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**PROJECT STATUS**

<b>Title</b>	Environmental Management Plan for the: Township Establishment of Township Establishment of Luiperdheuwel Extension 3, creation of street and installation of bulk services.		
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**ABBREVIATIONS**

AIDS	Acquired Immuno-Deficiency Syndrome
APF	Africa Planning Forum
DR	Developer's Representative
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immuno-deficiency Virus
I&APs	Interested and Affected Parties
NHCN	National Heritage Council of Namibia
Reg.	Regulation
S	Section
TB	Tuberculosis

## 1 INTRODUCTION

The Grootfontein Municipality hereinafter referred to as the proponent intends to undertake the following activities:

- **Township Establishment of Luiperdheuwel Extension 3, creation of street and installation of bulk services.**

The above are listed activities in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012).

An Environmental Management Plan (EMP) is one of the most important outputs of the EIA process as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP details the mitigation and monitoring actions to be implemented during the following phases of these developments:

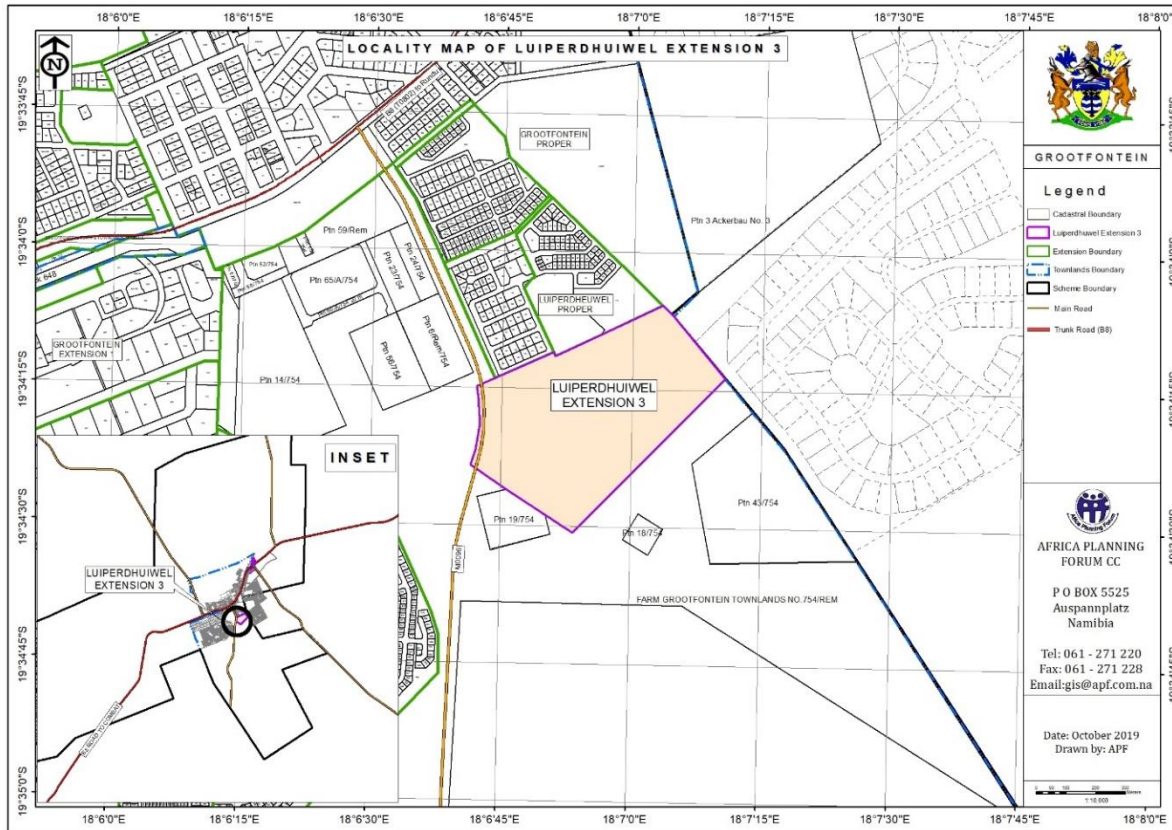
- Planning and Design – the period, prior to construction, during which preliminary legislative and administrative arrangements, necessary for the preparation of erven, are made and engineering designs are carried out. The preparation of construction tender documents forms part of this phase;
- Construction – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor for the development of services infrastructure and construction of the road to service the development as well as any other construction process(s) within the development areas;
- Operation and Maintenance – the period during which the services infrastructure will be fully functional and maintained.

It should be noted that to date, no engineering designs have been carried out for the development of the infrastructure associated with this development.

The decommissioning of these developments is not envisaged; however in the event that this should be considered some recommendations have been outlined in **Table 4-5**.

## 2 PROPOSED DEVELOPMENT

The proposed Luiperdheuwel Extension 3 is located on the eastern side of Grootfontein. The proposed township is bordered by Luiperdheuwel Proper and Extension 1 in the north and the Cemetery to the south west. Please refer to the below locality map **Figure 1** below for the locality of the intended township development.



**Figure 1:** Locality map proposed Luiperdhuwel Extension 3

The proponent intends to establish the township to be known as Luiperdhuwel Extension 3 on Portion A of Erf Remainder Farm Grootfontein Townlands No 754. The development further entails the creation of street and installation of bulk services within the proposed site. The site is a greenfield and has thus not been developed yet. The township is proposed to consist of approximately 286 erven which will comprise primarily residential erven. The land uses for the proposed erven include Residential 1, Residential 2, Business, Institutional, Education and Public Open Space. See the layout map in **Figure 2** below.

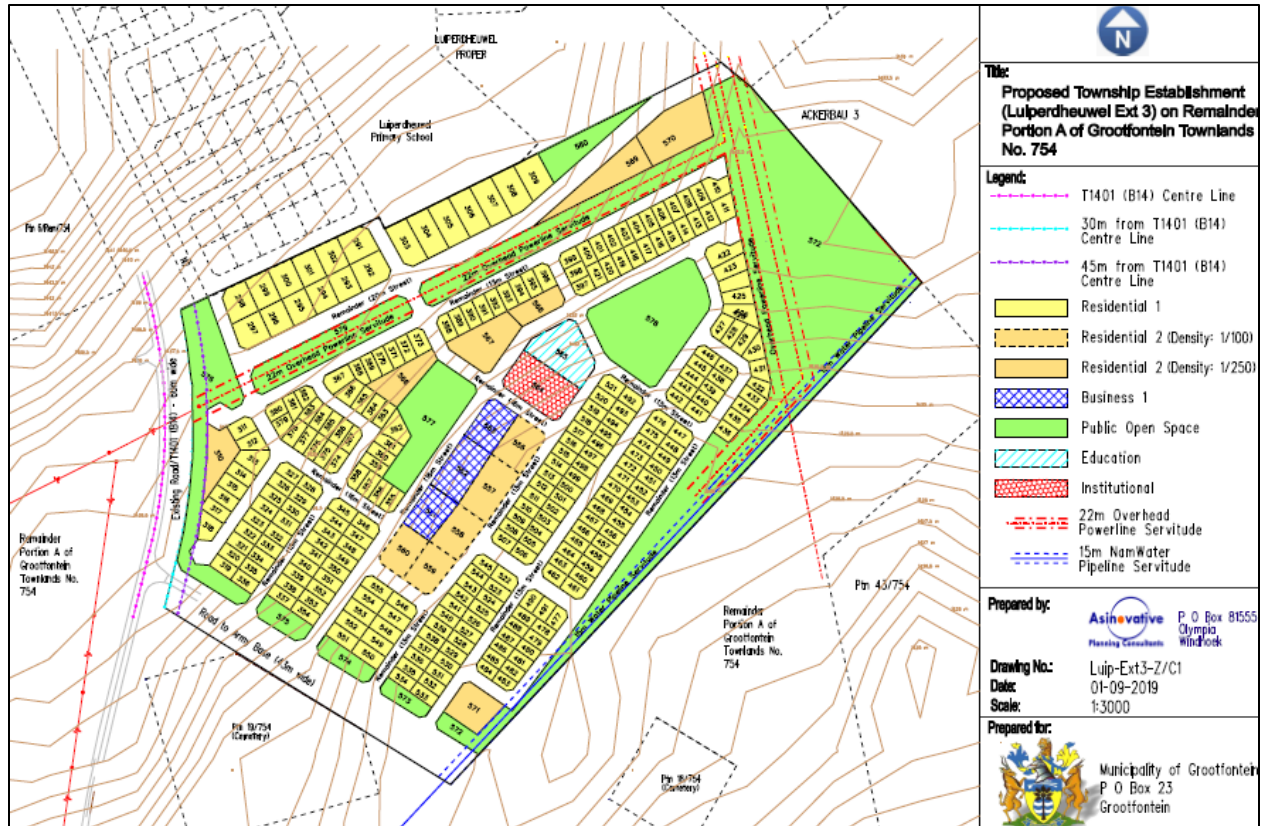


Figure 2: Layout map Luiperdheuwel Extension 1 (Asinovative Planning Consultants, 2017)

### 3 ROLES AND RESPONSIBILITIES

The proponent (Grootfontein Municipality) is ultimately responsible for the implementation of the EMP, from the planning and design phase to the decommissioning phase (if these developments are in future decommissioned) of these developments. The proponent will delegate this responsibility as the project progresses through its life cycle. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Council’s Representative;
- Environmental Control Officer; and
- Contractor (Construction and Operations and Maintenance).

#### 3.1 COUNCIL’S REPRESENTATIVE

The Grootfontein Municipality should assign the responsibility of managing all aspects of these developments for all development phases (including all contracts for work outsourced) and the implementation of the management actions of the EMP to a designated member of staff, referred to in this EMP as the Council’s representative (CR). The Grootfontein Municipality may decide to assign this role to one person for the full duration of these developments, or may assign a different CR to each of the development phases – i.e. one for the planning and design phase, one for the construction phase and one for the operation and maintenance phase. The CR’s responsibilities are as follows:

**Table 3-1** Responsibilities of CR

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in <b>Table 4-1</b> are obtained/adhered to.	<ul style="list-style-type: none"> <li>• Throughout the lifecycle of these developments</li> </ul>
Making sure that the relevant provisions detailed in <b>Table 4-2</b> are addressed during planning and design phase.	<ul style="list-style-type: none"> <li>• Planning and design phase</li> </ul>
Suspending/evicting individuals and/or equipment not complying with the EMP	<ul style="list-style-type: none"> <li>• Construction</li> <li>• Operation and maintenance</li> </ul>
Issuing fines for contravening EMP provisions	<ul style="list-style-type: none"> <li>• Construction</li> <li>• Operation and maintenance</li> </ul>

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### 3.2 ENVIRONMENTAL CONTROL OFFICER

The CR should assign the responsibility of auditing the implementation of the whole EMP on the ground during the construction and operation and maintenance phases to an external environmental consultant, referred to in this EMP as the Environmental Control Officer (ECO). The CR/Grootfontein Municipality may decide to assign this role to one person for both phases, or may assign a different ECO for each phase. The ECO will have the following responsibilities during the construction and operation and maintenance phases of these developments:

- Management and facilitation of communication between the Grootfontein Municipality, CR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting site inspections (recommended minimum frequency is monthly) of all construction and/or infrastructure maintenance areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the CR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the CR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual audit and review of the EMP and recommending additions and/or changes to this document.

### 3.3 CONTRACTOR

Contractors appointed by the Grootfontein Municipality are automatically responsible for implementing all provisions contained within the relevant chapters of this EMP. Contractors will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. **Table 4-3** applies to contractors appointed during the construction phase and **Table 4-4** to those appointed during the operation and maintenance phase. In order to ensure effective environmental management, the aforementioned chapters should be included in the applicable contracts for outsourced construction, operation and maintenance work.

The tables in the following chapter (**Chapter 4**) detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.



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## 4 MANAGEMENT ACTIONS

The aim of the management actions in this chapter of the EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these developments. These management actions have been organised temporally according to project phase:

- Applicable legislation (**Table 4-1**);
- Planning and design phase management actions (**Table 4-2**);
- Construction phase management actions (**Table 4-3**);
- Operation and maintenance phase management actions (**Table 4-4**); and
- Decommissioning phase management actions (**Table 4-5**).
- The proponent should assess these **commitments** in detail and should acknowledge their commitment to the specific management actions detailed in the tables below.

### 4.1 ASSUMPTIONS AND LIMITATIONS

This EMP has been drafted with the acknowledgment of the following assumptions and limitations:

- This EMP has been drafted based on the scoping-level Environmental Assessment (EA) conducted for the Township Establishment of Luiperdheuwel Extension 3, creation of street and installation of bulk services as outlined in **Section 4** of the Draft Environmental Scoping Report. APF will not be held responsible for the potential consequences that may result from any alterations to the above-mentioned layout.
- It is assumed that construction labourers will be sourced mostly from the Grootfontein townlands area and that migrant labourers (if applicable) will be housed in established accommodation facilities within Grootfontein.
- No engineering designs have been carried out for the development of the associated services infrastructure (roads, potable water, storm water, sewerage and electrical reticulations).

### 4.2 APPLICABLE LEGISLATION

Legal provisions that have relevance to various aspects of these developments are listed in **Table 4-1** below. The legal instrument, applicable corresponding provisions and project relevance details are provided.

**Table 4-1: Legislation applicable to proposed development**

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
<b>The Constitution of the Republic of Namibia as Amended</b>	<p>Article 91 (c) provides for duty to guard against “the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia.”</p> <p>Article 95(l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources.</p>	Sustainable development should be at the forefront of this development.
<b>Environmental Management Act No. 7 of 2007 (EMA)</b>	<p>Section 2 outlines the objective of the Act and the means to achieve that.</p> <p>Section 3 details the principle of Environmental Management</p>	The development should be informed by the EMA.
<b>EIA Regulations GN 28, 29, and 30 of EMA (2012)</b>	<p>GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate.</p> <p>GN 30 provides the regulations governing the Environmental Assessment (EA) process.</p>	<p>The intended development triggers the following activities:</p> <p>Activity 10.1 (a)</p> <p>Activity 10.1 (b)</p> <p>Activity 10.2 (a)</p>
<b>Convention on Biological Diversity (1992)</b>	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The project should consider the impact it will have on the biodiversity of the area.
<b>Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)</b>	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The EA process should incorporate the aspects outlined in the guidelines.
<b>Namibia Vision 2030</b>	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the development does not lead to the degradation of the natural beauty of the area.
<b>Water Act No. 54 of 1956</b>	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during construction and operation of the development.
<b>The Ministry of Environment and Tourism (MET) Policy on HIV &amp; AIDS</b>	MET has recently developed a policy on HIV and AIDS. In addition it has also initiated a programme aimed at	The proponent and its contractor have to adhere to the guidelines provided to manage

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	mainstreaming HIV and gender issues into environmental impact assessments.	the aspects of HIV/AIDS. Experience with construction projects has shown that a significant risk is created when migrant construction workers interact with local communities.
<b>Township and Division of Land Ordinance 11 of 1963</b>	The Townships and Division of Land Ordinance regulates subdivisions of portions of land falling within a Local Authority area	In terms of Section 19 such applications is to be submitted to the Townships Board
<b>Local Authorities Act No. 23 of 1992</b>	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development has to comply with provisions of the Local Authorities Act
<b>Labour Act no. 11 of 2007</b>	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.	Given the employment opportunities presented by the development, compliance with the labour law is essential.
<b>National Heritage Act No. 27 of 2004</b>	The Act is aimed at protecting, conserving and registering places and objects of heritage significance.	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.
<b>Roads Ordinance 17 of 1972</b>	<ul style="list-style-type: none"> <li>• Section 3.1 deals with width of proclaimed roads and road reserve boundaries</li> <li>• Section 27.1 is concerned with the control of traffic on urban trunk and main roads</li> <li>• Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads</li> <li>• Section 37.1 deals with Infringements and obstructions on and interference with proclaimed roads.</li> </ul>	Adhere to all applicable provisions of the Roads Ordinance.
<b>Public and Environmental Health Act of 2015</b>	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted	Contractors and users of the proposed development are to comply with these legal requirements.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	
<b>Nature Conservation Ordinance no. 4 of 1975</b>	Chapter 6 provides for legislation regarding the protection of indigenous plants	Indigenous and protected plants have to be managed within the legal confines.
<b>Water Quality Guidelines for Drinking Water and Wastewater Treatment</b>	Details specific quantities in terms of water quality determinants, which wastewater should be treated to before being discharged into the environment (see Appendix B).	These guidelines are to be applied when dealing with water and waste treatment
<b>Environmental Assessment Policy of Namibia (1995)</b>	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	This EIA considers this term of Environment.

### 4.3 PLANNING AND DESIGN PHASE

The CR should ensure that the management actions detailed below should be adhered to during the period before the construction of the services infrastructure starts.

**Table 4-2:** Planning and design management actions

Aspect	Management Actions
Proposed Service Infrastructure	<ul style="list-style-type: none"> <li>It is advised that the proponent engages the services of an engineering professional to design and construct the service connections for the proposed developments.</li> <li>Re-use of treated wastewater should be considered wherever possible to reduce the consumption of potable water.</li> </ul>
Roads	<ul style="list-style-type: none"> <li>Make ample provision in road design for pedestrian walkways and speed bumps at crossing and busy nodes.</li> <li>Ensure that road junctions have good sightlines.</li> <li>Implement traffic control measures where necessary.</li> </ul>
Visual Impacts	<ul style="list-style-type: none"> <li>It is recommended that more 'green' technologies be implemented within the architectural designs and building materials of the development where possible in order to minimise the visual prominence of such a development within the more natural surrounding landscape.</li> <li>Natural colours and building materials such as wood and stone should be incorporated as well as the use of indigenous vegetation in order to help beautify the development.</li> <li>Visual pollutants can further be prevented through mitigations (i.e. keep existing trees, introduce tall indigenous trees; keep structures unpainted and minimising large advertising billboards).</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>Incorporate the local depressions and areas inundated by flood waters into public open spaces.</li> <li>Remove existing structures within the flood prone areas which blocks off the natural flow of water.</li> <li>Appoint professional engineers to develop a detailed storm water management design as part of the infrastructure service provision of the developments.</li> </ul>
Clearing of vegetation	<ul style="list-style-type: none"> <li>The layout should incorporate existing trees as far as possible.</li> <li>Where protected tree species cannot be accommodated within the planned structures to be built, written motivation should be submitted to the Forestry Department of the MAWF requesting permission to remove such trees.</li> <li>Only once a permit has been issued from the Forestry Department may the trees be removed.</li> </ul>

#### 4.4 CONSTRUCTION PHASE

The management actions listed in **Table 4-3** apply during the construction phase. This table may be used as a guide when developing EMPs for other construction activities within these development areas.

**Table 4-3:** Construction phase management actions

Environmental Feature	Impact	Management Actions	Responsible Person
EMP training	Lack of EMP awareness and the implications thereof.	All construction workers are to undergo EMP training that should include as a minimum the following: <ul style="list-style-type: none"> <li>• Explanation of the importance of complying with the EMP.</li> <li>• Discussion of the potential environmental impacts of construction activities.</li> <li>• Employees' roles and responsibilities, including emergency preparedness.</li> <li>• Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities.</li> </ul>	Contractor, CR
Conservation of vegetation	Loss of biodiversity	<ul style="list-style-type: none"> <li>• The layout and development design should incorporate existing trees<sup>1</sup>.</li> <li>• The Contractor should compile a Plant Management Plan which should include the following as a minimum: <ul style="list-style-type: none"> <li>○ Trees if not already accounted for in an existing Geographic Information System (GIS), should be surveyed, coordinates/location incorporated into the Contractor's GIS, marked with paint (or other means so as to be readily visible) and protected;</li> <li>○ Trees, which are impossible to conserve, need to be identified and their location recorded on a map;</li> <li>○ The Contractor should apply to the local authority for a permit to remove these trees.</li> </ul> </li> </ul>	Contractor

<sup>1</sup>a "tree" is defined as an indigenous woody perennial plant with a trunk diameter  $\geq 150$  mm.

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>○ Special protection should be accorded to the protected endemic species, which are to be found within the development area.</li> <li>○ A list should be compiled of all trees to be removed detailing the erf on which they are located, the species as well as which plants will be planted to replace these. The nursery where these plants will be sourced from should also be included;</li> <li>○ Each tree that is removed needs to be replaced with an indigenous tree species after construction;</li> <li>○ Some of these trees can be obtained at the National Botanical Research Institute (NBRI) or at a commercial nursery.</li> <li>● Only a limited width +/- 5 m on the side of roads may be partially cleared of vegetation.</li> <li>● Workers are prohibited from collecting wood or other plant products on or near work sites.</li> <li>● No alien species may be planted on or near work areas.</li> </ul>	
Lay-down areas and materials camp	Loss of biodiversity	<p>Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the CR and the following should be considered in selecting these sites:</p> <ul style="list-style-type: none"> <li>● The areas designated for the services infrastructure should be used as far possible.</li> <li>● Second option should be degraded land.</li> <li>● Avoid sensitive areas (e.g. rivers/drainage lines).</li> </ul>	Contractor and CR

Environmental Feature	Impact	Management Actions	Responsible Person
Hazardous waste	Contamination of surface and groundwater sources.	<ul style="list-style-type: none"> <li>• All heavy construction vehicles and equipment on site should be provided with a drip tray.</li> <li>• All heavy construction vehicles should be maintained regularly to prevent oil leakages.</li> <li>• Maintenance and washing of construction vehicles should take place only at a designated workshop area.</li> </ul>	Contractor
Water, Sewage and grey water	Contamination of surface and groundwater sources and water wasting	<ul style="list-style-type: none"> <li>• The wash water (grey water) collected from the cleaning of equipment on-site should not be left standing for long periods of time as this promotes parasite and bacterial proliferation. Grey water should be recycled: <ul style="list-style-type: none"> <li>○ Used for dust suppression;</li> <li>○ Used to water a vegetable garden, or to support a small nursery;</li> <li>○ Used (reused) to clean equipment.</li> </ul> </li> <li>• Grey water that is not recycled should be removed on a regular basis.</li> <li>• No dumping of waste products of any kind in or in close proximity to water bodies.</li> <li>• Heavy construction vehicles should be kept out of any water bodies and the movement of construction vehicles should be limited where possible to the existing roads and tracks.</li> <li>• Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with.</li> <li>• Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles.</li> <li>• Contaminated runoff from the construction sites should be prevented</li> </ul>	Contractor



Environmental Feature	Impact	Management Actions	Responsible Person
		<p>from entering the surface and ground water bodies.</p> <ul style="list-style-type: none"> <li>• All materials on the construction site should be properly stored.</li> <li>• Disposal of waste from the sites should be properly managed and taken to the designated landfill site in Grootfontein.</li> <li>• Construction workers should be given ablution facilities at the construction sites that are located at least 30 m away from any surface water and ground water resources and should be regularly serviced.</li> <li>• Washing of personnel or any equipment should not be allowed on site.</li> <li>• Should it be necessary to wash construction equipment these should be done at an area properly suited and prepared to receive and contain polluted waters.</li> </ul>	
General waste	Visual impact and soil contamination	<ul style="list-style-type: none"> <li>• The road construction site should be kept tidy at all times.</li> <li>• All domestic and general construction waste produced on a daily basis should be cleaned and contained daily.</li> <li>• No waste may be buried or burned.</li> <li>• Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site.</li> <li>• All recyclable waste needs to be taken to the nearest recycling depot where practical.</li> <li>• A sufficient number of separate bins for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such.</li> </ul>	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.</li> <li>• No waste may remain on site after the completion of the project.</li> </ul>	
Topsoil	Loss of topsoil and associated opportunity costs	<ul style="list-style-type: none"> <li>• When excavations are carried out, topsoil<sup>2</sup> should be stockpiled in a demarcated area.</li> <li>• Stockpiled topsoil should be used to rehabilitate post-construction degraded areas and/or other nearby degraded areas if such an area is located a reasonable distance from the stockpile.</li> </ul>	Contractor
Rehabilitation	Visual impact	<ul style="list-style-type: none"> <li>• Upon completion of the construction phase consultations should be held with the local community/property owner(s) regarding the post-construction use of remaining excavated areas (if applicable).</li> <li>• In the event that no post-construction uses are requested, all excavated/degraded areas need to be rehabilitated as follows: <ul style="list-style-type: none"> <li>○ Excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g. sand removed with an oil spill) may be dumped as backfill.</li> <li>○ Rehabilitated excavated areas need to match the contours of the existing landscape.</li> <li>○ The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of revegetation and reduces the chances of potential erosion.</li> </ul> </li> </ul>	Contractor, CR

<sup>2</sup> Topsoil is defined here as the top 150mm of surface material, which accounts for the seedbank.

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>○ Topsoil is to be spread across excavated areas evenly.</li> <li>○ Deep ripping of areas to be rehabilitated is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall.</li> <li>○ Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion.</li> </ul>	
HIV/AIDS and TB training	Lack of awareness regarding implications of risky behaviour	The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase.	Contractor
Road safety	Injury or loss of life	<ul style="list-style-type: none"> <li>● Demarcate roads clearly.</li> <li>● Off-road driving should not be allowed.</li> <li>● All vehicles that transport materials to and from the site must be roadworthy.</li> <li>● Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules.</li> <li>● Loads upon vehicles should be properly secured to avoid items falling off the vehicle.</li> </ul>	Contractor
Safety around work sites	Injury or loss of life	<ul style="list-style-type: none"> <li>● Excavations should be left open for the shortest time possible.</li> <li>● Excavate short lengths of trenches and box areas for services or foundations in a manner that will not leave the trench unattended for more than 24 hours.</li> <li>● Demarcate excavated areas and topsoil stockpiles with danger tape.</li> <li>● All building materials and equipment are to be stored only within set out and demarcated work areas.</li> </ul>	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• Only road construction personnel will be allowed within these work areas.</li> <li>• Comply with all waste related management actions stated above in this table.</li> </ul>	
Ablutions	Non-compliance with Health and Safety Regulations	<ul style="list-style-type: none"> <li>• Separate toilets should be available for men and women and should clearly be indicated as such.</li> <li>• Portable toilets (i.e. easily transportable) should be available at every construction site:               <ul style="list-style-type: none"> <li>○ 1 toilet for every 15 females.</li> <li>○ 1 toilet for every 30 males.</li> <li>○ Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site in Grootfontein. Alternatively, sewage may be pumped into sealable containers and stored until it can be removed.</li> <li>○ Workers responsible for cleaning the toilets should be provided with environmentally friendly detergents, latex gloves and masks.</li> </ul> </li> </ul>	Contractor
Open fires	Injury or loss of life	<ul style="list-style-type: none"> <li>• No open fires may be made anywhere on site.</li> </ul>	Contractor
General health and safety	Injury or loss of life	<ul style="list-style-type: none"> <li>• A fully stocked first aid kit should permanently be available on-site as well as an adequately trained member of staff capable of administering first aid.</li> <li>• All workers should have access to the relevant personal protective equipment (PPE).</li> <li>• Sufficient potable water reserves should be available to workers at all times.</li> <li>• No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable).</li> </ul>	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• No workers should be allowed to drink alcohol during work hours.</li> <li>• No workers should be allowed on site if under the influence of alcohol.</li> <li>• Building rubble and domestic waste should be stored in skips.</li> <li>• Condoms should be accessible/ available to all construction workers.</li> <li>• Access to Antiretroviral medication should be facilitated.</li> </ul>	
Dust	Nuisance and health impacts	<ul style="list-style-type: none"> <li>• A watering truck should be used on gravel roads with the heaviest vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought.</li> <li>• In this case the use of waterless dust suppression means (e.g. lignosulphonate products such as Dustex) should be considered.</li> <li>• Cover any stockpiles with plastic to minimise windblown dust.</li> <li>• Dust protection masks should be provided to workers if they complain about dust.</li> </ul>	Contractor
Noise	Nuisance impacts	Work hours should be restricted to between 08h00 and 17h00 where construction involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents within the 500 m radius should be given 1 week's written notice.	Contractor
Recruitment of labourers	Negative conflict regarding recruitment	The Contractor should compile a formal recruitment process including the following provisions as a minimum:	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• Adhere to the legal provisions in the Labour Act for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.).</li> <li>• Recruitment should not take place at construction sites.</li> <li>• Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures.</li> <li>• Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the Grootfontein project area and only then look to surrounding towns.</li> <li>• Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.</li> </ul>	
Communication plan	Negative conflict with I&APs	<p>The Contractor or proponent should draft a Communication Plan, which should outline as a minimum the following:</p> <ul style="list-style-type: none"> <li>• How Interested and Affected Parties (I&amp;APs), who require ongoing communication for the duration of the construction period, will be identified and recorded and who will manage and update these records.</li> <li>• How these I&amp;APs will be consulted on an ongoing basis.</li> <li>• Make provision for grievance mechanisms – i.e. how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory.</li> </ul>	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
General communication	Negative conflict with I&APs	<ul style="list-style-type: none"> <li>• The CR must appoint an ECO to liaise between the Contractor, I&amp;APs, Developer.</li> <li>• The Contractor shall at every monthly site meeting report on the status of the implementation of all provisions of the EMP.</li> <li>• The Contractor should implement the EMP awareness training as stipulated above in this table.</li> <li>• The Contractor must list the I&amp;APs of the project and their contact details with whom ongoing communication would be required for the duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the CR before construction commences.</li> <li>• The Communication Plan, once agreed upon by the Developer, shall be legally binding.</li> <li>• All communication with the I&amp;APs must take place through the ECO.</li> <li>• A copy of the EMP must be available at the site office and should be accessible to all I&amp;APs.</li> <li>• Key representatives from the above mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding project progress.</li> <li>• The Contractor should liaise with the Developer regarding all issues related to community consultation and negotiation before construction commences.</li> <li>• A procedure should be put in place to ensure that concerns raised have been followed-up and addressed.</li> </ul>	Contractor, ECO, CR

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• All people on the I&amp;APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the CR prior to the commencement of construction activities.</li> </ul>	
Archaeology	Loss of heritage resources	<ul style="list-style-type: none"> <li>• Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a “chance find” procedure should be applied in the order they appear below:               <ul style="list-style-type: none"> <li>○ If operating machinery or equipment, stop work;</li> <li>○ Demarcate the site with danger tape;</li> <li>○ Determine GPS position if possible;</li> <li>○ Report findings to the construction foreman;</li> <li>○ Report findings, site location and actions taken to superintendent;</li> <li>○ Cease any works in immediate vicinity;</li> <li>○ Visit site and determine whether work can proceed without damage to findings;</li> <li>○ Determine and demarcate exclusion boundary;</li> <li>○ Site location and details to be added to the project’s Geographic Information System (GIS) for field confirmation by archaeologist;</li> <li>○ Inspect site and confirm addition to project GIS;</li> <li>○ Advise the National Heritage Council of Namibia (NHCN) and request written permission to remove findings from work area; and</li> <li>○ Recovery, packaging and labelling of findings for transfer to National Museum.</li> </ul> </li> </ul>	Contractor



Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> <li>• Should human remains be found, the following actions will be required:               <ul style="list-style-type: none"> <li>○ Apply the chance find procedure as described above;</li> <li>○ Schedule a field inspection with an archaeologist to confirm that remains are human;</li> <li>○ Advise and liaise with the NHCN and Police; and</li> <li>○ Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.</li> </ul> </li> </ul>	

#### 4.5 OPERATION AND MAINTENANCE PHASE

The management actions included in **Table 4-4** below apply during the operation and maintenance phase of these developments.

**Table 4-4: Operation and maintenance management actions**

Environmental Feature	Impact	Management Actions	Person Responsible
EMP training	Lack of EMP awareness and the implications thereof	All contractors appointed for maintenance work on the respective services infrastructure must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.	Contractor
Water	Surface and groundwater contamination	Ensure that surface run-off water accumulating on-site are channeled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.	Proponent, Contractor,
Aesthetics	Visual impacts	<p>The proponent should consult with a view to incorporate the relevant local/national/international development guidelines which addresses the following:</p> <ul style="list-style-type: none"> <li>• The incorporation of indigenous vegetation into road development.</li> </ul>	Proponent

Environmental Feature	Impact	Management Actions	Person Responsible
		<ul style="list-style-type: none"> <li>To mark the area with appropriate road warning signs (e.g. the road curves to the left/right)</li> </ul>	
Noise	Noise nuisance impact	The proponent should consult with the view to incorporate the relevant local/national/international guidelines to manage the generation of traffic noise in the development area.	Proponent

#### 4.6 DECOMMISSIONING PHASE

The decommissioning of these developments is not foreseen as the intended development is envisaged to be permanent. In the event that this infrastructure development is decommissioned the following management actions should apply.

**Table 4-5: Decommissioning phase management actions**

Environmental Feature	Management Actions
Deconstruction activity	Many of the mitigation measures prescribed for construction activity for these developments ( <b>Table 4-3</b> above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to the management actions laid out in <b>Table 4-3</b> above.

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**Appendix A - Property Development Environmental Management Plan**

<b>Environmental feature</b>	<b>Mitigation measure</b>
Conservation of vegetation	<ul style="list-style-type: none"> <li>• All trees listed (with co-ordinates provided) in the title deed for this erf should be conserved as far as practicably possible. These trees should be incorporated into the planning layout of any structures to be erected on this erf.</li> <li>• Where listed trees cannot be accommodated by the planned structures to be built, written motivation should be submitted to the Grootfontein Municipality Forestry Department under the Ministry of Agriculture Water and Forestry requesting permission to remove such trees.</li> <li>• Only once a permit has been received from the Municipality may the owner of the erf remove affected trees.</li> </ul>
Health and safety	<ul style="list-style-type: none"> <li>• No human waste may be expelled on open soil. Every construction site should have at least one portable toilet.</li> <li>• Only one or two security guards may reside/sleep on-site during construction. No other construction personnel may sleep/reside on-site.</li> <li>• No open fires may be made anywhere on-site during the construction period. Heating and cooking facilities (where necessary/applicable) should be provided by the Contractor.</li> </ul>
Waste management	<ul style="list-style-type: none"> <li>• The waste container of portable toilets should be emptied on a regular basis to avoid overflows. Waste from portable toilets should be disposed of at municipal wastewater treatment facility.</li> <li>• All waste should be placed in the appropriate waste containers daily.</li> <li>• All waste on-site should be removed on a weekly basis.</li> <li>• Concrete should not be mixed on open soil. Concrete should be mixed on an impermeable (i.e. lined) surface.</li> </ul>

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**APPENDIX B: WATER QUALITY GUIDELINES**