



**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED
AUASBLICK EXTENSION 1 TOWNSHIP DEVELOPMENT IN
WINDHOEK, KHOMAS REGION, NAMIBIA**

DRAFT SCOPING REPORT

November 2014

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NAMIBIA'S ENVIRONMENTAL MANAGEMENT ACT (No. 7 OF 2007) REQUIREMENTS FOR SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT REPORTS WITH REFERENCE TO RELEVANT SECTIONS OF THIS SCOPING REPORT

The Scoping and Environmental Impact Assessment (EIA) process has resulted in the production of a comprehensive Final Scoping Report (DSR), which provides detailed information relevant to the project.

Table 1 presents the structure of the comprehensive Scoping Report as well as the applicable sections that address the required information in terms of Environmental Management Act (No. 7 of 2007) and the 2012 EIA Regulations (No. 30 of 2012).

Table 1 | EMA requirements for Scoping and EIA Reports and location in this Scoping Report

EIA Regulations 2012		Section
Section 8 – Scoping Report		
8 (a)	The curriculum vitae of the EAP/s who prepared the report	Annexure A
8 (b)	A description of the proposed activity	Section 3
8 (c)	A description of the site on which the activity is to be undertaken and the location of the activity on the site	Section 5
8 (d)	A description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity	Section 5
8 (e)	An identification of laws and guidelines that have been considered in the preparation of the scoping report	Section 1
8 (f)	Details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including	Section 2.2
	(i) the steps that were taken to notify potentially interested and affected parties of the proposed application	Section 2.2.2
	(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given;	Annexure B
	(iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application;	Annexure B
	(iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;	Annexure B
8 (g)	A description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity;	Section 3.5
8 (h)	A description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity;	Section 5
8 (i)	Terms of reference for the detailed assessment;	Not applicable – all impacts have

EIA Regulations 2012		Section
		been adequately dealt with in this Scoping Report.
8 (j)	A draft EMP	Annexure C
Section 15 – Assessment Report		
15(1)(a)	The curriculum vitae of the EAP who compiled the report	Annexure A
15(1)(b)	A detailed description of the proposed listed activity	Section 1.3
15(1)(c)	A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity	Section 5
15(1)(d)	A description of the need and desirability of the proposed listed activity and identified potential alternatives to the proposed listed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	Section 3.5
15(1)(e)	An indication of the methodology used in determining the significance of potential effects	Section 4
15(1)(f)	A description and comparative assessment of all alternatives identified during the assessment process	Section 3.4 and Section 5
15(1)(g)	A description of all environmental issues that were identified during the assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures	Section 5
15(1)(h)	An assessment of each identified potentially significant effect, including - (aa) cumulative effects; (bb) the nature of the effects; (cc) the extent and duration of the effects; (dd) the probability of the effects occurring; (ee) the degree to which the effects can be reversed; (ff) the degree to which the effects may cause irreplaceable loss of resources; and (gg) the degree to which the effects can be mitigated	Section 5
15(1)(i)	A description of any assumptions, uncertainties and gaps in knowledge	Section 2.3
15(1)(j)	An opinion as to whether the proposed listed activity must or may not be authorised, and if the opinion is that it must be authorised, any conditions that must be made in respect of that authorisation	Section 6
15(1)(k)	An executive summary of the information	Refer to Executive Summary

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ABBREVIATIONS

BID	Background Information Document
CoW	City of Windhoek
CRR	Comments and Responses Report
dB(A)	Decibel
DSR	Draft Scoping Report
EAP	Environmental Assessment Practitioner
ECC	Environmental Compliance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (Act No. 7 of 2007)
EMP	Environmental Management Plan
Ha	Hectares
HPV	High Pollution Vulnerable
I&APs	Interested and Affected Parties
IPP	Independent Power Producer
IUCN	International Union for Conservation of Nature
KOP	Key Observation Point
LPV	Low Pollution Vulnerable
MET: DEA	Ministry of Environment and Tourism: Directorate of Environmental Affairs
mm	Millimetres
NEMA	Namibian Environmental Management Act (No. 7 of 2007)
PPP	Public Participation Process
RA	Roads Authority
SACNASP	South African Council for Natural Scientific Professions
SANS	South African National Standards
TIA	Traffic Impact Assessment
ToR	Terms of Reference
VIA	Visual Impact Assessment
°C	Degrees Celsius

EXECUTIVE SUMMARY

INTRODUCTION

The city Windhoek has been experiencing continuous growth in the past few years and this necessitated the need to avail more serviced land in a quest to meet the high demand for housing. Auasblick was chosen as a suitable location for high and high-middle income housing because of its steep terrain with well above average building costs. City of Windhoek municipality has since subdivided areas in Auasblick into townlands to create sites for housing development to be known as Extension 1 and Extension 2 respectively. The proposed extensions will be located on portions of R/B Klein Windhoek Town and Townlands No. 70 and will cover an area of approximately 66 4719.98 hectares.

Furthermore, the road network in the area of Auasblick is currently undergoing tremendous traffic pressure. Currently all City traffic exiting Auasblick to the east makes use of Sam Nujoma Drive through one narrow break in the mountains leading into Avis. The proposed Auasblick development will offer an opportunity to create alternative routes by extending Reginald Walker Street and Sean McBride Street to join Sam Nujoma Drive and the road to Hosea Kutako International Airport through Avis.

Aurecon Namibia (Pty) Ltd has been appointed by Hangala Properties (Pty) Ltd herein referred to as Hangala Group as the independent environmental consultant to manage the Environmental Impact Assessment (EIA) process for the proposed development of Auasblick Extension 1 in Windhoek. The findings from the EIA will help inform MET's decision-making and to inform the layout design of the proposed development.

PROJECT DESCRIPTION

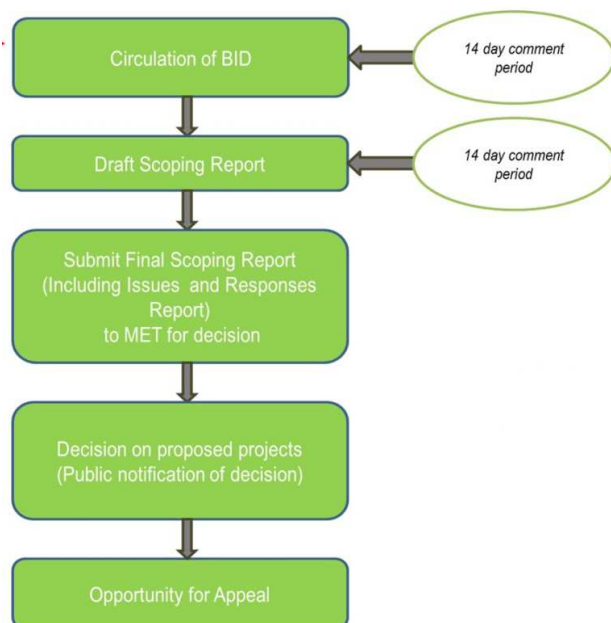
Approximately 210 erven have been reserved in Extension 1 and these will be composed of general residential and institutional erven. An erf will be left as undetermined to be reserved for Government activities such as a police station, public clinic or unanticipated expansion of business or general residential activities. Municipal services such as sewerage, water, storm water and electrical networks would be provided for the proposed township.

The proposed development site would have two possible access points serving as entrance and exit to the area. These roads would be the extension of Jason Hamutenya Street and Sam Nujoma Drive. Due to the current traffic pressure faced by the roads in Klein Windhoek, the alternative route will be the extension of Jason Hamutenya Street as first priority and Sean McBride Street to join Sam Nujoma Drive.

Construction is expected to last approximately 12 to 15 months and would require a labour force of approximately 50 people, 10 of which would be semi-skilled and 40 unskilled. It is anticipated that the associated jobs would improve the livelihoods of Windhoek residents given the expectation that most of the labour force would be sourced locally where possible. Auasblick Extension 1 is expected to operate for an indefinite period of time. Employment on the site during the operational phase is expected to be limited only to the institutions i.e. kindergarten and government facilities.

THE EIA PROCESS

An EIA is a process that evaluates the biophysical and socio-economic characteristics of a proposed development and its consequences on the environment as well as the people that live in the affected area. Where negative impacts are likely to result from the development, measures can be recommended to avoid or lessen these impacts to acceptable levels. Where positive impacts are likely to result, measures can be recommended to increase and harness such impacts. The EIA process also provides I&APs with opportunities to comment on the project and to be kept informed about decisions that may impact on them or the environment. The various stages of the consultation within the EIA process are shown in Figure 1 below.



The EIA process typically consists a scoping phase and an EIA phase. However, MET's decision can be informed by the scoping report if sufficient information is provided at this stage. The proposed development is expected to have minimal impacts due to increased development in the area.

This scoping report includes information of the proposed project, specialist's assessments of all anticipated impacts and mitigation measures. The report also addresses the anticipated impacts which should be sufficient for decision making by MET:DEA. It is therefore expected that the project would not need to proceed to the EIA phase.

Figure 1 | EIA assessment process

Please note that this is an executive summary of the Draft Scoping Report and does not replace the comprehensive report. It is recommended that should there be any significant interest or queries; please refer to the complete Draft Scoping Report for detailed information.

PUBLIC PARTICIPATION PROCESS (PPP)

This Draft Scoping Report is made available for a comment phase, allowing Interested and Affected Parties (I&APs) more than 14-days to comment on the Report, between **24 November 2014 and 8 December 2014**. The Draft Scoping Report is also available at the Aurecon Windhoek Office and at the City of Windhoek Municipal Offices. Registered I&AP's have also been notified of the availability of the Report.

IMPACT SUMMARY

The most significant negative construction phase impacts to the biophysical and socio-economic environment, without mitigation were impacts on flora and fauna due to an increase in vegetation clearance; increased impacts on surface water features; visual and noise impacts associated with the excavations and the road constructions. The socio-economic impact highlighted is the presence of workers on the site. These were rated between **low (-)** and **medium (-)**, respectively.

With the implementation of the proposed mitigation measures, the identified impacts would be reduced to **very low (-)** significance which is considered to be acceptable. It should however be noted that potential positive socio-economic impacts such as employment creation and the improved road network which are all rated at **medium (+)** significance will add value toward the economic status of Auasblick.

THE WAY FORWARD

Registered I&AP's have been notified of the availability of the Draft Scoping Report which is available for comment between **24 November 2014 and 8 December 2014**. The Draft Scoping Report is also accessible from Aurecon Windhoek office, as well as at the City of Windhoek Municipal offices. I&APs were also invited to raise their concerns, issues and or comments on the report and submit them to the Aurecon Team.

Cognisance will be taken of all comments in compiling the final report, and the comments received, together with the project team and proponent's responses thereto, will be included in the Final Scoping Report. Where appropriate, the report will be updated to final status and it will be submitted to the MET: DEA for consideration and decision-making. The MET: DEA will have 30 working days to review the report and issue a decision. All registered I&APs will be notified of the decision where after an appeal period will follow.

1 INTRODUCTION AND BACKGROUND

The purpose of this section is to briefly introduce the proposed township development and to describe the legislative context within which the project would take place.

1.1 INTRODUCTION

The City of Windhoek has been experiencing continuous growth in the past few years which necessitated the need to avail more serviced land to accommodate the increasing population. Auasblick was chosen as a suitable location for high and high-middle income housing because of its steep terrain with well above average building costs. City of Windhoek cc has since subdivided areas in Auasblick into townlands to create sites for townships to be known as Extension 1 and Extension 2 respectively. Hangala Properties (Pty) Ltd herein referred to as Hangala Group has been contracted by City of Windhoek cc to develop the Auasblick Township. This proposed development will be located on portions of R/B Klein Windhoek Town and Townlands No. 70 (see Figure 2).

The development of the township extensions in Auasblick would offer an opportunity to create alternative routes by extending Reginald Walker Street as first priority and Sean McBride Street to join Sam Nujoma Drive and the road to the international airport through Avis. Currently all the traffic that exits Auasblick to the east makes use of Sam Nujoma Drive through one narrow break in the mountains leading into Avis and this causes some traffic congestion. The proposed road extensions will assist to relieve traffic pressure on Klein Windhoek roads and to provide a much needed connection between Windhoek's southern and eastern suburbs.

The proposed construction activities for the township development would require authorisation in terms of the Environmental Management Act (No. 7 of 2007) (EMA) and the Environmental Impact Assessment (EIA) Regulations (Government Notice 30 of 6 February 2012). As a pre-requisite, an Environmental Impact Assessment (EIA) is required in order to obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism: Department of Environmental Affairs (MET: DEA) before the envisaged township development can proceed. Hangala Group has in turn appointed Aurecon Namibia (Pty) Ltd (Aurecon) to undertake the requisite EIA study to investigate the potential biophysical and socio-economic impacts that the proposed development would cause. The findings will inform MET: DEA's decision-making and will guide the construction of the township.

The Scoping process sets out to investigate the potential significant positive and negative biophysical and socio-economic impacts associated with construction activities for the proposed township. In addition to reporting on the potential impacts, the Scoping process will also serve to provide an opportunity for Interested and Affected Parties (I&APs) to provide comment and participate in the process. This report serves to document the Scoping Phase and is structured as follows:

-
- Section One: Provides the introduction, describes the legal framework and listed activities in terms of EMA.
- Section Two: Introduces the EIA process, describes the proposed public participation to be undertaken, lists the assumptions, uncertainties and limitations and describes the independence of the Environmental Assessment Practitioners.
- Section Three: Describes the proposed project and identified alternatives. It also describes the motivation for the proposed township.
- Section Four: Provides a description of the environment assessment methodology.
- Section Five: Provides a description of the environment and an assessment of the impacts thereto, it also provides mitigation measures to reduce negative impacts and enhance positive impacts.
- Section Six: Provides recommendations and concludes the report by describing the way forward.

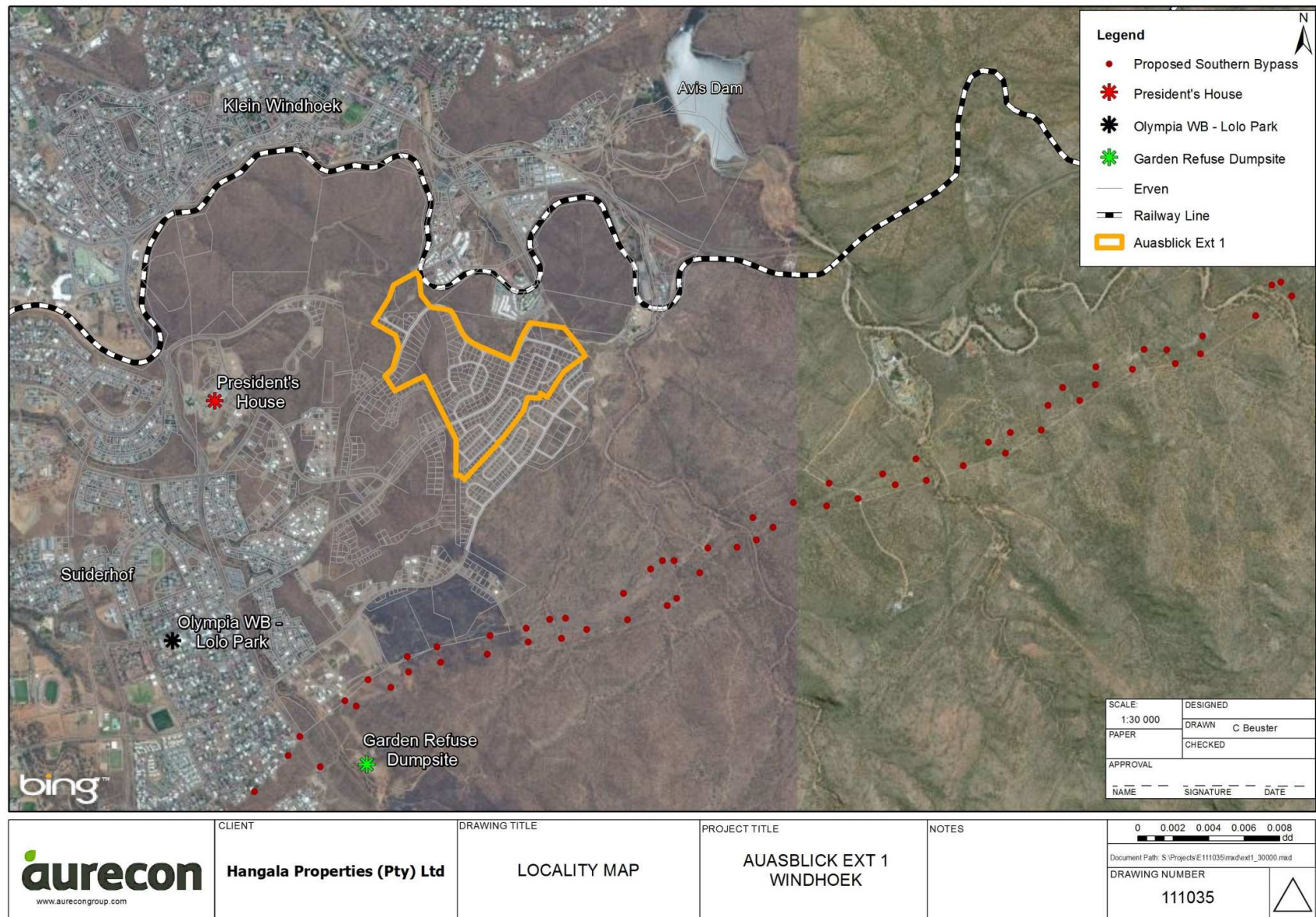


Figure 2 | Locality map indicating the location of the proposed township demarcated in yellow and the proposed southern bypass in red.

1.2 LEGISLATIVE REQUIREMENTS

In addition to the EMA that describes the EIA process that must be undertaken to obtain an ECC from the MET:DEA. There are additional legal and policy documents and legal guidelines that must be considered when undertaking an EIA as indicated in Table 2.

Table 2 | Relevant legislation and the applicability thereof

Legal Requirements		
Legislation considered	Relevant Organ of State / authority	Aspect of Project
The Constitution of the Republic of Namibia (1990)	Government of the Republic of Namibia	<p>The Namibian government has adopted a number of policies that promote sustainable development. Of specific relevance to sound environmental management practice are clause 91(c) and 95(l) of the Namibian Constitution. In summary these refer to:</p> <ul style="list-style-type: none"> • Guarding against over-utilisation of biological natural resources. • Limiting over-exploitation of non-renewable resources. • Ensuring ecosystem functionality. • Protecting Namibia's sense of place and character. • Maintaining biological diversity. • Pursuing sustainable natural resource use. <p>The above therefore commits the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the abovementioned sustainable development objectives.</p> <p>Through the implementation of mitigation measures as set out in this Scoping Report and the accompanying Environmental Management Plan (EMP), the holder of the ECC shall be advocating for sound environmental management as set out in the Constitution.</p>
EMA	MET:DEA	<p>Part 2 of the Act sets out 12 principles of environmental management, as follows:</p> <ul style="list-style-type: none"> • Renewable resources must be used on a sustainable basis for the benefit of present and future generations. • Community involvement in natural resources management and the sharing of benefits arising from the use of such resources must be promoted and facilitated. • The participation of all I&APs must be promoted and decisions must take into account the interest, needs and values of I&APs. • Equitable access to environmental resources must be promoted and the functional integrity of ecological systems must be taken into account to ensure the sustainability of the systems and to prevent harmful effects. • Assessments must be undertaken for activities which may have significant effects on the environment or the use of natural resources • Sustainable development must be promoted in all aspects relating to

		<p>the environment.</p> <ul style="list-style-type: none"> Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected for the benefit of present and future generations. The option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term, must be adopted to reduce the generation of waste and polluting substances at source. The reduction, re-use and recycling of waste must be promoted; A person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by pollution, including costs for measures as are reasonably required to be implemented to prevent further environmental damage. Where there is sufficient evidence which establishes that there are threats of serious or irreversible damage to the environment, lack of full scientific certainty may not be used as a reason for postponing cost-effective measures to prevent environmental degradation; and Damage to the environment must be prevented and activities which cause such damage must be reduced, limited or controlled. <p>The project proponent (Hangala Group) has the responsibility to ensure that the proposed development conforms to the principles of this Act. In developing the EIA process, Aurecon has been cognisant of this need, and accordingly the EIA process will be undertaken in terms of this Act and the EIA Regulations (2012). Several listed activities in terms of the Act, are triggered by the proposed development as listed in Table 3.</p>
Regional Councils Act, 1992 (Act No. 22 of 1992)	Ministry of Regional and Local Government, Housing and Rural Development	<p>The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development.</p> <p>The main objective of this Act is to initiate, supervise, manage and evaluate development within the regions countywide. The Khomas region and constituency councillors are considered to be I&APs and will be provided with the opportunity to comment on the proposed project.</p>
Water Resources Management Act (Act No. 11 of 2013)	Ministry of Agriculture, Water and Forestry	<p>This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.</p> <p>The township development activities would be located in close proximity to sensitive groundwater protection areas that are referred to as "<i>high environmental zone</i>". Special care should be taken and recommendations will be provided not to negatively impact on the protected groundwater in this area.</p>
Pollution Control and Waste Management Bill (<i>in preparation</i>)	MET and others	<p>This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force.</p> <p>The Bill also provides for noise, dust or odour control that may be</p>

		<p>considered a nuisance. The Bill would repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force. Furthermore, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management. As wastewater would be discharged to the existing sewer system a Water Pollution Licence is not required.</p> <p>The proposed development would not entail the discharge to air and or water, but could result in the generation of noise and dust during the construction phase.</p>
Atmospheric Pollution Prevention Ordinance (Act No.11 of 1976)	Ministry of Health and Social Services	<p>This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health.</p> <p>It is not anticipated that the development would generate any noxious or offensive gasses however, should this be the case, the proponent will ensure that a registration certificate (air pollution permit) is obtained prior to commencement of activities. As duty of care, the proponent will implement the necessary mitigation measures as set out in this Scoping Report and the EMP in order to limit air emissions in the form of dust during construction.</p>
National Heritage Act (Act No. 27 of 2004)	Ministry of Education and Culture: National Heritage Council	<p>The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 (ff) sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. The National Heritage Council has been established to identify, conserve, manage and protect places and objects of heritage significance.</p> <p>The archaeological specialist has identified a site (QRS 18/3) of heritage importance that could be impacted on by the proposed development. It is recommended that cognisance should be taken in the construction planning to limit the possibilities of Impacts on the identified site. The proponent will have to apply to the National Heritage Council for a permit to excavate the site prior to the commencement of the construction phase.</p>
Nature Conservation Ordinance (Act No. 5 of 1996)	MET	<p>This Ordinance will be replaced by the Parks and Wildlife Bill (<i>currently in draft version</i>) which will regulate protected areas and all indigenous flora and fauna in Namibia. It also includes provisions for protection against alien species.</p> <p>A few indigenous and protected plants are occurring on the site and therefore this Ordinance is relevant. A permit is required should any species onsite, with a protected status, be damaged or removed. If required, the proponent will apply for such a permit prior to commencing with construction.</p>

Forestry Act (Act No. 12 of 2001)	Ministry of Water, Agriculture and Forestry: Forestry Council	<p>The Act provides for the management and use of forests and forest products. It offers protection to any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse on land that is not a surveyed erven of a local authority area and a licence would be required to cut and remove any such vegetation.</p> <p>This is not applicable to the project since the site is located within the jurisdiction of the City of Windhoek.</p>
Soil Conservation Act (Act No. 76 of 1969)	Ministry of Water, Agriculture and Forestry	<p>The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.</p> <p>This Act is applicable since soil could potentially be impacted on by the proposed township development. Measures should be taken to protect the drainage lines and should comply with any notice issues in respect of this Act.</p>
Public Health Act (Act No. 36 of 1919)	Ministry of Health and Social Services	<p>The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.</p> <p>The proponent should ensure that the township is designed in a safe way that is not injurious or dangerous to public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels. This is mostly applicable during the construction phase.</p>
Labour Act (6 of 1992)	Ministry of Labour and Social Welfare	<p>This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees.</p> <p>The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.</p> <p>Specifically, no employer shall require or permit an employee to work in an environment in which they are exposed to an equivalent noise level equal to or exceeding 85 dB(A).</p> <p>The proponent as the employer should adhere with all the requirements of the Act and the associated Regulations.</p>
Windhoek Municipality: Waste Management Regulations (16 of 2011): Local Authorities Act (23 of 1992)	Municipality of Windhoek	<p>The Act stipulates measures that must be taken by builders in respect of builder's waste. Builder's waste is defined as waste generated during the building, construction, repair, alteration, renovation, excavation or demolition of any road, surface, structure, building or premises, including builders rubble, earth, vegetation and rock displaced during such building, construction, repair, alteration, renovation, excavation or demolition. The provisions relate to the collection, depositing, storage, and transport of such waste.</p> <p>The proponent should ensure that building contractors adhere with all the requirements of the Act.</p>

Relevant policies		
Policies considered	Relevant Organ of State / authority	Aspect of Project
Environmental Assessment Policy (1994)	MET: DEA	This policy aims to promote sustainable development and economic growth while protecting the environment in the long term by requiring environmental assessment prior to undertaking of certain activities. Annexure B of this policy contains a schedule of activities that may have significant detrimental effects on the environment and which require authorisation prior to undertaking. Please see Table 3 for a summary of the activities that would require special authorisation for the proposed township development.
Namibia's Vision 2030	Government of the Republic of Namibia	<p>Namibia 2030 was formulated in order to provide a clear vision to guide long term planning towards improved quality of life for Namibian citizens. The Vision recognises environmental constraints and opportunities in formulating sub-visions, the sub-visions being that, <i>inter alia</i>:</p> <ul style="list-style-type: none"> Namibia's freshwater resources are kept free of pollution and are used to ensure social well-being, support economic development, and to maintain natural habitats. Land is used appropriately and equitably, significantly contributing towards food security at household and national levels, and supporting the sustainable and equitable growth of Namibia's economy, whilst maintaining and improving land capability. Namibia's diverse woodlands, savannahs and the many resources they provide are managed in a participatory and sustainable manner to help support rural livelihoods, enhance socio-economic development, and ensure environmental sustainability. The integrity of vital ecological processes, natural habitats and wild species throughout Namibia is maintained whilst significantly supporting national socio-economic development through sustainable low-impact, high quality consumptive and non-consumptive uses, as well as providing diversity for rural and urban livelihoods. Despite high growth rates, Namibia's urban areas will provide equitable access to safety, shelter, essential services and innovative employment opportunities within an efficiently managed, clean and aesthetically pleasing environment. <p>The proposed township development is in alignment with the objectives of this vision as it will improve the socio-economic livelihood within Windhoek. Furthermore, the project will assist in reducing the high demand for properties in Windhoek.</p>
Relevant Guidelines		
Guidelines considered		
Draft Procedures and Guidelines for	MET	MET released a Draft Procedures and Guidelines for conducting EIA's and compiling EMP's in April 2008. This EIA process is informed by national Environmental Guidelines where applicable and relevant.

conducting EIA's and compiling EMP's, 2008		
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1.3 LISTED ACTIVITIES IN TERMS OF ENVIRONMENTAL MANAGEMENT ACT

The EMA is the primary legislative guardian of the environment and therefore focusses on the management of environmental resources and accordingly, identifies activities that require authorisation prior to commencement. The proposed township development would trigger a number of listed activities as included in Table 3, requiring an ECC prior to commencement.

Table 3 | Applicable listed activities in terms of EMA EIA Regulations

Activity	Description of Activity	Relevance of the activity
Activity 5.1 Land use and development activities.	5.1. (d) 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 zoned as open space.
Activity 10 Infrastructure	10.1 The construction of – (a) oil, water, gas and petrochemical and other bulk supply pipelines; (b) public roads 10.2: The route determination of roads and design of associated physical infrastructure where: (a) it is a public road.	10.1 (a) Water and sewer pipelines will be set up to connect onto the existing bulk supply pipeline networks in Auasblick. (b) An extension of Regionald Walker Street as well as joining of Sean McBride Street with Sam Nujoma Drive and the road leading to Hosea Kutako Airport via Avis. 10.2 (a) The roads will be used by the public.

2 EIA APPROACH

The purpose of this section is to provide the reader with an overview of the proposed EIA methodology. As engagement with the public and stakeholders forms an integral component of the EIA process, the report also provides a description of the proposed public participation. This is followed by a description on the assumptions and limitations of the EIA and the independence of the Environmental Assessment Practitioners (EAPs).

2.1 APPROACH TO THE PROJECT

The EIA process typically has three phases, namely the Initiation Application, the Scoping Phase, and the EIA Phase. Although this report is termed a Scoping Report, which typically documents the Scoping Phase of the process, it also includes an assessment of all potential environmental impacts that were identified through this process, including specialist assessments. This Report is therefore more comprehensive than a standard Scoping Report and documents information that is required for both Scoping and EIA Phases. Please refer to Figure 3 as presented below by a diagram outlining the proposed EIA process to be followed for this proposed development.

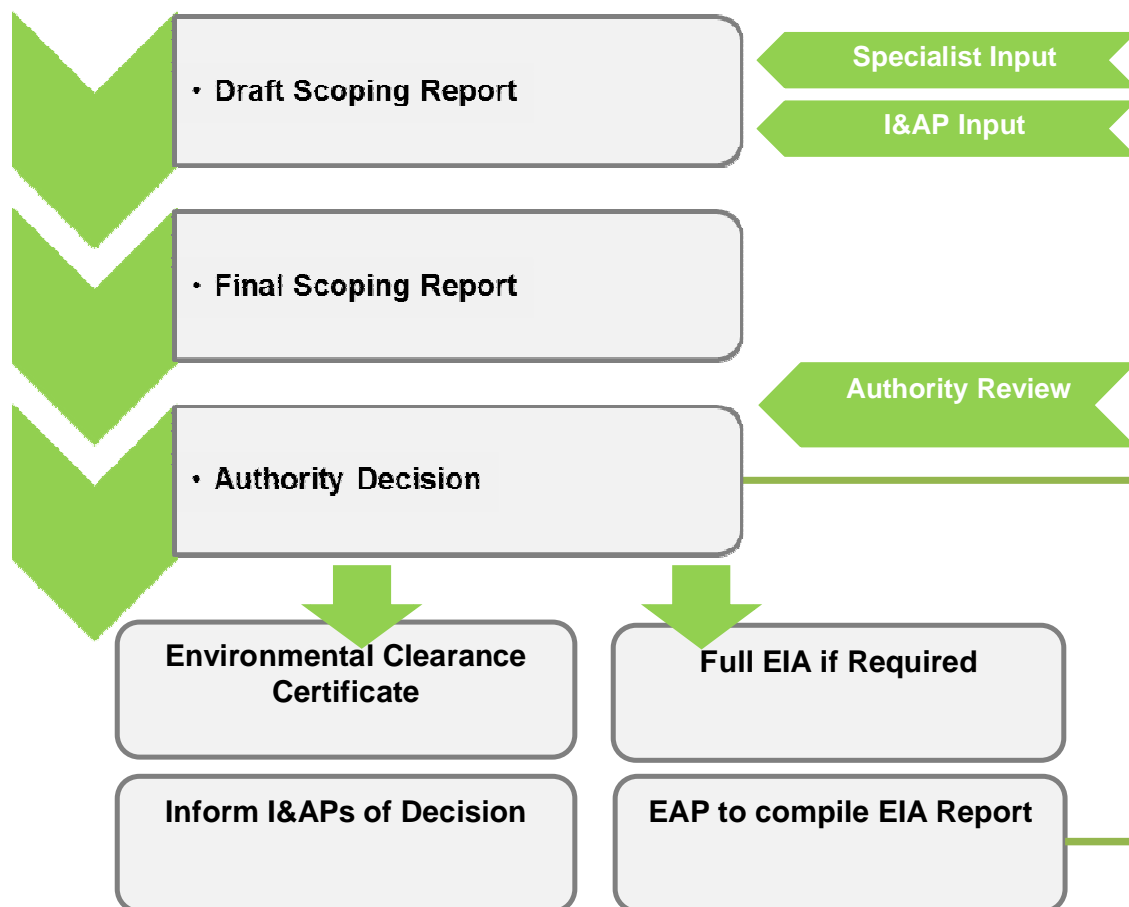


Figure 3 | The EIA process being followed

The decision to extend the scope of the Scoping Report to include an assessment was taken on the basis of the following:

- The potential social and biophysical environmental impacts relating to this type of development are well understood and localised.
- The receiving socio-economic and biophysical environment in its entirety is not considered to be significantly sensitive; and.
- Any additional issues identified by I&APs during the Public Participation Process (PPP) will be considered and included in the Final Scoping Report and EMP.

The purpose of an environmental assessment is to provide a basis for informed decision-making by the applicant and MET:DEA regarding the environmental acceptability of the proposed development. Activities occurring in the Scoping and EIA Phases have been combined into one phase and involved the following key tasks:

- Desktop review of the biophysical and social characteristics of the affected area including any other relevant previous environmental studies.
- Identification of biophysical and socio-economic sensitivities of the proposed development by specialists.
- Identification of feasible alternatives.
- Identification of significant issues/impacts associated with the proposed development;
- Assessment of significance of potential environmental impacts.
- Preparation of a Draft Scoping Report and EMP (refer to Annexure C).
- Identification and involvement of the relevant authorities and I&APs in order to elicit their interest in the project through the PPP as detailed in Section 2.2.
- Finalisation of the Scoping Report and EMP based on I&AP input.
- Authority review and decision-making.

2.2 THE PUBLIC PARTICIPATION PROCESS (PPP)

Public consultation forms an integral component of this investigation and it enables I&APs (e.g. directly affected properties; national and local authorities, environmental groups, civic associations, and communities), to identify their issues and concerns, relating to the proposed activities, which they feel should be addressed in the EIA process. The PPP for this project has therefore been structured to provide I&APs with an opportunity to gain more knowledge about the proposed project; to provide input through the review of documents/reports; and to voice any issues of concern during the EIA process.

The objectives of public participation are to provide information to the public, identify key issues and concerns, respond to the issues and concerns raised, provide a review opportunity, and to document the process properly. The PPP undertaken to date is summarised in Table 4 and the PPP still to be undertaken is include in Table 5.

Table 4 | Summary of the PPP to date

Task	Details	Date
I&AP notification (relevant authorities and I&APs)		
I&AP identification	An I&AP database was developed for the project by establishing the jurisdiction of organisations in respect of the project as well as those living or working in proximity to the project site. The database of I&APs includes adjacent	September 2014 – ongoing

	landowners, the local municipal officials, relevant national and regional government officials, and organisations including parastatals in the area. A copy of the I&AP database is attached in Annexure B1.	
Newspaper Advertisements	Adverts were placed in <i>The Namibian</i> and <i>Republikein</i> newspapers advertising the intended project and inviting I&APs to register and raise comments on it. See Annexure B for the adverts.	18 & 23 September 2014
Background Information Document	A Background Information Document (BID) was compiled and distributed to parties on the I&AP database. I&APs were also invited to register in the process from 18 September 2014 until 3 October 2014. The BID was also available for collection from Aurecon Windhoek Office (189 Newton Street, Windhoek) and the City of Windhoek (Customer Care Building, Rev Michael Scott Street, Windhoek). A copy of the BID is included in Annexure B3.	11 September 2014 to 3 October 2014
Site notices	Site notices were placed at the Windhoek Municipal Offices, Olympia Lolo Park Shopping Centre and the Olympia Engen Service Station (see Annexure B) to inform the general public of the proposed development and the availability of the BID for comment.	11 September 2014 to 3 October 2014
Addressing comments received	All comments received on the BID were collated into a Comments and Responses Report Version 1 (CRR1), along with responses from the EAPs. CRR1 is included in Annexure B5.	11 September 2014 to 3 October 2014
Review of Draft Scoping Report		
I&APs and authorities	<p>All potential I&APs were notified of the availability of the Draft Scoping Report via the post, fax or email. Relevant government departments as listed in Annexure B1 have also been notified of the report and were requested to submit comments.</p> <p>A copy of the Draft Scoping Report including the EMP was made available for review at the following locations:</p> <ul style="list-style-type: none"> • Aurecon Windhoek Office (189 Newton Street, Windhoek); and • City of Windhoek Municipal Offices (Customer Care Building, Rev Michael Scott Street, Windhoek). <p>Authorities and registered I&APs were accorded 14-days to review the Draft Scoping Report and were invited to submit comments in writing to the Aurecon team. The closing date for comments is 5 December 2014.</p>	Comment period for the Draft Scoping Report: 24 November 2014 to 8 December 2014

Table 5 | PPP tasks still to be undertaken

Review of Draft Scoping Report		
Addressing comments received	All comments that will be received on the Draft Scoping Report will be collated into a second Comments and Responses Report (CRR2). Responses provided to these comments from the proponent and the EAP will also be provided in the CRR2 and will be included as an annexure to the Final Scoping Report.	December 2014
Notification of MET decision-making		

Notification of the Departments Decision	If MET authorises the project by way of an ECC or requests that a full EIA be carried out, all registered I&APs would be notified of the decision.	
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2.2.1 Issues Raised

All issues raised by I&APs during the respective comment periods on the project will be recorded in a CRR, along with responses from the project proponent and the EAPs.

To date, the following key issues and or comments were raised by I&APs and authorities:

- A representative from Hakos Capital and Finance requested for more information and the locality of the project after reading the BID advert in the newspaper.
- City of Windhoek reiterated the fact the proposed site for development fall within a buffer-zone of the groundwater protection area for Windhoek and requested to be registered.
- Roads Authority requested for detailed site illustrations/drawings that would indicate the position of the proposed extension in relation to the future proposed Windhoek Southern Bypass.
- Residents of Auasblick requested for more information on the proposed development.

For responses to the above comments refer to CRR1 in Annexure B6.

2.2.2 Stakeholder involvement

I&APs including authorities, non-governmental organisations as well independent organisations (green groups) have been invited to participate in the process, as described in Table 4 and Table 5, to ensure that the final documentation satisfies MET:DEA's requirements and that the I&APs are fully informed with respect to the nature and scope of the proposed project. The list of registered I&APs and authorities is provided in Annexure B1.

2.3 ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

In undertaking this investigation and compiling the Scoping Report, the following has been assumed:

- It is assumed that information provided by the client Hangala Group is accurate and that no information that could change the outcome of this process has been withheld by the client.
- The scope of this investigation is only limited to assessing the environmental impacts associated with the proposed township development and associated infrastructures.
- It is assumed that other relevant authorisation and permits for the proposed township development would be managed as part of separate applications.

The gaps in knowledge that were evident during the assessment include:

- A commencement date of the construction phase was not provided.

This Draft Scoping Report has identified the potential environmental impacts associated with the proposed development activities and the nature as well as significance of the impacts presented in this report could change, should the project description be refined by the proponent.

2.4 THE ENVIRONMENTAL TEAM

Aurecon have selected a team of highly experienced multi-disciplinary practitioners in order to execute these projects as efficiently as possible. The Curriculum Vitae's of the key Aurecon staff are attached as Annexure C. The Project Director, Mr Andries van der Merwe is a certified Environmental Engineer registered with the Engineering Council of South Africa (*PrEng*) and holds a B Eng (Civil) degree. Mr van der Merwe has over 13 years' experience in the field of impact assessment.

Project Leader, Mrs Ilze Rautenbach one of the project staff, is an Environmental Practitioner in the Windhoek office with nine years' experience in the field. Mrs Rautenbach has a Masters of Philosophy (Environmental Management) degree and is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA) and is a professional member with the Southern African Institute of Ecologists and Environmental Scientists (SAIEES).

Co-Project Leader, Miss Louise Corbett, an Associate in the Cape Town office, has a Bachelor's of Science (Hons) Degree in Environmental and Geographical Science from the University of Cape Town, specialising in Environmental Management. She has nine years' experience in the environmental field. Miss Corbett is a Registered *Professional Natural Scientist* with the South African Council for Natural Scientific Professions.

Miss Grace Shihepo, the author of the Scoping Report, is an Environmental Practitioner with two years' experience in the field both nationally and internationally. Miss Shihepo has a Master of Environmental Science specialising in Environmental Planning and Management and is registered as a *Certificated Natural Scientist* with the South African Council for Natural Scientific Professions (SACNASP).

Independence of the environmental consultant from the project proponent reduces the potential for bias in the environmental process. Neither Aurecon nor any of its sub-consultants are subsidiaries of Hangala Group nor is Hangala Group a subsidiary to Aurecon. Furthermore, all these parties do not have any interests in secondary or downstream developments that may arise out of the authorisation of the proposed project.

3 DESCRIPTION OF THE PROPOSED PROJECT

The purpose of this section is to provide a technical description of the activities associated with the proposed township development, followed by a description of the feasible project alternatives. This section concludes with a motivation for the proposed projects.

3.1 PROPOSED PROJECT

Windhoek in general has been experiencing continuous population growth in the past few years, a trend that necessitated the need to avail additional serviced land to accommodate the increasing population. Auasblick was chosen as a suitable location for high and high-middle income housing because of its steep terrain with well above average building costs. The City of Windhoek has since subdivided areas in Auasblick into Townlands to create sites for townships to be known as Extension 1 and Extension 2 respectively. Additional to this, the road network in the area of Auasblick is currently undergoing tremendous pressure. Currently all City traffic exiting Auasblick to the east makes use of Sam Nujoma Drive through one narrow break in the mountains leading into Avis. The proposed Auasblick development will offer an opportunity to create alternative routes by extending Reginald Walker Street as first priority and Sean McBride Street to join Sam Nujoma Drive and the road to Hosea Kutako International Airport through Avis. The proposed road extensions will assist to relieve traffic pressure on Klein Windhoek roads and to provide a much needed connection between Windhoek's southern and eastern suburbs.

A large part of the area is fenced off with restricted access for the purpose of recreational activities, such as mountain biking, hiking, etc. There are a number of existing tracks throughout the area (varying from single tracks to graded roads).

The entire proposed development in Auasblick would have a total footprint of approximately 66 4719.98 hectares. Approximately 210 erven in Extension 1 have been reserved for residential units and an additional 100 erven in Extension 2. This is considered to be adequate to meet the demand for properties in Auasblick for the next three years, after which new extensions will require to be made available. Extension 1 will be composed of general residential, institutional as well as commercial erven. An erf will be left as undetermined to be reserved for Government activities such as a police station, public clinic or unanticipated expansion of business or general residential activities. Municipal services such as sewerage, water, storm water and electrical networks would be provided for the proposed township and link up with existing services.

The proposed Auasblick Extension 1 would be zoned in the different land use and erf sizes as described below and indicated in Figure 3 below:

- 308 residential erven (1 per erf);
- 3 residential blocks (1 per 250m²);
- 1 institutional erf;
- 2 public open spaces (POS);
- 8 municipal erven (including the borehole buffer zones); and
- streets.

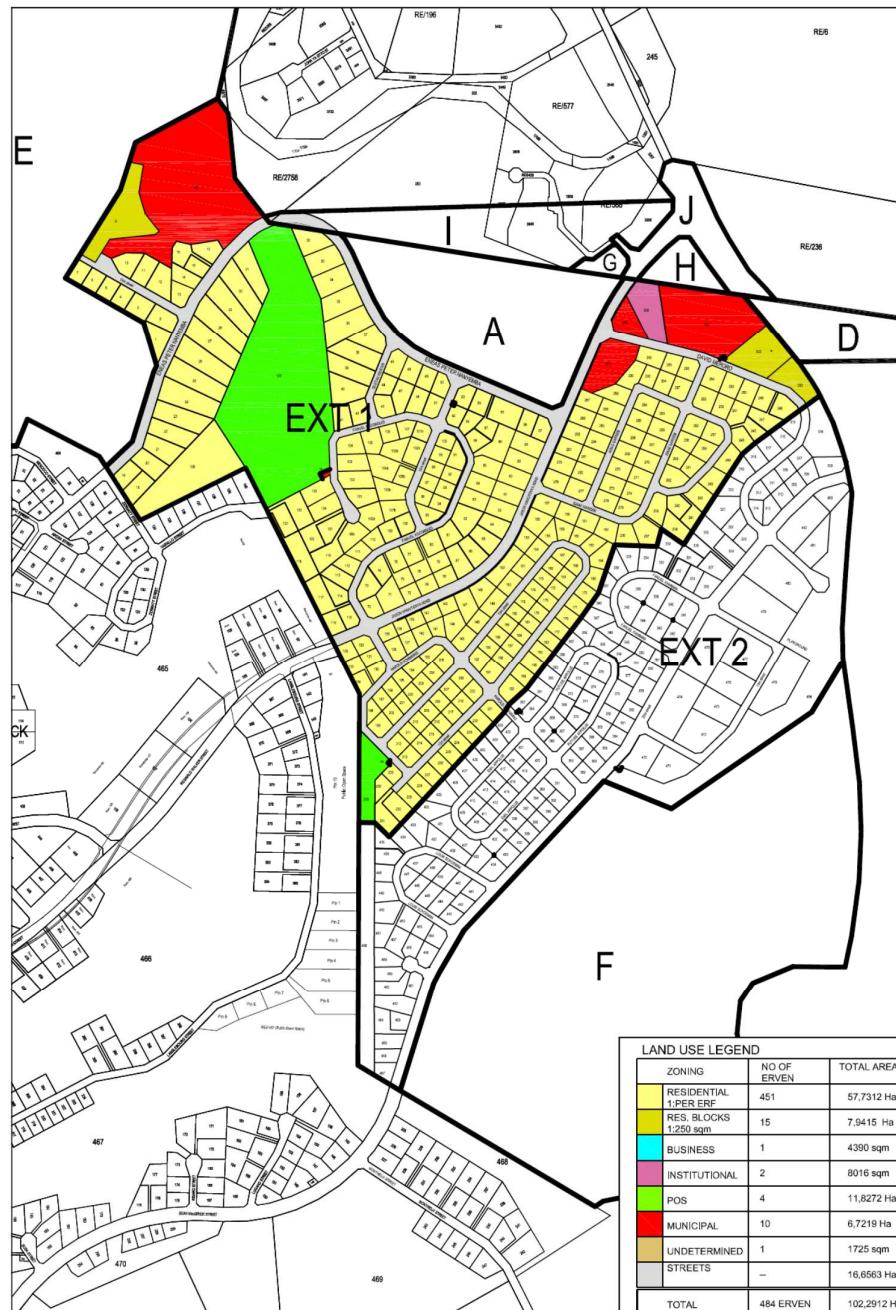


Figure 4 | The EIA process being followed

The proposed erven demarcations are described in more detail in the following sections.

3.1.1 Institutional

An institutional erf has been proposed within Extension 1 to be used for a church or other institutional uses such a day care or a kindergarten. The erf will be located on the northern side of the extension and it will have ample underdeveloped land for outdoor activities.

3.1.2 Residential

It is envisaged that 210 erven would be provided in Extension 1 to be used for residential purposes.

3.1.3 Undetermined

One erf has been zoned as “undetermined” and this is proposed to cater for government activities such as a police station, clinic or to be used for institutional use should a need for more arise or an anticipated expansion of business or general residential activities.

3.1.4 Street Layout

The streets in Extension 1 hinge on a central spine that connects east-west between the extended Sam Nujoma Drive on the east to the established suburbs of Auasblick and Olympia on the west i.e. Reginald Walker and Sean McBride streets. A small road curves though the northern side of Extension 1 to ensure adequate interconnection back to Auasblick.

The proposed development site would have two possible access points serving as entrances and exits to the area. These roads would be the extension of Jason Hamutenya Street and Sam Nujoma Drive. Due to the current traffic pressure faced by the roads in Klein Windhoek, the alternative route will be the extension of Jason Hamutenya Street as first priority and Sean McBride Street to join Sam Nujoma Drive.

3.1.5 Additional infrastructure

The service network for sewerage, electricity and storm water provisions would be provided for by the City of Windhoek (CoW) Municipality. CoW would also ensure that the provisions of all essential municipal services are available for Extension 1 and they would be responsible for the provision of solid waste removal as it is the case solid waste handling in Windhoek. Water supply to the individual properties would be provided by means of an underground water reticulation network that would be within the road reserve. Individual connections would be provided to ensure that households have access to potable water.

Additional infrastructure would also include boundary fences for safety and security. The fences would either be electrical or barbed wire fences, depending on the preference of the developer.

3.2 CONSTRUCTION PHASE

The construction phase of the township is expected to last approximately 12 to 15 months. The construction of the project would require a labour force of approximately 50 people, 10 of which would be semi-skilled or skilled and 40 of which would be unskilled. It is expected that the associated jobs would contribute towards improved livelihoods around Windhoek and nationally in general.

There would be no construction camp set up for the workers on site since the development is located within Windhoek with the majority of labourers being sought from the surrounding area. A construction yard would however be required onsite to store equipment and materials as well as temporary site offices for the management of construction activities.

3.3 OPERATIONAL PHASE

Auasblick Extension1 is expected to operate for an indefinite period of time and there is no defined design life. CoW would continue to provide municipal services to the township. Employment onsite during operational phase would mainly be restricted the type of institution to be constructed considering the fact the site will be for residential purposes.

3.4 ALTERNATIVES

According to the EMA EIA Regulations alternatives must be considered during the EIA process. These Regulations state that “*alternatives, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to:*

- (a) the property on which or location where it is proposed to undertake the activity;*
- (b) the type of activity to be undertaken.*
- (c) the design or layout of the activity.*
- (d) the technology to be used in the activity.*
- (e) the operational aspects of the activity”.*

The 2008 Draft Guidelines (Republic of Namibia, 2008) state that EIAs should consider the impacts of:

- *“the proposed activity for the proposed project under consideration.*
- *the no-action alternative.*
- *other alternatives to the proposed activity that fulfils the general objective or need”.*

No site alternatives have been considered for this project however, two access roads that would serve as entrances and exits to the area have been proposed as follows:

- 1.The extension of Jason Hamutenya Street and Sam Nujoma Drive; and
- 2.The extension of Sean McBride Street to join Sam Nujoma Drive.

3.4.1 ‘No-go’ alternative

The assessment of alternatives must at all times include the ‘No-go’ option as a baseline against which all other alternatives must be measured. The ‘No-go’ option means the *status quo* remains i.e. the site would remain vacant with no structures despite the proclamation into a township. CoW is currently undergoing pressure from the inhabitants to avail more serviced land for residential purposes therefore the ‘no-go’ option is regarded as not be feasible.

3.5 MOTIVATION FOR THE PROJECT

Section 8 (g) of the EMA requires “*a description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity*”. This Scoping Report considers the need and desirability in light of Namibia’s Vision 2030 and the associated acts, policies and regulations. This information allows the authorities to contemplate the strategic context of a decision on the proposed development. This section seeks to provide the context within which the need and desirability of the proposed development should be considered.

The proposed development for Extension 1 is in line with a sub-vision of Vision 2030 that is to provide a conducive urban and rural living environment through the provision of basic social services and infrastructural facilities.

4 ASSESSMENT METHODOLOGY

This section describes the assessment methodology that has been used in determining the significance of the construction and operational impacts of the proposed project.

4.1 ASSESSMENT METHODOLOGY

This section outlines the proposed method for assessing the significance of the potential environmental impacts including both operational and construction phase impacts.

Assessment of predicted significance of impacts for a proposed development is by its nature, inherently uncertain – environmental assessment is thus an imprecise science. To deal with such uncertainty in a comparable manner, standardised and internationally recognised methodology has been developed. Such accepted methodology is applied in this study to assess the significance of the potential environmental impacts of the proposed development is outlined in Table 6. For each impact, the **EXTENT** (spatial scale), **MAGNITUDE** and **DURATION** (time scale) would be described. These criteria would be used to ascertain the **SIGNIFICANCE** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the Scoping Report would represent the full range of plausible and pragmatic measures.

Table 6 | Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	Regional	Beyond a 10 km radius of the site.
	Local	Within a 500 m radius of the site.
	Site specific	Onsite or within 100 m of the site.
Magnitude of impact (at the indicated spatial scale)	High	Natural and/ or social functions and/ or processes are <i>severely</i> altered
	Medium	Natural and/ or social functions and/ or processes are <i>notably</i> altered
	Low	Natural and/ or social functions and/ or processes are <i>slightly</i> altered
	Very Low	Natural and/ or social functions and/ or processes are <i>negligibly</i> altered
	Zero	Natural and/ or social functions and/ or processes remain <i>unaltered</i>
Duration of impact	Long Term	5-15 years after construction
	Medium Term	Up to 5 years after construction
	Short term	Construction period

The **SIGNIFICANCE** of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in Table 7. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

Table 7 | Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	<ul style="list-style-type: none"> High magnitude with a regional extent and long term duration. High magnitude with either a regional extent and medium term duration or a local extent and long term duration. Medium magnitude with a regional extent and long term duration.
Medium	<ul style="list-style-type: none"> High magnitude with a local extent and medium term duration. High magnitude with a regional extent and construction period or a site specific extent and long term duration. High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration. Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term. Low magnitude with a regional extent and long term duration.
Low	<ul style="list-style-type: none"> High magnitude with a site specific extent and construction period duration. Medium magnitude with a site specific extent and construction period duration. Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term. Very low magnitude with a regional extent and long term duration.
Very low	<ul style="list-style-type: none"> Low magnitude with a site specific extent and construction period duration. Very low magnitude with any combination of extent and duration except regional and long term.
Neutral	<ul style="list-style-type: none"> Zero magnitude with any combination of extent and duration.

Once the significance of an impact has been determined, the **PROBABILITY** of such impact occurring as well as the **CONFIDENCE** in the assessment of the impact would be determined using the rating systems outlined in Table 8 and Table 9 and respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the **REVERSIBILITY** of the impact is estimated using the rating system outlined in Table 10.

Table 8 | Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 9 | Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

* The level of confidence in the prediction is based on knowledge of that particular field and the reliability of data used to make the prediction.

Table 10 | Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

Despite attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, environmental assessment processes can never escape the subjectivity inherent in attempting to define significance. The determination of the significance of an impact depends on both the context (spatial scale and temporal duration) and intensity of that impact. Since the rationalisation of context and intensity will ultimately be prejudiced by the observer, there can be no wholly objective measure by which to judge the components of significance, let alone how they are integrated into a single comparable measure.

This notwithstanding, in order to facilitate informed decision-making, environmental assessments must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Recognising this, Aurecon has attempted to address potential subjectivity in the current EIA process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above.
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing towards the determination of significance, thereby avoiding arbitrary assignment, but also provides the reader with a clear summary of how the assessor derived the assigned significance.
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.
- Utilising a team approach and internal review of the assessment to facilitate a more rigorous and defensible system.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

4.2 ASSESSMENT OF CUMULATIVE IMPACTS

Environmental Assessment Policy in Namibia requires that, “as far as is practicable”, cumulative environmental impacts should be taken into account in all environmental assessment processes. EIAs have traditionally, however, failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements.
- Environmental assessments are typically carried out on specific developments, whereas cumulative impacts result from broader biophysical, social and economic considerations, which typically cannot be addressed at the project level.

Cumulative impacts were considered and assessed as far as possible for each of the anticipated impacts, as included in Section 6.

4.3 MITIGATION MEASURES

For each impact assessed, mitigation measures have been proposed to reduce and/ or avoid negative impacts and enhance positive impacts as included in Section 5. These mitigation measures are also incorporated into the EMP to ensure that they are implemented during the planning, construction and operational phases. The EMP (Annexure C) forms part of the Scoping Report, as such its implementation would become a binding requirement should this project be authorised.

There is a hierarchy of actions which can be undertaken to respond to any proposed project or activity. These cover avoidance, minimisation and compensation. It is possible and considered sought after to enhance the environment by ensuring that positive gains are included in the proposed activity or project. If negative impacts occur then the hierarchy follows the steps as indicated in Figure 5.

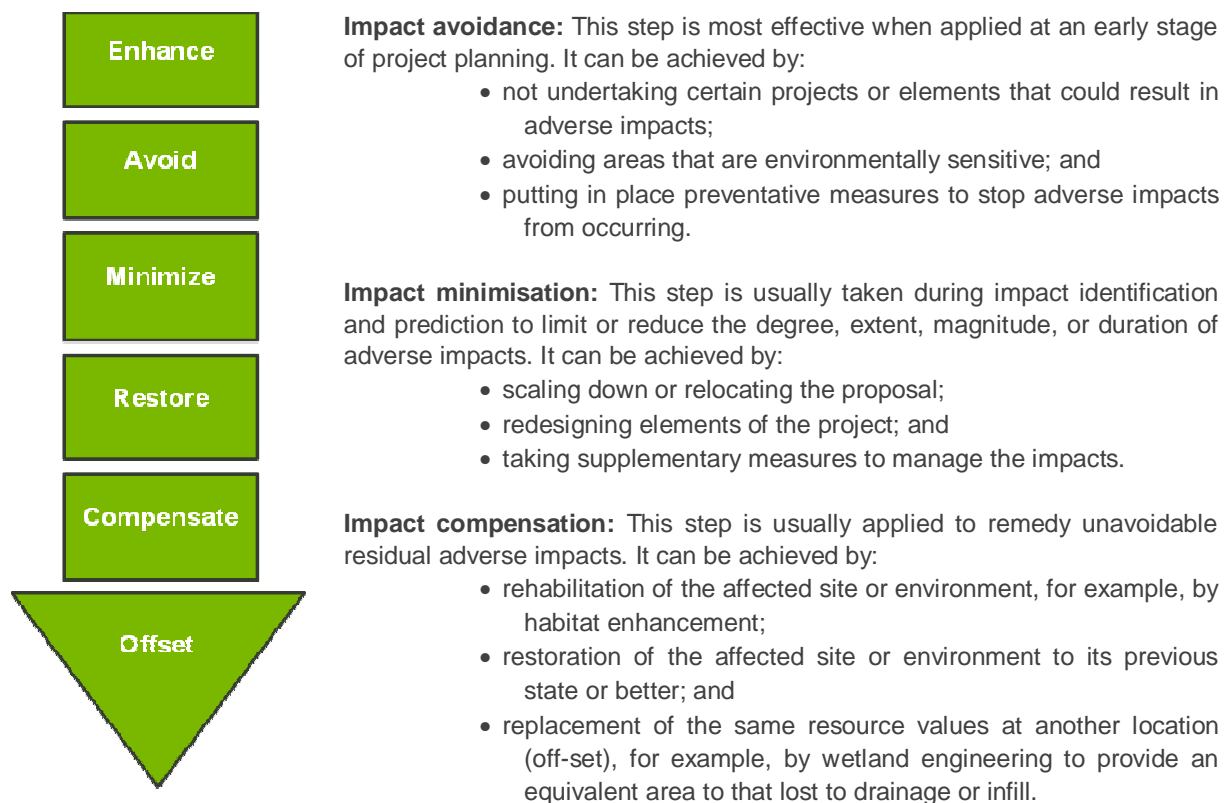


Figure 5 | Hierarchy of mitigation

5 BIOPHYSICAL AND SOCIO-ECONOMIC BASELINE DESCRIPTION AND IMPACT ASSESSMENT

This section forms the focus of this EIA process. It contains a detailed assessment of the construction and operational impacts associated with the proposed development on the affected biophysical and socio-economic environment, using the methodology described in Section 4. Mitigation measures to enhance positive impacts and reduce negative impacts are described for the anticipated impacts.

This section describes the affected environment as well as the potential impacts on the biophysical and socio-economic environments, which may occur due to the proposed project and activities described in Section 3. These include potential impacts, which may arise during the operation of the proposed development (i.e. long term) as well as the potential construction related impacts. These impacts on the biophysical and socio-economic environment were assessed, in terms of the methodology outlined in Section 4 and relevant mitigation measures have been proposed to reduce and/ or avoid negative impacts and to enhance positive impacts.

Impacts during construction and operation for the following fields have been assessed below:

- Impact on storm water;
- Impact on ecology (flora and fauna);
- Impact on heritage resources;
- Visual impact;
- Socio-economic impact;
- Traffic impact;
- Noise impact; and
- Air quality impact
- Cumulative impacts

The assessment of potential impacts will help to inform and confirm the selection of the preferred alternatives to be submitted to MET:DEA for consideration, and will also determine the required mitigation measures to be used to inform design and management of the project. In turn, MET:DEA's decision on the environmental acceptability of the proposed projects and the setting of conditions of authorisation (should the project be authorised by way of an ECC) will be informed by this section, alongside other information contained in this Scoping Report.

5.1 SITE DESCRIPTION

5.1.1 General

The proposed Auasblick Extension 1 is situated on portions of R/B Klein Windhoek Town and Townlands No. 70. The site lies between the presently proclaimed Auasblick Township and the Avis area of Klein Windhoek south of the railway line. The site has recently been proclaimed as a township by CoW and it has been chosen as a suitable location for high and high-middle income housing because of its steep terrain with well above average building costs.

5.1.2 Climate

Namibia is generally known to be a hot and dry country, but temperatures do vary greatly. Summer is from October to April and day time temperatures can reach up to 4 °C. Average summer temperatures range from 20°C to 34°C. In winter, from June to September, average night time temperatures range from 6°C to 10°C and daytime temperatures range between 18°C and 22°C. The average annual rainfall varies from less than 50 mm along the coast to 350 mm in the central interior and 700 mm in the Caprivi. The rainy season is from October till April¹.

Windhoek is located in a semi-desert climatic region which has a low average annual rainfall of 375 mm and a high rate of evaporation (Windhoek City Council, 2013). Rainfall peaks during summer between January and March (Namibia Meteorological Service, 2013) at an average high of 91 mm per month and is extremely unpredictable. At the peak of summer (December to February), average temperatures vary between 17 and 30°C with average mid-winter temperatures (June to July) varying between 7 and 21°C (Namibia Meteorological Service, 2013). For most of the year (70%) mean wind speeds are below 3.3 m/s and over the year average at 2.5 m/s (Namibia Weather, 2013). Winds favour no specific direction and wind speed increases during August and September which is the windiest period (Namibia Meteorological Service, 2013). Droughts are common, as are floods, and trends depict a pattern of drought approximately once every ten years (Namibia Meteorological Service, 2013).

5.1.3 Topography and Geology

Windhoek, is located in the Central Highlands of Namibia approximately 1 540 m above mean sea level and approximately 300 km inland of the ocean (Lahnsteiner and Lempert, 2007). Windhoek is located in a valley surrounded by the Auas, Eros and Otjihavera mountains. The geology is characterised by historical episodes of folding, faulting, thrusting and rifting and this is evidenced by the numerous faults in the north-western region (Gold and Muller, 2001). The biotite schist of the Kuiseb Formation is characteristic of the wider Windhoek area including the proposed site. Biotite schist is a moderately coarse-grained foliated crystalline rock with monoclinic biotite minerals and is known for its weathering property (Africon, 2004).

The area of Auasblick (the proposed development site) is moderately hilly with a well-developed drainage pattern and covered by sparse highland savannah vegetation (cf Geiss 1971). On the north-western side the area is bounded by a prominent ridge of Wasserberg quartzite (Kleine Kuppe Fmn) and on the southeast by semi-parallel outcrops of mica schist and amphibolite (Matchless Suite), striking in a roughly north-easterly direction (Geological Survey 1998). Faulting in a direction perpendicular to the strike is visible in many places, some of the faults showing ferrous calcrete encrustation resulting from artesian groundwater.

¹ <http://www.info-namibia.com/info/weather> and <http://www.weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine-in-Namibia> accessed on 22 May 2014.

5.2 IMPACT ON SURFACE WATER

As part of the EIA, a stormwater assessment for the construction and operation phase of the proposed development was conducted to determine the impacts as well as identify mitigation measures to minimise any adverse effects associated with the new development. The stormwater assessment was undertaken by Hannes van Schalkwyk of Aurecon Namibia (Pty) Ltd (2014). Flood recurrence intervals of 1:5 year and 1:20 year are considered to be adequate for the purposes of roads design and development of Auasblick Extension 1. The findings and recommendations from the assessment are provided in the following sections and the full report is attached in Annexure D1.

5.2.1 Description of the Environment

The proposed development falls in a “*high environmental control zone*” as per the Windhoek Environmental Structure Plan of September 2004. These control zones are associated with the sensitive groundwater resources in and around Windhoek. The presence of boreholes along the northern boundary of the proposed development (as well as to the east), supplying the city with water, confirms that this falls within a high environmental control zone. The control zones are based upon the following parameters;

- 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.

Two main catchment areas (Cat-1 and Cat-2) exist within the proposed development area and these have been channelled by privately developed townhouse schemes in the surrounding area (see Figure 6). The drainage areas eventually drain into the Klein Windhoek River leading into Avis dam to the north.

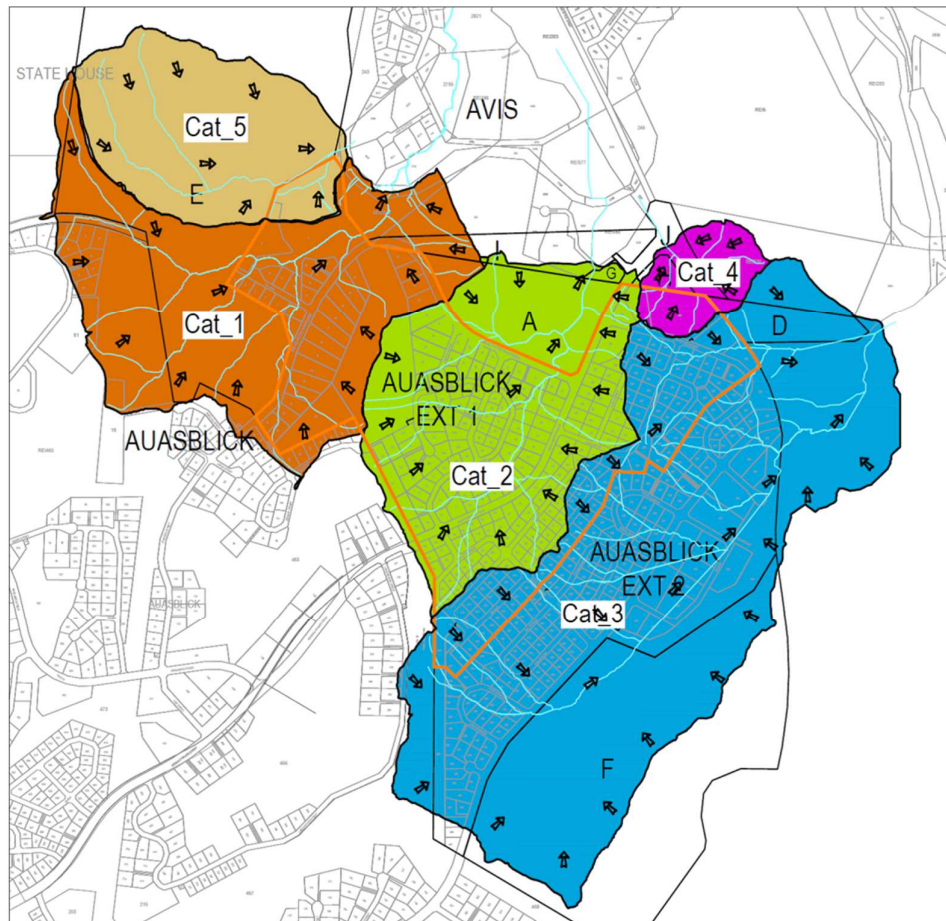


Figure 6 | Catchment and drainage layout of Auasblick area.

It is anticipated that the township development will have an influence on the natural drainage and flow of surface water in the area. The alterations will result in an increase of surface water runoff due to the change in permeability characteristics. However, all services will be constructed as per the general municipal standards, with paved roads, gravel sidewalks, full-bore gravity sewer reticulation, water reticulation, underground electrical and Telecom networks and stormwater drainage where needed.

5.2.2 Stormwater Assessment

The result of developing the proposed Auasblick Ext. 1 will be an increase of impermeable areas that will in return also increase the potential stormwater runoff for the area. The proposed site is located at the top or close to the top of the respective catchment areas and will have an effect on the existing stormwater drainage system downstream. Due to the construction of municipal services and housing in the proposed Auasblick Ext 1 development, there will be a reduction in the infiltration of rainfall into the soil and an increase in the runoff from this area.

The roads are expected to form stormwater channels for surface water, from where it will drain into a stormwater drainage system. The stormwater drainage system will then discharge into the natural drainage channels on the site and where applicable, culverts will be constructed to transport the water from one side of the road to the other. The stormwater assessment found that there will be a significant increase in stormwater runoff from the site, which will be discharged through the existing stormwater drainage systems.

5.2.3 Anticipated Stormwater Impacts

The proposed development will result in a total increase in 1:5 year peak flow of approximately 2,1 m³/s, of which Cat-1 and Cat-2 will be draining into the existing stormwater systems and will have a significant increase in the discharge (increase of 1,61 m³/s for 1:5 year storm and 2,21 m³/s for 1:20 year storm).

The localised increases in runoff could potentially cause erosion if the flows become concentrated. If the road crossings of the drainage lines are also incorrectly designed, it could also cause higher concentration of flow. When flow is concentrated, the energy increases, as well as the erosion potential. Concentration of flows is often the cause of dongas which commonly develop for example at road culverts and then migrate upstream.

It is further imperative that the proposed development does not cause any surface or groundwater pollution to the aquifer (boreholes) found in the area which supplies the city with water and in turn forms part of the high environmental control zone.

Construction phase impacts:

During the construction phase some vegetation would need to be removed to make way for construction of the municipal services. Trenches will be dug; backfilled and compacted, while material will be removed and replaced to construct roads. During this period the risk of erosion taking place is expected to be high (as well as the sediment build-up at pounding areas). This will particularly be the case at the existing stormwater structures.

Operation phase Impacts

During the operation phase, it is anticipated that there will still be an increased runoff from the site, however there will be a reduction in erosion and sedimentation risks due to the settlement of the soil, vegetation growth and the implementation of mitigation measures.

5.2.4 'No-go' development

The 'No-go' impact would allow the current *status quo* to prevail and this impact has been considered to be **neutral** as magnitude would be considered zero meaning natural and/ or social functions and/ or processes remain unaltered

5.2.5 Stormwater Mitigation Measures

The following mitigation measures are proposed to mitigate the stormwater impacts that are expected to occur throughout the project lifecycle.

Site design layout (pre-construction phase):

- The site design should take into account the localised increases in storm flows and where erosion could occur.
- Evaluate the existing drainage system to determine whether the capacity for the existing stormwater system is sufficient (e.g. a DN 900 mm pipe can handle 2.139m³/s at a slope of 1:100 and 80% full flow). The 1:20 year flood peak for Cat_1 is 2.697m³/s which is more than the capacity of a DN 900 mm pipe.

- Maximize the number of road culvert barrels.
- Design a “*spreader*” structure of stilling basin on the downstream side of culverts to reduce flow energy prior to water flowing back into the channel.
- Lay culverts with their bases to flush with the natural ground level of the channel and on the same slope as the natural channel. Do not lower the culvert barrels to below natural ground level as this generally causes dongas to form and migrate upstream.
- Confirm the adequacy and capacities of the existing stormwater system downstream of the proposed development to cater for the additional run-off.

Construction phase:

- Construct the drainage structures that have been included in the design at the same time as the main civil works in order to minimise the effects of storms during construction.
- Should construction activities for the proposed infrastructure need to take place within the drainage features (i.e. linear development including roads and transmission lines) such infrastructure should transect the streams at right angles and be limited as far as possible to ensure minimum disturbance of this area.
- Upon completion of construction, rehabilitate disturbed areas as soon as possible and re-vegetate with suitable indigenous vegetation.
- Visually monitor disturbed areas every three months; eradicate invasive alien plant growth and ensure that they do not become subject to erosion. Remove any regrowth of invasive alien plants on site.
- Prevent the disposal of rubble, sand and waste material resulting from the construction activities into any water stream and or drainage channels as this will impede flow in these channels.
- Prevent contaminated runoff from the construction site from entering the streams.
- Store and contain all materials on the construction site appropriately.
- Provide sufficient ablution facilities at the construction site and they must be located at least 100 m away from streams and drainage lines and must be serviced regularly.
- Should stormwater infrastructure be required, a management plan must be in place to ensure as a minimum that the structures are visually monitored after large rainfall events to ensure that blockages or eroded areas do not develop.

Table 11 overleaf indicates how the significance ratings of the impacts on surface water were derived.

Table 11 | Assessment of stormwater impacts

Key impacts	Mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility
Construction phase- disturbance to surface water features	Without Mitigation	Local	Medium	Construction phase	Medium	Probable	Sure	Irreversible
	With mitigation	Local	Medium	Construction phase	Medium	Probable	Sure	Reversible
Operational phase	Without Mitigation	Local	Medium	Long term	Medium	Probable	Sure	Irreversible
	With mitigation	Local	Medium	Long term	Medium	Probable	Sure	Reversible
'No-go' Option	NA	Local	Neutral	Long term	Neutral	Unlikely	Unsure	NA

5.3 IMPACT ON ECOLOGY (FLORA AND FAUNA)

The construction of the proposed housing development and its associated infrastructure could potentially impact on the bio-physical environment, because of habitat destruction and disruption. An Ecological Impact Assessment was undertaken by Peter Cunningham of Environment and Wildlife Consulting Namibia to assess the potential impacts. The study was informed by a comprehensive literature review followed by a rapid site assessment that was conducted 23 September 2014. The findings and recommendations from this assessment are summarised below and the full Ecological Impact Assessment is included in Annexure D2.

5.3.1 Description of the Environment

The general Windhoek area is commonly referred to as the Highland Savannah and has a vegetation structure that is classified as shrubs and low trees (Mendelsohn *et al.* 2002). The area is also regarded as “average to high” in overall species diversity while the overall terrestrial endemism is “high” (Mendelsohn *et al.* 2002). According to Simmons (1998a) central Namibia has between 161-200 endemic vertebrates (all vertebrates included). The Savannah Biome, of which the Windhoek area forms part, is underrepresented in the 37 % of the protected area network in Namibia. Only 7.5 % of the Savannah biome is covered within the protected area network, while the Highland Savannah only has 0.2% of the area having formal protection. The closest nationally protected area to Windhoek is the Daan Viljoen Game Park that is located approximately 25 km to the west. No conservancies are within the immediate area of Auasblick but freehold conservancies do surround Windhoek i.e. Khomas Hochland (west); Oanob (southwest); Namatanga and Seeis (east) (Mendelsohn *et al.* 2002). The mountains around Windhoek have over 500 species of which 7% of these are considered to be endemic (Burke, 2007). The Auas Mountains are considered to be an area of special ecological importance with highly restricted range plants, butterflies and lizards (Burke & Wittneben 2008, Curtis & Barnard 1998).

Plant Diversity

The Highland Savannah, although varied is characterised by *Combretum apiculatum* subsp *apiculatum*, various *Acacia* species and climax grasses on undisturbed area. The best palatable grass species have often been denuded in the general area over time due to over and selective grazing (Giess, 1971). Simmons (1998a) classified the plant endemism in the general Windhoek area to be between 61 and 70 species depending on the locality. The overall plant diversity (all species “higher” plants) in the general area is “high” and estimated at 400-499 species (Mendelsohn *et al.* 2002). Plant endemism is also “high” with >35 species expected from the general area while the actual Auas Mountains south of the Auasblick area have >500 species (Mendelsohn *et al.* 2002). The vegetation of the Auas Mountains are unique and have species reminiscent of the highland plateau grasslands in central South Africa and the Drakensberg (e.g. *Themeda triandra*) and the fynbos (e.g. *Passerina montana*) as well as succulents from the Northern Cape and South-western Namibia (e.g. *Crassula* & *Ebracteola* species) (Burke, 2007).

A “step point” method (straight line transects) was conducted during a rapid site assessment at the proposed site to determine tree/shrub and grass species composition and densities. Tree/shrub densities were determined in 20, 10m x 10m plots in representative areas throughout the area. 26 species of larger trees/shrubs were encountered with three species (i.e. *Acacia erioloba*, *Boscia albitrunca* and *Searsia lancea*) listed as protected under the Forestry Ordinance No. 37 of 1952 and two species (i.e. *Albizia anthelmintica* & *Ziziphus mucronata*) listed as protected by various

other Forestry laws (Curtis and Mannheimer 2005 and Mannheimer and Curtis 2009 (see Figure 6). The various protected tree species encountered were found to occur at low densities throughout the area. No endemic species were observed at the proposed development site.

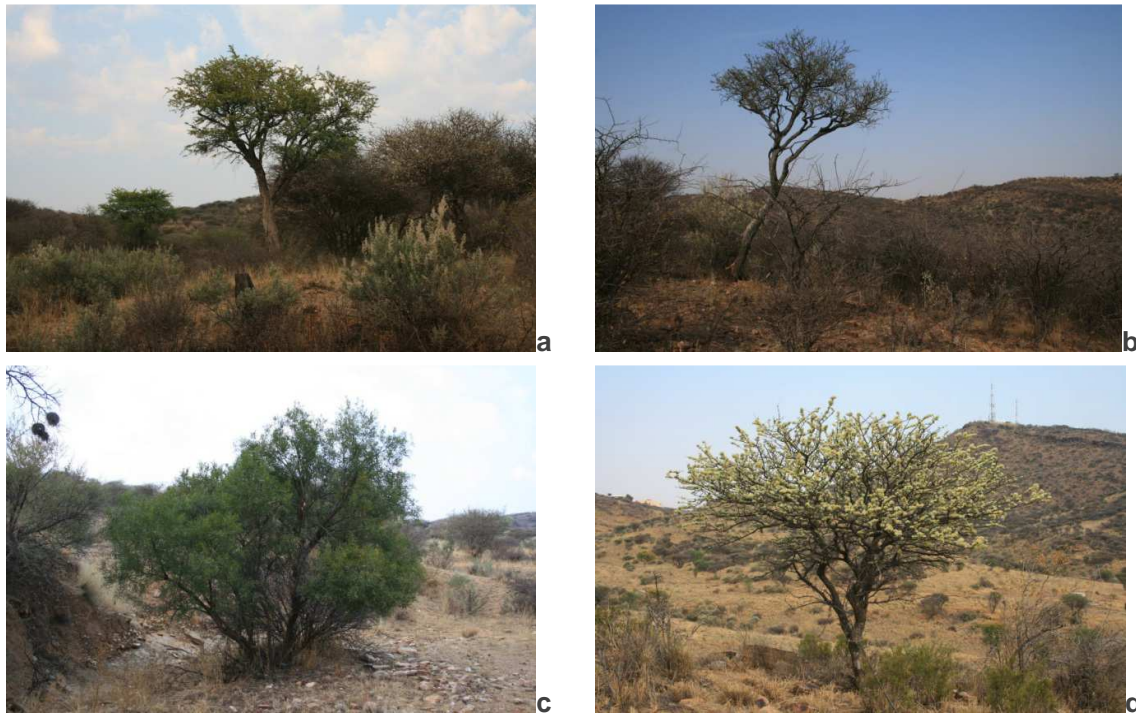


Figure 7 | Protected tree species encountered on the site (a) *Acacia erioloba* (b) *Boscia albintrunca* (c) *Searsia lancea* and (d) *Albizia anthelmintica*

The general area is relatively pristine for an urban environment but some refuse dumping was found to take place on the peripheries. The general surroundings of the development area has some dense patches of *Acacia mellifera* and *A. reficiens* which are culprits of bush encroachment as well as some open areas as indicated in Figure 8 below. The densities are currently not considered to be problematic with regards to bush encroachment as farming is not priority in the area.



Figure 8 | Evidence of refuse dumping in the area (left) and dense patches of *Acacia mellifera* and *A. reficiens* as well as open areas on site (right).

Various invasive alien species were encountered throughout the proposed Auasblick development area. The threat of such species to the local ecology is known, but eradication is rarely undertaken

(Cunningham *et al.* 2004, Joubert & Cunningham 2002, Shapaka *et al.* 2008). The alien species encountered included *Dodonaea angustifolia*, *Opuntia* sp., *Pennisetum setaceum* and *Prosopis* sp. (see Figures 9 below).

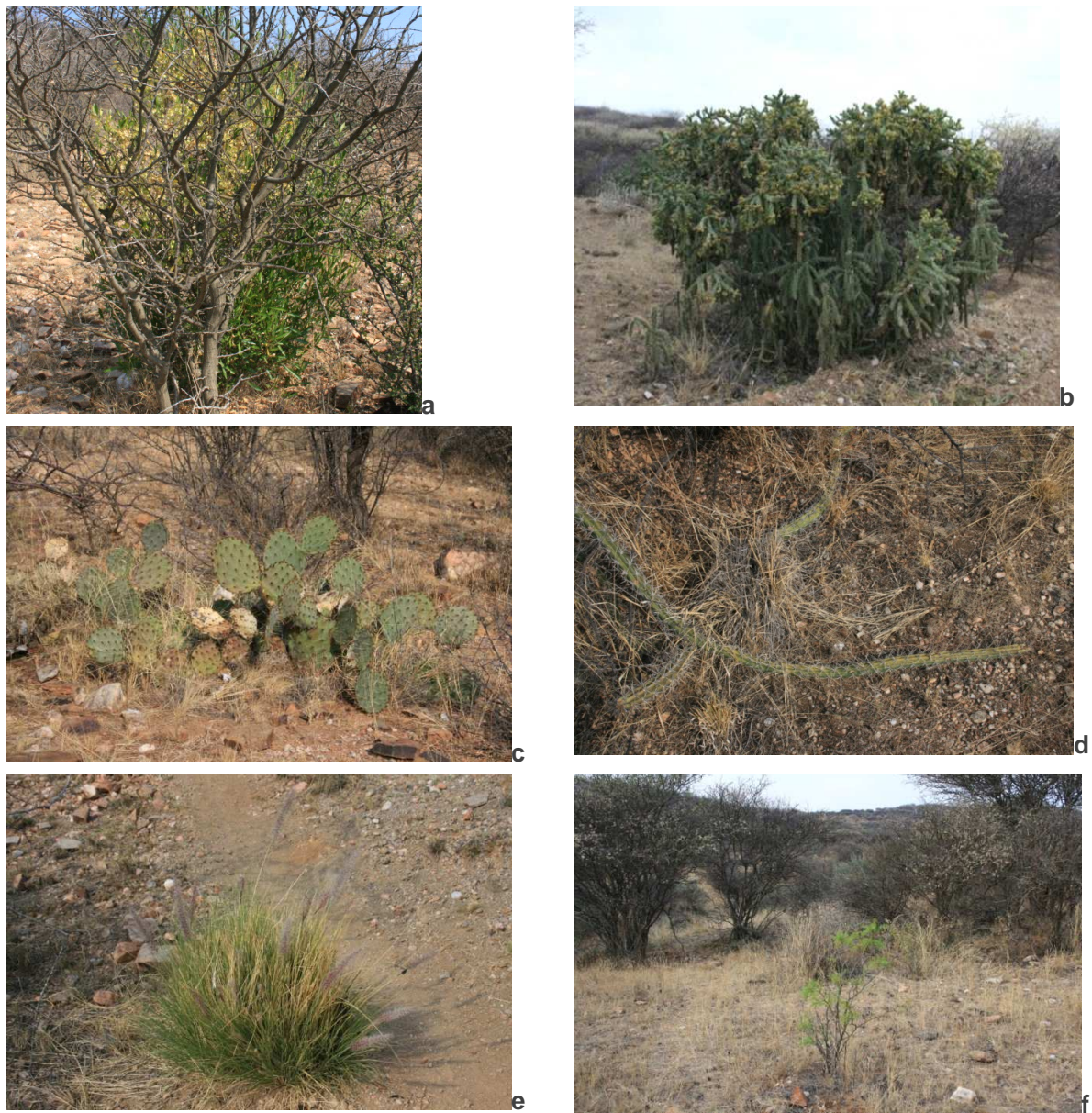


Figure 9 | Alien invasive plant species encountered on site (a) *Dodonaea angustifolia* the green plant behind an *Acacia mellifera* shrub (b-d) various *Opuntia* species (e) *Pennisetum setaceum* and (f) *Prosopis* specie.

Only 16 species of grasses were encountered at the proposed development site. No endemic species were observed. As the assessment was conducted at the end of the dry season many grasses could not be identified, however more annuals are expected to occur in the area. Parts of the area have also been heavily grazed by cattle making identification of species difficult. Dominant species identified were *Eragrostis trichophora*, *Eragrostis nindensis* and *Fingerhuthia Africana* of which none are protected and except for grazing value are not viewed as particularly important.

Reptile Diversity

The overall reptile diversity and endemism in the general Windhoek area is estimated to be between 71-80 species and 13-16 species, respectively (Mendelsohn *et al.* 2002). 35 snake species with 10 species being “endemic” and 18 lizard species (with 6 species being “endemic”) are the most important groups of reptiles expected from the general Windhoek area followed by geckos (10 species with 8 species being “endemic”). Geckos expected and/or known to occur in the general Windhoek area have the highest occurrence of endemics (80%) of all the reptiles in this area. Tortoises are viewed as the group of reptiles most under threat in Namibia as they are either consumed as food; indiscriminately killed when encountered or even used by traditional healers (Griffin 1998a). Four reptile species expected to occur in the area of which two are tortoises (*Stigmochelys pardalis*, *Psammobates oculiferus*, *Python natalensis* & *Varanus albigularis*) are classified as “vulnerable” and “protected game”. One species – *Python anchietae* – is classified as “protected game”, but not as vulnerable. Nineteen reptile species have some form of international conservation status (10 CITES Appendix II & III species and 6 SARDB species; *Python natalensis* has both a CITES & SARDB status) with *Python natalensis* classified as “vulnerable” and *Naya nigricincta* as “rare” although *N. nigricincta* is however more common in Namibia than South Africa. Only 8 species (all “least concern”) are classified by the IUCN (2014) although most reptiles have not yet been assessed for the IUCN Red List for endangered species.

Of importance to note are the restricted range of the Herero Girdled Lizard (*Cordylus pustulatus*) which only occurs within Namibia with specimens only known from the higher regions of the Auas Mountains; the mountains east of Windhoek and the mountainous areas of the Von Bach Recreational Area (Griffin 2003). *C. pustulatus* is furthermore classified as “insufficiently known” and considering its restricted range and understudied ecology, makes this species one of the most important occurring in Namibia. This species is however not expected to occur at lower lying elevations such as the proposed Auasblick development area. Owing to the fact that reptiles are an understudied group especially in Namibia, it is expected that more species may be located in the general Windhoek area including the proposed development site in Auasblick. The proposed development site is however not pristine and is bordered by urban infrastructure and it is therefore not expected to have a severe impact on unique reptiles.

Amphibian Diversity

Amphibians are declining worldwide due to various factors of which much has been ascribed to habitat destruction. Griffin (1998b) states that 50 amphibian species are expected to occur in Namibia 6 of which are endemic. This “low” number of amphibians from Namibia is not only a result of the generally marginal desert habitat, but also due to Namibia being under studied and under collected. Most amphibians require water to breed and are therefore associated with the permanent water bodies, mainly in northeast Namibia. Overall frog diversity in the general Windhoek area is estimated to be between 8-11 species (Mendelsohn *et al.* 2002). At least nine species of amphibians can occur in suitable habitat in the general Windhoek area. Of these, two species are endemic (*Poyntonophrynus hoeschi* & *Phrynomantis annectens*) (Griffin 1998b) and 1 species are classified as “near threatened” due to habitat loss and development (*Pyxicephalus adspersus*) (Du Preez & Carruthers 2009). *Pyxicephalus adspersus* is more common in northern Namibia where their numbers are also declining due to overutilization as food by humans.

Temporary pools in the various drainage lines traversing the proposed development area as well as the Avis Dam to the east are viewed as potential amphibian habitats. Other potential habitats in

the general Windhoek area include farm reservoirs and earth dams, although the latter are also dependant on localised rain showers and temporary nature. Except for ephemeral drainage lines associated with temporary pools after rains and road culvers, no permanent water bodies suitable for most amphibians is expected in the proposed development site. None of the important amphibian species are therefore exclusively associated with the proposed development area and are not expected to be adversely affected by the proposed new Auasblick residential developments.

Mammal Diversity

Namibia is well endowed with mammal diversity including the well-known big and hairy as well as a legion of smaller and lesser-known species. Currently 14 mammal species are considered endemic to Namibia are mainly associated with the Namib and escarpment with 60% of them rock-dwelling (Griffin 1998c). Overall terrestrial diversity and endemism amongst mammal species is classified as “high” in the central part of Namibia (Mendelsohn *et al.* 2002). The overall diversity (7-8 species) and abundance of large herbivorous mammals is “high” in the general Windhoek area with kudu and Oryx having the highest density of the larger species (Mendelsohn *et al.* 2002). The overall mammal diversity in the general Windhoek area is estimated at between 61-75 species with 5-6 species being endemic to the area (Mendelsohn *et al.* 2002). These species are mainly located in Daan Viljoen Game Park which has 65 species of mammals.

31.3% of the mammalian species that occur or are expected to occur in the general Windhoek area are represented by rodents, of which 16% are classified as “endemic”. This is followed by bat species at 22.5% and 1 species being “endemic” and “rare” (i.e. *Cistugo seabrae*) and carnivores at 21.3% of which 1 species is “endemic”. Of most importance is the House Mouse (*Mus musculus*) that is considered to be an invasive alien in the area is generally regarded as casual pests and are known to be carriers of “plaque”. None of the important mammal species are exclusively associated with the proposed development area and are not expected to be adversely affected by the proposed new Auasblick residential developments.

Avian Diversity

Windhoek area is not classified as an Important Birding Area (IBA) although bird diversity in the area is viewed as high. At least 209 species of terrestrial (“breeding residents”) birds occur and/or could occur in the general Windhoek area at any time (Hockey *et al.* 2006, Maclean 1985, Tarboton 2001). The most important species known or expected to occur in the area are the endemics especially Rüppel’s parrot and the rockrunner that have unique habitat requirements; species classified as endangered (i.e. Ludwig’s bustard and white-backed vulture); near threatened (kori bustard) and vulnerable (martial eagle and secretary bird) by the IUCN (2014) and those classified as endangered (tawny, booted and martial eagles), near threatened (white-backed vulture, Verreaux’s eagle, peregrine falcon & marabou stork) and vulnerable (lappet-faced vulture) by Simmons & Brown (*In press*). However, not all the important birds are expected to occur in the Auasblick area due to its close proximity to an existing urban environment as well as other anthropogenic influences.

None of the important bird species are exclusively associated with the proposed development area and are not expected to be adversely affected by the proposed new Auasblick residential developments.

Areas of Importance

The mountainous rocky terrain in the proposed development area site with rocky ridges and small cliffs has been identified as an important area. This terrain is found to contain a wide variety of flora including lichens and is an important habitat to a variety of fauna such as the endemic rock-runner. The Rockrunner is viewed as the most important species in the immediate development area. It is therefore recommended that this area must be protected from development and must be incorporated into the Auasblick green space (open area) and linked with other areas so as not to have an “island” scenario (see Figure 10).



Figure 10 | The rocky area (white oval) viewed as the most important habitat in the proposed development area at Auasblick. Proposed corridors (green arrows) are indicated so as not to isolate the important area, but rather link it with other important habitats and ensure movement of species.

5.3.2 Ecological Impact Assessment

Construction phase impacts anticipated

During the construction phase further vegetation clearance of the site will occur. The clearance of vegetation could lead to a loss of habitat for small fauna such as reptiles and might also result in the potential spread of weeds and alien invader plants. The magnitude of the impacts at the site were considered to range between low and medium, of site specific extent and occurring for a long term duration and therefore has a **low (-)** and **medium (-)** significance rating. With the implementation of the mitigation measures it can be further reduced to a **very low (-)** significance.

Operational phase

During the operational phase localised site specific destruction of vertebrate fauna may occur, together with the potential spread of weeds and alien invader plants. It is anticipated that fauna

would migrate to safer areas with the increase of human activities. The magnitude of the impacts is considered to be low, of local extent with a long term duration, and therefore of **medium (-)** significance without mitigation. With mitigation measures this rating could be reduced to **low (-)**.

5.3.3 Mitigation Measures

The following mitigation measures are proposed to mitigate the ecological impacts, namely the loss of natural vegetation and the potential spread of weeds and alien invader plants throughout the project lifecycle:

- Remove and relocate all high value reptile species e.g. tortoise, monitor lizards etc. prior to development or when observed during construction. These species could be relocated to an area of similar habitat e.g. Daan Viljoen Game Park.
- Prevent and discourage the setting of snares for ungulates (poaching) or collection of veld foods (e.g. tortoises), and indiscriminate killing of perceived dangerous species (e.g. snakes) during the construction phase.
- Prevent the capturing/killing of birds for own use or resale during the construction phase.
- Prevent or ensure that fire does not spread from the construction site as this could lead to loss of life, property and grazing for neighbouring landowners and associated problems.
- Avoid the removal of all the indigenous trees/shrubs and grasses in the area prior to construction.
- Ensure adequate erosion protection as some areas are steep and clearing and/or developing these areas could lead to increased runoff and erosion.
- Avoid the total clearance of the area using heavy machinery, but instead limit development to specific infrastructure and leave natural vegetation as ground cover.
- Identify and mark (e.g. with red and white tape) protected and unique plant species (i.e. *Acacia erioloba*, *Albizia anthelmintica*, *Boscia albitrunca*, *Searsia lancea* and *Ziziphus mucronata* before the commencement of construction activities. These species should be avoided as far as possible.
- Remove and relocate unique flora species e.g. various Aloe species from the development area. A permit must be applied for the relocation of such species² and permit conditions must be adhered to. Such species could also be reintroduced and incorporated into the overall landscaping of the site.
- Avoid the use of herbicides in the area due to the many tributaries draining the ephemeral drainage lines and Avis as well as Goreangab dams in the area.
- Incorporate indigenous vegetation especially the protected species – i.e. *A. erioloba* individuals as well as some of the larger bigger protected tree/shrub specimens in the overall final landscaping of the site. Indigenous plants also require less maintenance and water than exotic species.
- Avoid introducing potential alien invasive plant species (e.g. *Tecoma stans*, *Lantana camara*, *Opuntia* sp, *Pennisetum setaceum*, etc.) in the eventual landscaping (i.e. ornamental plants). Alien species have a potential to escape and infest the local surroundings.
- Eradicate and remove existing invasive alien plant species (i.e. *Prosopis* sp and *Opuntia* sp.) in the area. Such activity would be beneficial to the overall ecology of the areas.

² To obtain a permit from MET, an application would typically take one month.

- Avoid development and destruction of the drainage lines throughout the area and the rocky terrain that has been identified as an important habitat.
- Avoid development in the important rocky terrain as indicated in Figure 10 but instead consider incorporating it into green space (open space) and have corridors to link this area to other adjacent open areas to avoid an “island” scenario.
- Implement a policy of re-establishing (i.e. planting) two indigenous trees/shrubs species for each protected species destroyed. Indigenous species could be acquired at the forestry nurseries in Okahandja, Grootfontein or the National Botanical Research Institute (NBRI) as well as local nurseries in Windhoek.
- Show overall environmental commitment by adapting a minimalistic damage and indigenous planting approach to future development e.g. retain local flora and include other habitats such as drainage lines into the landscaping.
- Educate and inform contractors on environmental issues contained herewith prior to development and monitor compliance thereof throughout the project phase.
- Ensure that an Environmental Officer (EO) from City of Windhoek is seconded to the project to ensure compliance of environmental issues during the construction phase.

5.3.4 Ecological summary

The most important tree/shrub species confirmed during the rapid assessment occurring in the proposed development area are *Acacia erioloba*, *Boscia albitrunca* and *Searsia lancea* which are protected under the Forestry Ordinance No. 37 of 1952 and *Albizia anthelmintica* and *Ziziphus mucronata* which are protected by various other Forestry laws (Curtis and Mannheimer 2005 and Mannheimer and Curtis 2009). However, these protected species were found to occur at low densities throughout the area as scattered individuals and are not exclusively associated with the proposed development area.

The most notable species that are most likely to be adversely affected by the proposed Auasblick residential developments would be the variety of reptiles and birds. Specifically those that are associated with the proposed development area as well as the potential effect that such a development may have on carnivores. However, none of the species are exclusively associated with the proposed development area.

It is not expected that developing the area will adversely affect any unique vertebrate fauna and flora, especially if the proposed recommendations are incorporated in future envisaged developments aimed at indicating environmental sensitivity and commitment. The area most likely to be adversely affected by the proposed Auasblick residential development would be the mountainous terrain with rocky ridges and low cliffs with a wide variety of flora and associated habitat for vertebrate fauna.

Table 12 indicates how the significance ratings of the ecological impacts were derived.

Table 12 | Assessment of ecological impacts

Phase	Key impacts	Extent	Magnitude	Duration	SIG (No Mitigation)	SIG (With Mitigation)	Prob.	Conf.	Reversible
Construction	1) Destruction of vertebrate fauna; 2) Destruction of unique flora; 3) Destruction of special habitats;	Site specific	Medium	Long term	Low	Very low	Definite	Certain	Irreversible
		Site specific	High	Long term	Med	Very low	Definite	Certain	Irreversible
		Site specific	High	Long term	Med	Very low	Definite	Certain	Irreversible
Operation	Destruction of vertebrate fauna	Site specific	Very low	Long term	Medium	Low	Definite	Certain	Irreversible
Decommissioning.	General disturbances	Site specific	Very low	Cons. period	Low	Very Low	Definite	Certain	Reversible
No-Go Option	No further disturbance of area	Site specific	Zero	Long term	Neutral	Neutral	Unlikely	Sure	Irreversible

5.4 IMPACT ON ARCHAEOLOGICAL RESOURCES

An Archaeology Impact Assessment (AIA) was undertaken by Quaternary Research Services to determine and assess potential impacts on heritage and archaeological features and remains as required under the National Heritage Act (Act No. 27 of 2004).

The AIA was informed by a literature survey to identify known archaeological, cultural and historic sites in the project area followed by a field survey undertaken on 29 September 2014. The AIA report itself is included in Annexure D3 and a brief summary is provided below.

5.4.1 Description of the general archaeology resources in the affected area

The area under which the proposed development site is situated is moderately hilly with a well-developed drainage pattern, and is covered by sparse highland Savannah vegetation (cf Geiss 1971). On the north-western side of the site, the area is bounded by a prominent ridge of Wasserberg quartzite (Kleine Kuppe Fmn) and on the southeast by semi-parallel outcrops of mica schist and amphibolite (Matchless Suite), striking in a roughly north-easterly direction (Geological Survey 1998). Faulting in a direction perpendicular to the strike is visible in many places, some of the faults showing ferrous calcrete encrustation resulting from artesian groundwater. Down-cutting of the drainage has left a number of ancient colluvial deposits in elevated positions, although most of the sedimentation within the area is probably tertiary in age, taking the form of silty sand terraces flanking the wider stream courses.

Due to erosion of the central highlands during the recent geological times, this has resulted in the removal or occasional burial of archaeological evidence for early human occupation. Most archaeological sites in the central Namibian highlands date to within the last ten thousand years. Of these, the majority are very recent, probably dating to within the last two thousand years (Kinahan 1999). A considerable number of archaeological sites have been recorded in the Windhoek Townlands, often as a result of discoveries made in the course of civil engineering works. The general distribution of some loose clusters of archaeological sites is shown in Figure 11. The northern group which is mainly concentrated along the proposed Ceres Street extension includes evidence of defensive walling from the mid- to late 19th century, and evidence of quarrying activity in the late 19th and early 20th centuries (QRS 18/1 & 2). Two suspected burial cairns (QRS 18/3 & 4) in this group probably predate mission settlement in the Klein Windhoek valley in the second half of the 19th century. A second cluster of sites in the vicinity of the proposed Sam Nujoma Drive extension is dominated by remains of hut encampments. These probably predate the establishment of Windhoek in the mid- 19th century.

In recent years, several burials have been located and excavated in the course of building and roadwork expeditions in this part of Windhoek Townlands (northeast of the railway line and west of the existing Andries de Wet Street). The burials were in the valley and they relate to the existence of a small location attached to the mission church that has since been demolished in Ludwigsdorf. These materials are preserved in the Archaeological collection of the National Museum. The burials located by the present survey are covered by round stone cairns such as are found on earlier graves where the deceased is interred in a flexed rather than extended position. These burials could provide valuable evidence of pre-colonial settlement in Windhoek.

5.4.2 Archaeological Findings

Some archaeological sites were discovered to be located within and in close proximity to the proposed Auasblick development site. Two sites lie within the boundaries of the development area these are QRS 18/2 and 18/3. A further five sites are located on the peripheries of the development area and are described below (see Figure 11 for the distribution map of the site).

QRS 18/1 (VKE 001) Site is adjacent to impact footprint but not immediately vulnerable.

Remains of crude defensive stonework on hilltop; estimated as mid- to late 19th century on basis of small gold-plated pocket watch found crushed beneath fallen stones. The site is not vulnerable and does not require mitigation.

QRS 18/2 (VKE 002) Site lies within the footprint impact.

Dry-stone terrace for support of cart track on steep hillside. The cart track which is still in use was probably constructed at the turn of the century during quarrying work on the quartzite outcrops in this area. Road works for the Bypass route would probably destroy the terrace if it lay within the final construction area. Although the site is vulnerable, no mitigation work would be required as much of the extensive cart track network in these hills remains intact.

QRS 18/3 (VKE 003) Site lies within impact footprint.

Suspected burial cairn on colluvial deposits. The deposit is deeply eroded as a consequence of changes in the slope gradient in the construction of the railway to Gobabis. Although the burial cairn itself has not been affected by erosion, changes in the up-slope gradient would result in accelerated erosion and this would probably affect the site. The site is also very close to the Ceres Street extension; it is therefore highly vulnerable and would require mitigation.

QRS 18/4 (VKE 004) Site is adjacent to impact footprint and not immediately vulnerable.

Suspected burial cairn on colluvial deposits. Erosion of the deposit has encroached to within one metre of the cairn. Changes in up-slope gradient with the construction of the Ceres Street extension would probably affect the site. However, there is less certainty of a burial beneath this cairn than that of VKE 003 and it would have to be tested before a decision with regard to mitigation is made.

QRS 18/5 (VKE 005) Site is adjacent to impact footprint and not immediately vulnerable.

Rough stone walling features, probably associated with the suspected burial cairns on VKE 003 and 004. The site does not merit further attention.

QRS 18/6 (VKE 006) Site is adjacent to impact footprint and not immediately vulnerable.

Building stone quarry site, probably associated with VKE 002. The site does not merit further attention.

QRS 18/7 (VKE 007) Site is adjacent to impact footprint and not immediately vulnerable.

Contour drainage ditch, associated with VKE 002 and 006. The site does not merit further attention.

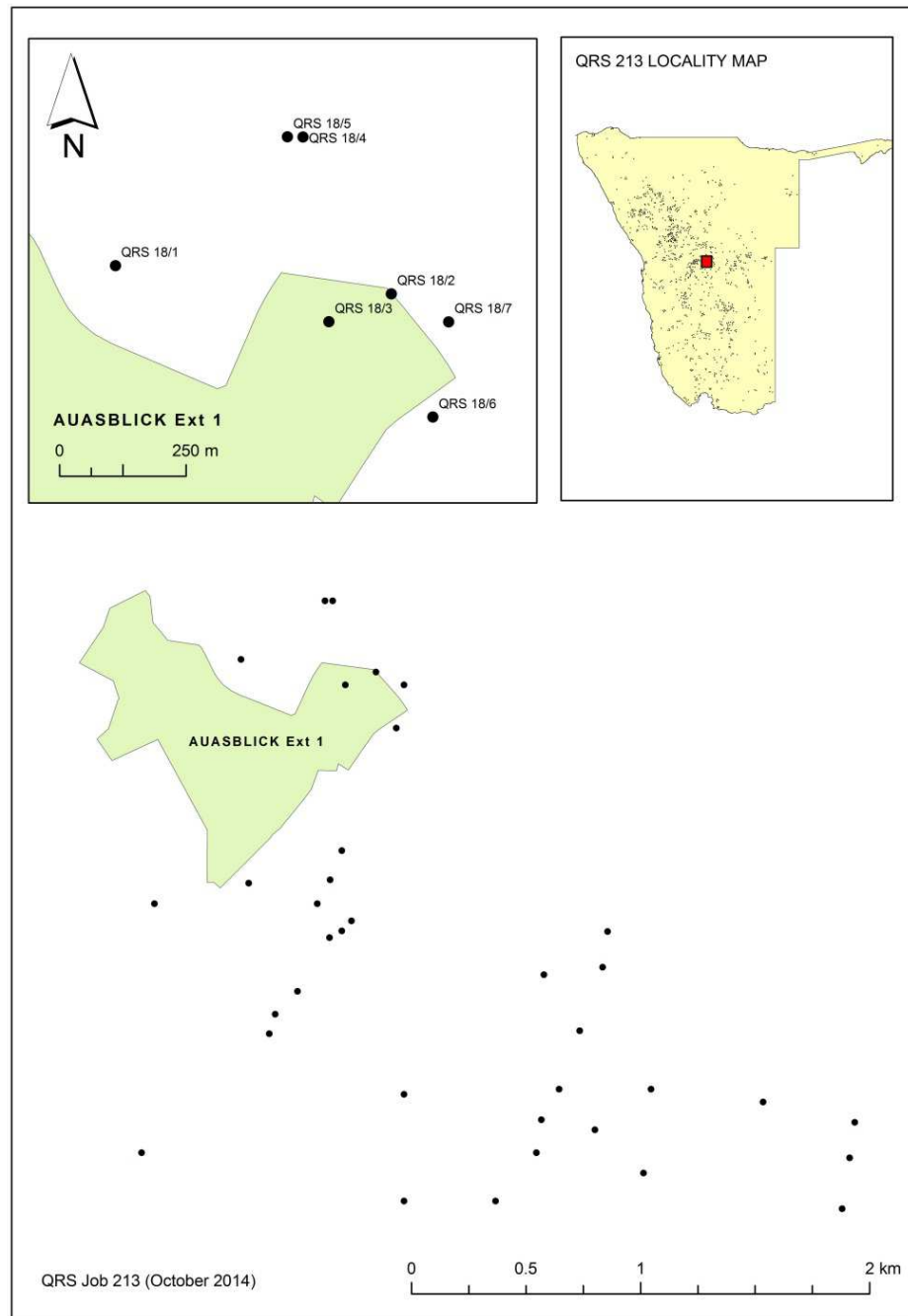


Figure 11 | The distribution of archaeological sites on Auasblick Extension 1 in relation to the local and regional archaeological site distribution.

5.4.3 Archaeological Impacts Assessment

It is predicted that the project would have a negative impact on certain archaeological sites should the mitigation measures not be adopted. These impacts would mainly affect QRS 18/2 & 18/3, and would occur mainly during the construction stage, resulting in disturbance or outright destruction of these sites. The extent of these impacts would be local, being confined to the immediate vicinity of the sites, although it must be pointed out that the project would greatly affect the landscape setting of the archaeological sites, thereby disrupting their landscape integrity. The magnitude of the impacts is considered to be medium, and of long-term duration.

With mitigation, these impacts could be adjusted to a low significance level if appropriate mitigation measures were adopted at QRS 18/2 & 3 in particular. It is considered probable that these impacts will occur, confidence in the observations and data supplied by Aurecon being sure. It should be noted that damage to archaeological sites cannot be reversed.

5.4.4 Mitigation Measures

It is recommended that construction planning should take cognisance of the possibility that archaeological sites may be found in the course of site work. Any such sites should be physically marked as advised in the Chance Finds procedure described in detail in the AIA (Annexure D3) and briefly below. In addition to the “chance Finds Procedure” the following recommendations are made:

- Site QRS 18/3 should be excavated in advance of site preparation and construction.
- The developer should apply to the National Heritage Council for a permit to excavate the site.
- Excavation of the suspected burial would require two to three days fieldwork, followed by two days of laboratory work to stabilize any remains recovered from the excavation.
- Contractors working on the site must be informed of the items that are protected in accordance with the National Heritage Act and the procedure to follow should such material be discovered during the course of the development.

The “chance finds” procedure shall be adhered to as it covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Action by person identifying archaeological or heritage material

- a) If operating machinery or equipment stop work.
- b) Identify the site with flag tape.
- c) Determine GPS position if possible.
- d) Report findings to foreman.

Action by foreman

- a) Report findings, site location and actions taken to superintendent
- b) Cease any works in immediate vicinity.

Action by superintendent

- a) Visit site and determine whether work can proceed without damage to findings
- b) Determine and mark exclusion boundary.
- c) Site location and details to be added to GIS for field confirmation by archaeologist.

Action by archaeologist (as appointed by project proponent at the time)

- a) Inspect site and confirm addition to GIS.
- b) Advise National Heritage Council of Namibia and request written permission to remove findings from work area.
- c) Recovery, packaging and labelling of findings for transfer to National Museum.

In the event of discovering human remains

- a) Actions as above.
- b) Field inspection by archaeologist to confirm that remains are human.

- c) Advise and liaise with National Heritage Council of Namibia and Police.
- d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

5.4.5 Archaeology Impact Table

Table 13 indicates how the significance ratings of the various archaeology impacts were derived.

Table 13 | Assessment of archaeology impacts

	Key impacts	Extent	Magnitude	Duration	SIGNIFICANCE (Without mitigation)	SIGNIFICANCE (With Mitigation)	Probability	Confidence	Reversibility
Construction phase	Disturbance or Destruction	Local	Medium	Long term	Medium	Low	Probable	Medium	nil
Operational phase	Disturbance or Destruction	Local	Medium	Long term	Medium	Low	Probable	Medium	nil
Decommissioning phase	Disturbance or Destruction	Local	Medium	Long term	Medium	Low	Probable	Medium	nil

5.5 VISUAL PROPERTIES OF THE SITE

The site forms part of an urban environment which is mostly utilised for residential land use. The assessment of visual impacts has been established based on desktop analysis and the recommendations are provided below.

5.5.1 Visual Impact Assessment

Construction phase risks to the environment could include the change to the surrounding landscape character created by the clearing of vegetation on the site, movement of vehicles, and construction of roads and building structures. New buildings and lights at night will be introduced in the area which could contribute to the visual impacts onto the existing adjacent residents. For the purposes of undertaking this assessment, it is assumed that the entire footprint of the proposed site would be disturbed and or lost. The proposed site for development is currently devoid of infrastructure; however some houses are located adjacent to the site as indicated in Figure 12 below.



Figure 12 | The current visual setting of the proposed site and some of the house developments adjacent (c) to the site.

Figure 12 below is a projected view of how the proposed Auasblick Ext 1 would look like in regards to the surrounding Auasblick areas nestles in-between the koppies. As can be seen in the pictures various houses are currently being constructed in the surrounding areas.

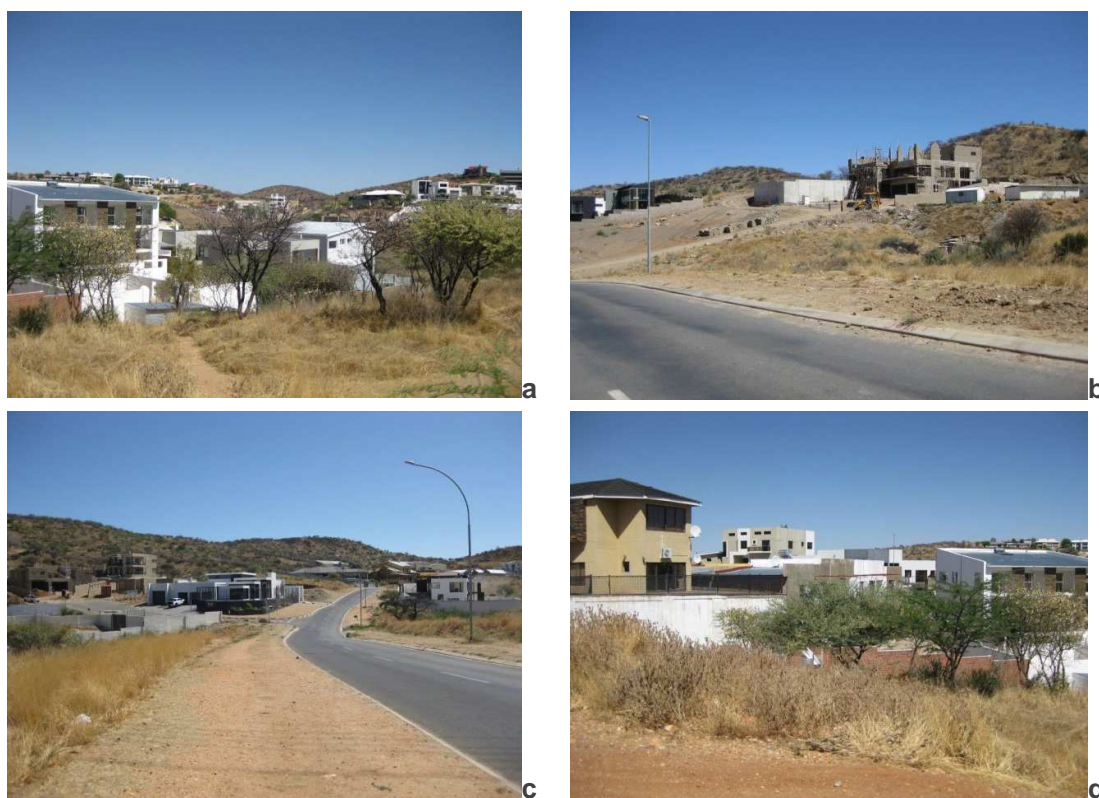


Figure 13 | The future proposed visual setting of Ext 1 as seen currently in the same existing developed surrounding areas.

Construction phase impacts anticipated

The construction phase will cause visual disturbance to adjacent receptors as a result of the haulage of materials and equipment to the site as well as dust from the construction activities. It is further expected that the natural visual setting of the site will be replaced by the proposed development and this could lead to the loss of natural sense of the immediate site.

The visual impacts are considered to be of low magnitude, local in extent and of short term duration prior to mitigation and therefore of **medium (-)** significance. With mitigation, these impacts would be of **low (-)** significance. The probability of the impact arising is probable, the confidence in the assessment is considered as sure and the impact is reversible.

Operational phase impacts anticipated

The establishment of the proposed development would have visual impacts resulting from the loss of a natural setting in the area; however this impact is expected to wear off with time as the township gets acclimatised with the surrounding development. The visual impact is therefore considered to be of **neutral** significance with and without mitigation. Since the proposed development of Extension 1 would eventually form part of the existing Auasblick residential area. It is therefore expected that the visual properties will eventually fit in with those of the existing surrounding properties in the area.

5.5.1.1 Cumulative impacts

Cumulative impacts were assessed and the main issue identified was the potential for the proposed project to set a precedent for similar type of developments in the area, resulting in an effect which would potentially dominate the surrounding landscape character (and tourist related land users where relevant). Considering the fact that there is other developments taking place in the surrounding area, the proposed township development is expected to fit in with the setting. The anticipated cumulative impact of the proposed development is therefore considered to have a **low (-)** significance.

5.5.2 Mitigation Measures

The following mitigation measures are proposed to reduce the visual impacts:

- Access roads shall be kept clean, and measures taken to minimise dust from construction activities and from traffic on gravel roads.
- Only designated roads (those to form part of the development road infrastructure) should be used by construction vehicles to minimise additional visible tracks especially on the higher hill slopes.
- Ensure sufficient road signage to warn motorists of the constructions in the area.
- Littering shall be regarded as a serious offence and no contaminants are to be allowed to enter the environment by any means.
- All impacted footprint areas shall be rehabilitated and restored satisfactorily.
- Keep as much of the natural vegetation as possible.

5.5.3 Visual Impact Tables

Table 14 indicates how the significance ratings of the various visual impacts were derived.

5.5.4 Visual summary

The visual assessment concluded that the proposed site is suitable for the proposed development due to its strategic location and the fact that it already forms part of Auasblick residential area.

Table 14 | Assessment of visual impacts

Project Phase	Key impacts	Mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility
Construction phase	Visual disturbance	Without Mitigation	Local	Medium	Construction phase	Medium (-)	Probable	Likely	Reversible
		With mitigation	Local	Medium	Construction phase	Low (-)	Probable	Likely	Reversible
Operational phase	Visual disturbance	Without Mitigation	Local	Neutral	Long term	Neutral	Probable	Sure	N/A
		With mitigation	Local	Neutral	Long term	Neutral	Probable	Sure	N/A
'No-go' Option	No disturbance	NA	Site specific	Zero	Long term	Neutral	Probable	Unsure	NA

5.6 SOCIO-ECONOMIC CHARACTERISTICS OF THE SITE

The site is located in an urban environment which is considered as suitable for the proposed development in Windhoek. The assessment of socio-economic impacts is based on information provided by the client, as well as a desk top study of the National Census (2011) data. The assessment addresses the socio-economic impacts that could be caused by the proposed development and the findings as well as recommendations are provided below.

5.6.1 Description of the environment

According to the 2011 Census, Windhoek City has an estimated population of 325 858 and falls within the Khomas Region which has an estimated population 342 141 people out of a total of 2 113 077 in Namibia equating to 16% of the total population (Namibia Statistics Agency, 2011). Since the 2001 Census the region has grown in population by 39.5% which is extremely high. As much as 95% of the population is urbanised, with a density of 9.2 people per square kilometre which is higher than the country average of 2.6 people per square kilometre but still low compared with urban areas in other countries.

Most Windhoek residents are Namibian (94%) with Oshiwambo (41%) being the dominant language, or cultural group, followed by Afrikaans speakers (19%), Nama/Damara (12%) and Otjiherero (10%) (Namibia Statistics Agency, 2011). Being host to Namibia's capital, Khomas Region literacy rate is high at 97% with only a low percentage (5%) of the adult population (over 15 years) never having attended school. Only 70% of people in the labour force (excluding students, homemakers, and pensioners who are part of the labour force) have employment and this is regarded as low. However this may be accounted for by analysing the source of household income which depicts that income comes mostly from salaries and wages (73%) but also from other business not related to farming (14%) and this may be indicative of informal activities (Namibia Statistics Agency, 2011). The Census showed that the median age in Khomas is 25 years of age which is older than most of the other regions and this reflects the migration of working age people to urban areas.

In summary, the Census results highlight the urbanised and more developed nature of the Khomas Region which is host to the country's capital city, Windhoek. Job opportunities and better services have attracted people from other areas of the country. However, while living conditions as a whole are more favourable in Windhoek than elsewhere in Namibia, there are still issues with informal settlements and the challenges related to these.

5.6.2 Socio-economic Impact Assessment

The impacts described below are applicable to the project during the construction phase and were assessed in terms of the assessment methodology described in Section 3.

5.6.2.1 Construction-related impacts

Employment creation and economic benefits

The construction of Auasblick Extension 1 would require a labour force of approximately 50 people of which 10 will be semi-skilled or skilled and 40 would be unskilled. The project may also lead to indirect job creation such as jobs from refuse removal. The jobs created will

increase spending power, from the wages and salaries earned. The impact is considered to be of low magnitude, regional extent and limited to the construction phase, and therefore of **low (+)** significance without mitigation. With mitigation, these impacts would be of **medium (+)** significance.

Impacts related to the presence of construction workers

The underlying intention is to make use of local recruits from Windhoek surroundings for construction work; it is not anticipated that some project workforce will originate from outside Windhoek. However, Auasblick is regarded as a quiet neighbourhood and the presence of construction workers may be viewed as a nuisance by the existing residents i.e. increases in noise, crime and negligence. This impact is considered to be of a local extent and to occur during construction, and is therefore predicted to be of **low (-)** significance with and without mitigation.

5.6.2.2 Operation-related impacts

Employment creation and contribution to the local economy

It is expected that a limited number of employees will be required to provide services in the operation of the institutional facilities (i.e. kindergarten and police station/clinic). These employees may be sourced locally and or, regionally. The Windhoek Municipality may also need to increase the labour force to be able to cater for providing municipal services to the established Extension 1. This could result in direct job creation as well as economic benefits to the local community. The impact is considered to be regional in extent and of long term duration, and therefore of **medium (+)** significance with and without mitigation.

Improved traffic flow and road network

The road extensions and upgrade of a traffic circle will result in an improved flow in traffic. The extension of Jason Hamutenya Street will result in improved traffic capacity and reduced traffic congestion. The impact is considered to be local in extent and of long term duration, and therefore of **high (+)** significance with and without mitigation.

5.6.2.3 'No-go' alternative

The implication of the 'No-go' alternative on the socio-economic environment of the study area would mean that the current situation will prevail and that no additional extensions will be made to Auasblick. With this status quo, none of the positive or negative impacts identified will materialise. Similarly, the potential contributions predicted with regards to economic advancement will not be realised.

The 'No-go' alternative is considered to have a **Medium (-)** significance as there will be no increase in housing in the immediate surroundings of Auasblick and there is currently a high demand for housing in the general Windhoek area. This would mean that the Windhoek Municipality would still be faced with the challenge of providing houses to the increasing population.

5.6.3 Mitigation Measures

The following mitigation measures are recommended to improve positive socio-economic impacts and reduce negative socio-economic impacts:

- The contractor shall be required to employ local labour where possible.
- Where possible encourage the use of local suppliers for procurement of goods, materials and services.
- The contractor shall provide an adequate supply of free condoms to all workers and these must be located in accessible areas on the construction sites.
- Daily construction activities shall end before nightfall.
- No overnight camping at the construction site will be allowed. Only the option of a security guard at the construction materials may be allowed.
- Implement clear identification of construction workers (including identifiable attire and tags).
- Establish clear rules and regulations for access to the construction sites.
- Ensure sufficient supply and adequate facilities (waste disposal and ablutions) onsite.
- Refuse shall be discarded in sealed bins or cover skips and shall be removed from site at regular intervals (at least once a week) and disposed at approved disposal sites.
- Ensure that set travelling speeds are enforced by monitoring vehicle travelling speed.

Table 15 (overleaf) indicates how the significance ratings of the various socio-economic impacts were derived.

5.6.4 Socio-economic summary

The assessment presented here confirms that there will be negative and positive social impacts attributed to the proposed development. The implementation of mitigation measures is expected to reduce the negative impacts to acceptable levels, while positive impacts will on average be significantly enhanced to maximise benefits to the surrounding communities. No difference will result from the alternatives being considered.

Table 15 | Assessment of socio-economic impacts

	Key Impacts	Mitigation	Extent	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility
Construction phase	Employment creation during construction	Without Mitigation	Local	Construction period	Low (+)	Very likely	Sure	N/A
		With mitigation	Local	Construction period	Medium (+)	Very likely	Sure	N/A
	Presence of construction workers	Without Mitigation	Local	Construction period	Medium (-)	Very likely	Sure	Reversible
		With mitigation	Local	Construction period	Low (-)	Very likely	Sure	Reversible
Operational phase	Employment creation during operation	Without Mitigation	Local	Long term	Medium (+)	Very likely	Sure	N/A
		With mitigation	Local	Long term	Medium (+)	Very likely	Sure	N/A
	Improved traffic flow and road network	Without Mitigation	Local	Long term	Medium (+)	Very likely	Sure	N/A
		With mitigation	Local	Long term	Medium (+)	Very likely	Sure	N/A
Cumulative impacts	Other related projects	N/A	Regional	Long term	Low (-)	Likely	Likely	N/A
No-go alternative	No disturbance	N/A	Local	N/A	Medium (-)	N/A	N/a	N/A

5.7 TRAFFIC IMPACT

The proposed Extension 1 will be located on portion R/B Farm Klein Windhoek Town and Townlands No. 70, lying between the presently proclaimed Auasblick Township and the Avis area of Klein Windhoek south of the railway line. The area currently has significant existing vehicular traffic, with volumes noted to be high during 07:00 to 08:00 AM peak and 16:45 to 17:45 PM peak hours. Construction of the proposed residential area is expected to take place over a period of 12 to 15 months and during this time, negative impacts are expected to arise from the increased vehicular traffic and heavy load transport. A Traffic Impact Assessment (TIA) was undertaken by Alicia Mustapha and Dave Kellock of Aurecon South Africa (Pty) Ltd (2014) and this will inform the full TIA which will evaluate the expected traffic impact of the proposed development on the road network surrounding the site, and identified the required mitigation measures (Annexure D4D4). The findings and recommendations from the TIA are provided in the following sections.

5.7.1 Description of the environment

Traffic in the existing eastern residential area passes along two main intersections namely; Sam Nujoma Drive; the B6; and Jason Hamutenya Ndadi Street and Robert Mugabe Avenue (see Figure 16). Sam Nuyoma Drive passes through a narrow break in the mountains leading to Avis area. Traffic from the southern suburbs of the City uses Jan Jonker Road, as it is the shortest route to this passage. The road network in the area is under tremendous pressure and an alternative route is desirable for the City of Windhoek. The Auasblick development therefore offers an opportunity to create alternate routes by extending Reginald Walker Street as first priority and Sam MacBride Street to join Sam Nujoma Drive and the road to the airport in Avis as indicated below in Figure 16.



	TRAFFIC COUNT INTERSECTIONS	PROJECT: 111035
		FIGURE: 2
October 2014	AURECON (PTY) LTD	SCALE: Not to Scale

Figure 14 | The current road network in the proposed to be used for Extension 1, note the main intersection in green and the proposed road extensions in red.

5.7.1.1 Sam Nujoma Road and B6 Intersection

This is an un-signalled road intersection between Sam Nujoma Road with B6 that is controlled by a stop and yield. Sam Nujoma Road that has a single lane in each direction travels in a north-south direction (see Figure 15), with the south approach lane measuring 3.4 metres and an additional right turning lane measuring 3.4 metres in width and 75 metres in length. The north approach lane is 3.4 metres wide. There is a 6.3 metre left slip lane on the north approach feeding into B6. This road has no formal sidewalks and no public transport facilities.



Figure 15 | Sam Nujoma Road, note the lack of signals, side-walks or public transport facilities on the road.

The B6 travels east-west and has single lanes in each direction, each measuring 6.9 metres. Close to the intersection with Sam Nujoma (see Figure 16), the lanes increase to two lanes in each direction. The east approach has a 3.6 metre wide right turn lane and a 4.1 metre left turning lane increasing to 6.9 metres on the slip. This road has no formal sidewalks and no public transport facilities.



Figure 16 | B6 Road before the intersection with Sam Nujoma Drive

The intersection between Sam Nujoma Road with B6 experiences average delays for all vehicles of 13.6 and 10.4 seconds during the AM and PM peak hours respectively. The maximum queue lengths at this intersection are 83.6 metres and 48.7 metres in the AM and PM peak hours respectively. A SIDRA priority controlled intersection analysis of the Sam Nujoma Drive/B6 intersection shows that all movements along Sam Nujoma Drive are operating at a good Level of Service (LOS) during both peak hours. B6 operates at an acceptable LOS during both the peak hours.

5.7.1.2 Robert Mugabe Avenue and Jason Hamutenya Street Intersection

This intersection forms a traffic circle with Jason Hamutenya Street in the east-west direction, while Robert Mugabe Avenue is in the north-south direction. At the intersection, each section has two

lanes in either direction see Figure 17 and Figure 18. Robert Mugabe Avenue is the major road at this intersection and accordingly has two lanes in each direction for the length of the road. The north approach lanes on Robert Mugabe measure 4.4 metres each, while on the south widths increase to 4.5 metres each.



Figure 17 | A snapshot of Jason Hamutenya Street before the intersection with Robert Mugabe

Jason Hamutenya Street, being the minor road in this regard only has two lanes at the intersection, reducing to one lane away from the intersection. At the intersection the east and west approach lane widths are 3.7m each. This road has no formal sidewalks and no public transport facilities.



Figure 18 | Snapshot of Jason Hamutenya Street

The intersection experiences average delays for all vehicles of 7.3 and 9.0 seconds during the AM and PM peak hours respectively. The maximum queue lengths at this intersection are 17.5 metres and 26.4 metres in the AM and PM peak hours respectively. A SIDRA priority controlled intersection analysis of the Robert Mugabe Avenue/Jason Hamutenya Street intersection showed that all movements along both roads operate at a good LOS during both peak hours.

5.7.1.3 Existing Pedestrian Activity & Road Conditions

Pedestrian activity in the vicinity of Sam Nujoma Drive and B6 has been noted as low while it is moderate at Robert Mugabe Avenue and Jason Hamutenya intersections. This moderate pedestrian activity is as a result from the surrounding residential areas. The road conditions are ranked as fair, however no public transport facilities, side-walks or pedestrian facilities are provided. Road safety conditions are generally good, having clear directional arrows and painted islands to guide road users.

5.7.1.4 Estimated Trip Generation and Distribution

The trip generation estimation in the focus area was conducted in accordance with the *South African Trip Generation Rates* as published by the national DOT, RR 92/228 (1995). Auasblick Extension 1 is expected to generate a total of 464 trips. The total trips generated in the AM/PM peak are split 75:25, with 348 trips outbound and 116 trips inbound in the AM peak hour, and the reverse in the PM peak hour. All traffic generated from Extension is expected to travel on Sam Nujoma Road into Klein Windhoek and Windhoek or Jason Hamutenya Street onto Robert Mugabe Avenue into Klein Windhoek and Windhoek. The distribution of the new traffic generated by the proposed subdivision is assumed to be split 80:20, with 80 percent of the traffic using the proposed new extensions of Jason Hamutenya. This route will run through the centre of the development making it the most attractive option to commuters. The remaining 20 percent of traffic generated is expected to travel along Sam Nujoma Drive.

5.7.2 Traffic Impact Assessment

The traffic impact analyses for the proposed development has been undertaken based on the current existing AM/PM peak hour traffic volumes on the surrounding network as well as the estimated AM/PM peak hour traffic volumes generated by the proposed development. The combined current existing and generated traffic volumes for the AM and PM peak hours are shown in Figure 19 below.



Figure 19 | The layout structure of the combined existing and estimated traffic in the proposed Extension 1

5.7.2.1 Analysis of existing flows

The existing traffic flows were analysed using the computer suite SIDRA to indicate the Level of Service (LOS) of traffic operations on the various elements of the road network.

Level of Service (LOS) is defined as a qualitative measure of the operational conditions within a traffic stream as perceived by road users. This definition generally describes these traffic conditions in terms of speed, travel times, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. There are six levels of service used to describe the quality of travel on the road network. Each of these levels is given a letter designation from A to F, with LOS A representing the best (free-flow) operating conditions while LOS F represents the least desirable (severely congested) conditions.

The road network surrounding the proposed development will be analysed in detail and the current levels of service on the existing road network will be discussed. The levels of service at each intersection will be presented schematically. The legend presented in Figure 20 was used to depict the LOS of each movement at the intersections.

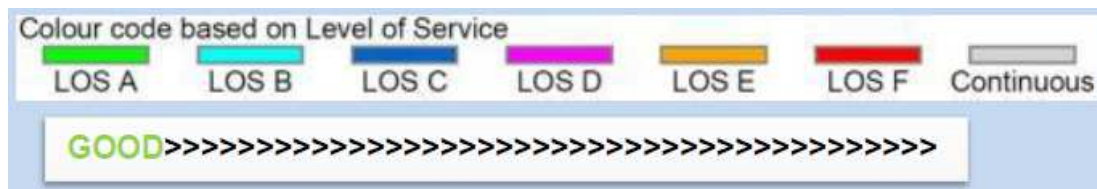


Figure 20 | The Legend of Level of Service Schematics that was used to depict the LOS at the intersections.

5.7.2.2 Sam Nujoma Drive and B6 Intersection

An additional 222 vehicles is estimated to pass through the Sam Nujoma Drive and B6 intersection during both the AM and PM peak hours. The City of Windhoek requested that a higher volume of traffic should make use of Jason Hamutenya Street as a daily route, therefore only 20 percent of traffic generated from the proposed development is expected to travel past this intersection.

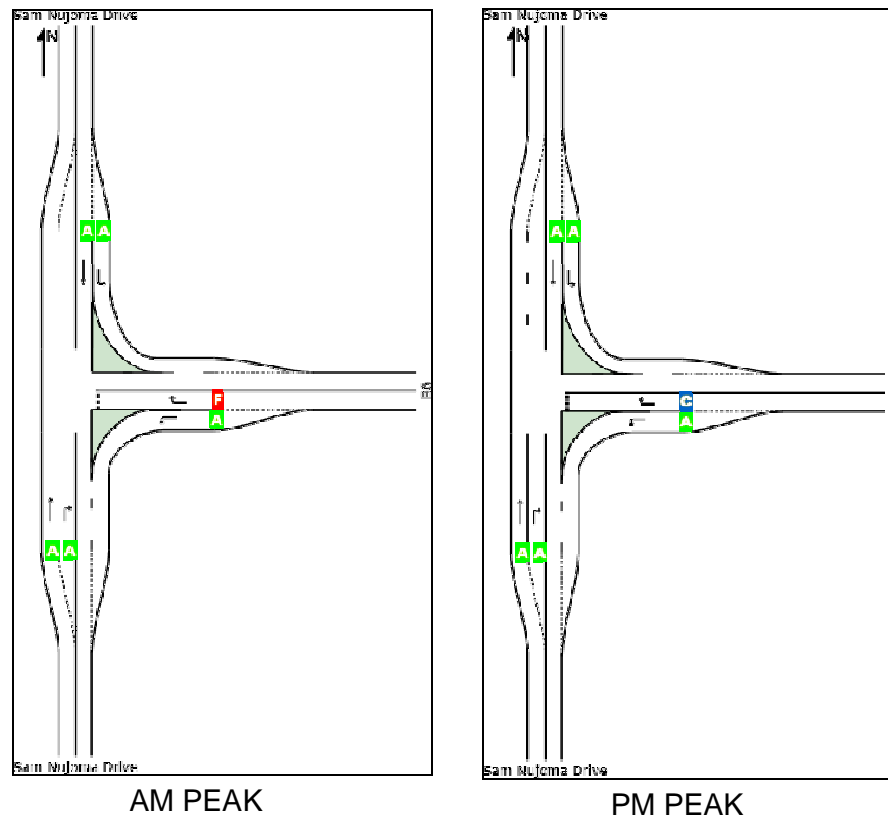


Figure 21 | Existing and generated peak hour SIDRA results for Sam Nujoma and B6 intersection

A SIDRA priority controlled intersection analysis of the existing and the generated traffic as indicated above in Figure 21 shows that all movements along each approach operates at a very good LOS, except for the morning traffic movement turning right on the B6 east approach which fails (F). This is as a result of the high traffic volumes turning right in the evening traffic peak.

The Sam Nujoma and B6 intersection is found to experience average delays for all vehicles of 26.9 and 11.4 seconds during the morning and evening peak hours respectively. The maximum queue lengths at this intersection are 192.2 meters and 61.3 meters in the morning and evening peak hours respectively.

5.7.2.3 Robert Mugabe Avenue and Jason Hamutenya Street Intersection

This intersection is expected to have an additional 650 vehicles passing through this intersection during both the morning and evening peak hours. According to the City of Windhoek, a higher volume of traffic is expected to use Jason Hamutenya Street as a daily route, therefore 80 percent of development generated traffic is expected to travel past this intersection.

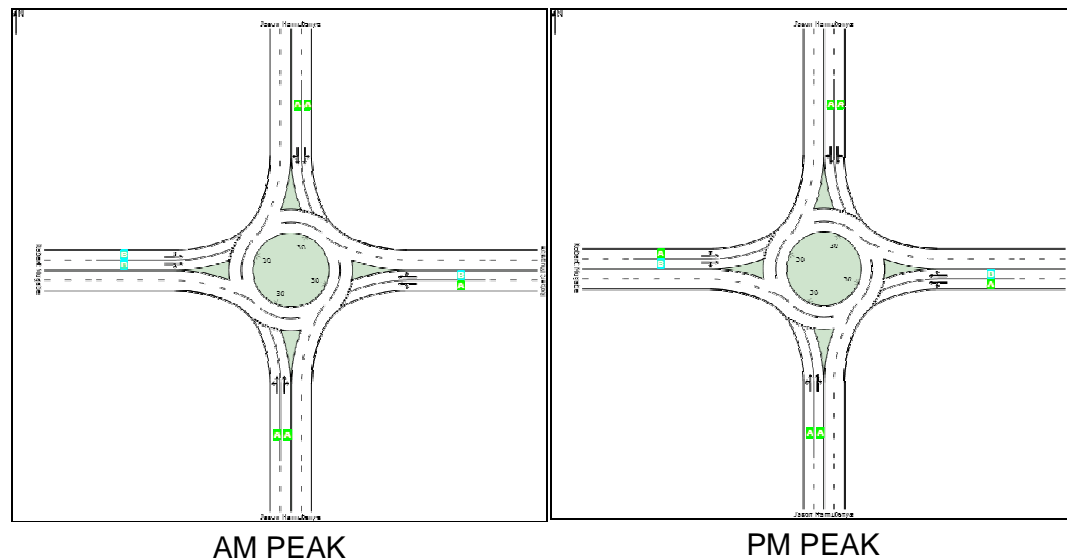


Figure 22 | Existing and generated peak hour SIDRA results for Robert Mugabe and Jason Hamutenya intersection

A SIDRA priority controlled intersection analysis of the existing and the generated traffic as indicated in Figure 22 above shows that all movements along each approach operates at a very good LOS as before the addition of the development generated traffic. The intersection experiences average delays for all vehicles of 8.2 and 9.8 seconds during the morning and evening peak hours respectively. The maximum queue lengths at this intersection are 21.2 meters and 34.1 meters in the morning and evening peak hours respectively.

5.7.3 Mitigation Measures

5.7.3.1 Construction phase

The following generic mitigation measures are recommended which will be revised on completion of the TIA:

- The Sam Nujoma Drive and B6 intersection must be upgraded from a T-Junction to a Traffic Circle in order for it to operate at an acceptable LOS. The traffic circle will have single approach lanes with two internal circulation lanes.
- Develop an alternate route for construction vehicles.
- Implement a pedestrian pathway to the site to accommodate workers walking to work.
- Ensure proper signage is in place.
- Consider adding speed humps to reduce speed where applicable.

5.7.3.2 Operational phase

- Implement public transport and pedestrian facilities in the area.
- Ensure and maintain proper road signage.
- Contact public information sharing talks.

Table 16 overleaf indicates the impact rating for anticipated traffic impacts.

Table 16 | Traffic Impacts and Mitigations during Construction

Key impacts	Mitigation Measures	Mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability
Increased construction vehicles on road network	Develop alternate route for construction vehicles	Without	Local	Medium	Construction	Medium (-)	Probable
		With	Local	Zero	Construction	Negligible	Probable
Increased noise pollution	Environmental Management Plan - Restriction of working hours	Without	Local	Medium	Construction	Medium (-)	Probable
		With	Local	Zero	Construction	Negligible	Probable
Increased air pollution	EMP- All construction vehicles must have a dust control plan in place	Without	Local	Medium	Construction	Medium (-)	Probable
		With	Local	Zero	Construction	Negligible	Probable
Waste generation	Contractor must develop a Waste Management Plan	Without	Local	High	Construction	Medium (-)	Probable
		With	Local	Zero	Construction	Negligible	Probable
Increased pedestrian activity	Implement a pedestrian pathway to the site to accommodate workers walking to work	Without	Local	Medium	Construction	Medium (-)	Probable
		With	Local	Zero	Construction	Negligible	Probable
Safety	Ensure proper signage is in place	Without	Local	High	Construction	Medium (-)	Probable
	Speed humps can be used to reduce speed	With	Local	Zero	Construction	Negligible	Probable

Table 17 | Traffic Impacts and Mitigations during Operations impacts

Key impacts	Mitigation Measures	Mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability
Impacts on existing traffic conditions	Conduct a Traffic Impact Assessment (TIA)	Without	Local	Medium	Operation	Medium (-)	Probable
		With	Local	Zero	Operation	Negligible	Probable
Increased pedestrian activity	Implement public transport and pedestrian facilities in the area	Without	Local	Medium	Operation	Medium (-)	Probable
		With	Local	Zero	Operation	Negligible	Probable
Safety	Ensure proper signage is in place	Without	Local	High	Operation	High (-)	Probable
	Public safety talks	With	Local	Zero	Operation	Negligible	Probable

5.8 NOISE IMPACT

Noise is generally defined as unwanted sound transmitted through a compressible medium such as air. Sound in turn, is defined as any pressure variation that the ear can detect. Human response to noise is complex and highly variable as it is subjective rather than objective. The proposed development would be located in close proximity to an existing residential area and noise generated from the project is likely to negatively impact these receptors and cause a nuisance. Potential noise impacts were therefore assessed qualitatively based on the findings of the TIA by the Aurecon Team. The findings and recommendations are provided below.

In terms of existing noise levels, Auasblick can be considered as an urban area with day and night-time noise levels of 60dBA and 50dBA respectively (SANS 10103, 2008) and therefore generally of moderate sensitivity when compared to rural districts and industrial districts.

5.8.1 Noise Impact Assessment

Construction phase impacts anticipated

The construction phase is expected to have the most notable impact on environmental noise levels. Construction related noise is mostly associated with the use of diesel mobile equipment, earthworks, concrete batching and building finishing operations. The level and character of the construction noise will be highly variable as different activities with different plant/ equipment take place at different times, over different periods, in different combinations, in different sequences and at different areas of the construction site. The additional people on the site would also contribute to increased noise levels.

The noise impacts are considered to be of medium magnitude, local in extent and of short term duration and therefore of **medium (-)** -significance without mitigation, which will be reduced to **low (-)** significance with mitigation. The construction phase is expected to have the most notable impact on environmental noise levels and may result in unacceptable noise at the site. This could have a negative impact on the noise sensitive receptors located in nearby residential properties. However, with implementation of mitigation measures, these impacts could be brought into compliance.

Operational phase impacts anticipated

It is anticipated that minimal noise will be generated from the operational phase mainly from the use of access roads. It is expected that the slight increase in traffic would be immaterial in comparison with current traffic related noise. Extension 1 would therefore fall within the same type of noise levels as found within a township setting as already experienced around the area of Auasblick. The noise impacts are considered to be of very low magnitude, local in extent and long term in duration and therefore of **very low (-)** significance, with and without mitigation.

5.8.1.1 Cumulative impacts

The potential for cumulative noise impacts exists near major roads as a result of the increase in traffic. The cumulative noise impacts are considered to be of **low (-)** significance with and without mitigations.

5.8.1.2 'No-go' impacts

Should the *status quo* persist in the area, the noise levels will remain unchanged and the impact is therefore considered to be neutral.

5.8.2 Mitigation Measures

The following mitigation measures are recommended for consideration by the proponent to reduce noise impacts:

- Keep all plant, equipment and vehicles in good repair.
- Ensure that all diesel powered equipment is regularly maintained and kept at a high level of maintenance. This must particularly include the regular inspection and if necessary, replacement of intake and exhaust silencers. Any change in the noise emission characteristics of equipment must serve as trigger for withdrawing it for maintenance.
- Combine noisy operations such as the use of diesel mobile equipment, earthworks and concrete batching so that they occur, where possible, at the same time.
- Shut down machines used intermittent in the intervening periods between work or throttle down to a minimum.
- Contain construction activities to reasonable hours during the day. Any construction activities to be undertaken at night must be approved by the resident engineer.
- Do not allow construction on weekends from 14h00 on Saturday afternoons to 06h00 the following Monday morning.

5.8.3 Noise Impact Table

Table 18 indicates how the significance ratings of the various noise impacts were derived.

Table 18 | Assessment of noise impacts anticipated

Project	Key impacts	Mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility
Construction phase	Noise impacts	Without Mitigation	Local	Low	Construction	Medium- (-)	Probable	Sure	Reversible
		With mitigation	Local	Very low	Construction	Low (-)	Probable	Sure	Reversible
Operational phase	Noise impacts	Without Mitigation	Local	Very low	Long term	Very low (-)	Probable	Likely	N/A
		With mitigation	Local	Very low	Long term	Very low (-)	Probable	Likely	N/A
'No-go' alternative	No disturbance	NA	Site specific	Zero	Long term	Neutral	Probable	Unsure	NA

5.9 IMPACT ON AIR QUALITY

The construction activities of the proposed Extension 1 could result in air quality impacts, through the generation of dust. These impacts could impact negatively on the health of the surrounding residents if mitigation measures are not implemented. Activities associated with dust generation during the construction phase include vegetation removal and land clearing, scraping and grading, and the construction of building and roads. Gaseous emissions would primarily be a result of construction equipment. The findings and recommendations are provided below.

5.9.1 Description of the Environment

Dust particulates would represent the main pollutant of concern during construction activities of the proposed development. Airborne particulate matter comprises a mixture of organic and inorganic substances, ranging in size, shape and density. Total Suspended Particulates is associated with dust fallout. There is currently no artificial or activity induced dust emissions in the area.

5.9.2 Air Quality Impact Assessment

Due to the lack of detailed information, air quality emissions from the construction activities were assessed qualitatively.

Construction phase impacts anticipated

Materials handling

The handling of topsoil and gravel for construction operations could be a potential significant source of dust generation. The quantity of dust generated would depend on various climatic parameters, such as wind speed and precipitation, in addition to the nature and volume of the material handled. Fine particulates are most readily disaggregated and released to the atmosphere during the material transfer process, as a result of exposure to strong winds. Increases in the moisture content of the material being transferred will decrease the potential for dust emission, since moisture promotes the aggregation and cementation of fines to the surfaces of larger particles.

The quantity and moisture content of the material and the hourly wind speed will determine the amount of dust that is given off from the various transfer points. During construction, the proposed topsoil storage piles and cleared land would be the key sources of wind-blown dust. A typical wind speed threshold is given as 5.4m/s for storage piles (as applied by the US EPA). Windhoek wind data depicts an average wind speed of 2.5m/s which indicates that wind erosion is not likely to occur throughout most of the year. During the windier months of August and September, erosion of stockpiles is however likely to occur. Materials handling operations can be mitigated through chemical dust suppressants that can result in a significant reduction in dust generation.

Dust from vehicles using access roads to the site

Dust emissions from vehicles using the roads can be significant, especially where there are high traffic volumes on a road. On unpaved roads in particular, the force of the wheels causes the pulverisation of surface material causing particulates to be lifted and dropped from the rotating wheels, whilst the strong air currents on the road surface cause turbulence which continues after the vehicle has passed. The quantity of dust emissions from unpaved roads increases with the increase of traffic expected on that road. Although a low number of construction trucks are

anticipated, it is possible that the traffic on the temporary unpaved roads could be significant sources of dust generation, if uncontrolled. The trucks on the paved road are likely to generate less dust.

Vehicle and equipment emissions

Gaseous emissions e.g. carbon dioxide, heavy metals, methane, nitrous oxide, would also result from the exhaust fumes of construction vehicles moving in and around the site as well as the use of diesel equipment such as compressors on the site. The levels of emissions are considered to be fairly low, in line with general traffic emissions. The overall air quality impacts are considered to be of medium magnitude, local extent and construction phase in duration prior to mitigation and therefore of **low (-)** significance, without and with mitigation.

Operational phase impacts anticipated

Emissions to air associated with the operational phase would be limited to exhaust fumes from vehicles making use of access roads to Extension 1. These air quality impacts are considered to be of low magnitude, site specific in extent and of long term in duration and therefore of **very low (-)** significance, with and without mitigation.

5.9.2.1 Cumulative impacts

The potential for cumulative air quality impacts would emanate from the increased traffic volumes in the area. More vehicles are expected to make use of the road extensions as well as an increase in traffic from the residents. The cumulative air quality impacts are considered to be of very low magnitude, regional extent and long term in duration and therefore of **very low (-)** significance without and with mitigation. The probability of the impact arising is probable, the confidence in the assessment is considered as unsure and the impact is irreversible.

5.9.2.1 'No-go' impacts

If the *status quo* persists, the dust levels will remain unchanged and the impact is therefore considered to be neutral.

Table 19 indicates how the significance ratings of air quality impacts were derived.

5.9.3 Mitigation Measures

The following mitigation measures are proposed:

- Implement reasonable measures to minimise dust generation during construction. If dust is experienced as a nuisance by nearby residents, then dust suppression measures shall be implemented onsite. In order to conserve water, dust suppression using chemical dust suppressants such as 'Dustex' is recommended, provided they are used in the prescribed manner and away from drainage lines.
- Ensure that vehicles carrying dust susceptible materials have their loads effectively covered/sheeted.

Table 19 | Assessment of air quality impacts anticipated

Project	Key impacts	Mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility
Construction phase	Air quality impacts	Without Mitigation	Local	Low	Construction	Low (-)	Probable	Sure	Reversible
		With mitigation	Local	Low	Construction	Low (-)	Probable	Sure	Reversible
Operational phase	Air quality impacts	Without Mitigation	Local	Low	Long term	Very low (-)	Probable	Likely	N/A
		With mitigation	Local	Low	Long term	Very low (-)	Probable	Likely	N/A
'No-go' alternative	No disturbance	NA	Site specific	Zero	Long term	Neutral	Probable	Unsure	NA

6 RECOMMENDATIONS AND CONCLUSION

This section concludes the report and provides information on the way forward.

6.1 CONCLUSIONS

The proposed Extension 1 is to be located within Auasblick, a residential area that the City of Windhoek has intentionally allocated for high and high-middle income housing. Auasblick Extension 1 will be composed of residential structures and institutional facilities for public service use.

The development of the proposed Extension 1 in Auasblick would also offer an opportunity to create alternative routes by extending Reginald Walker Street and Sean McBride Street to join Sam Nujoma Drive and the road to Hosea Kutako International Airport through Avis. The proposed road extensions will assist to relieve currently experienced traffic pressure on Klein Windhoek roads and to provide a much needed connection between Windhoek's southern and eastern suburbs.

This Scoping Report provides a comprehensive assessment of the environmental issues associated with each of the abovementioned alternatives of the proposed project. The environmental and social impacts and alternatives were derived in response to inputs from consultation with I&APs, stakeholders, local authorities, and the EIA project team. Table 20 overleaf provides summaries of the significance of the expected environmental impacts associated with this proposed development.

Table 20 | Summary of significance of the potential impacts associated with the proposed township development

IMPACTS		Construction		Operation	
		No Mitigation	With Mitigation	No Mitigation	With Mitigation
Impacts on stormwater	Disturbance surface water features	Low (-)	Very low (-)	Medium (-)	Medium (-)
	Provision of storm water facilities	Medium (-)	Low (-)	Medium (-)	Medium (-)
Impact on ecology (flora and fauna)	Destruction of vertebrate fauna	Low (-)	Very low (-)	Medium (-)	Very low (-)
	Destruction of unique flora	Medium (-)	Very low (-)		
	Destruction of special habitats	Medium (-)	Very low (-)		
	'No-go'	Neutral		Neutral	
Impact on heritage resources	Destruction of heritage resources	Medium (-)	Low (-)	Medium (-)	Low (-)
	'No-go'	Neutral		Neutral	
Visual Impacts	Visual disturbance	Medium (-)	Low (-)	Neutral	
	'No-go'	Neutral		Neutral	
Socio-economic Impacts	Employment creation during construction	Low (+)	Medium (+)	Medium (+)	Medium (+)
	Presence of construction workers	Medium (-)	Low (-)	-	-
	Improved traffic flow and road network	Medium (+)	Medium (+)	Medium (+)	Medium (+)
	'No-go'	Neutral		Neutral	
Traffic Impacts	Increased construction vehicles on road network	Medium (-)	Neutral	-	-
	Increased pedestrian activity	Medium (-)	Neutral	Medium (-)	-
	Safety	Medium (-)	Neutral	Medium (+)	Medium (+)
Noise impact	Noise pollution	Low (-)	Very low (-)	Very low (-)	Very low (-)
	'No-go'	Neutral		Neutral	
Dust impacts	Air Emissions	Low (-)	Low (-)	Very low (-)	Very low (-)
	'No-go'	Neutral		Neutral	

6.1.1 Construction Impacts

With reference to Table 20, the most significant negative construction phase impacts to the biophysical and socio-economic environment, without mitigation were impacts on flora and fauna due to an increase in vegetation clearance; increased impacts on surface water features; visual and noise impacts associated with the excavations and the road constructions. In addition the two archaeological sites found within the development footprint needs to be excavated prior to construction activities taking place. Special care should also be taken while clearing due to the high possibility of more archaeological sites located in the area. The socio-economic impact highlighted is the presence of workers on the site. These impacts were rated between **low (-)** and **medium (-)** significance, respectively. With the implementation of the proposed mitigation measures, the identified impacts could be reduced to **low (-)** significance which is considered to be acceptable.

It should be noted that potential positive socio-economic impacts such as employment creation and the improved road network which are all rated at **medium (+)** significance will add value toward the economic status of Auasblick.

6.1.2 Cumulative impacts

Cumulative impacts have been assessed by considering the impact of the development in combination with other broader biophysical, social and economic considerations, which typically cannot be addressed at the project level. It was found that the impacts on the environment were all acceptable.

6.1.3 Level of confidence in assessment

With reference to the information available at this stage of the proposed project planning cycles, the confidence in the environmental assessment undertaken is regarded as being acceptable for decision-making, specifically in terms of the environmental impacts and associated risks. The EAPs believe that the information contained within this Scoping Report is adequate to inform MET:DEA to be able to determine the environmental acceptability of the proposed development.

It is acknowledged that the project details will evolve during the detailed design and construction phases to a limited extent. However, these are unlikely to change the overall environmental acceptability of the proposed development and any significant deviation from what was assessed in this Scoping Report should be subject to further assessment.

6.2 RECOMMENDATIONS

Section 5 outlines the project specific mitigation measures which, if implemented accordingly, could significantly reduce the negative impacts and enhance the positive impacts that are associated with the proposed development. The identified mitigation measures have also been incorporated into the EMP (Annexure C). Where appropriate, the mitigation measures, and any others, identified by MET:DEA could be enforced as Conditions of Approval in the ECC, should MET:DEA approve the project.

6.2.1 EAP's opinion with respect to authorisation

Based on the outcome of the impact assessment, Aurecon is of the opinion that the proposed township development should be authorised as the incremental benefits have been found to outweigh negative impacts. The proposed development has a sound motivation demonstrating the need and desirability therefore. The significance of negative impacts can be reduced with effective and appropriate mitigation. If authorised, the implementation of an EMP should be included as a Condition of Approval.

Based on the outcome of this Scoping Assessment, we are of the opinion that the project is preferred over the 'No-go' alternative, and the project, should be approved as all impacts have been considered to be acceptable.

6.3 WAY FORWARD

Registered I&AP's have been notified of the availability of the Draft Scoping Report which is available for comment between **24 November 2014 and 8 December 2014**. The Draft Scoping Report is also accessible from Aurecon Windhoek office, as well as at the City of Windhoek Municipal offices. I&APs were also invited to raise their concerns, issues and or comments on the report and submit them to the Aurecon Team.

Cognisance will be taken of all comments in compiling the final report, and the comments received, together with the project team and proponent's responses thereto, will be included in the Final Scoping Report. Where appropriate, the report will be updated to final status.

The Final Scoping Report will then be submitted to the MET: DEA for consideration and decision-making. The MET: DEA will have 30 working days to review the report and issue a decision. Following this, all registered I&APs will be notified of the decision where after an appeal period will follow.

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- D4 Traffic Assessment

8 REPORT TRANSMITTAL NOTE

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