

APP-006066

**PHASE 1 LAND RECLAMATION AND EXPANSION OF THE
PORT OF LÜDERITZ IN ROBERT HARBOUR, LÜDERITZ,
||KHARAS REGION
ENVIRONMENTAL MANAGEMENT PLAN**



Prepared by:



Prepared for:



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1 INTRODUCTION

The Namibian Ports Authority, Namport, is tasked with the management and development of ports in Namibia. As part of their mandate, they are planning for the expansion of the Port of Lüderitz in the ||Kharas Region (Figure 1-1). To achieve this, Namport proposes two phases of expansion within Namport's area of jurisdiction as defined by the officially declared port limits (Figure 1-2). Phase 1 will entail extending the main quay wall by 500 m and reclaiming of approximately 14 hectares of sea area, below the high water mark, to serve as backup land for the extended quay. Phase 2 will see demolition of the existing wooden jetty in the southernmost part of the harbour, reclamation of approximately 3 ha of sea area, and construction of a new concrete jetty at the north-end of the reclaimed area. The extended quay walls, new jetty and additional backup land will allow for the berthing of additional vessels and increased backup cargo storage space, and thus increase the much-needed cargo handling capacity of the port.

The reclamation of land from below or above the high-water mark of the sea, as well as the construction of harbours, require environmental clearance from the Department of Environmental Affairs (DEA), Ministry of Environment, Forestry and Tourism (MEFT). An environmental clearance is required in terms of the Environmental Management Act, Act no. 7 of 2007 (EMA), as administered by the MEFT. Namport thus commissioned an environmental assessment with the purpose of, upon a favourable outcome of the assessment, applying for environmental clearance. This report presents the environmental management plan (EMP) prepared as part of the environmental assessment, and it outlines measures to prevent or mitigate potential negative environmental impacts while enhancing the project's positive outcomes.

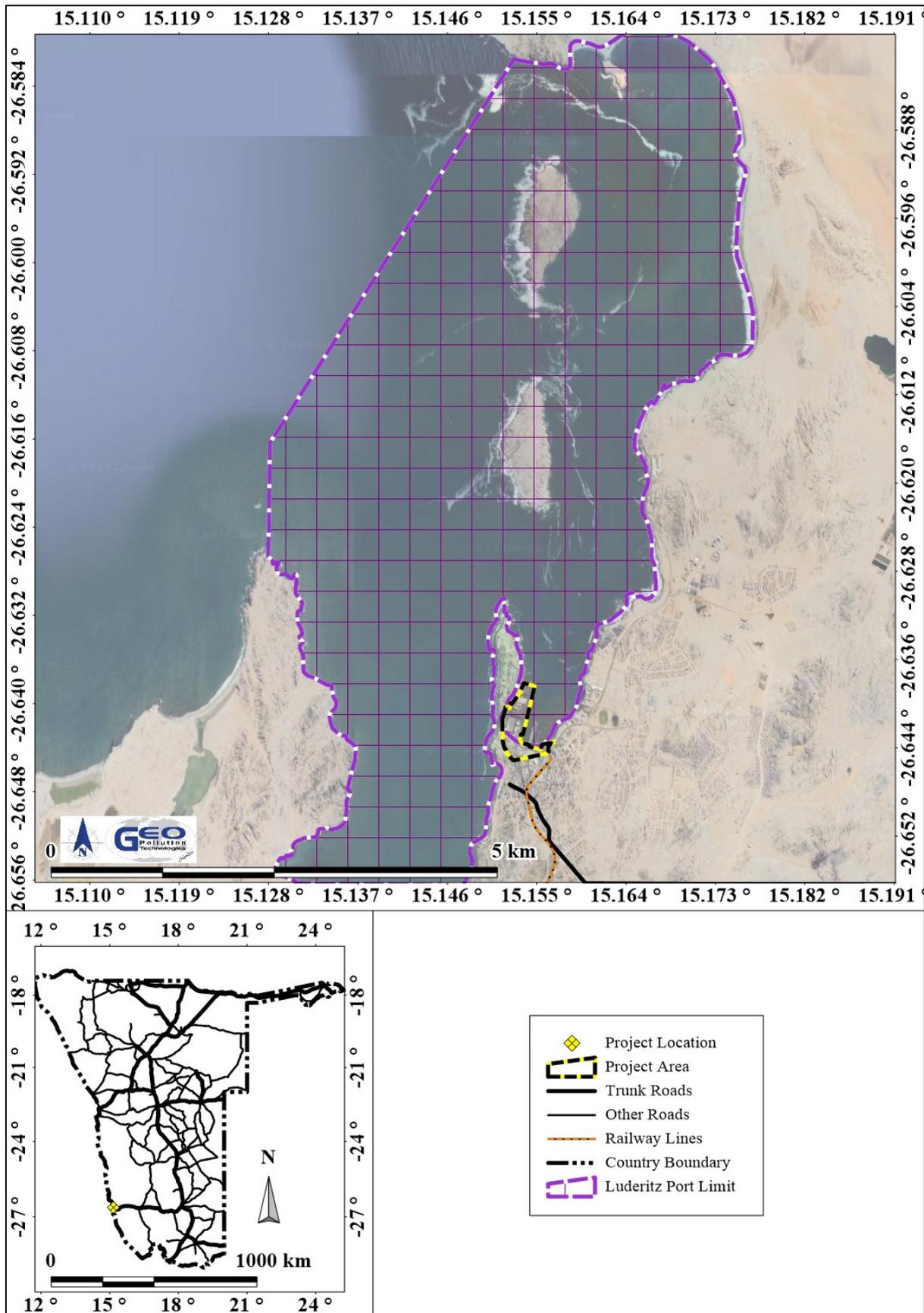


Figure 1-1 Existing commercial harbour

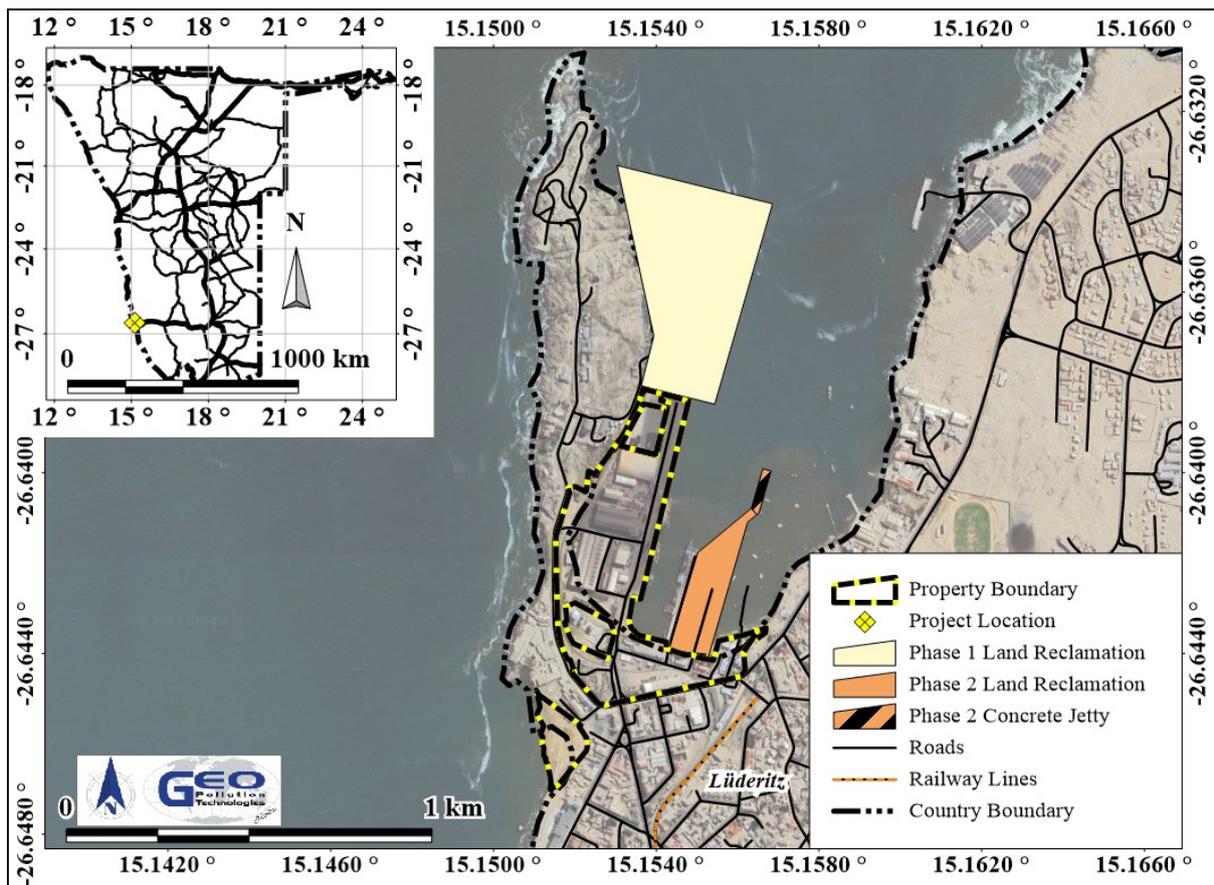


Figure 1-2 Phase 1 and Phase 2 port expansion areas

2 MANAGEMENT OF IMPACTS

This section presents an EMP outlining preventative and mitigating measures, based on the identified impacts.

2.1 ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. Preventative and mitigating measures are thus provided for impacts. These measures should be adhered to during the various phases of construction. Ultimately the operations of the new expanded port will be incorporated into the existing operational EMP of the Port of Lüderitz.

All contractors and personnel taking part in the construction of the expanded port should be made aware of the contents of this section, so as to plan the construction process accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- ◆ to include all components of construction and related activities;
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- ◆ to monitor and audit the performance of contractors and personnel in applying such controls; and
- ◆ to ensure that appropriate environmental training is provided to responsible contractors and personnel.

Various potential and definite impacts will emanate from the project. The majority of these impacts can be mitigated or prevented. The impacts, risk rating of impacts, as well as prevention and mitigation measures are listed below.

As depicted in the tables below, impacts are expected to mostly be of medium-high significance and can mostly be mitigated to have a medium to low significance. The spatial extent of impacts are mostly limited to the proposed port expansion area and the immediate surroundings. Some impacts are of a permanent nature. Due to the nature of the surrounding areas, some cumulative impacts are possible.

2.1.1 Planning

During the planning phase it is the responsibility of the Proponent to ensure they, and all contractors, sub-contractors, consultants and other personnel who will be involved with the construction of the new port area comply with all legal and industry specific requirements. Management measures must be put in place prior to, and during construction, to ensure potential environmental impacts and risks are minimised. The following actions are recommended during the planning phase and should continue for the duration of the project:

Namport

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that govern or authorise port construction are in place and remains valid.
- ◆ Ensure that reputable contractors and sub-contractors are appointed and enter into an agreement, which includes adherence to the EMP, with Namport.
- ◆ Assign a Health, Safety and Environmental Coordinator to oversee implementation of and compliance to the EMP, by all responsible parties.
- ◆ Appoint a community liaison officer who can receive and deal with complaints and suggestions and share the contact details with the community.
- ◆ Communicate Namport's various emergency response procedures and operational procedures which are relevant to construction, to the relevant contractors involved in the port expansion project.
- ◆ For any dredging, comply with the existing EIA and EMP for dredging of the Port of Lüderitz.
- ◆ Ensure sufficient insurance cover is available for aspects of environmental damage, pollution clean-up or restoration, if ever needed.
- ◆ Establish and maintain a reporting system to report on aspects of construction as outlined in the EMP in accordance with ECC conditions.
- ◆ Update the EIA and EMP if required and apply for renewal of the environmental clearance certificate prior to expiry.

Contractor

- ◆ Enter into an agreement with Namport which includes the EMP and environmental compliance, monitoring and reporting as required by Namport and the ECC.
- ◆ Where applicable, ensure that all requirements of the Ministry of Home Affairs, Immigration, Safety and Security are met with respect to work permits and entry into Namibia.
- ◆ Where relevant, include the EMP as part of all contracts for the procurement of services.
- ◆ Assign a Health, Safety and Environmental Coordinator to oversee the implementation of, and compliance to the EMP.
- ◆ Obtain and implement all Namport's emergency response and operational procedures.
- ◆ Ensure sufficient insurance cover is available for aspects of environmental damage, pollution clean-up or restoration, if ever needed.
- ◆ Establish and maintain a reporting system to report on aspects of construction as outlined in the ECC and as in agreement with Namport.

2.1.2 Employment

The construction of the expanded port will require various contractors, sub-contractors, building materials, equipment and infrastructure. Employment within goods and services suppliers' businesses will thus be sustained and new job opportunities may be created. Once operational, the new expanded port will require Namport to appoint new employees to be able to manage the larger footprint. However, more importantly, the additional space will be available to various new port tenants who will through both construction of for example new warehouses, and operations of those warehouse, sustain and create employment.

Desired outcome: Provision of employment to local Namibians and adhering to Namibian legal requirements with respect to work permits.

Actions:

Enhancement:

- ◆ If the skills exist locally, contractors and employees must first be sourced from the town, then the region and then nationally. Deviations from this practise must be justified.
- ◆ Work permits for foreign employees and contractors.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Immigration Control Act 7 of 1993.
- ◆ Work permits and employee contracts on file.
- ◆ Bi-annual reporting based on employee records that provides details on number of employees and demographic profile such as male vs. female, local vs. foreign, and disabled employees).

2.1.3 Revenue Generation

During construction, contractors, resources and services will be procured locally where available and feasible, contributing to the economy of the town, region and Namibia. Through the efficient functioning of the expanded Port of Lüderitz, additional businesses will establish in the port, also contributing to revenue generation. Payment of employees' salaries and wages contribute to the overall economy of the town, region, Namibia and SADC countries exporting and importing goods via Lüderitz.

Desired outcome: Revenue generation and contribution to the local, regional, Namibian and SADC economy.

Actions:

Enhancement:

- ◆ The Proponent must employ local Namibians and source Namibian contractors, goods and services as far as is practically possible. Deviations from this practise must be justified.
- ◆ Resources and services must be procured locally, if available. Deviations from this must be justified.
- ◆ Payment of taxes and remuneration in accordance with Namibian legislation.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Where requested, proof must be provided to show that goods and services are procured locally, and if this is not the case, justification for foreign acquisition of such goods and services must be provided.
- ◆ Bi-annual reporting based on employee records that provides details on number of employees and demographic profile such as male vs. female, local vs. foreign, and disabled employees).

2.1.4 Skills, Technology and Development

Through employment and contracting of local companies and employees for certain aspects of construction, some skills will be transferred to an unskilled workforce and technologies that are new to Namibia may be introduced. Development of people and technology are key to economic development.

Overall operations of the Port of Lüderitz may promote the port as a reliable location to conduct port related business ventures. This may further stimulate technological development in the port with associated benefits of training of employees and acquiring of new skills.

Desired outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the port.

Actions:

Enhancement:

- ◆ If the skills exist locally, contractors and employees must first be sourced from the town, then the region and then nationally. Deviations from this practise must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.
- ◆ Training and skills development must be focussed on Namibians.
- ◆ Employees to be informed about parameters and requirements for references upon employment.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Record should be kept of all training or development programmes provided to Namibians.
- ◆ Ensure that all training is certified or managerial references provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- ◆ Bi-annual reporting summarising any training or skills development programmes provided to Namibians.

2.1.5 Demographic Profile and Community Health

Impacts related to the demographic profile and community health relate to the influx of people (foreigners and Namibians) to the town, and the potential social ills and deviant behaviour that often accompany such events. This includes the spread of communicable diseases such as HIV/AIDS and increased criminal activities. Additional employment opportunities also mean more spending power which can lead to increased misuse of alcohol and drugs.

For the duration of construction there will be an influx of foreign people in Lüderitz. Contractors, employees or consultants may be sourced in Namibia and may require temporary accommodation and offices in town. Due to the scale and duration of construction it is foreseen that the influx of people will create a significant or permanent change in the demographic profile of the local community, and may result in significant instances of socially deviant behaviour.

The prospects of more operators in the port may entice jobseekers to migrate to the town. The probability of negative impacts occurring, as discussed above, thus increases. More pressure will be placed on goods and services supply and housing. This is further aggravated by the remoteness of Lüderitz from

Desired Outcome: To prevent growth in informal settlements and an increase in social ills, the spread of communicable diseases, and prevent / discourage socially deviant behaviour and criminal activities.

Actions:

Enhancement

- ◆ Timely information sharing with local, regional and national authorities as well as the suppliers of services to ensure timely development of the town and services to meet growing demands.
- ◆ As far as is practically possible, Namibian contractors and support services must be sourced from the town, region or nationally (if available). Deviations from this practice should be justified appropriately.
- ◆ Appoint reputable contractors with a proven track record of social responsibility.
- ◆ Maintain a comprehensive employee wellness program, ensuring that relevant support are provided to employees with information sessions on aspects such as dangers and prevention of communicable diseases such as HIV/AIDS, alcohol and drug abuse, and sound financial planning.
- ◆ No intoxicating substances, or persons under the influence of such substances, may be allowed in the port and construction areas.
- ◆ Adhere to all applicable laws and regulations relating to public and environmental health (e.g. sanitation requirements, work conditions, etc.).
- ◆ Disciplinary steps, within the legal parameters of Namibia, to be taken for socially deviant behaviour during working hours, should be clearly stipulated in employment contracts.

Mitigation

- ◆ Take disciplinary action against employees not adhering to contractual agreements with regard to socially deviant behaviour (e.g. alcohol or drug abuse during working hours).

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Bi-annual reporting summarising employee demographics, educational programmes provided, information session attendance and training conducted.

2.1.6 Health, Safety and Security

Construction and operations rely on human labour who are exposed to health and safety risks. Working at heights and in confined spaces, diving, handling of hazardous chemicals, working with machinery all pose risks.

During operations, working with machinery, unsafe stacking, falling from heights and handling of hazardous chemicals (inhalation of dust and potential health effects chemicals), poses risks to employees. If not contained, windblown dust may further pose health risk to nearby receptors.

The Namibian coast is characterised by very cold water and rough conditions. Falling in the water and being exposed to cold water, will quickly result in hypothermia which may rapidly become fatal.

Security risks are related to unauthorized entry, theft and sabotage.

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention

- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, material safety data sheets (MSDS) and signage requirements (personal protective equipment (PPE), flammable etc.).
- ◆ Appointment of reputable contractors with a known history of responsible and safe construction practices.
- ◆ All Health and Safety standards specified in the Labour Act, or better, should be followed.
- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products. This includes strict security to prevent unauthorised entry.
- ◆ Provide all employees with required and adequate PPE.
- ◆ Ensure that all personnel receive adequate training on operations of equipment / handling of harmful materials.
- ◆ Equipment on site must be stored in a way that does not encourage criminal activities (e.g. locked away to prevent theft).
- ◆ Security procedures and proper security measures must be in place to protect workers.
- ◆ Dredging, if any, to adhere to the approved dredging EMP of the Port of Lüderitz.

Mitigation

- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement emergency response procedures in case of incidents.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Industry standards and protocols, etc.
- ◆ An up-to-date health and safety file to be maintained.
- ◆ Any incidents or complaints must be recorded with action taken to prevent future occurrences.
- ◆ A bi-annual report should be compiled of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained, incidents or complaints received, including action taken to prevent future occurrences, must be included.

2.1.7 Traffic

Construction activities will increase traffic through the town to deliver constructing material, equipment, infrastructure, as well as filling material for land reclamation (if sourced from land). Should the latter be required, it will result in a significant temporary increase in traffic. Routes through town and into the port are limited and all traffic ultimately pass via Bismarck Street in the business area of town. This increases the likelihood of traffic delays, traffic incidents and road surface damage.

Future operations of the new port area will increase traffic on the roads through town, to and from the port. Heavy motor vehicles may result in an increased, cumulative impact on the road surface of the area, especially when turning on these roads. Trucks parking in town may block business' entrances and increase the likelihood of accidents and incidents.

Desired Outcome: Minimum impact on traffic, no transport or traffic related incidents, good quality roads.

Actions

Mitigation

- ◆ Continuous consultation with the Lüderitz Town Council (LTC), Roads Authority and port users to find feasible measures and alternative to alleviate traffic congestion in town (for both construction and operational phases. This could include investigation and implementation of truck staging areas outside town, alternative access roads, bridges, etc.
- ◆ Trucks should not be allowed to park, overnight or obstruct any traffic in areas surrounding the port and the town.
- ◆ Adhere to The Road Traffic and Transport Regulations and all other applicable legislation related to road transport and maximum axle loads.
- ◆ If any traffic impacts are expected, such as during delivery of abnormal loads, traffic management should be performed.
- ◆ The placement of signs to warn and direct traffic or placement of marshals at potentially high incident areas (close too schools, at four way stops, etc.) will aid in mitigation of traffic impacts.

Responsible Body:

- ◆ Proponent
- ◆ Contractor

Data Sources and Monitoring:

- ◆ The Road Traffic and Transport Regulations, 2001.
- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A bi-annual report should be compiled of all incidents reported, complaints received, and action taken.

2.1.8 Seafaring Traffic

Seafaring traffic may experience delays or in extreme instances be involved in collisions or allisions due to the construction of the expanded port area. Delays in ship arrivals or departures at the port can disrupt the timely delivery of goods, interfere with cruise liner schedules, affecting the tourism industry, and lead to a build-up of export-bound cargo within the port. The possibility for such events occurring increases when the proper navigational warnings are not issued, or vessels that are not seaworthy, and without proper communications systems, operate within the area.

Desired Outcome: Minimum impact on seafaring traffic and no accidents.

Actions

Prevention

- ◆ Proper communication, management and planning will largely prevent seafaring vessel delays and accidents.
- ◆ Timely issuing of navigational warnings (Namport).
- ◆ Planning and communication with regular provision of construction updates to the Port Captain.
- ◆ All communications, navigational and warning systems on the vessel in working order and regularly tested and maintained.

Mitigation

- ◆ Should an incident occur, it must immediately be reported to the Port Captain, followed by a detailed report within 24 hours, and corrective action should be taken to prevent any future occurrences of such events.

Responsible Body:

- ◆ Proponent
- ◆ Contractor

Data Sources and Monitoring:

- ◆ Part III of the regulations proclaimed under the Namibian Ports Authority Act; Merchant Shipping Act; Marine Traffic Act.; Convention on the International Regulations for Preventing Collisions at Sea; International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
- ◆ Ships' logs to be duly maintained.
- ◆ Any complaints or incident reports received from seafaring traffic, with regard to port construction, should be recorded together with corrective action taken and measures implemented to prevent impacts from repeating itself.
- ◆ Bi-annual reporting on all seafaring traffic related incidents reported, complaints received, and action taken.

2.1.9 Fire and Explosion Risk

Products used during construction, e.g. fuel, solvents, lubricants, etc., may be flammable to varying degrees. Whilst unlikely, these may become explosive under very specific conditions and in confined spaces. The primary causes of such accidents may include human error, technical failures and inadequate maintenance. Dredging also pose fire risks on board the dredging vessel.

Desired Outcome: To prevent injury or physical damage as a result of fire or explosions.

Actions

Prevention

- ◆ A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan, and should include specific substances handled at the site. The plan should consider risks posed to and by neighbouring properties.
- ◆ Appointment of reputable contractors with known histories of responsible and safe construction practices.
- ◆ Share the requirements for firefighting based on the products kept on site with Namport.
- ◆ Ensure all materials are stored strictly according to MSDS instructions. This include segregation of incompatible products.
- ◆ Maintain firefighting equipment, implement good housekeeping and conduct personnel training (firefighting, fire prevention and responsible housekeeping practises).
- ◆ Operations of the dredger must be according to the approved EMP for dredging.

Mitigation

- ◆ Implement the emergency and firefighting plan immediately if a fire is detected.

Responsible Body:

- ◆ Proponent
- ◆ Contractor

Data Sources and Monitoring:

- ◆ Record should be kept of all inspections and maintenance performed on firefighting equipment (date of last service, date of next service, replacement date, etc.).
- ◆ Record should be kept of all training related to firefighting, fire drills and evacuation procedures.
- ◆ Record should be kept of all inspections and maintenance performed on equipment whose failure may result in a fire and/or explosion. This include electrical installations, fuel storage and reticulation, etc.
- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ Bi-annual report on all record keeping and incidents, including corrective action taken.

2.1.10 Noise and Vibration

Noise and vibrations are closely linked. The main noise activities that will result from port construction activities are related to the installation of the steel sheet pile, pile driving (if conducted, compaction of fill material, and heavy motor vehicle movement through town. Operational noise will vary depending on the activities of tenants, but will likely constitute vehicle and train noise, audible warning signals, cranes, picking up and putting down skips and containers, vessel engine noise, and closing and opening of doors and hatches. Noise can cause permanent hearing loss if continued exposure to loud noises occur or can be a nuisance to nearby community members such as at residences and accommodation establishments. Whole body vibration is common in vehicle and heavy machinery operators. It can cause lower back pain, motion sickness, bone damage, and digestive issues. Long-term exposure may lead to fatigue, drowsiness, and reduced concentration. Hand-arm vibration affects workers using power tools. It can result in nerve damage, vascular disorders, and musculoskeletal problems.

Not only living organisms are affected by vibrations. Machinery and structures also undergo wear and tear as it leads to accelerated mechanical fatigue and component degradation, loosened joints, cracks, and structural instability.

A noise impact specialist study was commissioned and nearby residences and businesses were identified as noise sensitive receptors. Baseline noise levels were determined around the port. Measurements taken during both day and night reflect ambient sound levels characteristic of a low-noise urban environment. However, areas in close proximity to the port exhibited elevated noise levels, primarily due to the continuous operation of cranes and other port-related activities, which were clearly perceptible and acoustically dominant. In contrast, locations farther from the port resembled a typical coastal soundscape, where natural elements such as bird calls, wind, and waves prevailed. Depending on these natural ambient conditions, sounds from the port could be distinctly heard up to 750 metres away.

Conceptual noise models indicate potential noise impacts associated with the project would be: 1) of a high significance for daytime construction activities; 2) of a low significance for daytime operational activities associated with the port operational activities; and 3) of a high significance for night-time activities associated with the port operational activities. The author suggested various mitigating actions which are included below. It was concluded that existing port activities are generally audible at the closest noise sensitive receptors and the proposed expansion will slightly raise these noise levels. The increase is not flagged as a fatal flaw, and the expansion project authorisation from a noise impact perspective is recommended.

Desired Outcome: To ultimately reduce noise and vibration levels in order to prevent hearing loss and other health impacts on workers, side-effects of vibration, a nuisance to nearby receptors, and impacts on animals. Where noise and vibration levels cannot be lowered, the potential impacts thereof must be minimized.

Actions

Mitigation

- ◆ The potential noise levels and construction schedule should be discussed with all noise sensitive receptors staying within 500 m from the construction and future operational site. Measures that will be used to reduce noise levels should be highlighted
- ◆ The Health and Safety Regulations of the Labour Act and World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment for workers on site and not to be a nuisance to communities should be considered during the construction and operational phases.
- ◆ Confine noise generating construction activities to daytime hours.
- ◆ Confine noise generating operational activities to daytime hours as far as possible.
- ◆ Should piles be installed, vibratory pile driving with pre-drilling (coring) is preferred to reduce noise.
- ◆ Shrouds, noise barriers and acoustic enclosures must be used to limit noise.

- ◆ Contractors that use newer, quieter equipment should be appointed. Equipment should be well maintained as per manufacturers requirements, with the engine compartments closed.
- ◆ Induction training should include an environmental noise component, which should be given to all employees and contractors, highlighting the sensitivity of the area to noise. Sources of noise should be highlighted, especially the potential impact of material handling noises.
- ◆ Use white noise alarms (squawkers) instead of tonal reverse alarms on heavy vehicles and fork-lifts operating within the port area and consider changes to policies and guidelines for contractors and port users.
- ◆ Hearing protectors must be issued as part of PPE when working in noisy environments.
- ◆ Mechanisms to reduce vibration impact must be employed. This includes frequently rotating operators and wearing of PPE such as vibration absorbing gloves.
- ◆ Any machinery and vehicles that cause excessive vibrations should be given defect notices and taken off site immediately. Machinery and/or vehicles may only be used again on site once they have been serviced and approval has been granted by the site supervisor.
- ◆ Unnecessary vibrations can be minimised by ensuring that no machinery or vehicles are left idling when not in use.
- ◆ The appropriate and correct placement of specific work activities can ensure the reduction of handling of machinery that cause heavy vibrations. Careful placement of infrastructure and transport routes within the expansion area can optimize the noise-reduction effectiveness of walls and buildings. This could include locating loading and unloading activities to allow buildings to act as noise barriers.
- ◆ Pre assessment to allow for mitigation measures for any elevated levels of vibrations should take place if there is any suspicion that there may be excessive vibrations levels onsite during construction. These mitigation measures should then be in accordance with local regulations and standards or international best practice.
- ◆ Namport could install a real-time noise monitoring system to provide immediate and accurate noise levels to the contractors and Namport.
- ◆ Conduct annual noise auditing to assist in classifying noise sources, defining the associated noise levels (magnitude of the noise emission levels) and identifying the specific measures that could reduce noise levels.
- ◆ Investigate reasonable and valid noise complaints and implementing viable noise management measures

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Health and Safety Regulations of the Labour Act and WHO Guidelines on Community Noise
- ◆ Maintain a register to record complaints received from workers and the general public. Complaints should be investigated and if required, a noise and vibration survey should be conducted.
- ◆ Bi-annual reporting of all record keeping, including corrective action taken.

2.1.11 Waste

Various types of waste will be produced during the construction phase and the volume of waste originating from the port will increase during the operational phase. Where waste is not securely stored, it may be blown into the sea or town during strong winds and may wash up on the coastline and islands or blow into the desert. This form of pollution will not only have a visual impact, but may also negatively impact on marine and terrestrial animals like dolphins, seals and birds (e.g. entanglement, accidental ingestion, etc.).

Some wastes are hazardous and may deteriorate the quality of the environment, especially the waters in the bay (see section 2.1.12).

Desired Outcome: To reduce the amount of waste produced and prevent pollution of the environment.

Actions

Prevention

- ◆ Appointment of reputable contractors with a known history of environmental responsibility.
- ◆ Communicate proper waste disposal procedures to the contractor and employees.
- ◆ Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- ◆ Ensure adequate temporary waste storage facilities are available within the confines of the port and ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of waste.
- ◆ For hazardous substances, see the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.

Mitigation

- ◆ Waste should regular be disposed of at appropriately classified disposal facilities, this includes hazardous materials (empty chemical containers and contaminated rugs, paper, water and soil), if any. Since Lüderitz does not have a hazardous waste site, such waste will have to be transported to Windhoek or Walvis Bay for disposal.
- ◆ To prevent people from using potentially contaminated containers for transport or holding of drinking water, all containers that will be discarded must be crushed or punctured prior to disposal.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A record should be kept of any disposal of hazardous waste.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ Bi-annual reporting on all record keeping, including corrective action taken.

2.1.12 Water Quality

Impacts on water quality may negatively affect various receptors such as aquatic organisms, mariculture farms and seawater intakes (fish processing and land-based mariculture). Water quality can deteriorate during construction as a result of mixing of sediment in the water column (during dredging or filling of the reclaimed area), spilled or leaked hydrocarbons and chemicals directly entering the water or being blown/washed into the water from nearby surfaces.

With the larger port, more vessels can dock and load/offload cargo simultaneously. For bulk product loading/offloading this increases the potential for dust to be produced and blown into the water.

Many pollutants that can enter the water may result in reproductive abnormalities and reduced fertility, which may put the local food web at risk. It may also accumulate in aquatic organisms, especially filter feeders like mussels and oysters, and magnify in higher trophic levels where physiological stress and abnormalities can realise. For the mariculture industry, it may prevent the export of mariculture products and causes financial losses if pollution plumes reach mariculture areas.

Desired Outcome: To protect sensitive receptors against impacts of reduced water quality as a result of construction activities and pollution

Actions

Prevention

- ◆ Appointment of reputable contractors with a known history of environmental responsibility.
- ◆ Regularly inspect and maintain all vehicles and infrastructure, to minimize the chances of infrastructure failure. Regular training and refresher courses for operators of machinery and infrastructure that can cause pollution.
- ◆ Vehicles and heavy machinery should not be serviced on site.
- ◆ Dredger operators must adhere to the approved EMP for dredging.
- ◆ Port tenants must, where applicable, conduct their own EIA and operate according to their EMP which must be in line with the port's EMP.

Mitigation

- ◆ Use drip trays to contain leaks and repair such leaks before continuing to use the equipment/vehicle.
- ◆ Clean-up action must be taken immediately for all instances where any hazardous (and non-hazardous product is spilled or leaked.
- ◆ Where relevant a conditions survey should be conducted post-clean-up to confirm successful clean-up.
- ◆ For large spills containment equipment must be available such as absorbents and booms for oil spills in the ocean.
- ◆ Regular inspection and reporting on non-compliance to EMP requirements. Issue non-compliance order and follow up to confirm corrective action taken.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Inspection registers, logging of incidents, reporting of incidents, corrective action taken and inclusion in bi-annual report.

2.1.13 Ecological

Construction activities will impact the marine ecosystem in a localised small footprint. The area earmarked for the port expansion as well as its manoeuvring areas to be dredged will be completely destroyed. No range restricted endemic or unique species are expected or known of in the area.

Marine mammals do not frequent the area earmarked for construction and they will likely avoid the area during construction as a result of noise and activity.

During operations, various structures can act as suitable areas for birds to roost or nest. Bright lights used at night may impact birds like flamingos that fly at night. They may become blinded and disorientated, causing collisions with structures or veering off course.

Operational impacts will mostly be the same as that of the existing port, although at a larger scale.

Desired Outcome: To prevent or minimise destruction, degradation and disturbance of the ecological environment.

Actions:

Prevention

- ◆ Appointment of reputable contractors with a known history of environmental responsibility.
- ◆ Clearly define the footprint of the project area and work within this footprint at all times.
- ◆ Follow the EMP sections on noise, water quality and waste in order to minimise impacts on marine and terrestrial organisms and the environment.
- ◆ Dredger operators must adhere to the approved EMP for dredging.
- ◆ Port tenants must, where applicable, conduct their own EIA and operate according to their EMP which must be in line with the port's EMP.
- ◆ If any mortalities in marine fauna are observed at or around the construction site, it should be reported to the Directorate of Fisheries and the cause investigated and corrective action implemented if applicable.

Mitigation

- ◆ All lighting should be directed downwards to construction and operational areas to not blind birds flying at night.
- ◆ Use the minimum lighting required for safe operations and use auto dimming lights when no activity is ongoing.
- ◆ Record any bird strikes and take corrective action if needed.

Responsible Body:

- ◆ Proponent
- ◆ Contractor

Data Sources and Monitoring:

- ◆ Record any marine mammal sightings and any other significant encounters or observations of animals and birds (including sick or dead animals) and report these to the local offices of the MEFT and MAFWLR.
- ◆ Bi-annual reporting of all record keeping, including corrective action taken.

2.1.14 Visual

The expansion project will increase the footprint of the commercial harbour significantly, while the industrial nature will remain the same. This will have an impact on the visual character of the area, and considering Shark Island, a visual impact assessment was commissioned to determine the extent of impacts on the environment. This study indicated that “the visual effect of the Project, during both construction and operation, will lead to negative alterations to the visual baseline. These changes would be noticeable from nearby heritage and tourist observation points. The likelihood of a negative visual impact is high. The cumulative impact of the proposed Project activities, combined with the existing urban and industrial character of the port, is regarded as of moderate significance, as the Project activities would contribute negatively to the current visual and aesthetic baseline, particularly for sensitive viewing areas.” With mitigation as presented below, the conclusion of the assessment is however that the project should proceed.

Desired Outcome: To minimize the negative visual impact of the new port expansion.

Actions

Mitigation

- ◆ Confine construction to day time only.
- ◆ Contain construction and establishment activities within specifically demarcated areas with the smallest footprint possible.
- ◆ Regular waste disposal at an approved landfill site.
- ◆ Paint the buildings and structures with colours that reflect and complement the colours of the surrounding landscape, rock, and other structures.
- ◆ Minimise scale and massing. Break up large expanses of walling or roofing, as in the proposed warehouses, by using a textured effect on the western walls of these structures. This will create areas of light and shade, visually reducing the massing of the walls.
- ◆ Consider planting rows of palm trees along the western and northern edges of the warehouse areas. This would also, reduce the scale of the structures when viewed from Shark Island.
- ◆ “Housekeeping” procedures should be developed for the Project to ensure that the Project sites and lands adjacent to the Project sites are kept clean of debris, garbage, graffiti, fugitive trash, or waste generated onsite; procedures should extend to control of “track out” of dirt on vehicles leaving the port area.
- ◆ Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surroundings of the site.
- ◆ Avoid high pole top security lighting along the periphery of the site, specifically along the western and northern boundaries of Phase 1 and use only lights that are activated on illegal entry to the site.
- ◆ Minimise the number of light fixtures to the bare minimum, including security lighting.

Responsible Body

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Record all complaints received and investigate the validity of such complaints. Record all corrective measures taken.
- ◆ A bi-annual report should be compiled of all complaints received and actions taken.

2.1.15 Culture, Heritage and Archaeology

Various buildings, objects and areas in and around Lüderitz have some degree of cultural, heritage or archaeological significance. These range from being declared national monuments (e.g. buildings) to unprotected remnants of early habitation (e.g. middens). Directly relevant to the port expansion project are Shark Island and the water area surrounding it, and the historic buildings, trucks to and from the existing and planned port expansion will pass. The EIA, a terrestrial archaeological study and a maritime and underwater heritage assessment provide detailed information on the local archaeological and heritage setting.

Construction activity or human presence outside of the planned port footprint and on Shark Island can damage known or undiscovered heritage and archaeological remnants or artefacts. Dredging of sediments can also uncover similar items that may be present underneath sediments on the seabed. The proximity of the planned port in relation to Shark Island has also sparked public concern, especially among some of the Nama. It can lead to a diminished sense of place due to, among others, noise and visual impacts. Exhaust gases and dust of trucks passing old buildings can damage the paintwork and cause localised acidic conditions (acid rain) during fog or rain events.

Desired Outcome: To prevent damage to, or loss of, artefacts and buildings of archaeological / heritage value. To minimise indirect impacts on Shark Island leading to a diminished sense of place.

Action:

Prevention

- ◆ Appointment of reputable contractors.
- ◆ All construction and operational personnel must, as part of induction, be:
 - Informed of the heritage sensitivity of Shark Island.
 - Expected to consistently show respect for the area.
 - Informed to be vigilant for and report on any artefacts that may constitute an archaeologically or heritage significant find.
 - To prevent damage to any artefacts that may constitute an archaeologically or heritage significant find.
- ◆ A 20 m buffer (no-go zone) as measured on the water's surface, using mean sea level, must be maintained between the northern part of the port expansion area and Shark Island (Figure 2-1).
- ◆ No waste or overflow of sediments may enter the 20 m buffer zone.
- ◆ No construction or operational personnel may enter the 20 m buffer zone or access Shark Island from the port and port expansion area other than via the official entrance gate to Shark Island.

Mitigation

- ◆ Implementing preventative and mitigating measures in respect of impacts such as noise, visual and waste, will assist in maintaining the sense of place coupled to Shark Island.
- ◆ Any reporting on artefacts that may constitute an archaeologically or heritage significant find must be investigated by a designated person and the chance find procedure must be implemented. Work in the vicinity of the find must be stopped and can only continue once cleared by an archaeologist/heritage specialists registered with the NHC.
- ◆ Namport, together with the various authorities (NHC, LTC, etc.) must work together to protect what remains of Shark Island as a heritage site and implement measures to recognise its past and inform the public and tourists likewise. This can be achieved by erecting informative signage, supporting the capturing of the history of the genocide told by survivors and passed on over generations, and preserving and potentially exhibiting (museum) of remnants of the genocide (photos, objects, etc.).
- ◆ Vehicle emissions and dust affecting buildings requires a joint effort by Namport, LTC and port operators to find alternatives and solutions to redirect traffic or implement strict control over allowable emissions and the covering of loads.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ National Heritage Act
- ◆ Chance find procedure
- ◆ Record any discoveries of potentially significant archaeological or heritage artefacts and report it to the NHC.
- ◆ Bi-annual report of all record keeping and the proof of reporting of any discoveries to the NHC.



Figure 2-1 Approximate 20 m buffer/exclusion zone

2.1.16 Infrastructure

Damage can be caused to the existing port infrastructure during the construction phase. This may temporarily disrupt port services or create unsafe working conditions.

Desired Outcome: To prevent the damage to existing port infrastructure.

Action:

Prevention

- ◆ Appointment of reputable contractors with a known history of safe and responsible work practices.
- ◆ Trained operators of equipment.
- ◆ Emergency response plan with contact details of emergency personnel.
- ◆ Inform relevant stakeholders of the intention to work close to their facilities.
- ◆ Ensure the proper and correct functioning of all operational equipment and warning systems.

Mitigation

- ◆ Implement emergency response plan if any incident occurs.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Record and report to Namport any incidents with the corrective actions taken.
- ◆ Bi-annual report of all record keeping and the proof of reporting of any incidents to Namport.

2.2 DECOMMISSIONING

Closure and decommissioning of the expanded port as a whole is highly unlikely. However, it is possible that certain components of the project—such as auxiliary structures or civil infrastructure—may be decommissioned, upgraded or replaced at a later stage. Decommissioning is therefore included for this purpose, as well as to account for any construction activities that may involve the modification or removal of infrastructure.

Future land use after decommissioning should be assessed prior to the initiation of works, particularly if the affected land will not be used for similar purposes. Should decommissioning occur at any stage, rehabilitation of the area may be required to return the site to an acceptable condition. Decommissioning will entail the complete removal of infrastructure, including buildings, foundations, marine structures and associated support systems that are not required for the future use of the area. Any pollution present on-site must be identified, documented, and remediated in accordance with applicable environmental standards.

The impacts associated with the decommissioning phase include increased noise, dust, and waste production as structures are dismantled. These impacts are typically short-term and localised, but they must be managed effectively to avoid nuisance or environmental degradation. Noise levels must be maintained within the limits stipulated in the Health and Safety Regulations of the Labour Act and/or World Health Organization guidelines. Implementation of a waste management plan, especially for the identification and disposal of hazardous or contaminated materials, will be paramount. Waste must be securely contained and transported to licensed waste disposal sites; dumping or stockpiling in surrounding areas is not permitted. The EMP and associated waste management plan will need to be reviewed and updated at the time of full decommissioning to reflect any site changes, updated legislation, and improved mitigation approaches.

2.3 ENVIRONMENTAL MANAGEMENT SYSTEM

Namport subscribes to an environmental management system (ISO14001) that ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;
- ◆ An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy;
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS; and
- ◆ The EMP.

To ensure Namport continues to adhere to ISO14001, the contractor must also adhere to the parameters prescribed by this EMS. It remains Namport's responsibility to ensure that all contractors operating on behalf of Namport adhere to all environmental compliance requirements.

3 CONCLUSION

The EMP should be used as an on-site reference document throughout the planning and construction phases. It must be read in conjunction with the Proponent's internal Health, Safety, Security and Environmental Management System, and all construction personnel must be trained in its contents. Any

party responsible for non-compliance with the EMP should be held accountable for implementing corrective measures, including environmental rehabilitation where required.

Monitoring requirements outlined in the EMP are critical for effective environmental performance management. Should monitoring results indicate deviations from acceptable limits, alternative methods or technologies must be considered and implemented to ensure that operations remain within regulatory and environmental thresholds.

The port expansion project will diversify and enlarge the business and industrial sector of Lüderitz and provide much needed employment opportunities during the construction and operational phases.

Significant negative environmental impacts resulting from construction and operations of the port are expected, unless suitable preventative and mitigating measures are implemented. The most important of the impacts are archaeology/heritage, visual, noise, waste, pollution and health and safety.

An ECC issued based on this EMP, will render it a legally binding document which should be adhered to. It specifies some of the enhancement measures aimed at increasing the positive impacts. This include maximising the appointment of local Namibian companies as contractors and for support services. To minimise impacts on Shark Island, a 20 m buffer must be maintained on the north-eastern side of Shark Island as indicated in Figure 2-1. The chance find procedure must be initiated for any potentially significant archaeological or heritage finds. All infrastructure must be designed and finished to blend in with the surroundings. Construction activities must be restricted to day time. Good housekeeping must be performed at all times and equipment must be on site to deal with any emergencies such as spills, fire and injuries.