

**ENVIRONMENTAL IMPACT ASSESSEMENT REPORTS FOR EXTRACT AND PROCESS  
CLAY FROM EXCLUSIVE PROSPECTING LICENSE NUMBER 3903, OMDDEL DAM AREA,  
ERONGO REGION, NAMIBIA**

**Prepared and Submitted By**



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## Document Status

<b>PROPONENT</b>	Phoenix Mineral Resources
<b>PROJECT TITLE</b>	Environmental Impact Assessment Process for extract and process clay from the Exclusive Prospecting license number 3903, Omdel area, Erongo Region.
<b>PROJECT TYPE</b>	Environmental & Social Impact Assessment Study
<b>PROJECT LOCATION</b>	Exclusive Prospecting license number 6443, 3903, Omdel area, Erongo Region
<b>COMPETENT AUTHORITY</b>	Environmental Commission (Ministry of Environment and Tourism)
<b>PROJECT EAP / REVIEWER</b>	Contact person: Mr. David Shikoyeni NAMLAND CONSULTANTS P.O. Box 55160, Rocky Crest, Windhoek Cell: 0811474742/0812795499 Email: dshikoyeni@gmail.com
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### Abbreviation of Terms Used

- **BID** Background Information Document
- **CV** Curriculum Vitae
- **DEA** Department of Environmental Affairs
- **EA** Environmental Assessment
- **ECC** Environmental Clearance Certificate
- **EIA** Environmental Impact Assessment
- **EMP /S** Environmental Management Plan / Statement

- **GG** Government Gazette
- **GN** Government Notice
- **ha** Hectare
- **HIV** Human Immunodeficiency Virus
- **NMT** non-motorised transport
- **SMEs** Small and Medium Scale Enterprises
- **ASM** Artisanal and small-scale mining

# 1. EXECUTIVE SUMMARY

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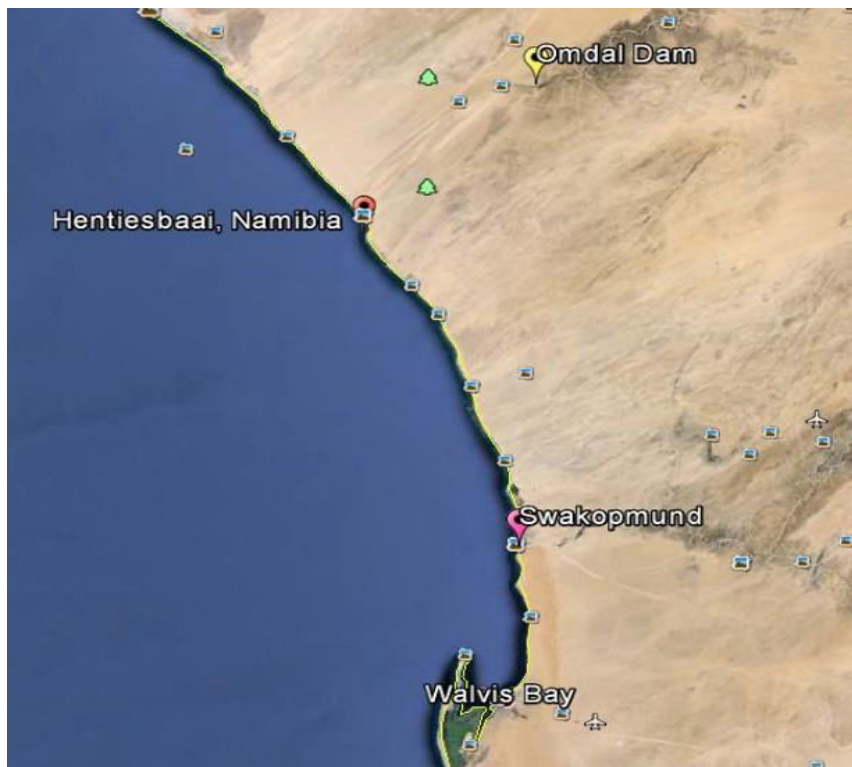
Phoenix Mineral Resources, has commissioned Namland Consultants to undertake the Environmental Impact Assessment (EIA) process and to compile an Environmental Scoping Report and Environmental Management Plan (EMP) for Process for extract and process clay from the Exclusive Prospecting license number 3903, Omdel area, Erongo Region.

Operationally, the business will be divided into two core divisions. The production facility will be established onsite at Omdel Dam and finished products will be distributed via a Depot to be established in Swakopmund. The reason for this separation is that it is not viable to transport the raw material, clay, and the main local market is in and around Swakopmund/Walvis Bay. The Omdel dam site is located 35km to the east of Henties Bay, 110km from Swakopmund, 145 km from the port of Walvis Bay in the Erongo region and approximately 350 km from Windhoek. Coastal Clay Products Project provides an exciting and viable business opportunity with the key focus to produce and sell clay products. This opportunity aligns with the development objectives of the Namibian Government, the Erongo Region as well as the Municipalities of Henties Bay and Swakopmund; additionally NAMWATER will benefit from this project in several ways ..

**Table 1.1:** Direct and indirect benefits arising from the exploration project

Project Phase	Direct Benefits	Indirect Benefits
<ul style="list-style-type: none"> <li>• <b>Exploration Project</b></li> </ul>	<ul style="list-style-type: none"> <li>• Continued employment opportunities</li> <li>• Direct capital investment in order to determine and define mineral resources in Namibia</li> <li>• Stimulation of economic development (e.g. ongoing supply of materials and services to the exploration and construction industry)</li> <li>• Continuing skills development</li> </ul>	<ul style="list-style-type: none"> <li>• Expansion of exploration and drilling industry in the region and country</li> <li>• Inducement of additional investments</li> <li>• Maintenance of new long-term employment opportunities in sectors relying on exploration and construction activities</li> </ul>

**Figure 1.1:** Location map of Exclusive Prospective License (EPL) 3903. Source: Namibia Mining Cadastre Portal, Ministry of Mines and Energy



## **2. INTRODUCTION TO THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EXPLORATION ACTIVITIES**

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The Namibian mining sector is characterized by large, medium and small-scale mining sector. However, this study is based on the small-scale mining. Namibia is rich in mineral deposits including diamonds, uranium, gold, base metals, industrial minerals and different types of precious stones and dimension stones. It is against this background that mining has been the backbone of the Namibian economy. Small-scale mining plays a major role in alleviating poverty and supplements the income of those involved. The Minerals (Prospecting and Mining) Act of 1992 and the Minerals Policy (2003) make provision for the registration of different types of mineral licence and mining claims. Thus, this study was undertaken within the context of the legislative framework, the Minerals Policy in particular, as it also provides the basis for the registration of mining claims.

### **2.1. Legal Requirements**

In terms of Section 58 of this Act, the Environmental Management Act came into force on the 6th of February 2012, as determined by the Minister of Environment and Tourism (Government Notice No. 28 of 2012).

Under Section 56 of the Environmental Management Act, 2007 (Act No.7 of 2007), the Minister has made the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012). These regulations require that all projects, plans, programmes and policies that have a detrimental effect on the environment must be accompanied by an EIA. Under Section 27 of the Environmental Management Act, 2007 (Act No. 7 of 2007), and after following the consultative process referred to in

section 44 of that Act, the Minister lists in the Annexure to the above mentioned Schedule, activities that may not be undertaken without an Environmental Clearance Certificate (Government Notice No. 29 of 2012).

The most important provisions in terms of guiding this Environmental Assessment process are those contained in the Town Planning, Road and Townships and Division of Land Ordinances, the Water and the Forestry Acts, The Minerals (Prospecting and Mining) Act of 1992 and the Minerals Policy.

The proposed developments will likely have minimal impact on sensitive aspects of the receiving environment, both biophysical and socio-economic, as it is remotely concentrated.

## **2.2. Public Consultations**

Public participation was carried out in accordance with the EIA Regulations. Various I&APs at local level were identified and their input solicited. Electronic and print media were fully utilized in communicating with the communities and stakeholders. The Consultant engaged on an extensive and exhaustive Field Survey as a way of engaging, informing and educating Interested and Affected parties.

## **2.3. Impact Assessment**

The issues identified and along with those identified during the Public Consultation Process are assessed using a range of assessment criteria. The application of these criteria involves a balanced consideration of duration, extent, and intensity/magnitude, modified by probability, cumulative effects, and confidence in order to determine significance. Mitigation measures are outlined for each identified impact.

## **2.4. Consultancy Terms of Reference**

The Terms of Reference (TORs) for the proposed project is technically and legally based on the requirements set out by the Namibian Environmental Management Act (2007) and the accompanying EIA Regulations (2012). The process covered the following steps:

- a) A description of all tasks to be undertaken as part of the assessment process, including any specialist studies to be included if needed;
- b) An indication of the stages at which the Environmental Commissioner is to be consulted;
- c) A description of the proposed method of assessing the environmental issues and alternatives
- d) An identification of all legislation and guidelines that have been considered in the preparation of the scoping study;
- e) Description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity
- f) A description of environmental issues and potential impacts, including cumulative impacts that have been identified
- g) A draft Environmental Management Plan that complies with EMA and its Regulations;
- h) The nature and extent of the Public Consultation processes to be conducted during the assessment process.

It should be noted that the ToR and scope of services required the Scoping Assessment and production of EMP for the proposed development, and this included extensive and exhaustive public consultation process.



## **2.5. The Environmental Assessment Practitioner**

Namaland Consultants It is a consortium of highly skilled and experienced Associates of researchers, scientists, town and regional planners, mapping and environmental specialists, engineers, geologists, hydrogeologists, chemists who work with clients to develop and implement site-specific solutions.

Namland Consultants as the EAP designate:

- Have knowledge of and experience in conducting assessments, including knowledge of the Environmental Management Act, Mineral Act, the Environmental Impact Assessment Regulations and guidelines that have relevance to this proposed activity, Stakeholder Engagement;
- Have performed the work relating to the application in an objective manner, even if this results in view and findings that are not favourable to the applicant;
- Have complied with the Environmental Management Act, the Environmental Impact Assessment Regulations, guidelines and other applicable laws, and
- Have disclosed to the proponent, competent authority / the Environmental Commissioner all material and information in its possession that reasonably has or may have the potential of influencing –
- Any decision to be taken with respect to the application in terms of the Environmental Management Act, the Environmental Impact Assessment Regulations; or
- The objectivity of any report, plan or document prepared by the EAP in terms of the Act and its regulations.

## **2.6. Conclusions and Recommendations**

It is therefore recommended that the proposed that an Environmental Clearance be issued by the Competent Authority, which is the Ministry of Environment and Tourism (MET) provided the recommendations included in this report and the EMP are implemented.

# **3. SCOPING METHODOLOGY**

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## **3.1. Information Collection**

Various sources to identify the environmental issues associated with the exploration activities were used. The main sources of information for the preparation of this Scoping Report include:

Project information and exploration activities were provided by

- Site visit of Namland Consultants to the site
- Consultation with Interested and Affected Parties (IAPs)
- Literature Review

## **3.2. Scoping Report**

The main purpose of this Scoping Report is to state which environmental aspects relating to the exploration activities might have an impact on the environment, to assess them and to set out management and mitigation measures to avoid or reduce these impacts.

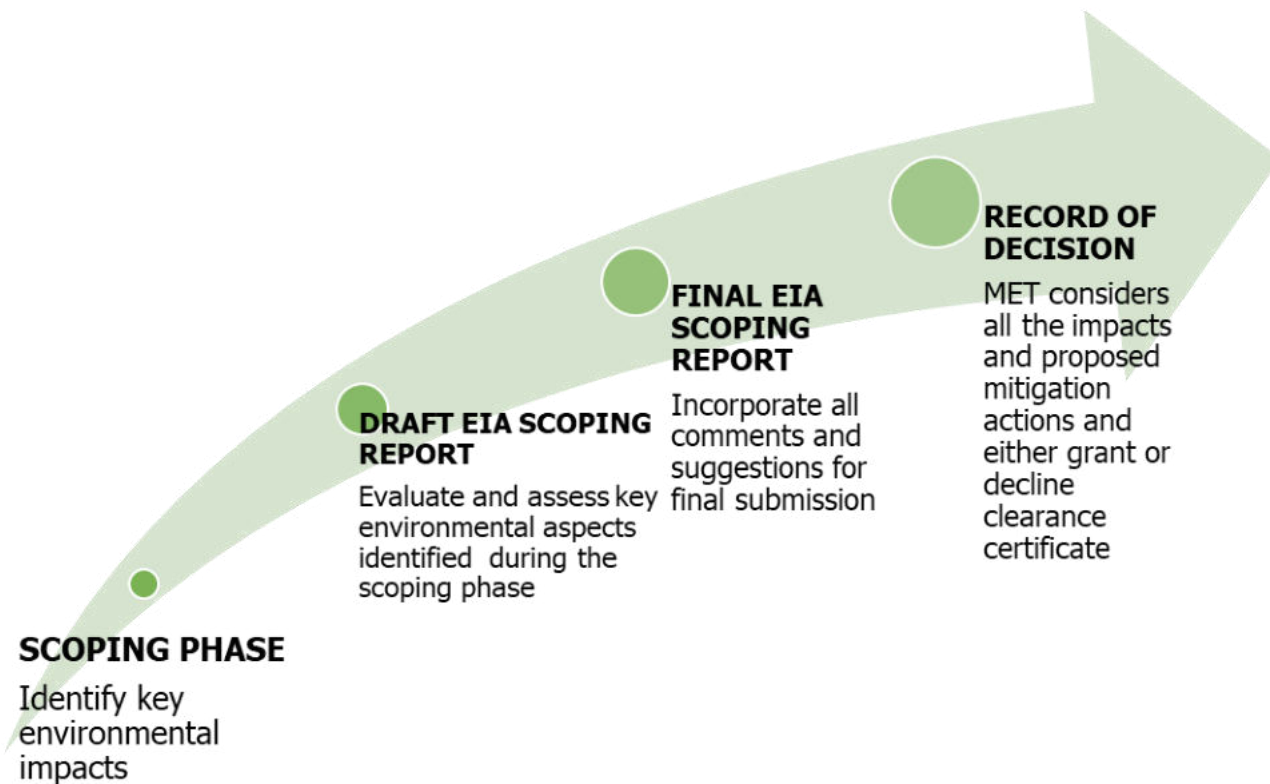


Figure 2: **The EIA process as per Environmental Management Act, 2007 (Government of the Republic of Namibia)**

## 4. PUBLIC PARTICIPATION PROCESS

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The public participation process for the exploration activities aimed to ensure that all Interested and Affected Parties (IAPs) and/or organisations that might be affected by the proposed exploration activities were informed of the project and could register their views and concerns. By consulting with IAPs the range of environmental issues to be considered in the Scoping Report (including the assessment of impacts) has been given specific context and focus.

Included below is a summary of the people consulted, the process that was followed, and the issues that were identified.

### 4.1 Stakeholders

### 4.2 Steps in The Consultation Process

The EAP followed the following steps in the consultation process that were conducted during the EIA Scoping process:

### 4.3 Summary of Issues Raised

**Table 5** below summaries the comments received (through e-mail) and the responses. As only a few comments were received no separate **Issue and Response** document has been compiled.

**10 EIA Scoping Report and Environmental Management Plan for Process for extract and process clay from the Exclusive Prospecting license number 3903, Omdel area, Erongo Region.**

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**Figure 4.1:** Some of the key environmental and social impacts identified are as follows:

<b>IMPACT</b>	<b>DESCRIPTION</b>
– <b>Noise and Dust Pollution</b>	Mining will increase ambient noise and slightly decrease air quality through dust. Noise and dust will lead to increased irritation especially in the directly affected communities especially pedestrians who had been temporarily using this area for some time now, which may cause social distress, reaction against the project.
– <b>Access “Restrictions” to Services and Developments</b>	The identified area is providing a variety of services such as access to socioeconomic services and facilities The Environmental (and Social) Management Plan (EMP) has included explicit details for mitigating the impacts caused by this formal restricted access.
– <b>Population Influx</b>	The creation of employment opportunities may also result in a population influx into the area in search of possible opportunities, contributing to existing ongoing population expansion in the project areas. Mining teams that are constituted from people not from the project area have potential to create social tensions and cause disruption though at a very low level.
– <b>Conflict Potential</b>	The project was assessed not to create any conflict as it was welcomed enthusiastically by all Interested and Affected Parties. Care was taken to ensure that the <b>Grievance Redress Mechanism</b> is well understood by all citizens, especially those directly affected by the implementation of the project.
– <b>Increase in Traffic and Safety Hazards</b>	The development will positively lead to a significant increase in human traffic along designated roads and access roads. Concentrated and guided increased human traffic will lead to deterioration of these access routes and the creation of dust. Details for management of impacts of increased traffic during the operational phase of the subprojects are articulated within the ESMP
– <b>Social-Environmental Linkages</b>	During the implementation of the project, no anticipated resultant environmental degradation is likely to hit hardest any population segment.

Other direct negative impacts will include: Wind erosion especially by Westerly Winds; Scouring of the landscape due to mining activities; Dust emissions; noise and vibrations during mining;

## **5. CONTROLLING NAMIBIAN LEGISLATION**

### **5.1. Procedural Overview**

The acts and policies listed below outline a fairly simple process through which a prospective developer may obtain a mining license. Legally, the decision as to whether an applicant receives a mining license rests in the sole discretion of the Minister of Mines and Energy. The prospective developer must include in his application a summary of the current environmental situation of the proposed site, an estimation of the impact that mining would have on that site, and proposed methods for mitigating the adverse effects of the mining operation. This scope of the information required, however, does not legally have to reach that of an Environmental Assessment. The difference in scope between the summary that is legally required in the application process and that of an Environmental Assessment is significant. For example, the Minerals Act of 1992 does not require the identification of alternatives or the notification of affected and interested parties, as would an Environmental Assessment.

Additionally, if the mining is to take place in a protected area, written permission from the Minister of Mines and Energy is needed in addition to a license. Presumably, if the proposed area was fully enclosed within an existing protected area, the permission to mine in that area would be granted simultaneously with the mining license. If the protected area in question is located within a game reserve or nature reserve, the prospector would also need to obtain permission from the Directorate of Parks and Wildlife Management, which is the

modern-day equivalent of the Executive Committee referred to in Nature Conservation Ordinance of 1975 listed above.

## 5.2. The Role of the Different Ministries in EA Process

The general framework of the process for allowing mining in a protected area is well delineated. The Minister must both grant a mining license and written permission for the prospector to use that license in the protected area. Depending on the nature of the protected area, the law also requires the signature of the Directorate of Parks and Wildlife, in order for any mining to occur. In most cases, a full Environmental Assessment is required of the applicant.

The pursuit of sustainability, with respect to any development, is guided by a sound legislative and policy framework. This section provides a review of applicable and relevant Namibian legislation, policies and guidelines. This review serves to inform the proponent of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled before the proposed project may commence. The findings of the abovementioned review are summarised below.

**Table 5.1: Namibian Legislation Relevant To The Project**

LEGISLATION/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
– <b>Namibian Constitution First Amendment Act 34 of 1998</b>	<i>“The State shall actively promote... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future” (Article 95(l)).</i>	Ecological sustainability should inform and guide this EA and the proposed development.
<b>1) The Minerals (Prospecting and Mining) Act of 1992, Section 91(f)</b>	any application for a mining license shall include  (i) the condition of, and any existing damage to, the environment in the area to which the application relates; (ii) an estimate of the effect which the proposed prospecting operations and mining operations may have on the environment and the proposed steps to be taken in order to minimize or prevent such effect; and (iii) the manner in which it is intended to prevent pollution, to deal with any waste, to safeguard the mineral resources, to reclaim and rehabilitate land disturbed by way of the prospecting operations and mining operations and to minimize the effect of such operations on land adjoining the mining area.	Ecological sustainability should inform and guide this EA and the proposed development.
<b>2) Proposed Legislation: The Parks and Wildlife Management Bill</b>	Would require attainment of, and accordance with, written authorization from the Minister of Environment and Tourism. Such authorization would not be permitted unless (a) a detailed environmental assessment, allowing for sufficient public participation, was performed; (b) the Minister is satisfied that allowing the activity would not significantly prejudice the attainment of the management objectives of the protected area; and (c) the permit was subject to enforceable	Ecological sustainability should inform and guide this EA and the proposed development.

	terms and conditions to safeguard against the risk of adverse effects and consequences relating to the proposed activity.	
<b>3) The Environmental Assessment Policy</b>	States that “mining, mineral extraction and mineral beneficiation” are activities requiring an Environmental Assessment. The Policy for Prospecting and Mining in Protected Areas and National Monuments (passed a full 5 years after the Environmental Assessment Policy) states that a full Environmental Assessment will usually be required for mining in a Protected Area and/or National Monument. It is interesting that the requirements set out in the later policy concern lands that are of a much greater national interest, and yet the language requiring an Environmental Assessment is actually softened.	Ecological sustainability should inform and guide this EA and the proposed development
<b>4) The Nature Conservation Ordinance (No. 4 of 1975), Section 18(1(d))</b>	The Nature Conservation Ordinance (No. 4 of 1975), Section 18(1(d)) states that “(N)o person shall without the written permission of the Executive Committee, will fully or negligently cause any damage to any object of geological, ethnological, archaeological, historical or other scientific interest within a game park or a nature reserve.”	The EMA and its regulations should inform and guide this EA process.
<b>5) The Policy for Prospecting and Mining in Protected Areas and National Monuments (1999)</b>	says the following about granting mining licenses in such areas: <ul style="list-style-type: none"> <li>• Granting of [Exclusive Prospecting Licenses and Mining Licenses]: Is generally permitted in Protected Areas and National Monuments . . . except areas within parks and monuments, which are particularly sensitive or are of special ecological or touristic importance. Each application would be considered on a case by case basis.</li> <li>• A full EA will usually be required for any prospecting or mining in a Protected Area and/or National Monument. The EA shall be conducted according to the procedures as stated in the Environmental Management Act. Should the [Minerals (Prospecting and Mining Rights) Committee] agree to recommend approval (after reviewing the EA) an Environmental Management Plan and an Environmental Contract shall be concluded before prospecting or mining may commence.</li> </ul>	
<ul style="list-style-type: none"> <li>– <b>Forestry Act 12 of 2001</b></li> <li>– <b>Nature Conservation Ordinance 4 of 1975</b></li> </ul>	<ul style="list-style-type: none"> <li>– Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22 (1)).</li> <li>– Prohibits the removal of and transport of</li> </ul>	Even though the Directorate of Forestry has no jurisdiction within townlands, these provisions will be used as a guideline for

	various protected plant species.	conservation of vegetation.
– <b>Labour Act 11 of 2007</b>	Details requirements regarding minimum wage and working conditions (S39-47).	The proponent should ensure that all contractors involved during the mining, operation and maintenance of the proposed project comply with the provisions of these legal instruments.
– <b>Health and Safety Regulations GN 156/1997 (GG 1617)</b>	Details various requirements regarding health and safety of labourers.	
<b>Public Health Act 36 of 1919</b>	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	
<b>National Heritage Act 27 of 2004</b>	Section 48(1) states that “A person may apply to the [National Heritage] Council [NHC] for a permit to carry out works or activities in relation to a protected place or protected object”.	Any heritage resources (e.g. human remains etc.) discovered during mining requires a permit from the NHC for relocation.
<b>Burial Place Ordinance 27 of 1966</b>	Prohibits the desecration or disturbance of graves and regulates how bodies may be unearthed or dug up.	Regulates the exhumation of graves.
<b>Water Act 54 of 1956</b>	The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: <ul style="list-style-type: none"> <li>– Prohibits the pollution of underground and surface water bodies (S23 (1)).</li> <li>– Liability of clean-up costs after closure/ abandonment of an activity (S23 (2)).</li> </ul>	The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction and hydrocarbon spills during operation and maintenance.
<b>Town Planning Ordinance 18 of 1954</b>	Subdivision of land situated in any area to which an approved Town Planning Scheme applies must be consistent with that scheme (S31).	The proposed use of the project site must be consistent with the Karibib Town Planning Scheme (2012).
<b>Townships and Division of Land Ordinance 11 of 1963</b>	Details the functions of the Township Board including what they consider when receiving an application for Township Establishment (S3).	The proposed layout and land uses should be informed by environmental factors such as water supply, soil etc. as laid out in Section 3.
<b>Road Ordinance 1972 (Ordinance 17 of 1972)</b>	<ul style="list-style-type: none"> <li>– Width of proclaimed roads and road reserve boundaries (S3.1)</li> <li>– Control of traffic on urban trunk and main roads (S27.1)</li> <li>– Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1)</li> <li>– Infringements and obstructions on and interference with proclaimed roads. (S37.1)</li> <li>– Distance from proclaimed roads at which fences are erected (S38)</li> </ul>	The limitations applicable on RA proclaimed roads should inform the proposed layout and zonings where applicable.

## **6. RECEIVING ENVIRONMENT**

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### **6.1. Property Description and Location**

The area is located on Western Namibia and eastern Atlantic Ocean immediately in Henties Bay district in Erongo Region

### **6.2. Need for the proposed development**

The rate of rural – urban migration coupled with economic development in Erongo has increased has drastically increased since 1990s when Namibia obtained independence. The largely informal expansion of the urban areas since the 1990s has seen the need for formal land use planning in Erongo . This Plan encompasses spatial development planning. The limited nature of natural resources is becoming increasingly apparent hence the development of sustainable settlements is (and will become more) important. The provision of affordable proper infrastructures and tourism attraction places are paramount importance in the region as it will contribute to socio economic development while it mobilize needs of a community.

A number of potential investors have approached the headman and regional council for requesting land to develop hospitality and accommodation facilities in the region

It is therefore a matter of some urgency that this facility should be officially established

### **6.2.Natural Environment**

The overview of the natural environment and the pressures exercised on the natural environment as result of the increasing urbanization and human habitation taking place within the Daures Erongo region area was obtained during the feasibility study.

#### **6.1 Bio-physical environment**

##### **6.1.1. Vegetation**

The vegetation in the area is generally classified as Broadleaf Savanna. The vegetation is characterized by broad-leafed deciduous woodland, which varies in structure and species composition due to soil and topographic heterogeneity.

This variation takes place at a localized spatial scale, which makes the classification of plant communities challenging. The vegetation in this region is therefore characterized as “mosaics” of smaller units as opposed to vegetative units (Obeid & Mendelsohn, 2001).

There are two major “mosaic” units prevalent in the Kameels Nek area. The first vegetation grouping includes vegetation types associated with drainage systems. The prevalent vegetation type within this grouping is *Floodplain and Open Water* vegetation (as outlined by Obeid & Mendelsohn, 2001). This vegetation is found along the River and all associated drainage lines.

Overgrazing by livestock has impacted much of the natural vegetation within the floodplain in the region. This issue will be dealt with in further detail in Section 4.3.1.

The second major vegetation grouping is comprised of fairly tall woodland growing on deep Kalahari sands. The prevalent vegetation type within the Kameels Nek Area is *Woodlands of the Northern Sand Plains*. This is the dominant vegetation type in the Area, covering all natural areas with the exception of the flood plains and open water systems.

### **6.1.2 Wildlife**

The major wildlife resources in the region are elephant, eland, wild dog, leopard, kudu, steenbok, rhinos, elephants (NACSO, 2007). Habitat destruction along the road transport route as well as human activity, has led to the exclusion of most wildlife from the region.

This fauna is currently being impacted by human activity in the region and is likely to decrease significantly in numbers should careful environmental planning not take place.

### **6.1.3 Surface water**

The major surface water feature in the daures constituency is the Ugab River. This river receives roughly all of its water from catchment areas in Angola. Namibia contributes almost no water to the River, despite the fact that it travels for roughly 415 km within the country (Obeid & Mendelsohn, 2001). This limited input is due to a number of factors.

Its lower section forms the border between Kunene Region and Erongo Region but its catchment area extends well into the Otjozondjupa Region. Ugab's source is near Otavi. From there it the riverbed leads westwards past the Paresis Mountains and the Fransfontein Mountains into the Skeleton Coast and the Atlantic Ocean. Inflows of the Ugab are Erundu, Ozongombo, Okomize and Uis.

That only flows above the surface of its sandy bed a few days each year, but even during much of the dry season its subterranean water surfaces as pools in places, and provides an important resource for species in the Damaraland region of northern Namibia. The Ugab's mean run-off is roughly 20 million cubic metres per annum, its catchment area (including its tributaries) is estimated to be between 24,800[1] and 29,355 square kilometres (11,334 sq mi).

The Ugab River's large subterranean water content makes it a major Namibian River. Stretching for 450 kilometres (280 mi), the river provides water for species such as the rare desert elephant, as well as giraffe, mountain zebra and the largest population of free-roaming black rhinoceroses in the world. The Ugab Wilderness Area was established here to protect the future of these rare animals. Important tourism destinations are the Brandberg, the Doros Crater and Vingerklip, settlements in its catchment area are the areas of Outjo and Otjiwarongo, as well as the settlements of Kalkfeld, Omatjette and Uis.

### **6.1.4 Underground Water**

There are a number of aquifers in the Erongo, which range in depth from about 20 m in the areas around the Ugab River, to 350 m in some places (Obeid & Mendelsohn, 2001). These aquifers recharge by groundwater flowing in a northerly direction from the more elevated areas to the south of the region (Obeid & Mendelsohn, 2001).

There are several hundred boreholes. The majority of the boreholes were provided by the Department of Water Affairs and a number are privately owned by farmers and parastatals (Obeid & Mendelsohn, 2001). This water is generally of good quality, with total dissolved solid (TDS) values of less than 1 000 mg/l (Obeid & Mendelsohn, 2001).



### **6.1.5 Rainfall**

There is a clear rainfall gradient in the region with an increase in rainfall as one moved in a northerly direction. There is an exceptionally high variation in rainfall from year to year, with less than 400 mm in the driest years to over 1000 mm in exceptionally wet years (Obeid & Mendelsohn, 2001). The average annual rainfall for the region is greater than 550 mm/year.

Following this period, rainfall generally increased until January, which is generally characterized by the highest rainfall. 80 % of the rainfall in the region falls between December and March (Obeid & Mendelsohn, 2001).

### **6.1.6 Temperatures, evaporation and wind**

The Daures constituency generally receives more rainfall than the areas to the south and the west and can be regarded as sub-tropical. The temperatures are generally high, which results in high rates of solar radiation and evaporation and comparatively little cloud cover. Humidity levels are also low during these periods (Obeid & Mendelsohn, 2001).

The coldest months are June and July and the warmest month is October. The explanation for October being the hottest month is that there is relatively little cloud cover to shield incoming solar radiation, whereas increasing cloud cover and rains make the remaining summer months cooler. With the exception of the period from May to July (which have average minimum temperatures of 10°C), average maximum temperatures are higher than 30°C. (Obeid & Mendelsohn, 2001)

## **6.3 Environmental pressures**

The current environmental pressures and issues, both socioeconomic and biophysical, currently facing the Kameels Nek Areaship area is presented here.

### **6.3.1 Bio-Physical**

#### **a) Population growth – pressure on natural resources**

All of the environmental pressures described below can be attributed to the rapid rate and scale of population growth in the region. The growing population is placing increasing demands on the natural environment, which is in turn leading to the degradation of natural resources and a depletion of the natural resource base.

According to Obeid & Mendelsohn (2011), in the Report “*A preliminary profile of the Erongo region in Namibia*”, the pressures placed on natural resources in the Daures constituency is immense particularly in the vicinity of ugab River.

#### **b) Vegetation clearing**

One of the most pressing issues in the region is the clearing of vegetation for crop cultivation and the repeated burning of natural vegetation. The rapidly growing population is increasing the demand for food. This has resulted in large amounts of natural vegetation being cleared to allow for crop cultivation.

The loss of natural vegetation has impacted the ecological function of the environment through direct vegetation removal and habitat loss. The natural vegetation in the area is adapted to the local conditions and

ensures that the natural nutrient cycle is maintained. The loss of nutrients and ecological function is impairing the sustainability of the region.

The removal of natural vegetation is also preventing the local community from benefiting from the utilization of natural resources.

### **c) Fires**

The frequent burning of natural vegetation has a number of significant negative effects on the natural environment. Vital grazing resources are lost, negatively impacting the livelihoods of people that are reliant on livestock. Young trees are less resilient to fire damage than established trees. Excessively frequent fires kill young trees, thereby inhibiting the natural recruitment of a number of tree species. These tree species are valuable in terms of ecological function as well as their use by local communities for construction, cooking, crafts, “fruit” harvesting and amenity. Large trees may also be damaged, with similar consequences to those described above. A major issue in the region relates to bush encroachment by shrubs such as *Terminalia sericea*, *Dichrostachys cinerea* and *Combretum* species (Obeid & Mendelsohn, 2001). This negatively effects grazing for wildlife and livestock. The final impact of these fires is the direct harm to domestic animals, wildlife and people.

#### **(a) Overgrazing**

Overgrazing by livestock, particularly cattle and goats, leads to a loss of vegetation cover. This in turn exposes soils, which results in the erosion of soils by wind and water. The loss of valuable soils inhibits the further growth of natural vegetation, thereby leading to environmental degradation and increased erosion rates. The sustainability of the environment is therefore impaired, impacting ecological functioning as well social utility. The loss of established vegetation species and grassland also leads to bush encroachment, which also limits the grazing potential of the land.

#### **(b) Urban expansion**

Urban expansion demands additional space, which results in a direct loss of natural space. It is vitally important that urban expansion with regards the proposed development

#### **(c) Overuse of reeds and grass**

Reeds growing along the banks of the Ugab River and thatching grass are used for the construction of houses. The ever-growing population requires additional housing, which is resulting in the increased harvesting of reeds and thatching grass.

#### **(d) Chemical, pesticide and fertilizer use**

Chemicals and pesticides are utilized in the vegetable gardens and cultivated areas along the river (although to a limited extent). These substances can flow into the river, leading to water pollution and negative impacts on the aquatic ecosystem.

#### **(e) Washing in the sea**

The river is extensively utilized for bathing especially in summer time as well as for the washing of vehicles.

**(f) Animal – human conflict**

The growing human population in the region is leading to increased conflict between wildlife and people. The majority of the terrestrial wildlife has already been removed or deterred from the region by disturbance and hunting.

The perceived dangers associated with elephants, cheetah, and lions and snakes often results in them being hunted and killed. These animals form an integral part of the natural ecological system. They are also an important asset (attraction) in terms of tourism in the area.

**(k) Overuse of trees or wood**

According to Obeid and Mendelsohn (2001), about 92% of homes are built of wood, and locally-harvested firewood is used for cooking by 97% of households.

Although the large commercial timber industry for the production of furniture has come to an end, great numbers of kiaat and false mopane trees were felled for timber. These and other trees are also used for the production of crafts and curios.

**(g) Air and noise pollution**

Increased vehicular activity in the region is resulting in air pollution from exhausts and dust generation, as well as noise generation. The air pollution may lead to respiratory problems in the local population and may impact plant growth by coating leaves with dust. Noise pollution will create a general disturbance.

**(h) Waste generation**

Of major concern to the local environment is the generation and inadequate disposal of waste. This site does not have the required capacity to cope with all of the waste produced by the proposed development.

The waste site for the proposed development is a properly designed site, capable of preventing any potential soil, water or air pollution.

The waste is currently burnt, but there are no provisions in place to prevent fires from spreading from the site to the nearby natural vegetation. Should burning be used to reduce waste loads, permission must be obtained from the Ministry of Environment and Tourism.

The waste site must also undergo the legal process of becoming registered as a licensed waste disposal site.

**(n) Sewage**

There is currently poor sewerage reticulation in the area, resulting in the majority of the people in the area utilizing the bush for sanitation. This creates a health risk and can contribute to environmental degradation. The current sewerage works are not fully utilized (they were dry at the time of the site investigation) due to poor reticulation and a lack of adequate sanitary conveniences in the area.

**(o) Borrow pits**

A number of borrow pits have been developed in the area in order to gain construction material and fill for the road that is currently being developed. The development of borrow pits can have a number of negative biophysical and socio-economic environmental consequences. The excavation of material negates any other potential land uses. By removing the nutrient laden topsoils, natural vegetation has difficulty re-establishing itself in the impacted areas. The disturbance also allows the establishment of alien invasive pioneer plant

species, which can then spread to the surrounding areas. Water collects in the depressions and is utilized by mosquitoes for larval development.

This can contribute to the spread of malaria in the region. The pits also create a safety risk for livestock and wild animals.

**(p) Alien invasive vegetation identified**

The following alien invasive plant species were identified in the area during the site visit:

- White Flowered Mexican Poppy (*Argemone ochroleuca ochroleuca*)
- Various *Opuntia* species (Prickly Pear and Cactus Species)
- Castor Oil Plant (*Ricinus communis*)

**(q) Lack of conservation**

It is vitally important that this proposed development considers conservation approaches in the designated area.

**6.2. EPL holder's exploration activities: Review and outlook**

The EPL holder was busy to source a business partner to team up with for exploration and processing. Several parties showed interest, but finally no serious association could be formed. Only during the last 6 months, a group of Namibian entrepreneurs came forward to assist in exploration and mining. This would include financing an EIA, to run an exploration campaign and to invest into machinery for trenching and mineral separation. EPL holder has sent a prospector for about 10 times to the field and guided interested investors to the most promising sites. Furthermore, two areas bearing a high diamond potential were discovered.

These areas will be pegged during the next two months and applied for as Mining Claims. Licence holder invested time and money into studying historical reports on mining in his area and visited surrounding EPLs in search for partners to cooperate with but could not observe any exploration or mining activities there.

For the coming two years and together with competent financial partners, a comprehensive exploration program is planned to be carried out. It will cover the following points:

- Carry out an EIA (environmental scoping study and management plan) on the EPL;
- Explore for gravel layers in old riverbeds in parallel to the Kaukasib River;
- Explore for mineral deposit containing conglomerate (cemented gravel) all over the EPL;
- Look for deflated gravel plains that might have enriched metal and other mineral deposit;
- Construct a simple plant to separate heavy minerals from sediments and to extract desirable mineral from it (sieves, jigs);

## 7. IMPACT ASSESSMENT

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### 7.1. Approach and Methodology Employed For Assessment

#### 7.1.1. The EIA Process

Environmental Impact Assessment (EIA) is a systematic process that identifies and evaluates the potential impacts (positive and negative) that a Project may have on the biophysical and socio-economic environment, and identifies mitigation measures that need to be implemented in order to avoid, minimise or reduce the negative impacts and also identifies measures to enhance positive impacts. The EIA is not fully a linear process, but one where several stages are carried out in parallel and where the assumptions and conclusions are revisited and modified as the project Progresses. The following sections provide additional detail regarding the key stages in this EIA process. These stages are:

- 1) Scoping Phase;
- 2) Specialist Study Phase; and
- 3) Integration and Assessment Phase.

#### 7.2. Scoping Phase

The first phase of the EIA process is a Scoping Study, with an emphasis on public involvement. The various tasks and consultation activities undertaken by the Consultant thus far are described and summarised below.

##### 7.2.1. Initial Site Visit and Project Initiation

As part of the project initiation, Namland carried out an initial site reconnaissance visit in June / July 2019. The purpose of the site visit was to familiarise the project team with the project proposal and affected project area and to begin the environmental and social screening and scoping process. Three more site visits were carried out by Namland.

**Figure 7.1: Public Participation Tasks**

ACTIVITY	DESCRIPTION AND PURPOSE
– Preparation of a preliminary stakeholder database	A preliminary database has been compiled of authorities (local and provincial), Non-Governmental Organisations and other key stakeholders. This database of registered I&APs was expanded during the ongoing EIA process.
– Erection of site notices	Site notices were placed on and along the mining site
– Distribution of BIDs	Background Information Documents (BIDs) were distributed to all I&APs.
– Release of Draft Scoping Report for Public Comment	The Draft Scoping Report was released for public comment. All comments received have been included in this Final Scoping Report.
– Newspaper Advertisement	The release of the Draft Scoping Report was advertised through the Facebook Pages, and bulk emailing
– Compilation of Comments and Responses Report	Through the public participation process a Comments and Responses Report has been compiled
– Notification of submission of Final Report	Notification of the submission of the final Scoping Report to the MET was sent to register I&APs.

<p>– <b>Notification of issuance of Environmental Clearance Certificate</b></p>	<p>The I&amp; APs will be notified through the normal channels on the issuance of the Environmental Clearance Certificate. Newspaper adverts will also be utilised.</p>
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### 7.3. Specialist Studies Phase

During the Specialist Study phase, the Consultant gathered data relevant to identifying and assessing environmental impacts that might occur as a result of the Project. They assisted the project team in assessing potential impacts according to a predefined assessment methodology included in the Scoping Report. The Consultant also suggested ways in which negative impacts could be mitigated and benefits could be enhanced.

### 7.4. Integration and Assessment Phase

The final phase of the EIA is the Integration and Assessment Phase. The assessment of impacts proceeds through an iterative process considering three key elements:

- 1) **Prediction of the significance** of impacts that are the consequence of the Project on the natural and social environment.
- 2) **Development of mitigation measures** to avoid, reduce or manage the impacts.
- 3) **Assessment of residual significant impacts** after the application of mitigation measures.

A synthesis of the studies, which addresses the key issues identified during the Scoping Phase, is documented in this ESIA. Relevant technical studies are included as appendices to this ESIA.

The Draft ESIA was made available to I&APs for a public comment period and registered and identified I&APs were notified of the release of the Draft EIA and where the report can be reviewed.

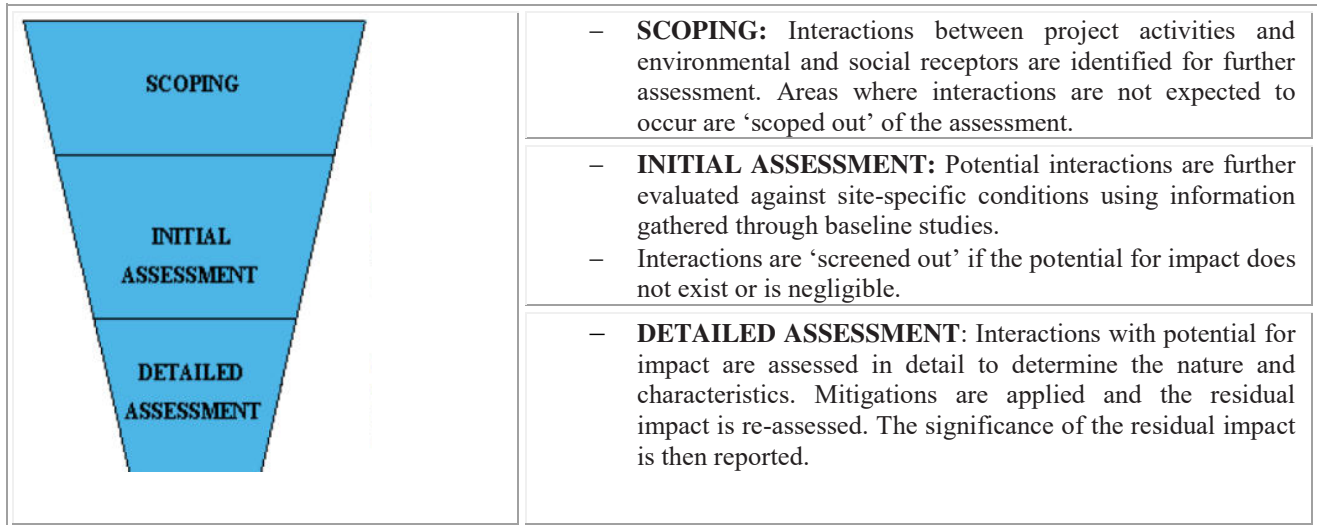
Comments received on the Draft EIA have been assimilated and the EIA project team provided appropriate responses to all comments. All registered I&APs will be notified when an Environmental Authorisation has been issued by MET.

### 7.5. Impact Assessment Methodology

#### 7.5.1. Impact Assessment Process

The following diagram describes the impact identification and assessment process through scoping, screening and detailed impact assessment. The methodology for detailed impact assessment is outlined below.

**Figure 7.2: Impact Identification and Assessment Process**



### 7.5.2. Impact Assessment Methodology

The purpose of impact assessment and mitigation is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe measures that will be taken to avoid or minimise any potential adverse effects and to enhance potential benefits.

### 7.6. Definition of Key Terminology

- **Project** - The features and activities that are a necessary part of the Project Proponent’s development, including all associated facilities without which the Project cannot proceed. The Project is also the collection of features and activities for which authorization is being sought.
- **Project Site** - The (future) primary operational area for the Project activities. Private transport corridors (i.e., those dedicated for use solely by Project operational activities) are included as part of the Project Site.
- **Project Footprint** - The area that may reasonably be expected to be physically touched by Project activities, across all phases. The Project Footprint includes land used on a temporary basis such as construction lay down areas or construction haul roads, as well as disturbed areas in transport corridors, both public and private.

**Figure 7.3: Impact Types and Definitions**

Nature or Type	Definition
<b>Positive</b>	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
<b>Negative</b>	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
<b>Direct impact</b>	Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).
<b>Indirect impact</b>	Impacts that result from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).
<b>Cumulative impact</b>	Impacts that act together with other impacts (including those from concurrent or planned future third-party activities) to affect the same resources and/or receptors as the Project.

An impact is any change to a resource or receptor brought about by the presence of a project component or by the execution of a project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the project could affect the biophysical and socio-economic environment.

Impacts are described according to their nature or type, as summarised in *Figure 7.4*

**Table 7.4 Significance Criteria**

IMPACT MAGNITUDE	
<b>Extent</b>	<p><b>On-site</b> – impacts that are limited to the boundaries of the development site.</p> <p><b>Local</b> – impacts that affect an area in a radius of 25km around the development site.</p> <p><b>Regional</b> – impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem.</p> <p><b>National</b> – impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences.</p>
<b>Duration</b>	<p><b>Temporary</b> – impacts are predicted to be of short duration and intermittent/occasional.</p> <p><b>Short-term</b> – impacts that are predicted to last only for the duration of the construction period.</p> <p><b>Long-term</b> – impacts that will continue for the life of the Project but ceases when the project stops operating.</p> <p><b>Permanent</b> – impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the project lifetime.</p>
<b>Intensity</b>	<p><b>BIOPHYSICAL ENVIRONMENT:</b> <i>Intensity can be considered in terms of the sensitivity of the biodiversity receptor (i.e. habitats, species or communities).</i></p> <p><b>Negligible</b> – the impact on the environment is not detectable.</p> <p><b>Low</b> – the impact affects the environment in such a way that natural functions and processes are not affected.</p> <p><b>Medium</b> – where the affected environment is altered but natural functions and processes continue, albeit in a modified way.</p> <p><b>High</b> – where natural functions or processes are altered to the extent that they will temporarily or permanently cease.</p> <p><i>Where appropriate, national and/or international standards are to be used as a measure of the impact.</i></p> <p><i>Specialist studies should attempt to quantify the magnitude of impacts and outline the rationale used.</i></p> <p><b>SOCIO-ECONOMIC ENVIRONMENT:</b> <i>Intensity can be considered in terms of the</i></p>



	<p><i>ability of people/communities affected by the Project to adapt to changes brought about by the Project.</i></p> <p><b>Negligible</b> – there is no perceptible change to people’s livelihood.</p> <p><b>Low</b> - people/communities are able to adapt with relative ease and maintain pre-impact livelihoods.</p> <p><b>Medium</b> – people/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.</p> <p><b>High</b> - affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.</p>
<b>Likelihood - the likelihood that an impact will occur</b>	
<b>Unlikely</b>	The impact is unlikely to occur.
<b>Likely</b>	The impact is likely to occur under most conditions.
<b>Definite</b>	The impact will occur.

Once a rating is determined for magnitude and likelihood, the following matrix can be used to determine the impact significance.

**Figure 7.5** Significance Rating Matrix

SIGNIFICANCE				
MAGNITUDE		LIKELIHOOD		
		Unlikely	Likely	Definite
	Negligible	Negligible	Negligible	Minor
	Low	Negligible	Minor	Minor
	Medium	Minor	Moderate	Moderate
High	Moderate	Major	Major	

**Figure 7.6** Significance Colour Scale

Negative ratings	Positive ratings
• Negligible	Negligible
• Minor	Minor
• Moderate	Moderate
• Major	Major

**Figure 7.7** Significance Definitions

SIGNIFICANCE DEFINITIONS	
<b>Negligible significance</b>	An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be ‘negligible’ or ‘imperceptible’ or is indistinguishable from natural background variations.
<b>Minor significance</b>	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
<b>Moderate significance</b>	An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that ‘moderate’ impacts have to be reduced to ‘minor’ impacts, but that moderate impacts are being managed effectively and efficiently.
<b>Major significance</b>	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the EIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into

the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.

Once the significance of the impact has been determined, it is important to qualify the **degree of confidence** in the assessment. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence can be expressed as low, medium or high.

- **Mitigation Measures and Residual Impacts**

For activities with significant impacts, the EIA process is required to identify suitable and practical mitigation measures that can be implemented. The implementation of the mitigations is ensured through compliance with the regulatory Frameworks. After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significance rating for the residual impact.

### **7.7. Identification of Mitigation Measures**

For the identified significant impacts, the project team, with the input of the client, has identified suitable and practical mitigation measures that are implementable. Mitigation that can be incorporated into the project design, in order to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the client as these are likely to form the basis for any conditions of approval by MET.

### **7.8. Specialist Study Methodology**

#### **7.8.1. Botany, Terrestrial Ecology and Avifauna**

A botany, terrestrial ecological and avifaunal specialist study was undertaken. As part of this study, a desktop study was carried out of publicly available scientific publications to investigate the ecology and biodiversity of the affected project area. A site visit was undertaken where the different biodiversity features, habitat, vegetation and landscape units present at the site were identified and mapped in the field. This included generating a fine-scale vegetation map for the site which identified and mapped the different plant communities present. Walk-through-surveys were conducted across the sites (corridors) and all plant and animal species observed were recorded. Searches for listed and protected plant species at the site were conducted and the location of all listed plant species observed was recorded. The impact assessment phase involved the determination of the nature of likely impacts of the development and recommendations on mitigation.

### Figure 7.8 Archaeology, Heritage and Palaeontology

A paleontological, archaeological and cultural heritage study was undertaken.

STUDY	DESCRIPTION
Palaeontology	A desktop paleontological study was undertaken for the identified site. The impact assessment phase involved the determination of the nature of likely impacts of the development and recommendations on mitigation.
Archaeology	A desktop study was carried out of publicly available scientific publications to determine the archaeological history of the affected project area. In addition, an archaeological field survey was undertaken of the affected project area. Archaeological materials and structures were inventoried, with approximate age and descriptions recorded as necessary. The impact assessment phase involved the determination of the nature of likely impacts of the development and recommendations on mitigation.
Heritage	Publications of the history of the affected project areas were investigated and informed the specialist study. A heritage field survey was undertaken in order to identify existing heritage structures in the affected project area. The impact assessment phase involved the determination of the nature of likely impacts of the development and recommendations on mitigation.

#### 7.8.2. Landscape and Visual

A landscape and visual impact assessment study was undertaken. Site visits were undertaken where visual features and the landscape setting of the site were recorded. An assessment was also made as to what degree people who make use of these locations would be sensitive to change(s) in their views, brought about by the Project. These receptors were then identified, as well as Key Observation Points (KOPs) (those sensitive receptors who had views of the Project) particularly those relating to intersections of major roads, arterial and scenic routes, as well as urban areas, settlements and farmsteads.

The landscape character was then surveyed in terms of scenic quality (landscape significance) and receptor sensitivity to landscape change (of the site) in order to define the visual objective for the project site. Photomontages using panoramic photographs were used to determine the degree of visibility of the Project and change in views of the surrounding landscape. The impact assessment phase involved the determination of the nature of likely impacts of the development and recommendations on mitigation.

#### 7.8.3. Agriculture

An agriculture impact assessment study was also considered, although in this whole project it was not of much impact or relevance considering the nature of the whole project, and setting as kaokoland is a semi desert, barren environment with not much agricultural activities taking place

#### 7.8.4. Socio-economic

The socio-economic study was undertaken. The study began with the compilation of a baseline description. The baseline description was derived from a range of secondary data (including but not limited to census data, existing reports, development plans and other strategic planning documents) and primary data collection. The primary data used for the baseline is based on information provided by the Client / Proponent and issues raised through the public consultation process.

The impact assessment phase incorporated the identification and assessment of socio-economic impacts (direct, indirect and cumulative) that may result from the closure of various corridors (construction and operation phases) of the project. Mitigation measures that address the local context and needs were recommended as the final phase of the study.

### **7.9. Assumptions and Limitations**

Environmental Impact Assessment is a process that aims to identify and anticipate possible impacts based on past and present baseline information. There is, inevitably, always some uncertainty about what will actually happen in reality. Impact predictions have been made based on field surveys and with the best data, methods and scientific knowledge available at this time. However, some uncertainties could not be entirely resolved. Where significant uncertainty remains in the impact assessment, this is acknowledged, and the level of uncertainty is provided.

In line with best practice, this ESIA has adopted a precautionary approach to the identification and assessment of impacts. Where it has not been possible to make direct predictions of the likely level of impact, limits on the maximum likely impact have been reported and the design and implementation of the project (including the use of appropriate mitigation measures) will ensure that these are not exceeded. Where the magnitude of impacts cannot be predicted with certainty, the team of specialists have used professional experience and available scientific research from solar facilities worldwide to judge whether a significant impact is likely to occur or not. Throughout the assessment, this conservative approach has been adopted to the allocation of significance.

#### **7.9.1. Gaps and Uncertainties**

Inevitably knowledge gaps remain. For instance, there is an incomplete understanding of cumulative impacts as it is not known how the project will get consolidated onto the main town plan.

#### **Gaps in Project Description**

- Regarding the location of the site, the assessment is based on a refined layout / rezoning derived from revisions of earlier layouts, to accommodate environmental sensitivities. Although the final layout has been confirmed,
- At this stage it is unknown, although unlikely, whether a borrow pit for rock or soil material will be required for the closing off of corridors.

#### **Gaps in Baseline Information**

- Ecological limitations; a limitation associated with the sampling approach was the narrow temporal window of sampling. Ideally, a site should be visited several times during all the different annual seasons to ensure that the full complement of plant and animal species present are captured, as well as the temporary usage of the corridor by some school children who frequently use these corridors were on holidays, including beer hall patrons who had gone for holidays

However, this is rarely possible due to time and cost constraints and therefore, the data captured is representative of the species at the site. The vegetation at the time of the site was in a reasonable condition for sampling. This represents a sufficiently conservative and cautious approach which takes account of the study limitations.

### **Gaps in Understanding of Impacts**

- It should be noted that the closure of various corridors all at once are new to Namibia and in this case the impacts associated with them have not been scientifically researched in the context of their occurrence in this country, and therefore the specialists have used the precautionary principal where necessary in undertaking their respective impact assessments.

All impacts included in the table below fall within the scope of this project and responsibility of the client or proponent. Each of the potential impacts is screened and subjected to the criteria stipulated above. The significance of each potential impact is determined based on the criteria below.

Detailed descriptions of mitigation measures for impacts that require mitigation are contained in the EMP (**Appendix B**).

Impacts for which insufficient information is available are discussed at the end of this section.

POTENTIAL IMPACT	DESCRIPTION	EXTENT	DURATION	INTENSITY	PROBABILITY	CONFIDENCE/ SUFFICIENT INFORMATION AVAILABLE?	SIGNIFICANCE	SIGNIFICANT MITIGATION DEEMED POSSIBLE?	NEXT STEP
<b>Aesthetic issues</b>	The change in the existing landscape may be an eye sour due to blockage of open views.	Immediate area	Temporary	Low	Improbable	Yes	Low	Yes	EMP
<b>Employment creation</b>	The mining activities associated with the project is due to create local employment opportunities.	Local	Temporary	Medium	Definite	Yes	Low	Yes	<b>EMP</b>
<b>Noise (construction phase)</b>	Mining activities can create noise for local nearby residents.	Local	Temporary	Low	Highly probable	Yes	Low	Yes	<b>EMP</b>
<b>Dust (construction phase)</b>	The ingress and egress of mining / construction vehicles can create dust.	Local	Temporary	Low	Improbable	Yes	Low	Yes	<b>EMP</b>
<b>Traffic (Operational phase)</b>	Increase in traffic in the area is expected due to mining activities	Local	Permanent	Medium	Definite	Yes	Low	Yes	<b>EMP</b>
<b>Impact on existing properties</b>	The proposed development is believed to impact on exiting property values in the area.	Local	Long-term	Low	Probable	Yes	Low	Yes	<b>EMP</b>
<b>Public open space encroachment</b>	The proposed development may encroach in public areas	Local	Temporary	Low	Probable	Yes	Low	Yes	EMP

**Figure Table 5.8: Screening and assessment of impacts**

## 8. CONCLUSIONS AND RECOMMENDATIONS

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It is known that a thin layer of clay on top of the river bed gravel would limit the water penetration. This clay seals the river bed so that most of the water of Omaruru and other westward flowing rivers in Namibia flows over the top and out to the sea. If the flood waters were contained for a time allowing the clay and silt to settle out, the clean water could then be released into the infiltration areas, thus ensuring that most of the floodwater would reach the underground aquifers.

The purpose of the Omdel Dam is to temporarily store ephemeral floodwaters in a large reservoir upstream of the aquifer of Omaruru delta. This storage would allow clean water to be released in a controlled manner to infiltration areas over the Omaruru delta aquifer to feed 16 boreholes further down the river. The aim is to transfer the contents of the reservoir to the aquifer during the dry season so that if there were a consecutive good rainy season, there would be storage space available in the reservoir

Due to growing population and industries on the Coast, the water demand is increasing averagely by 10 percent each year. Out of three sources of water supply for the Coastal area – Kuiseb aquifer, Omaruru delta aquifer and Desalination plant, demand for water from the Omdel aquifer in the last years rose at least double.

Potential impacts associated with the proposed project have been identified and their significance determined. None of the potential impacts identified had “high” impact significance. 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:

- (a) that the Exploration Activities on Exclusive Prospecting license number 3903 Omdel, granted **Environmental Clearance Certificate**, subject to the conditions as stipulated in the EMP and / or any other conditions from the MET

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