

The Environmental Impact Assessment Study for establishing Agricultural Projects within the Oranjemund Constituency

Report No: 201219A
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Document Status

Proponent	Oranjemund Constituency Office
Title of the proposed Activity	The Environmental Impact Assessment Study for establishing Agricultural Projects within the Oranjemund Constituency
Activity Type	Establishment of Agricultural Projects
Location of the Activity	<p>The Agricultural Project will be located along the Orange River and between Oranjemund and Rosh Pinah at four various areas:</p> <ul style="list-style-type: none"> • Farm 212 Hohenfels GPS Coordinates: 16.81000000 and 29.20750000 • Lucerne A and Lucerne B • GPS Coordinates: 16.72416667 and 28.46027778 • Upper portion closer to Plot B of Debaras 2 GPS Coordinates: 17.32388889 and 29.20750000 • Rosh Pinah GPS Coordinates: 17.01055556 and 28.54805556
Competent Authority	Environmental Commission (Ministry of Environment and Tourism)
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PURPOSE OF THIS DOCUMENT

This document, Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) for the establishment of an Agricultural Project for Oranjemund Constituency Office presents the findings of the impact assessment with respect to issues and concerns raised during the scoping phase of the EIA. The findings are presented in the following reports:

- The Environmental Impact Assessment (this report), with several appendices, including the Issues and Response Report (indicating to stakeholders where their issues have been captured)
- Environmental Management Plan (also part of this report as Annexure A).

Appreciation for participation by stakeholders

Stakeholders were invited to partake in the consultation process. Various media platforms were used to engage the public on the proposed activities as per the Background Information Document (BID) attached on the annexes. Newspaper advertisements were placed in two local daily English newspapers and notice boards were placed around community notice board in Oranjemund and Rosh Pinah areas. In addition, radio announcements were made via the local languages (NBC Oshiwambo, National Radio and Afrikaans NBC Radio Stations) inviting community members to a Public Consultation meeting. Social Media (Facebook) was also used to engage the stakeholders. Project Background Information Documents were available from the Henties Bay Community Library. The BID was also available from the KPM Offices in Windhoek (the consultant) on request via e-mail.

PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL SCOPING REPORT

A period of three weeks (from 29th of November to 21st December 2019) was dedicated to receiving comments and inputs from the public on the proposed Agricultural Project for Oranjemund Constituency Office in //Kharas Region. Copies of the BID were couriered to all registered Interested and or Affected Parties (I&APs) especially the farming

community in //Kharas Region and all other registered stakeholders. In addition, the availability of the draft EIA Report was announced in the media as well as by way of letters addressed to registered key stakeholders.

OPPORTUNITIES FOR PUBLIC REVIEW

The following methods of public review of the Environmental Impact Assessment Report were available:

- Completing the comment sheet enclosed with the reports;
- Additional written submissions;
- Comment by email or telephone;
- Comment during the public participation meeting at the Rosh Pinah Community Hall (meeting held on Friday, 20th December 2019 at 10h30).

FINAL ENVIRONMENTAL IMPACT REPORT

Comments received from stakeholders on the draft findings during the review period were assessed and are now included in this Final EIA Report.

EXECUTIVE SUMMARY

This Environmental Impact Assessment document puts forward the identified environmental impacts associated with the proposed Agricultural Project for Oranjemund Constituency Office located between the Oranjemund and Rosh Pinah areas and along the Orange River.

The need for this development arose out of the long-term sustainability plan for the Oranjemund and Rosh Pinah areas in terms of how the two areas will be sustained after the mining activities. The Oranjemund Constituency Office has the mandate to drive constituency development at the regional level.

The environmental impacts of the proposed Agricultural Project were identified through various processes such as public/residents engagement, site visits, and engagements with the Oranjemund Constituency Councillor and his officials. In addition, talks were also held with NAMDEB Environmental Management section.

The Impacts identified were assessed making use of the following criteria:

- Magnitude of impact
- Direction of impact
- Extent of impact
- Duration of impact
- Frequency of impact manifestation
- Reversibility of impact
- Likelihood of impact occurring

Based on the assessment criteria, loss of vegetation due to clearing of the site, waste management and water management were amongst the highest impacts identified. For all environmental impacts identified, an associated mitigation plan has been developed and these are captured in the Environmental Management Plan (EMP).

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Acronyms and Abbreviations

Abbreviations	Meaning
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ER	Employee Representative
I&AP	Interested and Affected Parties
KPM EC	KPM Environmental Consulting
NAMDEB	Namibia Diamond Corporation (Pty) Limited
OCO	Oranjemund Constituency Office
OTC	Oranjemund Town Council
TPS	Town Planning Scheme

GLOSSARY OF TERMS

- **Assessment** - The process of collecting, organizing, analyzing, interpreting and communicating information relevant to decision making.
- **Competent Authority** - means a body or person that has the legally delegated or invested authority, capacity, or power to perform a designated function, as promulgated in the r the Local Authority Act (23 of 1992).
- **Cumulative Impacts** - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
- **Evaluation** – means the process of ascertaining the relative importance or significance of information, the light of people’s values, preference and judgments in order to make a decision.
- **Environment** - As defined in the Environmental Assessment Policy and Environmental Management Act - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.
- **Environmental Impact Assessment (EIA)** - process of assessment of the effects of a development on the environment
- **Environmental Management Plan (EMP)** - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

- **Interested and Affected Party (I&AP)** - any person, group of persons or organization interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
- **Mitigate** - The implementation of practical measures to reduce adverse impacts.
- **Proponent (applicant)** - Any person who has submitted or intends to submit an application for an authorization, as legislated by the National Environmental Assessment Policy, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.
- **Public** - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.
- **Scoping Process** - process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.
- **Significant effect/Impact** - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment
- **Stakeholders** - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all Interested and Affected Parties (I&APs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

- **Stakeholder engagement** - The process of engagement between stakeholders (the proponent, authorities and I & APs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term “public participation”.

1. INTRODUCTION

1.1. Background

Oranjemund Constituency is one of the seven constituencies of the //Kharas Region. The constituency is headed by a Constituency Councillor who is also a member of //Kharas Regional Council Management Committee. The constituency offices are located at Oranjemund within the Oranjemund Town Council in Oranjemund. Oranjemund Constituency covers Oranjemund and Rosh Pinah areas. The Constituency has several areas rich in minerals such as Namdeb Diamond area within the Oranjemund area as well as Zinc within the Rosh Pinah area.

At the regional level, The //Kharas Region has, according to the Fourth Delimitation Commission (2013), a surface area of 161 325 km² and it is the largest region in Namibia. To the north, the region borders onto the Hardap Region, to the east along the 20 E Longitude line and to the South along the northern banks of the Orange River, the region shares common international borders with South Africa. The Atlantic Ocean forms the western border.

The //Kharas Region has an estimated population of 76000 (CBS, 2011), the average population density being 0.5 persons per square kilometre. The predominant languages in the region are Nama and Damara, Afrikaans, although OtjiHerero and Oshiwambo are also commonly spoken.

As part of its mandate, the Oranjemund Constituency Office intends to establish agricultural projects within the Oranjemund mining areas as well as in the Rosh Pinah areas that has been already mined. The purpose of the agricultural projects for the Constituency is to sustain the two areas after the mining activities both for Namdeb in Oranjemund and for Skorpion Zinc mine in Rosh Pinah has ended. The Oranjemund Constituency Office has identified several area in Oranjemund and along the Orange River where the initial projects will commence. The identified areas are:

- Farm 212 Hohenfels

- Lucern A & Lucern B
- Upper portion closer to Plot B Daberas 2 and
- Open area of Rosh Pinah (southern part of Rosh Pinah town along the C13 national road network).

Purpose of EIA

The EIA study serves to determine, analyze and present the environmental impacts (positive and negative) of the proposed township agricultural development and associated infrastructure, formulate remedial measures to mitigate the negative impacts and plan in such a way that enables a rational decision to be made regarding the implementation and management of the proposed project. The EIA further contributes to the reduction or mitigation of adverse impacts by generating a number of project alternatives for the proposed developments. In general, the purpose of the EIA is to anticipate and prevent, minimise and/or manage, potential significant negative impacts on the proposed development that may:

- Cost too much money to rectify in future,
- Pose risk to lives, livelihood or health or current and future generations,
- Help to seek opportunities to optimise potential benefits of development.

The Oranjemund Constituency Office, as a Local Government is committed to enhance positive biophysical and social environmental impacts of the proposed agricultural project while mitigating negative impacts of the project.

Therefore, this EIA Report has been prepared with a view to comply with Namibia's Environmental Assessment Policy of 1995, the Environmental Management Act No 7 of 2007 (Section 27(2)(a), Government Notice No 29 of 2012 for Listed Activities and EIA Regulations. The EIA is being undertaken by the KPM Environmental Consulting as appointed by the Oranjemund Constituency Office.

1.2. Terms of Reference

The terms of reference are inferred from the requirements of the Environment Impact Assessment Regulations (Government Notice No 30 of 2012), to enable an application for ECC with the Environmental Commissioner, as required by Section 27(3) of the Environment Management Act (No 7 of 2007). The objectives of this study is to apply for an ECC as per the requirements of the Environmental Management Act (Act No 7 of 2007).

1.3. Layout of Report

The outline of this report is presented below:

- **Executive Summary:** Provides an overview of the main findings of the study.
- **Section 1:** Provides the introduction which includes background to study, terms of reference, purpose of EIA, limitations of the study and structure of the report.
- **Section 2:** Gives an overview of the of the study area.
- **Section 3:** Provides an overview of the key legislation having an implication of activities associated with the proposed Agricultural Project.
- **Section 4:** Describe the type of project, the layout plan and activities that will be undertaken to provide the services on site.
- **Section 5:** This summarises the framework for environmental management in Namibia, the EIA process and methodology followed as part of the Scoping Study.
- **Section 6:** Provides a description of the environment.
- **Section 7:** Describe the public consultation process followed as part of the study.
- **Section 8:** This section describes and assess the potential impacts of the proposed development and mitigation measures relevant to construction and operation of agricultural infrsutructures.
- **Section 9:** Conclusions and recommendations are put forward in this section.
- **Section 10:** Provides management plan for the impacts the project will have; Roles and responsibilities of stakeholders involved in the implementation of the environmental plan during construction and operation is also described.

- **Section 10:** provide a list of documents reviewed.

2. LOCATION OF SITES

Oranjemund is a diamond mining town of 4,000 inhabitants situated in the extreme southwest of Namibia, on the northern bank of the Orange River mouth at the border to South Africa. The proposed agricultural projects are located within the Oranjemund and Rosh Pinah areas.

Farm 212 Hohenfels

Farm 212 Hohenfels is still earmarked for exploration activities by Namdeb and also partly falls on the aquifer that supplies Oranjemund with water. Namdeb have indicated that some land can be made available for agricultural use, some of which has been used already for agricultural in the past.

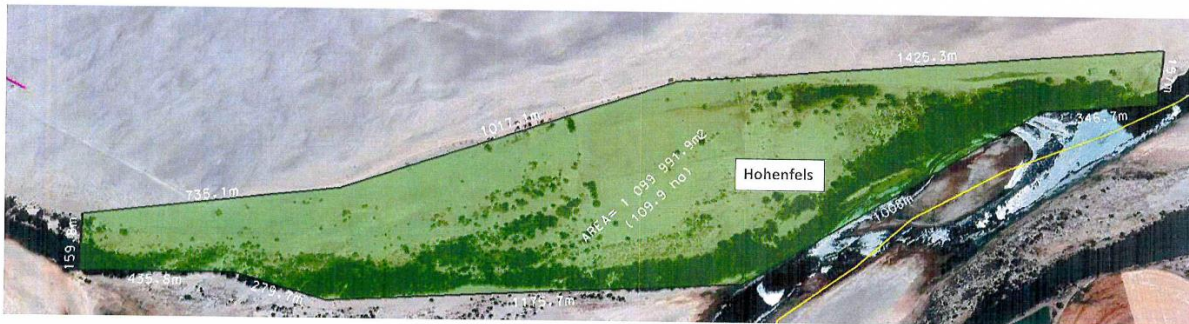


Figure 1 shows Farm 212 Hohenfels

Lucern A & Lucern B

Lucerne A and Lucerne B are among areas that has not been earmarked for future exploration and may be considered for use. Below are the layout of the proposed areas for Lucern A and Lucern B:

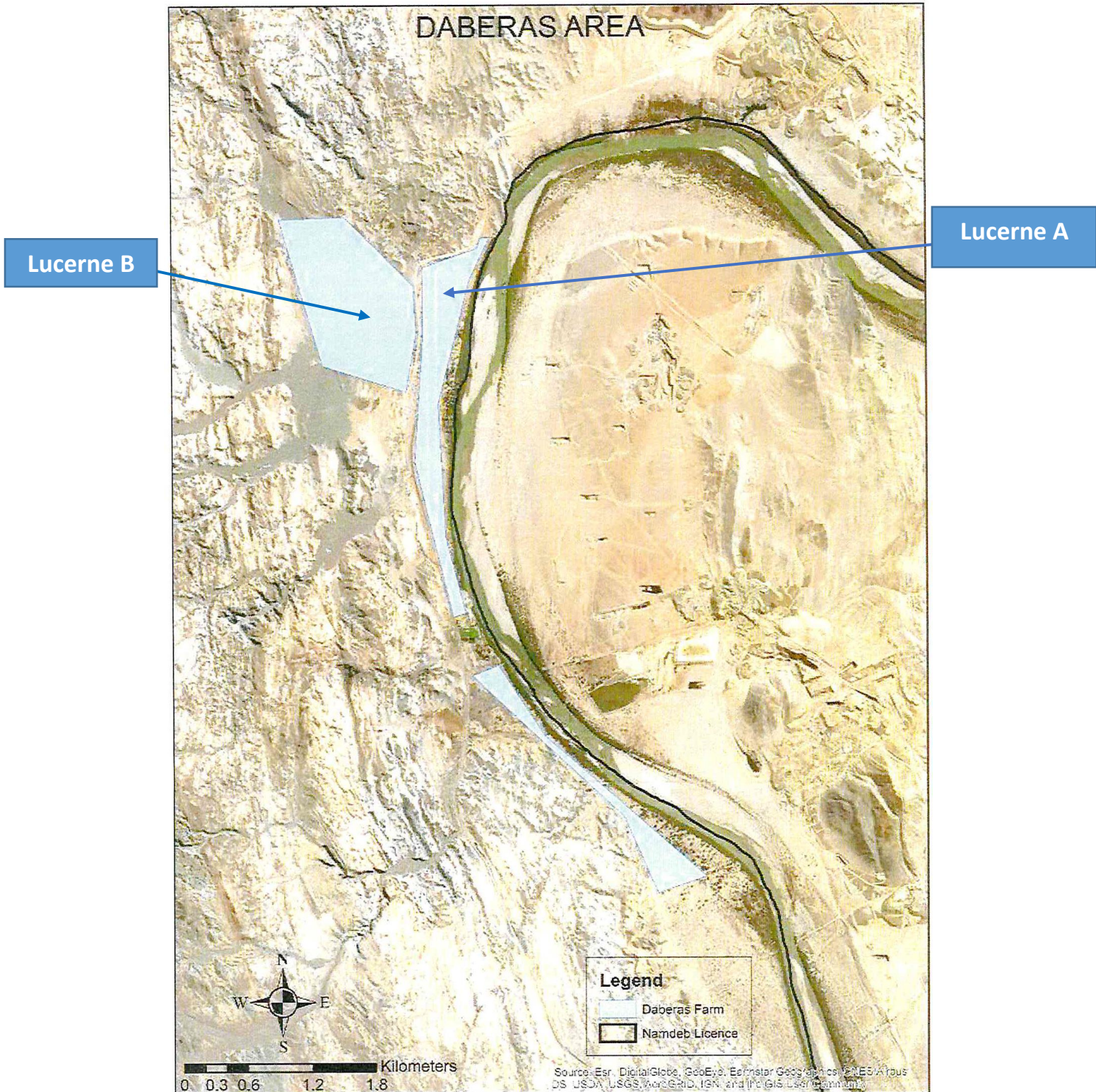


Figure 2 shows Lucerne A and B that are earmarked for Agricultural development



Figure 3 shows an up-close layout of Lucerne B that has been earmarked for agricultural development

Upper portion closer to Plot B Daberas 2

According to a response from Namdeb to Oranjemund Constituency Office Plot B Daberas and Plot B Daberas 2 are earmarked for current and future exploration activities and are therefore not available for consideration for the proposed agricultural developments. Only the upper portion closer to Plot B Daberas 2 is available for possible agricultural development. The picture below shows an upper portion of Plot B Daberas 2 that has been authorized by Namdeb for agricultural development.

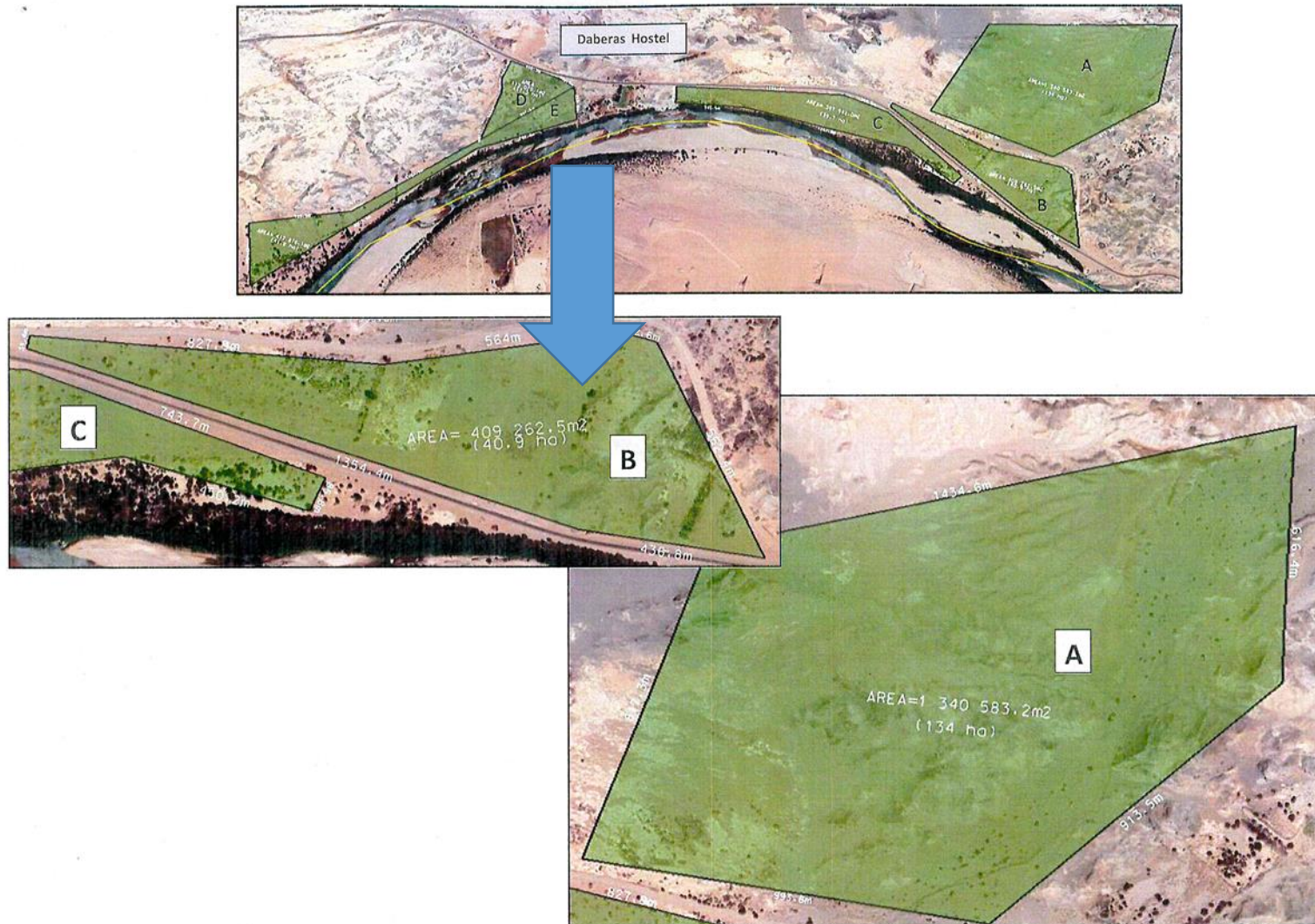


Figure 4 shows an upper part of Post B Daberas 2

Open area of Rosh Pinah (southern part of Rosh Pinah town along the C13 national road network).

In Rosh Pinah, the Oranjemund Constituency Office has identified an area outside of Rosh Pinah town towards the Tsau //Khaeb (Sperrgebiet) National Park and left of the C13 national road network. The identified area is owned by the state and can be used for agricultural development. Towards the north-east of the identified area and again on the eastern part of the site is private land which is currently used as commercial land for farming purpose.

The identified area for Rosh Pinah is slightly far from the Orange River and thus it is proposed to drill boreholes and provide borehole water for agricultural purpose. From the field exploration by the environmental team together with the Constituency Councillor, no major environmental issues were noted. However, the team came across some graves which according to the nearby farmers are for the farming communities who lived there many years ago.



Figure 5: family grave yard observed near by the proposed site in Rosh Pinah

3. POLICY AND LEGAL FRAMEWORK

3.1. Applicable legislation

Namibia has a range of policies, acts and regulations which provide strategic direction and control over most activities that could have an impact on the environment as a whole. These policies and acts, both promulgated and in draft form, were identified in each of the EIAs and the proposed agricultural project has been developed in compliance with these requirements. Table 1 provides a summary of the Namibian policies and laws and indicates how the requirements have been applied, or are still to be applied.

Legislation	Relevant Requirement	Implications for the Proposed agricultural projects
Constitution of the Republic of Namibia, 1990	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: <ul style="list-style-type: none"> ✓ Guarding against overutilization of biological natural resources, ✓ Limiting over-exploitation of non-renewable resources, ✓ Ensuring ecosystem functionality, ✓ Maintain biological diversity. 	Through implementation of the environment management plan, the proponent shall be advocating for sound environmental management as set out in the Constitution.
Environmental Management Act (No 7 of 2007) and Namibia's Environmental Assessment Policy (1995)	Schedule 1: Screening list of policies/plans/programme/ project subject to full Environmental Assessment. "The rezoning of land from use for nature conservation or zoned open space to any other land use". (Ministry of Environment and Tourism (MET), Directorate of Environmental)	An Environmental Impact Assessment is compulsory for listed activities, of which this project is.
Draft Pollution Control and Waste Management Bill (to repeal the APPO, 11 of 1976; the Hazardous Substances Ordinance, 14 of 1974; and S.21 of the	The Bill deals with the protection of particular species, resources and components of the environment. Aspects which would be relevant to the OCO proposed agricultural projects include: <ul style="list-style-type: none"> • Air pollution; • Water pollution; • Integrated pollution control; • Noise, dust and odour; • Waste management; • Hazardous substances; • Accident prevention. 	All the significant aspects as per the assessment process will be address in the EMP.

Legislation	Relevant Requirement	Implications for the Proposed agricultural projects
Water Act of 1956)		
Water Resources Management Act, 2013 (Act No. 11 of 2013)	The objective of the Act is to ensure that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with or conducive to fundamental principles set out in section 3 of the Act.	Licenses will have to be applied for in terms of this Act to: <ul style="list-style-type: none"> • Abstract and use water, including brackish or marine water for irrigation purpose; • Discharge effluent to the sea, a waste water treatment plant or any other effluent disposal site (this could be a combined license with the abstraction license); • Drill new boreholes for any other purpose other than for groundwater exploration. <p>The Minister may prescribe minimum standards for effluent quality.</p>
Diamond Act, 13 of 1999	Section 52 deals with Restricted Areas, where approved persons must enter with the required permit. Restricted Areas are declared as such by the Minister in the Government Gazette, and include areas where on- or offshore mining or related activities take place.	The Diamond Regulations in terms of the Act make provision for security check procedures for persons wishing to enter Restricted Areas. Some parts of Oranjemund Namdeb areas might require a permit to enter.
Soil Conservation Act 76 of 1969	Prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water sources. (Ministry of Environment and Tourism).	Removal of vegetation cover is to be avoided and minimized at all costs.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development. (National Heritage Council of Namibia)	Immediately inform the National Heritage Council of Namibia should any archaeological material e.g. graves be found during the construction phase. The site should be cleared for archaeological potential before construction or other usage may commence.
Labour Act (No 11 of 2007)	135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users of machinery in connection with the structure of such buildings of otherwise	The Act specifies the measures to be taken to secure the safety and the preservation of the health and welfare of employees at work.

Legislation	Relevant Requirement	Implications for the Proposed agricultural projects
	in order to prevent or extinguish fires, and to ensure the safety in the event of fire, of persons in such building;" (Ministry of Labour and Social Welfare).	
Convention on Biological Diversity (CBD)	Article 14 requires each contracting party to carry out environmental impact assessments (EIAs) of projects that are likely to adversely affect biological diversity. It further requires that the EIA be aimed at avoiding or minimizing such effects and, where appropriate, allow for public participation in the assessment.	The proposed sites lie in the areas that has been mined and thus some of these areas has already been disturbed by the mining activities. Extensive public participation has also taken place.
Convention to combat Desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	This is a general requirement to be considered in all projects.
Parks and Wildlife Management Bill of 2001 (to replace the Nature Conservation Ordinance, 4 of 1975)	The Bill provides for the declaration of protected areas e.g. the Sperrgebiet National Park.	All activities within the Sperrgebiet National Park will be subject to the provisions of this Act when it comes into force. This factor will be a major consideration in the drafting of the EMPs.
Protocol on Shared Watercourse Systems in the SADC Region, 1995	This Protocol is based on the conviction of "the need for coordinated and environmentally sound development of the resources of shared watercourse systems in the SADC region in order to support sustainable socio-economic development".	This Protocol is relevant because Oranjemund Constituency Office plans to abstract water from the Orange River.
Sewerage and Drainage Regulations (amendments) Local authorities Act, Section 23 of 1992	Affords the prevention of pollution and environmental damage caused by the improper construction of sewerage and water pipelines in drainage lines.	Provides guidelines for the proper construction of pipelines in drainage lines.
Road Ordinance 1972 (Ordinance 17 Of 1972)	<ul style="list-style-type: none"> • Width of proclaimed roads and road reserve boundaries (S3.1) Control of traffic on urban trunk and main roads (S27.1) 	The limitations applicable on RA proclaimed roads should inform the proposed layout and zonings of the agricultural projects where applicable.

Legislation	Relevant Requirement	Implications for the Proposed agricultural projects
	<ul style="list-style-type: none"> • Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1) • Infringements and obstructions on and interference with proclaimed roads. (S37.1) • Distance from proclaimed roads at which fences are erected (S38) 	

Table 1: Namibia's Environmental Policy and Legal Context

3.2. Listed activities of terms of EMA (2 of 2007)

The Environmental Management Act 7 of 2007 is the primary custodian of the environment and therefore focusses on the management of environmental resources and accordingly, identifies activities that require authorization prior to commencement. The proposed facility entails a number of listed activities as listed in Table 2.

Activity	Description of Activity	Activity Triggers
Section 4. Clearance of vegetation	Clearing of vegetation to pave way for development.	Bushes and trees (grass and succulents) would be cleared to pave way for installation of agricultural infrastructure.
Section 10.2 Construction of roads	Construction of access roads.	Construction of roads forms part of agricultural infrastructure. The proposed agricultural development will require development of new roads.
Section 10.1 (a), storm water	Construction of water reticulation and sewerage pipelines.	Construction of storm water system which forms part of roads constructions forms part of the required infrastructure.
Section 10.1 (a), water reticulation	Construction of water reticulation and sewerage pipelines.	Construction of water reticulation forms part of municipal services infrastructure.
Section 10.1 (a), sewerage lines	Construction of water reticulation and sewerage pipelines.	Construction of sewerage lines forms part of the required agricultural infrastructure.
Section 1 (b), Electricity	Electricity supply to the development.	Installation of electricity system, forms part of the required agricultural infrastructure.

Table 2: Legal Environmental Framework of the Project.

4. DESCRIPTION OF PROPOSED PROJECT

4.1. Ownership of the land

The proposed areas where Oranjemund Constituency Office intends to establish agricultural projects are all within the constituency and the land where all these projects will be is on state land. The constituency office is the custodian of the state land and thus authorisation can also be requested from the current user i.e Namdeb in the case of Oranjemund where most identified sites were used for mining purpose. In the case for Rosh Pinah, the identified site is idling and no current uses have been observed.

As mentioned before, assessment will look at the impacts of the construction and operations of the service infrastructure. The areas are not inhabited by anyone. However clearance of land is evident.

4.2. Land Use

4.2.1. Surrounding Land Use

The proposed plots within the Oranjemund areas have all been mined and by Namdeb and some have been used for agricultural purpose before. However, they are currently idling and not being used. Most of the sites have been infested by mixed vegetation and little bit of forest especially on areas that are water logged.

Apart from a few existing and archaic infrastructures, there is hardly any functional existing infrastructures noted during the site visit. Water pipelines have been observed in some areas and the proponent needs to establish their uses and ownership once the activities commence.

At the site for Rosh Pinah, the are is wide open and adjacent to an existing commercial farm on the north-eastern side and covered by a series of mountainous on the south-eastern side.



Figure 6: An open area for the Rosh Pinah agricultural development



Figure 7: Some archaic water infrastructure seen around the Rosh Pinah site



Figure 8: C13 road network adjacent to the identified site for Rosh Pinah



Figure 9: On the southern side of the Rosh Pinah site is the Tsau //Khaeb National Park

4.2.2. Current Land Use

The areas are currently an open pieces of land, however prior to its current state, the area was used for dumping scrap by the earlier administration of Oranjemund (pre-independence). The area is full of remnants of scrap left behind on the soil. In addition, there is evidence of old asbestos pipes and hydrocarbon spillages present in the area. Both gemsbok and springbok could be see grazing in the far distance along the edge of the mining area 1 fence and their footprints are scattered across the site.

The area has been rehabilitated following the removal of scrap, as part of the scrap removal project of MA 1. The site visit however revealed that there might still be scrap buried in the area as can be seen in figure 3. Talks and discussions with residents who have lived in Oranjemund for over 40 years further revealed that, apart from the scrap that was above ground (which was removed), there may still be large amounts of scrap buried underground, which was not removed as part of the scrap removal project. To remove the uncertainty regarding buried scrap in the area, an aerial survey with a ground penetrating radar must be carried out to determine if there are any other buried metals in the area.



Figure 10: The above photos shows a representation of various sites in Oranjemund

5. APPROACH TO THE STUDY

The EIA process will comply with Environmental Management Act 7 of 2007. Figure 10, below sets out the impact assessment process that will be followed. The EIA will review the potential impacts and benefits associated with the development.

The objectives of the EIA study are to:

- Identify the key environmental issues associated with the project concept of the proposed development.
- Put forward mitigation measures of key environmental issues identified that need to be considered during the intended development.

Included is a public participation process which provides opportunities for stakeholders and the public at large to engage in the process and to make comment or express their concerns regarding the proposed project. This public participation process component is fundamental to the impact assessment process and is an important informant to decision-making. An EMP, which will address environmental management statements for all the phases of the project, will form an integral part of the EIA Report.

6. ALTERNATIVES

In terms of the Environmental Management Act (7 of 2007), alternatives in relation to the proposed activity, means different means of meeting the general purposes and requirements of the activity, which may include alternatives to:

- The property on which, or location where, it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and
- The option of not implementing the activity.

From the above, no any other feasible and reasonable alternatives have been identified at this stage for the proposed Agricultural Projects except for those relating option for choosing the site for the agricultural development.

7. DESCRIPTION OF RECEIVING ENVIRONMENT

7.1. Physical Environment

7.1.1. Climate

Winds and weather in the region are controlled by the interaction of the south Atlantic anticyclone, the northward-flowing and cold Benguela Current (with associated upwelling), eastward moving mid latitude cyclones and the atmosphere pressure field over the subcontinent (Kamstra, 1985). This generally leads to strong zonal pressure gradients at the coast and the resultant fresh to strong equatorward winds. These strong equator wards winds are interrupted by the passing of coastal lows with which are associated periods of calm or NW wind conditions.

Fog occurs, on average, on more than 100 days per year at Oranjemund. It forms as moist cold air from the ocean and meets the hot dry air of the desert. The Orange River valley serves as a pathway for the fog to penetrate as far inland as Skilpad. The fog supplies fauna and flora with much of their water requirements. The area is arid with rainfall mostly restricted to the winter months. Very hot, dry and dusty conditions occur occasionally in winter when there are offshore (north-easterly) berg winds. A summary of Oranjemund’s climatic conditions are depicted below in table 7.

Description of Climatic Condition	Value
Average annual rainfall (mm/a)	50-100
Variation in annual rainfall (%)	40-50
Average annual evaporation (mm/a)	2600-2800
Water deficit (mm/a)	1701-1900
Average annual temperatures (°C)	<16

Table 3: Summary of Climatic conditions of Oranjemund

7.1.2. Topography

The topography between Oranjemund and the coast is low-lying and flat, but the sand dunes rise up gently towards the interior to the north and east of town. The main topographic features are the rocky outcrop of Swartkop, 73 metres above mean sea level, the mobile dunes east of town and the shallow Orange River valley.

7.1.3. Geology and Soils

The surface geology in the area consist mainly of alluvium and sand of the Namib Group from the Quaternary Age [Qn]. This is underlain at an unknown depth by phyllite, chlorite schist and / or arenite from the Gariep Supergroup – Namibian age. Rocks of the Gariep Supergroup crops out at Swartkops to the east-northeast of Oranjemund. In the Oranjemund area and along the banks of the Orange River, these rocks are unconformably overlain by sediments of the Cainozoic age. Most sand dunes are semi stabilised. At a few locations, moving sand dunes occur. Dunes trend in a north-easterly direction with the prevailing dynamic wind patterns.

The soils of the study area are mainly poorly formed, immature desert soils as a result of the extremely arid climate, low rainfall, and high intensity winds. The soils are subject to high salinisation, aggravated by high evaporation levels. The soils in the region are generally not suitable for irrigated agriculture. The scarcity of water and arid climate further limit agricultural potential though a few small pockets of land along the Orange River are suitable for growing high value crops.

7.2. Biophysical Environment

7.2.1. Fauna

As in the rest of the Namib, the Sperrgebiet is home to a very diverse fauna that reflects the adaptations of various animals to the diverse habitats. For instance, there are fog-dependent frogs, an impressive 80 species of reptiles and 20 species of rodents.

Due to the poor coverage of animal collecting in the Sperrgebiet, the ranges of many species are estimations based on scattered and/or isolated records, very often at the edges of the Sperrgebiet such as along the eastern boundary and south of the Orange River. So knowledge is quite limited, making prediction of impacts on the fauna more difficult.

7.2.2. Flora

The terrestrial fauna of the study areas from the Orange River mouth to the proposed plots earmarked for agricultural activities are adapted to a harsh environment with low rainfall and, inland of the fog belt, high summer temperatures. In adopting strategies to survive in these conditions, many of the species are cryptic or nocturnal or have extended dormant periods and only emerge under optimum conditions.

7.2.3. Archaeology

The Sperrgebiet has a particularly impressive fossil record, dating from the Cretaceous period, about 58 million years ago. Some extremely rich fossil sites have been found along the Orange River and in paeleo-channels (old meander channels).

Related archaeological and historical information suggest that materials from Early Stone Age, Middle Stone Age and Late Stone Age, covering the period from about one million years ago to the present, can readily be found in the entire Sperrgebiet. There were no archaeological art effects observed or discovered during the site visit. Should these items be discovered, the EMP details the process of what must be done.

7.3. Socio-Economic Environment

Following the discovery of rich ore deposits on the north bank of the Orange River, south of Lüderitzbucht, the town of Oranjemund was founded in 1936. The land is owned by the State, but all the infrastructure and assets in Oranjemund are currently owned by Namdeb. In mid-2003, the Namibian Cabinet resolved to alienate unreserved state land in preparation for the future proclamation of Oranjemund as an independent town.

Because it is a closed security town, no informal settlement has been allowed to develop around Oranjemund; according to the 2011 Housing and Population Census, Oranjemund has a population of 4451. These census figures are at variance with Namdeb estimates of 10 000. Population estimates of between 6000 and 9000, of whom 60% are males, can be assumed for planning purposes. The nearest towns are the diamond mining settlement of Alexander Bay on the South African side of the Orange River and the mining town Rosh Pinah, some 75km to the northeast.

Oranjemund falls within the Karas Region, with the regional government located in Keetmanshoop. The harsh climate limits agricultural potential, so that mining is the region's biggest employer.

Diamond Area 1 or "The Sperrgebiet" is off limits to all but Diamond Mining Companies that have held prospecting rights for this land for over 80 years. At present, the land falls under the jurisdiction of the Ministry of Mines and Energy. When the Sperrgebiet is proclaimed as a National Park, the Ministry of Environment and Tourism will control the land outside the diamond concession areas.

It is envisaged that the Sperrgebiet will act as a magnet for tourism in the south in much the same way that Etosha has done for the north. Not only do these parks create significant incomes in their own rights, but the surrounding areas have also benefited significantly from their presence.

The development of Oranjemund as a tourism node within this broader conservation area hinges on strategic decisions taken about its future (open up or keep closed with high security), and the implications of the Diamond Act on issues such as easy access to the town, land tenure, future mining areas, etc. According to the Sperrgebiet Land Use Plan, it is possible that Oranjemund would only become a tourist development node after the current mining areas are de-proclaimed, sometime after 2020.

There are, however several development opportunities if the constituency area and access controls to the town and immediate vicinity of the river are relaxed. These are mostly based on the river and the Ramsar site at the river mouth and include hotels, lodges, bird tours, sundowner cruises, golf, yachting, fish farm, mine museum, etc.

Oranjemund has always rated itself as a highly safe and secure town for its residents with an exceptionally low crime rate. This is partly due to the isolated nature of the town and its small size, but mostly because of the security measures which are implemented around the diamond industry.

However, local residents and business operators report a recent increase in the crime rate which they attribute to the out sourcing of certain Namdeb functions and the operation of private business in town. This slight "opening" of the town has facilitated the influx of unemployed people.

The town of Oranjemund offers social services and facilities at a level usually only found in much bigger towns. These include health facilities, schools, a technical college, a crèche, a public library, parks, recreation facilities and sports fields. Although Oranjemund remains a "closed" town, it nevertheless has developed a viable commercial service and industrial sector. There are more than 30 social and recreation clubs in Oranjemund, including horse riding, yachting, golf, soccer, tennis, youth clubs and gymnasiums. Namdeb equips and maintains all clubs and children's' playgrounds. Staff work with parents to co-ordinate youth activities.

8. PUBLIC PARTICIPATION PROCESS

Specific I&APs, whom KPM Environmental Consulting deemed interested in and/or affected by the proposed developments, were identified, contacted and registered as I&APs. These I&APs were identified from the broader project area, all tiers of government and the private (non-state) sector. In addition, notices regarding the project were placed in widely circulated national newspapers (Appendix C) inviting members of the public to register as I&APs and also to attend the public meeting.

A summary of the I&AP groups, consisting of authorities and interest groups at national, regional and local level, are presented in Table 8. The complete list of I&APs can be viewed in Appendix D.

Section 21 of the EIA Regulations (RN: MET, 2012) details steps to be taken during a given public consultation process and these have been used in guiding this process. Communication with I&APs about this proposed developments was facilitated through the following means:

- A Background Information Document (BID) was compiled that contained essential information about the proposed developments (Appendix E). The BID was sent to all registered I&APs;
- Notices were placed in the press, briefly explaining the development and its locality, inviting the public to register as I&APs (Appendix C); and
- KPM Environmental Facebook and website was further used to engage the broader public and community of Oranjemund and Rosh Pinah about the proposed agricultural projects. These are available in Appendix C.
- All I&APs invited to attend a public meeting held at the Rosh Pinah Community Hall at 10h30 on Friday, 20 December 2019.

9. IMPACT ASSESSMENT

9.1. Methodology of Impact Identification

The environmental impacts associated with the proposed agricultural projects were identified through the following avenues:

- Desktop literature research on aspects related to the EIA study;
- Specialist studies (Desktop Geohydrological Assessment Study);
- Public Participation Process;
- Comments from Interested and affected parties; and
- Site visits

Other studies such as EIA's conducted for mining activities and exploration in the area were also used to ensure a wider spectrum of research and consultation take place to identify the pertinent environmental issues for the proposed activity.

9.2. Potential Impacts Identified

Some of the envisaged environmental impacts associated with the proposed Oranjemund and Rosh Pinah agricultural projects are:

- Aesthetic issues (change of landscape);
- Employment creation;
- Noise & Vibration (construction phase);
- Dust (construction phase of agricultural infrastructure);
- Traffic (operational phase of agricultural activities);
- Effluent generation;
- Impact on water resources;
- Increase generation of domestic waste;
- Flooding;
- Potential historical pollution issues impacting on proposed agricultural site layout;

Assessment Criteria	Description of criteria
Magnitude (MA)	The absolute or relative change in the size or value of environmental feature. 0 – None 2 – Minor 4 – Low 6 – Moderate 8 – High 10 – Very high/don't know
Direction (DI)	Will the impact represent beneficial or adverse change? Positive (P) versus negative (N) impacts. Negative impacts are cause of concern. 0 – Positive Impact 1 – Negative Impact
Extent (EX)	The extent of environmental impacts associated with the proposed activity. 1 - Immediate (the site and immediate surrounds) 2 - Local (Oranjemund) 3 - Regional (//Kharas) 4 - National (Namibia) 5 - International
Duration (DU)	The time period over which the impact will be felt. 1 – Immediate 2 – Short term (0-5 years) 3 – Medium Term (5-15 years) 4 – Long term (impact ceases after the operation) 5 - Permanent
Frequency (FR)	Refers to the return period for impacts which will recur over and over again. 0 - Annually or less 1 - 1 to 10 years 2 - 10 to 100 years
Reversibility (RE)	Refers to the permanence of the impact. 0 -Temporary 1 - Permanent
Likelihood (LI) of occurrence	Refers to the possibility of particular impact occurring as forecast. 0 - None 1 - Improbable 2 – Low probability (possibility of impact occurring is low) 3 – Medium Probability 4 - Highly probable (where the impact is most likely to occur) 5 - Definite (where the impact will occur)

Table 4: Impact Assessment Criteria

Once the above factors has been ranked for each impact, the overall risk (environmental significance) of each impact was assessed using the following formula:

**SP = (magnitude + direction + extent + duration + frequency + reversibility)
X Likelihood**

The maximum value is 120 significance points (SP). Environmental impacts were rated as either **High**, **Moderate** or **Low** significance on the following basis:

•	SP ≥ 60	: indicates high environmental significance	:
	HIGH		
•	SP 40 ≥ 59	: indicates moderate environmental significance	:
	MEDIUM		
•	SP < 40	: indicates low environmental significance	: LOW

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP		
Aesthetic issues, clearing of land (change of landscape)	The proposed servicing of land for agricultural infrastructure will result in change of landscape due to earthworks associated with land preparation.	4	1	2	2	2	1	12	2	24	Areas will be identified which are not to be disturbed it is therefore important to ensure that proper fencing is erected around these areas, prior to vegetation clearance commencing.	4	1	2	1	1	1	10	2	20		
Employment creation	Servicing of proposed plots for agricultural purpose is likely to create employment opportunities for local residents through appointed contractors.	8	0	2	2	1	0	13	4	52	This is deemed to be positive impact for the residents of Oranjemund and Rosh Pinah. Adhere to the legal provisions in the Labour Act (see Table 1) for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract.	8	0	2	2	1	0	13	4	52		
Health and Safety Related impacts (Construction phase)	Employees contracted by the various servicing contractors may be exposed to health and safety related hazards.	4	1	2	2	1	1	11	3	33	The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase.	4	1	1	2	1	1	10	2	20		

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP		
Noise & Vibration (construction phase)	Machinery used during the active servicing of land will cause noise related nuisance to residents nearby the areas to be serviced.	8	1	2	2	1	0	14	4		56	Work hours should be restricted to between 08h00 and 17h00 where construction involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents within the 500 m radius should be given 1 week's written notice.	8	1	2	2	1	0	14	3		42
Dust (construction phase)	Dust could be generated during the land clearing and servicing process due to machinery and earthworks.	8	1	2	2	1	0	14	4		56	A watering truck should be used on gravel roads with the most heavy vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought.	8	1	2	2	1	0	14	2		28
Traffic congestion (Construction & Operational phase)	Increase in traffic in the area is expected due to construction activities and establishment of a township.	4	1	2	2	1	1	12	3		36	The town's traffic management division must be approach to manage construction related traffic. Particularly for abnormal vehicles. Designate special routes for through traffic and heavy vehicles. Provide traffic calming measures and speed limits along strategic routes.	4	1	2	2	1	1	12	2		24

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP		
Effluent generation	Once the agricultural plots have been established, effluent will be generated from the households. Increase pressure on existing effluent infrastructure.	8	1	2	2	1	1	15	4		60	Sewage should not be discharged directly onto open soil. The water collected from wash basins and showers (grey water), should not be left standing for long periods of time as this promotes parasite and bacterial proliferation. Grey water should be recycled: <ul style="list-style-type: none"> Used for dust suppression; Used to water a vegetable garden, or to support a small nursery; Used to clean equipment. Grey water that is not recycled should be removed along with sewage on a regular basis.	8	1	2	2	1	1	15	3	45	
Impact on water resources	Namibia Water Corporation (NamWater) should make provision for providing additional water to the newly formed township. Increase abstraction of water	8	1	2	2	2	1	16	4		64	Water for Oranjemund is extracted from the Orange River via boreholes on the north bank of the river. Water is not metered in Oranjemund; therefore citizens are unaware of the water usage, and according to sources quite ignorant of the consequences of water wastage. Contractor is urged to create	8	1	2	2	1	1	15	4	60	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION																						
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP															
	from the orange river.													water saving awareness amongst its employees. Oranjemund Constituency Office must establish demand management for business and domestic water use.																					
Increase generation of domestic waste	As the town grows, so is the generation of waste and associated disposal sites.	8	1	2	2	2	1	16	4		64		The Contractor should compile a Waste Management Plan which should address as a minimum the mitigation measures related to hazardous waste and domestic waste	8	1	2	2	1	1	15	4		60												
Flooding	Increase paving and poor storm water reticulation can result in localized flooding in the proposed areas.	6	1	2	2	1	1	13	3		39		Drainage around the proposed new sites must be designed in such a way that it limits possible localized flooding in the area.	6	1	2	2	1	1	13	2		26												
Land ownership	Some of the Oranjemund agricultural plots might still fall under the diamond area.	6	1	1	2	1	1	12	2		24		Consult NAMDEB if uncertain about the ownership of land around the proposed areas.	6	1	1	2	1	1	12	2		24												
Potential economic opportunities for	Creation of proposed townships	1	1	1	3	1	1	17	3		51		Deemed a positive impact.	1	1	1	2	1	1	17	3		51												

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP		
local contractors providing services and supplies, particularly in the road construction sector.	will result in opportunities other related industries.																					
Increase Crime	Influx of people into Oranjemund	6	1	2	2	2	1	14	3		42	Extend current security measures around to ensure the crime levels remains low as usual.	6	1	2	2	2	1	14	3	42	
Increased soil erosion risks due to excavations impact on vegetation and conservation	Increased erosion risks due to clearance of vegetation and associated increase in sediment loads to watercourses	8	1	2	2	2	1	16	4		64	<ul style="list-style-type: none"> When excavating, topsoil should be stockpiled in a demarcated area. Stockpiled topsoil should be used to rehabilitate the nearest borrow area (existing borrow pits), if such an area is located less than 20 km from the stockpile. 	8	1	2	2	2	1	16	3	48	
Increase Poaching	Populations of wildlife (mainly oryx, springbok, steenbok and ostrich) occasionally occur in the area surrounding Oranjemund.	6	1	2	2	2	2	15	3		45	Awareness creation at point of entry.	6	1	2	2	2	1	14	3	42	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION																										
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP	MA		DI	EX	DU	FR	RE	TOTAL	LI	SP																			
	Poaching of wildlife by residents of the town may occur for commercial or self-sustaining reasons. Furthermore, wildlife have become habituated to people, and may pose a safety hazard if approached.																																						
Soil Contamination	<p>Spillages of hazardous substances on the development site could impact on water bodies and downstream users.</p> <p>Soil, surface and ground water pollution from potential disposal of</p>	8	1	2	2	2	1	16	3		48	<ul style="list-style-type: none"> Store all hazardous waste in bunded areas on concrete slabs. Recycle or sell liquid wastes and by-products where possible. Separate oily and non-oily areas and route all oily drainage via an oil separator. Separated oil to be collected for recycling. Use environmentally friendly detergents. 	8	1	2	2	2	1	16	3		48																	

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP		MA	DI	EX	DU	FR	RE	TOTAL	LI	SP
	domestic waste on open spaces																			

Table 5: Identified Impact Assessment

9.3. Discussion of Impacts

All potential impacts have been screened and the applicable impacts have been subjected to the criteria outlined in Table 9. All impacts outlined in Table 10 above will be addressed in the EMP (Appendix A). The following should be noted regarding some of the key negative impacts associated with the proposed developments and their corresponding mitigation measures:

- **Impact on vegetation:** no conservation worthy species have been observed on-site. All mature trees should be conserved according to the guidelines outlined in the EMP (Appendix A).
- **Waste:** Volumes of waste are expected to escalate with the opening up of the town, as well as littering and illegal dumping. It is further expected that the current landfill site will be increased in size to cater for the town's growing needs. Recycling at source is applied at very low levels.
- **Water:** Water for Oranjemund is extracted from the Orange River, from production boreholes on the north bank of the river. Water is not metered in Oranjemund, therefore citizens are unaware of the water usage, and according to sources quite ignorant of the consequences of water wastage. It is however expected that water meters will be installed throughout town as the Oranjemund Town Council as the Council takes over the management of the town. The new town council has to implement a water demand management system and make residents aware about various water saving initiatives.

10. CONCLUSION AND RECOMMENDATIONS

Potential impacts associated with the proposed project have been identified and their significance determined. Impacts on Waste and Water were identified as significant for the proposed agricultural development at Oranjemund and Rosh Pinah. Specialist studies have been conducted where uncertainty and a lack of information about potential impacts existed the selected areas and a Geohydrological Assessment to advice on underground water availability has been conducted. A desktop Geohydrological Assessment study was commissioned for these areas as these areas were previously used for dumping scrap material. There is a general believe throughout town that, there may still be scrap buried in the area, which may impact on the proposed housing development in the areas.

All identified impacts can be mitigated so as to reduce the significance of these impacts to an acceptable level. Mitigation measures are described in greater detail in the EMP. Hence, the project, as proposed in this report, can be implemented with no significant impacts if executed according to the EMP.

It is therefore recommended that Environmental Clearance be granted for the proposed agricultural development for Oranjemund Constituency Office.

11. REFERENCES

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12. APPENDICES

- 12.1. Appendix A: Environmental Management Plan
- 12.2. Appendix B: KPM Environmental Consulting Company Profile
- 12.3. Appendix C: Newspaper Adverts
- 12.4. Appendix D: List of Interested and Affected parties
- 12.5. Appendix E: Background Information Document
- 12.6. Appendix F: Consulted Interested and Affected Parties
- 12.7. Appendix G: Map of the proposed agricultural sites
- 12.8. Appendix H: Desktop Geohydrological Assessment Report