

**ENVIRONMENTAL IMPACT ASSESSMENT**

**PROPOSED GOREANGAB EXTENSION 6 AND 7 TOWNSHIP ESTABLISHMENT IN WINDHOEK**



JANUARY 2024

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## **EXECUTIVE SUMMARY**

The City of Windhoek is proposing to formalise an informal settlement in Windhoek known as Thlabanelo, into the Goreangab Extension 6 & 7 Township. The proponent intends to provide security of tenure and access to basic services for the proposed township. The predominant land use as shown on the attached layout plan is “Residential” supported by other complimentary land uses such as Public Open Space, Business (local supermarket or shop) and General Residential.

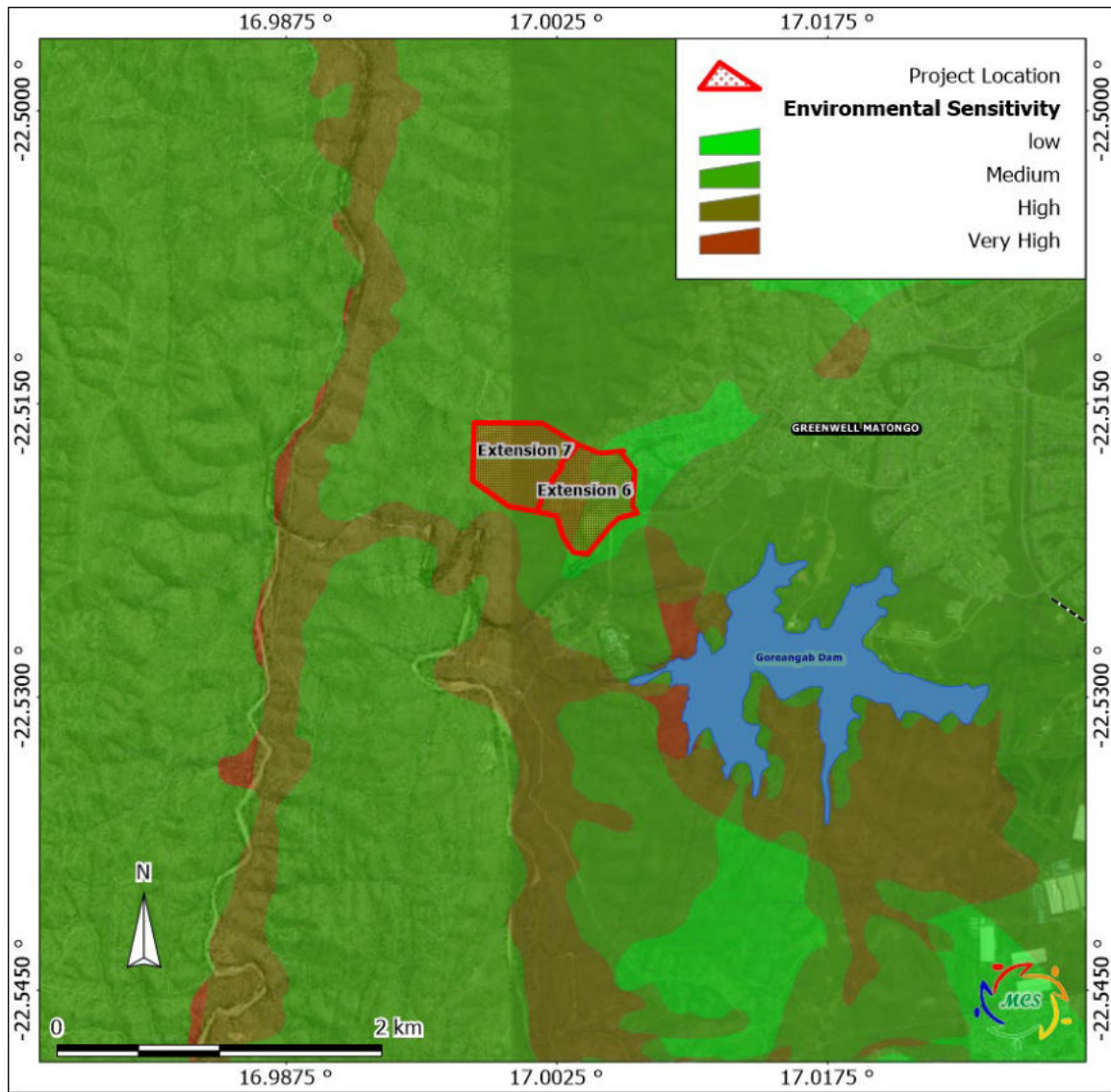
The Environmental Management Act No.7 of 2007 stipulates that township developments be subjected to Environmental Impact Assessments (EIA). Matrix Consulting Services, an independent consultant, has been appointed by City of Windhoek to undertake an Environmental Impact Assessment on the development / servicing of Goreangab Extension 6 & 7 Township, in Windhoek. According to City of Windhoek Environmental Structure Plan of 2004:

The control zones are based upon the following;

- The critical sensitivity of the southern Windhoek aquifer.
- The sensitivity of the catchment of the Goreangab Dam, and surface water resources, including rivers and streams throughout Windhoek.
- The sensitivity of the environment or a specific critical environmental component.
- The relative importance of the ‘sense of place’ or the specific character of Windhoek determined through resident participation, which includes topography and landscape quality as well as cultural / historical resources.
- The need to protect open space in Windhoek, which includes the river and aquatic systems, as well as the ridgelines, hills and mountains, and natural areas surrounding the city.
- The need to protect, manage and conserve sensitive natural vegetation cover

The study area falls within low to high environmental sensitivity zone. This means that the environmental consequences of the proposed development in that area can be significant, and needs careful environmental management to prevent pollution of the groundwater resource. Due to the high environmental sensitivity status of the project area, no wet industries development is intended for that area.





**Figure 1. Environmental control zones**

All known environmental and social risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that environmental performance be monitored regularly to ensure compliance and that corrective measures be taken if necessary. It is also recommended that this information be made available to the surrounding communities on a regular basis.

In general, the proposed Goreangab Extension 6 & 7 township project would pose limited environmental risks, provided the EMP for the activity is used properly during planning, construction and operational phase. Due to the occurrence of faults within the study area, the consultant recommends that no wet industries should be approved for this area. No potentially polluted liquid waste generating industries shall be placed within the new township development. This area is only suitable for residential and light/dry industries that do not produce polluted liquids in any form. The Environmental Management Plan should be used as an on-site tool during

all phases of the township project. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

Should the proposed township establishment project be modified or extended to a different area, it is recommended that a different EIA be done for the probable new location or extension.



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<b>Appendix F</b>	<b>Newspaper adverts / Public Meeting Registry</b>

## List of Abbreviations

<b>EIA</b>	Environmental Impact Assessment
<b>EMP</b>	Environmental Management Plan
<b>EMA</b>	Environmental Management Act
<b>EMS</b>	Environmental Management System
<b>ESA</b>	Environmental Scoping Assessment
<b>I&amp;Aps</b>	Interested and Affected Parties
<b>PPPPs</b>	Projects, Plans, Programmes and Policies



## **PROJECT DETAILS**

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### **TEAM MEMBERS**

<b>NAME</b>	<b>POSITION</b>	<b>COMPANY</b>
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**REPORT STATUS:** **FINAL**

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# 1. BACKGROUND AND INTRODUCTION

The City of Windhoek intends to develop the new Goreangab Extension 6 & 7 Township in Windhoek, Khomas region. The proposed development is aimed at addressing the residential erven shortage in the Windhoek. The proposed development will offer residential, business, institutional and municipal erven in the City. Bulk services and infrastructure that will be installed include provision of sewage, water, electricity, stormwater management and roads.

Matrix Consulting Services, an independent consultant, has been appointed by City of Windhoek to undertake an Environmental Impact Assessment (EIA) on the development/servicing of the new Goreangab Extension 6 & 7 township establishment, in the northwestern outskirts of Windhoek.

An assessment will be undertaken to determine the potential impact of the development on the environment and to determine all safety, health and social impacts associated with the proposed development activities. The project location is indicated in Figure 2 below.

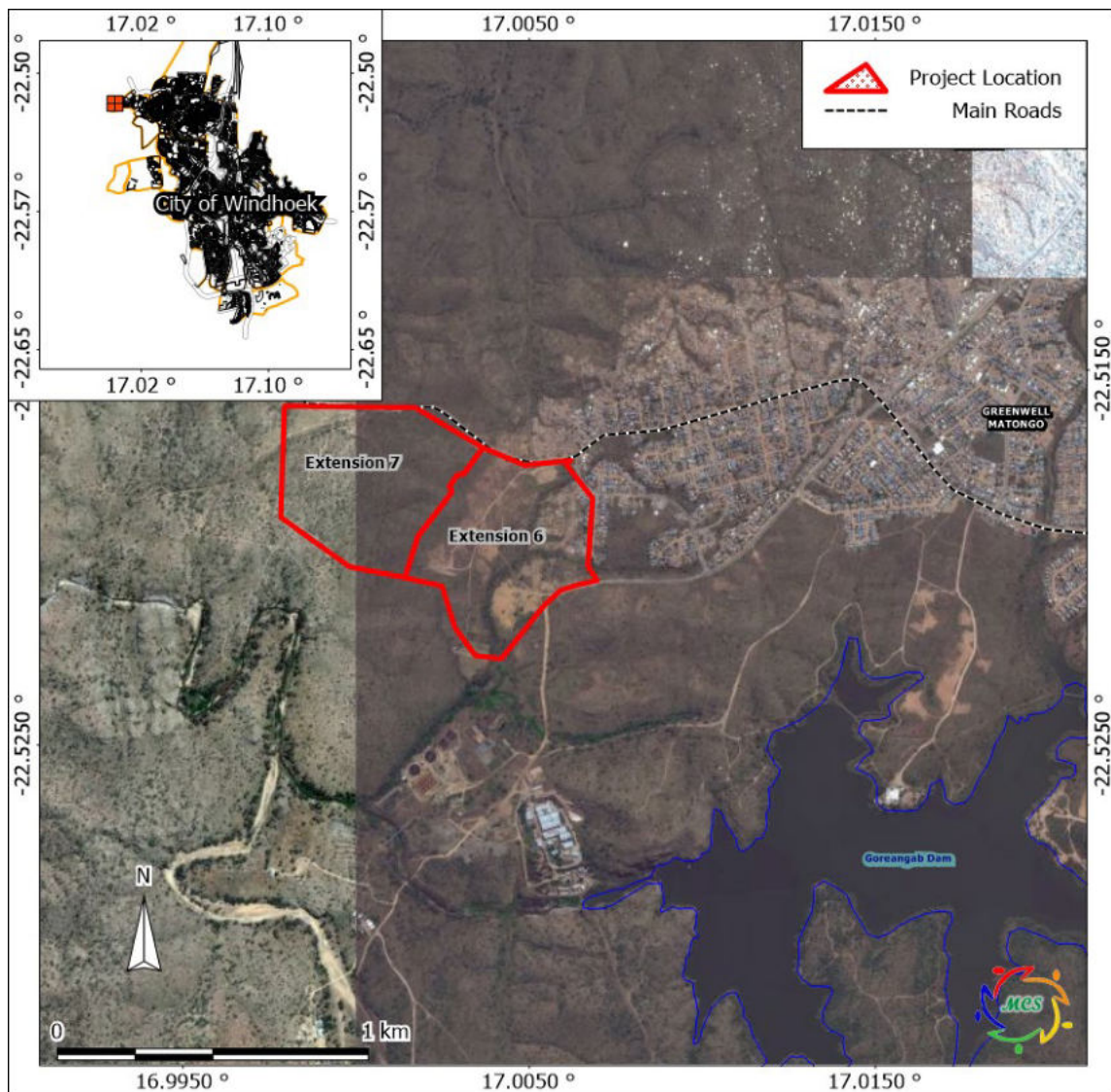


Figure 2. Location Map





The environmental assessment will be conducted as per Namibia's Environmental Assessment Policy and the Environmental Management Act No.7 of 2007 and its regulations of 2012.

The proposed land to be developed is currently informal settlement and the City of Windhoek wishes to apply for the rezoning of this portion and formalise it into Goreangab Extension 6 & 7 Township, at the same time maintaining the sensitive environmental setting of the area e.g. vegetation, groundwater etc.

This project was registered with the Ministry of Environment and Tourism (MET), as per Environmental Management Act No 7 of 2007 requirements (see appendix I).

## **2. TERMS OF REFERENCE**

The City of Windhoek has commissioned an Environmental Impact Assessment (EIA) for the proposed Goreangab Extension 6 & 7 township project, in Windhoek. The proposed township is one of the development mechanism projects that the City of Windhoek has engaged to address serviced land scarcity in Windhoek. The proposed township is located at 22.51794°S; 17.00452°E.

Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment of the proposed new Goreangab township development. This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts and that they are mitigated. The environmental impact assessment was conducted to comply with the Environmental Assessment Policy (1995) and the Environmental Management Act (2007).



### 3. PROJECT INFORMATION

#### 3.1 Project Rationale

The City of Windhoek is currently experiencing a scarcity of developable land for residential use and therefore initiated this project to formalise the existing Thlabanelo informal settlement into the Goreangab Extension 6 & 7 Township. The need for the project relate to the strategic plans of the City of Windhoek to avail serviced residential ervens.

The proposed project will provide formal residential to general residential, business, municipal, institutional ervens, streets and public open spaces. Other associated land uses of the township development are related to provision of bulk services. The development will therefore not only benefit the future occupants but also the surrounding areas by providing necessary facilities, potential jobs and social services that are not currently in place

The proposed development is desirable from the perspective of availability and proximity of engineering bulk services, compatibility with adjacent projects, accessibility, size and locality. The proposed development will also create employment, both during the construction and operational phase.

The proposed township will be serviced to ensure the provision of all municipal services, such as water, sewerage, roads and electricity.

#### **Other Potential spin-offs from the development of the proposed township:**

- ❖ Potential revenue generation from the sale of ervens by the City of Windhoek.
- ❖ Reduced serviced land scarcity in Windhoek. Creation of job opportunities, training and skills development during construction and operational phase. It is estimated that the new jobs will improve the livelihoods of the workers and their families. Given that the unemployment rate of 35 to 40% in the region, this in itself is regarded as a significant benefit to the socio-economic situation in the region (2011, Population and Housing Census, Khomas Region).
- ❖ Provision of housing and community facilities.
- ❖ Impact on health and safety of residents by developing the Goreangab Extension 6 & 7 Township.
- ❖ Change the sense of the place of the area from undeveloped townland to a formal township.
- ❖ Increase in economic opportunities in the area.



- ❖ General enhancement of the quality of life in the Khomas Region and the surrounding area, should the project be economically viable.

#### 4. TOWNSHIP DEVELOPMENT ACTIVITIES

The total project covers an area of approximately ±72 hectares in extent and are currently an informal settlement (known as Thlabanelo).

##### 4.1 Current land-use of the Township

The proposed project site (Extensions 6 & 7) is situated in an already existing informal settlement (known as Thlabanelo) located on Farm 1012 which is home to approximately 1900 households. The prevailing land use ranges from residential, businesses and sport facilities. the site has been inhabited by the informal settlers for a number of years.



Photo 1. Proposed Extension 6



Photo 2. Proposed Extension 7



Photo 3. Illegal waste dumping



Photo 4. Polluted riverbeds

## **4.2 Proposed land-use of the Township**

The proposed development is aimed at addressing serviced land scarcity in Windhoek. Formalising these informal settlements will provide security of tenure and access to basic services. The surrounding existing bulk services makes the site desirable for the proposed development. The predominant land use as shown on the attached layout plan is “Residential” supported by other complimentary land uses such as Private open space, Public open space, Municipal (local open market) and General Residential.

The development will be accessible from two (2) access points one from the 40m wide street that connects to Green Mountain Dam Road and the other from Matshitshi Street. The street layout comprises collectors and internal access streets which vary in size sliding from 20 to 15 meters wide.

The proposed statutory procedures will allow the City of Windhoek to formalise an informal settlement (known as Thlabanelo) located on Farm 1012 which is home to approximately 1900 households. The prevailing land use ranges from residential, businesses and sport facilities. Table 1 and Table 2 below provides a summation of the proposed land uses of the proposed township development.

- **Single Residential**

The proposed layout is predominantly residential. A total of 209 single residential erven are provided in the layout which vary in size from 260m<sup>2</sup> to 619m<sup>2</sup>. It is proposed that, all single residential erven be zoned “Residential” with a density of One Dwelling Unit per 250 m<sup>2</sup> (1:250). In line with the Development and Upgrading Policy the erven are less than 300 m<sup>2</sup> in order to accommodate more people since the area is already inhabited.

- **General Residential**

The layout provides for General Residential erven that will accommodate 17% of the population. In order to maximize convenience and widen scope for choice, the General Residential zoned erven are strategically located closer to the business erven and major movement networks. The close proximity to major movement networks allows for easy traffic flow considering the number of people that will be accommodated on the general residential erven. These two general residential erven are equally located in close proximity to the Public Open Space situated on Remainder 1012 which will accommodate the sports field. Given the compact nature of high-density housing, public open spaces are natural expansions for leisure activities that cannot be provide for on-site.



- **Business**

It is clear that there are various business activities currently taking place at the project site. The development makes provision for some business erven which will cater for the business needs of the community. These business erven are centrally located to serve both Portion A and Remainder 1012. The “Business” zoned erven carry a bulk factor of 0.4, on-site parking will be provided as stipulated in the Windhoek Town Planning Scheme.

- **Institutional**

“Institutional” Erven are provided to serve social needs of the residents in the. These Erven are placed within various neighbourhood cells to ensure easy access by pedestrians. Some of the institutional Erven are located along traffic intersections to form focal points.

- **Municipal**

“Municipal” zoned Erven are proposed for the purpose of accommodating municipal activities or services in line with requirements put forward by service departments.

- **Public Open Space**

The layout provides for public open spaces, of which majority of these are reserved to accommodate a number of watercourses that traverse the area mostly in south-westerly and southerly direction. In addition to the primary function, the erven that accommodate the watercourse can be developed into creative public spaces (walking or jogging trails etc). The layout further makes provision for one public open space that can be developed into a neighbourhood park.

- **Street**

The proposed development will be accessed through two vehicular access point and several pedestrian access ways. One of the vehicle access points provide the residents an opportunity to access the development from either Matshitshi street or the 40m wide street that connects to Green Mountain Dam Road. The internal street network is designed with two street hierarchy, collectors with a street width of 20m and internal streets with a width of 13m.

The layout further accommodates a portion of the proposed major arterial road (60m wide) which connects the developments at Farm Ongos and beyond to



Sam Nujoma Drive. This arterial provides these developments an alternative link to the CBD and other parts of Windhoek.

The proposed layout of the Goreangab Extension 6 & 7 township is illustrated in Figures 3 to 6 below.

**Table 1.** Summation of Land Uses - Goreangab Extension 6 Township

Land Use	Total Number of Erven	Potential # of dwelling units	Estimated population @ an average household size of 3.8 (2020)
Residential @ 1:250	133	133	505
General Residential @ 1:150	3	67	254
Municipal	3		
Private Open Space	1		
Public Open Space	4		
<b>TOTAL</b>	<b>145 (erven)</b>	<b>200 (dwelling units)</b>	<b>759 (people)</b>



Erf Zoning	No of Erven	Average Erf Size (sqm)
Residential	133	327
General Residential	3	3459
Municipal	3	2631
Private open space	1	17403
Public open Space	5	8636
<b>Total No of Erven</b>	<b>145</b>	

REV.	DATE	DRAWN	CHECKED
CARD EX:			
FILE:			
DESIGNED BY: Sylvanus		DATE 2021	
CHECKED: Kakero		DATE 2021	
HUMAN SETTLEMENT		DATE	

**Figure 3.** Township Layout plan - Goreangab Extension 6



**Table 2.** Summation of Land Uses - Goreangab Extension 7 Township

Land Use	Total Number of Erven	Potential # of dwelling units	Estimated population @ an average household size of 3.8 (2020)
Residential @ 1:250	209	209	794
General Residential @ 1:150	2	43	163
Business @ bulk of 0.4	4		
Undetermined	1		
Public Open Space	8		
Street	2		
<b>TOTAL</b>	<b>226</b> (erven)	<b>252</b> (dwelling units)	<b>957</b> (people)



Erf Zoning	No of Erven	Average Size (sqm)
Residential	216	340
General Residential	2	3344
Business	4	1330
Undetermined	1	25636
Public open Space	8	4820
Street	2	
<b>Total No of Erven</b>	<b>227</b>	



REV.	DATE	DRAWN	CHECKED
CARDEX:			
FILE:			
 City of Winnebush		DESIGNED BY:	DATE
		Sylvanus	2021
		CHECKED:	DATE
Kakero	2021		
HUMAN SETTLEMENT		DATE	

**Figure 4.** Township Layout plan - Goreangab Extension 7



The proposed township establishment requires the installation of supporting bulk services infrastructure, and will be serviced in accordance with City of Windhoek regulations. The bulk services required for the construction of the development will include the following:

**Sewage:** A full waterborne sewage system is proposed for all erven. Excavations for sewer pipelines will have the maximum depth of 2.8m. Sewage generated from the proposed development will be pumped to the Gammams Waste Water Treatment Works. The bulk sewer network has sufficient capacity to cope with the demand.

**Water:** City of Windhoek will provide the water for the proposed development from the existing Namwater/City of Windhoek reservoirs. Water will be provided by connecting to the existing bulk water main system in the area. Excavation for water pipelines will be  $\pm 1.2\text{m}$ , with soil cover of a minimum 600mm.

**Electricity (11kV):** The development will be supplied from the existing Nampower/City of Windhoek grid. Power will be connected to the ring network via underground cables from the Substations. Excavations for electrical cables will be  $\pm 1.0\text{m}$ , with soil cover of a minimum 600mm.

**Storm water Management System:** Provision will be made for stormwater attenuation to reduce the increase in stormwater run-off resulting from the development compared to pre-development phase, through the incorporation of storm water management system.

**Roads:** Access to the area will mainly be from the traffic along Matshishi Street and Green Mountain Dam Road (and other access nearby streets).

**Waste:** City of Windhoek waste removal contractors (e.g. Rent a Drum, Kleen Tek, Salute Trading etc) will remove domestic waste.

#### 4.2.1 Construction Activities

- Transporting relevant building material and equipment.
- Installation of associated electrical supply cables.
- Installation of associated water pipelines.
- Installation of associated sewer lines.
- Installation of storm water management system
- Roads construction
- Land clearance





The need to establish burrow pits and possible locations thereof for this project is unknown at present. As a result, this activity does not form part of this EIA.

#### **4.2.2 Operational Activities**

Operation and maintenance of the sewer, water, electrical services and roads.

#### **4.2.3 Housing**

Should a construction camp be necessary, it should be located in such a way that it does not pose a risk to the public.

#### **4.2.4 Access Road**

The site will be accessed using various streets and roads.

#### **4.2.5 Waste Management**

All waste generated at the site will be collected in plastic or steel drums and removed from site and disposed at Kupferberg Landfill. Hazardous waste will be collected and stored separately, and disposed off at an appropriate hazardous waste cell at Kupferberg landfill.

Mobile toilets will be used by the contractors during the construction phase respectively. The waste must be disposed off at Gammams Waste Water Treatment Works.

#### **4.2.6 Site Rehabilitation**

After the construction is complete, the site will be cleared of all chemical and hydrocarbon spills, pipe cuttings, electrical cuttings etc. Excavations for bulk services will need to be covered and levelled properly.

## **5. ENVIRONMENTAL STUDY REQUIREMENTS**

According to the Environmental Management Act no. 7 of 2007 the proponent requires an environmental clearance certificate from the Ministry of Environment and Tourism (Department of Environmental Affairs) to develop the township establishment, in Khomas Region.

The environmental certificate means that the Ministry of Environment and Tourism is satisfied that the activity in question will not have an unduly negative impact on the environment. It may set conditions for the activity to prevent or to minimise harmful impacts on the environment.



The proposed development is listed as a project requiring an environmental assessment as per the following listed activities in the Environmental Management Act no 7 of 2007 and its Guidelines (06 February 2012):

**Table 3. List of activities identified - EIA Regulations which apply to project**

Activity Description:	Description of Activity	Activities
Activity 1 The construction of facilities	Electricity supply to the development.	Installation of electricity system, forms part of municipal services infrastructure.
Activity 4 Clearance of Vegetation	Clearing of bushes to pave way for development	Bushes and trees would be cleared to pave way for installation of municipal service infrastructure.
Activity 5.1 (d) Land Use and Development Activities	The rezoning of land from – use for nature conservation or zoned open space to any other land use.	The project will be located on open land that is currently vacant and not utilised.
Activity 8.9 Water Resource Developments	The construction and other activities within a catchment area.	The project entails activities that will be undertaken within Arebbusch / Goreangab catchment area.
Activity 10.1 (a) (Infrastructure)	The construction of – Oil, water, gas and petrochemical and other bulk supply pipelines.	The proposed project includes the installation of bulk municipal services
Activity 10.1 (b) (Infrastructure)	The construction of – Public roads.	The proposed project includes the construction of roads.
Activity 10.2 (a) (Infrastructure)	The route determination of roads and design of associated physical infrastructure where – it is a public road;	The proposed project includes the construction of roads.

## 6. DESCRIPTION OF ALTERNATIVES

### 6.1 No-Go Alternative

The no-development alternative is the option of not going ahead with the development of the proposed Goreangab township establishment. The no-go alternative will keep the site in its current informal state. This alternative is undesirable in terms of the current serviced erven scarcity in Windhoek. Should the site remain in this state, the possibility and threat of more squatters settling on the site will persist, which promotes poor living conditions and threat to the environment and human health.

Should the proposed activity not take place, the region could also be deprived of developing a township, and ultimately reducing the residential ervens demand in Windhoek. The proposed activity could yield positive results that could provide an alternative serviced land to Windhoek. The No-go option will not be a viable alternative at this stage.



## **6.2 Site Alternative**

Serviceable land scarcity in the City of Windhoek remains a challenge due to terrain and suitability for such development. The project site is suitable for a housing development and the land already belongs to the City of Windhoek. The local authority wants to provide formal serviced land to address the scarcity of serviced residential land in Windhoek. The area is in close proximity to existing engineering services which has capacity to support the proposed township development.

The area holds less ecological and conservation values, and is considered best option chosen to develop the proposed new Goreangab township with strict consideration of environmental aspects. Mitigation measures on impacts likely to be caused by the activity are incorporated in the planning and execution of the activity. The proposed township development is expected to have minimal impact on the environment; hence the environmental footprint of this activity is expected to be minimal.

## **7. SCOPE OF THE EIA**

The scope of the EIA aims at identifying and evaluating potential environmental impacts emanating from the proposed establishment of the Goreangab Extension 6 & 7 Township development. Relevant data have been compiled by making use of secondary sources and from project site visits. Potential environmental impacts and associated social impacts are identified and addressed in this report.

The environmental impact assessment report aims to address the following:

- a) Identification of potential positive and negative environmental impacts.
- b) Provide sufficient information to determine if the proposed project will result in significant adverse impacts.
- c) Identification of “hotspots” which should be avoided where possible due to the significance of impacts.
- d) Evaluation of the nature and extent of potential environmental impacts.
- e) Identify a range of management actions which could mitigate the potential adverse impacts to required levels.
- f) Provide sufficient information to the Ministry of Environment to make an informed decision regarding the proposed project.
- g) Present and incorporate comments made by stakeholders.



## 8. METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment that could arise from the proposed new Goreangab township development in Windhoek:

- a) Information about the site and its surroundings was obtained from existing secondary information and site visits.
- b) Neighbours, interested and affected Parties (I&APs) were consulted and their views, comments and opinions are presented in this report.

## 9. STATUTORY REQUIREMENTS

### 9.1 National Legislative Requirements

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislations are relevant to this project:

#### I. The Namibian Constitution

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

#### II. Environmental Management Act No.7 of 2007

This Act provides a list of projects requiring an Environmental Assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:



- (a) to make sure that people consider the impact of activities on the environment carefully and in good time.
- (b) to make sure that all interested or affected people have a chance to participate in environmental assessments
- (c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

The rezoning of land from open space to any other land use is a '*listed activity*' as per the *List of Activities requiring Environmental Clearance* (Government Notice 29 of 6 February 2012) and accordingly requires an Environmental Impact Assessment (EIA) to be conducted.

*Line Ministry: Ministry of Environment, Forestry and Tourism*  
(Contact: Timo Mufeti, Tel: 061-284 2715)

### **III. Atmosphere Pollution Prevention Ordinance (1976)**

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

*Line Ministry: Ministry of Environment, Forestry and Tourism*  
(Contact: Timo Mufeti, Tel: 061-284 2715)

### **IV. Water Resources Management Act of Namibia Act (No. 11 of 2013)**

An Act to provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters. Thus developers are required to efficiently plan for sewage disposal.

*Line Ministry: Ministry of Agriculture, Water Affairs and Forestry*  
(Contact: Ms Elizabeth Amagola, Tel: 061-208 7719)

### **V. Water Act No.54 of 1956**

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse.



Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- ✓ Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and
- ✓ Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

*Line Ministry: Ministry of Agriculture, Water Affairs and Forestry*  
(Contact: Ms Elizabeth Amagola, Tel: 061-208 7719)

## **VI. The Draft Wetland Policy (1993)**

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

*Line Ministry: Ministry of Environment, Forestry and Tourism*  
(Contact: Timo Mufeti, Tel: 061-284 2715)

## **VII. Environmental Assessment Policy of Namibia (1995)**

Environmental Assessments (EA's) seek 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 (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

*Line Ministry: Ministry of Environment, Forestry and Tourism*  
(Contact: Timo Mufeti, Tel: 061-284 2715)

## **VIII. Forestry Act (No.12 of 2001)**

This Act makes provision for the protection various plant species. Harvesting permits are required from the Directorate of Forestry to clear certain protected vegetation species from the site.

*Line Ministry: Ministry of Agriculture, Water Affairs and Forestry*  
(Contact: Andries Uugwanga, Tel: 062-501925)

## **IX. Townships and Division of Land Amendment Act (No.28 of 1992)**

Article (l) of this Act stipulates that "Whenever any area of land constitutes, by reason of its situation, a portion of an approved township, or adjoins an approved township, the Executive Committee may, by proclamation notice in the Gazette and after consultation with the Board, extend the boundaries of



the township to include such an area". Thus the new township needs to be approved by the Namibian Planning Advisory Board and the Townships Board.

*Line Ministry: Ministry of Regional and Local Government, Housing and Rural Development*

*(Contact: Mr. Erastus Negonga, Tel: 061-297 2911)*

#### **X. Sewerage and Drainage Regulations (amendments) Local authorities act, section 23 (1992).**

The regulations make provision for proper construction of pipelines in drainage lines. The regulations also stipulate the prevention of pollution and environmental damage caused by improper construction of sewerage and water pipelines in drainage lines.

*Line Ministry: Ministry of Regional and Local Government, Housing and Rural Development*

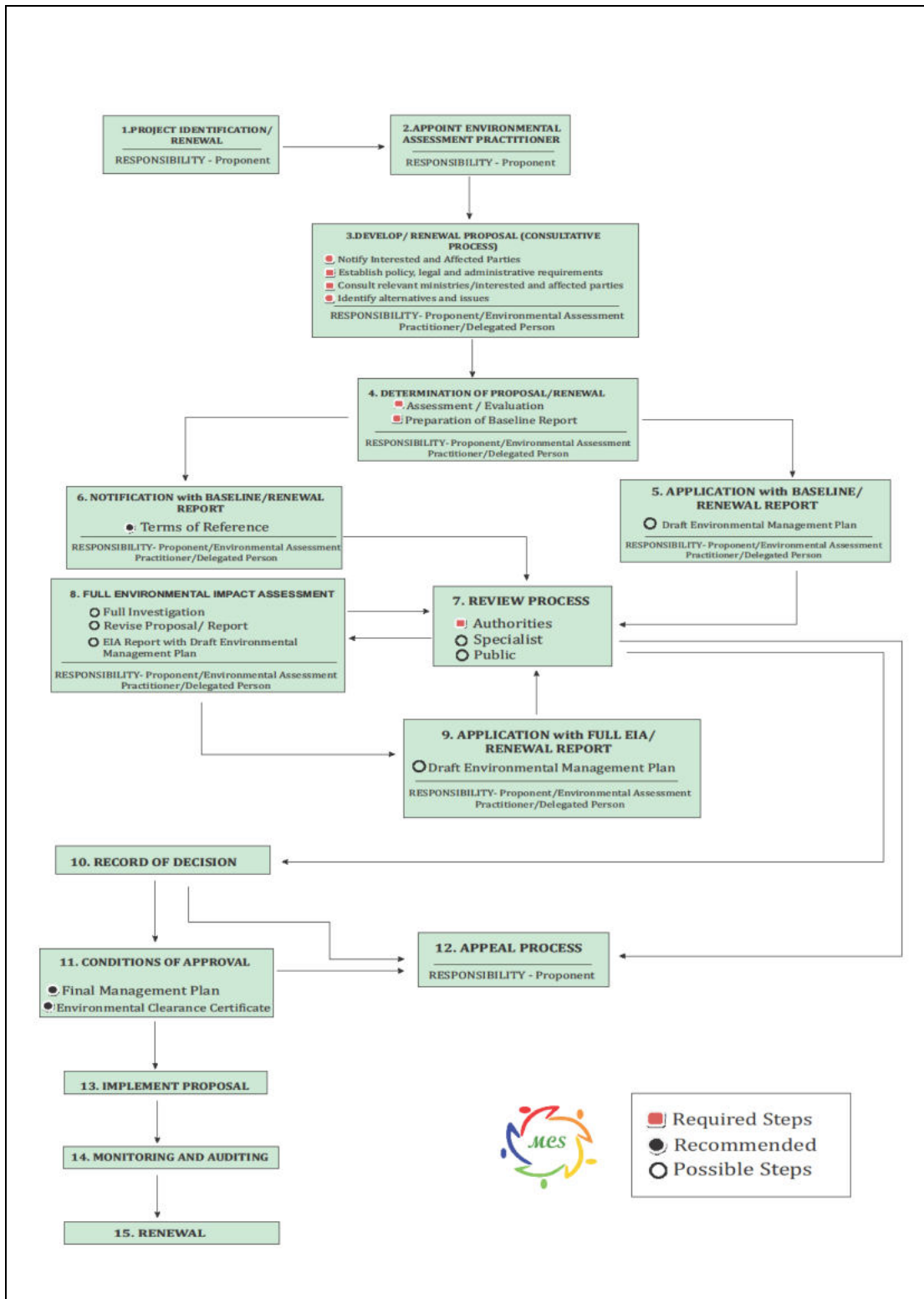
*(Contact: Mr. Erastus Negonga, Tel: 061-297 2911)*

#### **XI. Soil Conservation Act (No.76 of 1969).**

The Act advocates for the Prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

*(Contact: Timo Mufeti, Tel: 061-284 2715))*





**Figure 5. Environmental Assessment Procedure of Namibia** (Adapted from the Environmental Assessment Policy of 1995)

## XII. Draft Pollution Control and Waste Management Bill

The proposed project of Goreangab Extension 6 & 7 township development, only applies to Parts 2 and 7 of the Bill.



Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

### **XIII. Hazardous Substances Ordinance No. 14 of 1974**

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

*Line Ministry: Ministry of Health and Social Services*

### **XIV. Public Health Act 36 of 1919 and Subsequent Amendments**

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the development of Venus Proper & Venus Ext 1-4 Township project are expected to include dust, air quality impacts, noise nuisance and smoke emissions.

*Line Ministry: Ministry of Health and Social Services*

### **XV. National Heritage Act (No.76 of 1969).**

The Act calls for the protection and conservation of heritage resources and artefacts. Should any archaeological material, e.g. old weapons, coins, bones found during the construction, work should stop immediately and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material.

*(Contact: Rev. Salomon April, Tel: 061-244375, National Heritage Council of Namibia)*



#### **XVI. Electricity Act, 2007 (No. 4 of 2007).**

This Act regulates that electricity may only be generated or distributed with due compliance with the requirements of any other law, in particular laws relating to health, safety and environmental standards. The Minister or the Board may request the applicant for a licence to submit an environmental impact assessment study indicating the extent of any potential damage to or pollution of the environment and the steps proposed to be taken by the applicant to prevent or minimise such damage.

#### **XVII. Roads Authority Act, 1999 (No. 17 of 1999).**

Section 3 of the Act sets out the object of the Authority as follows: "Subject to this Act and the Road Fund Administration Act, the object of the Authority is to manage the national roads network in accordance with section 16 with a view to obtaining a safe and efficient road sector."

Key clauses of the Roads Authority Act that are of particular relevance to operational issues are Section 15 wherein the Roads Authority's functions are set out; and Section 16, which elaborates on one of these functions that being the environmental management of the national road network.

#### **XVIII. Namibia's National Policy on Climate Change – September 2010.**

The National Policy on Climate Change seeks to ensure the fulfilment of the national development goals in spite of the rise in climate variability and consequent impacts on the economy. While acknowledging the need for mitigation activities, this policy emphasizes the need for adaptation as the key response to climate change.

### ***9.2 International Conventions and Regulations***

Article 144 of the Namibian Constitution states that "the general rules of public international law and international agreements binding upon Namibia form part of the law of Namibia." This means that all the international agreements that Namibia signed become part of the law of our country. These laws and/or agreements are:

- ✓ Convention on Biological Diversity, 1992;
- ✓ United Nations Framework Convention on Climate Change, 1992;
- ✓ Kyoto Protocol on the Framework Convention on Climate Change, 1998;
- ✓ Stockholm Convention of Persistent Organic Pollutants, 2001.



### **9.3 Municipal By-laws (City of Windhoek)**

#### **I. Groundwater Protection Regulations**

The protection of the groundwater resource in a development scenario should be provided for, in a formally documented and legislated EIA process. The EIA process or procedure provides for the institutionalization of decision making regarding the potential impact development activities will have on the receiving natural, social and cultural environment. Further, the process makes provision for the identification and listing of types of activities that would be required to follow the process before any authorisation will be given.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*

#### **II. Environmental Structure Plan and Policy**

The Environmental Structural Plan & Policy provides sufficient information for those making decisions regarding a particular development so that proper environmental evaluation can be conducted, which is appropriate to the scale of the proposed project and the risks to the environment which it may pose.

It establishes where there are potential and real problem environmental areas, such as land degradation, pollution, indiscriminate resource use etc. The Environmental Structural Plan is the baseline upon which the policy is established.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*

#### **III. Windhoek Town Planning Scheme (2005)**

The Town Planning Scheme enables the comprehensive management of all property and related public sector functions across the city. The guidelines on the Conservation of Natural Resources should be addressed in this project.

#### **IV. Policy for the Distribution and Future Usage of Public Open Spaces in Windhoek (2000)**

The policy provides guidelines for the establishment of open spaces and green corridors along drainage lines and sensitive environmental areas. The policy advocates for the provision of land for the explicit development of open spaces.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*

#### **V. Noise Control Regulations (2006)**

The regulation provides measures for controlling, prevention and enforcement of noise pollution. The regulation prohibits noise nuisance within the municipal area from any person(s) in any form, unless that person(s) have obtained Council's written authorisation to do so.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*



## **VI. Solid Waste Management Policy (2006)**

The policy provides a framework through which the management of waste, irrespective of the nature, toxicity and quantity, shall be governed in Windhoek. The Policy further aims to ensure that the management of waste is done in such a manner that the risk of the impacts of waste on the residents and the environment is minimised. Through the policy, the City of Windhoek aims to maintain control over all waste management activities within its area of jurisdiction, including industrial, business, institutional and household levels.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*

## **VII. Sustainable Sand Mining Policy (2017)**

The policy promotes sustainable practises by setting basic principles having the objective of minimise the impact of sand mining activities on the social and biophysical environment. The Policy places emphasis on setting up of monitoring plans that will provide data on profile changes and sediment transport capacity to enable the authorities to evaluate the long-term effect of the mining activities both upstream and downstream of sand extraction sites.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*

## **VIII. Sewerage and Drainage Regulations Notice No. 312 of 11**

The policy affords the prevention of pollution and environmental damage caused by the improper construction of sewerage and water pipelines in drainage lines. The regulation provides guidelines for the proper construction of pipelines in drainage lines.

*(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)*



## 10. GENERAL ENVIRONMENT OF THE STUDY AREA

This section lists the most important environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

### 10.1 *Location and Land Use*

The proposed Goreangab Extension 6 and 7 (22.51794°S; 17.00452°E) is situated on Farm 1012 is located on the eastern corner of Remainder of Farm 508 and shares its eastern boundary with Goreangab Ext 3. It is situated along the Matshishi Street and measures approximately 36 hectares in extent.

### 10.2 *Topography and Surface Water*

The landscape of the project site is classified as being in the Khomas Hochland Plateau region, which is characterized by rolling hills in the west with many summit heights equivalent reflecting older land surfaces.

The township development lies in the Goreangab Dam catchment. The dam is situated approximately 1.1km southeast of the project site. Drainage is well developed and runoff takes place through small streams (rivers) and waterways running through the site. These streams eventually flow into the dam.

Care should be taken to avoid contamination of the surface water bodies in the area, especially during rainy seasons. Proper drainage systems (e.g. erection of culverts) should be developed for the township to control the flow of surface water, in order to avoid possible flooding. Storm water managements should form part of the engineering designs.

### 10.3 *Climate* (Mandelsohn et al, 2003)

**Table 4. Climate Data**

Classification of climate:	Sub-tropical area
Average rainfall:	Rainfall in the area is averaged to be between 300-350 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 30-50 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 3000-3200 mm per year.
Precipitation:	Irregular and highly strong and localized storm events between October and April do occur. Evaporation exceeds precipitation by approximately 93%.



Water Deficit:	Water deficit in the area is averaged to be between 1700- 1900mm per year.
Temperatures:	Temperatures in the area are averaged to be between 18- 20 °C per year.
Wind direction:	Wind directions in the area are predominantly easterly winds.

#### **10.4 Geology of the Area**

The general geology or rock formations underlying the township development consists mainly of mica rich schist, quartz rich schist and marble, containing quartz veins. These rock formations belong to the Kuiseb formation of the Damara Sequence. The sedimentary formations of the study area, strike in a north-easterly direction and dip 25-30° to the north-northwest. The schist has an abundance of layers (schistosity) consisting of quartz rich and mica rich layers.

The geology of the Windhoek area is a result of numerous folding and faulting episodes, including thrusting and rifting, to which the area has been subjected. Metasedimentary rocks of the Swakop Group, which is part of the Damara Sequence, constitute the Windhoek Aquifer.

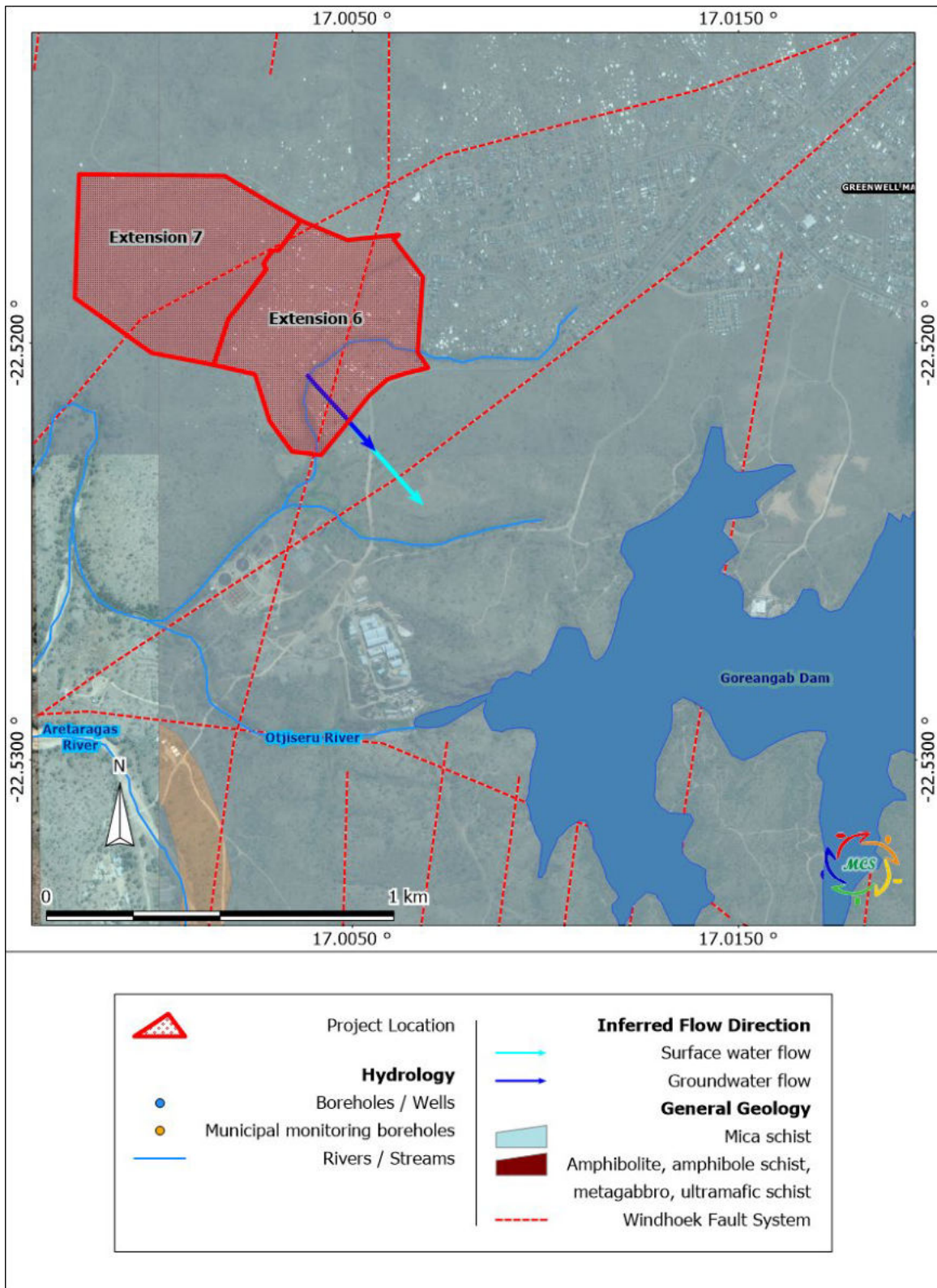
#### **10.5 Hydrogeological Characteristics**

A number of north- to north-westerly striking fault structures found in the Windhoek area form the major underground waterways of the Windhoek Aquifer and hence determine the state and condition of the aquifer.

In relation to lithology, the network of joints and minor fractures that are prevalent in the quartzites is considered to be more permeable than those of the micaceous quartzites, which in turn are considered to be more permeable than those of schists. The trend is the same with respect to major lineaments. The permeability of large faults and fracture zones that form major lineaments is considered to be greatest within the quartzites, and least within the schists. Groundwater flow would be mostly through secondary porosity along fractures, faults and other geological structures present within the underlying formations in the area (Murray, 2002).

Groundwater flow direction from the site is southeast, towards the Goreangab Dam. Local drainage patterns may however vary due to groundwater abstraction activities in the area.



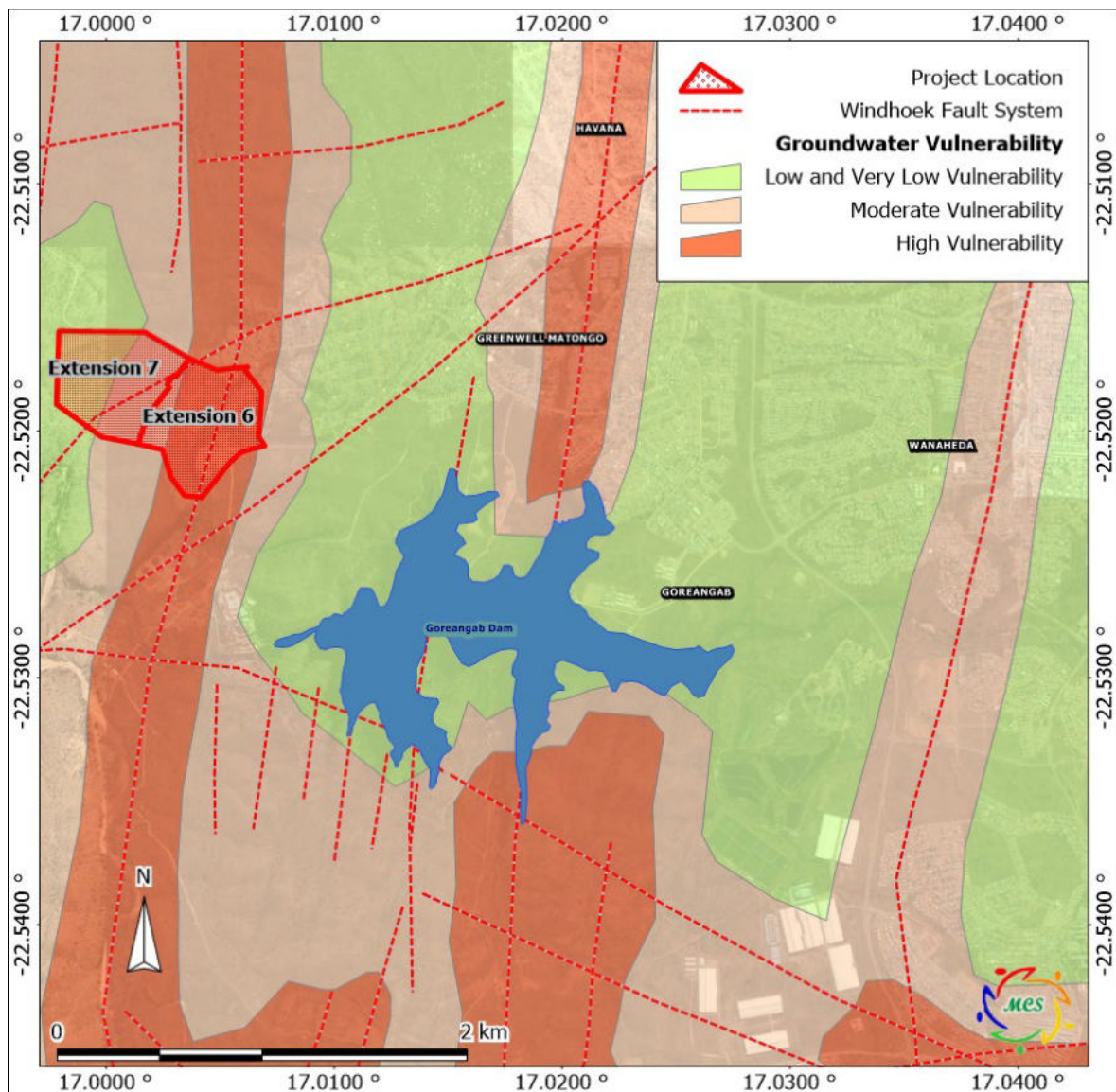


**Figure 6. Hydrogeological map**

According to the City of Windhoek, Namwater and Department of Water Affairs (DWA) database, no borehole exists within a 2km radius of the project site. Groundwater table in the area is expected to be less than 40m below ground level (mbgl).

Groundwater belongs to the government of the Republic of Namibia, hence the area does fall within the Windhoek-Gobabis Subterranean Water Control Area, of Government Notice 189 of 6 February 1970. This means that Government controls groundwater exploration and usage in this area.. See surface and groundwater specialist study report in Appendix C.

The project area was mapped during the Groundwater Vulnerability Study of the Windhoek Aquifer (City of Windhoek, 2000) as having low to high aquifer pollution vulnerability, mainly due to the presence of a highly sensitive fault in the area. These sensitive geological features may form preferential pathways to the underlying aquifer.



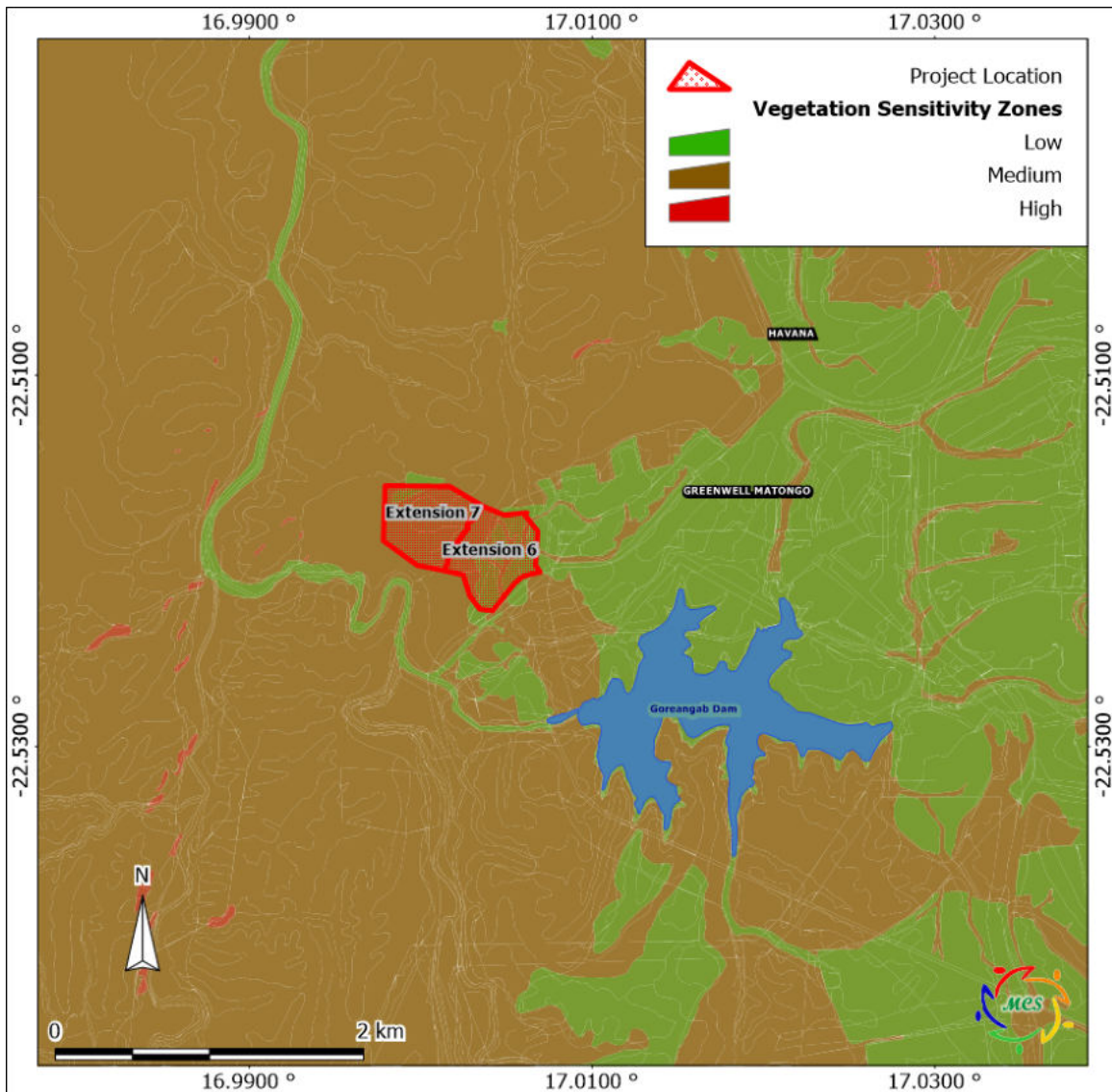
**Figure 7. Groundwater vulnerability map**

### **10.6 General Ecology**

The site falls within the Tree and Shrub savanna biome, which is characterised by high shrubland and thorn bush type vegetation. The vegetation structure type is classified as Dense Shrubland. According to the Windhoek's



environmental structure plan, the proposed township lies within a low to medium vegetation sensitive zone.



**Figure 8. Vegetation sensitivity zones**

As indicated earlier, some noticeable disturbance to the project area is observed through wood harvesting, illegal dumping and other human disturbances. The project area is within the already existing and disturbed informal urban setting; hence little vegetation is present at the project sites. The study area is typified by *Acacia reficiens*, *A. mellifera*, *A. hereroensis*, *Dichrostachys cinerea* and *Albizia anthelmintica* (a sensitive species). Several individuals of 2-5 m in height belonging to the species *A. anthelmintica* were spotted at the site giving it a low to moderate conservation status, and must be considered during the development of the project. A few big trees (see Appendix D) *Acacia reficiens*, *Boscia Albintruca* and *A. albizia* were noted at the site and it is recommended that these be factored into the development as far as possible, to preserve some of the natural integrity of the area.

Some invader plant species were also observed on some previously disturbed areas. They are *Prosopis Glandulosa*, *Helianthus annuus* and *Phragmites australis*, *Datura inoxia*, *Nicotiana glauca* and *Melia azedarach*.



Photo 10. Predominant vegetation at the project site

The following photos illustrate the vegetation on site. The ecologist gave recommendations to remove alien invasive plants and conserve the protected species. Vegetation recommended to be removed during development:



Photo 11. *Prosopis Glandulosa*, *Helianthus annuus* and *Phragmites australis* ( Invasive Species)

In addition, several big trees of our indigenous species have been noted in the area. There seems to be a common trend within Goreangab Extension 6 & 7 to preserve and use the big trees for shade. It is strongly recommended that these trees should rather be factored into the development as far as possible, because they can be used for shade and can contribute positively to the general aesthetics of the proposed development. This is bound to contribute to a proudly Namibian aesthetic feel of the completed development, instead of removing the entire local vegetation and replacing it with alien or non-native species as it often happens with many developments, creating a rather alien appearance for the area. Comparatively, indigenous tree species are incredibly hardy to Namibia's and require significantly low amounts of water to grow & survive, which would save this very scarce resource in arid Namibia.

Furthermore, it is recommended that the alien species (encountered during the survey be removed as far as possible. No red-listed species were encountered during the survey. In general, a low conservation status is assigned to this site and development (on condition of the recommendations) may take place.

Animals like Baboons and warthogs are known to occur within the surrounding habitats of Goreangab. Faunal species diversity of the study area in general is presented in the table below:

**Table 5.** General Fauna Diversity (Atlas of Namibia)

	<b>Diversity</b>	<b>Endemism</b>
<b>Mammal</b>	61 - 75 Species	0 Species
<b>Scorpion</b>	18 - 21 Species	0 Species
<b>Bird</b>	201 - 230 Species	0 Species
<b>Reptile</b>	71 - 80 Species	5 - 8 Species
<b>Lizard</b>	> 35 Species	N/A
<b>Termite</b>	7 - 9 Genera	N/A
<b>Snakes</b>	35 - 39 Species	N/A

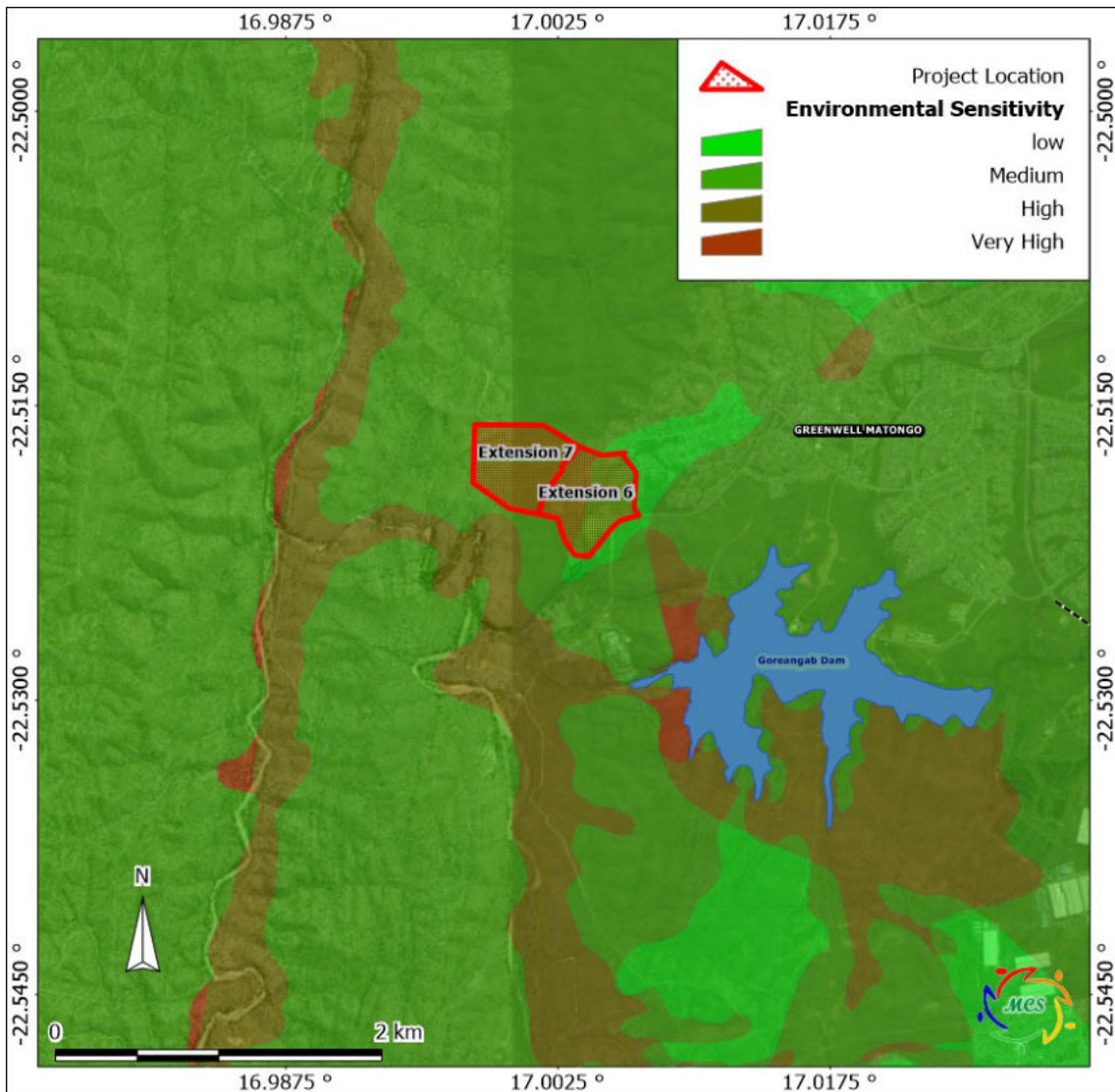
The study area falls within low to medium environmental sensitivity zone. According to City of Windhoek Environmental Structure Plan of 2004, the control zones are based upon the following;

- The critical sensitivity of the southern Windhoek aquifer.
- The sensitivity of the catchment of the Goreangab Dam, and surface water resources, including rivers and streams throughout Windhoek.
- The sensitivity of the environment or a specific critical environmental component.
- The relative importance of the 'sense of place' or the specific character of Windhoek determined through resident participation, which includes



topography and landscape quality as well as cultural / historical resources.

- The need to protect open space in Windhoek, which includes the river and aquatic systems, as well as the ridgelines, hills and mountains, and natural areas surrounding the city.
- The need to protect, manage and conserve sensitive natural vegetation cover



**Figure 9: Environmental sensitivity zones**

## **11. SOCIO-ECONOMIC ASPECTS**

This section provides an overview of socio-economic characteristics of the study area. It provides regional and local information on the, economic activities, population dynamics, vulnerability, and social services currently available in the area.

### **11.1 Regional Information**

The proposed township development will be situated in the Khomas Region of Namibia. The total current population is estimated to be 250,262 (126,648 males and 123,613 females) (NPC, 2001). Ninety-four percent of the population of the Khomas Region over 15 years of age are literate. The estimated unemployment rate in Khomas region is 29%, whilst it is 35 to 40% in Windhoek. The population density in Khomas region is relatively high at 6.8 persons per km<sup>2</sup>, compared to the national average of 2 persons per km<sup>2</sup>.

The life expectancy in Khomas region is 56 years in females and 54 years in males. The Human Poverty Index in Khomas region is 17.09, meaning almost a quarter of all people living in Khomas are poverty stricken.

### **11.2 Windhoek**

#### **11.2.1 Economic Activities**

The City of Windhoek is the capital city of Namibia and is often referred to as the cleanest city in Africa. The city is the hub for all economic activities in the Khomas Region and is linked to Namibia's air, rail and road network, making it well situated to service Zambia, Zimbabwe, Botswana, Southern Angola and South Africa.

The proposed Goreangab Extension 6 & 7 township project is a win-win opportunity for all parties involved, whether they are the land owner (City of Windhoek) and/or potential residents and the local government, or the surrounding community. The township project will address the land scarcity is currently rife in Windhoek. The township project has a potential revenue generation from the sale of ervens.

#### **11.2.2. Employment (Job Opportunities)**

Unemployment still hampers most of the developing world and Windhoek is not an exception. The proposed township project is likely to increase the job opportunities in Windhoek. The construction phase of the project will provide job opportunities, of which 80% are expected to be unskilled and semi-skilled people and can be sourced from the unemployed labour force of Windhoek (unemployment rate is 35 to 40% in Windhoek).

Even before projects produce profits from the sale of erven or use of bulk services, they produce a related benefit for the surrounding communities and the city at large, which is job creation. Bulk services construction



involves engineers, construction firms, equipment vendors, and utilities. All of this cost is spent locally for piping, construction, and operational personnel, contractors, providing additional economic benefits to the community through increased employment and local sales.

Some of the services in the operational phase will be outsourced e.g. maintenance of bulk services, waste removal etc. The outsourcing of these services will strengthen existing business operating in the area and provide employment to people.

### **11.2.3 Livelihoods**

Economic activities in Windhoek and the surrounding areas are limited and livelihoods are heavily dependent on the business sector and salaries of civil servants. The livelihoods of the locals are likely to be positively impacted therefore predicted to be better than before the township development.

### **11.2.4 Tourism**

Windhoek is the major tourism gateway to the rest of Namibia. The city itself also attracts a lot of tourists from all over the world, due to its range of attractions in and around the city; and the rich cultural diversity found in the capital.

This tourist city renowned for being one of the cleanest in the world, therefore the Goreangab Extension 6 & 7 township establishment helps combat the lack of serviced land available for low-middle income groups.

Excessive waste, dust, noise, vibrations and appalling air quality can have negative impacts on the tourism industry in the area, as it can become a nuisance to residents and tourists.

### **11.2.5 In - Migration**

Due to enhanced employment opportunities that could be created by the envisaged project, some in-migration of job seekers to Windhoek can be expected. Depending on the amount of in-migration, local areas may start experiencing overcrowdings, over use of infrastructure, local conflicts, increase of goods prices due to increased demand etc.

### **11.2.6 HIV & Prostitution**

Namibia has a high incidence rate of HIV/AIDS, which has a strong and adverse socio-economic impact on livelihoods of people in the region. The HIV prevalence rate for the age group 15 to 49 is estimated at 21.3% for Namibia (UNDP, 2005).

The spending power of locals working on this project is likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant



labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers.

Should the HIV prevalence increase, the following consequential issues could arise:

- ✓ Reduced workforce in the Khomas Region.
- ✓ Diversion of income expenditure to medical care.
- ✓ Increase in orphans and household headed by children.
- ✓ Increase in pregnancy related mortality.
- ✓ The current rate of 3,129 people per doctor could increase.

### **11. 2.7 Infrastructure & Increased Traffic**

The traffic in the area would be expected to increase slightly and it might contribute to heavy traffic during peak hours and a higher number of car accidents. Infrastructure like roads will be affected due to increased traffic and heavy-duty cargo trucks accessing the site from the various access routes in the area.

## **12. STAKEHOLDER PARTICIPATION**

Consultation with the public forms an integral component of an EIA investigation and enables I&APs e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the EIA. The primary aims of public participation were:

- ❖ To initiate participation of Interested and affected parties (I&APs), e.g. local authorities and communities.
- ❖ To inform I&APs and key stakeholders about the proposed development.
- ❖ To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development.
- ❖ To provide information to enable informed decision making
- ❖ To develop a communication structure with stakeholder and I&APs
- ❖ To promote transparency of the project
- ❖ To ensure the public and stakeholders comments are considered for the development.
- ❖ To provide answers to I&APs queries
- ❖ To encourage shared responsibility and sense of ownership.



Decision-making authorities were consulted throughout from the outset of the study, and have been engaged throughout the project process. Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.

Public participation notices were advertised in local newspapers on two different occasions, namely; (See Appendix F).

- ✓ The Namibian Newspaper, 30 November and 06 December 2023
- ✓ Windhoek Observer Newspaper, 30 November and 07 December 2023

In the adverts an e-mail address was provided to the general public to register as interested and affected parties; and to request a background information document for the project. Posters were placed at strategic locations to invite interested and affected parties to the meeting, e.g. at the site itself, Woerman Brock, Standard Bank, Puma Eveline Service Station and various businesses in the area. An open day public consultation session was held at the Soccer Field (Okapale), in Goreangab, between 09H00 to 14H00, on the 09<sup>th</sup> December 2023.

An environmental assessment and process presentation was presented during the public consultation session. The session was well attended with a total number of 39 people recorded in attendance. Most of the attendees were inhabitants of the Thlabanelo informal settlement. See Appendix F for public consultation registry.



Photo 12. Public consultation session



The general concerns received during the public consultation session were not environmental related at all, most of them were about socio-economic issues, preferential options to buy ervens, procedure on how the land will be sold, and making sure the City of Windhoek first take care of first-time buyers when selling the industrial and business ervens. A background information document was available to all interested and affected parties 14 days before and after the meeting.

Neighbourhood community members were also consulted and indicated no obvious environmental concerns regarding the proposed project.

### 13. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the proposed Goreangab Extension 6 & 7 Township Development. The following assessment methodology will be used to examine each impact identified, see Table 6:

**Table 6. Impact Evaluation Criterion (DEAT 2006)**

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts).
	H	High (Adverse impact).

<b>Probability:</b>	<b>Duration:</b>
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term (impact ceases)
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	
<b>Scale:</b>	<b>Magnitude:</b>
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
	0 - None

#### 13.1 Construction Activities of the Township Development

##### 13.1.1 Dust Pollution and Air Quality

Dust will be generated during the construction and installation of bulk services, and problems thereof are expected to be site specific. Dust is expected to be worse during the winter months when strong winds occur. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.

Release of various particulates and exhaust fumes from construction vehicles and machinery during construction of bulk services is also expected to take place.



### Proposed Mitigation Measures

- ✚ Ensure measures are in place to minimise dust generated during the construction phase.
- ✚ Use appropriate dust suppression measures when dust generation is unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather.
- ✚ Ensure excavations, handling and transport of materials which may generate dust under high wind conditions are short lived and well contained.
- ✚ Locate stockpiles of construction materials in sheltered areas where they are not exposed to erosive effects of the wind.
- ✚ Ensure all vehicle, plant and equipment are in good condition.
- ✚ Encourage reduction of engine idling.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	M	L

### 13.1.2 Noise Impact

An increase of ambient noise levels at the construction site is expected due to construction activities. Noise pollution due to construction vehicles, heavy-duty equipment and machinery will be generated. It is not expected that the noise generated during construction will impact any nearby land or properties.

### Proposed Mitigation Measures

- ✚ Ensure the use of construction vehicles and equipment that emit reduced noise levels. Where necessary, use mufflers on vehicles.
- ✚ Ensure proper maintenance is conducted on vehicles to ensure the reduction of noise emission.
- ✚ The construction staff should be equipped with ear protection equipment.
- ✚ Audio equipment (if any) should not be played at levels considered intrusive by others.

Construction activities will be limited to a period between 07h00 and 19h00.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	1	4	4	M	L

### 13.1.3 Safety and Security

Safety issues could arise from construction vehicles, earthmoving equipment and tools that will be used during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. Construction sites usually house construction building material and equipment on site which may attract criminal activities.



### **Proposed Mitigation Measures**

- ✚ Display telephone numbers of emergency services at the project site.
- ✚ Provide suitable emergency and safety signage on site (manufactured of durable, weatherproof material). The signage signs should be placed at strategic locations to ensure awareness.
- ✚ Demarcate and barricade any areas which may pose a safety risk (including hazardous substances, deep excavations etc). These notices must be worded in English language.
- ✚ Enforce the use of appropriate Personal Protective Equipment (PPE) for the right task or duties at all times.
- ✚ Should a construction camp be necessary, it should be located in such a way that it does not pose a risk to the public.
- ✚ Equipment housed on site must be placed in a way that does not encourage criminal activities.
- ✚ For safety and security reasons it is recommended that the entire site (construction site and camp) be barricaded or fenced-off; and security personnel be employed to safeguard the project site and to avert criminal activities.
- ✚ Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles, equipment and/or machinery not being used.
- ✚ The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times.
- ✚ Proper barricading and/or fencing around the work sites should be erected to avoid entrance of animals and/or unauthorized persons.
- ✚ Adequate lighting within and around the construction sites should be erected, when visibility becomes an issue.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety & Security	-VE	1	1	4	2	M	L

#### **13.1.4 Contamination of Groundwater**

Groundwater quality could be impacted through leachate of petroleum, chemical, harmful and hazardous substances. In particular, oil leakages, diesel, lubricants and grease from construction vehicles, equipment and machinery utilised during the bulk servicing of the townships may occur. Care must be taken to avoid contamination of soil and groundwater.

Any overflow of the temporary sewage systems available, may transport the effluent to drainage lines in the area. Geological structures (lineaments) present in the area may also act as preferential pathways for contaminants to groundwater.

### **Proposed Mitigation Measures**



- ✚ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays and linings when evidence of leaks are observed on vehicles or equipment.
- ✚ No major servicing and maintenance of vehicles and/or equipment should be conducted at the project sites.
- ✚ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery.
- ✚ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems.
- ✚ Should portable toilet facilities be necessary, adequate containment systems should be erected at the project site for use during the construction phase.
- ✚ Waste should be contained properly to avoid any leakages and/or spillages; and should be regularly disposed off at a suitable sewage disposal site. Avoid run-off from these toilets due to overflows at all cost.
- ✚ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	2	3	3	2	M	L

### 13.1.5 Contamination of Surface Water

Contamination of surface water bodies may occur through petroleum, chemical and hazardous substances. Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction equipment and machinery may occur during the construction phase. Oil spills may form a film on water surfaces in the nearby streams causing physical damage to water-borne organisms.

#### Proposed Mitigation Measures

- ✚ Use drip trays and linings when evidence of leaks are observed on construction vehicles or equipment.
- ✚ Remove leaking vehicles from project location immediately.
- ✚ No servicing and maintenance of vehicles and/or equipment should be conducted at the project site.
- ✚ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up immediately and disposed off at a designated disposal facility.
- ✚ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into waterways or any surface water bodies.
- ✚ Prevent illegal washing out of containers in nearby waterways or any surface water bodies.



- ✚ Properly secure all portable toilets (if any) to the ground to prevent them toppling due to wind or any other cause.
- ✚ Maintain toilets in a hygienic state and remove waste to a licensed disposal facility.
- ✚ Ensure that no spillages occur when the toilets are cleaned or emptied. Prohibit urination on site, other than at designated facilities.
- ✚ Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water.
- ✚ Stabilise cleared areas as soon as possible to prevent and control surface erosion.
- ✚ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
- ✚ An emergency plan should be in place on how to deal with spillages and leakages during this phase.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	2	2	3	M	L

### 13.1.6 Generation of Waste

Waste material will be generated during the construction activities of the township developments. Waste in the form of rock cuttings, building rubble, pipe cuttings, oil spills or leakages of petroleum products may occur during the construction phase.

#### Proposed Mitigation Measures

- ✚ Ensure that sufficient weather- and vermin- proof bins / containers are present on site for the disposal of solid waste. Waste and litter generated during this phase must be placed in these disposal bins.
- ✚ Empty bins regularly as required.
- ✚ Contractor shall institute a waste control and removal system for the site.
- ✚ All waste shall be disposed off site at an approved landfill site.
- ✚ No disposal of /or burying of waste on site should be conducted.
- ✚ No waste should be burned on site.
- ✚ All hazardous waste storage are to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members.
- ✚ Solid and liquid hazardous waste shall be stored in separate containers. The waste should be disposed of at an approved hazardous waste disposal site.
- ✚ Regular inspection and housekeeping procedures should be maintained at all times.



Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	1	4	4	M	L

### 13.1.7 Traffic

Construction related activities are expected to have a minimal impact on the movement of traffic along Matshishi Street and Green Mountain Dam Road (and other access nearby streets), as construction vehicles will frequent the project site periodically.

A slight nuisance might be experienced by motorists in the area. This will most likely be caused by slow moving vehicles frequenting the construction sites.

#### Proposed Mitigation Measures

- ✚ Install and maintain official traffic signalling (where necessary) along the access roads / intersection in conjunction with local or national traffic regulations.
- ✚ Should diversion of traffic or closure of any road be necessary, the City of Windhoek; and Traffic Department should be consulted in this regard.
- ✚ Speed limit warning signs must be erected to minimise accidents.
- ✚ Construction vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.
- ✚ Where feasible, Construction vehicles should not travel to and from the site during peak times (07h00 to 09h00 and 16h00 to 18h00), to minimise impacts on traffic.
- ✚ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	2	1	4	3	M	L

### 13.1.8 Fires and Explosions

There should be sufficient water available for fire fighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-VE	1	1	4	2	M	L



### 13.1.9 Nuisance Pollution

Aesthetics and inconvenience caused to persons using the roads and streets in the area. The construction activities would be visible from Matshishi Street, thus the supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Nuisance Pollution	-VE	1	1	2	2	L	L

### 13.1.10 Erosion and Sedimentation

Clearing of the vegetation during earthworks is expected to take place and can make the project site susceptible to soil erosion especially during rainy seasons. The constant movement of heavy construction vehicles during construction also tend to compact the soil surface, which can reduce infiltration capability, and increase surface water runoff.

#### Proposed Mitigation Measures

- ✚ Avoid unnecessary removal of topsoil cover during construction.
- ✚ Ensure stockpiles are located within the boundary of the project sites; and are protected from erosion.
- ✚ Stabilise cleared areas as soon as possible to prevent and control surface erosion.
- ✚ Limit clearing of vegetation to those areas within the footprint of project sites.
- ✚ Minimise open areas and reduce the frequency of disturbance.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Erosion and Sedimentation	-VE	1	1	4	2	M	L

### 13.1.11 Ecological Impacts

The project site is previously disturbed with an existing informal settlement, and has some alien invasive plants. Land will be cleared, leaving the big trees to maintain the vegetation within township development.

#### Proposed Mitigation Measures

- ✚ Limit clearing of vegetation to those areas within the footprint of construction sites.



- ✚ Disturbance of areas outside the designated working zone is not allowed.
- ✚ No vegetation should be removed outside the designated project area.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	1	4	2	L	L

### 13.1.12 Socio-Economic Impacts

Temporary employment opportunities are anticipated to be created during construction, both directly through construction workers and indirectly through suppliers, service providers, and informal traders attracted to the project site.

#### Proposed Mitigation Measures

- ✚ Construction contractor(s) should be sourced from Windhoek, and surrounding areas.
- ✚ Construction workers should be sourced from Windhoek, and surrounding areas.
- ✚ Suppliers of construction materials should be sourced from Windhoek, and surrounding areas.
- ✚ Locally source services required during the construction process, such as securities, rental of portable toilets, plant hire, etc.
- ✚ Designate an area outside the construction sites for informal traders (if any), to allow them to trade.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	4	2	L	L

#### *Summary of all potential impacts during the construction phase:*

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts during the construction activities are minimised. Proper storm water management plans must be in place to minimise the risk of flooding and pollution, and must form part of the engineering designs

The appointed contractor should be made aware of the content and environmental requirements of this report through proper induction training.





## 13.2 Operational Activities of Township Development

### 13.2.1 Dust Pollution and Air Quality

Vehicles that will be accessing the township development will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure or maintenance might also occur.

#### Proposed Mitigation Measures

- ✚ All maintenance of bulk services of the township have to be designed to enable environmental protection.
- ✚ Regular air quality monitoring should be conducted at the project site.
- ✚ Keep a complaints register regarding bad odour / smells at the project sites; and act on it if becomes a regular complaint.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	M	L

### 13.2.2 Noise Impact

Noise pollution already exists around the site in the form of noise generated from vehicles frequenting the existing Matshishi Street and Green Mountain Dam Road (and other access nearby streets). Noise pollution due to this project in the operational phase is expected to be mainly from generators or pumps, road maintenance machinery during maintenance.

#### Proposed Mitigation Measures

- ✚ Ensure that generator engines are fitted with mufflers. Operators working in close proximity to the generators should be equipped with ear protection equipment, when noise becomes an issue.
- ✚ Observation of on-site noise levels by the Manager or Supervisor of Bulk Services Maintenance Department.
- ✚ The city of Windhoek should instil strict operational hours that are not beyond 19h00.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	3	4	4	M	L

### 13.2.3 Surface and groundwater

Spillages might also occur during maintenance of the sewer system. This could have impacts on groundwater especially in cases of large sewer spills.



Potential health impact on groundwater users do exist. Potential impact on the natural environment from possible polluted groundwater also exists. The area is subjected to north-northwest structures, which may act as preferential pathways for any contaminants entering the saturated zone.

**Proposed Mitigation Measures**

- ✚ Proper design of bulk installations and containment mechanisms installed should be able to contain any leakages that might occur during the operation and maintenance of the township developments.
- ✚ Maintaining the installation in good operating order is of paramount importance in preventing failure of bulk services.
- ✚ Proper containment response and readiness should be available during operations and maintenance.
- ✚ During maintenance operations, remove leaking vehicles and/or equipment from project location immediately.
- ✚ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.
- ✚ Ensure all stormwater drains or channels are clear of litter or obstructing material.
- ✚ Remove all excess sedimentation, rubble and any other waste material present in waterways and dispose of in a suitable manner to ensure proper drainage runoff.
- ✚ Ensure that stormwater management systems are regularly maintained and tested, and are in good working order.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-VE	2	2	3	2	M	L

**13.2.5 Generation of Waste**

Waste in the form of solid waste from households, businesses and institutions will be generated. Waste will be removed and disposed off at Kupferberg Landfill by City of Windhoek Waste Removal Contractors e.g. Rent-a-Drum, Kleen Tek etc.

The City of Windhoek will have waste skips around proposed new township development, just like the rest of the suburbs in Windhoek.

**Proposed Mitigation Measures**

- ✚ Waste bins / containers must be readily available at the township development at all times. Ensure that the waste bins / containers are weather- and vermin-proof.



- Any waste generated must be contained and disposed off accordingly.
- No burning or burying of waste on site should be conducted.
- Empty bins regularly as required.

All waste shall be disposed off site at an approved landfill site

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	1	2	4	M	L

### 13.2.6 Socio-Economic Aspects

The creation of new employment opportunities is eminent for maintenance activities; and is considered to be a positive impact. At this stage, it is unclear how many temporary and permanent employment positions will be created but jobs will be created.

#### Proposed Mitigation Measures

- Employment creation should be targeted at the immediate communities of Windhoek.
- Maintenance contractors should be sourced from Windhoek, or the region at large.
- Locally source services required during the operational process, such as securities, plant hire, etc.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	8	2	L	L

### 13.2.7 Ecological Impacts

The operations of the development will have minimal impacts on fauna and flora; however vegetation control in and around the townships must be maintained.

#### Proposed Mitigation Measures

- Vegetation in open spaces should not be disturbed or removed during the operational phase.

Minimise the area of disturbance by restricting movement to the designated working areas during Maintenance.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology Impacts	-VE	1	1	4	2	L	L

### 13.2.8 Traffic

Traffic around the proposed township development should be monitored, to avoid traffic congestion in the area. Speed limits and road signs as set out by City of Windhoek Traffic Department should be adhered to in order to minimise accidents.



It is advisable that some traffic lights be erected to ease traffic flow around the new township.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	3	4	4	M	L

### 13.2.9 Safety and Security

A number of health and safety threats exist during operational activities of township developments. Waste water from leaking pipes (if unattended) can lead to waterborne diseases such as cholera, dysentery, typhoid and diarrhea, which is a health risk to local communities. Severe noise pollution can also become a nuisance, which can result in dangerous confrontations and/or violence, depression, headaches etc. Accidents on roads could increase as a result of increased traffic; and deteriorated roads in and around the township developments.

Safety issues could also arise from the vehicles, equipment and tools that will be used on during maintenance activities.

#### Proposed Mitigation Measures

- ✚ Residence / contractors must be made aware of safety and hazardous nature of powerline and electrical utilities, wastewater etc.
- ✚ Firefighting equipment and first aid kits should be readily available and serviced regularly at the township developments.
- ✚ Keep lawn clippings and other flammable items in safe places.
- ✚ Avoid uncontrolled and unauthorised open fires at the township development.
- ✚ Display contact details of emergency services, informative and warning signage at relevant locations of the development.
- ✚ Demarcate and place signage on any areas which may pose a safety risk (including trenches, excavations etc).
- ✚ Maintenance personnel / contractors are advised to ensure that proper personal protective gear and first aid kits are available, at all times. Staff should be properly trained in first aid and safety awareness.
- ✚ Ensure that installations of bulk services at the township developments are installed and approved by relevant qualified personnel who will issue Certificates of Compliance.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety and Security	-VE	1	3	6	3	M	L

*Summary of all potential impacts expected during the operational phase:*



In general, impacts are expected to be low, short lived and site to local specific. An Environmental Management Plan (EMP) will ensure that the impacts during the operational activities are minimised and includes measures to reduce all impacts identified.

### 13.3 Decommissioning Activities of the Township Development

The impacts associated with this phase will be similar to that of the construction phase. The Environmental Management Plan for this phase will have to be reviewed at the time of decommissioning to cater for changes made to the development.

## 14. CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the Goreangab Extension 6 & 7 Township project when added to other past, present, and reasonably foreseeable future actions regardless of what person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the development of Goreangab Extension 6 & 7 Township includes groundwater contamination, noise emissions, land disturbance, traffic and possible accidents involving vehicles frequenting the area. These impacts could become significant and this could collectively impact on the environmental conditions in the area. Cumulative impacts could occur in both the operational and the construction phase.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cumulative impacts	-VE	1	3	4	3	L	L

## 15. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) provides management options to ensure impacts of the proposed servicing of Goreangab Extension 6 & 7 Township are minimised. An EMP is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the proposed township project are prevented, and the positive benefits of the projects are enhanced.

The objectives of the EMP are:

- ✓ to include all components of the township project;
- ✓ to prescribe the best practicable control methods to lessen the environmental impacts associated with the township project;



- ✓ to monitor and audit the performance of the project personnel in applying such controls; and
- ✓ to ensure that appropriate environmental training is provided to responsible project personnel.

The EMP acts as a stand-alone document, which can be used during the various phases of the proposed project. All contractors taking part in the bulk services construction activities should be made aware of the contents of the EMP. An EMP for the construction and operational phases of Goreangab Extension 6 & 7 township project is attached as Appendix A.

## **16. CONCLUSIONS**

All known environmental and social risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that environmental performance be monitored regularly to ensure compliance and that corrective measures be taken if necessary. It is also recommended that this information be made available to the surrounding communities on a regular basis. The business ervens in Goreangab Extension 6 & 7 Township must only be reserved for light/dry industries that do not generate liquid pollutants, to protect the Goreangab Dam catchment and sensitive geological structures.

In general, the proposed Goreangab Extension 6 & 7 Township project would pose limited environmental risks, provided the EMP for the activity is used properly during planning, construction and operational phase. The Environmental Management Plan should be used as an on-site tool during all phases of the township project. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

Should the township project be modified or extended to a different area, it is recommended that a different EIA be done for the probable new location.



## 17. REFERENCES

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