APP 006825

STORAGE AND HANDLING OF INDUSTRIAL CARGO AND CHEMICALS ON ERF 5184 AND 5187 IN EXTENSION 14, WALVIS BAY

ENVIRONMENTAL MANAGEMENT PLAN

Prepared by:

Prepared for:

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Project:	**Storage and Handling of Industrial Cargo and Chemicals on on Erf 5184 and 5187 in Extension 14, Walvis Bay: Environmental Management Plan**	
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1 INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Pindulo Logistics (Pty) Ltd (hereafter referred to as the Proponent) to prepare an environmental scoping assessment (EIA) and environmental management plan (EMP) for proposed storage and handling of industrial cargo and chemicals on erven 5184 and 5187, Extension 14, Walvis Bay (Figure 1 1). The Proponent intends to utilise the properties for the storage and handling of metals and metal ores, industrial cargo and chemicals. Typical operational activities will involve the receipt, temporary storage and distribution of cargo, including break-bulk cargo (e.g. bagged, bundled, palletised or crated goods), bulk cargo and containerised freight (e.g. shipping containers), as well as packaged liquids (e.g. acids stored in intermediate bulk containers (IBCs)).

An environmental clearance certificate (ECC) for the proposed operations is required in terms of the Environmental Management Act, Act No. 7 of 2007 (EMA). As part of the EIA process, a risk assessment was undertaken to identify potential positive and negative impacts associated with the construction (where applicable), operational and possible decommissioning phases, as contemplated in the EMA. This report presents the EMP, which outlines measures to avoid, prevent or mitigate potential negative environmental impacts while enhancing the project's positive outcomes..

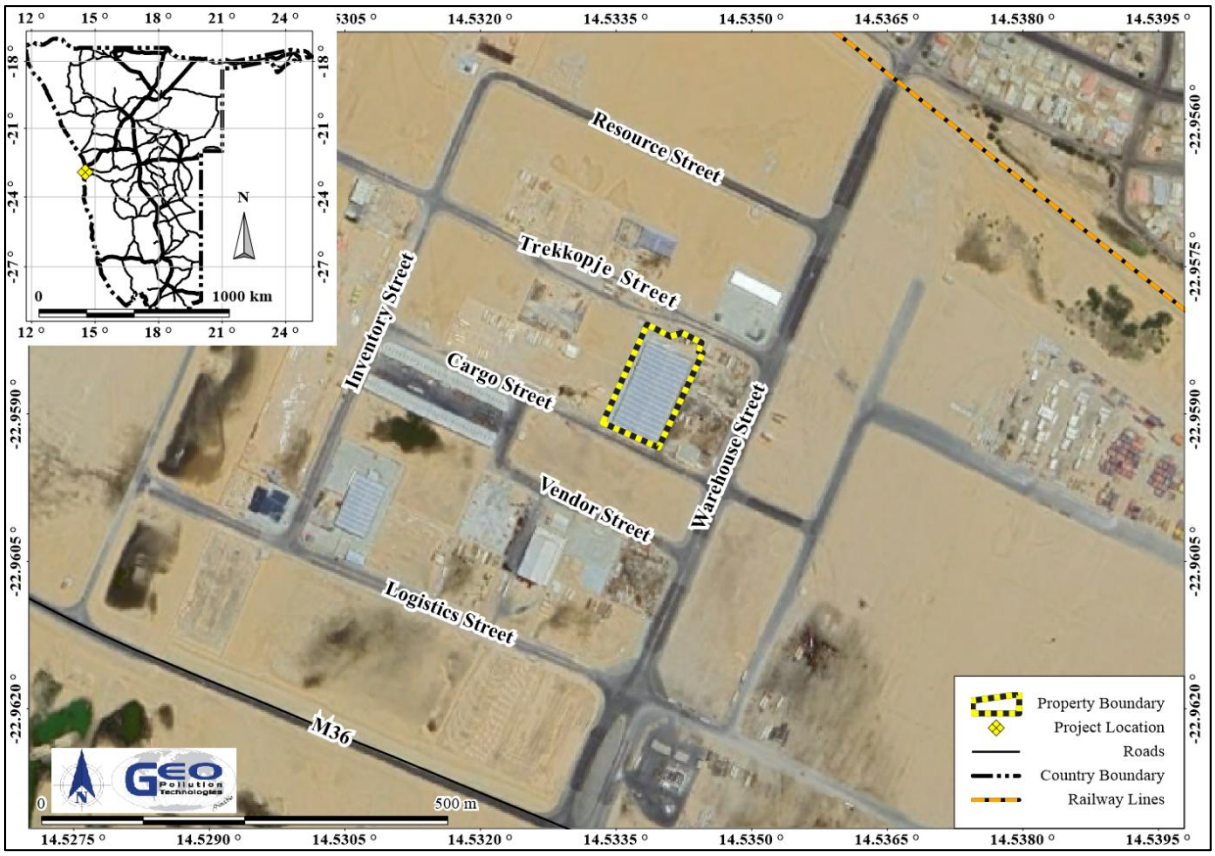

Figure 1-1 Project location

2 MANAGEMENT OF IMPACTS

The purpose of this section is to present 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 facility is 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. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the facility. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the facility should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- to include all components of construction activities (upgrades, maintenance, etc.) and operations of the facility;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- to monitor and audit the performance of operational personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible operational personnel.

Various potential and definite impacts will emanate from the operations, construction and decommissioning phases. 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 descriptions below, impacts related to the operational phase are expected to mostly be of medium to low significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature

2.1.1 Planning

During the phases of planning for construction, operations and decommissioning of the facility, it is the responsibility of Proponent to ensure they are and remain compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction (maintenance) and operations of the facility are in place and valid.
- Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- Make provisions to have a community liaison officer on site who will handle complaints and community input, and through whom, where reasonable, monitoring data can be requested. Communicate the contact details of the community liaison officer to interested and affected parties when the project is initiated.
- Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
    - Risk management / mitigation / EMP/ Emergency Response Plan and HSE Manuals;

  - Adequate protection and indemnity insurance cover for incidents;
  - Comply with the provisions of all relevant safety standards;
  - Procedures, equipment and materials required for emergencies.

- If one has not already been established, establish and maintain a fund for future ecological restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- Prepare and submit environmental monitoring reports as per the conditions of the environmental clearance certificate.
- Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the environmental clearance certificate prior to expiry.

2.1.2 Employment

An increase of skilled and professional labour will result from the operations of the project. Employment will be sourced locally as far as practically possible while ore transport companies / drivers may be contracted from other regions. Development of the existing facility into the proposed operations will increase the sustainability of the current employment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Employment contribution to local economy; project revenue generation	3	1	3	2	2	21	3	Definite
Indirect Impacts	Decrease in unemployment, increase in revenue generated	3	2	3	2	2	42	4	Definite

Desired Outcome: Provision of employment to local Namibians.

Actions

Mitigation:

- The Proponent must employ local Namibians where possible. If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Bi-annual summary report based on employee records.

2.1.3 Skills, Technology and Development

During operations, training will be provided to a portion of the workforce. Skills are transferred to an unskilled workforce for general tasks. The technology required for the development of the facility is often new to the local industry, aiding in operational efficiency. Development of people and technology are key to economic development.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Technological development and transfer of skills	3	1	3	2	2	21	3	Definite
Indirect Impacts	Economic development	3	1	3	2	2	21	3	Definite

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in associated industries.

Actions

Enhancement:

- If the skills exist locally, contractors 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.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record should be kept of training provided.
- Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- Bi-annual summary report based on records kept.

2.1.4 Revenue Generation

The project will change the way revenue is generated and paid to the national treasury. An increase of skilled and professional labour will result from the operations of the project and related wages and salaries will be paid. Employment at the warehouse will be sourced locally as far as practically possible while transport companies / drivers may be contracted from other regions in order to transport cargo to and from Walvis Bay. Revenue will be generated through the provision of port and related services such as stevedore operations.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Contribution to local and national economy	3	2	3	2	2	42	4	Definite
Indirect Impacts	Increase in revenue generated	3	1	3	2	2	21	3	Definite

Desired Outcome: Contribution to the local and national economy. Contribution to national treasury.

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.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Bi-annual summary report based on employee records.

2.1.5 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phases. Local construction teams in Walvis Bay will be used for all general maintenance and upgrade activities. The scale of the construction portion of the project is limited and it is not expected to create a change in the demographic profile of the local community. Where possible, existing labour, already employed by the Proponent will be used or new labourers will be sourced from the town. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, associated with the trucking industry (transport of goods to and from Walvis Bay) and increased spending power of the labour force. HMVs delivering products to the warehouse will not stay for extended periods of time at the site, however, may reside over-night in Walvis Bay. Foreign persons in the area may increase the cumulative risk of communicable disease (such as HIV/ AIDS) in Walvis Bay.

Positive impacts will related to employees and contractors' increased economic resilience and improved livelihoods.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Social ills related to unemployment and cross country transport	2	-1	3	2	2	-14	-2	Probable
Daily Operations and Construction	Increased economic resilience and improved livelihoods	2	2	3	2	2	28	3	Probable
Indirect Impacts	The spread of diseases	3	-1	3	2	2	-21	-3	Probable

Desired Outcome: To prevent the in-migration and growth in informal settlements, prevent the spread of communicable disease and prevent / discourage socially deviant behaviour.

Actions:

Prevention:

- Employ local people from the area where possible, deviations from this practise should be justified appropriately.
- Adhere to all municipal by-laws relating to environmental health which includes, but is not limited to, sanitation requirements for workers on site.
- Appointment of reputable contractors.

Mitigation:

- Educational programmes for employees (especially truck drivers) on HIV/AIDs and general upliftment of employees' social status.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Facility inspection sheet for all areas which may present environmental health risks, kept on file.
- Bi-annual summary report based on educational programmes and training conducted.
- Bi-annual report and review of employee demographics.

2.1.6 Health, Safety and Security

Some chemicals handled and stored on site are hazardous with inherent health risks to personnel on site when inhalation, accidental ingestion, eye or skin contact occurs. Some chemicals may in itself not be particularly dangerous, but may become dangerous when in contact or mixed with incompatible materials. This may happen when for example incompatible materials are stored with each other, during containment failure (e.g. ruptured bags), or when different spilled products are cleaned and stored in the same container. If not contained, windblown ore dust may further pose health risk to nearby receptors.

Injuries can occur due to incorrect lifting of heavy equipment and materials, failing from heights, stacked chemicals tipping over, and accidents involving forklifts and vehicles.

Security risks are related to unauthorized entry, theft and sabotage. Security risks are increased as a result of high value commodities, e.g. copper cathodes, stored and handled at the site.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Physical injuries, exposure to chemicals and criminal activities	2	-2	3	2	2	-28	-3	Improbable

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, MSDS's and signage requirements (personal protective equipment (PPE), flammable etc.).
- Develop emergency response plans for all possible health, safety and security impacts and appoint responsible personnel in key positions to activate and oversee such plans when required.
- Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- Provide all employees with required and adequate PPE which include coveralls, respirators and protective eyewear.
- Ensure that all personnel who will work in the warehouse receive adequate training on:
  - operation of equipment (mainly the forklift).
  - reading and understanding of MSDS instructions (take note that MSDS documents are not always 100% adequate and that some extra information for hazardous chemicals may be required).
  - handling of hazardous substances.
  - containment of hazardous substance spills.
  - correct application of neutralising agents, absorbents, etc. which may be used for spilled products (knowledge of incompatibilities is key).
  - identification of incompatible chemicals and the need to separate them during storage (segregation).
  - identification of potential hazardous conditions or events.
  - first aid and actions to be taken for specific highly dangerous chemicals should contact, inhalation or ingestion occur.
  - firefighting and compatible firefighting media for specific chemicals (see section 2.1.10).
- A MSDS file in which a particular MSDS can quickly be found, must be available in the warehouse.

- For specific highly dangerous chemicals (e.g. highly reactive with other chemicals and substances, highly flammable, highly corrosive or poisonous), abridged emergency procedures can be prepared that summarise they key do's and don'ts for each of these chemicals.
- The contact details of all emergency services must be readily available.
- An emergency shower, eyewash station and water bath must present and inspected daily to ensure it is in working order and ready for use in an emergency.
- Ideally, a worker should not be allowed to enter the warehouse alone when chemicals will be handled. Should an emergency situation result where a worker is injured to such an extent that he/she can't call for help (e.g. inhalation of noxious/corrosive fumes), aid and medical treatment may come too late to prevent serious injury or even fatalities. Safety measures must be implemented and these can include being accompanied by the security guard on site or using a panic button that can be worn by the warehouse employee which sounds an alarm in the offices.
- Security procedures and proper security measures must be in place to protect workers and clients.
- Equipment on site must be locked away or placed in a way that does not encourage criminal activities (e.g. theft).

Mitigation:

- For all emergency situations, the appropriate emergency response plan must be implemented as soon as possible in order to minimize the magnitude of impacts or prevent such impacts from developing into more severe impacts.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Receive chemical composition analysis results of various ores to be handled from the mines and scrutinise the results for any carcinogenic (or other hazardous) gangue material like asbestos. Should any such material be present, additional safety measures must be implemented to ensure that no workers or nearby receptors are exposed to dust.
- If regular complaints are received regarding dust, air quality monitoring must be conducted on and around the site to monitor ore dust fallout. Monitoring to be conducted by an independent specialist who must advise on the monitoring protocol to be followed.
- Any incidents 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.

2.1.7 Traffic

The volume of HMVs on the national road networks will increase. The warehouse is within an area zoned for industrial use and operations will result in an increase in traffic along Circumferential Road. Heavy motor vehicles turning in these roads may result in in an increased, cumulative impact on the road surface of the area. HMVs may block neighbouring business' entrances and increase the likelihood of accidents and incidents. Development of existing operations will not see a significant in an increase of traffic, however an altered flow patter with a dedicated entrance and exit will decrease possible collision risk at the access points.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Delivery of equipment and building supplies	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Increase traffic, road wear and tear and accidents	2	-2	3	2	2	-14	-2	Definite

Desired Outcome: Minimum impact on traffic and no transport or traffic related incidents.

Actions

Mitigation:

- HMVs delivering or collecting goods should not be allowed to obstruct any traffic in surrounding areas and the town.
- HMVs associated with the facility should not be allowed to park or overnight in Circumferential Road, and may only overnight at areas designated for this purpose.
- Adhere to The Road Traffic and Transport Regulations, 2001 and all other applicable legislation related to road transport and maximum axle loads.
- If any traffic impacts are expected, traffic management should be performed to prevent these.
- The placement of signs to warn and direct traffic will mitigate traffic impacts.
- Identify vehicles on which hazardous substances are to be transported and handle all dangerous or hazardous goods according to MSDS instructions and under supervision of trained staff. Ensure the correct documentation (e.g. dangerous goods declaration, TREM card, etc.) is provided in the vehicle. Verify that the driver of the vehicle has undergone appropriate training.

Responsible Body:

- Proponent

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 Air Quality Related Impacts

Reduced air quality as a result of exhaust gases (greenhouse gases) of HMVs visiting the property and the port during construction and operations. This may have localised health impacts, but are expected to disperse relatively quickly due to the prevailing south-westerly winds in Walvis Bay. It will however still contribute to greenhouse gas emissions that in turn contribute to climate change. In terms of greenhouse gas emissions from HMVs, it is the project in its entirety that should be considered. It is thus the responsibility of all stakeholders to implement strategies and measures to curb the release of greenhouse gases. The Proponent's contribution to greenhouse gas emissions will be minimal.

Air quality as a result of windblown dust can cause health effects, especially through chronic inhalation of such dust, in the nearby communities. The risk is not only related to the metals in the ores per se, but also to the potentially harmful gangue materials that comprise the bulk of the ore, as well as respirable fractions (PM10) and thoracic fraction (PM2.5) of the dust. Since the gangue materials present are not necessarily known, but could potentially include for example asbestos, it is crucial that the inhalation / ingestion of dust is prevented at all times. Sources of such dust can originate from the warehouse when, for example, bulk bags tear.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Exposure to metal ore dust and its subsequent inhalation and/or ingestion and inhalation of exhaust gases. Damage to buildings as a result of exhaust gases resulting in acid deposition, ozone and soot build-up.	2	-2	3	2	2	-28	-3	Probable

Desired Outcome: To prevent health impacts and to reduce greenhouse gas emissions.

Actions

Prevention:

- All cargo must be secured on HMVs to prevent cargo from falling off and subsequent damage to containment,
- Appoint reputable contractors for transporting of ore who prioritise a "zero dust policy".

Mitigation:

- Dust suppression in the warehouse if ever required.
- All HMVs must be serviced regularly and make use of technology to reduce emissions. This include selective catalytic reduction, diesel particulate filters and diesel oxidation catalysts.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Receive chemical composition analysis results of various ores to be handled from the mines and scrutinize the results for any carcinogenic (or other hazardous) gangue material like asbestos. Should any such material be present, additional safety measures must be implemented to ensure that no workers or nearby receptors are exposed to dust.

- If regular complaints are received regarding dust, air quality monitoring must be conducted on and around the site to monitor ore dust fallout. Monitoring to be conducted by an independent specialist who must advise on the monitoring protocol to be followed.
- Any incidents must be recorded with action taken to prevent future occurrences.
- A bi-annual report should be compiled of all incidents reported and monitoring performed. The report should contain dates when safety equipment and structures were inspected and maintained.

2.1.10 Fire

Construction and operational activities may increase the risk of the occurrence of fires if proper maintenance and housekeeping are not conducted. Of the cargo to be handled, specifically, sulphur is flammable and should be segregated from any oxidisers or heat or ignition sources. Ore dust (fines) suspended in the air can become flammable in excessive quantities. Some chemicals stored are flammable in nature and can even become explosive when exposed to incompatible materials (e.g. oxidisers when mixed with a fuel source like hydrocarbons). Uncontrolled fires and explosions can cause extensive damage to surrounding properties and can lead to casualties.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Fire and explosion risk	2	-2	3	2	2	-28	-3	Improbable

Desired Outcome: To prevent property damage, possible injury and impacts caused by uncontrolled fires.

Actions:

Prevention:

- A holistic fire protection and prevention plan must be developed for the site and it should specifically take into account flammable products stored on site. This plan must include an emergency response plan, firefighting plan and a spill recovery plan and should have dedicated assigned personnel to oversee their development and implementation.
- Install smoke detectors in the warehouses.
- Firefighting equipment must be maintained and regularly serviced.
- Regular personnel training (firefighting, fire prevention and responsible housekeeping practices).
- Ensure all chemicals are stored strictly according to MSDS instructions. This include segregation of incompatible products.
- Ensure sufficiently trained warehouse employees who knows which fire extinguishing media (e.g. water, powder, foam) are incompatible with which chemicals (e.g. water on concentrated acid can result in a seriously violent reaction).
- Maintain regular site, mechanical and electrical inspections and perform regular maintenance.
- Clean all spills/leaks without delay and dispose of any contaminated material according to their MSDS requirements and at suitable locations to prevent the accumulation of flammable or explosive products on site.

Mitigation:

- For any fire related emergency situation, the appropriate emergency response plan must be implemented as soon as possible in order to minimize the magnitude of impacts or prevent such impacts from developing into more severe impacts.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.

- A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

2.1.11 Noise

Noise pollution will exist due to heavy motor vehicles accessing the site to load and offload cargo as well as from the stacking and moving of bags and containers and other large equipment. As the site is situated in an industrial area, noise impacts on surrounding properties will be minimal. Construction (maintenance and upgrade) may generate excessive noise for short periods of time.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise generated from construction activities – nuisance and hearing loss	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Noise generated from the operational activities – nuisance and hearing loss	2	-1	3	2	2	-14	-2	Probable

Desired Outcome: To prevent any nuisance and hearing loss due to noise generated.

Actions

Prevention:

- 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 should be followed during the construction and operational phases.
- Confine noise generating operational activities to daytime hours as far as possible.
- At night, the nuisance created by audible warning signals on HMVs and forklifts can be prevented by switching to a flashing light or 'broadband white noise' system.

Mitigation:

- Hearing protectors as standard PPE for workers in situations with elevated noise levels.
- Maintain noise generating activities to within the warehouse as far as possible.
- All machinery must be regularly serviced to ensure minimal noise production.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act and WHO Guidelines.
- Maintain a complaints register.
- Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

2.1.12 Waste production

Various waste streams will result from the operational phase and development of the facility. Waste may include hazardous waste associated with the handling of hazardous products and contaminated packaging material. Domestic waste will be generated by the facility and related operations. Waste presents a contamination risk and when not removed regularly may become a fire hazard. Construction waste may include building rubble and discarded equipment. Contaminated soil and water is considered as a hazardous waste.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive waste production, littering, illegal dumping, contaminated materials	1	-2	2	2	2	-12	-2	Definite
Daily Operations	Excessive waste production, littering, contaminated materials	1	-2	3	2	2	-14	-2	Definite

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

Actions

Prevention:

- 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.
- Ensure waste cannot be blown away by wind.
- Prevent scavenging (human and non-human) of waste.
- All drains leading directly into sewers must be closed off, and locked where possible, to prevent any unwanted products from entering sewers should an accidental spill occur. Where drains are present to drain wash water, these should only be opened during times of washing.

Mitigation:

- Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- Liaise with the municipality regarding waste and handling of hazardous waste.
- Due to the nature of some hazardous materials they, or the containers they are packed in, should be disposed of in an appropriate way at an appropriately classified waste disposal facility. See the material safety data sheets available from suppliers for disposal methods.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- Any complaints received regarding waste should be recorded with notes on action taken.
- All information and reporting to be included in a bi-annual report.

2.1.13 Ecosystem and Biodiversity Impact

The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. No significant impact on the biodiversity of the area is predicted as this is an existing operation and the site is void of natural fauna and flora. Excessive lighting used at night and especially those that are directed upwards may blind birds like flamingos that fly at night. This may result in disorientation of birds and collisions with structures. Further impacts will mostly be related to pollution of the environment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and flora. Loss of biodiversity	1	-1	2	2	2	-6	-1	Improbable
Daily Operations	Impact on fauna and flora. Loss of biodiversity	2	-1	3	2	2	-14	-2	Improbable

Desired Outcome: To avoid pollution of and impacts on the ecological environment.

Actions.

Mitigation:

- Report any extraordinary ecological sightings to the Ministry of Environment, Forestry and Tourism.
- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- Prevent scavenging of waste by fauna.
- The establishment of habitats and nesting sites at the facility should be prevented where possible.
- Lights used at night should be kept to a minimum and should be directed downwards to the working surfaces.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- All information of extraordinary ecological sightings to be included in a bi-annual report.

2.1.14 Groundwater, Surface Water and Soil Contamination

Ore dust or chemicals that are not contained in the warehouse or HMVs can contaminate the environment. The entire property will be paved and pollution of soil and groundwater is not expected. There is no surface water present nearby. Dust that is not contained can however reach sensitive receptors during times of strong wind. Oil, hydraulic fluid and fuel leaks from vehicles may also present a pollution risk.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contamination from hazardous material spillages and hydrocarbon leakages	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Contamination from hazardous material spillages	2	-1	3	2	1	-12	-2	Probable

Desired Outcome: To prevent the contamination of water and soil.

Actions

Prevention:

- Proper training of operators must be conducted on a regular basis (e.g. forklift operators).
- Channel water from the roofs out of the yard to minimize runoff on the paving which may potentially be contaminated by some metal ore and chemical dust.

Mitigation:

- Clean-up action must be taken immediately for all instances where ore dust is not contained (e.g. spillages and torn bags).

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- A report should be compiled bi-annually of all spills. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, etc.

2.1.15 Visual Impact

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility. The site is within an area zoned for industrial use. The development of the site is in line with the urban character.

Operations will be kept tidy and neat which will promote effectiveness and pollution prevention while being aesthetically pleasing.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Aesthetic appearance and integrity of the site	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Aesthetic appearance and integrity of the site	1	1	3	2	2	7	1	Definite

Desired Outcome: To minimise aesthetic impacts associated with the facility.

Actions

Mitigation:

- Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- All structures and infrastructures constructed on site should be line with the visual character of the landscape as far as practically possible.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A bi-annual report should be compiled of all complaints received and actions taken.

2.1.16 Cumulative Impact

The main cumulative impact associated with the operational phase is an increase in traffic frequenting the site. This will have a cumulative impact on traffic flow on surrounding streets.

The increase of traffic and other noise generating activities in the area may further increase the noise impacts on nearby receptors, the facility is however situated in an industrial area. The cumulative effect of lighting on birds due to various industrial related developments may also increase the risk of collisions and interference with bird flight paths at night.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	The build-up of minor impacts to become more significant	2	-1	3	2	2	-14	-2	Definite

Desired Outcome: To minimise all cumulative impacts associated with the facility.

Actions

Mitigation:

- Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.
- Reviewing biannual and annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Review bi-annual summary reports based on all other impacts to gain an overall assessment of the impact of the operational phase.

2.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the environmental clearance certificate. Decommissioning was however assessed as construction activities include modification and decommissioning. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure not forming part of post decommissioning use. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within Health and Safety Regulations of the Labour Act and WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land would not be used for future purposes. The EMP for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and implement guidelines and mitigation measures.

2.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will 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 would need to 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.

3 CONCLUSION

The EMP should be used as an on-site reference document for the operations of the facility. . It must be read in conjunction with the Proponents internal Health, Safety, Security and Environmental Management System, and all operational 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. All relevant construction and operational personnel must be taught the contents of these documents.

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.

Should the Directorate of Environmental Affairs (DEA) in the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, the necessary authorisations and ECC may be granted to the Proponent. The ECC issued, based on this document, will render it a legally binding document which should be adhered to.