stinkhoutspruit River approximately 2 km north of the study site. During the site visit the main channel was recorded as flowing. The ephemeral river remained mostly undisturbed since as early as 1941 with changes including a dam within the main channel and a road crossing within the study site. Off-site several other roads cross the ephemeral stream. The riparian vegetation is now denser compared to earlier years. The marginal zone of the stream is characterised by a grassy layer as well as some sedges and herbaceous species, many of which are terrestrial species and indicates the ephemeral nature of the stream. The non-marginal zone is dominated by woody

vegetation as well as terrestrial grasses. The main woody species recorded within the riparian area include *Vachellia karroo, Ziziphus mucronata, Searsia lancea, Asparagus laricinus, Searsia pyroides, Scolopia zeyheri, Vachellia xanthophloea*. Some obligate wetland species, such as *Cyperus congesta*, also occurred in the dammed areas of the stream. This indicates that these pools often retain water for long periods after rainfall events.

A very small depressional pan wetland (325 m2) was recorded in close proximity to the episodic stream near the western border of the study site. Clear animal tracks can be seen from the feeding pens leading straight to this wetland. More recently several dirt roads have been constructed and join together directly adjacent to the wetland. Plant species recorded here include *Persicaria lapathifolia, Leptochloa fusca* and *Cyperus congesta.*

The position and extent of the watercourses, together with their associated buffer zones is shown in Figure 1

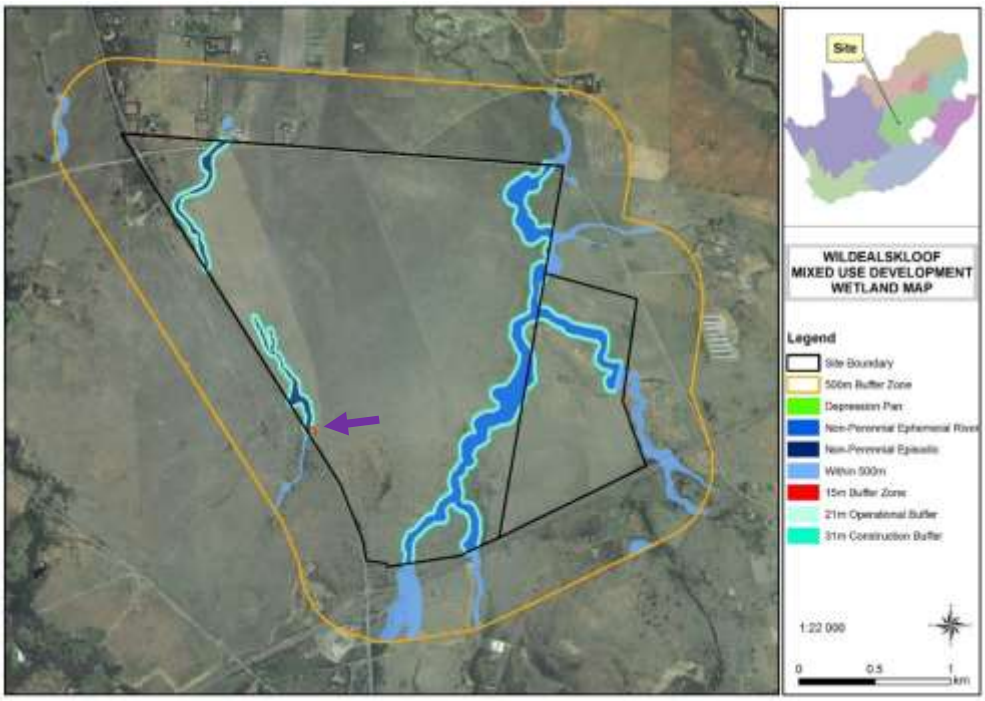


Figure 2: Map showing the location and extent of watercourses in relation to the study site and the associated scientific buffer. The purple arrow points to the pan.

The development has endeavoured to refrain from undertaking development in the majority of the Wetland areas and has included the wetland as part of a Public Open Space area. Nonetheless they are activities which are cannot be avoided and would require to be constructed within the wetland or its buffer areas. The activities entails the rehabilitation of the wetland stream to control flooding and erosion construction of attenuation facilities and storm water outlet structures as well as two road bridges that will span over the watercourse to provide a road access to site. Infilling and deposition of

construction material will occur within the watercourse. The identified potential impacts that may occur in the wetland both during construction and operation include the following below:

(i) Changes in water flow regime:

(ii) Changes in sediment entering and exiting the system:.

(iii) Introduction and spread of alien vegetation:.

(iv) Loss and disturbance of watercourse habitat and fringe vegetation.

(v) Changes in water quality due to pollution:

Most of the construction related activities scored in the High-medium category prior to mitigation and with mitigation the impacts are reduced to Moderate to Low category. While for operation the impacts related mostly in the moderate category and reduced to low after mitigation..

Impact on Vegetation

Loss of natural vegetation

Six vegetation types were encountered on site as per Figure 2 below

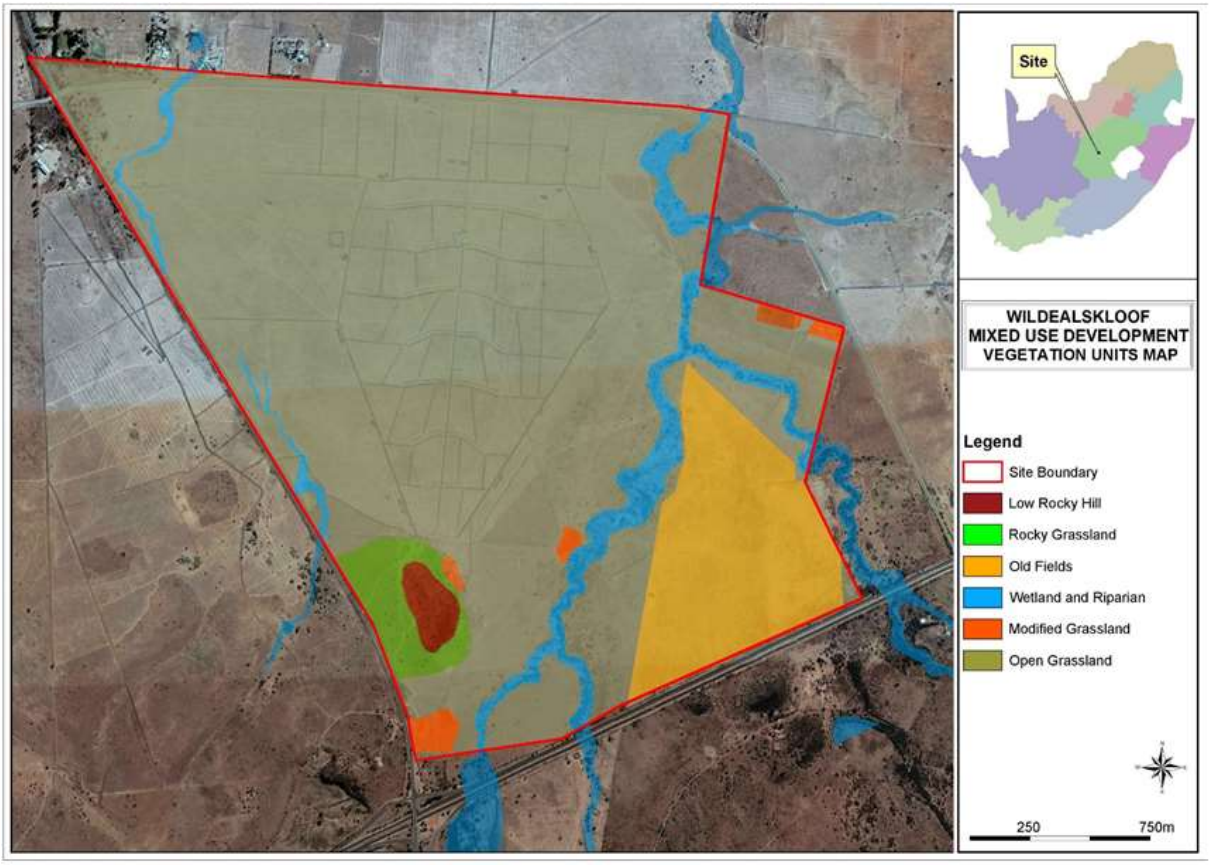


Figure 3: Vegetation units identified within the study area.

The proposed development is likely to disrupt the vegetation on the study site during construction phase but should have a positive impact during the operational phase if the rehabilitation structures are maintained and alien invasive clearing is continual. It is imperative that the rehabilitation efforts proceed with caution during the construction phase to ensure that the impacts are minimal. Mitigation measures suggested in the project EMPr should be implemented. The impact without mitigation is expected to be medium and reduced to low with the implementation of suggested mitigation measures.

The following impacts are likely to occur on site

(i) Loss of floral species diversity.
(ii) Loss of floral habitat.

(iii) Loss of threatened plants or plants of conservation concern

The study site contains areas of species of ecological conservation significance. The majority of floral SCC encountered are provincially protected and occurs within the Wetland and Riparian, the Low Rocky Hill and Rocky Grassland vegetation units. Through conserving these habitat areas within the proposed development, these species will also remain protected. As far as possible, the provincially protected floral species listed above should be conserved *in situ*, but where this is not possible it is recommended that these species be relocated to suitable similar habitat, within the study area under the supervision of a qualified botanist.

The following species of conservation concern were encountered on site

Table 2: Floral SCC encountered within the study area.

Species	Common name	IUCN/ SANBI RDL STATUS	Protected	Vegetation Unit
Olea europaea subsp. *africana*	Wild olive	LC	FSNCO	Low Rocky Hill Rocky Grassland Wetland and Riparian
Orbea lutea subsp. *lutea*	Yellow carrion flower	LC	FSNCO	Low Rocky Hill Rocky Grassland Open Grassland
Aloe grandidentata	Bontaalwyn	LC	FSNCO	Low Rocky Hill Rocky Grassland
Boophone disticha	Poison bulb/ Century plant	LC	FSNCO	Rocky Grassland
Haemanthus humulis subsp. *humulis*	Haemanthus/ Rabbit's ears	LC	FSNCO	Low Rocky Hill Rocky Grassland
Ammocharis coranica	Ground lily	LC	FSNCO	Open Grassland
Nerine laticoma	Nerine/ gifbol/	LC	FSNCO	Open Grassland

	misrybol			
Brunsvigia radulosa	Candelabra Flower	LC	FSNCO	Rocky Grassland
Raphionacme dyeri	Dyer's Raphio	LC (limited distribution)	FSNCO	Rocky Grassland
Hypoxis hemerocallidea	Star-flower	LC (decreasing)	-	Low Rocky Hill Rocky Grassland Open Grassland (suitable habitat)

Overview of the images of the protected plant species identified onsite of protected plant species


Aloe grandidentata
Bontaalwyn
Additional images:
www.iNaturalist.org


Boophone disticha
Poison bulb/ Century Plant
Additional images:
www.iNaturalist.org


Haemanthus humulis subsp. *humulis*
Haemanthus/ Rabbit's Ears
Additional images:
www.iNaturalist.org


Ammocharis coranica
Ground lily
Additional images:
keys.lucidcentral.org
www.iNaturalist.org


Nerina laticoma
Nerine/ Gifbol
Additional images:
www.iNaturalist.org


Brunvigia radulosa
Candelabra flower
Additional images:
pza.sanbi.org
www.iNaturalist.org

Raphionacme dyeri
Dyer's Raphio

Hypoxis hemerocallidea
Star-flower

(iv) **Proliferation of alien invasive plants**

Alien and invasive floral species lead to degradation of the ecological integrity of an area, which in turn may lead to, amongst others, a decline in and potential local extinction in indigenous species diversity, an ecological imbalance and the decreased productivity of grazing land (Bromilow, 2010). Alien invasive floral species must be controlled in terms of the Alien and Invasive Species Regulations (2014).

During the field assessment, the alien and invasive floral species encountered were identified and are listed in Table 5 below. The Categories 1a, 1b, 2 and 3 Listed Invasive Species Categories as indicated by the NEMBA Alien and Invasive Species Lists (2016) are also shown, as well as the categories as per CARA (Act 43 of 1983).

Table 3: NEMBA listed Alien floral species identified during the field assessment across all vegetation units.

Species	Common name	NEMBA Category	CARA Category
**Achyranthes aspera*	Burweed	Not Listed (N/L)	1
**Alternanthera pungens*	Khakiweed	N/L	N/L
**Amaranthus hybridus*	Green amaranth	N/L	N/L
**Argemone ochroleuca*	White-flowered Mexican poppy	1b	1
**Bidens bipinnata*	Spanish needles	N/L	N/L
**Chenopodium album*	Goosefoot	N/L	N/L
**Chenopodium murale*	Nettle-leaves goosefoot	N/L	N/L
**Datura ferox*	Large thorn apple	1b	1
**Datura stramonium*	Common thornapple	1b	1
**Galinsoga parviflora*	Small-flowered quick weed	N/L	N/L
**Hibiscus trionum*	Bladder weed	N/L	N/L
**Malva parviflora*	Small mallow	N/L	N/L
**Opuntia engelmannii*	Cow's tongue cactus	1b	N/L
**Opuntia ficus-indica*	Prickly pear	1b	1
**Portulaca oleracea*	Purslane	N/L	N/L
**Schkuhria pinnata*	Small khakiweed	N/L	N/L
**Sphaeralcea bonariensis*	Globemallow	N/L	N/L
**Tagetes minuta*	Tall khakiweed	N/L	N/L
**Xanthium spinosum*	Spiny cocklebur	1b	1
**Xanthium strumarium*	Large cocklebur	1b	1
**Zinnia peruviana*	Redstar zinnia	N/L	N/L

Category 1b – Invasive species that require control by means of an invasive species management programme.

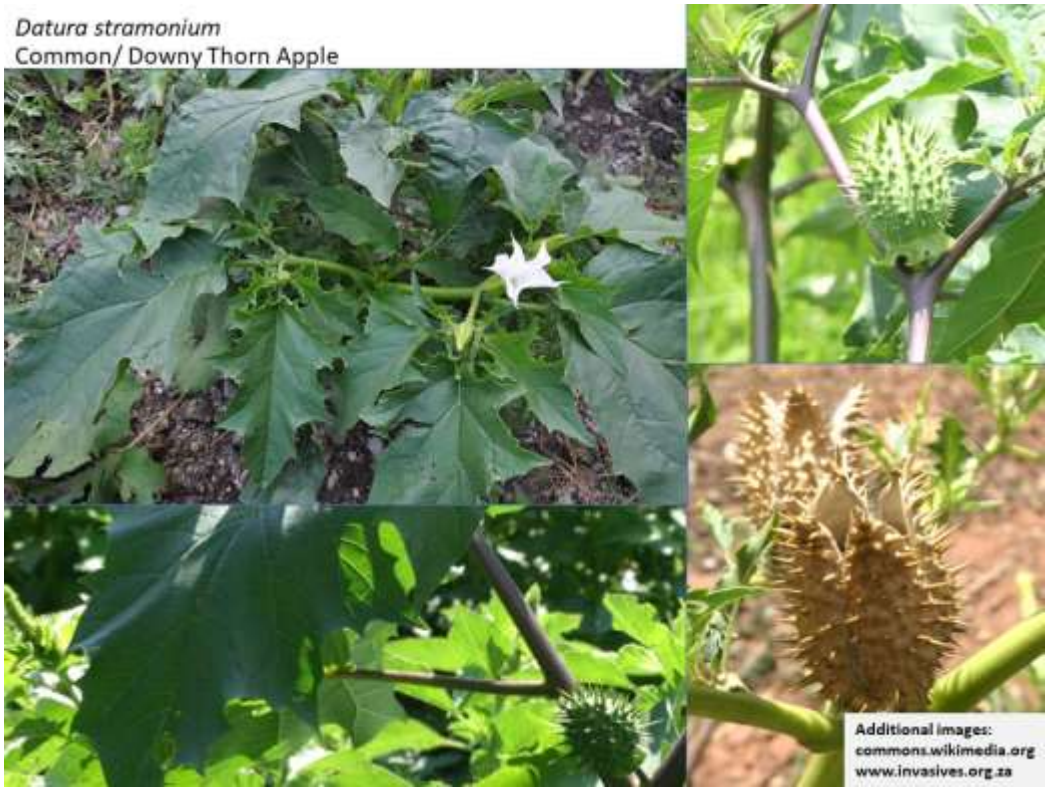
Category 2 – Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread.
Category 3 – Ornamentally used plants that may no longer be planted. Existing plants may remain, except within the flood line of watercourses and wetlands, as long as all reasonable steps are taken to prevent their spread.

From the table above, it is evident that a moderate diversity of listed alien species occurs within the study area, with a number of Category 1b invasive species present within the study area. Listed alien species within the study area has to be controlled throughout all development phases of the proposed project. The project alien management plan must be used in conjunction with this EMPr to control alien plants.

Images of listed alien species found on site are as shown below:

IMAGES OF CATEGORY 1b ALIEN INVASIVE SPECIES


Datura ferox
Large Thorn Apple
Additional images:
keys.lucidcentral.org
www.invasives.org.za


Datura stramonium
Common/ Downy Thorn Apple
Additional images:
commons.wikimedia.org
www.invasives.org.za


Opuntia engelmannii
Cow's Tongue Cactus/ Small round-leaved Prickly Pear
Additional images:
keys.lucidcentral.org
www.invasives.org.za


Opuntia ficus-indica
Prickly pear
Additional images:
keys.lucidcentral.org
www.invasives.org.za


Xanthium spinosum
Spiny Cocklebur
Additional images:
keys.lucidcentral.org
www.invasives.org.za


Xanthium strumarium
Large Cocklebur
Additional images:
keys.lucidcentral.org
www.invasives.org.za

Visual Impacts

The site is currently undeveloped, and clearing and development of the site, as well as lighting at night, will change its visual character, which may be perceived negatively particularly by observer's. Three observer groups are identified in the study area namely; residents, tourists and motorists. Residents and tourists are considered the most sensitive receptors. Residents from Mimosa Park S.H. and Ribblesdale are expected to experience the highest levels of visual exposure. Viewer incidence is however low due to the low population density. Affected tourists are identified as those visiting the nearby Sangiro Game Lodge and attractions at Tredenham Hill and Somerton Estate. A high viewer incidence is expected for motorists due to the high traffic volumes on the N1. Motorist`s exposure to the visual impacts will however be brief and therefore their sensitivity is considered low.

Mitigation measures are however paramount to alleviate the anticipated impacts. Screen planting will yield the greatest result and should be planted along the perimeter of the development in the early stages to gain maturity as soon as possible. The development should also consider roof gardens as well as adopt a vision of "greening" to compensate for the loss of vegetation. These measures should form part of a master plan development during the design and implementation phases.

No fatally flawed issues are identified on the bases of visual impacts, but serious consideration should be given to the IDP of Mangaung Metropolitan Municipality in order to adhere to town planning schemes etc.

Heritage Impacts

The following heritage resources were reported on site

- An existing informal burial place containing approximately 10 graves marked by stone cairns. Farm: Olrig 1710; Coordinates: S 29,02969, E 26,22727.
- A low density scatter (1/5m2) of MSA stone tools (blades and scrapers) and flakes was identified at the eastern foot of the hill located in the south-western corner of the study area. Farm: Olrig 1710; Coordinates: S 29,03001, E 26,22709
- At least twenty structures identified as sangars occur on the western side of the hill, with a few located on the eastern side. Farm: Olrig 1710; Coordinates: S 29,02997, 26,22577

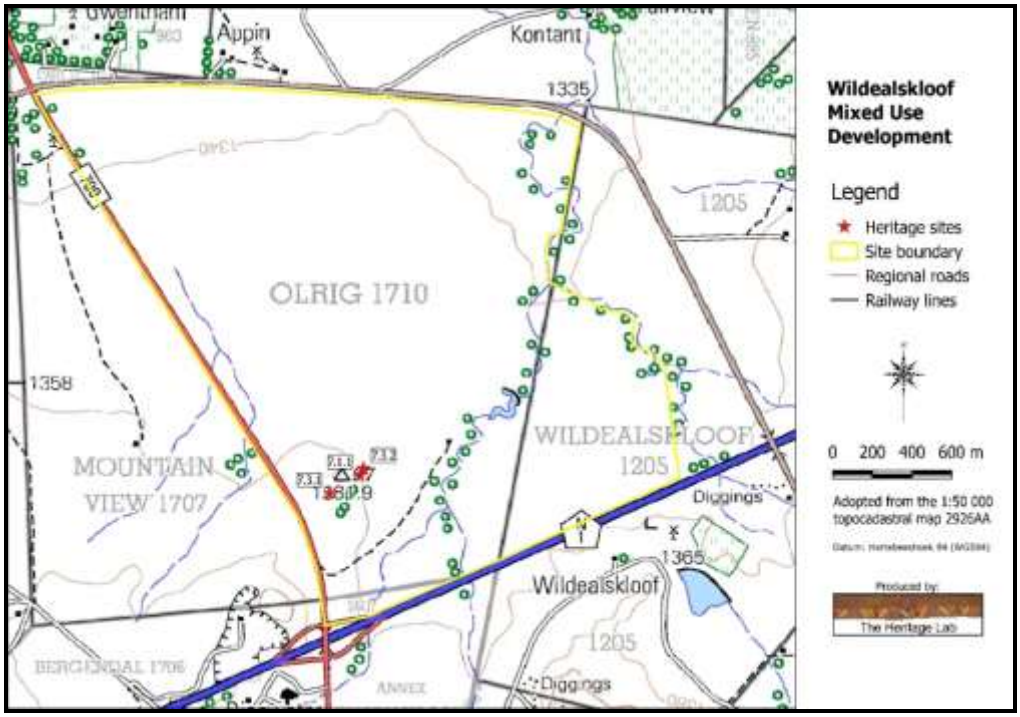


Figure 4: Location of heritage sites in the study area.

The impacts can be mitigated by excluding development in this area, where exclusion is not possible mitigation measures have been provided in this EMPr

Soil and Agricultural Impacts

Loss of agricultural land Soils of the study site are predominantly fairly shallow, dark coloured, clay-rich soils on underlying rock, of the Arcadia, Milkwood and Bonheim soil forms, with some rock outcrops. The soil on site limit the rainfed crop production as they are high in clay content, with shrink-swell characteristics, limited depth and occurrence of rock outcrops. The very high clay content soils are limited in terms of their plant available moisture reservoir. The limited moisture reservoir, in combination with fairly low rainfall, makes the study area unsuitable for rain fed crop production. Insufficient water availability limits the potential for irrigation. There is only one impact of the development on agriculture, and that is the loss to agriculture of approximately 580 hectares of agriculturally zoned land due to rezoning and development of the site to a mixed use development. Once the land is lost to a mixed use development other impacts that could potentially impact agricultural land, such as erosion and changes to soil fertility become irrelevant because the land is no longer agricultural land. ***No Mitigation measures were provided for the loss of soil and agriculture land***

Avifauna (Birds) Impacts

The main environmental impacts regarding avifauna on site is with the following:

Loss of faunal habitat and ecological structure –The already disturbed avian grassland habitat will be lost in the areas cleared for all the developments proposed in the project. The impact can be reduced by avoiding any development on the eastern side of the stream as well as the rocky outcrop on the property. These proposed areas can be used as the conservation area on the property that will allow avian diversity to remain on the property. The wetland area was identified as a NO-GO area, direct and indirect impact on the area must be avoided at all cost. Additional habitat loss may occur during the construction phase on surrounding grasslands

Disturbance – construction activities during the development will cause disturbance to birds on the proposed property. This impact will be most severe if it affects breeding birds, and disturbance should be kept to a minimum. In conclusion, given the highly disturbed nature of the grassland on the western side of the property, the avifaunal impacts of the Wildealskloof Mixed Use Development will be of low severity, with relatively few mitigation measurements necessary.

The overall impacts were rated as Medium with or without mitigation. Please refer to the bird sensitivity map below for areas to ensure caution when undertaking works on site

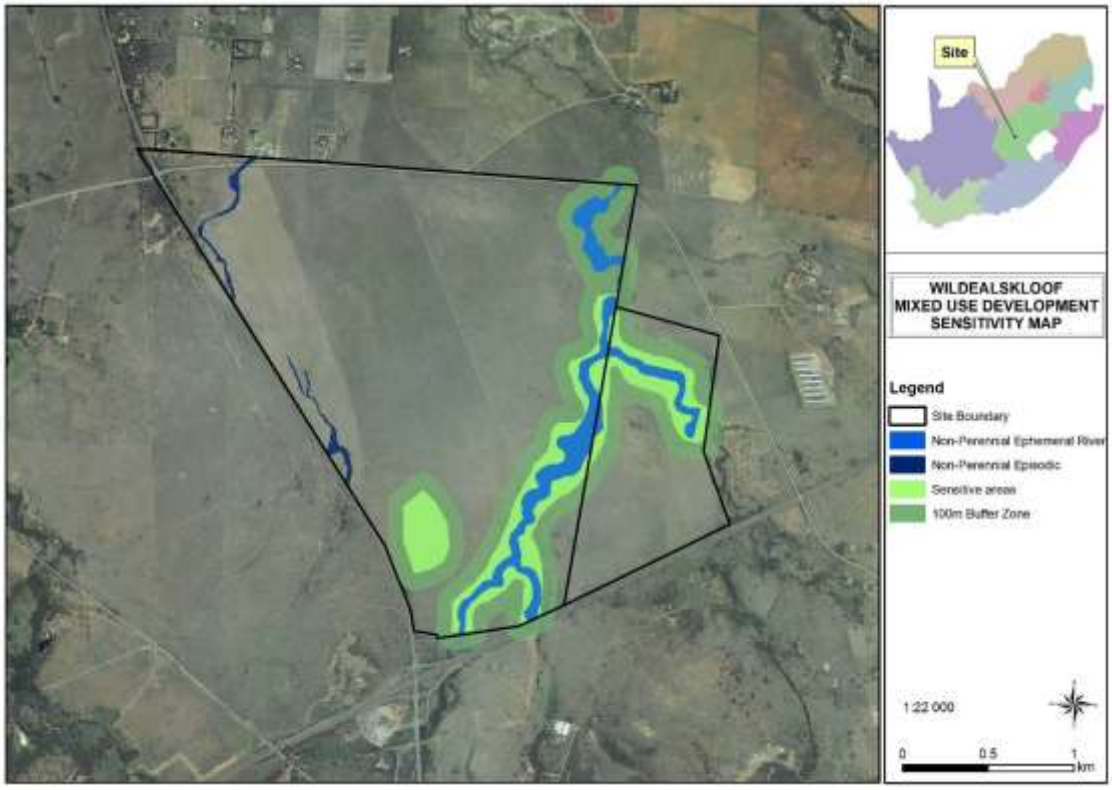


Figure 5: Overview of the Avian and bird most sensitive areas

Impacts on Mammal & Herpetofaunal

Impacts on Fauna: The main environmental concern regarding Mammal & Hepertofauna on site is with the following:

- Destruction of natural and sensitive mammals & Hepertofauna habitat
- Loss of ecosystem function of wetlands
- Poaching of wildlife in the vicinity
- Reduction of natural migratory and faunal dispersal routes.
- Possible increase in exotic vegetation
- Displacement of indigenous mammals & vertebrates

The high sensitive areas identified with respect to the mammal and Hepertofauna include the wetland, rocky grassland, the hill or kopje (refer to sensitivity map below). *Caution must be exercised when undertaking works in these areas*

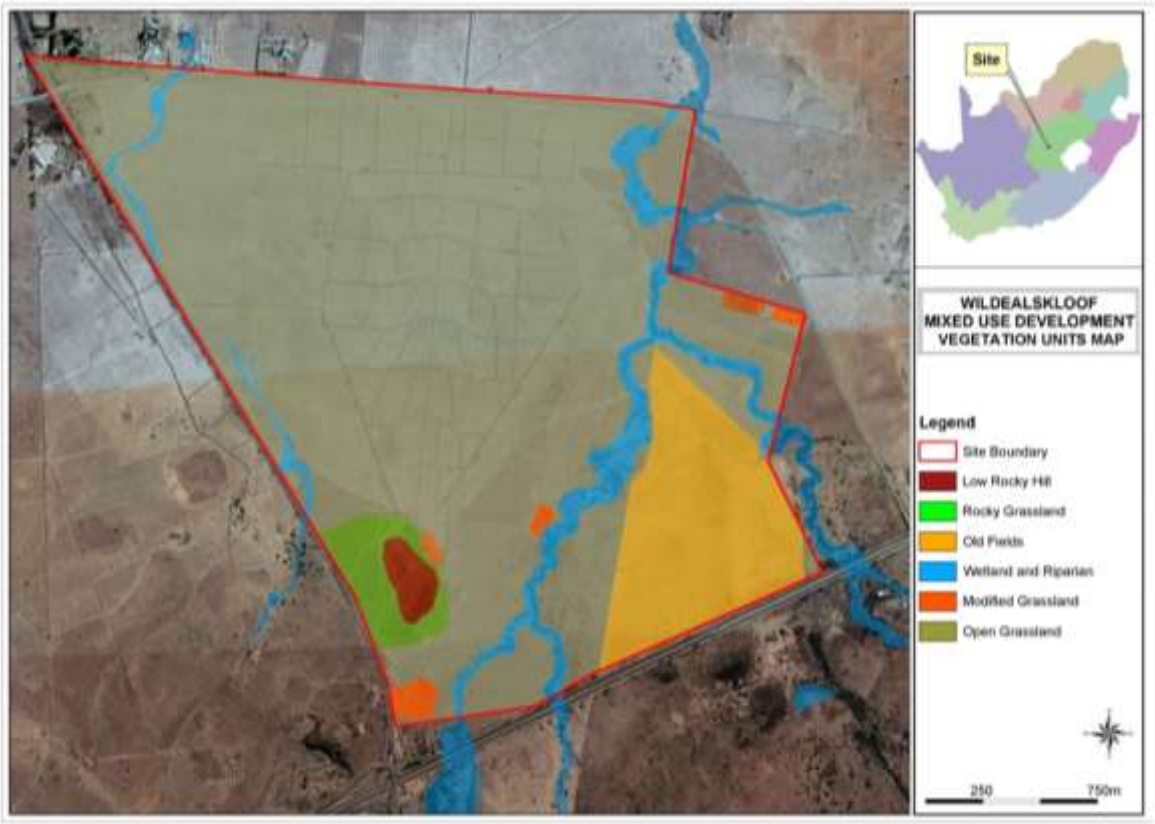


Figure 6: Sensitivity Map showing the high sensitive areas which are the hill or kopje, the wetland areas and the rocky grassland

Social Impacts

(Negative and positive impacts will occur) Where negative impacts are recorded mitigation measures are provided and where positive impacts are recorded enhancement to improve the impacts are provided

Broad potential impacts that may be associated with the proposed development during the construction phase include the following

- Population Change Impact on local employment and income levels during construction
- Impact on local businesses during construction
- Permanent loss of agricultural land
- The impact on property values during construction
- Impact on low income groups and income distribution
- Impact on tax income during construction

Broad potential impacts that may be associated with the proposed development during the construction phase include the following.

- Impact on local employment and income levels during operations
- Impact on local businesses during operations
- Permanent loss of agricultural land
- The impact on economic infrastructure and public services
- Impact on tax income during operations

Socio Economic Impacts (*Negative and positive impacts will occur*)

(Negative and positive impacts will occur) Where negative impacts are recorded mitigation measures are provided and where positive impacts are recorded enhancement to improve the impacst are provided

Broad potential impacts that may be associated with the proposed development during the construction phase include the following.

- Population Change Impact on local employment and income levels during construction
- Impact on local businesses during construction
- Permanent loss of agricultural land
- The impact on property values during construction
- Impact on low income groups and income distribution
- Impact on tax income during construction

Broad potential impacts that may be associated with the proposed development during the construction phase include the following.

- Impact on local employment and income levels during operations
- Impact on local businesses during operations
- Permanent loss of agricultural land
- The impact on economic infrastructure and public services

Impact on tax income during operations

Impacts on Topography, Soils and Geology

The study area is generally flat with one hill on the study site. Little impacts are anticipated. The soils on site are high in clay content, with shrink-swell characteristics, limited depth and occurrence of rock outcrops. No Cumulative impacts would be relevant.

Impact on groundwater

During the geohydrology survey reported that no ground water was encountered during the geotechnical investigation. This indicates a low water table; therefore potential impacts to ground water in this regard will be negligible. No Cumulative impacts would be relevant.

Other potential impacts that may occur include the following:

- Waste management impacts;
- Noise Impacts;
- Air quality impacts;
- Storm water and erosion impacts
- Pollution due to inappropriate handling of hydrocarbons used on site;

All the above potential impacts can effectively be mitigated provided measures stipulated in this EMPr are adhered to. The EMPr is designed to mitigate the above potential impacts and other disturbances and should be constantly adhered to by the contractor to mitigate pollution of the wetland and the surrounding environment. It thus of utmost importance that the mitigation measures proposed in this EMPr be adopted and be monitored by an independent Environmental Control Officer throughout the project phases to ensure the significance of the above impacts are minimised or negated were possible.

5. 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 1).

5.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and wetland 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 if not possible to a state that conforms to the principles of sustainable Development 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. The bio retention facility maybe completely silted up and filled with waste material. Proper cleaning and maintenance of these facilities will be required. 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.

6. 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, SHE 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 (DESTEA).

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/her 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 Department of Economic Small Business Development Tourism and Environment Affairs (DESTEA). 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 'Developer' 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. Safety Heath and Environmental Officer (SHE)

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

The SHE 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 Environmental Monitoring Committee meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the SHE must keep a register of complaints from any community members on environmental issues. Finally, the SHE 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, SHE's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

7. 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.

Planning & Design Phase
Environmental Management Programme

Table 1: 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, SHE	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 EMPr, applicable environmental project permits and conditions of the environmental authorisation. This statement will be prepared after the final audit during the rehabilitation phase.	ECO	Once-Off
Appointment and Duties of SHE	The contractor must appoint a Safety Heath and Environmental Officer (SHE)This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-	Contractor	Once-Off

	operation of all personnel. He should be fluent in the languages of the employees.		
EMPr	This EMPr must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.	Developer	Once-Off
Designs	Construction within wetlands and buffers must be planned to take place in the drier winter months	Developer	Once-Off
	Ensure that sufficient attenuation is included in the design of storage basins so that the loss of attenuation properties currently afforded by the wetland vegetation is replaced	Developer	Once-Off
	The storm water outlet structures will be equipped with energy dissipaters to minimise the possibility of erosion at the point of discharge.	Developer	Once-Off
	Those areas surrounding the construction site that are not part of the demarcated developer area should be considered as "no-go" areas for employees, machinery or even visitors;	Developer	Once-Off
	The extent of the construction sites and access roads should be demarcated on site layout plans and should be restricted to disturbed areas. Therefore, no construction personnel or vehicle may leave the demarcated area except those authorised to do so.	Developer	Once-Off

	Ensure that effective sediment barriers are incorporated in the rehabilitation layout in order to replace the sediment trapping function of current reed beds.	Developer	Once-Off
	The interface between the water that exits in the conduit and the wetland floor shall be designed to prevent erosion and canalization at all cost	Developer	Once-Off
Designs	"Green building and designs" Design the development in a way that it could lessen the need for additional infrastructure and services (e.g. electricity supply).	Developer	Once-Off
Design Development in a way that will minimise Visual impacts	Establish a philosophy that the development should be shrouded in vegetation and that more vegetation is visible than building facades, roofs, parking areas etc. Plant street trees and perimeter planting as soon as possible and appoint a horticulturist to guide on species. This will increase the screening capacity of the site from outside views.	Developer	Once-Off
	Encourage all future property owners in the development to "green" their properties by implementing an incentive scheme or subsidising such initiatives.	Developer	Once-Off
	A roof- and vertical garden are relatively novel building features in South African architecture but has proven valuable on levels of urban ecology and micro-climatic control. Installation of such features will compensate for the loss in grassland and reinstate some ecological function.	Developer	Once-Off
	Maintain an architectural character that provides for green open spaces and corridors into the development. Approximately a	Developer	Once-Off

	quarter of the development is dedicated for open space but consider creative ways of enlarging this footprint.		
	Avoid large bulky buildings with uninteresting facades. Instead, stagger and articulate the facades on horizontal and vertical planes to create shadow lines and to reduce the perceivable mass of the buildings. A mixed palette of building materials that are well designed to create unity within diversity will also create interesting and varied patterns.	Developer	Once-Off
Design Development in a way that will minimise Visual impacts	Avoid large open parking areas that are typically associated with shopping centres and offices. Consider basement parking for the majority of the facilities or introduce plenty of parking lot trees to minimise the visibility of hard surfaces.	Developer	Once-Off
	Avoid obtrusive lighting of the development. Obtrusive lighting, otherwise known as light pollution, can range from glare to light spillage that causes a nuisance to surrounding viewers.	Developer	Once-Off
	Appoint Architects, Landscape Architects and/or Urban Designers to implement sound urban design principles and develop a masterplan for the area that is sensitive towards the environment. Implement principles to address, scale and proportion of spaces, responsiveness of these spaces in terms of its context, legibility of the user, variety to provide a rich experience, robustness of usage and creation of a unique identity. These are concepts promulgated by urban design theorists and should be further explored by a professional in the field.	Developer	Once-Off
	The introduction of open water bodies is a certain way of increasing the aesthetic value of the site. The opportunity exists that storm water retention dams should be incorporated in the	Developer	Once-Off

	layout of the development to manage storm water effectively before being released into the Stinkhoutspruit. This is subject to a successful application for a water use license.		
	Building designs should take the character of the area into account and should not detract from the existing sense of place	Developer	Once-Off
	Designing of walls, roofs and buildings should be done in such a manner to blend in with the natural environment.	Developer	Once-Off
	Lighting issues should receive the attention it deserves to avoid any light pollution at night.	Developer	Once-Off
Design Development in a way that will minimise impact on Daily Living and Movement Patterns impacts	Taxi routes, subsidized bus routes (including bus and taxi stop shelters) and pedestrian walkways should be included in the development.	Developer	Once-Off
	A strong emphasis needs to be placed on ensuring the safety of pedestrians, and notably school children crossing local roads.	Developer	Once-Off
	Internal roads should be tarred with proper lighting.	Developer	Once-Off
	The R700 should be upgraded and maintained to be able to accommodate the increase in traffic volumes and to adhere to engineering standards.	Developer	Once-Off
	The S1066 situated to the north and east of the site should be upgraded.	Developer	Once-Off
	A planning forum with regards to bulk infrastructure development should be established to ensure integrated planning	Developer	Once-Off

Best Practice Designs for other land use proposed on site e.g. Filling Stations	<u>Requirements for the construction of the three filling stations proposed on site</u> • As far as possible, all yards and storage areas to be enclosed by masonry walls or screens. • The parking bays should be paved with brick or other unit pavers to minimise expansive asphalt areas. • All tanks, piping and filler points should be designed such that there is secondary containment as a safety precaution should a leak devSHEp. • Secondary containment includes but is not limited to the construction of concrete bunkers for tanks and concrete channels for piping a filler points • Tank, pipes and other work installation • Developer must at own cost install a water connection point to the satisfaction of the council. This may include a suitably sized reservoir with a booster pump station • The Developer must install a bio chemical sanitation system to the requirements of the Department of Water Affairs • Tank and pipe work installation must comply with the necessary SANS codes especially SANS 1535 and SANS 089-3 • The Underground storage tanks (USTs) will be composite tanks constructed and installed according to relevant National Building Regulation and SANS codes (10089-3, 10400:1987, 1020, 10142-1, 10108, 10131-2) • The UST installation must comply with SANS 10089 part 1	Developer	Once-Off

	(storage of dangerous goods in USTs). • The USTs must have a secondary containment area to prevent subsurface leaks from seeping directly into the ground.		
Design	<u>The following public transport facilities to be included in the final township layout:</u>	Developer	Once-Off
	2.0m paved sidewalks along both sides of all roads with a road reserve width of 20m or wider.	Developer	Once-Off
	2.0m paved sidewalks along one side of all roads with a road reserve width of 16m.	Developer	Once-Off
	Provide taxi stops and pedestrian crossings at the school sites.	Developer	Once-Off
	Provide taxi stops along certain main internal township roads.	Developer	Once-Off
	Provide taxis stops along Road S1066, downstream of Intersection 11 (Whistling Tree Boulevard) and on Road R700, downstream of Intersection 12 (Wildeals Boulevard) and Intersection 13 (Industry Way).	Developer	Once-Off
	Provide raised pedestrian crossings along certain roads.	Developer	Once-Off
	Pedestrian loading/off loading facilities at the school sites.	Developer	Once-Off
	Investigate the provision of a taxi rank at the "Regional Shopping Centre on Erf 1977.	Developer	Once-Off
Filling Station Design	***<u>Requirements for the construction of filling stations</u>***		
	As far as possible, all yards and storage areas to be enclosed by masonry walls or screens.	Developer	Once-Off

	The parking bays should be paved with brick or other unit pavers to minimise expansive asphalt areas.	Developer	Once-Off
	All tanks, piping and filler points should be designed such that there is secondary containment as a safety precaution should a leak develop.	Developer	Once-Off
	Secondary containment includes but is not limited to the construction of concrete bunkers for tanks and concrete channels for piping a filler points	Developer	Once-Off
	Tank, pipes and other work installation	Developer	Once-Off
	Applicant must at own cost install a water connection point to the satisfaction of the council. This may include a suitably sized reservoir with a booster pump station	Developer	Once-Off
	The applicant must install a bio chemical sanitation system to the requirements of the Department of Water Affairs	Developer	Once-Off
	Tank and pipe work installation must comply with the necessary SANS codes especially SANS 1535 and SANS 089-3	Developer	Once-Off
	The Underground storage tanks (USTs) will be composite tanks constructed and installed according to relevant National Building Regulation and SANS codes (10089-3, 10400:1987, 1020, 10142-1, 10108, 10131-2)	Developer	Once-Off
	The UST installation must comply with SANS 10089 part 1 (storage of dangerous goods in USTs).	Developer	Once-Off
	The USTs must have a secondary containment area to prevent subsurface leaks from seeping directly into the ground.	Developer	Once-Off

Training for Site Personnel	All Contractor teams involved in construction work are 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	Once-Off
	The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; • What is meant by "Environment" • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions • 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 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 and spill kits etc. 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	Contractor	Continuous

	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	SHE, 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 (Wetland, Fauna, Vegetation and Aquatic assessment reports) 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 a sensitive plant removal permit.	Developer, Contractor	Once off
	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	Developer, Contractor, SHE	As necessary

	can be retrieved easily.		
	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
Environmental Protection Plan	Within 21 days of the Commencement Date, the Site Contractor shall prepare and submit to the Project Manager for approval in consultation with the ECO an Environmental Protection Plan. The Plan shall cover all environmental protection works and shall also include descriptions of environmental safeguards and emergency procedures.	Developer, ECO, Contractor	Once - off
	The Plan shall include a description of the administrative structure and lines of communication which shall be established between the Contractor's and his subcontractors' workforce for the implementation of environmental protection procedures. Details of the expertise available for the implementation of environmental protection procedures must also be provided.	Contractor, RE, ECO	Once off
Environmental Protection Plan	In addition this plan must have a site layout plan and showing the final positions and extent of all permanent and temporary site structures and infrastructure, including: ▪ Buildings ▪ Contractors' camp ▪ Roads and access routes ▪ Gates and fences. ▪ Essential services (permanent and temporary water, electricity and sewage)	Contractor, RE, ECO	Once off

	▪ Rubble and waste storage areas ▪ Site toilets and ablutions. ▪ Firebreaks. ▪ Excavations and trenches. ▪ Topsoil stockpiles. ▪ Spoil areas. ▪ Construction materials stores. ▪ Vehicle and equipment stores. ▪ Sensitive and No go areas & applicable buffers. This must include all areas of Environmental sensitivity (natural environment, sensitive habitats e.g. the wetland on site ▪ All temporary water management structures including bunds and sumps(if required)		
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 required by the contract and with the permission of the RE.	Contractor, RE, ECO	Continuous .
	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

Emergency Preparedness	If chemicals in sufficient quantity and toxicity will be kept on the construction sites, emergency contingency plans should be prepared as safety measures (Bunded areas). These safety measures should be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites.	Contractor, SHE	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 ▪ 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	Contractor	As necessary

Method Statements	▪ 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	Contractor, RE	Continuous

	must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.		
	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
Site Establishment	*If the establishment of the site camp is cannot be avoided on site the following measures must be implemented.* 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.	Contractor, ECO	Continuous
	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
	All sensitive areas, heritage (if encountered), wetland, drainage lines, should be demarcated and fenced off before development commences. These areas should be treated as "no go" areas.	Contractor, ECO, SHE	Continuous
	Invasive alien plant species should be managed in an appropriate manner.	SHE 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.	SHE and Contractor	Continuous

Pre - Construction Phase
Environmental Management Programme

Table 2: Pre - Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Site Establishment	Locate and clearly indicate convenient access routes, temporary loading and packing areas so that vehicle movement can be confined to these areas	SHE, Contractor	Continuous
	Locate chemical toilets so that they are easily accessible for servicing	SHE, Contractor	Continuous
	Direct lights so that they do not pose a nuisance to neighbours	SHE, Contractor	Continuous
	Locate temporary waste bins and skips so that they are easily accessible for removal	SHE, Contractor	Continuous
Loss of wetland habitat	Construction activities in the wetland should be limited only to that authorised.	Contractor	Continuous
	Project engineers should compile a method statement, outlining the construction methodologies. The required mitigation measures to limit the impacts on the watercourse and associated buffers should be contained within the method statement. The method statement must be approved by the ECO and be available on site for reference purposes	Project Engineer	As necessary
	Plan construction activities to have the smallest possible footprint	Developer, Project Engineers	Once off

Activity / issue	Action required	Responsible party	Frequency
	Demarcate the construction footprint prior to commencement of construction and ensure that all workers and contractors are aware that access beyond the demarcated areas is not allowed. Where the structures will affect a wetland, the edge / boundary of this wetland must be clearly demarcated in the field with poles, sticks, or any solid structure that will last for the duration of the development. These indicators could be coloured as follows and communicated to workers Red – Indicating the edge / boundary of the wetland Orange – Indicating the edge of the buffer zone	Contractor, ECO, SHE	Continuous
	Ensure that copies of the Wetland Reports 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 Safety Health & Environmental Officer (EO) or Environmental Control officer (ECO)	Contractor, SHE, ECO	Continuous
	Prevent pedestrian and vehicular access into the wetland (activities must only be within authorised areas).	Contractor, ECO, SHE	Continuous
	Plan construction activities that necessitate wetland crossings to only cross the wetland at designated points	Developer	Once - off
	Avoid linear disturbances that run parallel to the wetland	Contractor, ECO, SHE	As necessary
Permits	Ensure all environmental permits among others a water uses licence, township planning approval are in place prior to construction	Developer	Once - off

CONSTRUCTION PHASE:
ENVIRONMENTAL MANAGEMENT PROGRAMME

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

Activity / issue	Action required	Responsible party	Frequency
Heritage Resources	A site management plan should be developed to protect the various identified features (sangars and burial site) on and at the base of the hill in the south-western section of the study area. This should include, inter alia, fencing off the area by creating a buffer zone of at least 50 metres calculated from the foot of the hill; controlling access to the area; and informing residents and their visitors about the legal aspects regarding the destruction of the features or the removal of any artefacts from the site.	Contractor/Developer	As necessary
	Should any 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	Contractor/Developer	As necessary
	No person may destroy damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site	Contractor/Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Should graves be required to be relocated or any of the identified heritage material to be disturbed, a permit from PHRA/SAHRA as well as other institutions will be required-However this is outside the scope of this EIA. The developer will ensure compliance with the NHRA requirements	Contractor/Developer	As necessary
Heritage Resources	*Relocation of graves* • If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits and have their own requirements that must be adhered to. • If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Once it has been decided to relocate particular graves, the following steps should be taken: • Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law. • Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.		
	Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.	Contractor/Developer	As necessary
Heritage Resources	Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.	Contractor/Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.	Contractor/Developer	As necessary
Paleontological Resources	The proposed footprint is underlain by sediments of the Volksrust Formation (Ecca Group, Karoo Supergroup) and the Adelaide Formation (Palingkloof Member) of the Beaufort Group (Karoo Supergroup). The Paleontological sensitivity of the Volksrust Formation is moderate while the paleontological sensitivity of the Adelaide Formation is very high. The lack of fossils at the proposed development footprint indicates that the impact of the development is of low significance in paleontological terms. **Chance find Procedure** • When a chance find is made the person must instantly stop all work near the find. • The site must be secured to protect it from any additional damage	Contractor, ECO, SHE	As necessary

Activity / issue	Action required	Responsible party	Frequency
	• The finder of the fossil heritage must immediately report the find to his/her direct supervisor, according to the reporting protocols instituted by the Mine/development management. The supervisor must in turn report the find to his/her manager and the ECO. The ECO must report the find to the relevant Authorities and a relevant palaeontologist. • The ECO must appoint a relevant palaeontologist to investigate and access the chance find and site. • Both ECO and palaeontologist must ensure that accurate records and documentation are kept. The documentation must start with the initial chance find report, including records of all actions taken, persons involved and contacted, comments received and findings. • These documents will be necessary to request authorizations and permits from the relevant Authorities to continue with the work on site		
Minimising Impacts on Birds (Avifauna)	***Disturbance of Birds***		
	If possible reduce the number of developments on the eastern side of the stream to reduce the impact on the stream.	Contractor, Developer	Once Off

Activity / issue	Action required	Responsible party	Frequency
	Minimise the impact on the stream and wetland area.	Contractor/Developer	Throughout construction
	Minimise the disturbance to the rocky outcrop.	Contractor/Developer	Throughout construction
	Minimise areas cleared for construction activities. These should be clearly demarcated, and personnel should be instructed to remain in the designated areas at all times.	Contractor/Developer	Throughout construction
	The development will probably be done in different phases over several years. Hence, clearly for each phase of the development should be done outside the breeding season of most birds and when migrants are absent (winter months).	Contractor/Developer	Throughout construction
	Construction of the eastern side of the stream should use an alternative gate on the southern side of the property avoid crossing the stream during the construction.	Contractor/Developer	Throughout construction
	Construction workers must be instructed to minimise disturbance of birds at all times.	Contractor/Developer	Throughout construction
	Illegal hunting of birds must be strictly prevented	Contractor/Developer	Throughout construction
	Loss of avifaunal habitat and ecological structure		
	If possible reduce the number of developments on the eastern side of the stream to reduce the impact on the stream.	Contractor/Developer	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	Minimise the impact on the stream and wetland area.	Contractor/Developer	Throughout construction
	Minimise the disturbance to the rocky outcrop.	Contractor/Developer	Throughout construction
	Minimise areas cleared for construction activities. These should be clearly demarcated, and personnel should be instructed to remain in the designated areas at all times.	Contractor/Developer	Throughout construction
Protection of Mammals and Hepertofauna	***Destruction of natural and sensitive mammals & Hepertofauna habitat***		
	No construction should be done on or near the hill.	Contractor/Developer, ECO	Throughout construction
	Restrict construction activities to the smallest possible area of development site.	Contractor/SHE/ECO	Throughout construction
	Cordon off of the wetland to restrict the movement of construction vehicles and construction	Contractor/SHE/ECO	Throughout construction
	Loss of ecosystem function of wetlands		
	Effective storm water management should be a priority during both construction and operational phase. This should be monitored as part of the EMPr.	Contractor/Developer/ECO	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	An environmentally friendly storm water design should be formulated based on empirical data showing how a neutral effect on the regional hydrograph will be achieved.	Contractor/Developer	As necessary
Protection of Mammals and Hepertofauna	High energy storm water input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively	Contractor/SHE/ECO	Throughout construction
	Effective storm water management should be a priority during both construction and operational phase. This should be monitored as part of the EMPr.	Contractor/SHE/ECO	Throughout construction
	Poaching of wildlife in the vicinity		
	Education of the construction staff about the value of wildlife and environmental sensitivity.	Contractor/SHE/ECO	Throughout construction
	Restrict access to the suitable and sensitive habitats of faunal species.	Contractor/SHE/ECO	Throughout construction
	The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.	Contractor/SHE/ECO	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	Reduction of natural migratory and faunal dispersal routes.		
	Ensure the maintenance of a proposed 30 metres buffer along drainage lines as primary dispersal corridor.	Contractor/SHE/ECO	Throughout construction
	Ensure any crossing opportunities at roads (culverts, pipes and bridges) are designed to also facilitate the movement of animals	Contractor/SHE/ECO	Throughout construction
	Possible increase in exotic vegetation		
	Implement an Alien Plant Control Plan	Contractor/SHE/ECO	Throughout construction
	Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.	Contractor/SHE/ECO	Throughout construction
	Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.	Contractor/SHE/ECO	Throughout construction & Operation phase
	Rehabilitate or vegetate disturbed areas	Contractor/SHE/ECO	Throughout construction
	Displacement of indigenous mammals & vertebrates		

Activity / issue	Action required	Responsible party	Frequency
	Maintenance of corridors should minimise losses and assist with any subsequent recolonization of the site.	Contractor/SHE/ECO	Throughout construction
Social- Management	It is recommended that local employment policy is adopted to maximize the opportunities made available to the local labour force.	Contractor, Developer	As necessary
	Where reasonable and practical Developer and Contractor should appoint local contractors and implement a (local first) policy especially for semi-skilled and low skilled job categories.	Contractor/Developer	As necessary
	Training and skills Developer programmers should be initiated prior to the commencement of the construction phase.	Contractor, SHE	As necessary
	No accommodation will be allowed on site. The contractor is responsible for making the necessary arrangements for transporting staff to and from site on a daily basis.	Contractor, ECO, SHE	As necessary
	Where possible, efforts should be made to employ local contractors that are compliant with Black Economic Empowerment (BEE) criteria.	Contractor, Developer	As necessary
	The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.	Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Develop strategies for local businesses to capitalise on project opportunities. These include related business such as suppliers of construction materials, waste collection, security services etc.	Contractor, Developer	As necessary
Social- Management Measures to control Population Change	A phased approach in terms of the development should be followed as this could spread population change impacts over a couple of years	Contractor, Developer	As necessary
	Pro-active planning with regards to infrastructure and service needs by the MMM is imperative	Contractor, Developer	As necessary
	Implementation and/or upgrading of the necessary infrastructure and services e.g. roads, water supply and waste facilities are required.	Contractor, Developer	As necessary
	Local labourers should be employed where possible to limit unnecessary temporary increase in the local population.	Contractor, Developer	As necessary
	Construction workers falling within the medium skilled to lower skilled category to avoid possible conflict arising between locals and an outside workforce (e.g. workers from Gauteng).	Contractor, Developer	As necessary
	Introduce contractual obligations for contractors to use local labour as far as possible.	Contractor, Developer	As necessary
	Labourers should remain at their existing residences. No workers should thus be accommodated on site at night. The erection of a construction camp where workers would be housed would not be recommended.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to control Population Change	Before construction commences, representatives from the MMM, other community leaders (e.g. councillors) and as well as management structures of the security villages and complexes, as well as representatives of the residential areas should be informed of the details of the contractors, size of the workforce and construction schedules.	Contractor, Developer	As necessary
	The contractor should make certain that the workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the local communities do not create conflict in the surrounding communities.	Contractor, Developer	As necessary
	Local community organisations and policing forums / neighbourhood watches must be informed of the presence of the workforce (where relevant).	Contractor, Developer	As necessary
	Local labourers should be employed where possible to limit unnecessary temporary increase in the local population.	Contractor, Developer	As necessary
Social- Management Measures to control Influx of temporary job seekers	A construction project of this size would usually make use of large established contractors with their own teams of workers, but the use of local labour and contractors must be maximised where possible.	Contractor, Developer	

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to control Influx of temporary job seekers	Construction workers falling within the semi-skilled to unskilled category should be sourced from the local population within the MMM, where possible, to avoid conflict arising between locals and the outside workforce, but also to limit the need for any temporary accommodation facilities	Contractor, Developer	As necessary
	Develop a strategy to involve local labour in the construction process e.g. communicate the construction requirements through the local leaderships such as the ward councillors, residents associations and representatives of the MMM, and advertise in the local newspapers in the local languages.	Contractor, Developer	As necessary
	If the majority of the construction workers could be sourced locally it would immediately lessen the negative impacts associated with a medium-term inflow of workers.	Contractor, Developer	As necessary
	An awareness/communication campaign with regards to the appointment of contractors should be launched to ensure transparency and an understanding among the community members of the process followed.	Contractor, Developer	As necessary
	Unrealistic employment expectations should not be created.	Contractor, Developer	As necessary
	Specify the conduct of contract workers in worker related management plans and employment contracts.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to control Influx of temporary job seekers	Workers should be transported to site on a daily basis. Preferably, from a social perspective an accommodation facility should not be constructed on site. If this cannot be avoided, the contractors should ensure that "outside" workers reside in suitable facilities to avoid the establishment of informal houses and illegal sub-letting.	Contractor, Developer	As necessary
	Construction workers should be supervised at all times.	Contractor, Developer	As necessary
	Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays.	Contractor, Developer	As necessary
	Property owners surrounding the construction areas should be informed of the construction schedules and activities.	Contractor, Developer	As necessary
	Security on-site should be present for the entire duration of the construction period	Contractor, Developer	As necessary
	Possible environmental pollution due to the localised increase in the population figures should be attended to through sound environmental management of the construction site.	Contractor, Developer	As necessary
	Conflict between outsiders and the local communities should not be excluded.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to control Influx of temporary job seekers	As far as possible, the movement of construction workers during operational hours should be confined to the work site to avoid any potential negative impact on the neighbouring property owners' daily living and movement patterns.	Contractor, Developer	As necessary
	Construction workers should be easily identified as part of the construction team by e.g. wearing specific clothing and/or identity tags.	Contractor, Developer	As necessary
	Criminal incidents should be communicated to the local SAPS.	Contractor, Developer	As necessary
	The development of informal vending "stations" where food and small goods are sold should be properly managed, to avoid littering, safety risks and possible environmental pollution	Contractor, Developer	As necessary
Social- Management Measures to control Inflow of Jobseekers	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process.	Contractor, Developer	As necessary
	The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area.	Contractor, Developer	As necessary
	The communication strategy should ensure that unrealistic employment expectations are not created.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	The establishment of a labour desk to deal with jobseekers could be investigated.	Contractor, Developer	As necessary
	No temporary workers should be employed from jobseekers gathering at the construction site.	Contractor, Developer	As necessary
	The lower skilled and medium skilled positions should be filled by permanent residents from the surrounding areas where possible. Proof of residence should be provided when applying for jobs.	Contractor, Developer	As necessary
	The applicant and contractors should ensure a fair and transparent recruiting process to limit the potential for conflict between locals in search of employment.	Contractor, Developer	As necessary
Social- Management Measures to improve on Employment Opportunities and Local Procurement	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process.	Contractor, Developer	As necessary
	The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area.	Contractor, Developer	As necessary
	The communication strategy should ensure that unrealistic employment expectations are not created.	Contractor, Developer	As necessary
	It is recommended that local individuals applying for work should submit their Curriculum Vitae (CV's) through local community structures. Some proof of residence should be attached	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	The development of skills and the creation of opportunities to obtain experience through the build-up phase are of critical importance to ensure that the medium and lower skilled positions can be filled from local individuals.	Contractor, Developer	As necessary
	If feasible undertake a skills audit of an available workforce within the closest communities) including the assistance of the local councilors and other representative community structures (e.g. the residents associations) in the process.	Contractor, Developer	As necessary
	To ensure a positive impact among locals within the medium and lower skilled categories would require some training programmes to start once the project has received a positive environmental authorisation and/or continue with on-site training for the duration of the construction phase, even if only focused on a limited number of individuals	Contractor, Developer	As necessary
	Guidance concerning legal requirements to which locals should adhere to, to make them employable, such as the standard construction industry requirements should be attended to	Contractor, Developer	As necessary
	Training of contract workers and/or community members should focus on construction related skills to equip trainees/beneficiaries with the necessary portable skills to find employment at other similar employment sectors in future.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to improve on Employment Opportunities and Local Procurement	Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process.	Contractor, Developer	As necessary
	The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area.	Contractor, Developer	As necessary
	The communication strategy should ensure that unrealistic employment expectations are not created.	Contractor, Developer	As necessary
	It is recommended that local individuals applying for work should submit their Curriculum Vitae (CV's) through local community structures. Some proof of residence should be attached	Contractor, Developer	As necessary
	The development of skills and the creation of opportunities to obtain experience through the build-up phase are of critical importance to ensure that the medium and lower skilled positions can be filled from local individuals.	Contractor, Developer	As necessary
	If feasible undertake a skills audit of an available workforce within the closest communities) including the assistance of the local councillors and other representative community structures (e.g. the residents associations) in the process.	Contractor, Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	To ensure a positive impact among locals within the medium and lower skilled categories would require some training programmes to start once the project has received a positive environmental authorisation and/or continue with on-site training for the duration of the construction phase, even if only focused on a limited number of individuals	Contractor, Developer	As necessary
	Guidance concerning legal requirements to which locals should adhere to, to make them employable, such as the standard construction industry requirements should be attended to	Contractor, Developer	As necessary
	Training of contract workers and/or community members should focus on construction related skills to equip trainees/beneficiaries with the necessary portable skills to find employment at other similar employment sectors in future.	Contractor, Developer	As necessary
Social Management	Communicate the project schedule to the neighbouring landowners to allow them to plan for anticipated negative impacts.	Contractor, ECO, Developer	As necessary
	Construction workers to abide to a code of conduct.	Contractor, ECO, Developer	Throughout construction phase
	Construction vehicles to adhere to speed limits and traffic regulations.	Contractor, ECO, Developer	Throughout construction phase
	Communicate the project schedule to the neighbouring landowners to allow them to plan for anticipated negative impacts.	Contractor, ECO, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
Social- Management Measures to control impact on sense of place	The construction site should be kept litter free	Contractor, Developer	Throughout construction phase
	Site rehabilitation on the different sections of the site should occur as soon as the construction process allows	Contractor, Developer	Throughout construction phase
	The construction site should be kept litter free	Contractor, Developer	Throughout construction phase
Social- Management Safety and security	Local labour should be employed as far as possible to limit the number of outsiders in the area.	Contractor, Developer	Throughout construction phase
	The movement of construction workers should be confined to the work site to avoid any increased safety and security risks.	Contractor, Developer	Throughout construction phase
	Before construction commences, representatives from the MMM, the ward councillors and Residents Associations, as well as neighbouring communities should be informed of the details of the construction company, size of the workforce and construction schedules.	Contractor, Developer	Throughout construction phase
	Construction workers should be easily identified as part of the construction team by e.g. wearing specific clothing and/or identity tags	Contractor, Developer	Throughout construction phase
	Operational safety risks should be addressed as part of the Occupational Health and Safety Act (1993)	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	A Fire/Emergency Management Plan should be developed and implemented. It is important that this management plan and associated communication channels are developed at the outset of the construction phase. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, representatives of the MMM and neighbouring landowners	Contractor, Developer	Throughout construction phase
	Open fires for cooking and related purposes should not be allowed on site.	Contractor, Developer	Throughout construction phase
	Appropriate fire fighting equipment should be on site and construction workers should be appropriately trained for fire fighting	Contractor, Developer	Throughout construction phase
Social- Management safety and security	The construction area should be fenced or access to the area should be controlled to avoid animals or unauthorised people entering the area without authorisation.	Contractor, Developer	Throughout construction phase
	Speed limits on the local roads should be enforced.	Contractor, Developer	Throughout construction phase
	Speeding of construction vehicles must be strictly monitored	Contractor, Developer	Throughout construction phase
Social- Management Measures to control Health Risks	Maximise the employment of locals where possible	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	First aid supplies should be available at various points at the construction site	Contractor, Developer	Throughout construction phase
	Emergency and health services should be notified of the construction schedule and peak construction periods	Contractor, Developer	Throughout construction phase
	Information distributed as part of established HIV/Aids awareness campaigns undertaken in the area by the MMM and Dept. of Health should again be focused on and communicated to the local workforce	Contractor, Developer	Throughout construction phase
	The general health of construction workers should be monitored on an on-going basis		
Social- Management Measures to control Impact on Housing	As RDP housing is proposed as part of the proposed development, it is imperative to ensure the buy in from the relevant government departments prior to the project's implementation. Government and private sector processes would therefore have to be aligned.		
	Potential home owners interested in the RDP houses and GAP housing (FLISP and Social Housing) section of the development, should be made aware of the requirements and criteria that have to be met prior to applying for these schemes		

Activity / issue	Action required	Responsible party	Frequency
Social- Management Enhancement Measures to improve on the positive Impact on Housing	A clear and transparent process would therefore have to be followed when negotiations with the potential home owners commence with regards to the future of the properties and the subsequent impact on the home owners	Contractor, Developer	Throughout construction phase
	As RDP housing is proposed as part of the proposed development, it is imperative to ensure the buy in from the relevant government departments prior to the project's implementation. Government and private sector processes would therefore have to be aligned.	Contractor, Developer	Throughout construction phase
	Potential home owners interested in the RDP houses and GAP housing (FLISP and Social Housing) section of the development, should be made aware of the requirements and criteria that have to be met prior to applying for these schemes	Contractor, Developer	Throughout construction phase
	A clear and transparent process would therefore have to be followed when negotiations with the potential home owners commence with regards to the future of the properties and the subsequent impact on the home owners	Contractor, Developer	Throughout construction phase
Social- Management **Measures to control impact on Infrastructure and**	An integrated planning process should be initiated to pro-actively determine the infrastructure requirements and service needs to enable the developer and the MMM to supply and install these associated infrastructure and services.	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
Services	Maximise the employment of locals where possible to limit any additional burden on the existing infrastructure	Contractor, Developer	Throughout construction phase
	An integrated planning process should be initiated to pro-actively determine the infrastructure requirements and service needs to enable the developer and the MMM to supply and install these associated infrastructure and services.	Contractor, Developer	Throughout construction phase
Social- Management Measures to control Intrusion Impacts ***Intrusion impacts refer to visual impacts, increased traffic volumes as well as possible noise and dust pollution***	Construction workers should be confined to the construction area as far as possible, and should be easily identified.	Contractor, Developer	Throughout construction phase
	Construction activities should keep to normal working hours e.g. 7 am until 5 pm.	Contractor, Developer	Throughout construction phase
	Noise should be kept to the minimum.	Contractor, Developer	Throughout construction phase
	The construction area should be fenced to avoid unauthorised entry by animals or children.	Contractor, Developer	Throughout construction phase
	Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, as well as to limit any risks of accidents.	Contractor, Developer	Throughout construction phase
	Construction vehicles should adhere to the speed levels.	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded.	Contractor, Developer	Throughout construction phase
	Source material and goods locally as far as possible to limit transportation of these over long distances	Contractor, Developer	Throughout construction phase
	On-site gravel roads should be sprayed with water to limit dust pollution during the construction phase	Contractor, Developer	Throughout construction phase
	Dust suppression methods should be strictly implemented if and where required	Contractor, Developer	Throughout construction phase
Socio-economic management Impact on local employment and income levels during construction	Develop a supplier base of local suppliers and ensure that the maximum percentage (if possible higher than 30%) is sourced from local suppliers	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	Develop and implement contractor management plans and include specifications for: o The use local labour as far as possible especially in the low and medium skilled categories o Up-skilling of unskilled local labour Preference to local suppliers within MMM o Preference to local suppliers within MMM	Contractor, Developer	Throughout construction phase
	Engage with the Municipal LED and Mangaung Business Chamber on a regular basis to facilitate the assistance of local SMMEs suppliers in the MMM construction industry	Contractor, Developer	Throughout construction phase
	Plan for an exit strategy for unskilled and medium skilled workers and facilitate on-going work after construction (e.g. as art of residential and other property maintenance program	Contractor, Developer	Throughout construction phase
Socio-economic management **Negative impact on other businesses during construction**	Phase the development starting with a smaller project and monitor and resolves issues related to the impact on the local market through regular interactions with a representative forum including adjacent farmers	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	During the entire construction process engage with a representative forum including adjacent farmers that meets regularly to discuss and resolve potential negative impacts or shared issues (related to the development (e.g. labour draw down, shared transport issues etc.)	Contractor, Developer	Throughout construction phase
	Phase the development starting with a smaller project and monitor and resolves issues related to the impact on the local market through regular interactions with a representative forum including adjacent farmers	Contractor, Developer	Throughout construction phase
Socio-economic management **Impact on property values**	The proposed development should be implemented in phases, in particular considering other high income residential developments in the north of Bloemfontein	Contractor, Developer	Throughout construction phase
	During the construction phase the implementation of the social management plan also forms an important measure to mitigate against disamenities (security risks and influx of people) that could negatively impact on the prices of adjacent properties during the construction phase	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
Socio Economic Management Income of low income households and income distribution in MMM during construction	***Enhancement*** Develop and implement contractor management plans and include specifications for: o The use local labour as far as possible especially in the low and medium skilled categories o Up-skilling of unskilled local labour o Preference to local suppliers within MMM	Contractor, Developer	Throughout construction phase
	Plan for an exit strategy for unskilled and medium skilled workers and facilitate on-going work after construction (e.g. as art of residential and other property maintenance program	Contractor, Developer	Throughout construction phase
Traffic Management	It is noted that the development will be constructed in 21 phase. It is therefore advised that a traffic management plan be developed for each phase of the development	Contractor, Developer	As necessary
	Vehicular movement of construction vehicles beyond the property boundaries of the site should be outside the am and pm peak hours.	Contractor, Developer	Throughout construction phase
	Where new access roads are required during the upgrade of external roads, they should disturb as limited an area as possible	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
Traffic Management	Areas demarcated as being out of bounds for construction personnel must be sign posted and must be regarded strictly as "no-go' areas. No contractor's personnel, vehicles or machinery may access these areas. Very strict control must be exercised over this aspect of construction activities	Contractor, Developer	Throughout construction phase
	Ensure that the necessary signage and traffic measures are implemented for safe and convenient use for other motorist.	Contractor, Developer	Throughout construction phase
	Traffic marshals/officers must be appointed to assist with smooth movement of motorists during construction phase.	Contractor, Developer	Throughout construction phase
	Traffic informative signs must be posted on site warning of motorist of possible closure of some lanes and to consider alternatives routes or public transport.	Contractor, Developer	Throughout construction phase
	Signage on speed limit must be displayed on site.	Contractor, Developer	Throughout construction phase
	Measures must also be put in place to ensure that these access points do not get built up with mud or sand	Contractor, Developer	Throughout construction phase
	The construction of the external road upgrades discussed in Section 6 of the Traffic Impact Report must be adhered to	Contractor, Developer	Throughout construction phase
	A road master plan is required for the study area to investigate additional link road from the south to support Road R700 and Road R30.	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
	The construction of the internal roads must be as shown on Mariteng Plan No.: 186-30-01 to 07 (Rev 0).	Contractor, Developer	Throughout construction phase
	Vehicular movement of construction vehicles beyond the property boundaries of the site should be outside the am and pm peak hours.	Contractor, Developer	Throughout construction phase
	Where new access roads are required during the upgrade of external roads, they should disturb as limited an area as possible	Contractor, Developer	Throughout construction phase
	Areas demarcated as being out of bounds for construction personnel must be sign posted and must be regarded strictly as "no-go' areas. No contractor's personnel, vehicles or machinery may access these areas. Very strict control must be exercised over this aspect of construction activities	Contractor, Developer	Throughout construction phase
	Ensure that the necessary signage and traffic measures are implemented for safe and convenient use for other motorist.	Contractor, Developer	Throughout construction phase
	Traffic marshals/officers must be appointed to assist with smooth movement of motorists during construction phase.	Contractor, Developer	Throughout construction phase
	Traffic informative signs must be posted on site warning of motorist of possible closure of some lanes and to consider alternatives routes or public transport.	Contractor, Developer	Throughout construction phase
	Signage on speed limit must be displayed on site.	Contractor, Developer	Throughout construction phase

Activity / issue	Action required	Responsible party	Frequency
Traffic Management	Measures must also be put in place to ensure that these access points do not get built up with mud or sand	Contractor, Developer	Throughout construction phase
	The construction of the external road upgrades discussed in Section 6 of the Traffic Impact Report the latent rights, as well as the development to contribute proportional to the upgrades.	Contractor, Developer	Throughout construction phase
	A road master plan is required for the study area to investigate additional link road from the south to support Road R700 and Road R30.	Contractor, Developer	Throughout construction phase
	The construction of the internal roads must be as shown on Mariteng Plan No.: 186-30-01 to 07 (Rev 0	Contractor, Developer	Throughout construction phase
Loss of wetland habitat	No water should be abstracted from any river / wetland	Contractor, ECO, SHE	As necessary
	Management of on-site water use and prevent storm water or contaminated water directly entering the watercourse	Contractor, ECO, SHE	As necessary
	Where possible, use manual labour and avoid heavy machinery	Contractor, ECO, SHE	As necessary
	Rehabilitation within wetlands and buffers must be planned to take place in the drier winter months	Contractor, ECO, SHE	As necessary
	Plan activities to have the smallest possible footprint	Contractor, ECO, SHE	As necessary

Activity / issue	Action required	Responsible party	Frequency
Prevention of pollution on wetland	If concrete batching will be required on site. 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	Contractor, SEE ECO	Once off
Prevention of pollution on wetland	Cement should only be mixed within mixing trays.	Contractor, ECO, SHE	As necessary
	Washing and cleaning of equipment should also be done within a bermed area (outside of the wetland buffer), in order to trap any cement, asphalt or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase	Contractor, SHE, ECO	As necessary
	The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses.	Contractor, SHE, ECO	As necessary
	Where access cannot be avoided into sensitive areas (wetland), the amount of vehicle and personnel traffic should be kept to a minimum and should make use of only one route	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	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	Contractor, SHE, ECO	Continuous
	Storage of materials as described above may not be within the 1:100 flood line, watercourses or associated buffer areas	Contractor, SHE, ECO	Continuous
	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	Contractor, SHE	As necessary
	Hydrocarbon spillages and dirty water from site must not be allowed to flow into the watercourse.	Contractor, SHE, ECO	Continuous
	All equipment should fuelled at least 30 meters from the wetland	Contractor, SHE	As necessary
	Drip trays (minimum of 10cm deep) must be placed under all leaking vehicles. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised	Contractor, SHE, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	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	Contractor, SHE, ECO	Continuous
	Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone	Contractor, SHE, ECO	Continuous
	Remove all construction equipment and material on completion of construction	Contractor, SHE	Once off
Prevention of Changes in wetland water flow regime	Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP.	Contractor, SHE, ECO	As necessary
	An environmentally friendly stormwater design should be formulated based on empirical data showing how a neutral effect on the regional hydrograph will be achieved.	Contractor, SHE, ECO	As necessary
	High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively	Contractor, SHE, ECO	As necessary
	Implement the principles set out in The South African Guidelines for Sustainable Drainage Systems (SuDS) (Armitage et al, 2013)	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Monitoring for local and downstream impacts during the construction as well as operational phases are imperative and should form part of the EMP	Contractor, SHE, ECO	As necessary
Prevention of wetland Sedimentation	Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.	Contractor, SHE, ECO	As necessary
	Water may seep into trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water thus reducing the risk of erosion. Effective sediment traps should be installed.	Contractor, SHE, ECO	As necessary
	Construction in and around watercourses must be restricted to the dryer winter months where possible.	Contractor, SHE, ECO	As necessary
	Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).	Contractor, SHE, ECO	As necessary
	Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.	Contractor, SHE, ECO	As necessary
	Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
Prevention of alien plants spread in the wetland	Implement an Alien Plant Control Plan	Contractor, SHE, ECO	As necessary
	Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.	Contractor, SHE, ECO	As necessary
	Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.	Contractor, SHE, ECO	As necessary
	Rehabilitate or revegetate disturbed areas	Contractor, SHE, ECO	As necessary
Loss and disturbance of watercourse habitat and fringe vegetation	Where construction occurs in the demarcated watercourse and buffer, extra precautions should be implemented to so as to minimise habitat loss.	Contractor, SHE, ECO	As necessary
	Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or associated buffer zones.	Contractor, SHE, ECO	As necessary
	Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas	Contractor, SHE, ECO	As necessary
	Weed control in buffer zone	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.	Contractor, SHE, ECO	As necessary
	Operational activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas	Contractor, SHE, ECO	As necessary
	Operational activities should not impact on rehabilitated or naturally vegetated areas	Contractor, SHE, ECO	As necessary
	Operational activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas	Contractor, SHE, ECO	As necessary
	Operational activities should not impact on rehabilitated or naturally vegetated areas	Contractor, SHE, ECO	As necessary
Changes in wetland water quality due to pollution	Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone.	Contractor, SHE, ECO	As necessary
	Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.	Contractor, SHE, ECO	As necessary
	The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	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, SHE, ECO	As necessary
	Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.	Contractor, SHE, ECO	As necessary
	Maintenance of buffer zones to trap sediments with associated toxins	Contractor, SHE, ECO	As necessary
	Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects.	Contractor, SHE, ECO	As necessary
	Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse	Contractor, SHE, ECO	As necessary
	Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects, failure of infrastructure such as sewage pipes. Implement litter traps at all watercourse crossings	Contractor, SHE, ECO	As necessary
	Treatment of pollution identified should be prioritized accordingly.		
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 , SHE,	Continuous

Activity / issue	Action required	Responsible party	Frequency
Management and handling of hazardous materials	Materials storage areas will not be allowed in close proximity to ecologically sensitive areas (wetland on site)	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
	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 & Sanitation (DWS) 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
	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

Activity / issue	Action required	Responsible party	Frequency
	All fuel stored on Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. Drip trays are to be inspected on a weekly basis for leaks and effectiveness, and emptied. This is to be closely monitored during rain events to prevent overflow.	Contractor, SHE, ECO	As necessary
	Spill kits must be available on site for the clean-up of any hydrocarbon spillages	Contractor, SHE, ECO	As necessary
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers.	Contractor, SHE, ECO	As necessary
	Safety Data Sheets (SDSs) must always be readily available on site for all chemicals and hazardous substances to be used on site.	Contractor, SHE, ECO	As necessary
	An appropriate storm water management system must be included in the final site layout. The design must ensure that all runoff from the forecourt is directed into the storm water management system, which must include an oil/water separator.	Contractor, SHE, ECO	As necessary
	No storm water runoff may be concentrated onto adjacent properties	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	All fuel stored on Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. Drip trays are to be inspected on a weekly basis for leaks and effectiveness, and emptied. This is to be closely monitored during rain events to prevent overflow.	Contractor, SHE, ECO	As necessary
	Spill kits must be available on site for the cleanup of any hydrocarbon spillages.	Contractor, SHE, ECO	As necessary
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers.	Contractor, SHE, ECO	As necessary
	The mixing of cement must not be undertaken directly on bare soils, hard durable plastic, wheelbarrows or metal containers can be used	Contractor, SHE, ECO	As necessary
Storm water runoff and erosion control	A detailed storm water management plan for the site (including storm water management to be implemented temporarily during construction phase and permanent measures to be installed for the operation phase) must be approved by the Local Municipality	Contractor, SHE, ECO	Continuous
	A storm water management and erosion control plan, as well as a rehabilitation plan should be implemented.	Contractor, SHE, ECO	Continuous
	Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the ECO	Contractor, SHE, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken	Contractor, SHE, ECO	Continuous
	Silt trenches between the works area and downstream wetland could be used to trap any sediment washing off the works area and to prevent scouring of the stream line in case of heavy flows. This will provide protection for the downstream section of the wetland	Contractor, SHE, ECO	Continuous
	Where wetlands are adjacent to the construction areas and these areas slopes toward the wetland, install sediment barriers along the edge of the construction areas as necessary to prevent sediment flow into the wetland, including the section of the road extension that runs parallel to the wetland	Contractor, SHE, ECO	Continuous
	Sediment barriers must be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or restoration of adjacent upland areas is complete	Contractor, SHE, ECO	Continuous
	It is important that topsoil should be conserved in areas where bedrock is shallow to avoid sedimentation.	Contractor, SHE, ECO	Continuous
	No topsoil or subsoil should be stockpiled next to the watercourse.	Contractor, SHE, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Should water need to be pumped around the works area and discharged back into the wetland, care must be taken to ensure that the water is discharged in a manner that does not cause siltation or erosion downstream. As such it is recommended that any water to be discharged from pumping around the construction area or from dewatering operations be first discharged into a structure that allows the settlement of all suspended material, and which allows the diffuse discharge of water	Contractor, SHE, ECO	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	SHE, Contractor	Continuous
	Only above ground temporary storage tanks will be allowed on site	SHE, Contractor	Continuous
	Contaminated or potentially contaminated water should not be discharged into the watercourse on site	SHE, Contractor	Continuous
Lighting	Working hours shall generally be restricted to daylight hours	SHE, 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.	SHE, Contractor	Continuous
	Security lights shall be directed from the perimeter wall towards the centre of the camp with a down angle	SHE, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
Waste management	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	SHE, Contractor	Weekly
	All building rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	SHE, 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.	SHE, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily
	No waste may be dumped into the wetland on site	SHE, Contractor, ECO	As necessary
	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	SHE, Contractor	Monitor daily - weekly
Waste management	Waste from ablution facilities must be regularly removed and care must be taken to ensure that there is no spillage.	SHE, Contractor	Monitor daily - weekly
	Ensure that the waste is removed by a suitably qualified waste service provider	SHE, Contractor, ECO	As necessary
	It is recommended that reputable waste transport companies and permitted waste disposal facilities are used.	SHE, Contractor, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	All waste service providers must have valid safe disposal certificates and must be kept on-site	SHE, Contractor	Once off, as necessary
	Waste storage receptacles must be covered or lidded to prevent scavenging by wild animals, and to prevent waste from being windblown into the adjacent sensitive areas or residential areas.	SHE, Contractor, ECO	As necessary
	Do not mix general and hazardous waste. Ensure that general and hazardous waste are put in separate holding waste receptacles/bins.	SHE, Contractor, ECO	Continuous
Management of Air Pollution (Noise, Dust & Vehicular Emissions)	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, SHE	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, SHE	As necessary
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches as these are prone to wind erosion.	SHE, Contractor	As necessary
	Working hours should be kept between daylight hours during the construction phase, and/or as any deviation that is approved by the relevant authorities.	ECO, SHE	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	The contractor must ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas.	ECO, SHE, Contractor	As necessary
	A comprehensive employee induction programme covering air quality must be included in the induction programme. This must be addressed in the construction EMPr as the best practice.	ECO, SHE, Contractor	As necessary
	A continuous dust monitoring process needs to be undertaken during construction.	ECO, SHE, Contractor	As necessary
	Speed restriction of 40km/h must be implemented for all construction vehicles.	ECO, SHE, Contractor	As necessary
	All vehicles transporting friable materials such a sand, rubble etc. must be covered by a tarpaulin or wet down.	ECO, SHE, Contractor	As necessary
	No burning of refuse or vegetation is permitted on site.	ECO, SHE, Contractor	As necessary
	Ensure no blown litter to other neighbouring farmlands	ECO, SHE, Contractor	As necessary
	An appropriate dust suppressant must be applied on all exposed areas as required to minimise/control airborne dust.	ECO, SHE, Contractor	As necessary
	Construction vehicles must be in good working order. Smoking vehicles should be taken for maintenance	ECO, SHE, Contractor	As necessary
	Dust masks must be provided to the construction crew	ECO, SHE, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Provide Personal Protective Equipment (PPE) such as dust masks for workers when required	ECO, SHE, Contractor	As necessary
	Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only.	ECO, SHE, Contractor	Throughout construction
	If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.	ECO, SHE, Contractor	Throughout construction
	No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.	ECO, SHE, Contractor	Throughout construction
	Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc.) must be used as per operating instructions and maintained properly during site operations.	ECO, SHE, Contractor	Throughout construction
	Provide Personal Protective Equipment (PPE) such as ear plugs for workers when required	ECO, SHE, Contractor	Throughout construction
	Ensure construction noise does not exceed 85 decibels in accordance to the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	ECO, SHE, Contractor	Throughout construction
	Ensure all construction machinery and vehicles are in good working order, no vehicles that will release black smoke to the environment should be allowed on site.	ECO, SHE, Contractor	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	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, SHE, Contractor	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	ECO, SHE, Contractor	Throughout construction
	Unnecessary horning of construction vehicles should not be allowed on site.	ECO, SHE, Contractor	Throughout construction
	Introduce a formal recording system/grievance mechanism to capture public perceptions and complaints with regard to noise impact.	ECO, SHE, Contractor	Throughout construction
Safety, health and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Continuous
	Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced.	SHE, Contractor	Continuous
	Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater.	SHE, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The Contractor shall supply all site offices, workshop areas, material stores and any other areas identified with suitable, tested and approved fire-fighting equipment.	SHE, Contractor	Throughout construction
	All equipment shall be maintained in good operating condition.	SHE, Contractor	Throughout construction
	Contractor to provide fire-fighting training to selected construction staff.	SHE, Contractor	As necessary
	Provide the construction workers with construction uniforms for easy identification and for keeping an authorised person away from site	Contractor	Throughout construction
	Ensure that only suitably qualified personnel use construction vehicles	Contractors	Throughout construction
	Ensure that the contact details of the police or security company and ambulance services are available on site	Contractor	Throughout construction
	Limit access to the construction crew camp to construction workers through access control.	SHE, Contractor	Throughout construction
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	SHE, Contractor	Throughout construction
	Ensure that the handling of equipment and materials is supervised and adequately instructed.	SHE, Contractor	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 40 km/hr.	SHE, Contractor	Throughout construction
Safety, health and security	Provide induction training to new employees on site and old employees to be provided with refresher training via regular toolbox talks (health safety and environmental related issues e.g. housekeeping etc.)	SHE, Contractor, ECO	As necessary
	Employees must be provided with personal protective equipment.	SHE, Contractor	Continuous
	A risk assessment must be undertaken for any activity that may pose risk to workers	SHE, Contractor	As necessary
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	SHE, Contractor	As necessary
	The security fence around the Development site must be completed before construction commences internally.	SHE, Contractor	Once-off
	Security fence is to be inspected daily to ensure no illegal entry points are created.	SHE, 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, SHE	Throughout construction

Activity / issue	Action required	Responsible party	Frequency
	Equipment and materials must be handled by staff that have been supervised and adequately trained.	Contractor, SHE	Continuous
	Staff must be regularly updated about the safety procedures.	Contractor, SHE	Continuous
	Emergency facilities must be available and adequately supplied for use by staff and customers.	Contractor, SHE	Continuous
	Ensure that the handling of equipment's and materials is supervised and adequately instructed.	Contractor, SHE	Continuous
	Limit access to the construction crew camp only to the workforce.	Contractor, SHE	Continuous
	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, SHE	Once-off, monitor daily
	Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles	Contractor, SHE	Once-off, or as necessary
Safety, health and security	All new labourers recruited from the community must undergo relevant training to reduce hazards that may arise from job responsibilities and improve on job skills.	Contractor, SHE	Once-off, or as necessary
	Ensure that chemical mobile toilets are maintained in a sanitary and operational state.	SHE, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
Loss of natural vegetation in sensitive areas (all undisturbed wetland communities as well as rocky grassland)	The working strip must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.	SHE, Contractor	Continuous
	The moist grasslands are sensitive, the work area (e.g. area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.	SHE, Contractor	Continuous
	A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the Development) to prevent access to sensitive environs.	SHE, Contractor	As necessary
	Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and moist grassland).	SHE, Contractor	As necessary
	No open fires are permitted	SHE, Contractor	Once off, as necessary
	Formalise access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas.	SHE, Contractor	Immediately after construction

Activity / issue	Action required	Responsible party	Frequency
	A vegetation rehabilitation plan should already be implemented during construction and include the following: ▪ Moist grasslands could also be removed as sods, but should be watered while stored until such time that it could be used for rehabilitation. ▪ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian access until such time that monitoring confirms that rehabilitation was successful (minimum of 2 years). ▪ Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. ▪ No activities should take place during rainy events and at least 2 days afterwards. ▪ Maintain site demarcations in position until the cessation of construction work.	SHE, Contractor	Once off, as necessary
Protection of threatened plants or plants of conservation	Ensure that a walk through, to identify red or orange listed species, is conducted prior to the initiation of any rehabilitation efforts.	Contractor, SHE, ECO	Once off
	Apply for a permit to remove any red or orange listed plants when losses of these plants are unavoidable.	Contractor, SHE, ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
concern	Ensure that the appropriate plant rescue techniques are used if the permit to remove them is granted.	Contractor, SHE, ECO	As necessary
Protection of threatened plants or plants of conservation	Ensure that all construction personnel are briefed on the potential occurrence of protected flora species, what they look like, and where they are likely to be found. Personnel are to be instructed that these species are not to be destroyed if encountered.	Contractor, SHE, ECO	As necessary
	Personnel must be instructed to report the presence of protected species to the contractor or ECO. The ECO will make provisions to relocate identified flora species at the site	Contractor, SHE, ECO	As necessary
Soil erosion & subsequent sedimentation of proximate moist grassland	Do not allow erosion to devSHEp on a large scale before taking action.	Contractor, SHE, ECO	As necessary
	Where possible, no construction / activities should be undertaken within the moist grasslands without that a Water Use License being granted by the Department of Water and Sanitation (DWS) for these activities.	Contractor, SHE, ECO	As necessary
	Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.	Contractor, SHE, ECO	As necessary
	Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed	Contractor, SHE, ECO	As necessary
	Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study site	Contractor, SHE, ECO	As necessary
	Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	Contractor, SHE, ECO	As necessary
Management of Alien plant species	Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the Development footprint and immediate surrounds, prior to construction or soil disturbances.	Contractor, SHE, ECO	As necessary
	Manual / mechanical removal is preferred to chemical control	Contractor, SHE, ECO	As necessary
	All alien seedlings and saplings must be removed as they become evident for the duration of construction.	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	Contractor, SHE, ECO	As necessary
Soil compaction and subsequent impacts on the seed bank	Vehicles and machinery may not veer from the dedicated roads.	Contractor, SHE, ECO	As necessary
	Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.	Contractor, SHE, ECO	As necessary
	Environmental audits are to be undertaken by an independent party during this construction period, especially in sensitive areas.	Contractor, SHE, ECO	As necessary
Excavation	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation	Contractor, SHE, ECO	As necessary
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	SHE, ECO, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	SHE, 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
Management of Topsoil	Topsoil (top 300mm as a minimum) must be temporarily stockpiled separately from subsoil or rocky material (the topsoil contains both the seedbed and nutrient supply necessary for plant growth - if mixed with subsoil layers the usefulness of the topsoil for rehabilitation will be lost) Topsoil shall be stripped from all areas to be utilized during construction period and where permanent structures and access is required. ▪ These areas will include all temporary and permanent access roads, and construction camps (if required)	SHE, Contractor	As necessary
	If construction occurs in summer, the areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.	SHE, ECO, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	If topsoil is to be stockpiled for extended periods, especially during the wet season, then the ECO may recommend one of the following measures: ▪ The covering of the stockpiles with a protective material such as hessian mats. ▪ Seeded with a temporary grass to keep the microbial activity within the soil alive.	SHE, ECO, Contractor	As necessary
	Topsoil shall be stripped after clearing of woody vegetation and before excavation or construction commences.	SHE, ECO, Contractor	As necessary
	Position topsoil stockpiles away from the watercourse and drainage lines	SHE, Contactor	As necessary
	Topsoil must be reinstated after construction. The stockpiled topsoil must be replaced as the final soil layer.	SHE, Contactor	As necessary
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area	SHE, Contractor	As necessary
	Remove spoil material from the area once the trench has been filled	Contractor	As necessary
	The construction site must be kept in a clean and orderly state at all times.	SHE, Contractor	Continuous
	No waste may be dumped into the wetland on site	SHE, Contractor	Continuous

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.	SHE, Contractor	Continuous
	Ensure appropriate housekeeping on site.	SHE, Contractor	Continuous
	Rehabilitate disturbed ground in the working area by seeding and spreading of vegetation that has been removed from the trench at the start of construction.	SHE, Contractor	Continuous
Aesthetic / visual	Should overnight work be authorised, the contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighbouring residents. In this situation low flux and frequency lighting shall be utilized.	SHE, Contractor	Continuous
	Down-size the entire development in order to reduce the scale and duration of the construction phase and the footprint.	SHE, Contractor	Continuous
	Reduce the heights of the buildings to max 4 storeys as this is considered the maximum height of a medium to large size tree that can be planted to effectively increase the screening capacity of the site.	SHE, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Identify a construction camp site for equipment storage, material stockpiling and site offices, which is screened from public view in order to avoid additional visual impacts in another location. An ideal location is identified near the small hill in the southern corner of the site where existing surface disturbances are already present.	SHE, Contractor	Continuous
	Increase the screening capacity by erecting a solid fence that is neat and of sufficient height to block external views.	SHE, Contractor	Continuous
	Keep the construction site neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.	SHE, Contractor	Continuous
	Implement dust suppression methods during the construction process.	SHE, Contractor	Continuous
	Screen construction activities where possible. Temporary screening can be provided via a temporary shade cloth or corrugated iron fence to limit visual exposure of surrounding observers	SHE, Contractor	Continuous
Erosion and Sedimentation	Cause of sedimentation should be identified and dealt with appropriately	Contractor, SHE	Continuous
	No stockpiles or construction materials may be stored or placed in close proximity to the wetland/ drainage lines	Contractor, SHE, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Erosion control of all banks must take place so as to reduce erosion and sedimentation into river channels or wetland areas.	Contractor, SHE	Continuous
	Where any hard structures (concrete, road bridge) are used, it should be well keyed into the surrounding bank walls and secured to the ground.	Contractor, SHE	Once off
	Construction should preferably commence during the dry months.	Contractor, SHE	Duration of construction
	Should sedimentation be observed to accumulate and smother vegetation, a wetland specialist should be consulted to find a suitable solution for the specific wetland and its plant species composition.	Contractor, SHE	Continuous
	The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed.	Contractor	During and immediately after Any construction
	Sediment barriers should be installed immediately after initial disturbance of the watercourse or adjacent upland	Contractor	Duration of construction
	Disturbances on site should be kept to a minimum to reduce the loss of material by erosion	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
Erosion and Sedimentation	Sediment barriers should be installed immediately after initial disturbance of the watercourse or adjacent upland	Contractor, SHE	Continuous
Protection of aquatic biota	No fires should be allowed in natural veld – demarcated areas for cooking should be allowed for workers in construction camp.	Contractor, SHE	Duration of construction
	The amount of vegetation removed should be limited.	Contractor, SHE	Duration of construction
	Avoid unnecessary river crossing - limit work within the stream, river or wetland.	Contractor, SHE	Duration of construction
	Other than approved and authorized structure, no other Development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones.	Contractor, SHE	Duration of construction
	Demarcate the wetlands and riparian areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas.	Contractor, SHE	Duration of construction
	Linear Developments (e.g. Roads) should span the watercourse.	Contractor, SHE	Duration of construction
	Weed control in buffer zone.	Contractor, SHE	Duration of construction

Activity / issue	Action required	Responsible party	Frequency
	Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.	Contractor, SHE	Duration of construction
	Conduct bi-annual bio monitoring to measure the impact of the rehabilitation efforts on the aquatic biota.	Developer	As specified
Protection of Herpetofauna Species (reptiles & amphibians)	DevSHEp a procedure for dealing with amphibians /reptiles encountered at the site, including dangerous reptiles' e.g. snakes. Where necessary, call in professionals (such as SPCA) to remove the reptiles.	Contractor, SHE	Duration of construction
	Ensure that all personnel are aware of what the procedures for dealing with reptiles. It is the contractor's responsibility to ensure that proper procedures are followed.	Contractor, SHE	Duration of construction
	Remedial works should be limited within the construction site. Avoid unnecessary encroachment on unplanned area.	Contractor, SHE	Duration of construction
Completion of Construction	The ECO must ensure that all construction equipment and all foreign material are removed on completion of construction	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	After construction of the Development, should erosion occur, Indigenous hydrophytes (e.g. reeds) should be established on the banks of the wetland as this could help stabilise the banks and limit sedimentation.	Developer	As necessary
	After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.	Contractor, SHE	As necessary during rehabilitation and construction
	On completion of construction activities, monitoring should be done in order to record compliance with the targets set out in the EMPr and to highlight any areas where further action are required in terms of rehabilitation or routine monitoring	ECO	Once off

OPERATION PHASE:
ENVIRONMENTAL MANAGEMENT PROGRAMME

(Please note that this development will be constructed in 21 phases over a period of 10 years and construction & operation activities will overlap each other)

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

Activity / issue	Action required	Responsible party	Frequency
Social Management **Measures to control population change**	A phased approach in terms of the development should be followed as this could spread population change impacts over a couple of years	Developer	As necessary
	A phased approach could allow associated infrastructure and services to be implemented to accommodate the additional population	Developer	As necessary
	Pro-active planning with regards to infrastructure and service needs by the MMM is imperative	Developer	As necessary
	Implementation and/or upgrading of the necessary infrastructure and services e.g. roads, water supply and waste facilities are required.	Developer	As necessary
Social Management Enhancement measures to improve on Employment Opportunities and Local Procurement.	***Enhancement:***		
	The Local Economic Development Plan (LED) of the MMM should take note and address the issue of local employment creation with the assistance of the local economic sectors.	Developer	As necessary
	The increased population should thus be incorporated into the larger economic systems to ensure local economic prosperity and resilience	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Social Management Measures to control Impact on Property Values	Establish a local material supply chain linked to ongoing services in maintenance work such as plumbing, electrical work, woodwork and light manufacturing	Developer	As necessary
	Infrastructure and services as part of the proposed Wildealskloof Mixed Use Development should be properly maintained.	Developer	As necessary
	The road infrastructure should be maintained and in roads within the study area should be upgraded when required (e.g. tarring, resurfacing or widening where traffic volumes and road design warrant such upgrades).	Developer	As necessary during maintenance
	An increase in the population density could result in the increase in criminal activities. Pro-active measures by the community and local policing structures as well as the SAPS should be implemented to combat and prevent heightened criminal activities.	Developer	Throughout operation
	Public open spaces forming part of the development should be kept crime free	Developer	Throughout operation
	Public open spaces should be maintained to ensure no littering, and to ensure continued safe and environmentally sound areas.	Developer	Throughout operation
Social Management Measures to control the Introduction of new social classes	An ongoing communication channel between the developer, MMM, local landowners and local representatives should be established.	Developer	As necessary
	Situations where social barriers or distrust could be created between the residents should be avoided.	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	The development should provide affordable high density residential components that would not have the characteristics of a low income development. This could assist in breaking down barriers between different social classes.	Developer	As necessary
	Safety and security issues should be addressed and pro-active measures should be implemented to limit any criminal activities	Developer	As necessary
	The development of the Wildealskloof development should be phased to ensure a sound development and acceptable implementation of infrastructure to ensure that dissatisfaction with regards to infrastructure does not create social conflict	Developer	As necessary
	An ongoing communication channel between the developer, MMM, local landowners and local representatives should be established.	Developer	As necessary
Social Management Education Facilities	The Crèche and other educational facilities planned as part of the development must be designed in such a manner as to provide safe and convenient access, appropriate lighting and other safety features to ensure the safety of the school going children.	Developer	As necessary
	The planned educational facilities should thus be made accessible to all residents and should be designed as such to cater for all the learners in the area and for future learners.	Developer	As necessary
	The schools should be accessible to learners from poor backgrounds.	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	The developer, MMM and Department of Education should cooperate in developing a school development	Developer	As necessary
Social Management Health Facilities	The planned health care facilities should be phased to accommodate the needs of the development's growing population and rate of occupancy	Developer	As necessary
	The planned facilities accommodate the different needs of the residents of the Wildealskloof Development	Developer	As necessary
Social Management Safety and Security	The MMM and local police service must assist in creating a safe city through community development, the protection of vulnerable groups, improvements to by-law compliance and enforcement, and responding to emergency and disaster situations.	Developer	As necessary
	The Wildealskloof Development should ensure that the sport and recreational areas provide a safe and inclusive environment for women and girls, and provide men and women with equal access to resources and activities of their preference	Developer	As necessary
	Lighting as security measure at night should be implemented as part of the development	Developer	As necessary
	Sub-letting as part of this development should not be allowed to ensure that the quality of life of the residents in the area remain high.	Developer	As necessary
	The local policing services should sufficiently respond to any criminal activities	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Public spaces and religious areas/churches should be designed to ensure safe and well maintained public places. Consideration	Developer	As necessary
Social Management Infrastructure and Services	A pro-active integrated planning approach to spatial planning and the development of infrastructure and services are urgently required.	Developer	As necessary
	The development of the Wildealskloof development should be phased to ensure a sound development and acceptable implementation of infrastructure	Developer	As necessary
	Future management of infrastructure and the provision of services to the residents should be effective and continuous.	Developer	As necessary
	The developers and MMM should provide a high level of certainty to landowners with regard to the status and future of their agricultural type of properties.	Developer	As necessary
	The improved municipal income generated by the proposed project should be used to ensure enhanced service delivery and infrastructure developments in the area. This would thus add to ensuring that the broader community also experience the benefits created by the proposed development.	Developer	As necessary
	It should be ensured that a sufficient and effective transport system is put in place (taxi routes, subsidized bus routes (including bus and taxi stop shelters and pedestrian walkways)	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Recycling of waste by the community is another option that could be investigated to minimize the volumes of waste generated. This could further assist in indirect employment opportunities for the local residents	Developer	As necessary
	Local procurement of suppliers and contractors for the housing process and transport system should be promoted	Developer	As necessary
Economic Management **local employment and income levels during operations**	Where possible, attract new greenfield commercial investments to the development	Developer	As necessary
	Assist the Mangaung Business Chamber and LED office in marketing MMM within the broader region as retail and investment destination	Developer	As necessary
	Establish a local material supply chain linked to ongoing services in maintenance work such as plumbing, electrical work, woodwork and light manufacturing on the estate	Developer	As necessary
	Where possible, attract new greenfield commercial investments to the development	Developer	As necessary
	Assist the Mangaung Business Chamber and LED office in marketing MMM within the broader region as retail and investment destination	Developer	As necessary
Economic Management	Where possible, attract new greenfield commercial investments to the development		

Activity / issue	Action required	Responsible party	Frequency
Economic Management Impact on other business	Assist the Mangaung Business Chamber and LED office in marketing MMM within the broader region as retail and investment destination	Developer	As necessary
Economic Management Infrastructure and Services (Transport, Energy and Water)	As per the social management plan with specific emphasis on the facilitation of an effective public transport system in the area (refer to economic specialist report for the social management plan)	Developer	As necessary
Pollution of the wetland	During maintenance, activities should be limited to the areas where maintenance has to be undertaken.	Developer, Contractor	Maintenance
	In the event that maintenance must be carried out, all equipment should be parked overnight and/or fuelled at least 30 meters from the wetland	Developer, Contractor	As necessary
	Storage of maintenance materials / chemicals may not be within the 30m of wetland or associated buffer areas	Developer, Contractor	As necessary
	The Developer must ensure that all maintenance equipment and material are removed on completion of maintenance	Developer, Contractor	As necessary
	Removal of vegetation during maintenance should be limited to the area of operation only.	Developer, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
Establishment of Alien Plant species	If establishment of alien invasive plant species in rehabilitated areas or in watercourses occurs. The following must be undertaken: ▪ Remove emergent invasive vegetation from the servitudes as o well as rehabilitated footprint as soon as it becomes apparent ▪ Manual labour is preferred above chemical or manual removal. ▪ Do not use herbicides or pesticides in or within 200 meters of o wetland areas	Developer, Contractor	Maintenance
Loss of natural vegetation in sensitive areas (all undisturbed wetland communities as well as rocky grassland)	The working strip must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.	Developer, Contractor	Continuous
	The moist grasslands are sensitive, the work area (e.g. area to be disturbed) in the moist grassland must be kept to a minimum and therefore manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the remnant rocky grasslands and moist grasslands.	Developer, Contractor	Continuous
	A temporary fence or demarcation must be erected around the maintenance area (include the servitude, construction camps, areas where material is stored and the actual footprint of the Development) to prevent access to sensitive environs.	Developer, Contractor	As necessary during maintenance

Activity / issue	Action required	Responsible party	Frequency
	Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area (specific to the rocky grassland and moist grassland).	Developer, Contractor	As necessary
	No open fires are permitted	Developer, Contractor	Once off, as necessary
	Formalise access roads and where possible, make use the existing road through the moist grassland, rather than creating new routes through naturally vegetated areas.	Developer, Contractor	Immediately after maintenance

Activity / issue	Action required	Responsible party	Frequency
	A vegetation rehabilitation plan should already be implemented during construction and include the following: ▪ Moist grasslands could also be removed as sods, but should be watered while stored until such time that it could be used for rehabilitation. ▪ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian access until such time that monitoring confirms that rehabilitation was successful (minimum of 2 years). ▪ Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. ▪ No activities should take place during rainy events and at least 2 days afterwards. ▪ Maintain site demarcations in position until the cessation of construction work.	SHE, Contractor	Once off, as necessary
Protection of threatened plants or plants of conservation concern	Ensure that a walk through, to identify red or orange listed species, is conducted prior to the initiation of any rehabilitation/mainetance efforts.	Developer	Once off, as necessary
	Apply for a permit to remove any red or orange listed plants when losses of these plants are unavoidable.	Contractor, SHE, ECO	Once off, as necessary

Activity / issue	Action required	Responsible party	Frequency
	Ensure that the appropriate plant rescue techniques are used if the permit to remove them is granted.	Contractor, SHE, ECO	As necessary
	Ensure that all construction personnel are briefed on the potential occurrence of protected flora species, what they look like, and where they are likely to be found. Personnel are to be instructed that these species are not to be destroyed if encountered.	Contractor, SHE, ECO	As necessary
Prevention of Soil Erosion & subsequent sedimentation of proximate moist grassland	Do not allow erosion to devSHEp on a large scale before taking action.	Contractor, SHE, ECO	As necessary
	Where possible, no construction / activities should be undertaken within the moist grasslands without that a Water Use License being granted by the Department of Water and Sanitation (DWS) for these activities.	Contractor, SHE, ECO	As necessary
	Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.	Contractor, SHE, ECO	As necessary
	Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.	Contractor, SHE, ECO	As necessary
	Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed	Contractor, SHE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study site	Contractor, SHE,	As necessary
	Protect all areas susceptible to erosion (especially the sloped rocky grassland) and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	Contractor, SHE	As necessary
Management of Alien plant species	Alien invasive species, in particular category 1 species that were identified within the study site should be removed from the Development footprint and immediate surrounds, prior to construction or soil disturbances.	Contractor, SHE	As necessary
	Manual / mechanical removal is preferred to chemical control	Contractor, SHE	As necessary
	All alien seedlings and saplings must be removed as they become evident for the duration of construction.	Contractor, SHE	As necessary
	All maintenance vehicles and equipment, as well as maintenance material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to site. This should be verified by the ECO.	Contractor, SHE	As necessary

Activity / issue	Action required	Responsible party	Frequency
Prevention of Soil compaction and subsequent impacts on the seed bank	Vehicles and machinery may not veer from the dedicated roads.	Contractor, SHE, ECO	As necessary
	Once maintenance is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.	Contractor, SHE, ECO	As necessary

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

Activity / issue	Action required	Responsible party	Frequency
Rehabilitation	Rehabilitate all eroded surface as soon as possible. Do not allow erosion to devSHEp on a large scale before effecting the remedial works.	Developer	As necessary
Prevention of Alien Plant species	If establishment of alien invasive plant species in rehabilitated areas or in watercourses occurs. The following must be undertaken: ▪ Remove emergent invasive vegetation from the from areas where they have established as o well as rehabilitated footprint as soon as it becomes apparent ▪ Manual labour is preferred above chemical or biological control ▪ Do not use herbicides or pesticides in or within 200 meters of o wetland areas	Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
	▪ Maintenance 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 the work area should be removed prior to maintenance. This will prevent seed spreading into disturbed soils	Contractor, SHE	As necessary
	All rehabilitated areas must be monitored for the presence of alien plant species. ▪ Should the presence of exotic/alien plant species be observed it should be removed appropriately	Contractor, SHE	As necessary
Mobilisation of pollutants	In case of emergencies or unforeseen events, problem must be remediated immediately and any spillage into any watercourses be reported to the Department of Water and Sanitation. In addition, the soil must be stabilised (import additional topsoil if necessary) and re-vegetated as soon as possible. Re-vegetation should include seeds from the adjacent grassland and any rescued protected plants and/or plants of conservation concern that might have been impacted upon by the emergency / unforeseen event	Contractor, SHE	As necessary
	Remove all project-related material used to support equipment on completion of construction	Contractor, SHE	Once off
	Any contaminated soil from the onsite needs to be removed and properly disposed off	Contractor, SHE,ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Storage of materials as described above may not be within the 1:100 flood line, watercourses or associated buffer areas	Contractor, SHE, ECO	Continuous
	In the case of significant pollution of the watercourse, the Regional Representative of the Department of Water Affairs (DWS) must be informed immediately	Contractor, SHE, ECO	As necessary
	Drip trays (minimum of 10cm deep) must be placed under all leaking vehicles and machinery that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised.	Contractor, SHE, ECO	Continuous
	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	Contractor, SHE, ECO	As necessary
	Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone	Contractor, SHE, ECO	Continuous
	Any water discharged must comply with the relevant Water Quality limits/guidelines specified by DWS.	Contractor, SHE, ECO	As necessary

8. ENVIRONMENTAL AWARENESS PLAN

OBJECTIVE: Ensure all operation personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm (Environmental Awareness Plan)

To achieve effective environmental management, it is important that Contractors and site employees and sub-contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor is responsible for informing its employees and subcontractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The Developer's obligations in this regard include the following:

- Employees must have a basic understanding of the key environmental features of the site copy of the EMPr is readily available on-site and that all site staff is aware of the location and has access to the document. Employees must be familiar with the requirements of the EMPr and the environmental specifications as they apply to the Development
- Ensuring that, prior to commencing any new site works, all employees have attended an Environmental Awareness Training course. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- Awareness of any other environmental matters, which are deemed to be necessary by the ECO
- Ensure that construction workers have received basic training in environmental management, including the storage and handling of hazardous substances, minimise of disturbance to sensitive areas (wetland), management of waste and prevention of water pollution
- Records must be kept of those that have completed the relevant training.
- Training should be done either in a written or verbal format but must be in an appropriate format and language for the receiving audience
- Refresher sessions must be held to ensure the construction staffs are aware of their environmental obligations.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

8.1 Environmental Awareness Training

Environmental awareness training must be presented to all persons who are to work on or visit the site – (site staff, sub-contractors or visitors to site) be it for short or long durations. This must be undertaken by the site supervision manager/ Safety Health and Environmental Officer (SHE) and must take the form of an on-site talk. A record of attendance of this training must be maintained by the site manager on site.

8.2 Induction Training

Environmental induction training must be presented to all persons who are to work on the site – prior to commencement of construction on site. This training must be provided by the ECO.

This induction training should include discussing the Developer's environmental policy and values, the function of the EMPr and the importance and reasons for compliance to these. The induction training must highlight overall dos and don'ts on site and clarify the repercussions of not complying with these. The reporting procedure must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE officer on site.

8.3 Toolbox Talks

Toolbox talks should be held on a scheduled and regular basis (at least once a month) where the foreman/site supervision manager, environmental and safety representative and all employees on site hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

9. 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, 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.

9.1 Method of Monitoring

The independent ECO will ensure compliance with the EMPr, and will conduct monitoring activities.

- Monitoring will be done as per the ECO monitoring protocol.
- The Contractor is deemed not to have complied with the Performance Specifications if:
    - There is evidence of wilful or accidental contravention of any specification included in the Specification.

- There is evidence of the contractor carrying out activities not permitted in terms of the Contract and / or the Specification.
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment.
- The contractor has failed to meet with the requirements of the approved schedule.

- A checklist of items, works and behaviours as outlined in the EMPr, and conditions of the Environmental authorisation (EA) will be created that will be monitored.
- Non-compliance of the EMPr and Environmental Authorisation will be reported as per the ECO monitoring protocol
- The independent ECO will ensure compliance with the EMPr and Environmental Authorisation 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 findings of the site inspection to the Site Manager, Environmental Monitoring Committee and submit such reports to DESTEA if specified in the environmental authorisation.

9.1.2 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to the Developer, Site Manager, Environmental Monitoring Committee and submit such reports to DESTEA if specified in the environmental authorisation. 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.

9.1.3 Environmental Monitoring Committee

An Environmental Management Monitoring Committee that includes the Developer, contractor, ward councillor and independent ECO must be established and Environmental Monthly Meetings must be held.

9.2 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.

9.3 Internal Audits and Reporting

Internal audits must be undertaken by the contractor. 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.

9.4 Final Audit Report

A final environmental report must be compiled by the ECO and submitted to DESTEA 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.

10. CONCLUSION

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 Developer'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 (SHE) 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.

Key issues

- Construction should preferably take place in **the dry season,** leaving enough time for the germination of seeds and revegetation of barren areas before the onset of the rainy season;
- Warning tape must be erected to inform public of the inherent dangers

WASTE MANAGEMENT PLAN

The Waste Management Plan will be applicable during the Construction and Operational phases of the proposed filling station and will be for use by the Contractors and the subcontractors that will be involved during the Construction phase. Although many of the Waste Management procedures have already been included in the general EMPr, the Developer, Subcontractors, on-site workers, and other suppliers are expected to adhere to both the specifications of the general EMPr and the WMP procedures for the duration of the contract.

It is recommended that an integrated waste management approach be used that is based on waste minimization and must include reduction, recycling, re-use and disposal where appropriate. Disposal of waste must only be taken to licensed landfill sites. All the waste generated during the activity must be disposed of at a site registered for this purpose. Approval must be obtained to dump rubble at an approved site.

Waste Management Plan

Activity / issue	Action required	Activity / issue	Action required
Site establishment	The developer should provide dustbins to be used during site preparation and surveying.	ECO, Contractor	Once off
	Prior to construction commencing, adequate waste bins should be provided in order to prevent littering on site.	Contractor	Monitor weekly
	The Contractor must ensure that provision is made for the separation of waste into categories for easy recycling and disposal purposes.	Contractor	Monitor monthly
	The Contractor must liaise with the Local Authority or the responsible company for the collection of domestic waste on a weekly basis, depending on the volumes and quantities generated thereof.	Contractor, ELO & ECO	Monitor weekly
	The Contractor must ensure that there is an area that has been clearly demarcated as a temporal storage for general, hazardous and recyclable wastes.	Contractor	Monitor weekly
	The Contractor must ensure that necessary arrangements are made beforehand for the safe disposal of hazardous materials generated on site by an accredited waste company.	Contractor, ELO	Monitor weekly
	The Contractor will also be required to make necessary arrangements for the storage and collection of recyclable waste that is generated on site.	ELO, Contractor	Monitor weekly

Activity / issue	Action required	Activity / issue	Action required
Site control, Demarcation, Security, Access Control in Waste Storage areas	Waste storage areas shall be provided with signs and display boards which inform everyone entering the site of the demarcated waste storage areas.	Developer	Once off, monthly
	All Waste Storage areas including areas where potentially hazardous waste is stored shall be adequately fenced in and secured to prevent any access of public members and unauthorised people.	ECO, Contractor	Once off, monitor weekly
	Areas, Containers and Skips identified for the storage of general, recyclable wastes shall be clearly marked to indicate the intended purposes i.e. glass only.	ECO, Contractor	Once off, Bi-weekly inspections
Requirements for Waste Management and Collection Contractors	General waste shall be collected by a recognised service provider and be disposed of in registered waste site.	ECO, Contractor	Monitor Daily
	Recyclable waste shall be collected by a recognised recycling service provider for appropriate recycling purposes.	Contractor, ECO	Weekly
	Hazardous wastes shall be collected by a recognised service provider for disposal in a registered hazardous waste site.	Contractor	Continuous
General: waste	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
	The Contractor must 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	Activity / issue	Action required
	Wet waste should by no means escape from the waste truck whilst in transit.	ELO, Contractor	As necessary
	The Contractor must 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 at dumping site as approved by the Council.	ELO, Contractor	Monitor daily - weekly
	The Contractor must ensure the Waste collection vehicles, when collecting waste from site, are equipped with covers to prevent waste from being blown off the waste collection vehicle during transportation	ELO, Contractor	As necessary
Hazardous Substances	If potentially hazardous wastes are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.	Contractor,	Monitor daily - weekly
	Hazardous chemical substances used during construction shall be disposed of appropriately.	Contractor	Monitor daily - weekly

Activity / issue	Action required	Activity / issue	Action required
	The waste, resulting from the use of hazardous materials, shall be disposed of at a hazardous waste disposal site as approved by the RE. Storage and disposal of waste is regulated through other legislation, which should be complied with i.e. the Occupational Health and Safety Act.	Contractor, RE	Monitor daily - weekly
	Some items of stock and chemicals used in the car wash and for general cleaning can be harmful. Exposure to them through use, accidental spillage or leaks, can cause respiratory problems, dermatitis or chemical burns. The following steps must be followed: • Store all hazardous chemicals in their original containers. • Obtain information on all substances stored and used in the premises from manufacturers hazard data sheets. • Train staff and provide appropriate protective clothing	Contractor, RE	Monitor daily - weekly
Health Risks	The Contractor and the ELO must ensure that all persons involved in waste collection, sorting, transport and disposal have undergone the necessary training.	Contractor, ECO	Once off
Record Keeping	The Contractor shall keep records for the regular collection of all waste types and disposal thereto, details of waste company responsible for waste collection	Contractor	Monitor monthly
General	Waste storage facilities must have cover lids to prevent odours and flies..	Contractor	As necessary
	No waste shall be retained on site for a period exceeding 14 days	Contractor	Continuous

Activity / issue	Action required	Activity / issue	Action required
	Containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.	Construction crew, ELO	Continuous

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: _____		