February 2021

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE PROPOSED WIND POWER PLANT NEAR LÜDERITZ

ENVIRO DYNAMICS
Environmental Management Consultants

NamPower
Powering the Nation and beyond

COPYRIGHT © NAMPOWER, 2020. ALL RIGHTS RESERVED	
PROJECT NAME	Environmental and Social Impact Assessment for the Proposed Wind Park near Lüderitz Namibia
REPORT	Environmental and Social Management Plan
STAGE OF REPORT	Draft to Public
CLIENT	NamPower Enquiries: Eliaser Nghishiyeleke Assistant Engineer: Generation Capital Projects Tel: 264 61 205 2220 E-Mail: eliaser.nghishiyeleke@nampower.com.na
LEAD CONSULTANT	Enviro Dynamics Enquiries: Stephanie van Zyl Tel: (061) 223-336 E-Mail: **stephanie@envirod.com**
DATE OF RELEASE	February 2021
CONTRIBUTORS TO THE REPORT	Stephanie van Zyl

DECLARATION

I hereby declare that I do:

(a) have knowledge of and experience in conducting assessments, including knowledge of the Act, these regulations and guidelines that have relevance to the proposed activity;

(b) perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

(c) comply with the Act, these regulations, guidelines and other applicable laws.

I also declare that there is, to my knowledge, no information in my possession that reasonably has or may have the potential of influencing –

(i) any decision to be taken with respect to the application in terms of the Act and the regulations; or

(ii) the objectivity of this report, plan or document prepared in terms of the Act and these regulations.

Stephanie van Zyl

Environmental Assessment Practitioner

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

Acromym	Description	Acromym	Description
AIDS	Acquired immunodeficiency syndrom	kV	kilovolt
AGL	Aeronautical Ground Lighting	m^2	Square meter
AMSL	above mean sea level	MEFT	Ministry of Environment, Forestry and Tourism
CoC	Code of Conduct	MME	Ministry of Mines and Energy
CAA	Civil Aviation Authority	MW	megawatt
ECB	Electricity Control board	NBRI	National Botanical Research Institute
ECC	Environmental Clearance Certificate	NHC	National Heritage Council
ECO	Environmental Control Officer	NP	NamPower
ER	Engineering Representative	OLS	Obstacle Limitation Surfaces
ESIA	Environmental and Social Impact Assessment	PANS-OPS	Procedures for Air Navigation Services — Aircraft Operations
ESMP	Environmental and Social Management Plan	PPE	Personal Protective Equipment
EWG	Environmental Working Group	PAPI	Precision Approach Path Indicator
GIS	geographic information system	SME	Small and Medium Enterprises
GPS	Global Positioning System	TK(S)NP	Tsau//Khaeb (Sperrgebiet) National Park
Ha	Hectare	UV	Ultraviolet
HSE	Health, Safety and Environmental	WESCO	WESCO WASTE MANAGEMENT PTY LTD
ICAO		WTG	Wind Turbine Generator
IFC PS6	International Finance Corporation, Performance Standard 6	40MW NPWP	40MW NamPower Wind Park
IPP	Independent Power Producer	50MW IPPWP	50MW Independent Power Producer Wind Park
IUCN	International Union for Conservation of Nature		

1 INTRODUCTION

This Environmental and Social Management Plan (ESMP) concerns the development of the Lüderitz Wind Power Plant (see **Figure 1** below). The project consists of two separate sites. The north-western site will be owned and operated by NamPower, while the south-eastern one will be owned and operated by an Independent Power Producer (IPP), to be appointed by NamPower through a competitive bidding process.

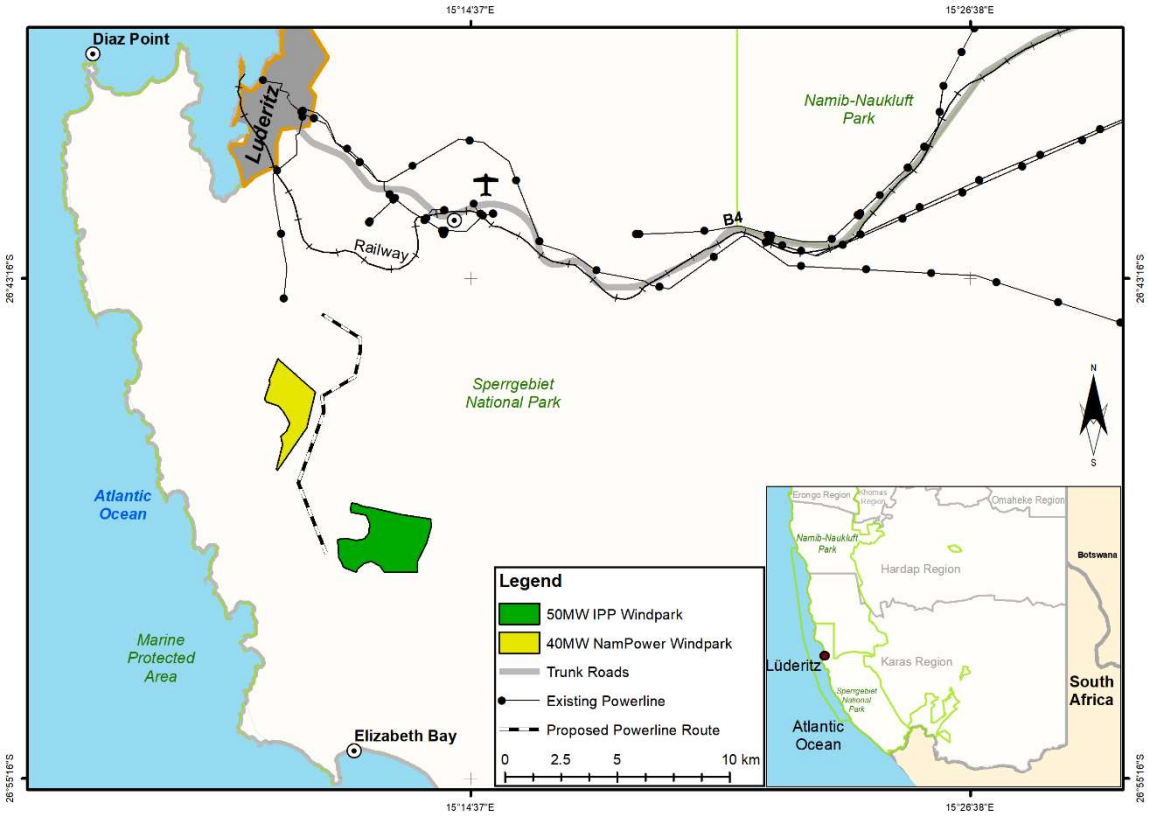

Figure 1 Locality map of the sites for the proposed NamPower Wind Park near Lüderitz

The project area of approximately 1648 Ha, comprising of two distinct sites, is located to the south-east of Lüderitz in the diamond protection area Sperrgebiet and in the Tsau//Khaeb (Sperrgebiet) National Park.

This document is a culmination of the recommendations made in the NamPower Lüderitz Wind Park Environmental and Social Impact Assessment (ESIA), its Specialist Reports and the Tsau//Khaeb (Sperrgebiet) National Park Management Plan.

2 PROJECT INFORMATION

Key characteristics of the wind electricity generation activities of the NamPower Lüderitz Wind Park are summarized in **Table 1**.

Table 1: Project description

Element	Description
Proponent	NamPower.
Life of project Construction phase Operational phase	 12 to 18 months. 25 years.
Project location	South-east of the town of Lüderitz in the Sperrgebiet diamond protection area and Tsau//Khaeb (Sperrgebiet) National Park.
Total land area of site	1648 Ha.
Land use zoning	Tsau//Khaeb (Sperrgebiet) National Park IUCN II[1] status with restricted access. Managed Resource area according to the Tsau//Khaeb (Sperrgebiet) Management Plan. The use is permissible, but under a strict management regime. The implementation of the ESMP is a crucial part of ensuring the project does not harm the sensitivities of the area.
Wind Turbines	[36][2] units of wind turbines on the two sites distributed within the boundaries of each site. There will be two plants, namely a 40 MW plant owned and operated by NamPower, and a 50 MW plant to be owned by an Independent Power Producer (IPP), appointed by NamPower through a competitive bidding process. The NamPower plant will comprise of an estimated 16 turbine locations, while the IPP plant will comprise of an estimated 20 Wind Turbine Generator (WTG) locations. Each unit will consist of conical tubular tower type, 130 - 140m high and with 3 blades rotor, each approximately 60m in length. Therefore, the total height of the structure, including the blade apex, is up to 190m."

1 II National Park: " Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational and visitor opportunities all of which must be environmentally and culturally compatible" (Definition according to the Guidelines for protected area management categories"(https://www.iucn.org/node/2364)).

2 The number and exact position of the turbines may change depending on the design bases and size of wind turbine selection.

Element	Description
	Approximately 2.6MW per wind turbine, totalling about 90MW. This size and number of wind turbines may change depending on the measured wind resource and final turbine supplier.
Transmission lines	Construction and installation of the following: • a site substation building, this will include warehouse storage and some office facilities; • overhead 132 kV transmission line from a site substation to the Diaz Substation or NamPower Namib Substation [3](See Figure 1); • an overhead power line between the 40MW and the 50MW sites; and • internal cabling (overhead or underground) for collecting power from each wind turbine to the site substation and for internal reticulation.
Expected disturbance	4000m^2 per WTG, totalling 144Ha excluding the transmission lines, road accesses, parking areas, and buildings.

[3] The route from the Diaz substation to the Namib substation has been covered in a previous EIA, which will require an amended Environmental Clearance Certificate (ECC).

3 ENVIRONMENTAL FEATURES

The following key features (Table 2) show the vulnerability of this environment and raises awareness of the features to be conserved and managed to ensure protection and avoidance of collateral damage.

Table 2 Environmental features

Element	Description	Impact expected
Geology	Soils are susceptible to erosion and are very shallow.	Physical disturbance of soil during transport and construction activities. Shallow Gneiss will hamper foundation construction. Proliferation of tracks. Erosion of structures.
Hydrology	Occurrence of sandy inlays in washes.	Sand inlays may act as traps for contaminants causing soil and water pollution.
Critical Habitat	The Lüderitz Peninsula dwarf-shrublands and Lüderitz Plains dwarf-shrublands are categorised as Critical Habitats according to the IFC PS6 (International Finance Corporation, Performance Standard 6) criteria.	The project will contribute to the reduction of a critical habitat in the Lüderitz Plains and Lüderitz Peninsula dwarf-shrublands. All contractors have the responsibility to impress this key sensitivity on all staff and to continue training, information sharing and managing minimal impact during all phases of the project. **A Critical Habitat Study has been completed to Comply with IFC PS 6.**
Vegetation	The vegetation forms part of the Succulent Karroo Biome, which predominantly has low, succulent-leaved shrubs, few grasses, and few tall shrubs and trees. There are various	Physical destruction of vegetation, by construction activities and new roads.

Element	Description	Impact expected
	vegetation zones subdivided within this biome. The Lüderitz Peninsula dwarf-shrubland is highly sensitive and limited. Therefore, any form of development in this habitat should be avoided. The Lüderitz Plains dwarf-shrubland is sensitive and development should be strictly controlled. The site activities should be managed through a Vegetation Management Plan, which forms an integral part of the Environmental and Social Management Plan (see Appendix B).	
Fauna	Avifauna and the Brown Hyena have been identified as groups which should receive specific attention for this project. As for avifauna, interference with coastal flight paths for avifauna have been avoided, although "short cut" routes may still exist. Potential collisions with transmission line towers and turbine blades is a significant potential impact especially for birds prone to such collisions, including Greater and Lesser Flamingos and Ludwig's Bustard. The area seems to be species-poor based on pre-construction monitoring work done so far, but this is being confirmed as with monitoring work continuing.	Disturbance through noise, movement and temporary occupation of an otherwise undisturbed habitat. Habitat loss, including foraging, roosting and breeding habitat of the area occupied by the completed structure. Collision of priority species, including globally threatened birds and/or migrating birds with wind turbine blades. **A Longitudinal bird impact study is being conducted during 2020/2021.**

Element	Description	Impact expected
	The brown hyena's IUCN classification status was increased from Lower Risk – least concern to Lower Risk – Near threatened in 2000. The effect of WTG noise and general activity on the movement and territoriality of the brown hyena has been avoided as far as possible, but there remains a concern in this regard, with especially the south-eastern site still infringing on their territory.	Disturbance of brown hyenas as follows: Effects of construction/maintenance operations on territory boundary (habitat fragmentation). Effects of construction/maintenance operations on denning behaviour. Disturbance and/or mortality of brown hyenas through increased traffic.
Archaeology	No individual sites of historical or scientific data concern were identified.	Overall visual degradation / landscape disturbance (disturbance of the common middens found generally in the area). A chance-find procedure is to be implemented and overall degradation is to be limited.
Visual sensitivity	The route entering the Sperrgebiet past the sites carry some tourism traffic and could increasingly do so in future.	Visual degradation during construction and visual impact of the WTGs. The sites need to be managed diligently to maintain order and avoid visual degradation. Design adaptation recommendations are made in this ESMP for reducing visual impact on the WTGs.
Socio-economic indicators.	Housing to be catered for in Lüderitz, which has capacity concerns with land, housing and infrastructure provision. Recent downscaling of industries in Lüderitz causes an expected high unemployment rate.	Job creation and economic upliftment should be enhanced with a locals first policy. The workforce for the project should be sourced from the local population to avoid increased pressure on the infrastructure and housing stock of the town. Engagement with the Lüderitz Town Council is crucial.

The Environmental and Social Management Plan aims to provide a high-level management tool for the overall environmental management of the project in principle as well as direct mitigation measures related to the impacts expected.

4 ENVIRONMENTAL MANAGEMENT REQUIREMENTS

The following legal framework forms the backbone of this ESMP.

4.1 Adhering to the existing conservation framework.

The project falls in the IUCN II category and triggers the IFC Standard 6 (Sections 16 to 20 – Critical Habitat, Legally Protected and Internationally Recognised Area). Therefore, a Critical Habitat Study was conducted and forms part of the ESIA/ESMP.

All activities of the development must be managed within the boundaries and requirements set in the Tsau//Khaeb (Sperrgebiet) National Park Management Plan, which will take precedence over all other environmental and other management requirements. Nonetheless the strictest requirements will be followed from either document.

The project planning, implementation and operation must be done in consultation with and approval of the relevant assigned representatives of the Directorate of Parks of the MEFT.

4.2 Implementation and monitoring of the entire Environmental Management Plan

The ESMP must be included in a contractual agreement between the Developer (NamPower or its appointed IPP) and the MEFT. Strict adherence to the ESMP is essential in view of the conservation framework which the project is executed in. The ESMP incorporates the following essential components:

- The recommended mitigation measures as listed in the Impact Assessment to manage specific sensitivities as listed as a summary in Section 3.
- General mitigation measures that are applicable to all projects to ensure sound environmental and social management principles for a sustainable outcome.
- The specific mitigation measures for this project that have been identified to avoid and reduce the significance of impacts in this sensitive environment.

4.3 Management and auditing capacity requirements.

In order to be able to adhere to the above-mentioned requirements the following capacity and system must be put into place:

- NamPower and IPP shall appoint an Environmental Control Officer (ECO) for each project to coordinate and monitor the adherence to the Tsau//Khaeb (Sperrgebiet) National Park Management Plan and the Environmental and Social Management Plan, as well as the external environmental audit process.

  This position will be:

  - Either a full-time appointment, especially during construction, or assigned as a role to a permanent site employee.
  - Responsible for the coordination of and liaison with the MEFT working group.

  - Responsible for the coordination of the Vegetation Management Plan.
  - Responsible for the implementation of the ESMP and the TK(S)NP Management Plan.
  - Responsible for the coordination and reporting of the external environmental audit system.

- NamPower should initiate the establishment of an environmental working group with the relevant stakeholders such as MEFT, Namdeb, Sperrgebiet Diamond Mining, and Lüderitz Town Council, which will actively be involved in the project implementation as a consultation body. The role of the group shall be to act as the communication link between the project and the various stakeholder groups and authorities, channelling information to assist timeous responses and to assist in the speedy, yet sustainable implementation of the project. The group will play an advisory role in practically following the spirit and requirements of the Tsau//Khaeb (Sperrgebiet) National Park Management Plan and the ESMP, the access and security requirements of the Sperrgebiet, as well as the external environmental audits. The group should be convened at least three months before site establishment. Following the establishment, the Developer (NamPower and the IPP) shall both be actively involved in the group, depending on each project's construction timeline.
- NamPower should implement an external environmental audit system on a quarterly basis during construction and on an annual basis during the operation of the Wind Park. This is be used to verify the effectiveness of the ESMP, to implement adjustments if required, and to have an objective set of records for the sake of satisfying international and stakeholder requirements.

4.4 Promoting compliance

NamPower is responsible to manage an environmental compliance system as a motivation to adhere, and a deterrent to contravene the ESMP by the various construction, operation and maintenance operators throughout the entire life-cycle of the project. [4] The system should incorporate the following guidelines:

(a) The Operator shall be encouraged to comply with the environmental specifications and requirements as described in the ESMP on an ongoing basis. This shall include the necessary training and awareness raising as a constant process on site, including to new staff. Any failure to comply should set in motion a corrective procedure by the ECO, which culminates in a penalty with continual non-compliance. Certain contraventions are of high importance and a penalty shall be charged regardless of the correction, especially in cases where the damage is irreparable.

[4] In case NamPower remains the operator, a system promoting compliance is still required, with a disciplinary process being made applicable in cases of severe non-compliance, e.g. health and safety measures contravened, plants indiscriminately damaged, Park rules contravened, etc.

(b) In the event of non-compliance, the following recommended process shall be followed:

- The ECO shall issue a notice of non-compliance to the Operator, stating the nature and magnitude of the contravention.
- The Operator shall act to correct the non-compliance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Operator shall provide the ECO with a written statement describing the actions to be taken to discontinue the non-conformance and to replace it with confirming actions, as well as the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the MEFT Parks Officer.
- In the case of the Operator failing to remedy the situation within the predetermined timeframe, the ECO shall impose a monetary penalty based on the conditions of contract.
- In the case of the Operator not being unable to remedy the situation due to permanent environmental damage already incurred, the ECO shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the ECO shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Operator the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc., between any parties in regard to or arising from interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP, etc., any party shall be entitled to require that the issue be referred to independent specialists for determination.
- The ECO shall at all times have the right to stop work and/or certain activities on site in the case of ESMP non-compliance or failure to implement remedial measures.

(c) A list of appropriate penalties based on the content of the ESMP must be developed by the ECO and if feasible, in conjunction with the Environmental Working Group (EWG) before the project implementation starts and revised annually by the EWG. Appendix C provides an example of an Environmental Penalty System.

(d) A record of all penalties given and adhered to should form part of the Environmental Penalty System. This record must be reviewed at a quarterly ECO-EWG meeting. Repeat offenders will receive an increased penalty or will be ordered from the site if the quarterly meeting deems this necessary.

5 MANAGEMENT REQUIREMENTS

5.1 Planning Phase

The panning phase constitutes the phase before the onset of construction. It ensures all design and preparation requirements are in place before construction commences.

Responsibility: The Proponent shall consider these aspects in conjunction with the ECO and EWG.

Table 3 Management Requirements - Planning

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS	To fulfil the legal requirements in constructing and operating the proposed Wind Park.	• The project Proponent must obtain permission from the Electricity Control board (ECB) in order to generate the electricity of the power plant. • The Proponent is further obliged in terms of Section 22 of the Electricity Act 2 of 2007 to obtain a preliminary license from the Minister to build and complete any structure which would be involved in the production of electricity, including the construction of wind turbines and equipment. • The ECB will inform the Proponent of the conditions and requirements imposed by the Minister in granting a preliminary license. The license is valid only for the period referred to on the license or any extension granted by the Minister in terms of Section 22(4) of the Electricity Act 2 of 2007. • The Proponent must apply for a collection/rescue/relocation permit at MEFT in order to rescue or relocated identified plant species.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		Since the project falls within a National Park, the Chief Warden of the SKNP should be contacted for these arrangements. A period of three months should be allowed for obtaining this permit. The Vegetation Management Plan will be required, as well as the approximate numbers/quantities involved and a relocation position/s will be identified in collaboration with the MEFT. AS specified in the ESIA, a vegetation specialist should be involved to identify the exact species involved prior to construction and should also take part in the above required process with MEFT.	
BIODIVERSITY MANAGEMENT SYSTEM	To optimise the site in terms of avoidance of sensitive habitats. Compliance with IUCN II and IFC Standard 6 (Sect. 16 to 20).	• Clearly indicate the different sensitivity zones in the final layout design for the Wind Park **(see Appendix A for map / coordinates). The no-go areas are to be excluded from the development area.** • Uncontrolled vehicle activity is of major concern. Careful pre-planning of construction activities must be done to identify where infrastructure will be absolutely necessary for both construction and maintenance, overlapping these in a single infrastructure corridor (roads, electricity). • These infrastructure corridors must be clearly marked prior to construction activities beginning, together with designated turning points and construction clearance areas. Turning points for heavy vehicles must be designated and adhered to. The area used must be constrained as far as possible.	NamPower/IPP, Project Engineer. Environmental Control Officer (ECO) Once off. Monitor enforcement weekly. Monitor vehicle movement continuously.
PLANT COLLECTION AND RELOCATION OF PLANTS	To rescue and remove all plants of conservation concern.	• Involve a specialist to identify plants that are candidates for rescue and removal or relocation. Consult with NBRI as to whether any of the plants must be brought to the National Botanic Garden.	NBRI. NamPower/IPP.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
OF CONSERVATION CONCERN		• Take care to make these arrangements well in advance so that NBRI staff can schedule and plan for any needed plant relocation. (Contact: The Head of NBRI 061 202 2017) via the specialist coordinator for the Vegetation Management Plan. Please contact the specialist coordinator of the Vegetation Management Plan, Colleen Mannheimer (Tel. + 264 61 233614, Fax + 264 61 233727). • Lift the plants as soon as possible, once it is certain that an area is to be compromised, to prevent their destruction. • Lifting and relocation of the plants must be supervised, by a knowledgeable person, such as an environmental rehabilitation practitioner, a botanist or a horticulturist with some expertise in this field. The plants need to be directly transferred to a damaged area or stored in suitable conditions as required depending on the species involved, until they are relocated. • Plants may only be stored for periods of less than three weeks. • The following must be recorded for each plant/species (other parameters might need to be recorded depending on the species involved, but that would have to be decided once the species are known for certain): o Reason for relocation. o Date lifted and exact method used to remove, store and relocate the plants. o Period of storage. o Date replanted and method of replanting (if applicable).	As per the vegetation management plan. Plan at least four weeks ahead and monitor implementation daily. Keep planning and monitoring records.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		○ Watering regime (if applicable). ○ Monitoring method (if applicable). • In the case of relocation on-site, plant survival will be assessed for several years, notably each growing season when others of this species in the area are found to have come into flower or leaf. Monitoring method to be determined by rehabilitation practitioner involved. • Information on the entire procedure must be published or made available online so as to contribute to future rescue/relocation attempts in the Tsau//Khaeb (Sperrgebiet) National Park/southern Namib.	
CIVIL AVIATION	To adhere to Civil Aviation Safety Regulations.	• The obstacles and their positions are limited to the AMSL provided in **Appendix E.** • The Screening areas' Maximum Permissible Elevations should be used when investigating positions for any obstacle associated with the NamPower Lüderitz Wind Power Plant. • Obstacles which lie outside of the OLS are not limited to a maximum elevation AMSL but authorisation will still need to be obtained from the Namibia Airports Company (NAC) and the Namibia Civil Aviation Authority (NCAA). • If NamPower requires the turbine height to penetrate the OLS a full PANS-OPS assessment will be required. The PANS-OPS assessment will then facilitate NamPower to negotiate approval with the NCAA and NAC.	NamPower/IPP. Record keeping of approvals.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
TSAU//KHAEB (SPERRGEBIET) NATIONAL PARK	To ensure that access is permitted to work in a restricted area.	• The Proponent must obtain the relevant permits from Sperrgebiet Diamond Mining (SDM) in order to gain access into the area for construction purposes. • The Proponent must consult with the Ministry of Mines and Energy, who may impose additional requirements and conditions before granting permits to investigate, construct and operate the site. • Negotiations are required and a plan devised for the practical entry and exit of all equipment, vehicles, construction materials, goods, etc. needed for the construction, operations and decommissions of the proposed Wind Power Project.	NamPower. Namdeb. Ministry of Mines and Energy (MME). Sperrgebiet Diamond Mining (SDM). As Required.
FAUNA RELATED MONITORING REQUIREMENTS	To continue or initiate the required monitoring procedures as per the bird, bat and brown hyena specialist studies.	• A bird monitoring programme during the construction and operational phase that includes searches for bird mortalities based on proposed guidelines in the specialist study. • If deemed necessary by the specialist, extend monitoring to include nocturnal monitoring episodes as per proposed guidelines. • Pre-construction bat monitoring requires that a bat detector be erected on a static meteorological mast (if possible, one on each wind park site) with microphones mounted at 10 m and 50 m and 90 m recording for a period of ideally 12 consecutive months, but at least six (6) months. Further operational monitoring should be planned in conjunction with a bat specialist as per the South African Guidelines proposed. • Brown Hyena monitoring is required as follows (consult with the specialist to develop a detailed monitoring plan):	NamPower to initiate, Developer takes over responsibility, in collaboration with MEFT.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Set up 5 cameras (2 at dens, 1 along the road to Wolf Bay, 2 near Albatroskop) for long term monitoring in the 40MW NP WP. All cameras should be checked every 6 to 8 weeks. • Set up 5 cameras (within the 10-30% activity area) for long term monitoring in the 50MW IPP WP. All cameras should be checked every 8 weeks. • The project owner should appoint a relevant specialist (i.e. preferably one who has knowledge and experience of the particular species) to manage this monitoring process, including the processing, interpretation and recommendations from the data. Changes recommended are to be implemented by the project owner. • The monitoring is to continue for a period of at least 5 years. At the end of this period, the project owner shall review the monitoring programme and its results through the fauna specialist, who shall recommend the future of the monitoring programme according to its usefulness for the sustainability of the project.	
DESIGN OF WIND TURBINES	To minimise the abrasion effect of wind –driven sand.	• Consider some form of protection for the WTGs (i.e., rubber or another energy absorbing material).	NamPower/IPP Periodical design review.
	To minimise the risk of turbine-bird collisions.	• Keep turbine layout clustered to present a more visible obstacle and avoid placing solitary turbines. • Keep lighting associated with wind turbines to a minimum (except for civil aviation requirements).	NamPower/IPP

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Mark turbine towers and rotor blades to make them more visible to birds, for example by painting one of the three rotor blades black (May et al. 2020), using reflectors, flashing lights and / or UV-coating (May et al. 2015). • When monitoring proves high mortality rates, consider installing radar devices to act as early warning systems that temporarily shut down turbines during times of high bird activity.	
	To optimise the placement of turbines in relation to brown hyena habitat and territories.	• Investigate the viability of moving the 50MW IPP Wind Park turbines further north-east within the restriction of the diamond exclusion zones and Tsau//Khaeb (Sperrgebiet) National Park Zonation Map. • Design the access/maintenance roads to avoid the existing movement corridor area (see specialist report). • If the implementation of the above options cannot be achieved, human activities have to be limited to daylight hours, with no activity at dusk, dawn and night.	NamPower/IPP
DESIGN OF TRANSMISSION LINE PYLONS	To minimise the risk of power line-bird collisions.	• Where new transmission line runs parallel to existing one, alternate position of poles of new and existing transmission lines to present a more visible obstacle. • Equip transmission line with Raptor ClampTM / OWL bird flight averting devices (or similar devices) to make them more visible to birds at night.[5]	NamPower/IPP

[5] https://preformed.com/energy/distribution/wildlife-protection/raptor-clamp-diverter

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
DESIGN OF NOISE DAMPING	To reduce noise levels of turbines and other noise generating equipment in order to conserve the brown-hyena habitat.	• Consider noise dampening design options for turbines and other noise-generating equipment to conserve the brown-hyena habitat.	NamPower/IPP
DESIGN OF LIGHTING	To minimise the effect of lighting on avifauna.	• Ensure lighting is bird friendly. • Avoid the use of bright, skyward-orientated lighting for the facility, except where necessary for civil aviation purposes. • Mark top of large cranes with low intensity red light.	NamPower/IPP
DESIGN TO MINIMISE VISUAL IMPACT AND ACHIEVE AVIATION SAFETY	To minimise the visual impact of the wind turbines.	• Design Engineers investigate paint patterns that are broken on a lower viewpoint and form coherent safety patterns from an aircraft viewpoint. • Use bird-friendly turbine lighting. • Eliminate or minimise additional light sources, e.g., at site substation. • Prescribe underground cabling between each turbine and the site substation to minimise visual impact. • Place transmission line route to the eastern side of the existing line from the road. • Adhere to Civil Aviation Regulations with regard to the colour of the turbines (**Appendix E**).	NamPower/IPP Periodical design review.
POVERTY ALLEVIATION AND GENDER EQUALITY	To ensure that the project renders the maximum level of poverty alleviation possible, and to	• During drafting of tender documents, NamPower (or appointed labour consultant) shall include provisions designed to maximise the use of local labour. All unskilled labour shall be sourced from local	NamPower. //Kharas Regional Council. Criteria design.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
	promote gender equality in economic opportunities. Optimise local service and contractor procurement. Optimise expenditure to local companies.	communities, i.e. Lüderitz. Specific recruitment procedures shall be discussed with the //Kharas Regional Council and spelled out. • The Proponent shall ensure that local firms enjoy preference during tender adjudication, subject to the provisions of the Public Procurement Act. • The Proponent shall consider how to structure the various components of the projects so as to optimise benefits to local contractors and SMEs. • The Proponent shall include provisions in all contracts to ensure gender equality, i.e. equal access to all positions, given personnel qualifications including aptitudes, experience, skills and abilities.	Tender / Bid review. Central Procurement Board of Namibia.
TENDERING PROCESS	Ensure all environmental and social requirements are included in all contracts of contractors involved in the project.	• Ensure this ESMP and the Tsau//Khaeb National Park Management Plan is included in all contracts. • Ensure adequate budgeting and financial provision is allowed for the items in the above documents.	NamPower

5.2 Construction Phase

Responsibility: The **NamPower** shall take ultimate responsibility for these aspects, with delegation to the applicable project operator, and the various contractors.

Table 4 Management Requirements - Construction

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
ENVIRONMENTAL MANAGEMENT	To ensure adherence to the ESMP.	• The Proponent shall appoint an Environmental Control Officer (ECO) to coordinate and monitor the adherence to the Tsau//Khaeb (Sperrgebiet) National Park Management Plan and this Environmental and Social Management Plan (ESMP), as well as the external environmental audit process. • NamPower should initiate the establishment of an environmental working group with the relevant stakeholders such as MEFT, Namdeb, Sperrgebiet Diamond Mining, and Lüderitz Town Council, which will actively be involved in the project implementation as a consultation body. The role of the group shall be to act as the communication link between the project and the various stakeholder groups and authorities, channelling information to assist timeous responses and to assist in the speedy, yet sustainable implementation of the project. The group will play an advisory role in practically following the spirit and requirements of the Tsau//Khaeb (Sperrgebiet) National Park Management Plan and the ESMP, the access and security requirements of the Sperrgebiet, as well as the external environmental audits. The group should be convened at least three months before site establishment. Following the establishment, the Developer (NamPower and the IPP) shall both be actively involved in the group, depending on each project's construction timeline.	NamPower, ECO, MEFT. Scope of responsibility. Quarterly performance review. See section 5.3.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• The ECO is responsible for the coordination of and liaison with the MEFT work group. • All management and development decisions and activities shall be based on the principle of Sustainability and on the Precautionary and Polluter Pays Principles (See Tsau//Khaeb (Sperrgebiet) National Park Management Plan). • Implement an external environmental audit system on a quarterly basis during construction and on an annual basis during the operation of the Wind Park. This shall be used to verify the effectiveness of the ESMP and implement adjustments if required.	
ACCOMMODATION AND PERSONNEL MANAGEMENT	To ensure that the impact of personnel is minimised.	• No personnel shall be accommodated on site, except for security guards on duty (to be agreed on with MEFT, MME, Namdeb and Sperrgebiet Diamond Mining Company). • No permanent accommodation facilities shall be allowed on site. • The daily transport of personnel to and from site needs to be agreed upon with the above organisations and authorities. • It is envisaged that the majority of personnel will be from Lüderitz, in order to reduce pressure on local housing and services. The onus will be on every employee to make arrangements regarding housing in Lüderitz.	NamPower, IPP, ECO, MEFT. Periodical review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
EMPLOYEE AWARENESS RAISING	To ensure that the entire construction workforce is aware of the provisions of this ESMP and the reasons for enforcing them.	• All staff shall receive an induction course prior to commencing work. The ECO shall discuss the ESMP and Code of Conduct (CoC) with all employees and make sure that all understand the contents and importance thereof. • Photographs of specific sensitivities such as vegetation, brown hyena, etc shall be used to sensitise the workforce. • The employees shall be explained why this ESMP is being enforced, i.e., the need to protect the environment. • Constant reinforcement is crucial. • New employees who join the project later shall receive an induction course before they commence with work. • Acknowledgement of attending the induction course and understanding the contents of it shall be signed off and the attendance register kept on record. • Personnel performance appraisal shall include environmental compliance issues.	ECO. Induction and reinforcement plan and records.
HEALTH, SAFETY AND SECURITY	To aim for zero incidents and accidents on the construction site. To ensure there are emergency response procedures in place in case of incidents and accidents.	• MEFT team shall be allowed to do site inspections at any time. • Some parts of the project could however pose a safety risk to the MEFT staff if they do not inform the site supervisor beforehand of their intention to visit the site. • The site supervisor shall therefore be contacted before the intended visit so that he/she can inform the MEFT staff of the necessary safety requirements before entering the site.	MEFT, ECO, Contractor. HSE Management Plan and procedures. Approvals and periodical review records.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
	To ensure security measures are in place to protect property and life for the duration of the contract.	• MEFT shall also be made aware that they will be required to wear the necessary PPE (Personal Protective Equipment) on site. • The Contractor shall ensure the least potential safety hazards during construction. The Contractor's plan to achieve this shall be discussed at the project initiation meeting. • The Contractor shall liaise with the Traffic Authorities for their approval of road use and the conditions to be imposed. • Proper traffic and safety warning signs shall be placed at the construction site to the satisfaction of the Engineer and the Roads Authority. • The Contractor shall adhere to the regulations pertaining to Health and Safety of the Labour Act, including the provision of protective clothing, failing which the Contract may be ended with immediate effect. • The contractor shall enforce relevant Health and Safety Regulations for these specific activities. • Staff will be trained in the appropriate use of PPE and the potential consequences if it is not used. The use of PPE shall be enforced. • Make sure that all staff are equipped and know how to use safety and personal protective equipment (PPE). This includes safety goggles, ear plugs, dust masks, steel-toed shoes, gloves, overalls, etc. • Signage indicating the use of PPE will be required at appropriate locations. • All hazardous materials shall be stored (on bunded area), handled and disposed of according to the applicable MSDS, as well as applicable regulations (e.g. the Health and Safety Regulations).	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Hazard identification signage shall be erected at appropriate locations. • All items for treatment as specified in the material safety data sheets (MSDS) for hazardous materials shall be available in the first aid kit. • Keep a comprehensive first aid kit at construction points. • Ensure that all staff know where the first aid kits are located and who is trained in first aid. • At least one person must be available on site that is trained in first aid. • All injuries and near miss incidents will be reported to the Engineering Representative (ER) and recorded in a Health and Safety report to be submitted to the developer's operational manager on a monthly basis. Measures to prevent recurrence shall be implemented and included in the monthly report. • Establish an emergency rescue system for evacuation of injured people, if needed. • Emergency procedures for accidents shall be communicated to all employees. • Emergency facilities are available at Lüderitz (police, fire brigade, and hospitals). Emergency telephone numbers shall be prominently displayed in the site office as well as on the outside of the site office. • Contact details of the contractor's representative and the second in charge must be forwarded in writing to the Lüderitz Town Council. • The Lüderitz fire brigade shall be informed in a case of fire as soon as possible. Do not wait until the fire is out of control.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• No alcohol/drugs are allowed on site and anyone found to be under the influence of alcohol/drugs will be disciplined accordingly. • All drivers must adhere to traffic regulations at all times. No speeding shall be allowed. • All vehicles shall use the 4-wheel drive mode only on site. • The speed limited at the construction site will be 30km per hour. • No driving on site shall be allowed after 19h00, unless with agreement (permission) from relevant authorities. • Make sure all drivers/operators have licenses for the vehicles/equipment they are driving or operating. Copies of these records must be kept on file and must be readily accessible for inspection. • Fire extinguishers (with valid service date) shall be readily available at the construction site office. Staff members from the construction team must be designated and trained to handle emergency situations such as fires, and trained to handle the necessary emergency equipment. • Emergency procedures shall be in place for incidents and accidents on site and staff trained in these procedures. • Indiscriminate movement outside the construction areas shall be avoided. The maximum area to be used for construction should be demarcated. • It is important that the necessary precautions be taken to protect property against theft. • Nobody shall carry any firearm, or store it in his vehicle or at the construction site.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Dangerous areas shall be clearly marked and access to these areas controlled or restricted. • All visitors shall report to the site office before entering the construction site. No visitors shall be allowed on site without the permission of the contractor's representative , and without receiving safety induction. • Train people who handle fuels in the correct procedure / technique to transfer fuels. • Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts, etc. immediately. • Good driving and adherence to safety rules will result in a minimum number of road and workplace accidents. • Fire extinguishers shall be available at all high-risk areas. Staff shall be trained to handle such equipment. • Provide an AIDS awareness programme to all staff. • Food catering and preparation shall be done by the Contractor in an enclosed space only, using gas/electrical/solar cooking methods. • No fires shall be lit on the construction site. • Smoking is prohibited in areas where it is a fire hazard, e.g., fuel storage areas, workshops, etc.	
CONSERVATION OF THE NATURAL AND HISTORICAL ENVIRONMENT	To minimise damage to soil, vegetation, habitat and heritage resources during the construction phase.	• At the outset of construction, the NO-GO areas shall be clearly set out (**Appendix A**) • At the outset of construction (and during construction as may be applicable), the ECO and the contractor shall visit all areas to be	Contractor's representative and ECO, in collaboration with the NBRI and MEFT.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		disturbed, including the access road and other areas. Work shall be carefully planned before entering the worksite to limit the total footprint of the operations: o at the substation and support facility to 300m by 300m maximum, o at each WTG worksite to 4000m^2 and incorporate the crane erection section along the access road and o reduce operational WTG worksite footprint to 2300m^2 each, o at access roads, reduce all internal access roads to 4.5m wide with inside turning radius of 30m and 8m wide bends. • Access and parking at work sites shall be planned and organized in order to facilitate the work intended at each site while preventing the creation of new tracks around work sites. • Areas to be disturbed shall be clearly demarcated with small pole markers, and no land outside these areas shall be disturbed or used for construction activities. The pole markers shall remain in place during the operation of the project and shall be removed during decommissioning. • A Botanist or rehabilitation specialist in conjunction with the ECO and NBRI shall be responsible for the plant relocation (Refer to **Appendix B** for a list of plants that need to be rescued). • In the case of relocation on-site, plant survival shall be assessed for several years, notably each growing season when others of this species in the area are found to have come into flower or leaf. Monitoring Method to be determined by rehabilitation practitioner involved.	Activity planning approval and review of plan. See Vegetation Management Plan (review and monitoring). Audit and review periods.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Record all succulent species in order to contribute to a national succulent atlas. • Information on the entire procedure shall be published or made available online so as to contribute to future rescue/relocation attempts in the Tsau//Khaeb (Sperrgebiet) National Park/southern Namib. • Fixed point photography, initiated prior to construction activities, shall be extensively utilized. • Consult the ECO before any new areas are disturbed which have not yet been visited. • No off-road driving shall be allowed. • All vehicles must stay strictly in the one track made – be careful to drive carefully in this track and not to deviate from it. • Turning points for vehicles should be designated. • No plants shall be removed in the project area by any member of the construction team, including sub-contractors. • Note that the collection of animals, plants and minerals is prohibited in all Namibian National Parks. • If any Namaqua chameleons are encountered during construction activities, they need to be carefully removed and relocated to an undisturbed area in the Park. • No animal shall be killed intentionally, chased, baited or harassed, and no eggs shall be removed from a bird's nest, nor may the nest be tampered with or damaged.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Staff should be particularly aware of the behaviour of the brown hyena and a protocol should be established for encounters. Consult a park warden or specialist to assist, and include a set of rules (e.g., no feeding, no leaving of food remains, no chasing of wildlife, etc.) developed together with researchers. Staff should be briefed on a regular basis. These rules are to be included in the employment contracts. • Any staff members caught in such an activity shall be handed over to the relevant authorities and shall be dismissed/disciplined according to their employment contract. • Avoid small mammal / reptile and bird nesting. Do not hurt, kill, or unnecessarily disturb birds or animals. • Keep an eye out for ground nests and mark their position to avoid accidental destruction. • Ask a bird specialist for advice on protocols regarding particular nests. • No wood shall be collected from the construction area. Meals shall be provided and prepared only by the Contractor, using only electrical and/or gas cooking methods in an enclosed area (no fires/firewood). • Avoid unnecessary noises such as hooting. • Any transgressions of Park rules shall immediately be communicated to the ECO who will take the necessary action.	
CONSTRUCTION ACTIVITY HALTED DURING BROWN HYENA DENNING	To minimise construction activity during denning in the vicinity of dens.	• Avoid construction activity or reduce to minimum when brown hyena dens are active • Dens to check are located at: o Lat -26.7874, Lon 15.1667	ECO, Contractor

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		o Lat -26.7939, Lon 15.1689	
ARCHAEOLOGICAL SITES	To ensure a proper chance-find procedure for archaeological sites.	• Under the Heritage Act of 2004, it is illegal to remove a fossil or an archaeological site without the consent of the National Heritage Council of Namibia. Should any new finds come to light at any stage during the construction phase, the site shall be demarcated to prevent damage. • The chance-find procedure provided in **Appendix D** should be in place.	ECO, Contractor.
ROAD CONSTRUCTION/UPGRADING AND DRIVING	To ensure the making of roads are kept to a minimum, so as to avoid unnecessary damage to the fragile desert plains. To ensure the roads used are well maintained. To ensure that track discipline is maintained at all times by the entire construction team. To minimise amount of dust generated.	• Do not make new roads when the quality of existing roads deteriorates. Repair or upgrade existing roads. Bitumen surfacing on internal access roads is not recommended, since this will complicate their rehabilitation, but tarring strategic portions, e.g. at bends could be considered. • Road construction methods shall ensure good road surfaces to preclude vehicles driving off road to find smoother surfaces with less corrugations or potholes. • Do regular road maintenance to ensure good road surfaces i.e., grading of the road once every two weeks (or as frequently as necessary) during the construction phase. The road should also be sprayed with water and biodegradable dust suppressor (grey water if available) once a day to limit dust pollution. A proposal could be made to the contractor's representative if it is found that the dust suppressor keeps down the dust for longer than one day, in which case the daily restriction may be extended. • Demarcate areas that are prone to corner cutting to avoid such.	ECO, Contractor. Planning and design review at each step of approval. Continuous monitoring and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Activities causing dust shall be limited along access roads by keeping to the driving speed (30 km/hr) on all tracks in the project area. • As far as possible existing tracks within the present servitude shall be utilized for both construction and maintenance. These shall be clearly indicated, together with designated turning points. • Vehicles driving along the Project Area shall engage four wheel drive to prevent spinning and consequent impacts on fragile desert surfaces. • Large vehicles shall have right of way and light vehicles shall leave the road (at the designated areas) to allow for an oncoming heavy vehicle to pass. • In order to promote visibility and communication between drivers (and prevent accidents with consequent environmental impacts) vehicles shall always be driven with their lights on and indicators as per road traffic rules shall be used on the Project Area. • Markers shall be used to delineate the chosen access tracks into the construction area. • Erect warning signage at the access points to warn motorists about construction activities and heavy vehicle movement where appropriate. • Only use designated turning circle areas. Use 3-point turns and not U-turns. • Prevent shortcuts between roads. • Tyre pressures should be as low as possible to reduce impacts. • All material for road or site construction to be brought in from outside of Park area and to be approved by the ECO.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Put a dust suppressant on the road, with regular re-sprays scheduled when the existing coat is no longer efficient. • Roads no longer in use shall be rehabilitated. (See Rehabilitation section).	
WASTE MANAGEMENT AND WATER RESOURCE MANAGEMENT	To avoid potential surface and groundwater pollution. To ensure that sound waste management practices are adhered to during construction.	• The Contractor shall submit a waste management plan, including how it is intended to dispose of hazardous and general waste, as described hereunder. This plan shall be reviewed and approved by the ECO • All sewerage waste shall be removed regularly and disposed of at a designated sewerage treatment facility (i.e. not to be disposed of anywhere at the construction site). • The site should be inspected regularly for standing or leaking water or wastewater points and attended to immediately. Brown hyenas will be attracted to the site of such, if spills are not attended to timeously. • Make sure that portable chemical toilets to be used on site are in good working order and that they are clean. Cleaning record should be kept on site and readily accessible for inspection. • All waste (including domestic and construction waste) produced daily shall be sorted and taken out as the team leaves the park (or as arranged with MEFT). • No waste shall be buried. • All recyclable waste shall be taken to a recycling depot. • Adequate separate containers for hazardous and domestic waste shall be provided on site. They shall be clearly marked. • The workforce shall be sensitised to dispose of waste in a responsible manner and not to litter.	ECO. Management plan approval and periodic monitoring and review. Design planning and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• The construction area shall be kept free of waste at all times. All construction sites shall be cleaned on a daily basis before leaving the construction site. • Provide sufficient waste bins at work sites. Make sure that all waste is removed from work and campsites. • Refuse bins must be stable, i.e. cannot be tipped by animals, and have scavenger and baboon proof lids. • Make sure that the bins are covered so that plastic bags, paper, etc., are not blown away. • Make sure that the bins are regularly emptied and the waste taken to an appropriate waste disposal site (i.e. Lüderitz for general waste and a reputable hazardous waste collection company to be contracted to remove hazardous waste). • No waste shall remain on site after completion of the project. • Servicing of vehicles in the field or at the construction site is not permitted. • Drip trays shall be available for all heavy vehicles that are intended to be used during construction. These trays shall be placed underneath each vehicle while the vehicles are parked. The drip trays shall be cleaned every morning and the spillage handled as hazardous waste. • Accidental spills shall be cleaned immediately. The contaminated soil shall be treated as hazardous waste. • In the event of a hazardous spill: o Immediately implement actions to stop or reduce the spill.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		○ Contain the spill. ○ Arrange implementation of the necessary clean-up procedures. ○ Collect contaminated soil, water and other materials and store it in an appropriate container for later disposal at the Walvis Bay hazardous waste disposal site (or removal by Wesco Salvage) ○ All spills shall be reported and a "spills register" kept. ○ A hazardous material spill kit shall be available at the construction site and there shall be at least one person with appropriate authority who is trained in hazmat response. • Refuelling vehicles shall be equipped with specific vehicle spill kits. Drivers shall be trained in relevant spill response procedures. • Explosives shall be stored according to the prescribed regulations. • Designated areas for the storage of potentially hazardous material shall be lined with concrete. The bunded area shall be of adequate capacity to contain 1,2 times (120%) the volume of the hazardous material to be stored in the bunded area, unless otherwise specified in relevant regulations and standards. • Corrosive, explosive, toxic, and flammable material shall be stored in separate areas. • All hazardous materials (such as oil) shall be stored in separate containers (concrete liner, container, or metal or plastic drip tray) and stored for transport and proper disposal at an approved waste disposal site or for collection by an oil recycling company such as WESCO Salvage (this	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		company collects significant quantities of oil from central locations throughout the country). • The nearest Hazardous waste disposal site is in Walvis Bay but WESCO Salvage removes hazardous waste from Lüderitz and shall they or any other available and reputable contractor shall be contacted to remove all hazardous waste. No hazardous waste shall be burned. • Fuel tanks on site shall be properly bunded. The volume of the bunded area shall be sufficient to hold 1.2 times (120%) the capacity of the storage tanks. The floor of the bunded area shall be concrete and the sides high enough to achieve the 1.2 times (120%) holding capacity. • Foam fire extinguishers shall be in close proximity to fuel kept on site. There shall be trained personnel to operate and handle this equipment. At least two extinguishers shall be placed at every fuel storage area. • The contractor shall utilise water only as specified in the approved water resource plan for the project. • Water shall be used sparingly and all faulty and leaking taps, toilets and pipes shall be immediately repaired.	
BORROW MATERIAL AND BORROW PITS	Use of soil and rock from the site for construction purposes.	• Only materials from commercial borrow-pits shall be used for construction. No soils on site shall be used for construction except for material excavated for foundations, and compaction of in-situ material for roads.	ECO, Contractor. Record management and review.
REHABILITATION	Re-establishment of pre-disturbance form and ecological	• Rehabilitation should be done in the following manner: o Compacted areas such as where tracks crossed gravel plains shall be ripped by using picks and rakes, avoiding parallel furrows that will	Design of rehabilitation and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
	function (soil crusts, plants and animal burrows).	promote erosion. o Ripping shall occur to full rooting depth. On gravel plains a depth of about 50 mm should be adequate as this will break down the compaction without loosening too much of the soil. o The disturbed area shall be remodelled to, as far as possible, resemble previous conditions and fit in with the adjacent landscape. o Ripping should only be done of compacted, disturbed areas, NOT of vegetated areas. The areas to be ripped should be carefully marked off before this process is initiated. ***Continuous supervision of this process is required.*** o Soil and gravel shall be raked from adjacent areas to try and recreate the same texture and look as surrounding areas. Stones shall be redistributed with rakes so that the surface texture resembles the surroundings. o Where applicable, surfaces shall be swept using brooms to fill in the spaces between the stones with the fine sand and to remove visible borders and edges. o To promote re-establishment of surface crusts on the gravel plains or in areas of powder sand, a fine spray shall be sprayed over the swept soil to simulate rain. o In order to prevent re-disturbance of rehabilitated tracks, physical barricades (e.g. rocks or sign boards) shall be implemented as an interim deterrent. All district personnel will be allowed to use the existing access/servitude roads. Any temporary roads (i.e. turning points for heavy vehicles) will be closed and rehabilitated.	Audit rehabilitation. Apply Vegetation Management Plan.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
No Go Zones and technical ridge	To protect sensitive habitats.	• New impacts to these habitats shall be avoided at all costs. No movement of vehicles or personnel on foot are allowed. • Project workers shall be informed of the sensitive aspects of these habitats to avoid aimless wandering around on these sites. With the extended nature of this project even the impact of human footprints over a long period of time can have a significant impact on sensitive habitats.	NamPower, ECO, contractor. Exclusion planning, weekly monitoring, monthly review and immediate rectification. Audit as per section 5.3
REHABILITATION	To rehabilitate the site office, work sites, servitude areas, tracks and other areas disturbed during construction as close to their original state as reasonably possible.	• All equipment, waste, temporary structures, stockpiles, etc., shall be removed from the work sites. • Final payment shall not be issued unless the environmental consultant is satisfied with the obligations listed under this section ("rehabilitation"). • Main contractor shall be held responsible for all unnecessary damage due to non-compliance, whether caused by his/her company or by subcontractors.	Contractor's representative, ECO Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan.
REHABILITATION MONITORING	To ensure successful rehabilitation.	• During the first month of rehabilitation, monitoring is very crucial and it is recommended that the ECO visit all rehabilitated sites at least twice a week. During this visit, the ECO shall check for any signs of erosion and check the progress on re-establishing the surface crust. Any indications of unsuccessful rehabilitation shall require that the rehabilitation process to be repeated again and at this point it shall be necessary to gain the expertise of a desert rehabilitation specialist.	NamPower, ECO. Design of rehabilitation and review. Audit rehabilitation.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• The ECO shall oversee the project and implement management and monitoring recommendations. • Workers shall be familiarized with the management recommendations and contractually bound to its stipulations. • The ECO shall conduct regular site inspections and submit reports in this regard to the MEFT and EWG.	Apply Vegetation Management Plan

5.3 Operation and Maintenance Phase

Responsibility: The Operator shall be responsible to ensure all obligations are being met and shall audit them at least annually.

Table 5 Management Requirements – Operation and Maintenance

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
CONTINUITY OF SOCIAL AND ENVIRONMENTAL MANAGEMENT	To ensure continuity of environmental and social management actions once the Wind Park is operational.	• Implement an external environmental audit system on an annual basis during the operation of the Wind Park. This shall be used to verify the effectiveness of the ESMP and implement adjustments if required. • The ECO shall provide staff with appropriate guidelines for environmental management during operation of the Wind Park, including: o All relevant provisions contained in the "construction" ESMP such as keeping a complaints register, sound disposal of hazardous and general waste, track discipline, health and safety precautions, etc. o Keeping a complaint register. o The ECO shall design a record system for environmental, health and safety incidents and accidents along this pipeline. • All contractors to be working on site during operation and maintenance, should have an Environmental Management Plan as part of their contract (see "Construction" section.)	NamPower/IPP Periodic review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
CONTINUOUS MONITORING - VEGETATION	Successful relocation and rehabilitation of vegetation.	• In the case of relocation on-site, plant survival shall be assessed for several years each growing season when others of this species in the area are found to have come into flower or leaf. • Monitoring of the success of relocation and rehabilitation shall be done every 6 months. • Information on the entire procedure shall be published or made available online so as to contribute to future rescue/relocation attempts in the Tsau//Khaeb (Sperrgebiet) National Park/southern Namib.	Site operations Manager. ECO. Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan
CONTINUOUS MONITORING – BROWN HYENA	To determine the long-term effect of noise of turbines on Brown Hyena community.	• Monitoring of operation of wind parks (especially noise) on the movement of Brown Hyena as per the camera trap monitoring plan.	Site operations manager. ECO. Specialist access and research support plan. Monitoring review.
CONTINUOUS MONITORING – BIRDS & BATS	To determine the long-term incidences of bird and bat mortalities during the operational phase of the project.	• Implement bird and bat monitoring programmes during the operational phase that includes searches for bird and bat mortalities, as per financing institution (e.g., IFC) requirements. Searches should follow detailed protocols and should, at least initially, be intensive (e.g., daily for the first two months) to gauge scavenger effects, after which search protocols may be amended.	Site operations manager, ECO in collaboration with avi-fauna specialist. Specialist access and research support plan. Monitoring review.

5.4 Decommissioning Phase

Responsibility: NamPower/IPP shall consider these aspects in conjunction with the ECO and EWG.

Table 6 Management Requirements - Decommissioning

COMPONENT	TARGET	MANAGEMENT/MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
DECOMMISSIONING	To ensure that the project does not have cumulative negative effects after decommissioning.	• All provisions under the Construction section shall be applicable for all contractors during decommissioning. • No waste may remain on site after completion of the project. • Eradication of all exotic or invasive plants shall be conducted before decommissioning. • Implement staff severance packages according to labour legislation and inform staff of this step in advance. • All areas used during the construction and operation (haul roads, site offices, etc.) shall be cleared and inspected for decommissioning approval by the EWG. Before approval, the contractor shall still be liable for any costs to ensure proper decommissioning.	NamPower. ECO. Employer's and contractor's representative. Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan. MEFT to review and approve final decommissioning results.

APPENDIX A Maps of no-go zones with coordinates

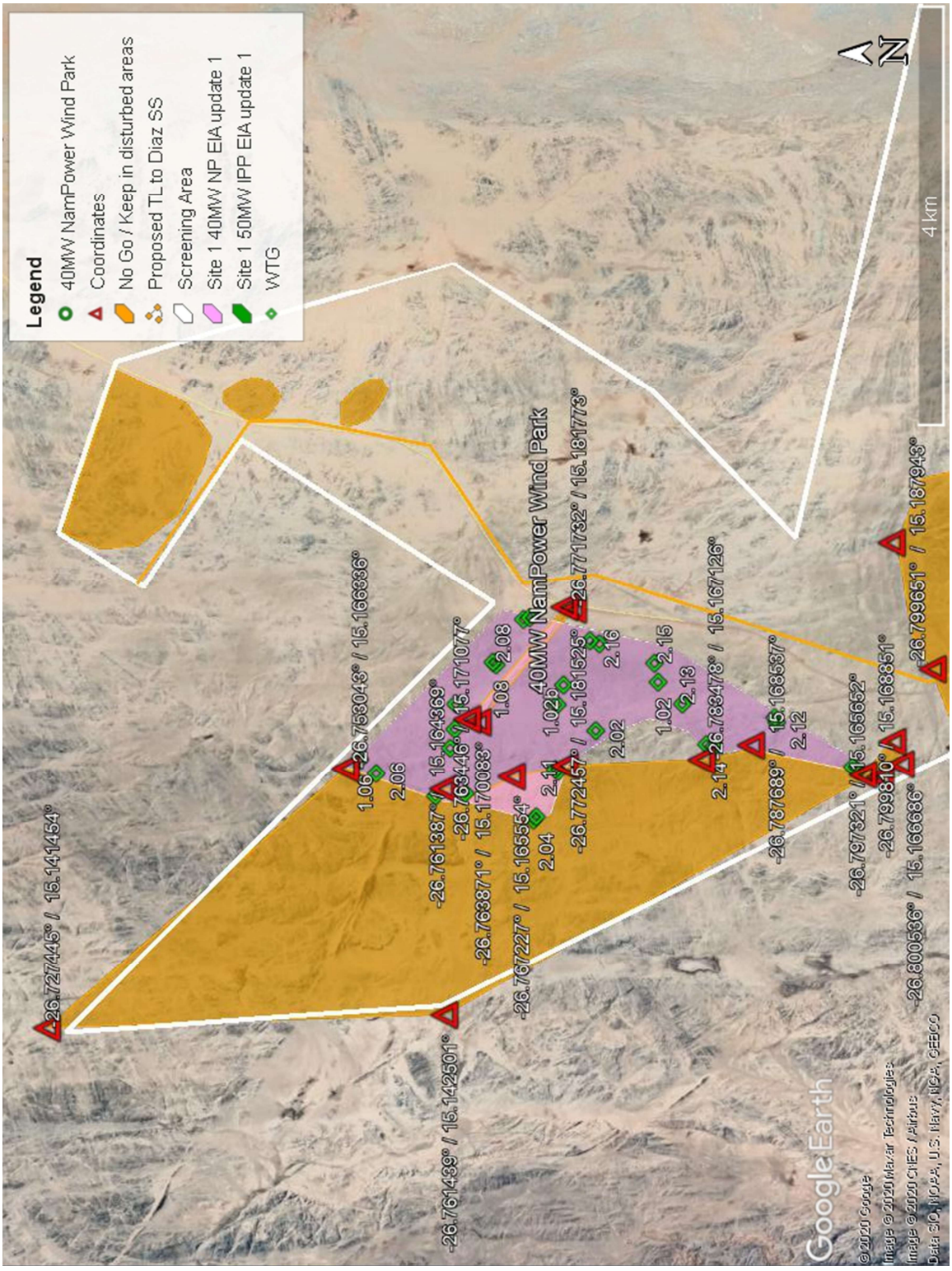

Figure A-1: 40 MW NamPower Wind Park No-Go Zone with coordinates (IPP/NamPower in conjunction with the vegetation specialist will adjust the coordinates, where necessary, before construction pending the placement of final WTB's and other infrastructure)

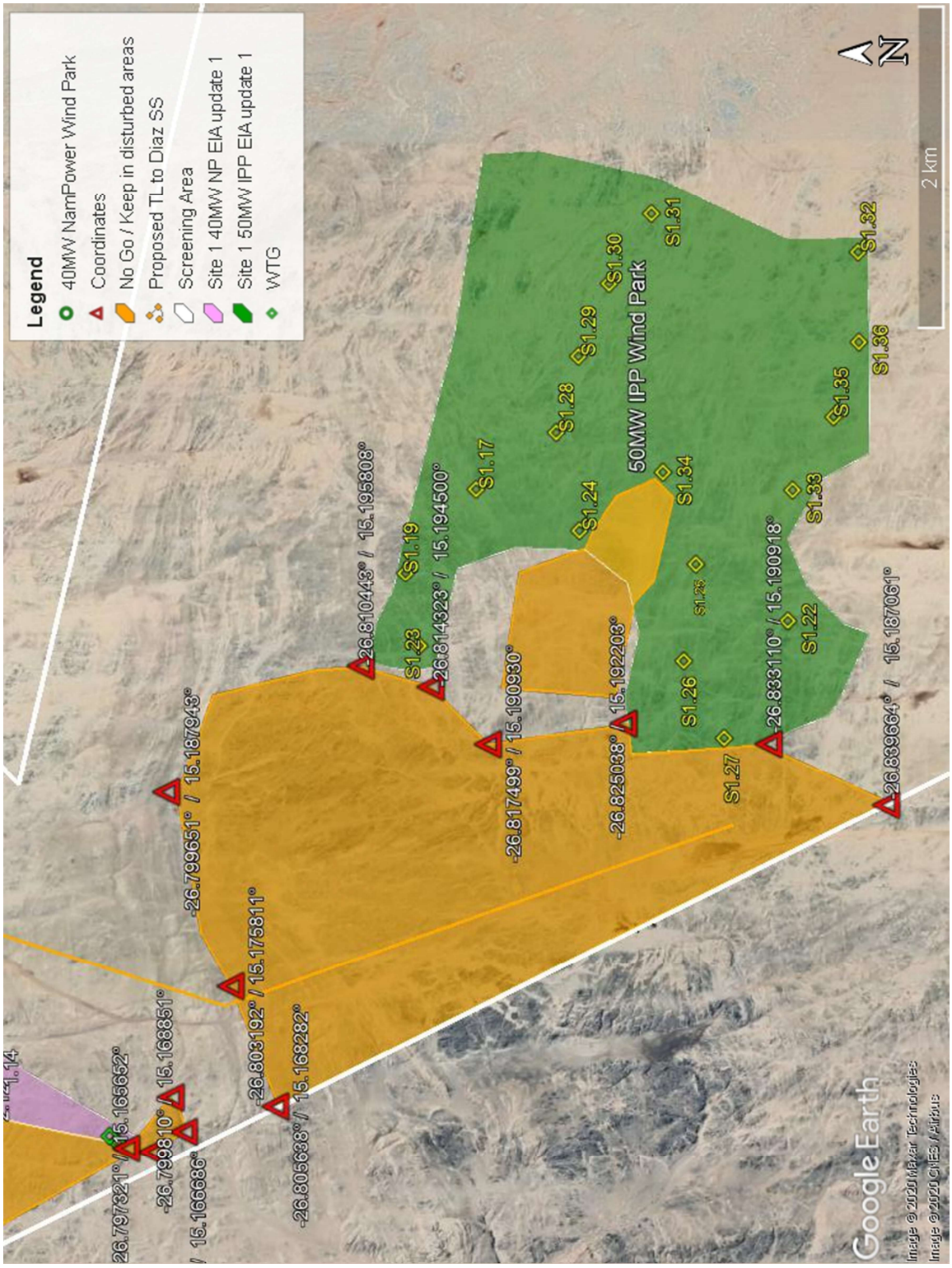

Figure A-2: 50 MW IPP Wind Park No-Go Zone with coordinates (Note that the vegetation specialist will confirm the zones and the coordinates will be updated)

APPENDIX B Vegetation Management Plan

The primary goal is to avoid unnecessary damage and to mitigate unavoidable damage to habitats and plants of conservation concern.

The purpose of rescue and rehabilitation would be to try and minimize the number of individuals of conservation concern that would be physically destroyed during the project development, and to try and restore the habitat as far as possible so that the natural biota, including plants could eventually, over time, re-establish itself in the project area.

The approach taken to prevent and mitigate damage will determine whether or not plant relocation is an essential part of rehabilitation efforts. If it is, then it will be necessary to do some preliminary field trials to determine the best methodology for plant rescue, and to assess whether the success rate of transfer is high enough to justify such efforts being made. Table B-1 lists species that might warrant special rescue and/or relocation efforts.

Table B-1: Species of conservation concern that might warrant translocation or rescue, depending on numbers of individuals to be affected by the project.

Species of conservation concern	**[Evaluation Criteria]**				**[Remark]**
D = dominant; A = abundant; F = frequent; O = occasional; R = rare	Protected	Red Data Status	Habitat A: Lüderitz Peninsula Dwarf Shrubland	Habitat B: Lüderitz Plain Dwarf Shrubland	Comments
Antimima dolomitica (Dinter) H.E.K. Hartmann	X	NT	-	O	Restricted distribution
Brownanthus namibensis (Marloth) Bullock	-	LC	F	O	Restricted distribution
Euphorbia angrae N.E.Br.	-	LC	O	-	Restricted to coastal fog zone of the southern Namib
Euphorbia verruculosa N.E. Br.	-	LC	O	F	Restricted to the dense coastal fog zone from just north of Lüderitz to Chameis Bay
Juttadinteria deserticola (Marloth) Schwantes	X	VU	F	O	N/A
Lithops optica (Marloth) N.E.Br.	X	NT	O	O	Restricted distribution, increasingly threatened by mining and illegal collecting
Pelargonium cortusifolium L'Hér.	-	-	F	F	Restricted distribution but reasonably common. Possibly useful to National Botanic Garden.
Key (Colour coding):	Near Endemic				
	Endemic				

The process to be followed:

a. Once the final sites for the turbines have been fixed, the area of unavoidable and certain damage should be mapped. This should include all zones of collateral damage, such as crane pads and internal access roads. Areas of permanent or repeated damage throughout the life of the facility due to infrastructure and access during operation and maintenance should be distinguished from temporary damages (those which will only be damaged during construction and which are thus worth rehabilitating).

b. Road planning should be done in such a way as to restrict approach and access to No Go Zones (Appendix A).

c. A field reconnaissance should be undertaken to assess the areas zoned for damage to estimate whether the numbers of plants of species of conservation concern to be destroyed warrant the expense of rescue and relocation efforts. This will depend on the final location of the turbines and roads etc.

d. If there are not enough plants of sufficient conservation concern to warrant such efforts then a plan should be put in place to store topsoil in a position necessary to facilitate natural transport by prevailing winds over compromised areas. Even if it is necessary to rescue and relocate plants this policy of carefully placing topsoil heaps to the south and slightly west of the areas from which the soil has been removed should be observed.

e. If rescue/relocation efforts are warranted then trials should be carried out on a limited number of plants of each species of concern to try and determine the best method to be used, as well as to assess the overall success of relocation. At least two methods should be tried:

    1. Simple transplanting and watering in. The plants must be very carefully dug out, taking care to damage the root system as little as possible, and must be replanted equally carefully. The sites for relocation must be carefully chosen so as not to compromise other plants of concern that may already be there.

    2. Transplanting, watering in and weighing down or supporting with small rocks.

f. The plants should be reassessed in monthly over a period of six months and then quarterly over one year to gauge success and decide which methodology is the most successful.

g. If the plants translocate successfully then ideally a systematic plan should be put in place to undertake such rescue throughout construction. At present it seems that the logical approach would be for construction to start on designated turbines, and as the work moves, plants could be moved

successively from each new construction area to one where construction is complete. This would probably entail some manual transport of the topsoil back to the area it came from, as it would not be practical to wait for natural transport to take its course.

The most important mitigating and restoring activities that can be undertaken are:

- To demarcate roads clearly before construction starts, and to strictly enforce adherence to these demarcated tracks by ALL VEHICLES AT ALL TIMES, with punitive penalties for those who transgress. Uncontrolled vehicle activity is of major concern. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy construction vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The areas used should be constrained as far as possible and should be rehabilitated once construction is complete if it is unlikely that they will be damaged again during the life of the project.
- To store topsoil downwind of where it is removed, as previously discussed.

Monitoring

Once roads are demarcated, fixed point photography before construction activities can be used to assess overall compliance.

Several permanent transects, as well as fixed point photography should be used for at least three years, preferably longer, after construction, to monitor rehabilitation success. These should be repeated annually after the rainy season (i.e.: in September/October).

The condition of any plants of high conservation concern, such as *Lithops* for instance, that are transplanted must be assessed annually during late September to early October for at least three years to determine translocation success.

Critical Habitat Assessment Summary

Lüderitz Peninsula dwarf-shrubland

The rocky ridges and outcrops and sandy valleys that cover the Lüderitz Peninsula and areas directly to the south and east would be affected by the north-western section of the project. This habitat is characterised by a predominance of low, often succulent, shrubs and perennial herbs, including *Brownanthus marlothii, Zygophyllum clavatum, Lycium tetrandrum, Euphorbia chersina* and *Pelargonium cortusifolium*. Forty-three species were found here, of which more than half are endemic or near-endemic. Of the nine (9) endemic species found on site in this habitat during the study, two (2) are protected and seven (7) are range-restricted (including both of the species that are protected). *Lithops optica* is of special concern because it is already becoming rarer on the peninsula due to illegal collecting. *Euphorbia angrae* and *E. verruculosa* have patchy distributions and are also of high concern. Of the 17 near-endemic species found here, 5 are protected. Table B-1 summarises the species of conservation concern in both habitats. It does not include all endemics or all protected species, only those that warrant consideration in the context of this project by virtue of range and/or protected status. Figure B-1 shows an example of an area in the Lüderitz Peninsula dwarf-shrubland. It should be noted that there are smaller habitats within the broader area – they do not necessarily all resemble this photograph.

Figure B-1: The Lüderitz Peninsula dwarf-shrubland is characterised by rocky ridges and sandy valleys that carry numerous range-restricted plant species.

Lüderitz Plain dwarf-shrubland

The sandy-gravel plains with low rocky (often quartz) outcrops further to the south and east of Lüderitz would be affected by the south-eastern section of the project (Figure B-2). This habitat is characterised by sandy areas with small hummocks where *Zygophyllum clavatum* and *Othonna furcata* dominate together with *Salsola* c.f. *zeyheri* and *Brownanthus marlothii*. The plains are interspersed with quartz outcrops where *Brownanthus namibensis* is often dominant, and small succulents, such as *Conophytum saxetanum* and *Psammphora modesta* occur together with *Pelargonium* spp. and *Limeum deserticolum*. Twenty-seven (27) species were found here, of which more than 60% are endemic or near-endemic. Of the 8 endemic species three (3) are protected and seven (7) are range restricted, including all three (3) of the protected species. Of the nine (9) near-endemic species found here, five (5) are protected.

Assessment: Both habitats are classified as **Critical Habitat** due to presence of endemic, range-restricted species, as well as unique assemblages of species.

Figure B-2: A quartz ridge in the sandy-gravel plains in the Lüderitz Plain dwarf-shrubland. These ridges are noted for carrying important species, such as Lithops, which are not easily visible unless there have been recent rains or heavy fogs.

Discussion

The Namib Desert harbours numerous endemic and near endemic plant species, of which many are of restricted distribution or habitat. This makes them extremely vulnerable to disturbance. A number of them are also formally protected under Namibian legislation. In instances where it is impossible or impractical to prevent destruction of these species *in situ* it may be desirable in some instances to initiate rescue or relocation missions for individuals at risk. The purpose of the second phase of this work is:

- To identify the plants for which rescue and relocation is necessary in the footprint of the proposed project.
- To make recommendations on where rescue plants should be relocated. It is generally not acceptable to damage pristine areas for the purposes of relocation unless the plants in question are of very high conservation concern.
- To do field trials to determine the best strategy for successful plant rescue and transplanting operations.
- Initiate monitoring programs to evaluate success of the relocation and rehabilitation exercises and methods.
- To consult with the engineers to ensure that, above all, every possible effort has been made to avoid damaging sensitive habitats and species.

The purpose of this work will not be to simply recommend rescue of individual plants or species, but to know the reason and purpose for any rescue efforts, as well as to make recommendations on monitoring of translocated plants and ecosystem restoration.

APPENDIX C Example of Environmental Penalty System

This is only an example and must be reviewed and compiled for site conditions by the ECO and the Environmental Working Group.

The following fines and penalties are in place for transgressions listed below. It shall be issued after the non-compliance procedure has been duly followed. The ECO shall be the judge as to what constitutes a transgression in terms of this document.

FINES

Fines shall be issued per incident at the discretion of the ECO. Such fines shall be issued in addition to any remedial costs incurred as a result of non-compliance with the ESMP. The ECO shall inform the Operator of the contravention and the amount of the fine, and shall deduct the amount from monies due under the Contract.

Fines for the activities detailed below, shall be imposed by the ECO on the Operator and/or his Subcontractors:

Significant damage to areas designated as no-go zones. Significant damage to the construction site without a map in place specifying where construction/movement is permitted. Movement of the contractor on site before the vegetation specialist has identified sensitive vegetation and identified no-go zones.	N$ 20,000.00
Any person, vehicle, equipment, etc., related to the Operator's operations outside the designated boundaries, specifically within No-Go Zones.	N$3,000
Any person guilty of reckless driving on and in the vicinity of the site, including excessive speeds.	N$2,000
Any vehicle driven and items or materials parked or stored outside the demarcated boundaries of the construction site, specifically in No-Go Zones.	N$2,000
Person repeatedly caught trespassing outside the demarcated construction area.	N$1,000
Persistent and un-repaired spilling of hazardous materials and materials causing pollution.	N$3,000
Persistent littering on site.	N$500
Individuals repeatedly not making use of the designated toilet facilities.	N$200
Disposal of waste in a manner other than what was agreed upon on site or the prescribed method in the waste management plan section.	N$5,000
Deliberate non-compliance with Safety Policy	N$2,000

For each subsequent similar offence the fine may, at the discretion of the ECO, be doubled in value to a maximum value of N$20,000.

PENALTIES

Where the Operator inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.

The Operator is deemed NOT to have complied with this Specification if:

- within the boundaries of the site, site extensions and haul/ access roads there is enough evidence of contravention of the Specification;
- environmental damage due to negligence;
- destruction of vegetation within No-Go Zones
- Safety of Operator personnel and public being compromised due to negligence;
- the Operator fails to comply with corrective or other instructions issued by the Engineer within a specific time;
- the Operator fails to respond adequately to complaints from the public; and
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The ECO shall be responsible for a Report on the non-repairable damage and / or non-compliance with visual and other evidence as well as issuing the penalty to the Operator with the report attached. A copy shall be handed to the Environmental Working Group.

The following penalties are suggested for transgressions:

Oil spills:	A penalty equivalent in value to the cost of clean-up operation plus N$1,000.
Damage to sensitive environment:	A penalty equivalent in value to the cost of restoration operation plus 20%.
Impact on birds:	A penalty to a maximum of N$2,000 for damages to any natural occurring birds.
Accident due to safety negligence:	A penalty to a maximum of N$50,000 for injuries to personnel or public.

APPENDIX D: Archeology Chance Find Procedure

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found in the course of development works. The procedure set out herein covers the reporting and management of such finds.

Scope: The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): " a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator	To exercise due caution if archaeological remains are found.
Foreman	To secure site and advise management timeously.
Superintendent	To determine safe working boundary and request inspection.
Archaeologist	To inspect, identify, advise management, and recover remains.

Procedure:

Action by person identifying archaeological or heritage material includes the following:

a) If operating machinery or equipment stop work.

b) Identify the site with flag tape.

c) Determine GPS position if possible.

d) Report findings to foreman.

Action by foreman:

a) Report findings, site location and actions taken to superintendent.

b) Cease any works in immediate vicinity.

Action by superintendent:

a) Visit site and determine whether works can proceed without damage to findings.

b) Determine and mark exclusion boundary.

c) Site location and details to be added to project GIS for field confirmation by archaeologist.

Action by archaeologist:

a) Inspect site and confirm addition to project GIS.

b) Advise NHC and request written permission to remove findings from work area.

c) Recovery, packaging and labelling of findings for transfer to National Museum.

In the event of discovering human remains:

a) Actions as above.

b) Field inspection by archaeologist to confirm that remains are human.

c) Advise and liaise with NHC and Police.

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

APPENDIX E: Civil Aviation requirements

The obstacles and their positions as contained in Appendix A are limited to the following maximum elevations (AMSL):

1. All obstacles within the proposed **North-west (40MW NamPower) site** are to be limited to the maximum elevation of **264m AMSL**;

2. All obstacles within the proposed **South-eastern (50MW IPP) site** and bounded by the area with the following coordinates:

i) 26 48 10.40771 S, 15 10 33.64057 E

ii) 26 49 02.95813 S, 15 13 50.60654 E

iii) 26 49 20.53740 S, 15 13 44.65326 E

iv) 26 48 27.98474 S, 15 10 27.67958 E

are to be limited to the maximum elevation of **264m AMSL**;

3. All obstacles within the proposed **South-eastern (50MW IPP) site** and bounded by the area with the following coordinates:

i) 26 48 27.98474 S, 15 10 27.67958 E

ii) 26 49 20.53740 S, 15 13 44.65326 E

iii) 26 49 48.94284 S, 15 13 35.42516 E

iv) 26 48 56.38673 S, 15 10 18.43900 E

are to be limited to the maximum elevation of **278m AMSL** ;

4. Obstacles which lie outside of the OLS are not limited to a maximum elevation AMSL but authorisation will still need to be obtained from the Namibia CAA.

5. If NamPower requires the turbine height to penetrate the OLS a full PANS-OPS assessment will be required. The PANS-OPS assessment will then facilitate NamPower to negotiate approval with the Namibia CAA.

OR

B. The Screening areas' Maximum Permissible Elevations be used when investigating positions for any obstacle associated with the NamPower Lüderitz Wind Power Plant:

1. The area bounded by the following coordinates:

i) 26 43 54.84720 S, 15 12 01.12680 E

ii) 26 44 00.18974 S, 15 12 19.22404 E

iii) 26 44 10.48860 S, 15 12 22.57441 E

iv) 26 44 03.37017 S, 15 12 12.10695 E

are to be limited to the maximum permissible elevation of **254m AMSL** for all obstacles within it;

2. The area bounded by the following coordinates:

i) 26 43 42.72433 S, 15 11 20.06492 E

ii) 26 43 54.84818 S, 15 12 01.12804 E

iii) 26 44 10.48860 S, 15 12 22.57441 E

iv) 26 45 44.18174 S, 15 12 53.06236 E

v) 26 46 45.57234 S, 15 12 08.79893 E

vi) 26 47 29.17343 S, 15 11 18.31091 E

vii) 26 48 16.74855 S, 15 15 04.48910 E

viii) 26 49 14.84957 S, 15 14 54.68726 E

ix) 26 49 14.49840 S, 15 14 21.66000 E

x) 26 49 12.24199 S, 15 13 47.34793 E

xi) 26 49 20.53740 S, 15 13 44.65325 E

xii) 26 48 22.27352 S, 15 10 06.29354 E

xiii) 26 45 40.24610 S, 15 08 36.16922 E

xiv) 26 43 44.69870 S, 15 08 27.69252 E

xv) 26 45 56.46532 S, 15 10 55.95582 E

xvi) 26 44 38.94618 S, 15 11 51.88335 E

xvii) 26 44 08.92787 S, 15 11 01.49885 E

are to be limited to the maximum permissible elevation of **264m AMSL** for all obstacles within it;

3. The area bounded by the following coordinates:

i) 26 48 22.27352 S, 15 10 06.29354 E

ii) 26 49 20.53740 S, 15 13 44.65325 E

iii) 26 49 48.94284 S, 15 13 35.42515 E

iv) 26 48 58.53186 S, 15 10 26.47257 E

are to be limited to the maximum permissible elevation of **278m AMSL** for all obstacles within it ;

4. Obstacles which lie outside of the OLS are not limited to a maximum elevation AMSL but authorisation will still need to be obtained from the Namibia CAA.

5. If NamPower (or IPP) requires the turbine height to penetrate the OLS a full PANS-OPS assessment will be required. The PANS-OPS assessment will then facilitate NamPower (or IPP) to negotiate approval with the Namibia Civil Aviation Authority (NCAA) and the Namibia Airports Company (NAC).

The marking and/or lighting of obstacles are intended to reduce hazards to aircraft by indicating the presence of the obstacles. It does not necessarily reduce operating limitations which may be imposed by an obstacle.

5.1.2 Aeronautical Ground Lighting (AGL) provides flight crew with location, orientation and alignment information in adverse visibility conditions and at night. Below is an example of a Precision Approach Path Indicator (PAPI), as used by the pilot during final approach to land.

The units are normally installed on the left hand side of the runway, viewed from the approach; a right hand installation is permitted if it is not practicable to position them on the left or if a second set is required.

5.1.3 These are protected by:

- Preventing them from being obscured;
- Preventing the installation and display of other lights, particularly street lighting, in a
- pattern or colour which could be mistaken for visual aids;
- Preventing a high level of background lighting which could diminish their
- effectiveness;
- Preventing other lights which could confuse pilots.

5.1.4 All structures and buildings in and around an airport, treated as an obstacle, shall be clearly marked and identified in accordance with the requirements of ICAO Annex 14, Chapter 6.

5.1.5 Steady burning, red, aeronautical low intensity type "A" obstruction lights must be fitted to the masts, to clearly define the outline of the structures, in accordance with the requirements of ICAO Annex 14, Chapter 6.

APPENDIX F: Transport route

- The recommended route follows Bismarck Street from the Harbour up to Bay Road and then leaving Lüderitz, continue along the B4 eastbound up to the Kolmanskop/Elizabeth Bay Road and the follows the Elizabeth Bay Road to the site (refer to Figure F-1).
- The final route will have to be checked for compliance during the final design stages of the project. Permits will need to be obtained from the Roads Authority the relevant road authority for all abnormal loads and the specific route will be specified based on the characteristics of each load type.

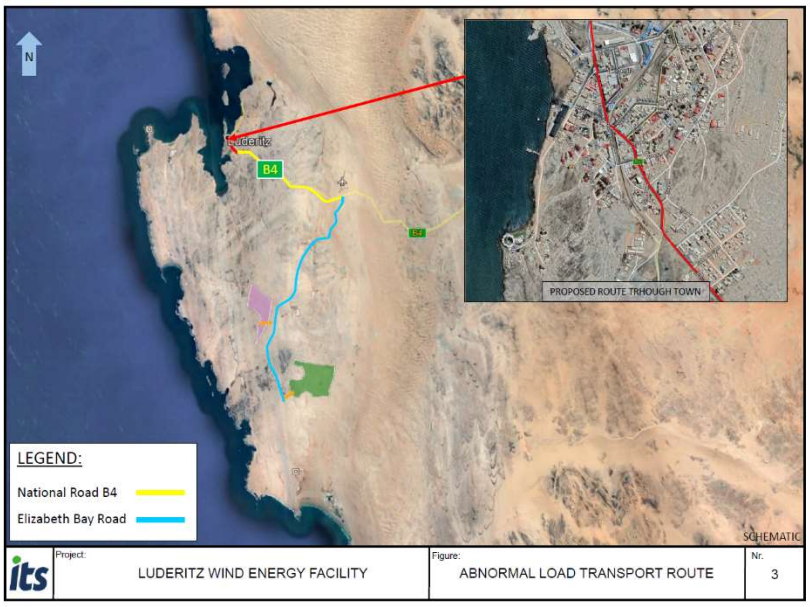

Figure F-1: Recommended abnormal transport route

It is recommended that construction and abnormal load traffic should be limited to outside the typical traffic peaks in build-up areas. Traffic officials should assist abnormal load vehicles through Lüderitz.

Considering all the above transportation matters, as well as restrictions of MEFT, Namdeb and the Sperrgebiet Diamond Company, a Traffic Management and Transportation Plan should be devised in collaboration with and approval of the Roads Authority.