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# Operational Environmental Management Plan (EMP) for the existing Naukluft Camp

**EMP**

**Final**

**June 2023**

**Namibia Wildlife Resorts**



**GCS Project Number: 21-1081**

**Client Reference: EMP Naukluft Camp Site**



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## 1 OVERVIEW

### 1.1 Project Background

Namibia Wildlife Resorts (NWR) is a state-owned enterprise, mandated to run the tourism facilities within the protected areas of Namibia. NWR has several operations across the country which are owned and managed by NWR. Environmental Clearance was granted on 7 June 2017 (**Appendix B**) to Namibia Wildlife Resorts (NWR) for the operation and maintenance of the NWR Resorts located in the Namib-Naukluft National Park namely Naukluft Camp.

In accordance with the Environmental Management Act No 7 of 2007 and the Environmental Impact Assessment Regulations of 2012 the Environmental Clearance Certificate (ECC) is only valid for three years and as such the ECC expired. As part of the application for the renewal of the expired ECC, an Environmental Management Plan (EMP) Compliance Audit has been conducted and subsequently the EMP for the project has been reviewed and updated. The EMP is herewith updated as part of the application to apply for the ECC renewal for the activities at Naukluft Camp.

### 1.2 Naukluft Camp

Naukluft camp site (24.26561°S; 16.23911°E) is situated about 250km from Windhoek, and 91km from Sesriem. The locality of the Naukluft Campsite is depicted in **Figure 1-1** below.

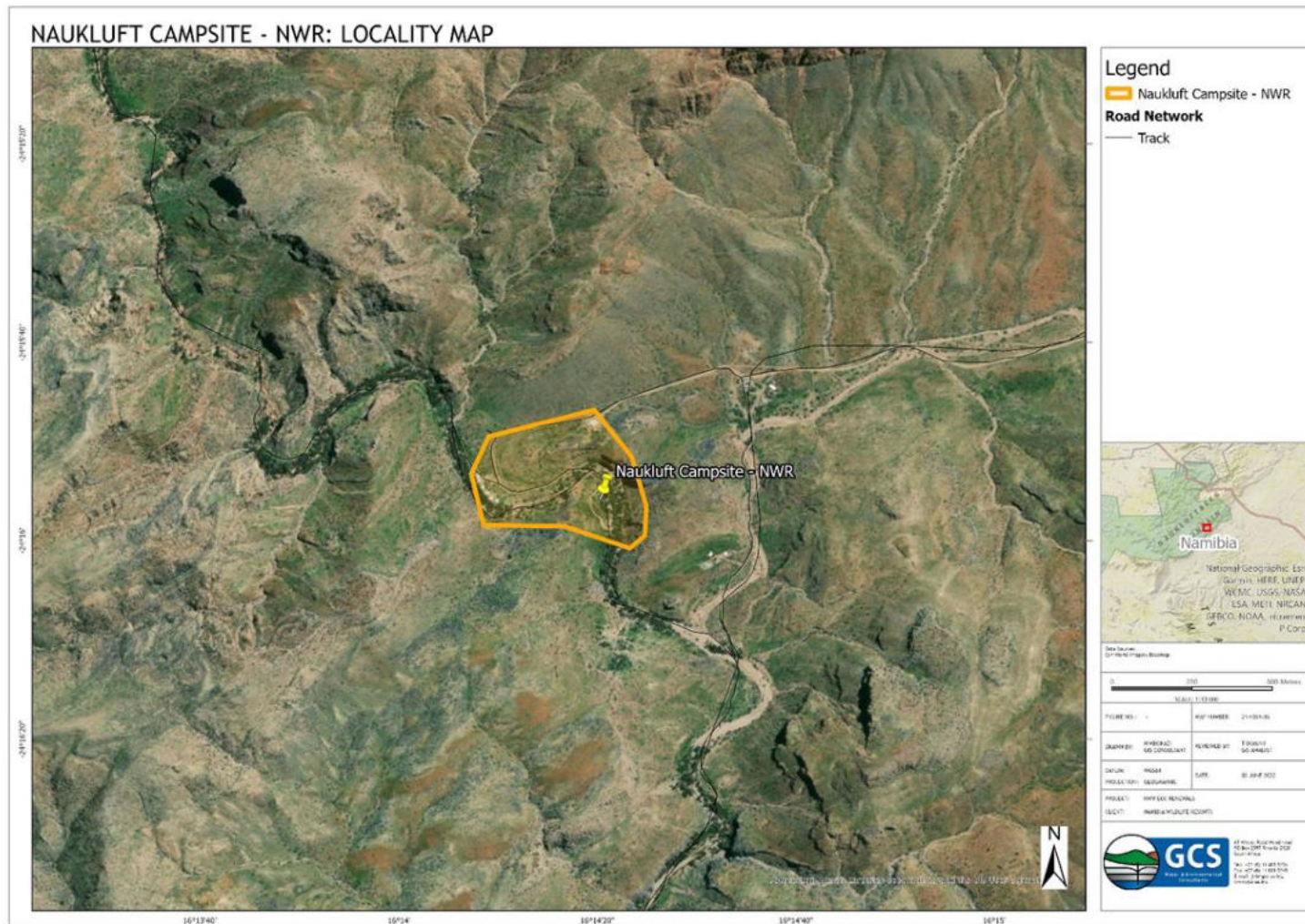


Figure 1-1: Locality map of Naukluft Camp

### **1.2.1 Accommodation facilities**

The resort includes the following accommodation facilities:

- 21 Campsites
- 6 Chalets

Other facilities available at the resort include restaurant, bar and natural rock pools.

### **1.2.2 Engineering Services**

#### **1.2.2.1 Waste Disposal**

The general waste at Naukluft camp site is collected onsite in designated waste bins in 4 categories by types of waste (glass, plastic, metals, and other) as shown in **Figure 1-2** below. The waste is then loaded on a truck and disposed of at the waste collection site at Naukluft (**Figure 1-3**). A contractor then collects the waste and takes it to the existing dumping site at Rehoboth.

As per the Namib-Naukluft National Park Management Plan (2013) all “sites which generate domestic solid waste such as bottles, plastics, tins and paper should have a fenced repository area for storage of this waste before it is transported out of the park to the nearest designated authorized landfills”. There shall be no voluntary disposal of any form of waste in all protected areas of the Republic of Namibia. A suitable waste storage facility must be constructed to serve as a waste retention device prior to transportation out of the protected area. No permanent waste disposal is allowed inside the park. Where solid waste needs to be temporarily stored, this must happen within an enclosed and secured area that prevents litter being blown out and solid waste must equally be transported securely (Ministry of Environment Forestry and Tourism, 2021). As such, the waste collection site at Naukluft is not compliant and the site must be fenced and it should be ensured that only domestic solid waste is temporarily disposed here before it is transported out of the site.

It should be noted that the EIA for the Rehoboth dumping site is currently ongoing and the application for an ECC will be made by the consultants of the Rehoboth Town Council.





Figure 1-2: General waste collection on site



Figure 1-3: Temporary waste collection site

#### 1.2.2.2 Water

Naukluft Camp site uses borehole water for domestic use and treated water for landscaping.

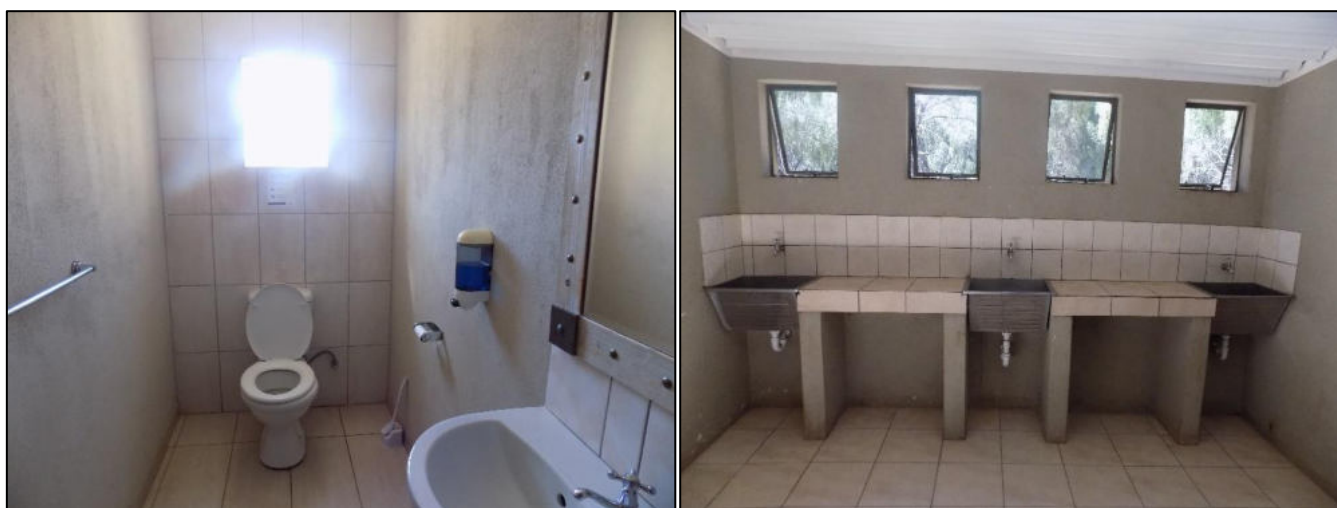


### 1.2.2.3 Electricity

Naukluft Camp site uses solar energy as a source of electricity.

### 1.2.2.4 Sewer

Naukluft camp has a centralized sewer system in place and has a wastewater treatment plant on site (**Figure 1-4**). The treated water is used for landscaping on site. NWR needs to apply to the Ministry of Agriculture, Water and Land Reform (MAWLR) for an effluent discharge license.



**Figure 1-4:** Ablution Facilities on site

### 1.2.2.5 Access

Access to Naukluft Camp site is gained through the C19 road from Solitaire.

## 1.3 Archaeology

Naukluft camp is situated in proximity to the Namib Sand Sea. The Namib Sand Sea was inscribed on the World Heritage List on 2013 as depicted in **Figure 1-5** below. The Namib Sand Sea is the only coastal desert in the world that includes extensive dune fields influenced by fog. Covering an area of over three million hectares and a buffer zone of 899,500 hectares, the site is composed of two dune systems, an ancient semi-consolidated one overlain by a younger active one. The site is a world heritage site and should therefore not be further disturbed by the current and future activities taking place on the site. Management of the activities taking place within the Namib Sand Sea should comply with the provisions as per the Namib-Naukluft National Park Management Plan (2021).



Figure 1-5: Namib Sand Sea

#### 1.4 Purpose of the EMP

An Environmental Management Plan (EMP) is defined as:

*“...a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored.”*

An EMP is one of the most important outputs of the EA process as it synthesises all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the Environmental Impact Assessment (EIA) Process and the required environmental management on the ground during project implementation and operation. It is important to note that an EMP is a legally binding document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and should be amended to adapt to project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of this document is therefore to guide environmental management throughout the following life-cycle stages of the proposed development, operation, and decommissioning.

The following phases are addressed in this EMP:

- **Operation** - the period during which the facility is operational.
- **Decommissioning** - Should the development be closed; this phase will be implemented.

## 1.5 Environmental Assessment Practitioner (EAP)

GCS Water Environmental Engineering Namibia (Pty) Ltd (“GCS” hereafter) has been appointed by Namibia Wildlife Resorts (NWR) as independent environmental consultants to update the Environmental Management Plan (EMP) for the proposed development. The initial EMP was developed by Matrix Consulting Services in 2017. The EMP is to be submitted with the supporting documents as part of the application for the renewal of the Environmental Clearance Certificate (ECC) to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT). The EMP will also be used by Contractors as well as the Proponent in guiding them during the operations to ensure that impacts on the environment are limited or avoided altogether.

## 1.6 Legal Requirements

The contents of the EMP must meet the requirements Section 8 (j) of the EIA Regulations. The EMP must address the potential environmental impacts of the activity on the environment throughout the project life cycle. It must also include a system for assessment of the effectiveness of monitoring and management arrangements after implementation. NWR therefore has the responsibility to ensure that the proposed activity conforms to the principles of the EMA and must ensure that any contractors appointed by them also comply with such principles. **Table 1-1** below lists the relevant Namibian legislation that is applicable to the project.

**Table 1-1: Applicable and relevant Namibian legislations and guidelines applicable to the project**

Legislation	Permit/Approval/Requirement	Contact Details
Environmental Management Act 2007 Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	Amendments (required every 3 years) to this EMP will require an amendment of the ECC for these developments.  Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an ECC.  Activity 6 The construction of resorts, lodges, hotels or other tourism and hospitality facilities	Mr Damian Nchindo  Department of Environmental Affairs, Ministry of Environment, Forestry and Tourism  Tel: 061 284 2701

Legislation	Permit/Approval/Requirement	Contact Details
Water Act 54 of 1956	<p>Prohibits the pollution of underground and surface water bodies (S23 (1)).</p> <p>Liability of clean-up costs after closure/abandonment of an activity (S23 (2)).</p>	<p>Mr Witbooi (Department of Water Affairs):</p> <p>Tel: (061) 208 7226</p>
Water Resources Management Act No.11 of 2013	<p>The act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).</p>	
Forestry Act 12 of 2001	<p>The Act provides for the management and use of forests and related products / resources. It offers protection to any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse on land that is not a surveyed erven of a local authority area. In such instances, a licence would be required to cut and remove any such vegetation.</p> <p>These provisions are only guidelines.</p>	<p>If there are trees within the proposed footprint of the project area that need to be removed, the proponent should notify the local Forestry Department of the number and/or type of trees to be removed and apply for a permit to remove protected tree species.</p>

Legislation	Permit/Approval/Requirement	Contact Details
National Heritage Act (27 of 2004)	Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains. Section 48 ff sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Heritage sites or remains are defined in Part 1, Definitions 1, as “any remains of human habitation or occupation that are 50 or more years old found on or beneath the surface”.	Ms. Erica Ndalikokule National Heritage Council of Namibia erica@nhc-nam.org
Namibia Tourism Board Act 21 of 2000	To establish the Namibia Tourism Board and to provide for its functions; to provide for the registration and grading of accommodation establishments; to provide for the declaration of any sector of the tourism industry as a regulated sector and for the registration of businesses falling within a regulated sector; and to provide for matters incidental thereto.	Namibia Tourism Board info@namibiatourism.com.na +264 61 290 6000



Legislation	Permit/Approval/Requirement	Contact Details
National Policy on Tourism 2008	The National Policy on Tourism for Namibia aims to provide a framework for the mobilisation of tourism resources to realise long term national goals defined in Vision 2030 and the more specific targets of the Third National Development Plan, namely, sustained economic growth, employment creation, reduced inequalities in income, gender as well as between the various regions, reduced poverty, and the promotion of economic empowerment.	Department of Tourism and Gambling, Ministry of Environment, Forestry and Tourism +264 61 284 2178
Water Resources Management Act No 11 of 2013	Provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.  Part 13 of the Act relates to the control of water pollution.	Mr Beajah Wohler  Ministry of Agriculture, Water and Land Reform  Directorate Water Resource Management  Policy and Water Law Administration  Beajah.Wohler@mawf.gov.na
Petroleum Products Regulations Information Guide: Guidelines for operators of retail outlets, 2000	The document provides guidelines relating to the operation of retail outlets.	These guidelines are to be applied during the proposed development.
Petroleum Products and Energy Act (Act 13 of 1990) and Regulations (2001)	<ul style="list-style-type: none"> <li>Any facility intending to store fuel in bulk requires a Consumer Installation Certificate.</li> <li>S 4.12 prescribes the South African National Standards (SANS) as the criteria to which fuel installations must be constructed, operated and decommissioned.</li> <li>S 2 (1) requires a permit for the obtaining and use of up to 20 000 litres of used mineral oil per annum.</li> </ul>	NWR must ensure that Enercom complies with all provisions of the Petroleum Products and Energy Act and its Regulations (2001).  Ndamona Elias  Ministry of Mines and Energy - Inspector  Ndamona.Elias@mme.gov.na

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Legislation	Permit/Approval/Requirement	Contact Details
	<ul style="list-style-type: none"><li data-bbox="520 309 983 383">• Regulation 47 describes fire precautions.</li></ul> <p data-bbox="520 409 983 521">Regulation 46(2) requires the annual submission of Form PP/10 for all Consumer Installation certificate holders.</p>	

## 1.7 Assumptions and Limitations

This EMP has been drafted with the acknowledgment of the following assumptions and limitations:

- This EMP has been updated based on the existing Operational EMP as prepared by Matrix Consulting Services in 2017 for the proposed development. No detailed specialist studies were included as part of the assessment; and
- The mitigation measures recommended in this EMP document are based on the risks/impacts which were identified based on the provided project description and site investigation. Should the scope of the project change, the risks will have to be reassessed and mitigation measures provided will be revised accordingly.

## 1.8 Report Structure

This EMP lays out the management actions for the existing operations at the site. The EMP addresses the following phases:

- **Operation phase** - the period during which the facility will be operational and conducted by the proponent and/or their contractors; and
- **Decommissioning phase:** the period during which the Proponent may decide to discontinue the operations and its associated activities.

## 2 ENVIRONMENTAL AND SOCIAL BASELINE

The environmental and social baseline description has been adopted from the 2017 EMP as developed by Matrix Consulting Services.

### 2.1 Topography

The landscape of the Namib-Naukluft Park is predominantly flat with few ornamental plants scattered around. The area is mostly dry and relatively flat. Sand dunes and shrubs are noticed in most areas of the park.

### 2.2 Geology

The Naukluft Mountains are a segment of the great escarpment that forms the western border of the highland in the country's interior and separates it from the Namib Desert, situated at a much lesser altitude. Geologists believe that one giant piece of limestone moved westwards for about 120 km to become the Naukluft mountains today. The older one is around 12 million years while the younger ones cover the older system and has been active for about 5 years.

### 2.3 Hydrogeology

The water potential in the area is high due to the proximity of nearby water resources. Groundwater resources which are exploitable are limited and linked to the existence of alluvial aquifers created by ephemeral or even fossil rivers (Tsondab, Tsauchab and Koichab Rivers) (SLR Environmental Consulting (Namibia) (Pty) Ltd, 2021). The Tsauchab within proximity of Naukluft, is deeply incised into a thick calcrete layer, resulting in a permanent supply of water from a spring at the head of the canyon (SLR Environmental Consulting (Namibia) (Pty) Ltd, 2021).

### 2.4 Soils

The soils in the study area are shallow, with either bedrock or evaporate (usually calcrete) hardpan at shallow depth. Extensive physical weathering as well as erosion under arid and semi-arid are the dominant semi-arid conditions.

Substrates in the Naukluft area, which is a potential constraint to development, may be divided into three groups, calcrete ridges, turf pans and the intermediate area which has medium-sized to small loose calcrete blocks scattered on the surface between the calcrete and turf pans.

### 2.5 Fauna

The Namib-Naukluft Park is not really a wildlife destination. Visitors mostly go there to see the natural environment. There are a variety of creatures present, although not all of them are easily seen.

Oryx and Springbok are the most common of the big mammals - these desert-adapted antelope even inhabit the driest areas of the park. Closer to the rivers you can find klipspringer, steenbok, and troops of desert adapted baboons.

### 2.6 Flora

The Namib-Naukluft Park falls within the Southern Namib hyper-arid Desert and Coastal Biomes, with the Naukluft extending to above the escarpment into the Desert-Dwarf Shrub Transition of the Nama Karoo Biome. Camel thorn trees are dotted around the desert, usually along underground water systems. These classically Southern African trees have an impressive tap root system that reaches as far as 60 meters below the sand to access water. Not only are they able to tap into the underground water systems to allow them to survive the incredibly hot and dry days, but they are also adapted to survive frost.

The dominant vegetation on site consists mainly of large Ebony trees (*Euclea pseudobenus*), Buffalo thorn (*Ziziphus mucronata*) and riverine grass and shrubs. Thorn bush of acacia species are also present at the site.

## 2.7 Socio - Economic

Over the past 20 years the freehold land on the immediate eastern border of the Namib-Naukluft Park has increasingly turned from farming to wildlife, biodiversity, and landscape conservation. Today the mainland-use is low-impact tourism with some low levels of wildlife off-take in a few localities. Past land use in the western parts of Namibia was mainly small-stock farming. Land was partitioned into camps by thousands of kilometres of mesh and strand fencing. While many of the internal fences have been removed on farms now used for wildlife and tourism, the boundary fences generally remain.

The population in this area consists of farmers and the indigenous Topnaar communities. The Topnaar communities have lived in the river valleys for generations. They farm goats and cattle and are a permanent population in the park. Part of their rich heritage is evident in many place-names, such as Gobabeb meaning 'the place of the fig tree'. Recently government awarded this community with tourism concession rights to enter joint ventures with private tourism operators. There are other concessions in the area ranging from accommodation establishments, guided and self-guided 4x4 drives and tours, and horse and walking trails and campsites.

The Namib-Naukluft Park and surrounding areas represents one of the most visited tourist areas in Namibia. The Namib-Naukluft Park is one of the flagship parks in Namibia and there are 60 lodges surrounding the park mainly toward its eastern border. These and the number of concessions in the area provide a flow of local, regional, and national economic benefits from this area.

## 3 ROLES AND RESPONSIBILITIES

NWR (the Proponent) is ultimately responsible for the implementation of the EMP. The Proponent may delegate this responsibility at any time, as they deem necessary, from planning and design to operation and maintenance phase and decommissioning phase (if considered). The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Proponent's Representative; and
- Environmental Control Officer.



### 3.1 Proponent's Representative

If the Proponent does not personally manage all aspects of the operation and decommissioning activities, referred to in this EMP, they should assign this responsibility to a suitably qualified individual referred to in this plan as the Proponent's Representative (PR). The Proponent may decide to assign the role of a PR to one person for both phases. Alternatively, the Proponent may decide to assign a separate PR for each component i.e., operation, and decommissioning phase. The PR's responsibilities are included in **Table 3-1** below.

**Table 3-1: Responsibilities assigned to the Proponent's Representative for the operation and decommissioning phases.**

Responsibility	Project Phase
Managing the implementation of this EMP and updating and maintaining it when necessary	Throughout the lifetime of the project
Management and monitoring of individuals and/or equipment on-site in terms of compliance with this EMP	Throughout the lifetime of the project
Issuing fines for contravening EMP provisions	Throughout the lifetime of the project

### 3.2 Environmental Control Officer

The Proponent should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the life-cycle of the project to a designated person, referred to in this EMP as the Environmental Control Officer (ECO). The Proponent may decide to assign this role to one person for each project phase or may assign separate individual ECOs to oversee EMP implementation during each phase. The ECOs will have the following responsibilities:

- Management and facilitation of communication between the Proponent, PR and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting site inspections (recommended minimum frequency is bi-annually) of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

## 4 ENVIRONMENTAL MANAGEMENT PLAN ACTIONS

### 4.1 Key Potential environmental impacts to be managed.

The following key potential impacts have been identified per project phase and are summarised in **Table 4-1** below.

**Table 4-1: Summary of key potential environmental impacts per project phase**

	Project Phase	Potential impacts identified in the EA
1	Operation	Health and safety, soil, surface and groundwater contamination, wildlife disturbance, dust, noise, environmental degradation, erosion, archaeological and social impacts.
2	Decommissioning	Health and safety, soil, surface and groundwater contamination, wildlife disturbance, dust, noise, environmental degradation, erosion, archaeological and social impacts.

The aim of the management actions of the EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

Management actions recommended to manage the potential impacts outlined above are presented in the following tables. The management actions were compiled based on the two project phases:

- Operation and maintenance phase management actions (during operation of the facility) (**Table 4-2**).
- Decommissioning phase (**Table 4-3**)

The responsible persons at NWR should assess these commitments in detail and should acknowledge their commitment to the specific management actions detailed in the table of the next subchapters.

### 4.2 Phase 1: Operational Phase Management Actions

The management actions for the operational phase during which the facility is operational are listed in **Table 4-2**.

**Table 4-2: Operation phase management actions**

Environmental Feature	Impact	Management Actions
EMP training	Lack of EMP awareness and the implications thereof	<ul style="list-style-type: none"> <li>• Employees appointed for work (construction, maintenance etc.) must ensure that all personnel are aware of necessary health, safety, and environmental considerations applicable to their respective work.</li> <li>• A copy of the EMP should be available at the facility.</li> <li>• Employees appointed for work (construction, maintenance etc.) should be made aware by the PR of the provisions of the EMP that their work must comply with.</li> </ul>
Monitoring	EMP non-compliance	<ul style="list-style-type: none"> <li>• Appoint a Proponents Representative (PR) or delegate a member of staff to be the PR.</li> <li>• The PR must be a senior person reporting directly to the resort manager and NWR Environmental and Compliance Specialist at Head Office.</li> <li>• Establish an Environmental Management Committee (which comprises of the PR from each resort in the ENP and the Environmental Compliance Specialist) which meets regularly to discuss the implementation of this EMP, including water and power use (using figures collected for monitoring purposes during the month), management of litter, wise use of natural resources and adherence to park rules and regulations in this regard, etc.</li> <li>• The Proponent/PR should monitor the implementation of this EMP.</li> <li>• The PR should inspect the site at least on a monthly basis.</li> <li>• Bi-annual audits should be conducted of site activities by an external ECO.</li> </ul>

Environmental Feature	Impact	Management Actions
Illegal Harvesting of natural resources and poaching	Loss of Biodiversity	<ul style="list-style-type: none"> <li>• Ensure all staff, residents and local community members are aware of the park rules and regulations relating to the harvesting of natural resources (firewood) and the need for these.</li> <li>• Enforce regulations to prohibit stripping of natural vegetation.</li> <li>• Ensure that poaching in the park or on neighbouring land by staff, residents and local community members is not tolerated and that action is taken against any offenders in collaboration with MEFT.</li> </ul>
Waste Management	Visual impact and soil contamination	<ul style="list-style-type: none"> <li>• Formally adopt and implement a Solid Waste Management Plan (SWMP).</li> <li>• The site should always be kept tidy.</li> <li>• All domestic and general waste produced daily should be disposed of correctly.</li> <li>• No waste may be buried or burned.</li> <li>• Waste containers (bins) should be emptied regularly and removed from site to the nearest municipal waste disposal site. Records of collection should be kept for auditing purposes.</li> <li>• Set up a Waste Management Programme to include sorting of waste by separate waste streams for recycling wherever possible.</li> <li>• All recyclable waste needs to be taken to the nearest recycling depot.</li> <li>• Adequate separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.</li> <li>• Staff should be sensitised to dispose of waste in a responsible manner and not to litter.</li> <li>• No permanent waste disposal is allowed inside the park.</li> <li>• Domestic solid waste such as bottles, plastics, tins and paper should have a fenced repository area for storage of this waste before it is transported out of the park to the nearest designated authorized landfills.</li> <li>• Where solid waste needs to be temporarily stored, this must happen within an enclosed and secured area that prevents litter being blown out and solid waste must equally be transported securely.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>• Temporary waste storage facilities must be properly enclosed to prevent access by wildlife and pollution by wind-blown litter. These facilities must be approved by the MEFT and may hold waste for a maximum of 28 days; shorter periods will apply if high volumes accumulate, and health issues arise.</li> <li>• Transport of waste to storage or dumpsites must be in properly constructed vehicles or containers to ensure that no littering occurs in transit.</li> </ul>
Hazardous Waste	Soil and groundwater contamination	<ul style="list-style-type: none"> <li>• Adequate separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.</li> <li>• Hazardous waste should be disposed of at a facility that is able to receive such waste and records of disposal should be kept.</li> <li>• Maintenance and washing of vehicles and machinery on site should take place only at a designated workshop area that is on a bunded, impermeable surface.</li> <li>• Ensure that all bunded areas, e.g., in workshops and around generators, are regularly drained and cleared and that all material is safely stored on site until disposed of as hazardous waste at appropriate facility.</li> <li>• Set up a Contingency Plan to deal with minor and major pollution incidences e.g., oil spill clean-up kit available at all necessary points.</li> <li>• Liquid waste must be processed according to the most appropriate system, considering the practicalities, volumes of waste, availability of water, costs of disposal and environmental impact.</li> <li>• The MEFT and other relevant ministries must approve all liquid waste handling systems, which should comply with national standards and legislation.</li> <li>• The pollution of groundwater is to be avoided, but also monitored, if necessary, by enlisting the help of relevant government departments.</li> <li>• Any toxic substances and the disposal of the empty containers must comply with national regulations and the use of all cleaning and other potentially toxic substances must be approved by MEFT.</li> </ul>



Environmental Feature	Impact	Management Actions
Biodiversity	Loss of Biodiversity	<ul style="list-style-type: none"> <li>• Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.</li> <li>• Off-road driving should not be allowed on site.</li> <li>• No alien vegetation should be introduced on site.</li> <li>• Conduct regular checks to prevent alien and/or invasive plants from establishing.</li> <li>• No pets or domestic animals allowed in settlements as per standing park rules.</li> </ul>
Noise	Disturbance to fauna	<ul style="list-style-type: none"> <li>• Noise restrictions should be in place on site to minimise disturbance.</li> </ul>
Health and Safety	Health and Safety on site	<ul style="list-style-type: none"> <li>• Ensure first aid training and environmental awareness training is provided to staff.</li> <li>• Fire extinguisher training should be provided to a designated member of staff who will act as a fire marshal during fire events.</li> <li>• Any accidents/incidents occurring on site should be reported to MEFT and other relevant authority within 24 hours.</li> <li>• Ensure that adequate emergency procedures are in place to reduce the magnitude of the impacts in the event of an emergency.</li> </ul>
Health and Safety	Fire	<ul style="list-style-type: none"> <li>• Ensure adequate fire breaks and control of moribund material around and between infrastructures as needed.</li> <li>• Establish emergency procedures to allow for immediate action in the case of accidental fire and ensure that firefighting equipment is on hand and in good working order at all times and that all staff and residents are trained and understand procedures to be followed and how to use equipment.</li> </ul>
Fuel Facility and Storage	Health and safety Fire	<ul style="list-style-type: none"> <li>• Ensure all employees and contract workers having any function related to the fuel facility have the necessary knowledge and competence to carry out their delegated tasks in compliance with the EMP, especially those appointed to tasks that have the potential to cause significant environmental damage.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>○ A generic Induction Training Course should be delivered to all new employees.</li> <li>○ Reduce health and safety risks by ensuring effective worker competence, training, and awareness.</li> <li>• The fuel storage facility should be fitted with the required health and safety warning and information signage that is required and suitable for such installations.</li> <li>• Ensure that there are adequate and appropriate first aid provisions to respond to accidents in the facility.</li> <li>• Ensure safety during fuelling operations.</li> <li>• To reduce spills and avoid fires, the following procedures must be used when dispensing fuels:               <ul style="list-style-type: none"> <li>○ Never leave the area unattended when refuelling even if automatic shut-off nozzles are being used.</li> <li>○ Do not allow smoking in the workshop yard, especially when handling fuels.</li> <li>○ Turn off engines, electrical appliances and pilot lights while refuelling equipment.</li> <li>○ Connect a bonding line between the storage tank and vehicle before starting fill-up - a flexible, copper conductor, 12 gauge or larger is recommended.</li> <li>○ Turn off vehicles while refuelling.</li> <li>○ Perform all fuel transfers outdoors to prevent fumes from building up and creating a dangerous explosive environment.</li> </ul> </li> <li>• Install an adequate number of fire extinguishers at the site.</li> <li>• Use a carbon dioxide (CO2) fire extinguisher which is suitable for inflammable and combustible liquids and does not leave a harmful residue after use (as a dry chemical extinguisher does).</li> <li>• The fire extinguisher must be easily accessible in case of emergency (i.e., close enough to the fuel facility to be able to use immediately but not so close that the intensity of a fire would prevent it from being accessed).</li> <li>• Keep the area within 6m of the tanks clear of all vegetation and debris.</li> <li>• Check and maintain the extinguisher regularly.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>• Ensure electrical systems, such as pumps, are properly maintained to prevent sparks.</li> <li>• Ensure fuel lines, hoses, valves, and nozzles are in good condition.</li> <li>• Close the valves on tank discharges when they are not in use to prevent leakage through the hose or nozzle.</li> <li>• Ensure that gasoline is not used as a cleaning or degreasing agent (has inherent fire risk).</li> <li>• Material Safety Data Sheets that contain information on the potential hazards and how to work safely with the chemical product must be obtained from the supplier and should be available on site.</li> <li>• Ensure that any minor spills are cleaned up immediately.</li> </ul>
Employment	Recruitment	<ul style="list-style-type: none"> <li>• Local employment and use of local businesses/suppliers should be encouraged to promote and improve the local economy as far as reasonably possible.</li> <li>• Should the required services and/or goods not be available locally then look to other localities for these services/goods.</li> </ul>
Ablution	Sanitation	<ul style="list-style-type: none"> <li>• Separate ablutions should be available for men and women and should clearly be indicated as such.</li> <li>• Sewage waste needs to be removed on a regular basis to the nearest approved sewage disposal site.</li> <li>• Workers responsible for cleaning the toilets should be provided with latex gloves and masks.</li> </ul>
Sewage Management	Environmental pollution and underground water resources contamination from wastewater	<ul style="list-style-type: none"> <li>• Suitably qualified and/or skilled personnel should be appointed to run the wastewater treatment plant as required (which may include processing technicians, mechanical technicians, and electrical technicians) based on the technology employed and the relevant expertise required to ensure efficient operation of the plant.</li> <li>• Ensure that the sewage system is managed and maintained as per design and engineering specifications.</li> <li>• Ensure that all concerned staff are trained in critical health and safety issues regarding operation and maintenance of the sewage system components.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>• Ensure that all concerned staff are issued with the necessary safety equipment and protective clothing required for them to do their jobs safely and at no risk to their health.</li> <li>• Be on the lookout for leaking water pipes and any signs of environmental contamination resulting from the sewage infrastructure (encouraging residents to do the same) and take remedial action to resolve any identified problems as rapidly as possible.</li> <li>• Ensure that guests are informed of what may and may not be flushed in order to protect the sewage system.</li> <li>• Groundwater monitoring of known boreholes in the area, to determine if there is an impact. Mitigation measures should then be formulated.</li> <li>• The solid sludge produced should be disposed at a registered waste dumpsite.</li> <li>• Hazardous waste, including emptied chemical containers (e.g. liquid chlorine, sodium hypochlorite) and other chemicals used for disinfection in the operational phase should be safely stored on site where they cannot be reached and used by the unsuspecting and unformed locals for personal use.</li> </ul>
Water Management	Water saving Groundwater contamination	<ul style="list-style-type: none"> <li>• Water saving mechanisms should be implemented on site e.g., installation of water saving devices where practical.</li> <li>• Should any hazardous material and wastes be produced these shall be managed in a safe and responsible manner so as to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.</li> <li>• Hazardous and non-hazardous waste shall be stored separately at all times and should be disposed at a facility that is licenced to receive such waste.</li> <li>• In the event of a pipe burst, the burst pipe section must be isolated by closing the nearest valves on either side of the break.</li> <li>• A qualified plumber with water distribution pipeline experience must be contacted to repair such pipe breaks as soon as possible.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>• The plumber must repair the burst pipe by means of an approved method, and the repair must be tested by opening all the valves prior to backfilling of the trench.</li> <li>• Only once the repair is tested and confirmed to be correct may the pipe trench be backfilled.</li> <li>• Replace washers and seals on pipes fittings, taps and toilets when fittings leak.</li> </ul>
Archaeology	Archaeological Impacts	<ul style="list-style-type: none"> <li>• Should a heritage site or archaeological site be uncovered or discovered on site, a “chance find” procedure should be applied in the order they appear below:                             <ul style="list-style-type: none"> <li>○ If operating machinery or equipment, stop work;</li> <li>○ Demarcate the site with danger tape;</li> <li>○ Determine GPS position if possible;</li> <li>○ Report findings to the construction foreman;</li> <li>○ Report findings, site location and actions taken to superintendent;</li> <li>○ Cease any works in immediate vicinity;</li> <li>○ Visit site and determine whether work can proceed without damage to findings;</li> <li>○ Determine and demarcate exclusion boundary;</li> <li>○ Site location and details to be added to the project’s Geographic Information System (GIS) for field confirmation by archaeologist;</li> <li>○ Inspect site and confirm addition to project GIS;</li> <li>○ Advise the National Heritage Council of Namibia (NHCN) and request written permission to remove findings from work area; and</li> <li>○ Recovery, packaging and labelling of findings for transfer to National Museum.</li> </ul> </li> <li>• The development should comply with the provisions as outlined in the Namib-Naukluft National Park Management Plan in relation to the Namib Sand Sea World Heritage site.</li> </ul>
Traffic	Traffic Impacts	<ul style="list-style-type: none"> <li>• Introduce speed limits and signage within the facility.</li> </ul>

Environmental Feature	Impact	Management Actions
		<ul style="list-style-type: none"> <li>• Roads to be clearly demarcated.</li> <li>• No off-road driving to be permitted on site.</li> </ul>
Sense of place	Visual Impact	<ul style="list-style-type: none"> <li>• Educate staff and residents about the desirability of maintaining housing and residential facilities in good condition and the need for regular and ongoing maintenance activities.</li> <li>• Establish an NWR Housing Policy which determine the rules and regulations for the management of the NWR houses. The Housing Policy can call for a Housing Committee.</li> <li>• Check roofs for leaks and undertake repair work needed</li> <li>• Maintain the exterior walls of houses in good condition and in natural colours as per original design specifications.</li> <li>• Manage the use of existing and any new lighting in dwellings, floodlighting and security lights in order that light pollution does not become a problem.</li> <li>• Treat timber structures as required with (MEFT approved) environmentally friendly products.</li> </ul>

### 4.3 Phase 2: Rehabilitation and Decommissioning Management Actions

The facility is expected to be permanent and is not anticipated to be decommissioned. However, the decommissioning impacts have been assessed. The table below (Table 4-3) presents the management action for decommissioning phase, should this take place.

**Table 4-3: Decommissioning phase management actions**

Environmental Feature	Impact	Management Actions
Employment	Loss of employment	<ul style="list-style-type: none"> <li>The Proponent should inform the employees well in advance (no less than 6 months), of its intentions to close the facility, and the expected date of such.</li> <li>The Proponent should raise awareness of the possibilities for work within the tourism sector.</li> </ul>
Rehabilitation	Soil and Groundwater contamination	<ul style="list-style-type: none"> <li>An inspection of the soil and groundwater contamination must be undertaken to determine the presence, nature and extent of contamination on site.</li> <li>This will guide the level and kind of remediation to be undertaken on site.</li> <li>Prior to the infrastructure being destroyed, all residue products must be carefully removed for recycling or safe disposal.</li> <li>Solid materials must be used for filling. Only clean soil should be used for filling purposes.</li> </ul>
Waste Management	Pollution	<ul style="list-style-type: none"> <li>Contaminated soil must be removed from site and disposed at a facility that is able to receive such waste.</li> <li>No waste may remain on site after the closure of the facility.</li> <li>Waste must be disposed of at an approved waste facility. Proof of disposal certificates must be available.</li> </ul>

#### 4.4 Recommendations for Monitoring

In order to prevent and minimize the above-mentioned environmental impacts, the following site monitoring measures need to be done:

- Monitor whether provisions as set out in the EMP has been complied with.
- Non-compliance is to be recorded and discussed at weekly site meetings and timeous remedial actions taken.
- Monitoring feedback is to be recorded using the attached checklist (**Appendix D**).

### 5 CONCLUSION

Based on the recommendation given in this EMP, GCS is confident that the activities, as described in **Chapter 1** of the EMP may be granted an Environmental Clearance Certificate, provided that the EMP is implemented and that all the legal requirements pertaining to this development are complied with.



## 6 REFERENCES

Afromach Investment (Pty) Ltd. 2018. *OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN ( OEMP ) FOR NWR RESORTS IN ETOSHA NATIONAL PARK.*

Ministry of Environment and Tourism. 2013. *Namib Naukluft Park Management Plan.* [Online], Available: [http://www.met.gov.na/files/files/Namib Naukluft Management Plan.pdf](http://www.met.gov.na/files/files/Namib%20Naukluft%20Management%20Plan.pdf).

Ministry of Environment Forestry and Tourism. 2021. *Management Plan Namib-Naukluft National Park.*

SLR Environmental Consulting (Namibia) (Pty) Ltd. 2021. *EIA Scoping Report for the proposed developments / upgrades of park management infrastructure in the Coastal Parks of Namibia.*

**APPENDIX A: CV OF EAP**

**APPENDIX B: ECC PREVIOUSLY ISSUED**

## APPENDIX C: EMP COMPLIANCE AUDIT REPORT

**APPENDIX D: GUIDELINE ECO ENVIRONMENTAL MONITORING REPORT**

Reported by: .....

Date: .....

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
EMP training	Lack of EMP awareness and the implications thereof	<ul style="list-style-type: none"> <li>• Employees appointed for work (construction, maintenance etc.) must ensure that all personnel are aware of necessary health, safety, and environmental considerations applicable to their respective work.</li> <li>• A copy of the EMP should be available at the facility.</li> <li>• Employees appointed for work (construction, maintenance etc.) should be made aware by the PR of the provisions of the EMP that their work must comply with.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
Monitoring	EMP non-compliance	<ul style="list-style-type: none"> <li>• Appoint a Proponents Representative (PR) or delegate a member of staff to be the PR.</li> <li>• The PR must be a senior person reporting directly to the resort manager and NWR Environmental and Compliance Specialist at Head Office.</li> <li>• Establish an Environmental Management Committee (which comprises of the PR from each resort in the ENP and the Environmental Compliance Specialist) which meets regularly to discuss the implementation of this EMP, including water and power use (using figures collected for monitoring purposes during the month), management of litter, wise use of natural resources and adherence to park rules and regulations in this regard, etc.</li> <li>• The Proponent/PR should monitor the implementation of this EMP.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• The PR should inspect the site at least on a monthly basis.</li> <li>• Bi-annual audits should be conducted of site activities by an external ECO.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
Illegal Harvesting of natural resources and poaching	Loss of Biodiversity	<ul style="list-style-type: none"> <li>• Ensure all staff, residents and local community members are aware of the park rules and regulations relating to the harvesting of natural resources (firewood) and the need for these.</li> <li>• Enforce regulations to prohibit stripping of natural vegetation.</li> <li>• Ensure that poaching in the park or on neighbouring land by staff, residents and local community members is not tolerated and that action is taken against any offenders in collaboration with MEFT.</li> </ul>			
Waste Management	Visual impact and soil contamination	<ul style="list-style-type: none"> <li>• Formally adopt and implement a Solid Waste Management Plan (SWMP).</li> <li>• The site should always be kept tidy.</li> <li>• All domestic and general waste produced daily should be disposed of correctly.</li> <li>• No waste may be buried or burned.</li> </ul>			



Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Waste containers (bins) should be emptied regularly and removed from site to the nearest municipal waste disposal site. Records of collection should be kept for auditing purposes.</li> <li>• Set up a Waste Management Programme to include sorting of waste by separate waste streams for recycling wherever possible.</li> <li>• All recyclable waste needs to be taken to the nearest recycling depot.</li> <li>• Adequate separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.</li> <li>• Staff should be sensitised to dispose of waste in a responsible manner and not to litter.</li> <li>• No permanent waste disposal is allowed inside the park.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Domestic solid waste such as bottles, plastics, tins and paper should have a fenced repository area for storage of this waste before it is transported out of the park to the nearest designated authorized landfills.</li> <li>• Where solid waste needs to be temporarily stored, this must happen within an enclosed and secured area that prevents litter being blown out and solid waste must equally be transported securely.</li> <li>• Temporary waste storage facilities must be properly enclosed to prevent access by wildlife and pollution by wind-blown litter. These facilities must be approved by the MEFT and may hold waste for a maximum of 28 days; shorter periods will apply if high volumes accumulate and health issues arise.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>Transport of waste to storage or dumpsites must be in properly constructed vehicles or containers to ensure that no littering occurs in transit.</li> </ul>			
Hazardous Waste	Soil and groundwater contamination	<ul style="list-style-type: none"> <li>Adequate separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.</li> <li>Hazardous waste should be disposed of at a facility that is able to receive such waste and records of disposal should be kept.</li> <li>Maintenance and washing of vehicles and machinery on site should take place only at a designated workshop area that is on a bunded, impermeable surface.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Ensure that all bunded areas, e.g. in workshops and around generators, are regularly drained and cleared and that all material is safely stored on site until disposed of as hazardous waste at appropriate facility.</li> <li>• Set up a Contingency Plan to deal with minor and major pollution incidences e.g. oil spill clean-up kit available at all necessary points.</li> <li>• Liquid waste must be processed according to the most appropriate system, considering the practicalities, volumes of waste, availability of water, costs of disposal and environmental impact.</li> <li>• The MEFT and other relevant ministries must approve all liquid waste handling systems, which should comply with national standards and legislation.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• The pollution of groundwater is to be avoided, but also monitored, if necessary, by enlisting the help of relevant government departments.</li> <li>• Any toxic substances and the disposal of the empty containers must comply with national regulations and the use of all cleaning and other potentially toxic substances must be approved by MEFT.</li> </ul>			
Biodiversity	Loss of Biodiversity	<ul style="list-style-type: none"> <li>• Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.</li> <li>• Off-road driving should not be allowed on site.</li> <li>• No alien vegetation should be introduced on site.</li> <li>• Conduct regular checks to prevent alien and/or invasive plants from establishing.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>No pets or domestic animals allowed in settlements as per standing park rules.</li> </ul>			
Noise	Disturbance to fauna	<ul style="list-style-type: none"> <li>Noise restrictions should be in place on site to minimise disturbance.</li> </ul>			
Health and Safety	Health and Safety on site	<ul style="list-style-type: none"> <li>Ensure first aid training and environmental awareness training is provided to staff.</li> <li>Fire extinguisher training should be provided to a designated member of staff who will act as a fire marshal during fire events.</li> <li>Any accidents/incidents occurring on site should be reported to MEFT and other relevant authority within 24 hours.</li> <li>Ensure that adequate emergency procedures are in place to reduce the magnitude of the impacts in the event of an emergency.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
Health and Safety	Fire	<ul style="list-style-type: none"> <li>• Ensure adequate fire breaks and control of moribund material around and between infrastructures as needed.</li> <li>• Establish emergency procedures to allow for immediate action in the case of accidental fire and ensure that firefighting equipment is on hand and in good working order at all times and that all staff and residents are trained and understand procedures to be followed and how to use equipment.</li> </ul>			
Fuel Facility and Storage	Health and safety Fire	<ul style="list-style-type: none"> <li>• Ensure all employees and contract workers having any function related to the fuel facility have the necessary knowledge and competence to carry out their delegated tasks in compliance with the EMP, especially those appointed to tasks that have the potential to cause significant environmental damage.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>○ A generic Induction Training Course should be delivered to all new employees.</li> <li>○ Reduce health and safety risks by ensuring effective worker competence, training and awareness.</li> <li>• The fuel storage facility should be fitted with the required health and safety warning and information signage that is required and suitable for such installations.</li> <li>• Ensure that there are adequate and appropriate first aid provisions to respond to accidents in the facility</li> <li>• Ensure safety during fuelling operations.</li> <li>• To reduce spills and avoid fires, the following procedures must be used when dispensing fuels:                             <ul style="list-style-type: none"> <li>○ Never leave the area unattended when refuelling</li> </ul> </li> </ul>			



Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<p>even if automatic shut-off nozzles are being used.</p> <ul style="list-style-type: none"> <li>○ Do not allow smoking in the workshop yard, especially when handling fuels.</li> <li>○ Turn off engines, electrical appliances and pilot lights while refuelling equipment.</li> <li>○ Connect a bonding line between the storage tank and vehicle before starting fill-up - a flexible, copper conductor, 12 gauge or larger is recommended.</li> <li>○ Turn off vehicles while refuelling.</li> <li>○ Perform all fuel transfers outdoors to prevent fumes from building up and creating a dangerous explosive environment.</li> </ul> <ul style="list-style-type: none"> <li>● Install an adequate number of fire extinguishers at the site.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Use a carbon dioxide (CO2) fire extinguisher which is suitable for inflammable and combustible liquids and does not leave a harmful residue after use (as a dry chemical extinguisher does).</li> <li>• The fire extinguisher must be easily accessible in case of emergency (i.e. close enough to the fuel facility to be able to use immediately but not so close that the intensity of a fire would prevent it from being accessed).</li> <li>• Keep the area within 6m of the tanks clear of all vegetation and debris.</li> <li>• Check and maintain the extinguisher regularly.</li> <li>• Ensure electrical systems, such as pumps, are properly maintained to prevent sparks.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Ensure fuel lines, hoses, valves and nozzles are in good condition.</li> <li>• Close the valves on tank discharges when they are not in use to prevent leakage through the hose or nozzle.</li> <li>• Ensure that gasoline is not used as a cleaning or degreasing agent (has inherent fire risk).</li> <li>• Material Safety Data Sheets that contain information on the potential hazards and how to work safely with the chemical product must be obtained from the supplier and should be available on site.</li> <li>• Ensure that any minor spills are cleaned up immediately.</li> </ul>			
Employment	Recruitment	<ul style="list-style-type: none"> <li>• Local employment and use of local businesses/suppliers should be encouraged to promote and improve the local economy as far as reasonably possible.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>Should the required services and/or goods not be available locally then look to other localities for these services/goods.</li> </ul>			
Ablution	Sanitation	<ul style="list-style-type: none"> <li>Separate ablutions should be available for men and women and should clearly be indicated as such.</li> <li>Sewage waste needs to be removed on a regular basis to the nearest approved sewage disposal site.</li> <li>Workers responsible for cleaning the toilets should be provided with latex gloves and masks.</li> </ul>			
Sewage Management	Environmental pollution and underground water resources contamination from waste water	<ul style="list-style-type: none"> <li>Suitably qualified and/or skilled personnel should be appointed to run the wastewater treatment plant as required (which may include processing technicians, mechanical technicians and electrical technicians) based on the technology employed and the relevant expertise required to ensure efficient operation of the plant.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Ensure that the sewage system is managed and maintained as per design and engineering specifications.</li> <li>• Ensure that all concerned staff are trained in critical health and safety issues regarding operation and maintenance of the sewage system components</li> <li>• Ensure that all concerned staff are issued with the necessary safety equipment and protective clothing required for them to do their jobs safely and at no risk to their health.</li> <li>• Be on the lookout for leaking water pipes and any signs of environmental contamination resulting from the sewage infrastructure (encouraging residents to do the same) and take remedial action to resolve any identified problems as rapidly as possible.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• Ensure that guests are informed of what may and may not be flushed in order to protect the sewage system.</li> <li>• Groundwater monitoring of known boreholes in the area, to determine if there is an impact. Mitigation measures should then be formulated.</li> <li>• The solid sludge produced should be disposed at a registered waste dumpsite.                      Hazardous waste, including emptied chemical containers (e.g. liquid chlorine, sodium hypochlorite) and other chemicals used for disinfection in the operational phase should be safely stored on site where they cannot be reached and used by the unsuspecting and unformed locals for personal use.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
Water Management	Water saving Groundwater contamination	<ul style="list-style-type: none"> <li>• Water saving mechanisms should be implemented on site e.g., installation of water saving devices where practical.</li> <li>• Should any hazardous material and wastes be produced these shall be managed in a safe and responsible manner so as to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.</li> <li>• Hazardous and non-hazardous waste shall be stored separately at all times and should be disposed at a facility that is licenced to receive such waste.</li> <li>• In the event of a pipe burst, the burst pipe section must be isolated by closing the nearest valves on either side of the break.</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>• A qualified plumber with water distribution pipeline experience must be contacted to repair such pipe breaks as soon as possible.</li> <li>• The plumber must repair the burst pipe by means of an approved method, and the repair must be tested by opening all the valves prior to backfilling of the trench.</li> <li>• Only once the repair is tested and confirmed to be correct may the pipe trench be backfilled.</li> <li>• Replace washers and seals on pipes fittings, taps and toilets when fittings leak.</li> </ul>			
Archaeology	Archaeological Impacts	<ul style="list-style-type: none"> <li>• Should a heritage site or archaeological site be uncovered or discovered on site, a “chance find” procedure should be applied in the order they appear below:                             <ul style="list-style-type: none"> <li>○ If operating machinery or equipment, stop work;</li> <li>○ Demarcate the site with danger tape;</li> </ul> </li> </ul>			



Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>○ Determine GPS position if possible;</li> <li>○ Report findings to the construction foreman;</li> <li>○ Report findings, site location and actions taken to superintendent;</li> <li>○ Cease any works in immediate vicinity;</li> <li>○ Visit site and determine whether work can proceed without damage to findings;</li> <li>○ Determine and demarcate exclusion boundary;</li> <li>○ Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist;</li> <li>○ Inspect site and confirm addition to project GIS;</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<ul style="list-style-type: none"> <li>○ Advise the National Heritage Council of Namibia (NHCN) and request written permission to remove findings from work area; and</li> <li>○ Recovery, packaging and labelling of findings for transfer to National Museum.</li> <li>● The development should comply with the provisions as outlined in the Namib-Naukluft National Park Management Plan in relation to the Namib Sand Sea World Heritage site.</li> </ul>			
Traffic	Traffic Impacts	<ul style="list-style-type: none"> <li>● Introduce speed limits and signage within the facility.</li> <li>● Roads to be clearly demarcated.</li> <li>● No off-road driving to be permitted on site.</li> </ul>			
Sense of place	Visual Impact	<ul style="list-style-type: none"> <li>● Educate staff and residents about the desirability of maintaining housing and residential facilities in</li> </ul>			

Environmental Feature	Impact	Management Actions	Observation	Remedial Action	Compliance (Yes/No)
		<p>good condition and the need for regular and ongoing maintenance activities.</p> <ul style="list-style-type: none"> <li>• Establish an NWR Housing Policy which determine the rules and regulations for the management of the NWR houses. The Housing Policy can call for a Housing Committee.</li> <li>• Check roofs for leaks and undertake repair work needed.</li> <li>• Maintain the exterior walls of houses in good condition and in natural colours as per original design specifications.</li> <li>• Manage the use of existing and any new lighting in dwellings, floodlighting and security lights in order that light pollution does not become a problem.                             <ul style="list-style-type: none"> <li>○ Treat timber structures as required with (MEFT approved) environmentally friendly products.</li> </ul> </li> </ul>			