ECC
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COMPLIANCE CONSULTANCY

ECC-99-313-REP-14-D

ENVIRONMENTAL MANAGEMENT PLAN

THE CONSTRUCTION OF A BULK STORAGE AND HANDLING FACILITY FOR INDUSTRIAL SULPHURIC ACID AT THE SKORPION ZINC WAREHOUSE AT THE PORT OF LÜDERITZ, IN THE !KARAS REGION, NAMIBIA

PREPARED FOR

skorpion zinc

JUNE 2021

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TITLE AND APPROVAL PAGE

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DEFINITIONS AND ABBREVIATIONS

ECC	Environmental Compliance Consultancy
ECP	Environmental Contingency Plan
EIA	Environmental Impact Assessment
ESIA	Environmental Impact Assessment
EMP	Environmental Management Plan
I&APs	Interested and Affected Parties

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) was engaged by Namzinc (Pty) Ltd and to compile an Environmental Management Plant (EMP) in accordance with the Environmental Management Act, No. 7 of 2007. Skorpion Zinc (Namzinc) (Pty) Ltd herein referred to as the 'Namzinc' propose to transport 314 000 tonnes of zinc sulphide concentrate from their sister company Black Mountain Mining (Pty) Ltd for processing at their Namzinc Refinery located in Rosh Pinah, Namibia. A distance of 120 kilometres, from the Namibian-South Africa border, using interlink trucks. Due to the nature of the proposed project, limited jobs may potentially be created during the construction and operation phases of the project, however additional jobs will be created at the refinery itself.

The processing of this material will produce an excess of 75 000 tonnes per annum of sulphuric acid as a by-product. This would then be transported within Namibia to local consumers, and to the Skorpion Zinc warehouse at the Port of Lüderitz for export, by road over a distance of 293 kilometres. Within the existing warehouse at the port, a purpose-built storage facility will be constructed to store 15 000 tonnes of sulphuric acid.

The proposed design of the storage and handling facility's foundation will include piling and plate work. Piles and plate work (installation of mild steel pumps) are typically used as reinforcement methods in foundation construction to support heavy load bearing structures.

Thereafter, pipes would be installed to the facility for the process of stevedoring (loading or discharging/ offloading) the acid onto the ships for exportation. The proposed development will take approximately one year to construct. The development will entirely consist of land-based construction.

The construction of the new storage and handling facility will take place on an area extent of approximately 1649 m^2, as an add-on, east of the existing Skorpion Zinc warehouse, at the Port of Lüderitz (Figure 1). The Port of Lüderitz serves the mines in the southern regions of Namibia and north-western South Africa with imports and exports of mining commodities.

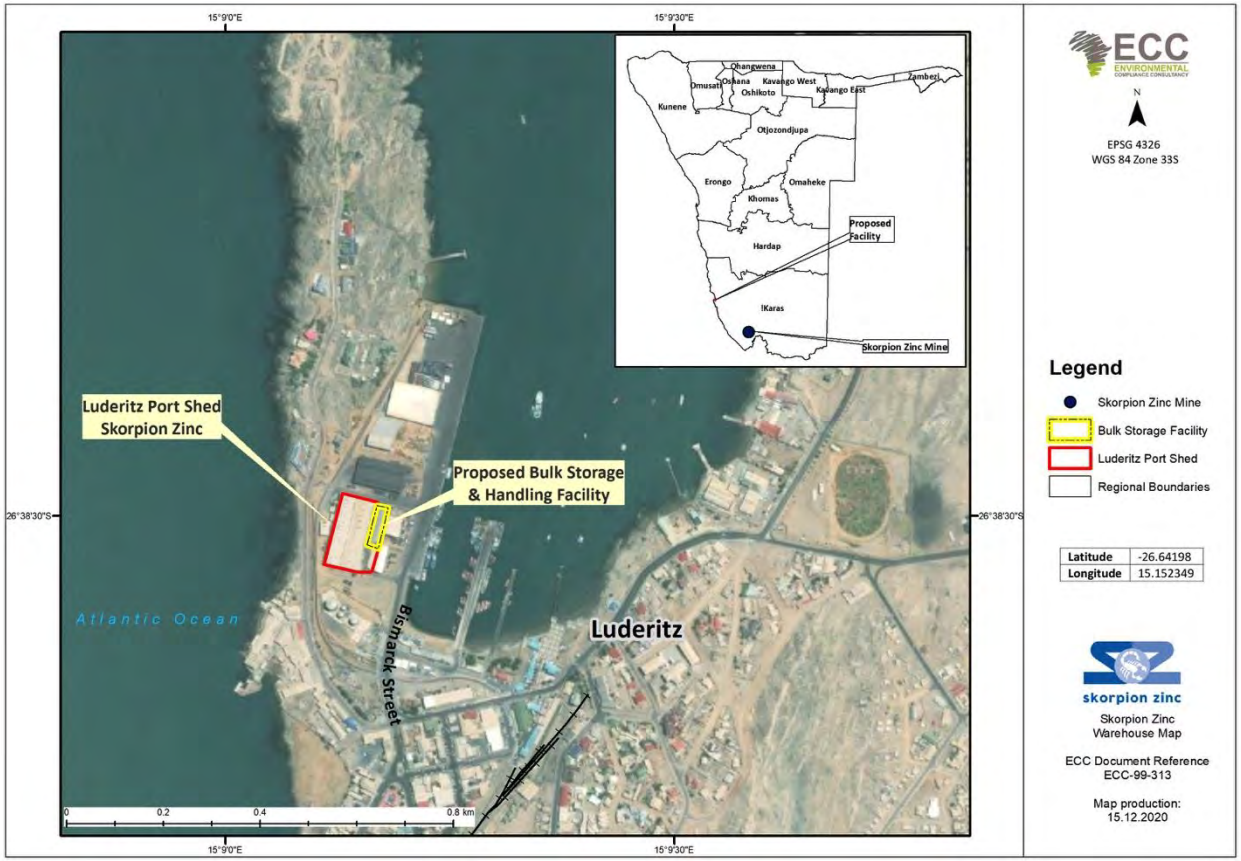

FIGURE 1 – LOCALITY MAP OF THE PROPOSED PROJECT SITE, LÜDERITZ

The Skorpion Zinc mine and Refinery was placed under Care and Maintenance in May 2020 following slope failures in the open pit. This was deemed to have an economic impact on both the Rosh Pinah community and the Namibian economy as a whole. To prolong the life of the Skorpion Zinc facilities and to reduce the economic and social impacts of full-scale closure of the site, the Company is working on a project to convert the existing facility into a zinc sulphide concentrate treatment smelter. An application for an environmental clearance certificate was submitted for the conversion of the Skorpion Zinc Refinery. This was granted by the Ministry of Environment, Forestry and Tourism (MEFT) on the on the 31 August 2020 to 31 August 2023. The conversion and modification to the Skorpion Zinc (Namzinc) Refinery will enable the treatment of zinc sulphide (ZnS) concentrate that will be transported from their sister company Black Mountain Mining (Pty) Ltd, Gamsberg Mine, Northern Cape, South Africa.

The Namzinc Refinery is located in the !Karas Region of Namibia, approximately 100 km north-east of Oranjemund and 20 km north-west of Rosh Pinah. Sulphuric acid is a by-product of the zinc refining process. The Namzinc Refinery is situated inside the eastern boundary of the Tsau //Khaeb (formally known as the Sperrgebiet) National Park.

Sulphuric acid is a hazardous, clear colourless material that may emit choking fumes when hot. The material is non-flammable but when in contact with reactive materials may result in a fire or exothermic reactions. The major use of sulphuric acid is in the production of fertilizers, manufacturing of chemicals, in the petroleum refining process as well as in the processing of metals. Some of the risks associated with the sulphuric acid exposure is its corrosivity to metal and biological tissue, of which the latter may cause severe skin burns and eye damage and should therefore be handled cautiously.

Namzinc will manage the program for the proposed project and engage with their business partners to ensure that the norms of health, safety and environment are met.

The proposed development is expected to generate income and job opportunities for the local community. It is estimated direct and indirect employment opportunities could be created during the construction and operation phase.

1.2 Environmental Regulatory Requirements

In terms of the Environmental Impact Assessment (EIA) Regulations and the Environmental Management Act, No. 7 of 2007, the proposed development qualifies as a listed activity. Therefore, an application for an environmental clearance certificate is to be submitted to the Directorate of Environmental Affairs. An Environmental Scoping Report and EMP are required to be submitted as part of the application process, as well as to support the decision-making process.

This report presents the EMP and has been undertaken in terms of the requirements of the act and its regulations.

1.3 Purpose And Scope Of This Report

The purpose of this EMP is to provide a management framework for the proposed activities so that the potential environmental impacts identified through the scoping process are avoided, minimised and mitigated as far as reasonably practicable, and that statutory requirements and other legal obligations are fulfilled.

This EMP also presents protocols, procedures, roles and responsibilities to ensure the management arrangements are appropriately and effectively implemented. This EMP forms an appendix to the environmental assessment report and has been based on the findings of the assessment; therefore, the environmental assessment report should be referred to for further information on the proposed project, assessment methodology, applicable legislation, and assessment findings.

This EMP is a live document and shall be reviewed at predetermined intervals, and or updated when the scope of works alters, or when further data or information can be added. All personnel working on the project will be legally required to comply with the standards set out in this EMP.

The scope of this EMP includes all construction and operational activities carried out.

1.4 Management of this EMP

The proponent, Namzinc (Pty) Ltd will hold the environmental clearance certificate for the proposed project and will be responsible for the implementation and management of this EMP. The implementation and management of this EMP and thus the monitoring of compliance shall be undertaken through daily duties and activities and monthly inspections.

1.5 Limitations, Uncertainties and Assumptions of this EMP

This EMP does not include measures for compliance with statutory occupational health and safety requirement, which includes the component, fire safety management. This will be provided in the overall Health and Safety Management Plan (HSMP) to be developed by the proponent.

Where there is any conflict between the provisions of this EMP and any business partners obligations under their respective contracts, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines, and relevant laws), the contract and statutory requirements are to take precedence.

The information contained in this EMP has been based on the project description as provided in the environmental scoping report. Where the design or construction methods alter, this EMP may require updating and potential further assessment to be undertaken.

1.6 Environmental Consultancy

Environmental Compliance Consultancy (ECC), a Namibian consultancy with registration number 2013/11401, has prepared this EMP on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across southern Africa, in the public and private sectors. ECC is independent of the proponent and has no vested or financial interest in the proposed project, except for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this document should be forwarded by email or posted to the following address:

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2 PROJECT MANAGEMENT PERSONNEL

This EMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. The EMP also indicates monitoring and reporting requirements and sets responsibilities for those carrying out management and mitigation measures. Namzinc shall provide a project team to oversee activities and responsibilities.

2.1 ORGANISATIONAL STRUCTURE, ROLES, AND RESPONSIBILITIES

The proponent shall be responsible for:

- Ensuring all members of the project team, including business partners, comply with the procedures set out in this EMP;
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement; and
- Ensuring that any person's allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

The proponent and business partners shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above.

The key personnel and environmental responsibilities of each role are presented in Table 1.

TABLE 1 - KEY ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY & DUTIES
Proponent	– Overall responsibility for the implementation and management of this EMP; – Ensure the environmental policy is communicated to all personnel throughout the proposed project and ensure that employees, business partners and visitors understand and adhere to the EMP; – Responsible for providing the required resources (including financial and technical) to complete the required tasks; – May appoint a project manager and a site manager (or nominated supervisor), to who they may delegate tasks and responsibilities within the mandate of the proponent; and – Ensure that all employees, business partners and visitors are inducted on environmental measures.
Site Manager (or nominated supervisor)	– Responsible for ensuring compliance with this EMP including overseeing all day-to-day activities during the duration of the project, including routine and non-routine maintenance works, as well as decommissioning tasks; – Ensure adequate resources are made available for implementation of this EMP;

ROLE	RESPONSIBILITY & DUTIES
	– Responsible for the management, maintenance and revisions of this EMP; – Ensure all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the project; – Ensure all employees and business partners participate in a site induction process prior to commencing work on the project; – Maintain the community issues and concern register, and keep records of complaints; – Ensure that best environmental practice is undertaken throughout the duration of the project; and – Report any non-compliance or incidents to the regulatory authority. – Ensure that all employees, business partners and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times; – Provide environmental awareness / management training and site inductions for all employees, business partners and visitors; – Monitor daily operations and ensure adherence by personnel to the EMP; – Receive, respond to and record complaints; and – Report any non-compliance or incidents to the proponent.
Employees (and business partners and visitors where applicable)	– Responsible for being compliant with this EMP throughout the project; – Adhere to this EMP at all times; – Ensure attendance of site inductions; – Ensure appropriate briefings for certain activities have been provided and are fully understood; and – Report any operations and conditions that deviate from the EMP or any non-compliant issues or incidents to the site manager and proponent.

2.2 Business Partners and Service providers

All business partners involved with establishment of the proposed project (including partners appointed for maintenance activities and service providers) shall be compliant with this EMP, and shall be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implement appropriate environmental and safety management measures;
- Report environmental issues, including actual or potential environmental incidents and hazards, to the proponent; and
- Ensure appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported.

2.3 EMPLOYMENT

The proponent should ensure that a locals first policy be adopted on the project pertaining to employment opportunities during the construction and operational phase of the project. The following shall be complied with:

- In liaison with the relevant authorities, the proponent shall ensure that local people have access to information about job opportunities and are considered first for contract employment positions;
- The number of job opportunities shall be made known together with the associated skills and qualifications;
- The maximum length of time jobs is likely to last for shall be clearly indicated;
- Foreign persons with no proof of permanent legal residence shall not be hired; and
- Every effort shall be made to recruit from the pool of unemployed persons living in the local area.

3 COMMUNICATIONS AND TRAINING

To ensure potential risks and impacts are minimised, it is vital that personnel are appropriately informed and trained on operational procedures that include the above mitigation measures. It is also important that regular communications are maintained with all the stakeholders and made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training in relation to the EMP.

3.1 COMMUNICATIONS

During the entire project, the proponent and / or site manager (or nominated site supervisor) shall communicate site-wide environmental issues to the project team through the following means (as and when required):

- Site induction;
- Site notices;
- Audits and site inspections;
- Toolbox talks, including instruction on incident response procedures; and
- Briefings on key project-specific environmental issues.

This EMP shall be distributed to the project team, including business partners, to ensure that the environmental requirements are communicated effectively. Key activities and environmentally sensitive operations shall also be briefed to employees and business partners.

During the entire project regular communications between the management team shall include discussing any complaints received and actions to resolve them; any inspections, audits or non-conformance with this EMP and any objectives or target achievements.

3.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

Table 2 contains a list of numbers to be contacted in case of an emergency. All personnel will be made aware of these numbers.

TABLE 2 - EMERGENCY CONTACT DETAILS

TOWN	EMERGENCY CONTACT	POLICE / FIRE	AMBULANCE	Namport SHEQ
Lüderitz	Mr. Nicolaas De Wee Tel: +264 63 207 846 Cell: +264 811 601 114 nico@ltc.com.na	+264 (63) 202 255	+264 (63) 202 446	Mr. Stefanus Gariseb Tel: 0642082206 Cell: 0811672175 s.gariseb@namport.com.na
Namzinc	Mr. Tshiningayamwe Eliakim ETshiningayamwe@vedantaresources.co.na			

(Pty) Ltd	063 2712381

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the MEFT office informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the General Manager as guided by the SHE Representative.

Site notices with the emergency contact details will be posted and site employees made aware of the contents and numbers.

3.3 Response concept

Possible incidents involving spill of hazardous chemical substances may include:

- Release of hazardous chemicals as a result of tankers incidents;
- Release as a result of capsized or damaged tanks with chemical liquid (sulphuric acid);
- Accompanied by fire, explosives, property damage and involving environmental pollution; with corrosive or toxic products resulting from vehicle collision; and
- As a result of handling of chemical substances while in transit.

Road incidents may potentially occur on designated route of the (Namzinc refinery – Port of Lüderitz) road corridor while the sulphuric acid is being transport and such incidents may potentially impose threats on the health and lives of communities living along the route (should such occurs near/within inhabited areas) as well as on the environment.

3.4 Complaints Handling and Recording

Any complaints received verbally or in writing by any personnel on the project site shall be recorded by the receiver. Information recorded should include:

- The name and contact details of the complainant;
- Date and time of the complaint; and
- The nature of the complaint.

The information shall be given to the proponent who is overall responsible for the management of complaints and will provide a written response to the complainant. The proponent shall inform employees of issues, concerns or complaints.

The proponent shall maintain a complaint register that will detail the name and contact details of the complainant, date and time of the complaint, nature of the complaint, action is taken to resolve issues, and date of complaint handover. The proponent shall be responsible for nominating the correct personnel to coordinate and resolve the issue.

The workforce shall be informed about the complaints register, its location and the person responsible, in order to refer local residents or the general public who wish to lodge a complaint. The complainant shall be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons are to be recorded in the register.

The complaints register shall be kept for the duration of the project and will be available for government or public review upon request.

3.5 Training And Awareness

All personnel working on the project shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training and experience.

3.6 Site Induction

All personnel involved in the project, business partners and visitors shall be inducted to the site with specific environmental and social awareness training, and health and safety issues. The environment and social awareness training shall ensure that everybody on site is familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The proponent shall ensure a register of completed training is maintained.

The site induction should include, but not limited to the following:

- A general site-specific induction that outlines:
    - What is meant by “environment” and “social”;
    - Why the environment needs to be protected and conserved;
    - How construction activities can impact on the environment; and
    - What can be done to mitigate against such impacts;
- The inductee’s role and responsibilities with respect to implementing the EMP;
- The site environmental rules and policies;
- Details of how to deal with, and who to contact if environmental problems should occur;

- Focal themes such as compliance, reporting of incidents, good housekeeping and standard procedures for waste management;
- The potential consequences of non-compliance with this EMP and relevant statutory requirements; and
- The role of responsible people for the project; and
- Emergency response training.

4 EMERGENCY RESPONSE PLANS AND PROCEDURES

Namzinc emergency preparedness plans for potential emergency environmental incidents shall be implemented. All plans may include the following minimum content:

- Clearly defined roles and responsibilities of relevant emergency response personnel through Duty Cards;
- Emergency response procedures;
- Resources to be used in response to an emergency environmental incident;
    - Availability of emergency response documentation and procedures;
    - Site specific Emergency response training;
    - Emergency response and management teams;
    - Emergency equipment;
- Monitoring (including procedures for accessing monitoring locations during emergency environmental incidents);
- Communication procedures and coordination with stakeholders (e.g. emergency services, local government and state government);
- Notifications and reporting;
- Incident investigation; and
- Site clean-up and remediation.

4.1 EMERGENCY RESPONSE PROCEDURES

Emergency response procedures are provided in the relevant emergency preparedness plans in the form of Emergency Situation Checklists. These Emergency Situation Checklists are scenario based and act as a guide to assist the relevant emergency response personnel when responding to a specific emergency. Variations to the checklists will be based upon sound emergency response management, engineering judgement and operational experience, and are at the discretion of the response leaders (e.g. the site manager or nominate site supervisor).

The emergency response and management teams will serve a critical role in controlling an incident. The emergency response and management teams may meet regularly to review the emergency response procedures and to update the procedures as site conditions warrant. Additionally, if improvements in the response procedures are identified, the ECP and other relevant emergency preparedness plans will be updated accordingly.

4.2 Emergency Response Actions

4.2.1. General Response to an Emergency Environmental Incident

The general measures provided in the sections below apply to all environmental incident scenarios. These measures will be executed in response to an environmental emergency to:

- Reduce the threat to human life or injury;
- Protect against environmental damage; and
- Preserve infrastructure, product, and equipment.

More specific response actions will be dependent on the type and location of the emergency environmental incident and detailed in the relevant emergency preparedness and response plan.

4.2.2. General Response Measures

1. Evacuate (all non-essential personnel);
2. Eliminate (sources of ignition, sparks, etc.);
3. Stop and Coordinate (stop source of the incident (e.g. spill) and coordinate shut down of relevant equipment, if possible);
4. Notify (internal and external notifications):
    - All emergency environmental incidents must be reported to the site manager immediately upon discovery; and
    - Conduct regulatory or emergency services report, as required.
5. Identify (material (if unknown) and identify PPE, hazards, and response procedures using SDSs);
6. Contain / Isolate (contain released material / incident using emergency response equipment and/or set up perimeter to isolate area);
7. Stabilise and Neutralise (neutralise / stabilise spilt material (where relevant), use absorbents to stabilise other released materials etc);
8. Clean up (remove released materials, spill response materials, any affected media etc.); and
9. Evaluate, document and Investigate and Remediate (if necessary).

If initial monitoring conducted in response to an environmental release indicates the potential for environmental impact, a Contaminated Site Assessment is to be conducted to assess whether the site contamination poses a potential risk to human health and/or the environment (either on or

off the site), and if the release is of sufficient magnitude to warrant remediation or a management control appropriate to the current or proposed land use.

On the basis of the release and potential area of impact, an investigation work plan will be developed. This work plan will consider the fluids / chemical released, the media impacts (land and/or water), and the environmental setting.

Once the situation has stabilised, refer to the following sections for additional information:

- Section 3 – Communication: ensure that the proper notifications are made;
- Section 5 – Environmental Monitoring: coordinate and implement the appropriate monitoring regimen, determined on a case-by-case basis.

5 REPORTING, COMPLIANCE, AND ENFORCEMENT

5.1 Environmental Inspections and Compliance Monitoring

Environmental monitoring will be conducted to ensure compliance to the EMP and Environmental authorisation conditions as well as in response to an emergency environmental incident. Compliance monitoring will consist of daily, weekly and monthly inspections. These inspections will be conducted against commitments made in the EMP and compliance conditions as stipulated in the environmental authorisation.

5.1.1. Emergency Monitoring

The specific aspects of the environmental monitoring activities, including suitable monitoring locations, will vary depending on the nature of the incident and will be determined at the time of the incident. Typical monitoring that will be required may include:

- Visual inspections to determine the nature and extent of impacts and ongoing response actions;
- Vapour monitoring associated with the release of gases and petroleum hydrocarbon and/or chemical vapours to atmosphere;
- Field measurements of pH and conductivity in released waters, waters contained within temporary containment structures or tanks and receiving waters; and/or
- Laboratory measurements to identify constituents of concern in affected media where required (e.g., waters, soils).

More robust sampling and analysis may be conducted in the post incident investigation, assessment and, if required, remediation activities. This will include the implementation of receiving environment monitoring programs where contaminants have been released to land or water, so as to determine the extent of any environmental impact.

5.1.2. Daily Compliance Monitoring

A copy of this EMP shall be on-site throughout the duration of the project and shall be available upon request. It is the responsibility of the proponent and site manager (or nominated site supervisor) to ensure this EMP is complied with through their daily roles. Daily and weekly inspections will be undertaken. Daily and weekly inspections should include as a minimum the following:

- Housekeeping inspections;
- Condition of emergency response equipment such as spill kits;
- Integrity of containment facilities;

- Condition of signage;
- Condition of transport tankers;
- Couplings and line integrity during stevedoring;
- Condition and capacity of waste management facilities.

Inspection records will be kept by the site manager. Any environmental problems or risks identified shall be notified to the proponent and actioned as soon as is reasonably practicable.

5.1.3. Monthly Compliance Monitoring

Monthly inspections shall be undertaken by the site manager to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly. Any non-conformance shall be recorded, including the following details: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action taken and any necessary follow up measures required. As a minimum monthly inspection should include:

- Storm water management infrastructure;
- Sumps and bunds;
- Illumination especially around offloading area;
- Integrity of protective infrastructure at offloading facilities;
- Storage tank integrity; and
- Condition of couplings.

5.2 Reporting

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issue, failure of equipment or incident, is reported to the proponent immediately.

5.3 Environmental Permits

Whilst the Water Resources Management Act, No. 11 of 2013 is not enforced, it is best practice to adhere to its stipulations while ensuring compliance with the Water Act, No. 54 of 1956, which is maintained still. Should the client consider abstracting water from a borehole or seawater, a licence to abstract water is required. A permit to discharge is also required. The proponent will apply for the relevant permits and shall operate in accordance with any conditions stipulated.

5.4 NON-COMPLIANCE

Where it has been identified that activities are not compliant with this EMP, the proponent shall employ corrective actions so that the activities return to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the proponent shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

A non-compliance event / situation, for example, is considered if:

- There is evidence of the contravention of this EMP and associated indicators or objectives;
- The proponent and / or site manager (or nominated supervisor) have failed to comply with corrective or other instructions issued by the proponent or qualified authority; or
- The proponent and /or site manager (or nominated supervisor) fail to respond to complaints from the public

Activities shall be stopped in the event of a non-compliance until corrective action(s) has been completed.

5.5 INCIDENT REPORTING

The proponent must ensure that an incident (including minor or near-miss) reporting system is maintained so that all applicable statutory requirements are covered. For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe. For a serious environmental incident, the required statuary reporting needs to be adhered to.

The proponent with the site manager or nominated supervisor shall investigate the cause of all safety and environmental significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

5.6 DISCIPLINARY ACTION

This EMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties;

- Legal action;
- Monetary penalties imposed by the proponent on the business partners;
- Withdrawal of license/s; and
- Suspension of work.

The disciplinary action shall be determined according to the nature and extent of the transgression or non-compliance, and penalties are to be weighed against the severity of the incident.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT

6.1 Objectives and Targets

Environmental objectives for the project are as follows:

- Zero pollution incidents;
- Minimal disturbance to traffic;
- Minimise noise pollution;
- Minimise light pollution (the correct placement of lights);
- Minimise dust pollution; and
- Minimise the generation and disposal of waste.

6.2 Register Of Environmental Risks And Issues

An environmental review of the proposed project has been completed to identify all the commitments and agreements made within the environmental assessment report. From this, a list of environmental commitments and risks were produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the project.

The supporting Contingency Plan for Emergency Environmental Incidents (herein referred to as the ECP) aims to provide an overview of management practices in place to minimise environmental harm during emergency environmental incidents. The ECP identifies potential emergency environmental incidents and details of a response to an emergency environmental incident, including escalation, communication, reporting and monitoring (as provided in Appendix A).

6.3 Impacts Identified For Further Actions

6.3.1. Noise impacts and gases emitting from the storage facility site

Construction activities and related traffic in the vicinity may increase noise levels emanating from the site, as well as gases emitting from the site during the operation phase. Noise from equipment can often be reduced by modification or by the application of improved sound reduction methods, but this should only be carried out after consultation with the manufacturer.

For steady continuous noise, such as that caused by diesel engines, it might be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or by designing an acoustic canopy to replace the normal engine cover. Any such project should be carried out in consultation with the original equipment manufacturer and with a specialist in noise reduction techniques. The

replacement canopy should not cause the engine to overheat nor interfere excessively with routine maintenance operations.

Those undertaking piling works should endeavour to ascertain the nature and levels of noise produced by the mechanical equipment and plant that will be used. They should then take appropriate steps to reduce either the level or the annoying characteristics, or both, of the noise.

Impact noise when piling is being driven can be reduced by introducing a non-metallic dolly between the hammer and the driving helmet. This will prevent direct metal-to-metal contact but will also modify the stress wave transmitted to the pile, possibly affecting the driving efficiency. The energy absorbed by the dolly will appear as heat. Further noise reduction can be achieved by enclosing the driving system in an acoustic shroud. Several commercially available systems employ a partial enclosure arrangement around the hammer. It is also possible to use pile driving equipment that encloses the hammer and the complete length of pile being driven, within an acoustic enclosure.

The duration of piling work is usually short in relation to the length of construction work as a whole, and the amount of time spent working near to noise-sensitive areas might represent only a part of the piling period. Furthermore, the noisiest part of the pile construction process might occur at each individual pile location only for a short period of time.

The recommended mitigation measures for consideration include restricting operation hours, traffic calming measures, defined routes to and from the site, maintain boundary fence, scheduling of noisy activities, and notice to community prior to noisy activities.

The potential for gases emission from the site during operation was assessed. Sulphuric acid is mainly a clear, colourless to yellow, odourless and oily liquid with a low viscosity. Although it is odourless, it has a choking odour when heated. In high concentrations, sulphuric acid may smell like rotten eggs. The impact of foul odour being released as a result of the sulphuric acid storage is unlikely during the operation phase and any effects will be short-term depending on the activities at hand. Operators on site should always were appropriate PPE when handling the acid.

6.3.2. Fire risk occurrences on site and possible corrosion of the storage tanks

Sulphuric acid is very reactive and dissolves most metals, it is a concentrated acid that oxidizes and dehydrates most organic compounds, often causes an incomplete combustion. Sulphuric acid reacts violently with alcohol and water to release heat. It reacts with most metals, particularly when diluted with water, to form flammable hydrogen gas, which may create an explosion hazard. Sulphuric acid is not combustible and does not burn itself, but it is a strong oxidizer that enhances the combustion of other substances. During fire, poisonous gases are emitted.

The proponent will ensure that the bund and any acid capturing area is coated with an anticorrosive protector that prevents corrosion. The storage tanks will be inspected monthly for any holes, visual effects, damages or breaching as a result of corrosion. Annual wall thickness testing will be conducted to ensure the integrity of the storage facility. Furthermore, the tanks will be level monitored on an electronic system linked to an alarm/notification system. In the event a level difference is detected the system will immediately inform the operators. This system will be tested regularly as part of the planned maintenance schedule. Repair and renovation of the storage tanks should be part of the proponent's long-term maintenance plans and standard operating procedures for the proposed facility.

The proponent should ensure that the building is coated with an anticorrosive protector that prevents corrosion. The storage tanks shell or cover should be inspected regularly for any holes and breaching as a result of corrosion. Repair and renovation of the storage tanks should be part of the proponent's long-term maintenance plans and standard operating procedures for the proposed facility.

6.3.3. TRAFFIC IMPACTS FROM CONSTRUCTION AND OPERATION ACTIVITIES

During construction, increased traffic to and from the project site may disrupt normal traffic flow for the Lüderitz town. This could potentially impact local residents that might find the need to find alternative routes through the area may be necessitated, increasing traffic flow times. This may result in the increased traffic congestion on the road to the port and within, increase in the risk of incidents, result in deterioration of road surfaces, and cause vibration related damage to existing infrastructure. The developer is responsible for ensuring a practical traffic management plan is implemented to manage the potential effects on traffic conditions surrounding the site so as to reduce the level of significance on sensitive receptors. A traffic impact assessment was carried out to determine baseline conditions and suitable mitigation measures to manage traffic related impacts.

Vehicles such as trucks and tankers during construction and operation should not be allowed to obstruct any traffic or access points to any other businesses and facilities on the routes through Lüderitz. If any extraordinary traffic impacts are expected, traffic management should be performed in conjunction with local traffic department, to prevent these. Traffic regulation to and from the port should be adhered to.

6.3.4. SURFACE WATER QUALITY AND MARINE LIFE IMPACTS FROM CONTAMINANTS

Uncontrolled or incidental spillage of chemicals such as hydrocarbons and sulphuric acid during operation were considered to be a significant impact, which could results into hazardous contaminants entering the marine environment, with potential impact to marine life and birdlife.

All spillages should be contained and management as quick as possible to reduce the surface area and further contamination.

Sulphuric acid will be stored in bulk tanks on the port's premises within the containment facility to ensure that any possible tank failure will be contained, within the bunded area of a 110% size. Moreover, the bund will be built of cast concrete with acid proof tiles to control any damage from incidental spills of the sulphuric acid. Appropriate material reinforcement will be carried out and its strength will be calculated, considering a worst-case scenario that the tanks or the bund's wall collapses. In a case that any seismic activity is a potential risk, the design of the facility would need to be built accordingly, so that it can withstand earth traumas.

During stevedoring operations a procedural sequence will be established to ensure that valves to pipes will be opened in such a sequence that the acid pumping procedure into the vessels is done without spilling any acid from couplings. A decoupling procedure will be developed to ensure that the pipeline does not have residual acid before decoupling from the vessel occurs and shall be strictly enforced. Additionally, as a monitoring procedure of the facility, routine (monthly) maintenance inspections will be conducted on pipe couplings and a full visual inspection on the integrity of the line will be conducted before each loading.

The design of the proposed storage facility (tanks, pipe work and walkway) should follow marine specification to limit corrosion risks caused by the harsh coastal environment factors and or exposure to the marine atmospheric conditions.

Other control measure will include inspection of the pipe work regularly, establishing lever meters in the tanks to ensure that any leak is detected early and mitigated. Should any failure occur, the only line of defence would be the containment bund that would hold a 110% capacity for one tank only. There is no secondary bunding and if a spill of more than 5000 L is released into the environment, there is a potential risk of the acid flowing into the Lüderitz coastal environment causing risks of injury and disruption to the marine life, as well as destroying the marine habitants and quality of the surface water.

The Port of Lüderitz is located near the Shark Island, the proponent and business partners should avoid the disturbance of any protected or threatened species and local birdlife. Marine life is managed and protected under the jurisdiction of the Ministry of Fisheries and Marine Resources.

Table 3 provides a register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as the responsible person. This register will be subject to regular review by the proponent and updated when necessary. The proponent will use this register to undertake monthly inspections to ensure the project is compliant with this EMP.

TABLE 3 - ENVIRONMENTAL RISKS AND ISSUES, AND MITIGATION AND MONITORING MEASURES

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
CONSTRUCTION PHASE				

General construction activities (surface ground site preparation, and general construction)	– Potential pollution to the environment
	– Potential risk to the occupational and safety of construction crew.
	– Potential nuisance effect on community and surrounding communal areas
		– Develop and implement an operation manual or procedures to conduct work and implement monitoring programmes thereafter;
		– Develop method statements for construction activities:
		  – Construction procedures;
		  – Materials and plant to be used;
		  – Transport of materials and plant to and from site;
		  – How the plant/ material will be moved while on site;
		  – How and where material will be stored;
		  – The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
		  – Timing and location of activities;
		  – Compliance/ non-compliance with the Specifications; and
		  – Any other information deemed necessary by the Engineer.
		– Conduct site toolbox talks before shifts commence;
		– Maintain continuous communication with I&APs to identify concerns and mitigation measures;
		– Compliance with all applicable laws and agreements through rigorous inspections and audits;
		– Train and raise awareness to sensitize employees about contentious issues like working in urban spaces and control of pollutants;
		– Ensure appropriate supervision of all activities;
		– Incidents need to be reported to the proponent and recorded in the incident register;
		– Preventative measures will be in place when service and maintenance activities are done (drip trays, non-porous surfaces, funnels, non-damaged containers); and
			Weekly, monthly	Site manager or the nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		– Employees should be shifted according to the project works schedule requirement, so as to avoid a large concentration of people/employees on site at any given moment. All employees should not be present on site at any given point in time; – The proponent should ensure adequate and quality break areas are provided for employees on site during their lunch breaks; – Access to the beach should be restricted at all times during work hours; – Security personnel to be stationed at access points to the site at all times during construction to manage pedestrian and vehicle entry to and exit from the site; and – A visitor's register should be placed at the main entrance to the site and updated and maintained regularly to keep track of who comes to site.		
	– Movement of heavy equipment and vehicles, – Nuisance (noise) pollution – Light disturbances – Trampling, compaction and disruption of the ground surface on site due to construction	– Restrict speed of vehicles to national traffic and road use regulations and speed limits within the port; – All vehicles and machinery / equipment to be shut down between periods of use; – Restrict construction activities to daytime hours (7 am to 7 pm weekdays and 7 am until 1 pm on Saturday if necessary; – Control of noise emissions may include the use of silencers for machinery, equipment and noise barriers; – No load music is allowed to be played on site; – Vehicle horns are only allowed to be used in safety situations and not for any other purpose on site during work hours; – In areas of high noise (more than 80dB), personal hearing protection measures would be mandatory; – Continuous engagement with residents to identify any concerns or issues, and appropriate mitigation and management measures agreed upon;	Daily throughout the construction period	

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	activities	– All outside facility lights should be placed facing downward to the ground and should be LED lights; and – Floodlights (LED)around the perimeter of the site should never face upward or outward, but at a 90˚ plane or less and downward. – Maintain construction boundary walls, scheduling of noisy activities, and notice to community prior to noisy activities. – Avoid activities during windy conditions; – Limit the possibility of compaction and creation of a hard subsurface in and outside the site. Areas utilized as construction equipment laydown areas should not be allowed to remain compacted after the construction period;		
	– Dust and emissions	– All vehicles and machinery / equipment to be shut down between periods of use; – Use one identified access route only with appropriate turning circles and delivery zones; – Apply dust suppression measures where possible as a proactive measure to avoid dust creation; – Restrict speed of vehicles; – Specific activities that may generate dust and impact on residents shall be avoided during high wind events; and – Locate construction materials stockpiles in sheltered areas where it is not exposed to erosive effects of wind.	Daily, weekly	

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	Disruption to traffic flow in the immediate vicinity	– Set up appropriate vehicle movement signage on at intersections surrounding the project site to direct traffic flow in a safe manner; – Whenever feasible, construction and trucks should avoid leaving the site at peak traffic periods (07:00 to 08:30 AM, 12:00PM to 14:00PM and (17:30PM to 18:30 PM); – Construction vehicles should not be allowed to park off site, except in dedicated parking spaces (off site) as may be agreed upon between the proponent and the local authority; – All necessary reflective and lighting signs should be placed on project and construction vehicles to maximize visibility and reduce potential incidents that may have occurred otherwise. – Compulsory toolbox talks and induction of employees; – Always determine the line / route of activity beforehand and restrict all activities to a demarcated area whenever renovations to the facility or landscaping is required;	Daily	
Hazardous contaminants handling and storage (such as fuel), maintenance on equipment, machinery and vehicles	– Site contamination – Surface water contamination – Nuisance (visual impacts, litter)	**Storage** – Storage of hazardous volume should be in adequate containment areas (non-porous surface, 110% bunded, within a fenced-in area) – Label chemicals appropriately – Chemicals with different hazard symbols should not be stored together - clear guidance on the compatibility of different chemicals can be obtained from the Materials Safety Data Sheets (MSDS) which should be readily available – Store chemicals in a dedicated, enclosed, secure facility and a paved/concrete floor. – Chemical tanks should be completely contained within secondary containment such as bunding – Storage and handling of fuels and chemicals shall be compliant with	Daily	Site manager (or nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		relevant legislation and regulations – Fuels, lubricants, and chemicals are to be stored within appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored **Spills** The kits with the following items as a minimum should be made available on site: – Absorbent materials according to the chemical type – Heavy-duty plastic bags – Protective clothing (e.g. gloves and overalls) – For small repairs and required maintenance activities all reasonable precautions to avoid spills must be taken (e.g. spill trays, impervious sheets). – Provision of adequate and frequent training on spill management, spill response and any refuelling activities must be provided to all onsite staff – Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks – All major petroleum product spills (spill of more than 200 litres per spill) should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled "Reporting of major petroleum product spill', attached as Appendix B. **Handling and maintenance** – Good housekeeping; – Training and awareness through toolbox talks and induction;		

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		– Raise awareness about the importance of responsible waste management, including wastewater management; – Implement a culture of correct waste collection, waste segregation and waste disposal; – Avoid hazardous waste on site; – Wastewater discharges will be contained – no disposal of wastewater directly into the environment; and – All fuel and petrochemical products are to be stored on an impermeable, bunded and covered surface that is clearly marked and access controlled.		
General construction activities	– Fire risks and potential fire outbreaks	– All personnel and business partners on the site should comply with the fire management and emergency preparedness and occupational health and safety plans in its entirety, as developed by the proponent; – Fire extinguishers must be kept on site at strategic locations, easily accessed and maintained in good working order; – Regular fire toolkits talks to be conducted on site and attendance and performance recorded; and – The proponent to develop a fire rescue and management procedure in collaboration with the local authority for the site and implement its provisions. – Authorisation from the port master will be obtained prior to construction to ensure no other non-compatible products are within the same vicinity. It is advised that no hot works is to be done close to the storage tanks. – Develop protection and a prevention plan, with inclusion of an emergency response and firefighting plant to manage fire risks.	Daily	Site manager or the nominated site supervisor
Heritage	– Disruption of heritage sites	Discovery of unearthed archaeological remains to be uncovered, the following measures (chance find procedure) shall be applied:	Daily	Site manager or the nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		– Works to cease, area to be demarcated with appropriate tape by the site supervisor, and the Site Manager to be informed – Site Manager to visit the site and determine whether work can proceed without damage to findings, mark exclusions boundary and inform the Environment and Social Manager with the GPS position if possible – If works cannot proceed without damage to findings, Site Manager to inform the Environmental Manager who will get in touch with an archaeologist who will provide advice – Environment and Social Manager / Archaeological Specialist to evaluate the significance of the remains and identify appropriate action, for example, record and remove; relocate or leave in situ (depending on the nature and value of the remains) – Inform the police if the remains are human, and – Obtain appropriate clearance or approval from the competent authority, if required, and recover and remove the remains to the National Museum or National Forensic Laboratory as direct.		
Job creation, skills development and business opportunities	Beneficial socio-economic impacts on a local and regional scale.	– Maximise local employment and local business opportunities; – Enhance the use of local labour and local skills as far as reasonably possible; and – Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	Monthly	Site manager or the nominated site supervisor
OPERATIONAL PHASE				
General operation activities and Storage of sulphuric	Risks of fire occurrences. Fire risks may result in property damage, possible	– An emergency and management procedure should be in place in collaboration with the local authority for the facility and implement its provisions including monitoring; – Adequate safety signage should be displayed on all levels of the facility as per the proponent's health and safety management plan principles and	Daily throughout the operation period	Site manager or the nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
acid with any other non compatible	injury/death and impacts of uncontrolled fires and explosions on site	local municipal regulations in this regard; – All firefighting systems to be tested and maintained regularly as well as firefighting equipment; and – All emergency escape routes to be kept uncluttered and unblocked to allow easy exit from the building. – Fire protection systems should be provided in the entire facility area along with appropriate type of fire extinguishers. – Fire alarm system provided in main production units, warehouse and administrative office. – Conduct quarterly emergency drills. – The client will ensure that only compatible chemicals and products will be stored within proximity to the acid. – Maintain a fire protection and a prevention plan, with inclusion of an emergency response and firefighting plan to manage fire risk. – Avoid hot works near storage tanks.		
	Safety of employees, site visitors and other users or stakeholders within the port	– The proponent should implement its health and safety management plan stringently; – Ensure all entrances and exits are structurally sound and safe to use at all times; – Ensure security personnel are adequately trained and visible throughout the public spaces within and outside the building; – Ensure that effective complaints recording procedures are in place; – Piping will be provided with continuity jumpers and earthling for flammable liquid; – Safety valve provided as per requirement – Pre employment and periodic medical screening being carried out. – Adequate Personal Protective Equipment (PPE) such as appropriate gloves, safety goggles, helmets, safety shoes, protective clothing, apron, respirators are provided.	Daily	Site manager (or nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		– First aid and firefighting training will be provided to all the employees. – Standard operating procedures provided for each unit operations – On site emergency plan is prepared for the onsite emergencies.		
Storage and handling of sulphuric acid on site, pumping, piping and stevedoring activities	– Incidental and or uncontrolled spills may potentially result in surface water contamination and release of hazardous substances on site – Risks of explosions – The potential impact likely to occur from a voluminous acid spill event (i.e., total loss of containment) may include: – Terrestrial and onshore/coastal biodiversity destruction.	**Storage and handling:** – Sulphuric acid to be stored in bulk tanks within the port's premises within the containment facility to ensure that any possible tank failure will be contained within the bunded area of a 110% size. – The bund to be built of cast and concrete with acid proof tiles to control any damage from incidental spills of the sulphuric acid. – During stevedoring operations a procedural sequence will be established to ensure that valves to pipes will be opened in such a sequence that the acid concentrate pumping procedure into the vessels is done without spilling any acid from couplings. – Ensure development of decoupling procedure to ensure that the pipeline does not have residual acid before decoupling from the vessel occurs and shall be strictly enforced. – Regular inspection of the pipe work, establishing level meters in the tanks to ensure that any leak is detected early. – The developer will ensure that the building is coated with an anticorrosive protector that prevents corrosion. – The storage tanks shell or cover should be inspected regularly for any holes and breaching as a result of corrosion. – Conduct wall thickness testing on annual basis **In an event of a spill the following points therefore apply to all areas on the**	Weekly, Monthly	Site manager or the nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	– Surface water contamination	**site:** – Assess the situation for potential hazards. – Notify trained personnel immediately, such as the company fire officer or the local fire department. Untrained persons or those without proper personal protective equipment must not enter areas with high concentrations of sulphuric acid. – Evacuate and restrict people from the hazardous area of a sulphuric acid release. – Do not come into contact with the spilled substance until it has been characterised and necessary personal protective equipment (PPE) is provided. – Stop or control the source of exposure. – Isolate the area as required. – Collect or confine the spill. Dilute and neutralize the spill and dispose in a secured landfill. Sulphuric acid may be absorbed in vermiculite, dry sand, or similar material. **The following measures are to be implemented in response to a spill:** – Spills are to be stopped at source as soon as possible (e.g. close valve or upright drum); – Spilt material is to be contained to the smallest area possible using a combination of absorbent material, earthen bunds or other containment methods; – Spilt material is to be recovered as soon as possible using appropriate equipment; – Acid spills should be neutralized and then cleaned up. Do not use a strong base, to neutralize a strong acid rather dilute and then		

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		neutralize; – All contaminated materials recovered subsequent to a spill, including soils, absorbent pads and sawdust, are to be disposed of at an appropriately licensed facility; – A written Incident Report must be submitted to the general manager and local authority or the Port of Lüderitz management.		
	– Increased traffic flow in the immediate vicinity – Additional heavy traffic volume and flow within the storage site and via the designated route to the Port	– During operations restrict movement to agreed upon operation hours; – Establish traffic calming measures and defined routes to and from the site – The developer is responsible for ensuring a practical traffic management plan is implemented to manage the potential effects on traffic conditions surrounding the site so as to reduce the impact. – It was recommended that truck circulation on-site should only occur in a forward direction. Any reversing of trucks should be kept to a minimum and only within areas that are closed off to general public movements.	Monthly	Site manager or the nominated site supervisor
Generation of general waste	Unhygienic proliferation of domestic waste on site	– During operations, the solid waste for the proposed development will be managed and improved in line with the principles of the waste hierarchy of waste prevention, re-use, recycle or compost, energy recovery and disposal, where waste minimisation and recycling is preferred to waste treatment and disposal (National Solid Waste Management Strategy, MET 2019); – A refuse container will be a SABS approved (SABS 1494), 240 litre, Polyethylene, two wheeled, mobile refuse containers (MGB 240), internationally known as the "Otto Bin"); and – Every commercial unit should be supplied with an Otto Bin and all bins should be stored in a central storage area within the premises and emptied on a weekly basis.	Weekly	Site manager or the nominated site supervisor

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Waste Management	Environmental pollution (littering and poor storage of waste)	– Implement a waste management plan covering all aspects of waste generated on site – Training and toolbox talk about importance of waste management – Ensure high standard of housekeeping across the site – Solid waste shall be stored in an appointed area in covered, tip-proof metal drums/skips for collection and disposal to an approved waste management site. – The waste storage areas shall always be kept clean and tidy – Implement the waste management hierarchy across the site: Avoid, reuse, recycle, then the disposal – Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty bags, to facilities for reuse – Solid wastes should be deposited/emptied on a regulate basis – See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers – Liaise with the municipality regarding the waste and handling of hazardous waste. – Hydrocarbon and chemical contaminated solids have the potential to cause contamination to the soil, ground and/or surface water, thus correct storage and disposal methods are required.	Daily	– Site manager or the nominated site supervisor – All staff members
Job creation, skills development and business opportunities	Beneficial socio-economic impacts on a local and regional scale.	– Maximise local employment and local business opportunities; – Enhance the use of local labour and local skills as far as reasonably possible; – Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	Quarterly	Site manager or the nominated site supervisor

7 IMPLEMENTATION OF THE EMP

All construction activities will be carried out in compliance with the relevant legal requirements Whilst the transportation and operation of the proposed project does not fall under the listed activities of the EMA, No. 7 of 2007 it is recognised that as an indirect consequence of the project, some activities may infer to the act – therefore the EMP considers the relevant guidelines and requirements of the act.

No significant impacts are anticipated for the activities that have been identified and management and mitigation measures are in place for potential risks.

This EMP:

- Has been prepared pursuant to a contract with the proponent
- Has been prepared on the basis of information provided to ECC up to May 2021
- Is for the sole use of the proponent, for the sole purpose of an EMP
- Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP, and
- Must not be copied without the prior written permission of ECC.

ECC has prepared the EMP on the basis of information provided by the proponent and the environmental and social impact assessment report

APPENDIX A – AN EXAMPLE OF THE CONTINGENCY FOR EMERGENCY ENVIRONMENTAL INCIDENTS (ECP) DOCUMENTS

SUB SECTION REPORT SQAS

INCIDENT REPORT FORM

DEPARTMENT		DATE & TIME	

TYPE OF INJURY / INCIDENT
☐ LTI ☐ NEAR MISS ☐ ENVIRONMENTAL INCIDENT ☐ UNSAFE ACT
☐ UNSAFE CONDITION ☐ DAMAGE TO PROPERTY ☐ MINOR INJURY ☐ FATALITY

PERSON INJURED / INVOLVED/ WITNESSING THE INCIDENT							
NAME		DESIGNATION					
Employee		Temporary Worker		Contractor		Other (visitors,delivery personnel, etc)	

Section 1	Completed by the person/persons witnessing the Incident – Description of Incident
LOCATION OF THE INCIDENT	

Section 2	Root Cause – What was the underlying root cause of the Incident
Corrective/ Preventive Action (What is the action taken to reduce the likelihood of a reoccurrence?)	
Actioned by:	Action date:

Reported By:		**Signature**	
Departmental Supervisor		**Signature**	
Departmental Manager		**Signature**	
Health, Safety & Environmental Officer		**Signature**	

APPENDIX B – APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

DEPARTMENT OF WATER AFFAIRS & FORESTRY

FAX:	(061) 208 7160	PRIVATE BAG 13184
TEL:	(061) 208 7111	WINDHOEK
REFERENCE NO:		NAMIBIA

APPLICATION FOR A WASTEWATER DISCHARGE LICENCE, IN TERMS OF PART XIV OF THE WATER RESOURCES MANAGEMENT ACT, 2004

(Act No. 24 of 2004 - as published in the Government Gazette of the Republic of Namibia, No. 3357, of 23 December 2004, Government Notice No. 284)

A. GENERAL INSTRUCTIONS

1. Applications must be submitted in duplicate to:

   The Permanent Secretary
   Attn.: Law Administration
   Ministry of Agriculture, Water and Forestry
   Private Bag 13184
   WINDHOEK

2. Application Fee (to accompany this document): N$_____

3. The various sections have to be completed as follows:

   Section B & C - All applicants
   Section D - Complete only the part relevant to technology employed in your works.
   Section E - All applicants (compulsory!)

4. Only the relevant Sections that have been filled in need to be submitted with this application.

5. A separate application needs to be filled in for each different plant/works.

NAME OF TREATMENT PLANT/WORKS: _____

PLACE: _____ **GPS Coordinates:** _____
(e.g. town, settlement)

1

B. GENERAL INFORMATION

1. Name of applicant: _____

2. Address - Contact Person: _____
   - Postal: _____
   - Physical: _____
   - Tel No.: _____
   - Fax No.: _____
   - E-mail: _____

3. Region in which plant is situated: _____

4. Constituency in which plant falls: _____

5. Type of establishment:
   (e.g. school, town, industry) _____

6. Source of water supply:
   (e.g. borehole, river, sea) _____

7. Total water consumption: _____ m^3/day ADWF*

   (*ADWF = Average Dry Weather Flow) _____ m^3/day ADWF*

   - Consumption based on the average usage over a 12-month period. _____ m^3/day ADWF*
   - List different sources separately _____ m^3/day ADWF*

8. Application:
   - Prepared by: Name : _____ Position: _____
     (e.g. Consultant) Signature: _____ Date: _____
   - Responsible Executive: Name : _____ Position: _____
     Signature: _____ Date: _____

2

C. TECHNICAL DETAILS - GENERAL

Answers to the following information must be contained in this application either from the questionnaire or as an attachment thereto (see also details in Appendix A):

NAME OF TREATMENT PLANT/WORKS: _____

1. Type of effluent (please also refer to Section D for classifications): _____

2. Site of works:

2.1 Submit a site plan indicating the exact location (or intended location) of the works. This plan should indicate (as a minimum):

2.1.1 General location of the works with regards to settlements, main roads, boreholes, rivers etc.

2.1.2 Layout plan of property showing all existing and proposed water pipes and effluent and drainage lines in distinctive colours.

2.1.3 Topographical plan/area photograph/contour plans showing the property and effluent treatment plant in relation to residential areas, rivers, pans, dams, lakes and boreholes.

2.1.4 Contour plans indicating the exact location of the effluent treatment works and point of discharge of final effluent in relation to watercourses that drain the area.

2.1.5 Give the following information:

2.1.5.1 Distance to nearest inhabitants: _____m

2.1.5.2 Distance to nearest water abstraction point (e.g. river, borehole): _____m

2.1.5.3 Distance to nearest watercourse (e.g. dry river) and specify: _____m

2.1.5.4 Wind direction (main/normal) _____

2.2 Submit overall details of works:

2.2.1 Type of effluent treatment system and a brief description of its method of operation. (If domestic effluents are dealt with by the local authority please enclose a letter from the authority confirming this agreement).

2.2.2 Flow diagram/mass balances to show the present average quantities of incoming water, recycled water, final outflow, seepage and evaporation losses (all in m^3/day).

2.2.3 Layout orientation drawing indicating all major treatment units and fence around works.

2.2.4 Complete flow diagram and key design parameters to include:

2.2.4.1 Dimensions and design capacities of each unit process;

2.2.4.2 Process Flow Diagram(s) and major instrumentation employed, e.g. water meters;

2.2.4.3 Loadings on the system (e.g. hydraulic, COD, BOD, nitrogen, phosphate);

2.2.5 Indicate allowances that have been made for future expansion and increased loads (if any).

2.2.6 Methods of sludge disposal or recirculation.

2.2.7 Disinfection of the final effluent (indicate dosing type, method, retention period and optimum disinfectant level in final effluent).

3. Monitoring boreholes for monitoring groundwater pollution over time must be available within 500 m of the point of final effluent discharge.

4. Please note: Additional information is required for new treatment plants (e.g. an environmental impact assessment) - details can be obtained from the Department of Water Affairs and Forestry.

5. All relevant information must be included with this application. **It is a criminal offence to deliberately withhold vital information relevant to this application.** Where applicants are found to be in contravention with this requirement, they may/will be prosecuted.

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D. TECHNICAL DETAILS - SPECIFIC

Applicants should only complete sections relevant to their specific effluent (please tick relevant box):

☐	D-1: Domestic Effluent - Includes wastewater collected in towns (excluding industrial effluent!), villages, schools, lodges, administration buildings.
☐	D-2: Industrial Effluent - Includes wastewater generated by any industry, factory, etc.
☐	D-3: Mining Effluent - Includes wastewater accumulated or collected due to mining operations (e.g. Acid mine wastewater)
☐	D-4: Combination/mix of various effluents (list major effluent streams on page 11)

Final Effluent Reuse

The pressure on Namibia's existing fresh-water supplies can, to a great extent, be eased by the sensible reuse of effluents for a variety of purposes including dust control, agriculture and industrial processes. Therefore, reuse of effluent after suitable treatment is encouraged.

The allowable reuse of an effluent is dependent upon its quality as well as many local circumstances and hence each application in this category needs careful and individual scrutiny, which should be undertaken by a specialist in this field and must be supported by an environmental impact assessment study.

A separate licence for effluent reuse is required and more details in this regards can be obtained from the Department of Water Affairs and Forestry.

D-2. INDUSTRIAL EFFLUENTS

Plant Name: .....

2.1	Describe industry and major activities resulting in effluent generation		
2.2	Capacity / Flowrates :		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	If ponds are employed, state total surface area		m^2
2.3	List only major contaminants (also attach full analysis of typical effluent sample)		
2.4	Type of treatment employed (give short overview of process):		
2.5	List major treatment chemicals* employed in the unit process(es):		
2.6	Final effluent quality after treatment (put envisaged final quality for a new plant):		
2.7	Sludge generation:		
	- Volume generated		m^3/d
	- Mass		kg/d (dry solid)
	- Method of disposal		
	- Place of disposal		
	- Major constituents		
	- If sludge ponds, state frequency of cleaning		
2.8	Do you employ cleaner production principles (CPP)? Yes/No If "yes", elaborate:		
2.9	Is the following documentation included (give reason if not)? ▪ Water (and waste) management plan: Yes/No ▪ Decommissioning plan: Yes/No		

* For the chemicals employed, proper mass balances should be included that show chemical usage, movement and discharge within the factory/process(es). All safety aspects related to handling, storage and disposal of chemicals on site must be followed at all times.

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D-4. COMBINATION OF VARIOUS EFFLUENTS

Plant Name: .....

4.1	Describe major activities resulting in effluent generation (e.g. type of industry):				
4.2	Capacity / Flowrates of different streams (major only)	1	2	3	
	Type (e.g. domestic, industrial, mining, others)				
	Design - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
	Actual (if in operation) - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
4.3	List only major contaminants (also attach full analysis of typical effluent sample)				
4.4	Type of treatment employed (give short overview of process)				
4.5	List major treatment chemicals employed in the unit process(es):				
4.6	Final effluent quality after treatment (put envisaged final quality for a new plant)				
4.7	Sludge generation:				
	- Volume generated				m^3/d
	- Mass				kg/d (dry solid)
	- Method of disposal				
	- Place of disposal				
	- Major constituents				
	- If sludge ponds, state frequency of cleaning				

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E. FINAL EFFLUENT DISPOSAL

1.4.1	Where is the final effluent discharged to? (E.g. French drain, pumped out by Local Authority, dry river course, perennial river, etc.)	
1.4.2	IF soakaway, state: - Type of soil - Suitability/porosity of soil - Size of soakaway area - Include topography and plan of soakaway area	
1.4.3	Is there any post-treatment applied? (e.g. disinfection, filtration)	
1.4.4	Is the final effluent re-used? (Yes/No)	
	If "Yes", complete:	
	- Do you have a reuse licence?	
	- Amount of water that will be re-used:	m^3/d
	- For what application:	
	- Type of irrigation used (if applicable):	
	- What crops are grown:	
	- Area of land that will be irrigated:	ha
1.4.5	Name (if any) downstream users (downstream of discharge point).	
1.4.6	Past records of complaints or objections by people living close to works:	

Reuse:
A reuse licence is required – details can be obtained from the Department of Water Affairs and Forestry.

Irrigation:

The crops allowed to be irrigated are dependent upon effluent quality (details will be supplied on request by the Department of Water Affairs and Forestry).

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APPENDIX B - REPORTING OF MAJOR PETROLEUM PRODUCT SPILL FORM PP/11

64 Government Gazette 23 June 2000 No. 2357

FORM PP/11

MINISTRY OF MINES AND ENERGY

PETROLEUM PRODUCTS AND ENERGY ACT, 1990
PETROLEUM PRODUCTS REGULATIONS (2000)

REPORTING OF MAJOR PETROLEUM PRODUCT SPILL

(Regulation 49(1))

(Please note that where form is completed by hand it must be completed in capital letters)

1. Name of licence/certificate-holder/person .....
.....
*(*Delete whichever is not applicable)*

2. Postal address .....
.....

3. Physical address .....
.....

4. Telephone Number (including code) .....

5. Facsimile Number (including code) .....

6. Licence/certificate* number and date of issue, if applicable .....
.....
*(*Delete whichever is not applicable)*

7. Date of petroleum product spill .....

8. Location of petroleum product spill .....
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9. Reasons for petroleum product spill .....
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10. Type of petroleum product involved in petroleum product spill .....
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11. Quantity of the petroleum product spill .....
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12. Indicate whether the petroleum product has or will have any negative effect on the environment and the safety and health of person or the property of persons .....
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13. Provide full details of all remedial actions taken to minimise risks associated with petroleum product spills and all cleaning-up operations taken in connection therewith .....
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DECLARATION

I, ……, hereby declare that the information submitted by me in this application is true and correct.

…… . …… ……
Signature *Place* *Date*

APPENDIX C - TEMPLATE FOR MONITORING

INSPECTION DATE: _____

INSPECTION COMPLETED BY: _____

SUMMARY OF ACTIVITIES OCCURRING:

_____

_____

_____

_____

Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
1	Noise	– Is the facility avoiding noise generating activities at night? – Is scheduling of works to avoid disturbance between the hours of 22pm and 5 am in place? – Are Saturday operational periods from 8 am – 12 noon, when near residential areas? – Are procedures for receiving complaints from nearby land users or residents in place and mitigation measures implemented should operations generate excessive noise?	– SHE Representative	Yes☐ No☐ N/A☐	

Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
2	Operations of mechanical equipment and engines	– Are regular checks of all equipment conducted routinely? – Are equipment services up to date? – Are spill kits and/or drip trays available?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
3	Production and effluent discharge	– Is the domestic and industrial effluent discharged off into approved systems? – If not, are regular water quality samples taken to ensure the treated wastewater complies to the prescribed general standards as set out in the Water Resources Management Act, 2004 (Act No. 24 of 2004)?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
4	Solid waste generation	– Has the waste management plan and the application of the waste management hierarchy implemented? – Are suitable collection points in place for waste collection at the factory? – Is waste collected regularly and transported correctly? – Is hazardous waste such as waste oil/lubricant stored in a hazardous waste storage area and disposed of by accredited hazardous waste handlers such as Rent A Drum?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
5	Lighting	– Are energy-efficient light bulbs installed? – Is unnecessary lighting avoided where possible? – Are lights switched off at night?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
7	Air Emissions	– Are the dust extractors cleaned regularly? – Are vehicles serviced regularly to reduce emissions? – Is there dust monitoring system in place?	– SHE Representative	Yes☐ No☐ N/A☐	

Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
8	PPE	– Are personnel wearing the correct PPE? – Is PPE in good condition? – Are there any complaints on the health of Employees	– SHE Representative	Yes☐ No☐ N/A	

APPENDIX D - COMPLAINTS REGISTER TEMPLATE

NAME	CONTACT DETAILS	DATE AND LOCATION OF COMPLIANT	NATURE OF COMPLIANT	ACTION TAKEN TO RESOLVE	NOMINATED PERSON TO RESOLVE ISSUE *(Signature)*	DATE OF RESOLUTION/ CLOSED OUT COMPLAINT

APPENDIX E - MONTHLY INTERNAL COMPLIANCE CERTIFICATE

FOR THE PERIOD …… TO ……

MANAGEMENT REPRESENTATIVE:	SIGN:
SHE Representative:	SIGN:
Date of Submission:	
Key activities on site during the month:	
NON-CONFORMANCE: Area of activity:	

Reason:
Responsible party:
Results:

Correction action taken:	

Intended follow-up:	

GOOD PERFORMANCE:

Description of activity or action in which the area/person went beyond compliance towards responsible care for the environment:

ADDITIONAL COMMENTS: