

ENVIRONMENTAL MANAGEMENT PLAN FOR THE:

**LAYOUT APPROVAL AND TOWNSHIP
ESTABLISHMENT ON CONSOLIDATED ERF X,
OTJOMUISE EXTENSION 1, OTJOMUISE,
WINDHOEK, KHOMAS REGION**

APP-006133

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REPORT DATE: JULY 2024



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PROJECT STATUS

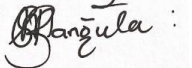
Title	Environmental Management Plan: Layout approval and Township Establishment on Consolidated Erf X, Otjomuise Extension 1		
Report Status	Final		
Reference	Otjomuise 1003-1301		
Proponent	National Housing Enterprise No 7, Gen. Murtala Muhammed Ave Eros, Windhoek 		
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List of Abbreviations

AIDS	Acquired Immuno-Deficiency Syndrome
DEA	Department of Environmental Affairs
DEAF	Department of Environmental Affairs and Forestry
DESR	Draft Environmental Scoping Report
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
FESR	Final Environmental Scoping Report
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
I&APs	Interested and Affected Parties
MET	Ministry of Environment and Tourism
MEFT	Ministry of Environment, Forestry and Tourism
mamsl	Metres above mean sea level
NHE	National Housing Enterprise
NHCN	National Heritage Council of Namibia
PPP	Public Participation Process
PR	Proponent's Representative
Reg.	Regulation
S	Section
TB	Tuberculosis

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1. Introduction

The National Housing Enterprise (NHE) hereinafter referred to as the proponent intends to undertake the following activities:

- 1. Rezoning of Erf RE/1301, Otjomuise Extension 1 from “Residential” to “Institutional”**
- 2. Consolidation of Erven RE/1003 and RE/1301 Otjomuise Extension 1, into Consolidated Erf X, Otjomuise Extension 1**
- 3. Rezoning of Consolidated Erf X, Otjomuise Extension 1 from “Institutional” to “Undetermined” for Township Establishment purposes**
- 4. Layout approval and Township Establishment on Consolidated Erf X, Otjomuise Extension 1**

The above development triggers 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 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 10.

2. Proposed Development

2.1. Locality

Erven RE/1003 and RE/1301 are located adjacent to one another in the Otjomuise Extension 1 township. The northern boundary of Erf RE/1301 is adjacent to Moses Garoeb Street, and the southern boundary of Erf RE/1003 is adjacent to Beijing Street, in Otjomuise. The locality of the subject erven is depicted in **Figure 1** below.

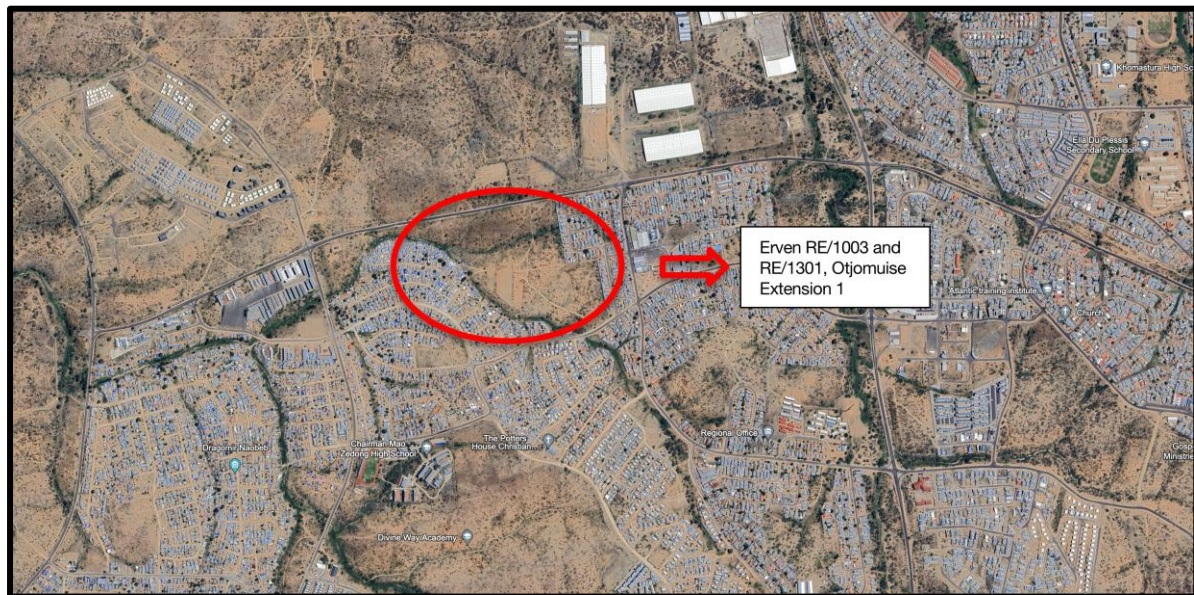


Figure 1: Locality of Erven RE/1003 and RE/1301, Otjomuise Extension 1

2.2. Zoning

As per the attached zoning certificates, the Remainder Erf of 1003, Otjomuise Extension 1 is zoned for “Institutional” purposes, while the Remainder Erf of 1301, Otjomuise Extension 1 is zoned for “Residential” purposes. Kindly note that there is no density or bulk factor indicated on the zoning certificates of either property.

2.3. Size

As per the attached Title Deeds, Erf RE/1003, Otjomuise Extension 1 measures 73 096m² in extent and Erf RE/1301, Otjomuise Extension 1 measures 90 103m² in extent.

2.4. Ownership

Ownership details of the subject properties is outlined in **Table 1** below.

Erf No.	Title Deed No.	Registered Owner
Erf RE/1003, Otjomuise Extension 1	T7453/2001	National Housing Enterprise (NHE)
Erf RE/1301, Otjomuise Extension 1	T7452/2001	National Housing Enterprise (NHE)

Table 1: Ownership Details

It should be noted that there are neither restrictions nor servitudes registered against the subject erven that may prohibit the proposed application.

2.5. Topography and Natural Features

Erven RE/1003 and RE/1301, Otjomuise Extension 1 and the surrounding has a generally gentle topography, characterised by a slope of 1:57, which translates to a gradient of about 1.8%. The site has a tributary that runs along its western border. This tributary has been incorporated into the proposed layout.

2.6. Current Land Use on the Properties

Erven RE/1003 and RE/1301, Otjomuise Extension 1 mostly lie vacant. As depicted in **Figure 2** below, there are encroachments on the subject properties which are outlined in yellow below. These encroachments cover an area of 1746m² on Erf RE/1003 and an area of 2643m² on Erf RE/1301.



Figure 2: Encroached Area on the Subject Erven

2.7. Surrounding Land Uses

As depicted in **Figure 3** below, Erven RE/1003 and RE/1301, Otjomuise Extension 1 are predominantly surrounded by erven that are zoned for Residential uses. Other zonings in the area include Business, Institutional, Public Open Space, Municipal and Undetermined.

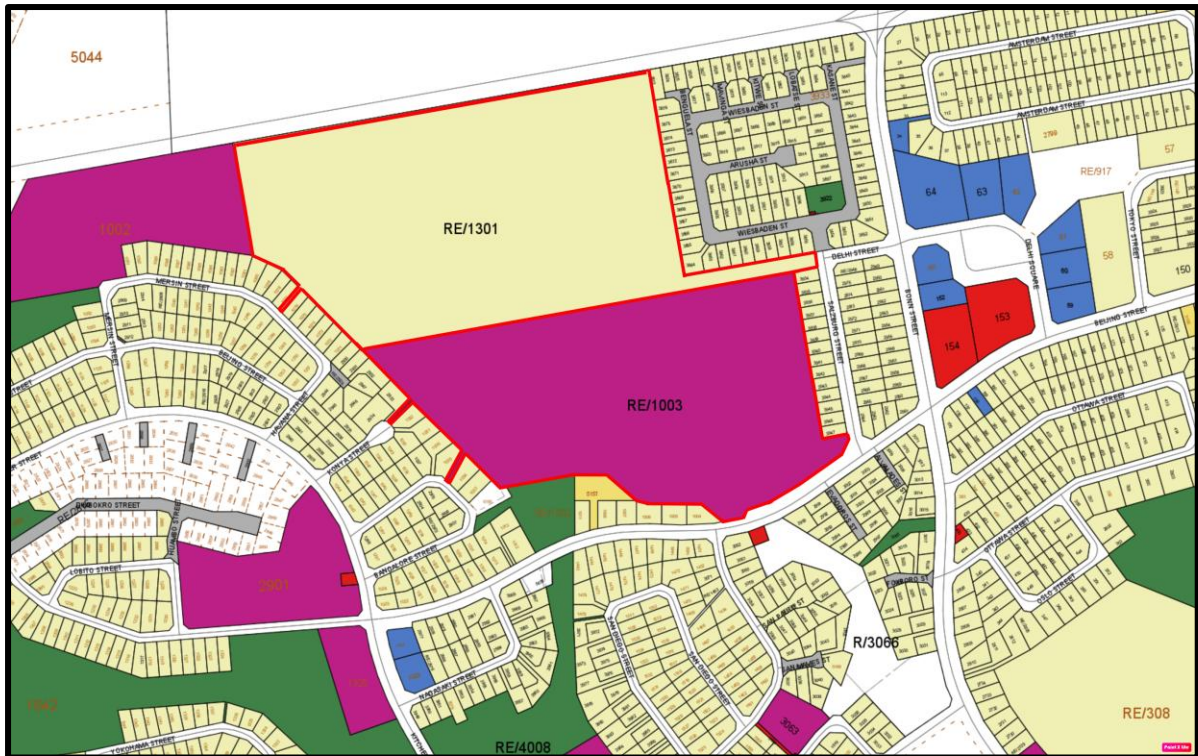


Figure 3: Surrounding Zonings

Figure 4 below shows the land use activities surrounding Erven RE/1003 and RE/1301, Otjomuise Extension 1. These land uses include the area local business node known as “the Otjomuise Shops” as well as dwelling units.



Figure 4: Land use activities surrounding the subject property

2.8. Development Description

Windhoek, the capital city of Namibia, is the largest urban centre in the country, and it also has the highest population, compared to other towns in the country. As such, there is a constant need to provide housing in Windhoek.

The property market in Windhoek has a variety of housing providers, including, but not limited to the Local Authority, Private Developers, Individuals and state owned enterprises such as NHE, all providing various housing typologies at various price levels, to individual in need of housing.

The NHE, as the national housing provider, mainly focuses on providing housing to the lower and middle income groups in Namibia, and it promotes home-ownership by being a customer-driven institution that provides housing solutions in order to alleviate the national housing need. Through the NHE's housing projects, by 2019, the NHE had developed 17113 houses nationwide, and the NHE wants to significantly increase this number, by increasing the amount of land development projects that it completes, with the end goal of exponentially increasing the amount of houses that it provides for Windhoek and the nation at large.

The site on which the proposed township is located, is highly suitable for the proposed development, and it will serve as an infill to the general neighbourhood of Otjomuise. The proposed development will provide much needed residential erven, which will assist the City of Windhoek in clearing its housing backlog, with a special aim of housing people from the low- to ultra-low-income groups.

The proposed development will allow for over 400 families to obtain housing, which will empower them socially and economically.

The National Housing Enterprise (NHE) was established by the NHE Act of 1993 with the objective of providing housing to low- and middle-income Namibian households by initiating and financing housing projects. It is against this background that the NHE appointed Kamau Town Planning and Development Specialists to undertake a township establishment on the subject properties. This township establishment will provide much needed housing to over 400 low income households, furthering the NHE's aim to achieve its mandate as the national housing provider.

2.9. Layout Informants

Following instructions from NHE, Kamau Town Planning and Development Specialists commenced with the layout for Erven RE/1003 and RE/1301, Otjomuise Extension 1 in Windhoek. The layout was informed by the following structuring elements:

- The river tributary on the western boundary of the site
- The need for the provision of affordable housing for the low-income bracket
- The topography in the area
- The Moses Garoeb road running adjacent north of the site (from which access to the site cannot be obtained)

The proposed layout has been designed to increase synergy with the surrounding developments within the Otjomuise neighbourhood. As such, the proposed township blends in with the surrounding area, and that it is in line with settlement design standards. The subject erven are mostly vacant, and this makes them ideal for the proposed greenfield development.

In order for the township establishment to be enabled, our office seeks approval for the following statutory steps, which are outlined in Paragraphs 2.9.1 – 2.9.5 below.

2.9.1. Rezoning of Erf RE/1301, Otjomuise Extension 1 from “Residential” to “Institutional”

The first step in this application, is the rezoning of RE/1301, Otjomuise Extension 1 from “Residential” to “Institutional”. The rezoning will ensure that both subject portions have a common zoning, which will legally enable the two properties to be consolidated. It should be noted that due to there being no bulk factor allocated to the “Institutional” zoning of Erf RE/1003, Otjomuise Extension 1, as outlined on its zoning certificate, the proposed rezoning of Erf RE/1301 also has no bulk factor attached to it, to match the zoning conditions for Erf RE/1003.

2.9.2. Consolidation of Erven RE/1003 and RE/1301 Otjomuise Extension 1, into Consolidated Erf X, Otjomuise Extension 1

Once the two properties have been assigned a common zoning, the two properties are intended to be consolidated, to create one large portion on which the township can be established.

The consolidation of the subject properties is outlined in **Table 2** below.

Erf No.	Size (m²)
Erf RE/1003, Otjomuise Extension 1	73,096
Erf RE/1301, Otjomuise Extension 1	90,103
Consolidated Erf X	163,199

Table 2: Proposed Consolidation

2.9.3. Rezoning of Consolidated Erf X, Otjomuise Extension 1 from “Institutional” to “Undetermined” for Township Establishment purposes

Once the erven have been consolidated, it will then be necessary to rezone the consolidated property to “Undetermined” for township establishment purposes.

2.9.4. Layout approval and Township Establishment on Consolidated Erf X, Otjomuise Extension 1

As outlined above, it is the intention of the National Housing Enterprise (NHE) to establish a township on approximately 16 hectares of relatively undeveloped land. The proposed township is a natural infill of the surrounding Otjomuise neighbourhood. The layout has a

legible grid-block layout as far as possible, which will allow the appointed Engineer to cost effectively install municipal services. The road network is also designed to permit easy vehicular traffic and pedestrian movement to take place.

The layout makes provision for 389 erven and the remainder streets, and majority of these erven will be used for “Residential” purposes. The layout makes provision for erven with a range of sizes, to ensure a variety in choice for those that will purchase the properties.

Single Residential Use Provision

There are 374 erven zoned for “Residential” in the proposed layout. These erven are reserved for single residential purposes. The largest residential erf measures 473m², while the smallest residential erf measures 200m², however the average size for the residential erven is 232m². It is important to note that this layout is meant to provide housing to the low- and ultra-low-income residents that are currently struggling to afford housing in the current housing market. This is why 346 out of the 374 residential erven created in this layout measure less than 300m² in extent. The provision of erven that measure less than 300m² in extent will give individuals a more affordable option, enabling them to forge a path to home ownership and economic growth. Additionally, our office has submitted an application to the Minister of Urban and Rural Development for permission to create residential erven smaller than 300m² in the proposed township (kindly see attached application).

General Residential Use Provision

The layout provides for 2 erven zoned for “General Residential” purposes. These erven measure 1930m² to 2188m² in extent. The general residential erven will allow for alternative housing typologies for people who do not wish, or cannot afford to live in freestanding homes. The provision of both single residential and general residential erven in the layout reinforces the settlement-making principles of choice and convenience, by providing a wide range of housing, for people with a wide range of housing needs.

Institutional Use Reservation

The layout proposes 1 erf which is zoned for “Institutional” purposes. This erf measures 1307 m² in extent, and it can be used for a wide range of uses as permitted in the Windhoek Zoning Scheme, such as Places of instruction, social halls and places of public worship. This property is located centrally within the township, in order for them to be conveniently accessed by the community, and to reinforce a sense of community at the centre of the proposed township.

Business Activities Reservation

The layout additionally makes provision for 3 business properties, which approximately measure 920m² on average. One of these business properties is located along Beijing Street, which is already a busy street in the general area of Otjomuise, and this means that the business activities that will be located there will benefit from the foot traffic that already exists in the area. The other two business property is located within the development to serve as a convenience shop for the residents. It should be noted that the site does not contain a very large business component, as the area locally known as the “Otjomuise Shops”, which is an area containing different business activities in Otjomuise, is located about 350m away

from the centre of the site. As such, the layout focuses on providing residential properties, as there is a strong presence of supporting land uses in the surrounding.

Municipal (Substations) Reservation

To comply with the comments submitted by the Electricity Department, the layout makes provision for five (5) properties which are zoned for “Municipal” purposes, and they will be used for electrical substations. These properties are located at the positions indicated by the department, and they measure approximately 17m² in extent.

Street Network

The township has a well-defined street network, which has streets that range from 13 metres to 15 metres in width. The streets are designed in a manner that promotes efficient traffic flow within the extension, with a large consideration to the amount of people who will walk there and those that will drive.

The layout’s proposed street network allows for future connection of the main street running across the layout from east to west. This possible connection is currently designed as a cul de sac, however in future, the street can be connected to Havana Street through to Kitchener Street. The dimensions of this possible connection (in metres) are outlined in Figures 6 and 7 below.

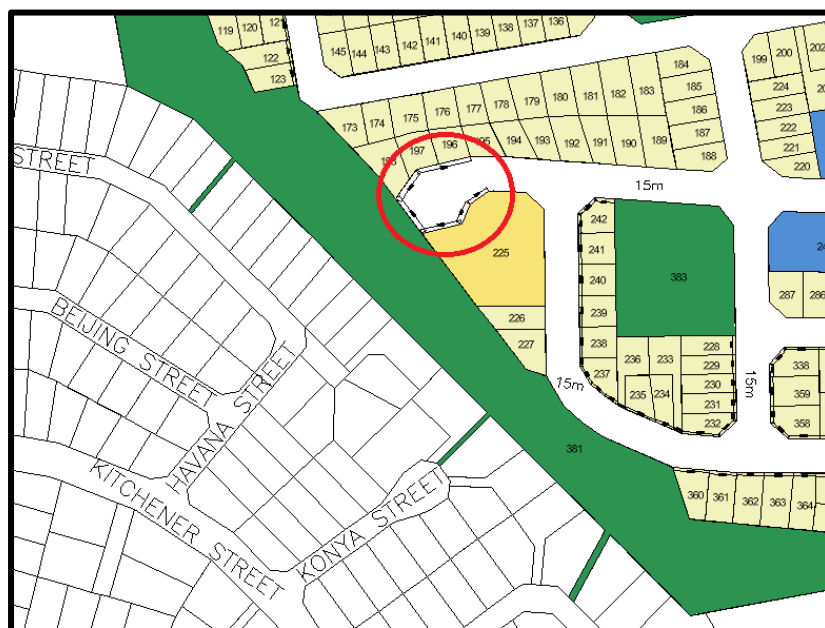


Figure 5: Cul de Sac

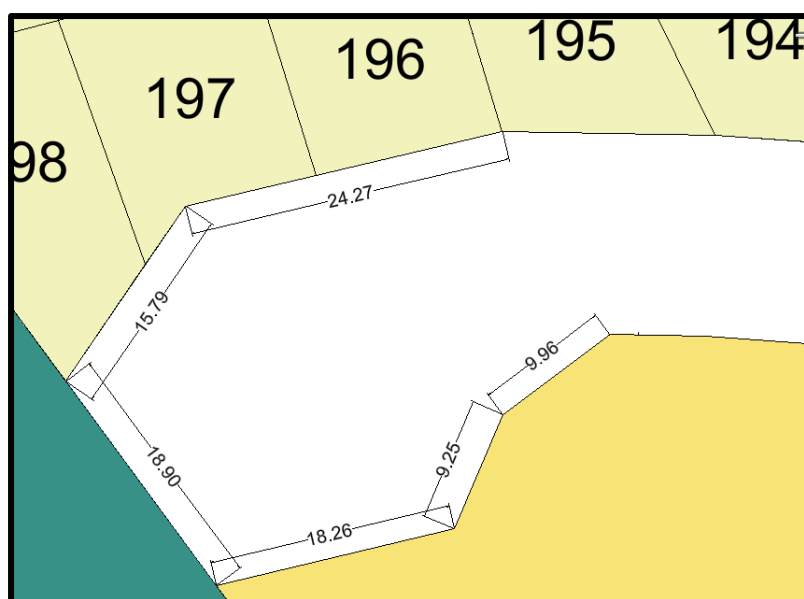


Figure 6: Cul de Sac dimensions

Public Space

The layout makes provision for four (4) public open spaces. The largest public open space (Erf 386), which runs along the western boundary of the site, accommodates a tributary which usually accommodates storm water run-off in the area. Erf 388 is a Public Open Space that accommodates an existing informal soccer field, which was also recommended by the Department of Parks and Recreation.

Table 4 below provides the land use summary for the proposed township establishment.

Summary Table				
Zoning	No. of Erven	Area (Sqm)	Area (Ha)	Percentage
Business	3	2761.51	0.28	1.69
General Residential	2	4119.29	0.41	2.52
Institutional	1	1307.21	0.13	0.80
Municipal	5	87.35	0.01	0.05
Residential	374	87068.00	8.71	53.35
Public Open Space	4	23469.62	2.35	14.38
Street	Remainder	44386.02	4.44	27.20
Total	389 & Rem	163199.00	16.32	100.00

Table 3: Land Use Summary

The proposed layout is depicted in **Figure 7** below.

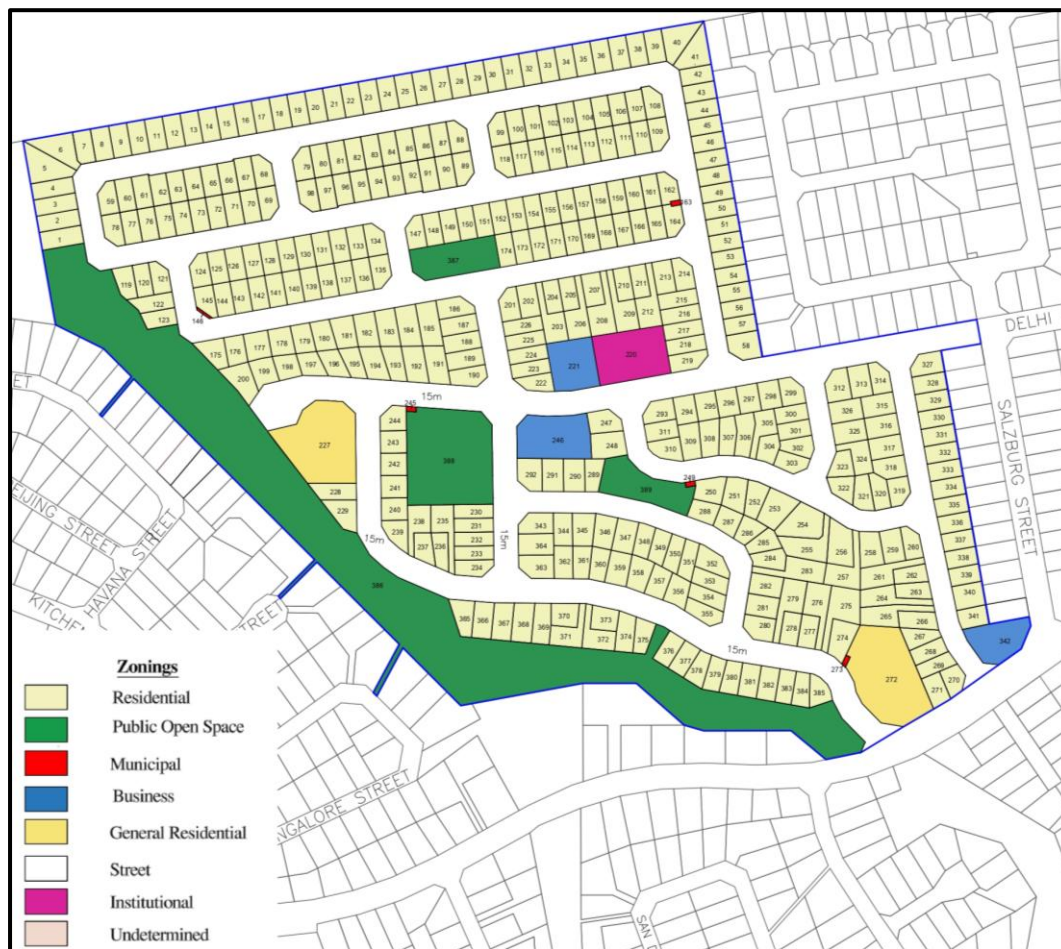


Figure 7: Proposed Layout

3. Roles and Responsibilities

The proponent (National Housing Enterprise) 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:

- Proponent's Representative.
- Environmental Control Officer; and
- Contractor (Construction and Operations and Maintenance).

3.1. Proponents Representative

The National Housing Enterprise should assign the responsibility of managing all aspects of this development for all development phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Proponent's Representative (PR). The National Housing Enterprise may decide to assign this role to one person for the full

duration of these developments, or may assign a different PR 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 PR's responsibilities are as follows:

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in Table 6 are obtained/adhered to.	• Throughout the lifecycle of these developments
Making sure that the relevant provisions detailed in Table 7 are addressed during planning and design phase.	• Planning and design phase
Monitoring the implementation of the EMP monthly	• Construction • Operation and maintenance
Suspending/evicting individuals and/or equipment not complying with the EMP	• Construction • Operation and maintenance
Issuing fines for contravening EMP provisions	• Construction • Operation and maintenance

Table 4: PR's responsibilities

3.2. Environmental Control Officer

The PR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the construction and operation and maintenance phases to an independent external consultant, referred to in this EMP as the Environmental Control Officer (ECO). The PR/ National Housing Enterprise may decide to assign this role to one person for both phases and 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 CR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting site inspections (recommended minimum frequency is weekly) of all construction and/or infrastructure maintenance areas with respect to the implementation of this EMP (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 PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review and bi-annual audit of the EMP and recommending additions and/or changes to this document.

3.3. Contractor

Contractors appointed by the National Housing Enterprise 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 8 applies to contractors appointed during the construction phase and Table 9 to those appointed during the operation and maintenance phase. 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.

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 6);
- Planning and design phase management actions (Table 7);
- Construction phase management actions (Table 8);
- Operation and maintenance phase management actions (Table 9); and
- Decommissioning phase management actions (Table 10).
- 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 proposed development. Kamau Town Planning and Development Specialists will not be held responsible for the potential consequences that may result from any alterations to the abovementioned layout.
- 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 6 below.

Table 5: Legislation applicable to proposed development

Legislation/Policy	Relevant Provision	Relevance to Project
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against “the degradation and destruction of	Sustainable development should be at the forefront of this development.

Legislation/Policy	Relevant Provision	Relevance to Project
	ecosystems and failure to protect the beauty and character of Namibia.” Article 95(l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources.	
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principle of Environmental Management	The development should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.	The following listed activities are triggered by the proposed development: Activity 5.1 (d) (Land Use and Development) Activity 8.8 (Water resource developments) Activity 10.1 (a) Infrastructure Activity 10.1 (b) Infrastructure Activity 10.2 (a) Infrastructure
Convention on Biological Diversity (1992)	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.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	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.
Namibia Vision 2030	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.
Water Act No. 54 of 1956	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.

Legislation/Policy	Relevant Provision	Relevance to Project
The Ministry of Environment, Forestry and Tourism (MEFT) Policy on HIV & AIDS	MEFT has recently developed a policy on HIV and AIDS. In addition, it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor must adhere to the guidelines provided to manage 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.
Township and Division of Land Ordinance 11 of 1963	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 are to be submitted to NAMPAB and Townships Board respectively.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development must comply with provisions of the Local Authorities Act.
Labour Act no. 11 of 2007	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.
National Heritage Act No. 27 of 2004	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.
Roads Ordinance 17 of 1972	- Section 3.1 deals with width of proclaimed roads and road reserve boundaries - Section 27.1 is concerned with the control of traffic on urban trunk and main roads - Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads - Section 37.1 deals with Infringements and obstructions on and interference with proclaimed roads.	Adhere to all applicable provisions of the Roads Ordinance.

Legislation/Policy	Relevant Provision	Relevance to Project
Public and Environmental Health Act of 2015	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 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).	Contractors and users of the proposed development are to comply with these legal requirements.
Nature Conservation Ordinance no. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants.	Indigenous and protected plants must be managed within the legal confines.
Water Quality Guidelines for Drinking Water and Wastewater Treatment	Details specific quantities in terms of water quality determinants, which wastewater should be treated to before being discharged into the environment	These guidelines are to be applied when dealing with water and waste treatment.
Environmental Assessment Policy of Namibia (1995)	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
Water Resources Management Act No. 11 of 2013	Part 12 deals with the control and protection of groundwater Part 13 deals with water pollution control	The pollution of water resources should be avoided during construction and operation of the development. Should water need to be abstracted, a water abstraction permit will be required from the Ministry of Water, Agriculture and Forestry.
Forest Act 12 of 2001 and Forest Regulations of 2015	To provide for the establishment of a Forestry	Protected tree and plant species as per the Forest Act No

Legislation/Policy	Relevant Provision	Relevance to Project
	Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and the control and management of forest fires; to repeal the Preservation of Bees and Honey Proclamation, 1923 (Proclamation No. 1 of 1923), Preservation of Trees and Forests Ordinance, 1952 (Ordinance No. 37 of 1952) and the Forest Act, 1968 (Act No. 72 of 1968); and to deal with incidental matters.	12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Department of Forestry.
Atmospheric Pollution Prevention Ordinance No 45 of 1965	Part II - control of noxious or offensive gases, Part III - atmospheric pollution by smoke, Part IV - dust control, and Part V - air pollution by fumes emitted by vehicles.	The development should consider the provisions outlined in the act. The proponent should apply for an Air Emissions permit from the Ministry of Health and Social Services (if needed).
Hazardous Substance Ordinance 14 of 1974	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	The handling, usage and storage of hazardous substances on site should be carefully controlled according to this Ordinance.
Soil Conservation Act No 76 of 1969	Act to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of	The proposed activity should ensure that soil erosion and soil pollution is avoided during construction and operation.

Legislation/Policy	Relevant Provision	Relevance to Project
	use of the soil and vegetation and the protection of the water sources.	

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 development starts.

Table 6: Planning and design management actions

Aspect	Management Actions
Visual Impacts	- It is recommended that more 'green' technologies be implemented within the architectural designs and building materials of the development where possible to minimise the visual prominence of such a development within the more natural surrounding landscape. - Natural colours and building materials such as wood and stone should be incorporated as well as the use of indigenous vegetation to help beautify the development. - 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).
Stormwater	Stormwater runoff should be accommodated within the street creation to ensure that the natural flow of water is not disturbed.
Existing Service Infrastructure	- It is recommended that the subject area should be connected to the existing services. - An investigation by an engineer is to be done to determine whether the existing services would be sufficient for the additional number of portions.
Flora and Fauna (Biodiversity)	- Do not clear cut the entire development site, but rather keep the few individual trees/shrubs not directly affecting the developments as part of the landscaping. - Protected trees are not to be removed without a valid permit from the Department of Forestry.

4.4. Construction Phase

The management actions listed in Table 8 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 7: 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:	Contractor, CR

Environmental Feature	Impact	Management Actions	Responsible Person
		• Explanation of the importance of complying with the EMP. • Discussion of the potential environmental impacts of construction activities. • Employees' roles and responsibilities, including emergency preparedness. • Explanation of the mitigation measures that must be implemented when work groups carry out their respective activities.	
Conservation of vegetation	Loss of biodiversity	• The layout and development design should incorporate existing trees¹. • The Contractor should compile a Plant Management Plan which should include the following as a minimum: ○ Trees to be preserved should be marked with paint (or other means to be readily visible) and protected. ○ Prevent the destruction of protected and endemic plant species. If trees with stem diameter > 20mm be found within the development site, it should be conserved and be made part of the development. ○ Trees, which are impossible to conserve, need to be identified and. ○ The Contractor should apply to the local authority for a permit to remove these trees (prior to removing them). ○ Special protection should be accorded to the protected endemic species, which are to be found within the development area (As per the Forest Act 12 of 2001	Contractor

¹ a "tree" is defined as an indigenous woody perennial plant with a trunk diameter ≥150 mm.

Environmental Feature	Impact	Management Actions	Responsible Person
		and Forest Regulations of 2015). ○ Each tree that is removed needs to be replaced with an indigenous tree species after construction. ○ Some of these trees can be obtained at the National Botanical Research Institute (NBRI) or at a commercial nursery. ● Only a limited width +/- 5 m on the side of roads may be partially cleared of vegetation. ● Workers are prohibited from collecting wood or other plant products on or near work sites. ● No alien species may be planted on or near work areas.	
Lay-down areas and materials camp	Loss of biodiversity	Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the PR and the following should be considered in selecting these sites: ● The areas designated for the services infrastructure should be used as far possible. ● Second option should be degraded land. ● Avoid sensitive areas (e.g. rivers/drainage lines).	Contractor and PR
Hazardous waste	Contamination of surface and groundwater sources.	● All heavy construction vehicles and equipment on site should be provided with a drip tray. ● All heavy construction vehicles should be maintained regularly to prevent oil leakages. ● Maintenance and washing of construction vehicles should take place only at a designated workshop area and should not take place on open soil.	Contractor
Water, Sewage, and grey water	Contamination of surface and groundwater sources and water wasting	● 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	● Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		parasite and bacterial proliferation. • Grey water should be recycled: ○ Used for dust suppression. ○ Used to water a vegetable garden, or to support a small nursery. ○ Used (reused) to clean equipment. • Grey water that is not recycled should be removed on a regular basis. • No dumping of waste products of any kind in or near water bodies. • 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. • Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. • Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles. • Contaminated runoff from the construction sites should be prevented from entering the surface and ground water bodies. • All materials on the construction site should be properly stored. • 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. • Washing of personnel or any equipment should not be	

Environmental Feature	Impact	Management Actions	Responsible Person
		allowed on site. 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.	
General waste	Visual impact and soil contamination	• The construction site should be always kept tidy. • All domestic and general construction waste produced daily should be cleaned and contained daily. • No waste may be buried or burned. • Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site. • All recyclable waste needs to be taken to the nearest recycling depot where practical. • Enough separate bins for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. • Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter. • No waste may remain on site after the completion of the project. • Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts;	Contractor
Topsoil	Loss of topsoil and associated opportunity costs	• When excavations are carried out, topsoil ² should be stockpiled in a demarcated area. • Stockpiled topsoil should be used to rehabilitate post-construction degraded areas	Contractor

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

Environmental Feature	Impact	Management Actions	Responsible Person
		and/or other nearby degraded areas if such an area is located a reasonable distance from the stockpile.	
Rehabilitation	Visual impact	• 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). • If no post-construction uses are requested, all excavated/degraded areas need to be rehabilitated as follows: ○ 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. ○ Rehabilitated excavated areas need to match the contours of the existing landscape. ○ The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of re-vegetation and reduces the chances of potential erosion. ○ Topsoil is to be spread across excavated areas evenly. ○ Deep ripping of areas to be rehabilitated is required, not just simple scarification, to enable rip lines to hold water after heavy rainfall. ○ Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion.	Contractor, CR
Road safety	Injury or loss of life	• Demarcate roads to be used by construction vehicles clearly. • Off-road driving should not be allowed.	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		• All vehicles that transport materials to and from the site must be roadworthy. • Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. • Loads upon vehicles should be properly secured to avoid items falling off the vehicle.	
Safety around work sites	Injury or loss of life	• Excavations should be left open for the shortest time possible. • 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. • Demarcate excavated areas and topsoil stockpiles with danger tape. • All building materials and equipment are to be stored only within set out and demarcated work areas. • Comply with all waste related management actions stated above in this table.	Contractor
Ablutions	Noncompliance with Health and Safety Regulations	• Separate toilets should be available for men and women and should clearly be indicated as such. • Portable toilets (i.e. easily transportable) should be available at every construction site: ○ 1 toilet for every 15 females. ○ 1 toilet for every 30 males. ○ Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site in Windhoek. ○ Alternatively, sewage may be pumped into sealable containers and stored until it can be removed. ○ Workers responsible for cleaning the toilets should be provided with	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		environmentally friendly detergents, latex gloves, and masks.	
Open fires	Injury or loss of life	No open fires may be made anywhere on site.	Contractor
General health and safety	Injury or loss of life	- 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. - All workers should have access to the relevant personal protective equipment (PPE). - Sufficient potable water reserves should be always available to workers. - No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). - No workers should be allowed to drink alcohol during work hours. - No workers should be allowed on site if under the influence of alcohol. - Building rubble and domestic waste should be stored in skips. - Condoms should be accessible/available to all construction workers. - Access to Antiretroviral medication should be facilitated.	Contractor
Dust	Nuisance and health impacts	- 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. - The use of waterless dust suppression means (e.g. lignosulphonate products such as Dustex) should be considered.	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		• Cover any stockpiles with plastic to minimise windblown dust. • Dust protection masks should be provided to workers if they complain about dust. • Vehicles travelling to and from the construction site must adhere to the speed limits to avoid producing excessive dust. A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas.	
Noise	Nuisance impacts	Work hours should be restricted to between 08h00 and 17h00 and 7:30 – 13:00 on Saturdays 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. • Provide ear plugs and earmuffs to staff undertaking the noisy activity or working within proximity thereof or alternatively, all construction workers should be equipped with ear protection equipment.	Contractor
Recruitment of labourers	Negative conflict regarding recruitment	The Contractor should adhere to the below provision as a minimum for the recruitment of labour: • 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.). • Recruitment should not take place at construction sites. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures.	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		- Contractors should give preference in terms of recruitment of subcontractors and individual labourers to those who are qualified and from the Windhoek project area and only then look to surrounding towns. - Clearly explain to all jobseekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.	
Communication plan	Negative conflict with I&APs	The Contractor or proponent should draft a Communication Plan, which should outline as a minimum the following: - How Interested and Affected Parties (I&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. - How these I&APs will be consulted on an ongoing basis. - 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.	Contractor
General communication	Negative conflict with I&APs	- The PR must appoint an ECO to liaise between the Contractor, I&APs, Developer. - The Contractor shall at every monthly site meeting report on the status of the implementation of all provisions of the EMP. - The Contractor should implement the EMP awareness training as stipulated above in this table.	Contractor, ECO, CR

Environmental Feature	Impact	Management Actions	Responsible Person
		• The Contractor must list the I&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 PR before construction commences. • The Communication Plan, once agreed upon by the Developer, shall be legally binding. • All communication with the I&APs must take place through the ECO. • A copy of the EMP must be available at the site office and should be accessible to all I&APs. • Key representatives from the abovementioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding project progress. • The Contractor should liaise with the Developer regarding all issues related to community consultation and negotiation before construction commences. • A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. • All people on the I&APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the PR prior to the commencement of construction activities.	
Archaeology	Loss of heritage resources	• Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a “chance find”	• Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		procedure should be applied in the order they appear below: ○ If operating machinery or equipment, stop work; ○ Demarcate the site with danger tape; ○ Determine GPS position if possible; o Report findings to the construction foreman; ○ Report findings, site location and actions taken to superintendent; ○ Cease any works in immediate vicinity; ○ Visit site and determine whether work can proceed without damage to findings; ○ Determine and demarcate exclusion boundary; ○ Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; ○ Inspect site and confirm addition to project GIS; ○ Advise the National Heritage Council of Namibia (NHCN) and request written permission to remove findings from work area; and ○ Recovery, packaging and labelling of findings for transfer to National Museum. ● Should human remains be found, the following actions will be required: ○ Apply the chance find procedure as described above; ○ Schedule a field inspection with an archaeologist to confirm that remains are human; ○ Advise and liaise with the NHCN and Police; and	

Environmental Feature	Impact	Management Actions	Responsible Person
		Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.	

4.5. Operation and Maintenance Phase

The management actions included in Table 9 below apply during the operation and maintenance phase of these developments.

Table 8: 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 streets 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 channelled 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	The proponent should consult with a view to incorporate the relevant local/national/international development guidelines which addresses the following: - The incorporation of indigenous vegetation into the development. - To mark the area with appropriate road warning signs (e.g. the road curves to the left/right) 'green' technologies should be implemented within the architectural designs and building materials of the development where possible to minimise the visual prominence of such a development within the more natural surrounding landscape. - keep existing trees, introduce tall indigenous trees; keep structures unpainted and minimising large advertising billboards. - No illegal dumping of waste should be allowed.	Proponent

Environmental Feature	Impact	Management Actions	Person Responsible
Noise	Nuisance impacts	No activity having a potential noise impact should be allowed after 18:00 hours if possible. - Do not allow commercial activities that generate excessive noise levels. - Continuous monitoring of noise levels should be conducted to make sure the noise levels does not exceed acceptable limits.	Proponent
Socio-Economic	Social Impacts	The local community be consulted in terms of possible job creation opportunities and must be given priority if unspecialised job vacancies are available.	Proponent

4.6. Decommissioning Phase

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

Table 10: Decommissioning phase management actions

Table 9: Decommissioning phase management actions

Environmental Feature	Management Actions
Decommissioning activity	Many of the mitigation measures prescribed for construction activity for these developments (Table 8 above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.

5. Conclusion

The management actions included in this report aim to assist in the avoidance, management and/or mitigation of potential impacts on the environment that may result from the proposed activities. Should the measures recommended in this EMP be implemented and monitored, Kamau Town Planning and Development Specialists is confident that the risks identified in the FESR can be reduced to acceptable levels.

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