

Environmental Assessment Scoping Report for:

June 2021

*Rezoning and Consolidation of
Erven 580 and Erf 581,
Lüderitz Extension 4, for the
proposed construction and
operation of a bird sanctuary in
Lüderitz.*

Prepared for: NAMDEB Diamond Corporation
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PROJECT DETAILS

Title	Environmental Scoping Report for the: <ul style="list-style-type: none"> Rezoning and Consolidation of Erven 580 and Erf 581, Lüderitz Extension 4 for the proposed construction and operation of a bird sanctuary in Lüderitz. 		
Report Status	Final		
SPC Reference	W/20073		
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EXECUTIVE SUMMARY

Introduction

NAMDEB Diamond Corporation (Pty) Ltd hereinafter referred to as the proponent or NAMDEB intends to undertake the following activities:

- **Rezoning and Consolidation of Erven 580 and 581, Lüderitz Extension 4 for the proposed construction and operation of a bird sanctuary in Lüderitz.**

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

As such the proponent appointed Stubenrauch Planning Consultants (SPC) to undertake an independent Environmental Assessment (EA) in order to obtain an Environmental Clearance Certificate (ECC) for the above activities. The competent authority is the Ministry of Environment and Tourism: Department of Environmental Affairs and Forestry (MEFT: DEAF).

Project Description

NAMDEB primarily performs land-based prospecting (exploration), mining and rehabilitation operations and services for NAMDEB Holdings. NAMDEB operations are located within the Tsau //Khaeb (Sperrgebiet) National Park, adjacent to the international Orange River and Namibian Islands Marine Protected Area.

In addition to mining, NAMDEB is involved in numerous conservation, monitoring and ecological history programmes. For several years the company has supported various research and conservation efforts in both land and marine environments through the establishment of partnerships with key research and academic institutions. The unique biodiversity and archaeological/heritage resources found within NAMDEB's mining licence areas provides a great opportunity for the development of programmes and establishment of facilities that encourage conservation of the biodiversity. NAMDEB makes provision for rehabilitation programmes for mining based, nature based and conservation areas.

In light of the above, as part of their conservation and environmental rehabilitation programme, NAMDEB hereby presents an opportunity to develop a Bird Sanctuary on the proposed "Consolidated Erf X" Lüderitz Extension 4.

Public Participation

Communication with Interested and Affected Parties (I&APs) about the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing descriptive information about the proposed activities was compiled and sent out to all identified and registered I&APs via email on **5 March 2021**;
- Notices were placed in The New Era and The Sun newspapers dated **4 March 2021 and 11 March 2021**, briefly explaining the activity and its locality, inviting members of the public to register as I&APs (**Appendix B**); and
- Notices were fixed at the project site (see **Appendix A**).

Public consultation was carried out according to the Environmental Management Act's EIA Regulations. After the initial notification, the I&APs were given two weeks to submit their comments on the project (until **16 March 2021**). The comment period will remain open until the final scoping report is submitted to MEFT.

The Draft Scoping Report was circulated from the **28th of April 2021 until the 12th of May 2021** so that the public could review and comment on it. The overall commentary received from the public on the draft report is documented in a comments and responses report document to be included in the final report.

Conclusions and Recommendations

With reference to **Table 8**, none of the negative planning and design phase impacts were deemed to have a high significant impact on the environment. The planning and design phase impacts were assessed to a **Medium to Low (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

With reference to **Table 8**, none of the negative construction phase impacts were deemed to have a high significant impact on the environment. The construction impacts were assessed to a **Medium to Low (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

With reference to **Table 8**, none of the negative operational phase impacts were deemed to have a high significance impact on the environment. The operational impacts were assessed to a **Medium (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

It is recommended that this project be authorised because should the development not proceed the socio-economic benefits among others that could result from the project would not be realized. None of the positive or negative impacts from the proposed development would be realized.

The “no go” alternative was thus deemed to have a High (negative) impact, as all the benefits resulting from the development would not be realised.

The significance of negative impacts can be reduced with effective and appropriate mitigation provided in this report and the EMP. If authorised, the implementation of the EMP should be included as a condition of approval.

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LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CRR	Comments and response report
dB	Decibels
DESR	Draft Environmental Scoping Report
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EAR	Environmental Assessment Report
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
FESR	Final Environmental Scoping Report
GTZ	Gesellschaft für Technische Zusammenarbeit
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
MEFT	Ministry of Environment, Forestry and Tourism
MEFT: DEA	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry
MURD	Ministry of Urban and Rural Development
MWTC	Ministry of Works Transport and Communication
NAMPAB	Namibia Planning Advisory Board
NPC	Namibia Planning Commission
PPP	Public Participation Process
SADC	Southern African Development Community
SPC	Stubenrauch Planning Consultants
USAID	United States Agency for International Development
VMMC	Voluntary Medical Male Circumcision

1 INTRODUCTION

1.1 PROJECT BACKGROUND

NAMDEB Diamond Corporation (Pty) Ltd hereinafter referred to as the proponent (*or NAMDEB*) intends to undertake the following activities:

- **Rezoning and Consolidation of Erven 580 and 581, Lüderitz Extension 4 for the proposed construction and operation of a bird sanctuary in Lüderitz.**

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

In terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), the following listed activities in **Table 1** were triggered by the proposed project:

Table 1: List of triggered activities identified in the EIA Regulations which apply to the proposed project

Activity description and No(s):	Description of relevant activity	The portion of the development as per the project description that relates to the applicable listed activity
Activity 11.2	Construction of cemeteries, camping, leisure and recreation sites	The proposed project includes the construction of a bird sanctuary facility.

The above activities will be discussed in more detail in Chapter 4. The proponent appointed Stubenrauch Planning Consultants (SPC) to undertake an independent Environmental Assessment (EA) in order to obtain an Environmental Clearance Certificate (ECC) for the above activities. The competent authority is the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs (MEFT: DEA).

The process will be undertaken in terms of the gazetted Namibian Government Notice No. 30 Environmental Impact Assessment Regulations (herein referred to as EIA Regulations) and the Environmental Management Act (No 7 of 2007) (herein referred to as the EMA). The EIA process will investigate if there are any potential significant bio-physical and socio-economic impacts associated with the intended activities. The EIA process would also serve to provide an opportunity for the public and key stakeholders to provide comments and participate in the process.

1.2 PROJECT LOCATION

The subject erven are located on the southwestern side of the Lüderitz townlands in Lüderitz Extension 4. Each erf currently accommodates a house which is owned by NAMDEB and is to be demolished to allow for the construction of the proposed facility. The subject erven are located in a primarily residential area with a few dwellings located to the east and to the west of the properties and a Public Open Space to the south. Other surrounding erven are still vacant. Additionally, there is a filled in lagoon area to the south of the subject erven. Please refer to below locality map (**Figure 1**) and aerial photo (**Figure 2**).

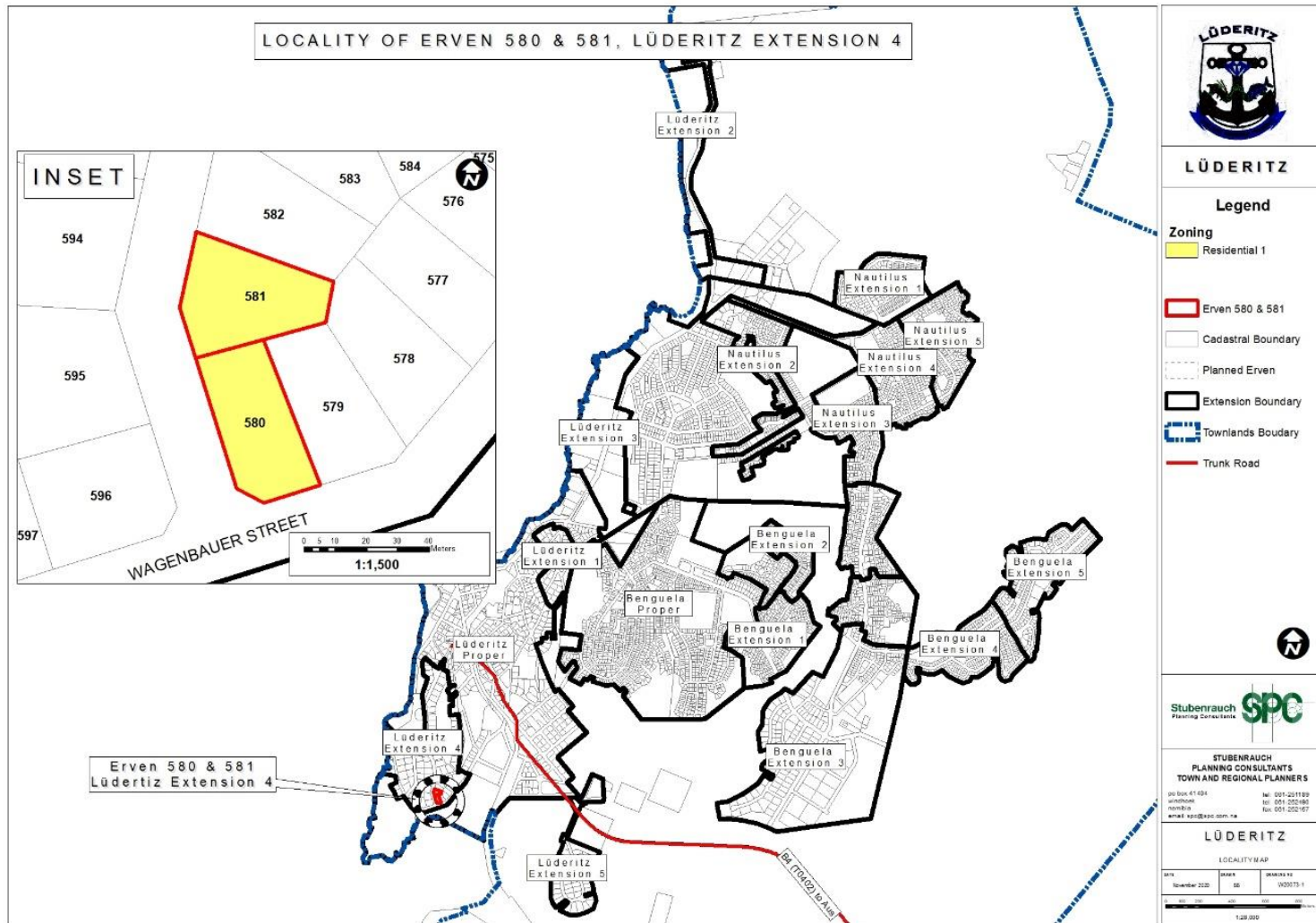


Figure 1: Locality of Erven 580 and 581, Lüderitz Extension 4

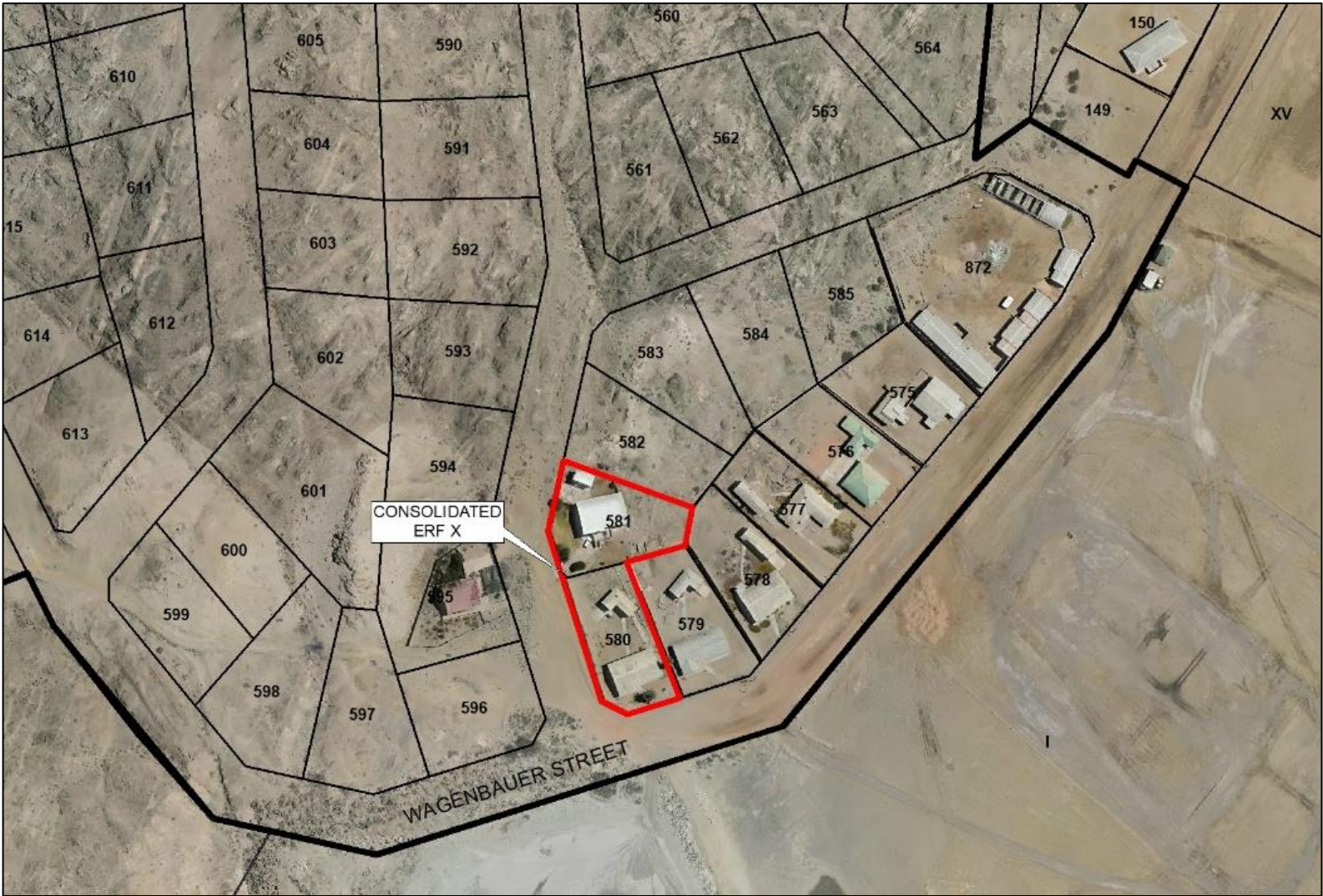


Figure 2: Aerial Map of Erven 580 and 581, Lüderitz Extension 4

1.3 TERMS OF REFERENCE AND SCOPE OF PROJECT

The scope of this project is limited to conducting an environmental impact assessment and applying for an Environmental Clearance Certificate for the following as indicated in section 1.1 above:

- **Rezoning and Consolidation of Erven 580 and 581, Lüderitz Extension 4 for the proposed construction and operation of a bird sanctuary in Lüderitz.**

1.4 ASSUMPTIONS AND LIMITATIONS

In undertaking this investigation and compiling the Environmental Scoping Report, the following assumptions and limitations apply:

- Assumes the information provided by the proponent is accurate and discloses all information available.
- The limitation that no alternative except for the preferred layout plans and the 'no-go' option was considered during this assessment. The unique character and appeal of Lüderitz were however taken into consideration with the design perspective.

1.5 CONTENT OF ENVIRONMENTAL ASSESSMENT REPORT

Section 8 of the gazetted EIA Regulations requires specific content to be addressed in a Scoping / Environmental Assessment Report. **Table 2** below is an extract from the EMA and highlights the required contents of a Scoping / Environmental Assessment Report whilst assisting the reader to find the relevant section in the report.

Table 2: Contents of the Scoping / Environmental Assessment Report

Section	Description	Section of FESR/ Annexure
8 (a)	The curriculum vitae of the EAPs who prepared the report;	Refer to Annexure D
8 (b)	A description of the proposed activity;	Refer to Chapter 4
8 (c)	A description of the site on which the activity is to be undertaken and the location of the activity on the site;	Refer to Chapter 3
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;	Refer to Chapter 3

Section	Description	Section of FESR/ Annexure
8 (e)	An identification of laws and guidelines that have been considered in the preparation of the scoping report;	Refer to Chapter 2
8 (f)	Details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including	Refer to Chapter 5
	(i) the steps that were taken to notify potentially interested and affected parties of the proposed application	Refer to Chapter 5
	(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given;	Refer to Annexures A and B for site notices and advertisements respectively.
	(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;	Refer to Annexure C
	(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;	Refer to Annexure C
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;	Refer to Chapter 4
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	Refer to Chapter 7

Section	Description	Section of FESR/ Annexure
	construction, erection or decommissioning associated with the undertaking of the proposed listed activity;	
8 (i)	terms of reference for the detailed assessment;	NB – Assessment of impacts are included in this EA Report
8 (j)	An environmental management plan	Refer to Annexure E

2 LEGAL FRAMEWORK

2.1 LEGISLATION RELEVANT TO THE PROPOSED DEVELOPMENT

There are multiple legal instruments that regulate and have a bearing on good environmental management in Namibia. **Table 3** below provides a summary of the legal instruments considered to be relevant to this development and the environmental assessment process.

Table 3: Legislation applicable to the proposed development

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against “the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia.” Article 95(l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources.	Sustainable development should be at the forefront of this development.
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principle of Environmental Management	The development should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.	The following listed activities are triggered by the proposed development: Activity 11.2
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The project should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The EA process should incorporate the aspects outlined in the guidelines.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the development does not lead to the degradation of the natural beauty of the area.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during construction and operation of the development.
The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS	MET has recently developed a policy on HIV and AIDS. In addition, it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor must adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with construction projects has shown that a significant risk is created when migrant construction workers interact with local communities.
Township and Division of Land Ordinance 11 of 1963	The Townships and Division of Land Ordinance regulates subdivisions of portions of land falling within a Local Authority area	In terms of Section 19 such applications are to be submitted to NAMPAB and Townships Board respectively.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development must comply with provisions of the Local Authorities Act.
Labour Act no. 11 of 2007	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.	Given the employment opportunities presented by the development, compliance with the labour law is essential.
National Heritage Act No. 27 of 2004	The Act is aimed at protecting, conserving and registering places and objects of heritage significance.	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Roads Ordinance 17 of 1972	<ul style="list-style-type: none"> • Section 3.1 deals with width of proclaimed roads and road reserve boundaries • Section 27.1 is concerned with the control of traffic on urban trunk and main roads • Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads • Section 37.1 deals with Infringements and obstructions on and interference with proclaimed roads. 	Adhere to all applicable provisions of the Roads Ordinance.
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	Contractors and users of the proposed development are to comply with these legal requirements.
Nature Conservation Ordinance no. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	Indigenous and protected plants must be managed within the legal confines.
Water Quality Guidelines for Drinking Water and Wastewater Treatment	Details specific quantities in terms of water quality determinants, which wastewater should be treated to before being discharged into the environment	These guidelines are to be applied when dealing with water and waste treatment
Environmental Assessment Policy of	The Policy seeks to ensure that the environmental consequences of development projects and policies	This EIA considers this term of Environment.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Namibia (1995)	are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	
Water Resources Management Act No. 11 of 2013	Part 12 deals with the control and protection of groundwater Part 13 deals with water pollution control	The pollution of water resources should be avoided during construction and operation of the development. Should water need to be abstracted, a water abstraction permit will be required from the Ministry of Water, Agriculture and Forestry.
Forest Act 12 of 2001 and Forest Regulations of 2015	To provide for the establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and the control and management of forest fires; to repeal the Preservation of Bees and Honey Proclamation, 1923 (Proclamation No. 1 of 1923), Preservation of Trees and Forests Ordinance, 1952 (Ordinance No. 37 of 1952) and the Forest Act, 1968 (Act No. 72 of 1968); and to deal with incidental matters.	Protected tree and plant species as per the Forest Act No 12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.
Atmospheric Pollution Prevention Ordinance No 45 of 1965	Part II - control of noxious or offensive gases, Part III - atmospheric pollution by smoke, Part IV - dust control, and	The development should consider the provisions outlined in the act. The proponent should apply for an Air Emissions permit from the Ministry of Health and Social Services (if needed).

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	Part V - air pollution by fumes emitted by vehicles.	
Hazardous Substance Ordinance 14 of 1974	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	The handling, usage and storage of hazardous substances on site should be carefully controlled according to this Ordinance.
Soil Conservation Act No 76 of 1969	Act to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources	The proposed activity should ensure that soil erosion and soil pollution is avoided during construction and operation.

This EIA process will be undertaken in accordance with the EIA Regulations. A Flow Diagram (refer to **Figure 3** below) provides an outline of the EIA process to be followed.

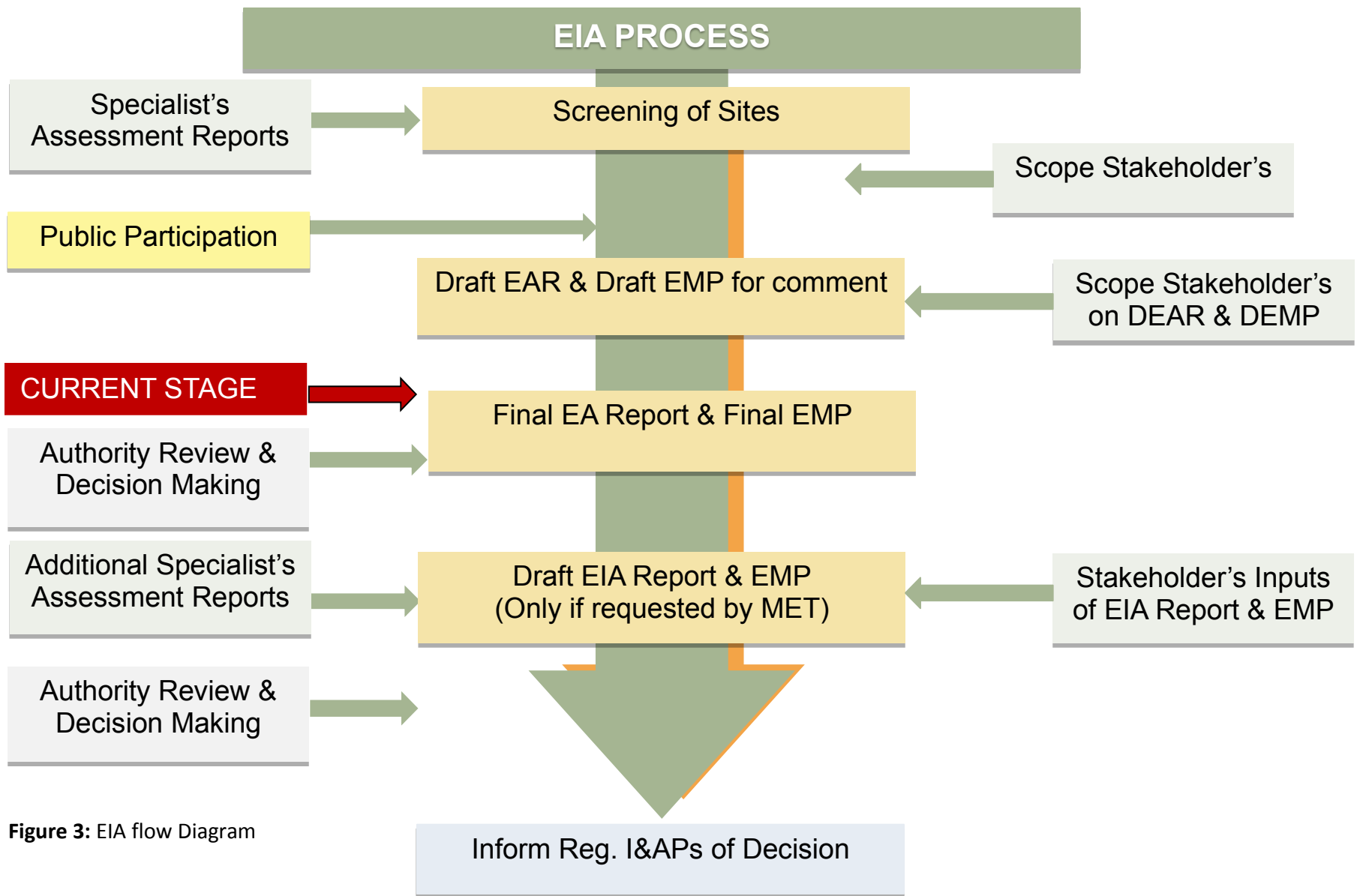


Figure 3: EIA flow Diagram

3 ENVIRONMENTAL BASELINE DESCRIPTION

3.1 SOCIAL ENVIRONMENT

3.1.1 Socio-Economic Context

The statistics shown in **Table 4** below are derived from the 2011 Namibia Population and Housing Census (Namibia Statistics Agency, 2013), and presented from a local and regional perspective.

Table 4: Statistics of the Lüderitz Constituency and //Karas Region (Namibia Statistics Agency, 2011)

LÜDERITZ CONSTITUENCY	
ATTRIBUTE	INDICATOR
Population	13 859
Females	6 887
Males	6 972
Population under 5 years	10%
Population aged 5 to 14 years	20%
Population aged 15 to 59 years	66%
Population aged 60 years and above	4%
Female: male ratio	100:101
Literacy rate of 15 years old and above	98%
People above 15 years who have never attended school	5%
People above 15 years who are currently attending school	10%
People above 15 years who have left school	82%
People aged 15 years and above who belong to the labour force	78%
Population employed	72%
Homemakers	7%
Students	78%
Retired or old age income recipients	45%
Income from pension	5%
Income from business and non-farming activities	8%
Income from farming	1%
Income from cash remittance	3%
Wages and salaries	79%
Main Language	Afrikaans Languages- 36%
//KARAS REGION	
ATTRIBUTE	INDICATOR
Population	77,421
Population aged 60 years and above	6%
Population aged 5 to 14 years	19%
Population aged 15 to 59 years	63%

3.1.2 Archaeological and Heritage Context

Lüderitz falls within a historical diamond mining area and some artefacts of historical importance may still be located in the area. Other archaeological sites in Lüderitz consist mainly of small surface scatters of stone artefacts and artifact debris, as well as small shell middens composed mainly of various limpet species, with osteological evidence of penguin, fish and seals on the more recent sites (Kinahan, 2016). Some of these sites are also associated with the nomadic pastoralist pottery dating to within the last 2000 years. In addition, several small rock shelter sites have been investigated and a number of burial sites have been excavated.

It is unlikely that the proposed project area will have any significant archaeological resources due to the fact that no major historical activity took place within close proximity to the sites. An accidental find procedure may, however, be required in the EMP.

3.2 BIO-PHYSICAL ENVIRONMENT

3.2.1 Air Quality

Air quality in Lüderitz is characterised to be comparatively good, since there are no current large-scale anthropogenic activities. With any construction activity the creation of fugitive dust will result which may be both a nuisance and a health risk. Dust may be generated by a variety of activities on site but taking the already high background dust levels into consideration, the increase resulting from this activity will be negligible under normal circumstances or when considered in combination with other activities.

3.2.2 Climate

Lüderitz has a desert climate (BWk, according to the Köppen climate classification), relatively dry with an annual average temperature of between 0mm– 50mm per year as indicated in **Figure 4**. The main problem with the rainfall is that it is highly variable in terms of amount of rainfall and its distribution.

The median annual rainfall varies between about 15mm and 70mm as indicated in **Figure 5**. Rainfall in the area is highly unpredictable and rainfall events are equally unlikely throughout the year. Windy and cold conditions can occur due to the cold South Atlantic current on the coast. Summer rains occur in the area and coastal fog plays an important role in the moisture regime of many organisms (Mendelsohn, *et al.*, 2002).

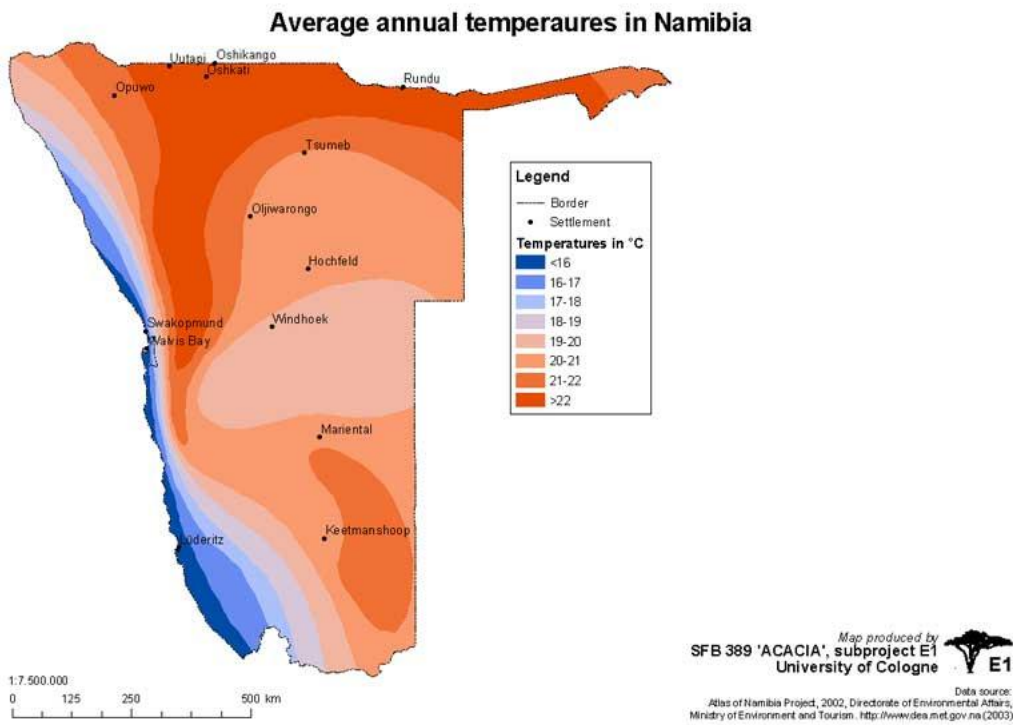


Figure 4: Annual average temperature (Acacia Project E1, n.d.)

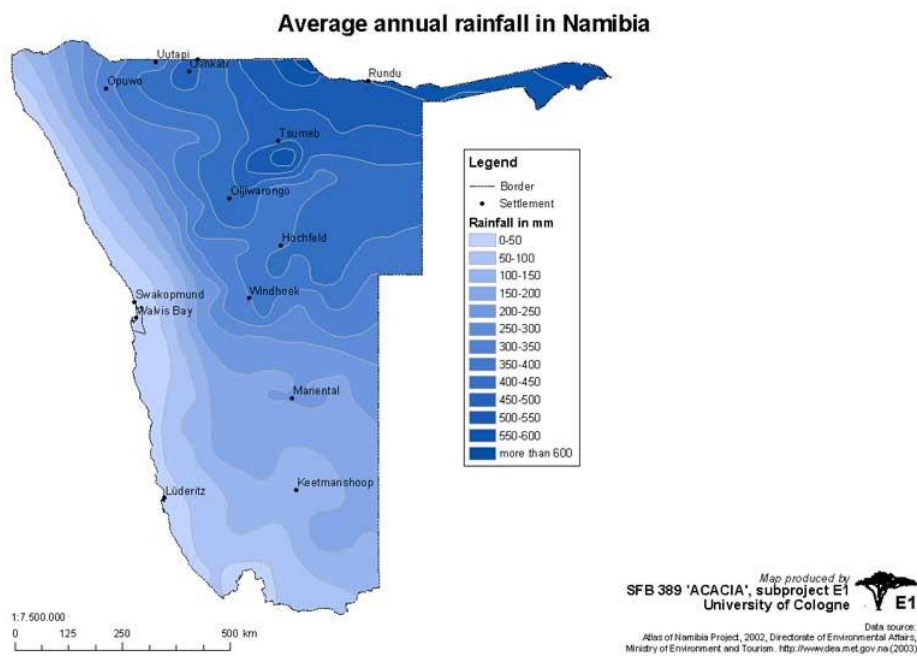


Figure 5: Average annual Rainfall (Acacia Project E1, n.d.)

3.2.3 Topography, Hydrogeology and Geology

The Naukluft Mountain area dominantly consists of fractured and karstified dolomites and limestones of the Damara Sequence representing a so-called nappe complex. The soil in this area is weakly developed and shallow. Vegetation cover will generally be sparse because the soil will not be able to provide plants with sufficient water or nutrients. The Sperrgebiet environment is fragile and characterised with aridity.

The carbonate rocks of the Naukluft are heavily karstified. Numerous springs and waterfalls are fed by this huge karst groundwater body which may be described as a natural lysimeter discharging above the low permeable sediments of the Nama Sequence. Also, tufa or travertine formations are typical for the Naukluft. Although some drilling was done in the beginning of the last century, very little is known about the quantity, quality, and utilisation of the groundwater of the Naukluft.

During the following semi-arid phase, erosion diminished, and calcareous soils formed on stable surfaces. These soils are today exposed as extensive calcrete surfaces that cover most of the plains and valleys of the Namib and Sperrgebiet (Mendelsohn *et al.*, 2002).

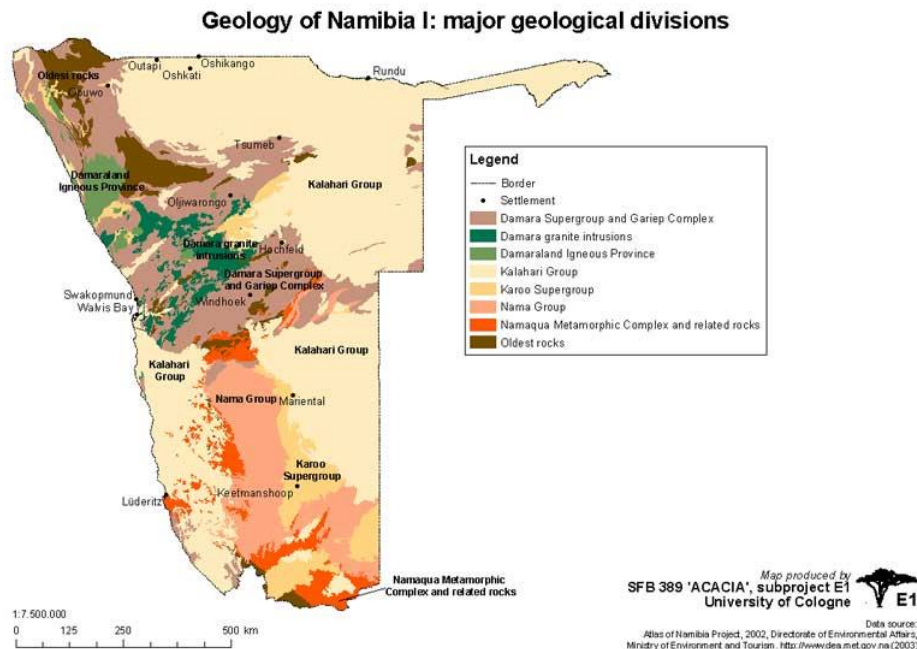


Figure 6: Geology of Namibia (Acacia Project E1, n.d.)

The town of Lüderitz and the western part of the //Karas Region falls within the Southern Namib and Naukluft hydrogeological region as shown in **Figure 7**. The only permanent water in this region is the Orange River, which supplies water to towns and mines (Oranjemund, Rosh Pinah) as well as agricultural and tourism projects. The water supply to Lüderitz is based on fossil water reserves in the Koichab paleo-channel. The Koichab wellfield (49) is situated 100 km north-east of Lüderitz at the foot of a massive dune formation up to 200m high. The Koichab area was proposed as early as 1914 as the most suitable source of water supply for the growing town of Lüderitz, however a water supply scheme was only established in 1968.

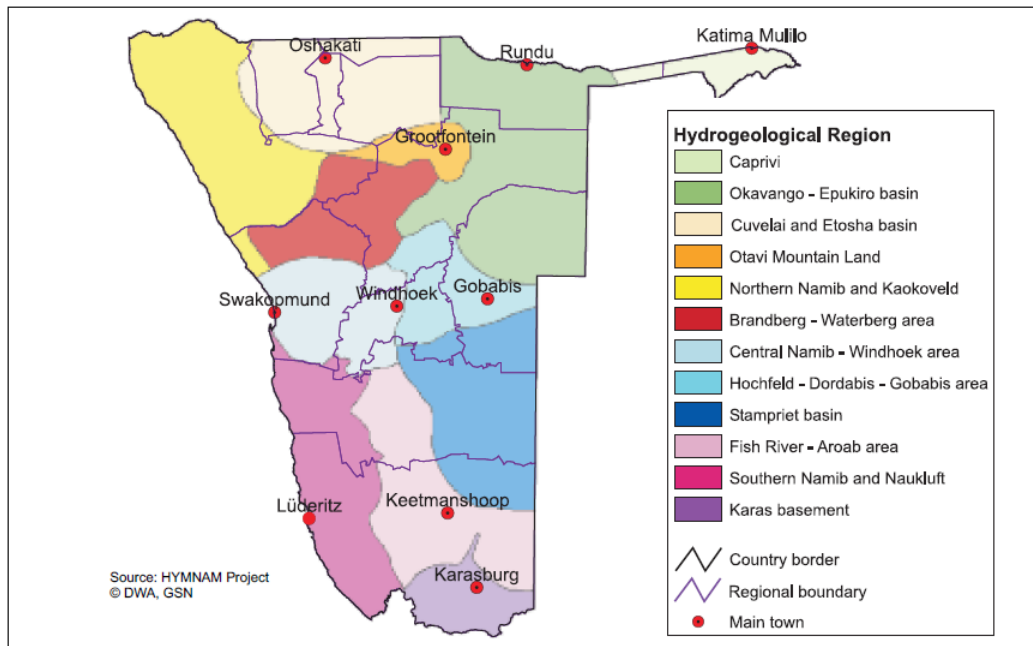


Figure 7: Groundwater basins and hydrogeological regions in Namibia (Ministry of Agriculture Water and Rural Development, 2011)

3.3 Terrestrial Ecology

3.3.1 Flora and Fauna

The succulent Karoo Ecosystem is the most diverse desert system in the world. There is high plant, particularly succulent, diversity. According to MET (2014), some 1050 species are known to occur in the Tsau//Khaeb (Sperrgebiet) National Park near Lüderitz. This contributes to nearly 25% of the entire flora of Namibia on less than 3% of land area of the country. It is for this reason that the succulent Karoo is listed amongst the world 's 25 biodiversity hotspots. The subject site is situated within an urban area, as such no significant flora is expected to be found on the proposed site.

Lüderitz falls within an Important Bird Area (IBA) as depicted in **Figure 8** below. The area is characterized by high species abundance due to the nutrient rich waters caused by upwelling. The Lüderitz Bay Island Complex consist of four coastal islands namely Halifax, Penguin, Seal and Flamingo

Island (BirdLife International, 2021). The shoreline and the Lüderitz harbour form part of the IBA. The island complex is considered to be globally important as it regularly supports more than 10,000 seabirds, many of which are threatened. The Islands are managed by the Ministry of Fisheries and Marine Resources.

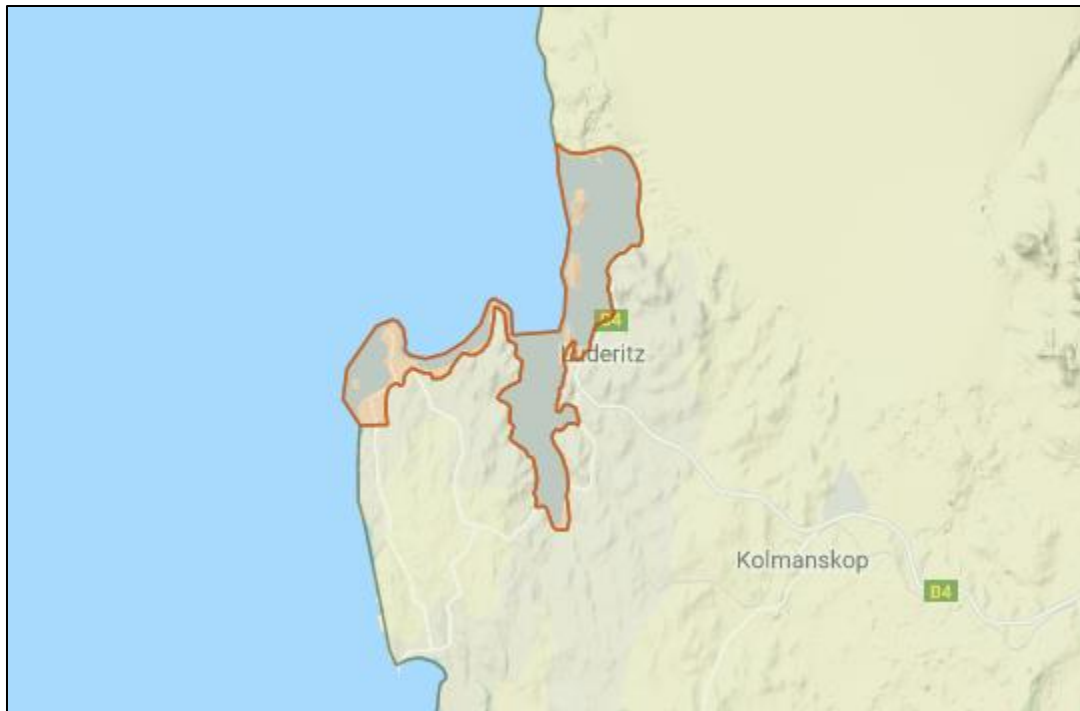


Figure 8: Lüderitz Bay Island

The photos below display some of the key bird species occurring within the IBA.



Photo 1: Cape Gannet



Photo 2: African Penguin



Photo 3: Crowned Cormorant



Photo 4: African Oyster Catcher

4 PROJECT DESCRIPTION

4.1 PROJECT COMPONENTS

As previously outlined in Section 1.1, the proposed project involves the following activities:

- **Rezoning and Consolidation of Erven 580 and 581, Lüderitz Extension 4 for the proposed construction and operation of a bird sanctuary in Lüderitz.**

These components will be described in further detail below, in terms of the proposed construction, operation and footprint of the facility.

4.2 ALTERNATIVES

4.2.1 No – Go Alternative

The no-go alternative is the baseline against which all alternatives are assessed. The no-go alternative would essentially entail maintaining the current situation, whereby the existing land would remain zoned for residential purposes. Thus, none of the positive or negative impacts associated with the intended development would realize.

4.3 THE PROPOSED DEVELOPMENT

NAMDEB primarily performs land-based prospecting (exploration), mining and rehabilitation operations and services for NAMDEB Holdings. NAMDEB operations are located within the Tsau //Khaeb (Sperrgebiet) National Park, adjacent to the international Orange River and Namibian Islands Marine Protected Area (see **Figure 9** below).

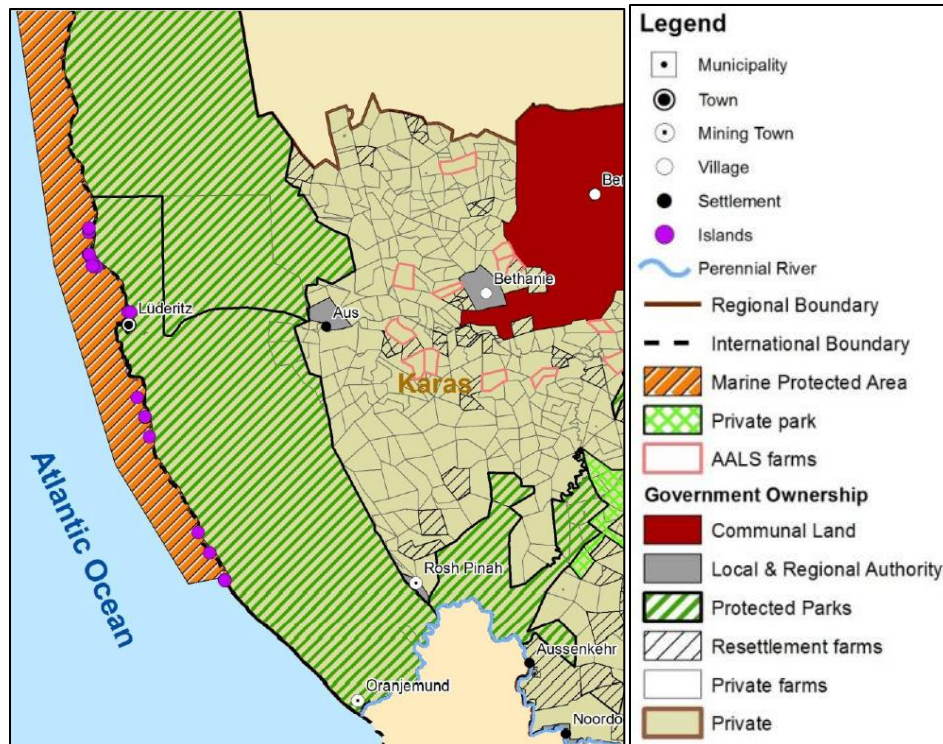


Figure 9: Land Use Map from the Karas Integrated Regional Land Use Plan (2011 – 2016)

In addition to mining, NAMDEB is involved in numerous conservation, monitoring and ecological history programmes. For several years the company has supported various research and conservation efforts in both land and marine environments through the establishment of partnerships with key research and academic institutions. The unique biodiversity and archaeological/heritage resources found within NAMDEB’s mining licence areas provides a great opportunity for the development of programmes and establishment of facilities that encourage conservation of the biodiversity. NAMDEB makes provision for rehabilitation programmes for mining based, nature based and conservation areas.

In light of the above, as part of their conservation and environmental rehabilitation programme, NAMDEB hereby presents an opportunity to develop a Bird Sanctuary on the proposed “Consolidated Erf X” Lüderitz Extension 4.

4.3.1 The Bird Sanctuary

The proposed development aims to work towards conserving and protecting Namibia's sea birds, especially threatened species, for the benefit of present and future generations by means of a rehabilitation center/ hospital for wounded, diseased, oiled or starving sea birds, accompanied by

other facilities. This facility will aid in increasing the population of seabirds through the following means:

1. Education Training and Research

This will include programmes to educate children and adults on taking care of birds. The proposed development will also be a center for educating and training bird keepers and aquarium staff all over the country to increase the understanding of seabird species behaviour, diseases and other factors that impact long term survival.

2. Chick Bolstering

This refers to the hand rearing of abandoned and weak chicks from eggs. This method is essential and proven successful in bolstering.

3. Oiled Wildlife Preparedness and Response

Overtime, maritime activities around the world have continued to increase since coal was replaced by oil in the 1930s. A lot of vessels pass the Namibian coastline annually and a large number of them are tankers with excess tons of crude oil which create a high risk of oil spills. With this initiative, NAMDEB will help the country in its preparedness to respond to potential oil spills that could affect wildlife by maintaining a state of 24/7 readiness to rescue and rehabilitate affected seabirds.

4. Seabird Disease Project

This facility will help test and treat birds while conducting research to understand better the baseline prevalence of diseases to allow for quick detection of future outbreak. The proposed development aims to benefit the natural environment by contributing to the conservation of endangered seabirds and preserve the biodiversity while contributing to the national and local economy through tourism and research development.

5. Rescue and Rehabilitation

The proposed bird sanctuary will collect sick and injured birds who are brought in either by staff or from members of the public. The proximity to the harbour provides a great advantage for this.

The proposed development will be using the Cape Town branch for the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) which is the international body dedicated to seabird

rehabilitation as a precedent. The NAMDEB team will also be working very closely with that of SANCCOB in the planning phase of the project.

4.3.2 The Town Planning Process for development

The subject erven are zoned for Residential purposes. They currently accommodate houses which are owned by Namdeb. These houses are to be demolished to allow for the construction of the proposed facility.

Due to the amount of space required by such a facility it is deemed necessary not only to rezone, but also to consolidate the two erven for the creation of the Bird sanctuary. The proponent thus intends to develop a Bird Sanctuary on Erven 580 and 581 Lüderitz Extension 4 by rezoning the subject erven from “Residential 1” to “Special” (**Figure 10**) and consolidating them to form “Consolidated Erf X” (**Figure 11**).

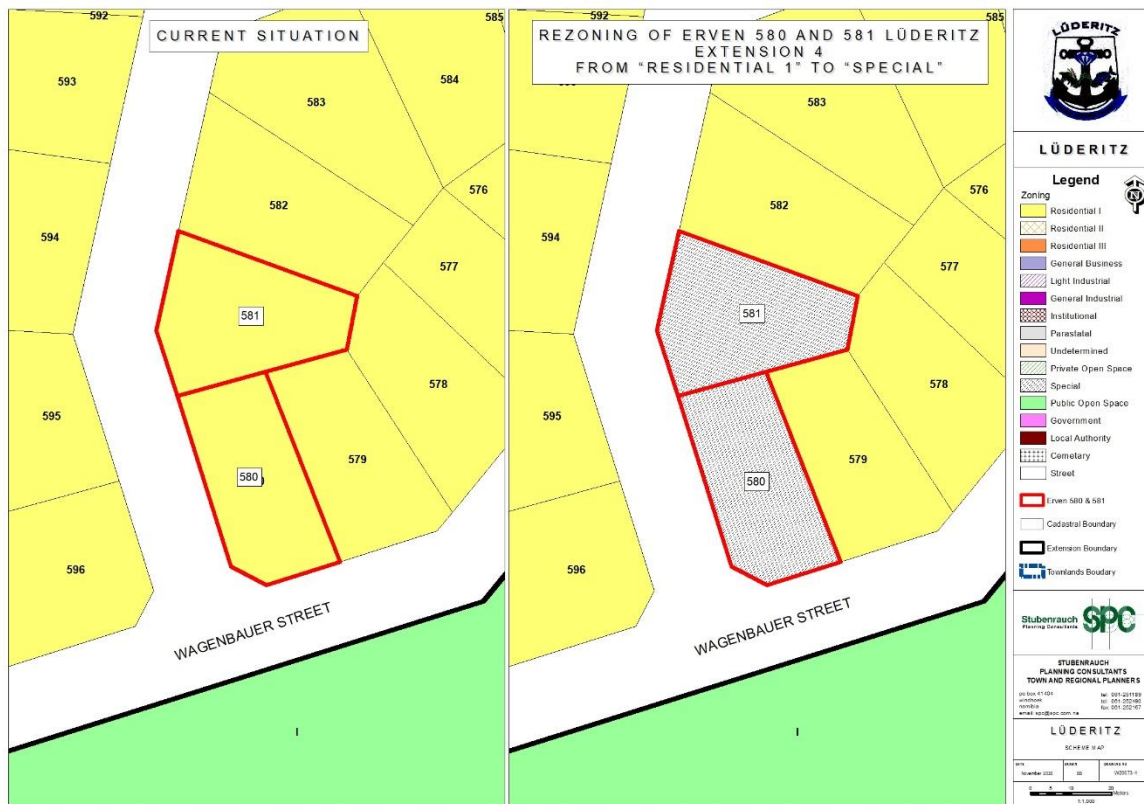


Figure 10: The Rezoning of Erf 580 and Erf 581 Lüderitz Extension 4 from “Residential 1” to “Special”

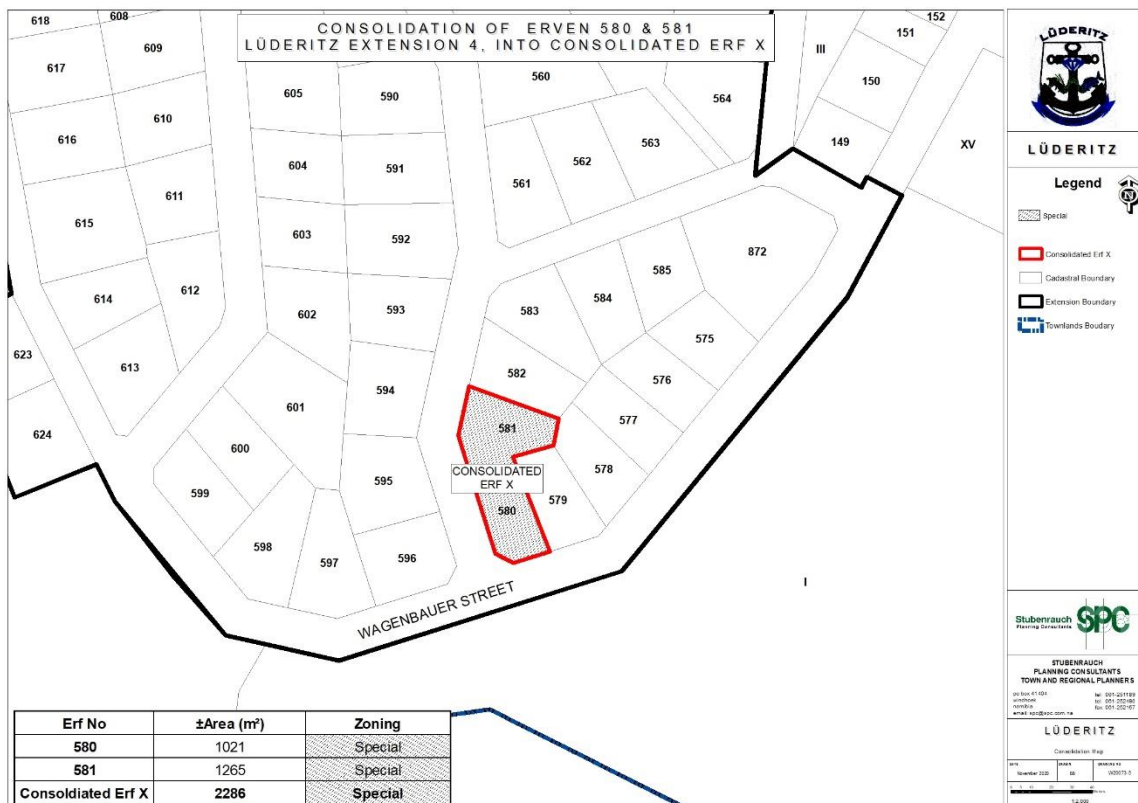


Figure 11: Consolidation of Erven 580 and 581 Lüderitz Extension 4, into Consolidated Erf X

4.4 ENGINEERING SERVICES AND ACCESS PROVISION

A professional engineering is to be appointed by the proponent to design the connection of the erven to the municipal reticulation of the town.

The facility is proposed to obtain access from Wagenbauer Street.

5 PUBLIC PARTICIPATION PROCESS

5.1 PUBLIC PARTICIPATION REQUIREMENTS

In terms of Section 21 of the EIA Regulations a call for open consultation with all I&APs at defined stages of the EIA process is required. This entails participatory consultation with members of the public by providing an opportunity to comment on the proposed project. Public Participation has thus incorporated the requirements of Namibia's legislation, but also takes account of international guidelines, including Southern African Development Community (SADC) guidelines and the Namibian EIA Regulations. Public participation in this project has been undertaken to meet the specific requirements in accordance with the international best practice. Please see **Table 5** below for the activities undertaken as part of the public participation process. The I&APs were given time to comment from **4 March 2021 to 25 March 2021**.

Table 5: Table of Public Participation Activities

ACTIVITY	REMARKS
Placement of site notices/posters in Tsumeb	See Annexure A
Placing advertisements in two newspapers namely the New Era and the Namibian Sun (4 March 2021 and 11 March 2021)	See Annexure B
Written notice to surrounding property owners and Interested and Affected Parties via Email (5 March 2021)	See Annexure C

A public meeting was held in Lüderitz on the **16th of March 2021** at 18h00. The following comments and responses were received during the meeting.

Table 6: Comments and Responses received during public meeting

Attendant	Comment	Respondent	Response
K. Grobler (Neighbour, MFMR)	Thank you for your presentation and I would want to point out that you did not mention much about the operational impacts such as water use and solid waste, the chemicals that are to be used during the cleaning of birds that will be covered in oil and how this waste water/runoff will be treated/handled? In	David Roberts (SANCCOB ¹ VETERINARIAN)	For the waste we will have a contract with existing waste disposal company to remove the effluent and treat it as how hospital waste is handled. The birds that die because of disease will be cremated whilst those that die of natural causes will be afforded a communal burial. Maybe we must liaise with

Attendant	Comment	Respondent	Response
	addition what will happen to the dead birds?		<p>the Lüderitz Town Council to give us a piece of land for these communal burials.</p> <p>In case of oil spills, all waste is put in a container and disposed at a recycling facility where the hydrocarbon is separated from the water using special techniques and bioremediation measures are employed.</p>
Julien Cloete (NamDeb environmentalist)	During the operational phase there will be synergies with current conservation projects. In an ideal world, the polluter pays principle must apply but in reality it only works if we find the culprits, by the time the oil is covering the birds, the ships/ferries have already sailed. So the bird sanctuary will assist the responsible government line ministries with information on how to improve monitoring oil spills at sea.	SPC	Great thank you for your responses, I am sure that the questions on the operational phase impacts have been addressed and mitigation measures proposed. The bird sanctuary will also promote edu-tourism since the monitoring activities will add to the body of knowledge about seabirds and I am sure many tourists would love to visit and adopt some of the birds at the sanctuary. Any further inputs?
Jessica Kemper (Seabird Biologist)	Some other operational concerns we must consider must include, the noise from the birds especially at night, the smell and flies that will come from the sanctuary and we must look at the possibility of recycling the water since desalination of sea water is expensive. What about the spread of diseases like bird flu?	Laura Roberts (SANCCOB ¹ VETERINARIAN wife)	The probability of the centre being a source of infection is low since the disease is usually already outside and all birds in the sanctuary are usually coming to be treated or are injured somewhere outside. For instance, pheral penguins nesting on the nearby island from the sanctuary can be a source of infection.
		David Roberts (SANCCOB ¹ VETERINARIAN)	The open area at the sanctuary will be covered with a shade on top. Bird flu is confined to the avian birds, and the only disease that you

Attendant	Comment	Respondent	Response
			are at risk of getting is diarrhoea if you eat without washing your hands after handling birds so basic hygiene must be adhered to.
K. Grobler (Neighbour, MFMR)	The part of the road going uphill between erf 595 and the two (to be) consolidated ervens 581 & 580 need to be upgraded, as it washes away every time we have good rains (which is a rare event in Lüderitz, but when it does happen, Town Council never bothers to repair the road properly). During heavy rain the entrance to erf 581 has in the past washed away totally and the mud and sand and water from the road tend to rush into erf 580, to the backdoor of the house in erf 580. However, if they do upgrade this part of the road, the contractors need to be cognizant of the fact that the sewerage and water pipes and electrical cables to erf 595 runs underneath the road surface, opposite erf 581.	Julien Cloete (Namdeb environmentalist)	Thanks for the suggestion we will ask Mr. Patrick Hamman who is responsible for that section to address it in the best way possible so the neighbours benefit from this conservation effort as well.
SPC	Thank you for your valuable inputs, it was really a constructive discussion and all points have been recorded. Thanks for your time.	Julius Moongo (Namdeb environmentalist)	Thank you all for attending and from here the project will move forward, it is a great step forward.

5.1.1 Environmental Assessment Phase 2

The second phase of the PPP involved the lodging of the Draft Environmental Scoping Report (DESR) to all registered I&APs for comment. Registered and potential I&APs were informed of the availability of the DESR for public comment *via* a letter/email dated **28 April 2021**. An Executive Summary of the DESR was included in the letters to the registered I&APs. I&APs had until **12 May 2021** to submit comments or raise any issues or concerns they may have with regard to the proposed project. The overall commentary received from the public on the draft report is documented in a comments and responses report document to be included in this final report.

6 ASSESSMENT METHODOLOGY

The purpose of this chapter is to describe the assessment methodology utilized in determining the significance of the construction and operational impacts of the proposed project, and where applicable the possible alternatives, on the biophysical and socio-economic environment.

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, a 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, outlined as follows in **Table 7**.

Table 7: Impact Assessment Criteria

CRITERIA	CATEGORY
Impact	Description of the expected impact
Nature Describe type of effect	Positive: The activity will have a social / economical / environmental benefit. Neutral: The activity will have no effect Negative: The activity will have a social / economical / environmental harmful effect
Extent Describe the scale of the impact	Site Specific: Expanding only as far as the activity itself (onsite) Small: restricted to the site's immediate environment within 1 km of the site (limited) Medium: Within 5 km of the site (local) Large: Beyond 5 km of the site (regional)
Duration Predicts the lifetime of the impact.	Temporary: < 1 year (not including construction) Short-term: 1 – 5 years Medium term: 5 – 15 years Long-term: >15 years (Impact will stop after the operational or running life of the activity, either due to natural course or by human interference) Permanent: Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular means or in a particular time period that the impact can be considered temporary
Intensity Describe the magnitude (scale/size) of the Impact	Zero: Social and/or natural functions and/ or processes remain unaltered Very low: Affects the environment in such a way that natural and/or social functions/processes are not affected

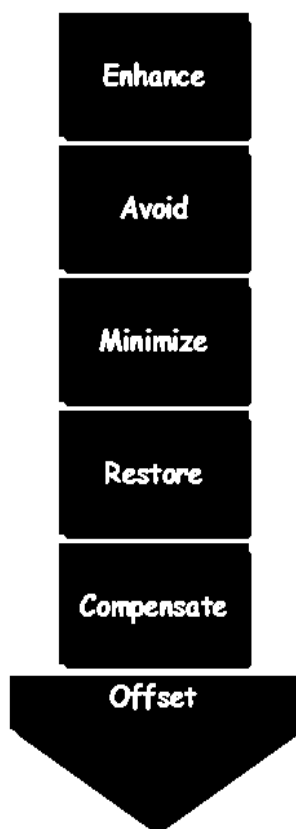
CRITERIA	CATEGORY
	<p>Low: Natural and/or social functions/processes are slightly altered</p> <p>Medium: Natural and/or social functions/processes are notably altered in a modified way</p> <p>High: Natural and/or social functions/processes are severely altered and may temporarily or permanently cease</p>
<p>Probability of occurrence Describe the probability of the Impact <u>actually</u> occurring</p>	<p>Improbable: Not at all likely</p> <p>Probable: Distinctive possibility</p> <p>Highly probable: Most likely to happen</p> <p>Definite: Impact will occur regardless of any prevention measures</p>
<p>Degree of Confidence in predictions State the degree of confidence in predictions based on availability of information and specialist knowledge</p>	<p>Unsure/Low: Little confidence regarding information available (<40%)</p> <p>Probable/Med: Moderate confidence regarding information available (40-80%)</p> <p>Definite/High: Great confidence regarding information available (>80%)</p>
<p>Significance Rating The impact on each component is determined by a combination of the above criteria.</p>	<p>Neutral: A potential concern which was found to have no impact when evaluated</p> <p>Very low: Impacts will be site specific and temporary with no mitigation necessary.</p> <p>Low: The impacts will have a minor influence on the proposed development and/or environment. These impacts require some thought to adjustment of the project design where achievable, or alternative mitigation measures</p> <p>Medium: Impacts will be experienced in the local and surrounding areas for the life span of the development and may result in long term changes. The impact can be lessened or improved by an amendment in the project design or implementation of effective mitigation measures.</p> <p>High: Impacts have a high magnitude and will be experienced regionally for at least the life span of the development or will be irreversible. The impacts could have the no-go proposition on portions of the development in spite of any mitigation measures that could be implemented.</p>

*NOTE: Where applicable, the magnitude of the impact has to be related to the relevant standard (threshold value specified, and source referenced). The magnitude of impact is based on specialist knowledge of that particular field.

For each impact, the EXTENT (spatial scale), MAGNITUDE (size or degree scale) and DURATION (time scale) are described. These criteria are 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 decision as to which combination of alternatives and mitigation measures to apply lies with the proponent, and their acceptance and approval ultimately with the relevant environmental authority.

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

6.1 MITIGATION MEASURES



There is a mitigation hierarchy of actions which can be undertaken to respond to any proposed project or activity (See **Figure 12** below). These cover avoidance, minimization, restoration 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 indicates the following steps.

Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

- not undertaking certain projects or elements that could result in adverse impacts;
- avoiding areas that are environmentally sensitive; and
- putting in place preventative measures to stop adverse impacts from occurring.

Impact minimization: This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- scaling down or relocating the proposal;
- redesigning elements of the project; and
- taking supplementary measures to manage the impacts.

Figure 12: Mitigation Hierarchy

Restoration: This step is taken to improve degraded or removed ecosystems following exposure to impacts that cannot be completely avoided or minimised. Restoration tries to return an area to the

original ecosystem that occurred before impacts. Restoration is frequently needed towards the end of a project's life-cycle but may be possible in some areas during operation.

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- rehabilitation of the affected site or environment, for example, by habitat enhancement;
- restoration of the affected site or environment to its previous state or better; and
- replacement of the same resource values at another location (off-set), for example, by wetland engineering to provide an equivalent area to that lost to drainage or infill.

7 ASSESSMENT OF POTENTIAL IMPACTS AND POSSIBLE MITIGATION MEASURES

7.1 INTRODUCTION

This Chapter describes the potential impacts on the biophysical and socio-economic environments, which may occur due to the proposed activities described in Chapter 4. These include potential impacts, which may arise during the operation of the proposed development (i.e. long-term impacts) as well as the potential construction related impacts (i.e. short to medium term). The assessment of potential impacts will help to inform and confirm the selection of the preferred layouts to be submitted to MEFT: DEAF for consideration. In turn, MEFT: DEAF's decision on the environmental acceptability of the proposed project and the setting of conditions of authorisation (should the project be authorised) will be informed by this chapter, amongst other information, contained in this EA Report.

The baseline and potential impacts that could result from the proposed development are described and assessed with potential mitigation measures recommended. Finally, comment is provided on the potential cumulative impacts which could result should this development, and others like it in the area, be approved.

7.1 PLANNING AND DESIGN PHASE IMPACTS

During the planning and design phase consideration should be given on aspects such as impacts of existing municipal infrastructure and noise impacts.

7.1.1 Existing Service Infrastructure Impacts

The proponent is to appoint a professional engineering to design the connection of the erven to the municipal reticulation of the town. The area is located in close proximity to the existing services and thus connections are not expected to be difficult.

The road located next to the subject erven (Between proposed Consolidated Erf X and Erf 595) is in a poor condition and has been known to be subject to flooding during heavy rain events. As such the use of heavy construction vehicles on this road will be difficult due to the poor condition of the road.

7.1.2 Noise Impacts

The proposed facility is expected to produce noise from the birds housed in the facility. The architectural design of the facility needs to be aligned to ensure that noise impacts are effectively minimised and mitigated.

7.2 CONSTRUCTION PHASE IMPACTS ON THE BIOPHYSICAL ENVIRONMENT

The construction phase impacts are those impacts on the biophysical and socio-economic environment that would occur during the construction phase. These impacts are inherently temporary in duration but may have longer lasting effects.

7.2.1 Flora and Fauna Impacts (Biodiversity)

The subject sites have been developed already and thus do not accommodate any significant flora or fauna on site. It is anticipated that the proposed development area and associated infrastructure (e.g. water, sewage, access route, etc.) would have localised negative implications on the environment and associated fauna and flora should the proposed mitigation measures as outlined in the EMP be enforced.

7.2.2 Surface and Ground Water Impacts

Surface and groundwater impacts may be encountered during the construction and operation phase, especially if development takes place within the rainy season. The risk of contaminating such water sources can be increased by accidental spillage of oils and fuels and any other equipment used during construction. This risk is minimised by the fact that the construction phase will be a short-term activity.

7.2.3 Soil Erosion Impacts

Given the characteristics of the proposed site, soil erosion is likely to be encountered especially if construction will take place during the rainy season, the removal of vegetation will render the soil vulnerable to erosion as they also serve the purpose of keeping the soils compacted.

7.3 CONSTRUCTION PHASE IMPACTS ON THE SOCIO-ECONOMIC ENVIRONMENT

7.3.1 Heritage impacts

No archaeological and heritage resources are expected to be found on the site. The project management should however be made aware of the provisions of the National Heritage Act regarding the prompt reporting of archaeological finds. Section 3.1.2 provides an overview of the archaeological and heritage context of the town and region.

7.3.2 Health, Safety and Security Impacts

Working conditions on site need to ensure that the health and safety of construction workers are ensured at all times. The use of local labour during construction is strongly encouraged so as to reduce the need to migrant workforce. Health and Safety requirements need to comply with the Labour Act No. 11 of 2007, local and international health and safety legislation and standards during construction.

7.3.3 Traffic Impacts

Traffic is expected to increase slightly during the construction phase of the project in areas where construction will take place. A number of trucks and other heavy machinery will be required to deliver, handle and position construction materials as well as to remove spoil material. Not only will the increase in traffic result in associated noise impacts, but it will also impact on the roads in the area.

7.3.4 Noise Impacts

Construction may result in associated noise impacts. These noise impacts will mainly be associated with construction machinery and construction vehicles. The impact is however limited mainly to the construction period only.

7.3.5 Dust and Emission Impacts

Excavation and stockpiles during the construction phase could result in dust impacts, if not managed correctly. Dust could impact negatively on the health of the nearby community if mitigation measures are not implemented. Dust impacts are primarily associated with the construction phase.

7.3.6 Municipal Services

The construction phase will result in additional people on-site, who will require provision of the following services:

- Potable water for domestic (ablution and drinking) and construction purposes.
- Temporary toilets during the construction phase.
- Solid waste management (domestic and construction waste).

These services should be managed in accordance with the EMP to reduce avoid water wastage; litter; solid and human waste pollution at the site.

7.3.7 Storage and Utilisation of Hazardous Substances

Hazardous substances are regarded by the Hazardous Substance Ordinance (No. 14 of 1974) as those substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. During the construction period, the use and storage of these types of hazardous substances, such as shutter oil, curing compounds, types of solvents, primers and adhesives and diesel, on-site could have negative impacts on the surrounding environment if these substances spill and enter the environment.

7.4 OPERATIONAL PHASE IMPACTS

The operational phase impacts are those impacts on the biophysical and socio-economic environment that would occur during the operational phase of the proposed project and are inherently long-term in duration.

7.4.1 Visual Impacts

The subject sites currently accommodate one dwelling each. These will be demolished and replaced with the proposed bird sanctuary facility. The extent of this disturbance will depend on how highly the interested and affected parties valued the initial aesthetic quality of the site. The change in sense of place is not expected to be significant as the proposed land use for the subject erven is in line with the surrounding land uses of the area.

7.4.2 Noise Impacts

The operational activities may result in associated noise impacts which may result from the birds housed within the bird sanctuary. The facility is proposed to be developed in a Residential area and

thus the resulting noise impact is expected to be of Medium significance. Mitigation measures as per the EMP are to be implemented during operation of the facility to ensure that the noise impacts are effectively managed and mitigated.

7.4.3 Emission Impacts

The air quality in the area is considered to be fairly good. Additional emissions are not expected due to the land uses that are intended for the site. Emissions in terms of the smell of birds particularly with regards to waste is expected from the site. Mitigation measures should be implemented as per the EMP to ensure that potential smells generated on site are managed and mitigated.

7.4.4 Waste Generation

Waste generated on site is to be effectively managed. Solid waste is to be disposed of and removed from site as per the Municipal regulations. Hazardous waste is to be disposed of separately at a facility that is equipped to receive and handle such waste.

7.4.5 Wastewater Disposal and Treatment

Wastewater is expected to accumulate on site resulting from the cleaning of oiled birds as well as washing of injured/diseased birds. Chemicals are often used to clean the birds and as such the wastewater is not safe to be disposed of into the environment. Wastewater accumulating on site is to be collected and disposed of at a wastewater treatment facility that is able to receive and treat the water appropriately. This wastewater is not to be disposed directly into the environment as it may result in contamination.

7.4.6 Disposal of deceased birds

The birds which died as a result of illness by disease are to be cremated. Birds that die of natural causes can be buried. An appropriate site for the burials should be confirmed with the Lüderitz Town Council.

7.4.7 Socio-Economic Impacts

The presence of the proposed Bird Sanctuary is expected to contribute to the increase of the seabird population in the area through rescue and rehabilitation. This resultantly can potentially make Lüderitz a biodiversity hotspot for the seabird population. The proposed facility is expected to attract both international and local interest and opportunities, both for tourism and research purposes. This aims to benefit Lüderitz by boosting development not only for the tourism sector but other pillars of the town such as transport and logistics, development of institutional facilities, economic and

commercial incentives which encourage residential development etc. The facility will provide environmental education to the people of Lüderitz and can potentially have a ripple effect for socio-economic development in the long run.

7.5 CUMULATIVE IMPACTS

The cumulative impacts of the proposed developments in regard to the degradation of the project area is very difficult to rate. If all proposed mitigation measures are however in place to minimise the overall impacts, then the cumulative impact can be expected to be rated as **Medium-Low (negative)** for the proposed developments.

7.1 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) is contained in **Annexure E** of this report. The purpose of the EMP is to outline the type and range of mitigation measures that should be implemented during the construction and decommissioning phases of the project to ensure that negative impacts associated with the development are avoided or mitigated.

7.2 SUMMARY OF POTENTIAL IMPACTS

A summary of all the potential impacts from the proposed project assessed above is included in **Table 8**. The **Tables 9 – 11** provide a summary of the mitigation measures proposed for the impacts. While some difference in magnitude of the potential impacts would result from the proposed alternatives this difference was not considered to be significant for any of the potential impacts. As such, the table below applies to all proposed alternatives.

Table 8: Summary of the significance of the potential impacts

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
PLANNING AND DESIGN PHASE										
1. Existing Service Infrastructure	Lüderitz Bird Sanctuary	No mitigation	Local	Medium-Low	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
2. Noise Impacts	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Low	Short term	Medium - low	Probable	Certain	Reversible	Medium - Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
CONSTRUCTION PHASE										
3. Biodiversity (Fauna and Flora)	Lüderitz Bird Sanctuary	No mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very	Short term	Very Low	Probable	Certain	Reversible	Very Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
4. Surface & ground water	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Low	Short term	Medium - low	Probable	Certain	Reversible	Medium - Low (-ve)

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
5. Soil erosion	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Short term	Medium – low	Probable	Certain	Reversible	Medium – low (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
6. Heritage	Lüderitz Bird Sanctuary	No mitigation	Local	Very low	Short term	Very low	Probable	Certain	Irreversible	Very low(-ve)
		Mitigation	Local	Negligible	Short term	Negligible	Probable	Certain	Irreversible	Negligible (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
7. Health, safety and security	Lüderitz Bird Sanctuary	No mitigation	Local	Medium-Low	Short term	Medium-Low	Probable	Certain	Reversible	Medium-Low (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
8. Traffic impacts	Lüderitz Bird Sanctuary	No mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very low	Short term	Very low	Probable	Certain	Reversible	Very low
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
9. Noise impacts	Lüderitz Bird Sanctuary	No mitigation	Local	Medium - Low	Short term	Medium - low	Probable	Certain	Reversible	Medium - Low (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
10. Emissions impacts	Lüderitz Bird Sanctuary	No mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very Low	Short term	Very Low	Probable	Certain	Reversible	Very Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
11. Municipal services	Lüderitz Bird Sanctuary	No mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very low	Short term	Very low	Probable	Certain	Reversible	Very low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
12. Waste	Lüderitz Bird Sanctuary	No mitigation	Local	Low	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Very low	Short term	Very Low	Probable	Certain	Reversible	low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
13. Hazardous Substances	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
OPERATIONAL PHASE										
1. Visual & sense of place	Lüderitz Bird Sanctuary	No mitigation	Local	Medium - Low	Medium term	Medium-Low	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Low	Medium term	Low	Probable	Certain	Reversible	Medium-Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
2. Noise	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Medium term	Medium	Probable	Certain	Reversible	Medium-Low (-ve)
		Mitigation	Local	Medium - Low	Medium term	Medium - Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
3. Emissions	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Medium term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Medium-Low	Medium term	Medium - Low	Probable	Certain	Reversible	Medium-Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
4. Waste Generation	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Medium term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Medium-Low	Medium term	Medium - Low	Probable	Certain	Reversible	Medium-Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
5. Wastewater disposal and treatment	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Medium term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Medium-Low	Medium term	Medium - Low	Probable	Certain	Reversible	Medium-Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
6. Disposal of deceased birds	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Medium term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Medium-Low	Medium term	Medium - Low	Probable	Certain	Reversible	Medium-Low (-ve)
	No go	No mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
7. Socio-Economic impact	Lüderitz Bird Sanctuary	No mitigation	Local	Medium	Long term	Medium (+)	Probable	Probable	Reversible	Medium (+)

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	Significance	Probability	Confidence	Reversibility	Cumulative impact
		Mitigation	Local	Medium	Long term	Medium (+)	Probable	Probable	Reversible	Medium (+)
	No go	No mitigation	Local	Neutral	Long term	Neutral	Probable	Probable	Reversible	Neutral
		Mitigation	Local	Neutral	Long term	Neutral	Probable	Probable	Reversible	Neutral

Table 9: Proposed mitigation measures for the planning and design phase

PLANNING AND DESIGN PHASE	
Impact	Mitigation Measures
Existing Service Infrastructure	<ul style="list-style-type: none"> It is recommended that the subject site should be connected to the existing services. The proponent is to appoint an engineer to connect the erven to the existing services.
Noise Impacts	<ul style="list-style-type: none"> Ensure that the architectural design of the facility is aligned to ensure the reduction of noise generated from the facility. The use of hoarding during construction of the buildings to act as noise protector Enclosures and pools within the facility are to be situated furthest away from the houses.

Table 10: Proposed mitigation measures for the construction phase

CONSTRUCTION PHASE IMPACTS	
Impact	Mitigation Measures
Flora and Fauna	<ul style="list-style-type: none"> • Adapt the proposed developments to the local environment – e.g. small adjustments to the site layout could avoid potential features such as water bodies and vegetation. • Prevent the destruction of protected and endemic plant species. • Prevent contractors from collecting wood, veld food, etc. during the construction phase. • Recommend the planting of local indigenous species of flora as part of the landscaping as these species would require less maintenance than exotic species. • Prevent the introduction of potentially invasive alien ornamental plant species such as; <i>Lantana</i>, <i>Opuntia</i>, <i>Prosopis</i>, <i>Tecoma</i>, etc.; as part of the landscaping as these species could infest the area further over time. • Protected trees and plants are not to be removed without a valid permit from the Ministry of Agriculture, Water and Forestry.
Surface and Ground Water Impacts	<ul style="list-style-type: none"> • No dumping of waste products of any kind in or in close proximity to surface water bodies. • Heavy construction vehicles should be kept out of any surface water bodies and the movement of construction vehicles should be limited where possible to the existing roads and tracks. • Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. • Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles. • Contaminated runoff from the construction sites should be prevented from entering the surface and ground water bodies. • All materials on the construction site should be properly stored. • Disposal of waste from the sites should be properly managed and taken to the designated landfill site. • Construction workers should be given ablution facilities at the construction sites that are located at least 30 m away from any surface water and regularly serviced.

CONSTRUCTION PHASE IMPACTS	
Impact	Mitigation Measures
	<ul style="list-style-type: none"> • Washing of personnel or any equipment should not be allowed on site. Should it be necessary to wash construction equipment these should be done at an area properly suited and prepared to receive and contain polluted waters.
Soil Erosion	<ul style="list-style-type: none"> • It is recommended that construction takes place outside of the rainy season in order to limit potential flooding and the runoff of loose soil causing further erosion. • Appropriate erosion control structures must be put in place where soil may be prone to erosion. • Checks must be carried out at regular intervals to identify areas where erosion is occurring. • Appropriate remedial actions are to be undertaken wherever erosion is evident.
Heritage	<ul style="list-style-type: none"> • The project management should be made aware of the provisions of the National Heritage Act regarding the prompt reporting of archaeological finds. • In the event of such finds, construction must stop, and the project management or contractors should notify the National Heritage Council of Namibia immediately.
Health, Safety and Security	<ul style="list-style-type: none"> • Construction personnel should not overnight at the site, except the security personnel. • Ensure that all construction personnel are properly trained depending on the nature of their work. • Provide for a first aid kit and a properly trained person to apply first aid when necessary. • Restrict unauthorised access to the site and implement access control measures. • Clearly demarcate the construction site boundaries along with signage of “no unauthorised access”. • Clearly demarcate dangerous areas and no-go areas on site. • Staff and visitors to the site must be fully aware of all health and safety measures and emergency procedures. • The contractor must comply with all applicable occupational health and safety requirements. • The workforce should be provided with all necessary Personal Protective Equipment where appropriate.

CONSTRUCTION PHASE IMPACTS	
Impact	Mitigation Measures
Traffic	<ul style="list-style-type: none"> • Limit and control the number of access points to the site. • Ensure that road junctions have good sightlines. • Construction vehicles' need to be in a road worthy condition and maintained throughout the construction phase. • Transport the materials in the least number of trips as possible. • Adhere to the speed limit. • Implement traffic control measures where necessary.
Noise	<ul style="list-style-type: none"> • No amplified music should be allowed on site. • Inform immediate neighbours of construction activities to commence prior to commencing and provide for continuous communication between the neighbours and contractor. • Limit construction times to acceptable daylight hours. • Install technology such as silencers on construction machinery. • Do not allow the use of horns as a general communication tool but use it only where necessary as a safety measure.
Dust and Emission	<ul style="list-style-type: none"> • It is recommended that dust suppressants such as Dustex be applied to all the construction clearing activities to ensure at least 50% control efficiency on all the unpaved roads and reduce water usage. • Construction vehicles to only use designated roads. • During high wind conditions the contractor must make the decision to cease works until the wind has calmed down. • Cover any stockpiles with plastic to minimise windblown dust. • Provide workers with dust masks where necessary.

CONSTRUCTION PHASE IMPACTS	
Impact	Mitigation Measures
Waste	<ul style="list-style-type: none"> • It is recommended that waste from the temporary toilets be disposed of at an approved Wastewater Treatment Works. • A sufficient number of waste bins should be placed around the site for the soft refuse. • A sufficient number of skip containers for the heavy waste and rubble should be provided for around the site. • Solid waste will be collected and disposed of at an appropriate local land fill or an alternative approved site, in consultation with the local authority.
Hazardous Substances	<ul style="list-style-type: none"> • Storage of the hazardous substances in a bunded area, with a volume of 120 % of the largest single storage container or 25 % of the total storage containers whichever is greater. • Refuel vehicles in designated areas that have a protective surface covering and utilise drip trays for stationary plant.

Table 11: Proposed mitigation measures for the operational phase

OPERATIONAL PHASE IMPACTS	
Impact	Mitigation Measures
Visual and Sense of Place	<ul style="list-style-type: none"> • It is recommended that more 'green' technologies be implemented within the architectural designs and building materials of the development where possible in order to minimise the visual prominence of such a development within the more natural surrounding landscape. • Natural colours and building materials such as wood and stone should be incorporated as well as the use of indigenous vegetation in order to help beautify the development. • Visual pollutants can further be prevented through mitigations (i.e. keep existing trees, introduce tall indigenous trees; keep structures unpainted and minimizing large advertising billboards).
Noise	<ul style="list-style-type: none"> • Use of effective noise barriers in areas where significant noise is expected to be generated on site. • The feeding of birds to be conducted at certain times i.e. not during the evening or early morning when it is likely to disturb the surrounding residents.
Emissions	<ul style="list-style-type: none"> • Consider tarring of the internal road network. • Manage activities that generate emissions.
Waste	<ul style="list-style-type: none"> • Solid waste will be collected and disposed of at an appropriate local land fill or an alternative approved site, in consultation with the local authority. • Hazardous waste is to be disposed of at an approved facility that is able to handle and received such waste.
Wastewater Disposal and Treatment	<ul style="list-style-type: none"> • It is recommended that wastewater generated on site be disposed of and treated at an approved Wastewater Treatment Works.
Disposal of deceased birds	<ul style="list-style-type: none"> • Diseased birds are to be cremated. • Birds that die of natural causes can be buried. • An appropriate site for the burials should be confirmed with the Lüderitz Town Council.
Socio- Economic Impacts	<ul style="list-style-type: none"> • No specific mitigation measures are required, only that the local community be consulted in terms of possible job creation opportunities and must be given first priority if unspecialised job vacancies are available.

8 CONCLUSION

The purpose of this Chapter is to briefly summarise and conclude the DESR and describe the way forward.

8.1 PLANNING AND DESIGN PHASE IMPACTS

With reference to **Table 8**, none of the negative planning and design phase impacts were deemed to have a high significant impact on the environment. The construction impacts were assessed to a **Medium to Low (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

8.1 CONSTRUCTION PHASE IMPACTS

With reference to **Table 8**, none of the negative construction phase impacts were deemed to have a high significant impact on the environment. The construction impacts were assessed to a **Medium to Low (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

8.2 OPERATIONAL PHASE

With reference to **Table 8**, none of the negative operational phase impacts were deemed to have a high significance impact on the environment. The operational impacts were assessed to a **Medium (negative)** significance, without mitigation measures. With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction phase impacts is likely to be reduced to a **Low (negative)**.

8.3 LEVEL OF CONFIDENCE IN ASSESSMENT

With reference to the information available at the project planning cycle, the confidence in the environmental assessment undertaken is regarded as being acceptable for the decision-making, specifically in terms of the environmental impacts and risks. The Environmental Assessment Practitioner believes that the information contained within this FESR is adequate to allow MEFT: DEAF to be able to determine the environmental acceptability of the proposed project.

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

to further assessment. If this was to occur, an amendment to the Environmental Authorisation may be required in which case the prescribed process would be followed.

8.4 MITIGATION MEASURES

With the implementation of the recommended mitigation measures in Chapter 7 as well as in the EMP, the significance of the construction and operational phase impacts is likely to be reduced to a **Medium - Low (negative)**. **It is further extremely important to include an Environmental Control Officer (ECO) on site during the construction phase of the proposed project to ensure that all the mitigation measures discussed in this report and the EMP are enforced.**

It is noted that where appropriate, these mitigation measures and any others identified by MEFT: DEAF could be enforced as Conditions of Approval in the Environmental Authorisation, should MEFT: DEAF issue a positive Environmental Authorisation.

8.5 OPINION WITH RESPECT TO THE ENVIRONMENTAL AUTHORISATION

Regulation 15(j) of the EMA, requires *that the EAP include an opinion as to whether the listed activity must be authorised and if the opinion is that it must be authorised, any condition that must be made in respect of that authorisation.*

It is recommended that this project be authorised because should the development not proceed the socio-economic benefits among others that could result from the project would not be realized. None of the positive or negative impacts from the proposed development would be realized.

The “no go” alternative was thus deemed to have a **High (negative)** impact, as all the benefits resulting from the development would not be realized. The significance of negative impacts can be reduced with effective and appropriate mitigation provided in this report and the EMP. If authorised, the implementation of the EMP should be included as a condition of approval.

8.6 WAY FORWARD

The FESR is herewith submitted to MEFT: DEAF for consideration and decision making. If MEFT: DEAF approves, or requests additional information / studies all registered I&APs and stakeholders will be kept informed of progress throughout the assessment process.

9 REFERENCES

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