

APP-003764
WASTE OIL STORAGE, HANDLING AND RE-REFINING ON
ERF 1302, WALVIS BAY

ENVIRONMENTAL MANAGEMENT PLAN



Prepared by:



Prepared for:



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1 BACKGROUND AND INTRODUCTION

Wesco Waste Management (Pty) Ltd requested Geo Pollution Technologies (Pty) Ltd to undertake an environmental impact assessment (EIA) for the operations of existing waste oil storage, handling and re-refining facility situated within Walvis Bay. The operations take place on erf 1302, 4th Street East, in the Walvis Bay industrial area. Re-refining entails processes of filtering, separation and cleaning of used oil while both used and re-refined oil are stored in tanks on site.

As part of the assessment, an environmental management plan (EMP) for the facility is required. This EMP was developed in support of the EIA and application for an environmental clearance certificate (ECC) in compliance with Namibia's Environmental Management Act (Act No 7 of 2007) (EMA).

2 ENVIRONMENTAL MANAGEMENT PLAN

The purpose of this section is to list the most pertinent environmental impacts that are expected from the operational, construction (upgrades, maintenance, etc.) and potential decommissioning activities of the facility.

2.1 OBJECTIVES OF THE EMP

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 facility. All personnel taking part in the construction, operations or decommissioning 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.

2.2 IMPLEMENTATION OF THE EMP

Section 2.3 outline the management of the environmental elements that may be affected by the different activities. Impacts addressed and mitigation measures proposed are seen as minimum requirements which have to be elaborated on. Delegation of mitigation measures and reporting activities should be determined by the proponent and included in the EMP. The EMP is a living document that must be prepared in detail, and regularly updated, by the proponent as the project progress and evolve.

The EMP and ECC must be communicated to the site managers and copies should be kept on site. All monitoring results must be reported on as indicated. Reporting is important for any future renewals of the ECC and must be submitted to the MEFT. Renewal of ECC will require six monthly reports based on the monitoring prescribed in this EMP.

Various potential and definite impacts will emanate from the construction, operations and decommissioning phases. The majority of these impacts can be mitigated or prevented. The prevention and mitigation measures are listed below.

2.3 MANAGEMENT OF IMPACTS: OPERATIONS AND CONSTRUCTION

The following section provide management measures for both the operational phase as well as construction activities related to facility.

2.3.1 Planning

During the phases of planning for future operations, construction and decommissioning of the facility, it is the responsibility of the 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) activities and operations of the facility remains 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.
- ◆ 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 a spill occur or 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.
- ◆ Keep proof of monitoring report submissions on file (submission every six month) for submission with environmental clearance certificate renewal applications where needed.
- ◆ Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the environmental clearance certificate prior to expiry.

2.3.2 Skills, Technology and Development

During various phases of the facility, training is provided to a portion of the workforce, in order to maintain and operate various features of the facility according to the required standards. Skills are transferred to an unskilled workforce for general tasks. The technology required for the facility is often new to the local industry, aiding in operational efficiency. Development of people and technology are key to economic development.

Desired outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the waste oil re-refining industry.

Actions

Enhancement:

- ◆ If the skills exist locally, contractors must first be sourced from the town, then the region and then nationally. Deviations from this practice must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.
- ◆ Employees to be informed about parameters and requirements for references upon employment.
- ◆ The proponent must employ Namibians where possible. Deviations from this practise should be justified appropriately.

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.

2.3.3 Revenue Generation and Employment

Through the project, revenue is generated and paid to the national treasury. An increase of skilled and professional labour has and will continue to take place due to the operations of the facility. Employment is sourced locally while skilled labour/contractors may be sourced from other regions. A waste product is effectively recycled and reused, aiding in revenue generation.

Desired outcome: Contribution to national treasury and provision of employment to local Namibians.

Actions

Enhancement:

- ◆ 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.
- ◆ Deviations from this practice must be justified.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Bi-annual summary report based on employee records.

2.3.4 Demographic Profile and Community Health

The project is reliant on labour during the operational phase. The scale of the project is limited and it is not believed to have created a change in the demographic profile of the local community. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, associated with trucking of oil. An increase in foreign people in the area may potentially increase the risk of criminal and socially/culturally deviant behaviour. However, such trends have not been observed since the site became operational. Spills and leaks may present risks to employees. Emissions from the re-refining facility may affect the community directly and in a cumulative manner.

Desired Outcome: To prevent the in-migration and growth in informal settlements and to prevent the spread of communicable diseases and prevent / discourage socially deviant behaviour. To prevent health impacts on the community.

Actions:

Prevention:

- ◆ Employ only local people from the area, deviations from this practice should be justified appropriately.
- ◆ Adhere to all municipal by-laws relating to environmental health which includes, but is not limited to, sanitation requirements.
- ◆ Continued use and maintenance of the emissions mitigation measures such as the air scrubber purification system.

Mitigation:

- ◆ Educational programmes for employees on HIV/AIDs and general upliftment of employees' social status.
- ◆ Appointment of reputable contractors.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

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

2.3.5 Waste Oil Handling

Due to a lack of approved hazardous waste disposal sites in Namibia, it is likely that waste oil would be disposed of incorrectly and may then potentially cause environmental pollution. Thus, the operations of the Wesco Waste Management facility provides an avenue for the disposal of waste oil throughout Namibia. What would otherwise be hazardous waste are processed into a usable resource with limited waste.

Desired Outcome: Provide suitable avenue for waste oil disposal and prevent environmental contamination.

Actions

Mitigation:

- ◆ Ensure compliance to the petroleum regulations of Namibia.
- ◆ Regularly collect waste oil throughout Namibia and ensure waste oil disposal points are available at all times.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Keep record of volumes of waste oil receipt and include in figures in a bi-annual summary report.

2.3.6 Traffic

Traffic to and from the site, especially linked to the transportation of waste oils and recycled products, has increased congestion in 4th Street East and may result in an increased risk of incidents and accidents, as well as unauthorised traffic movement on neighbouring properties. The impact has a strong cumulative nature as various industries, on surrounding properties, rely on heavy motor vehicles for product and / or service delivery.

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

Actions

Prevention:

- ◆ Erect clear signage regarding access and exit points at the facility.

Mitigation:

- ◆ Trucks delivering waste oil or collecting LFO and HFO should not be allowed to obstruct any traffic or access to facilities in 4th Street East or in the cul-de-sac.
- ◆ 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.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ 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.

2.3.7 Health, Safety and Security

Every activity associated with the operational phase is reliant on human labour and therefore exposes them to health and safety risks. Activities such as the operation of machinery and handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), poses the main risks to employees. Security risks are related to unauthorized entry, theft and sabotage.

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

Actions

Prevention:

- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- ◆ Equipment that will be locked away on site must be placed in a way that does not encourage criminal activities (e.g. theft).
- ◆ Provide all employees with required and adequate personal protective equipment (PPE).
- ◆ Ensure that all personnel receive adequate training on operation of equipment / handling of hazardous substances.
- ◆ All Health and Safety standards specified in the Labour Act should be complied with.
- ◆ Implementation of maintenance register for all equipment and fuel/hazardous substance storage areas.
- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Security procedures and proper security measures must be in place to protect workers and clients.
- ◆ Strict security that prevents unauthorised entry.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ 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.

2.3.8 Fire

Operational and construction activities may increase the risk of the occurrence of fires. The site is located next to built-up area which increases the risk as well as the difficulty of fighting fires. Flammable products are stored on site. Heating of the waste oil, as well as the burning of LFO significantly increases fire risk associated with such products. Waste oil may have been mixed with fuel after prolonged periods of use, resulting in oil dilution. The entry of foreign substances, fuel or water, are the reason why the flash point of other oils could drop, hence increasing the risk of fire. LFO stored on site could have a flash point of below 100 °C. Boiler operation see temperatures exceeding 100 °C. Fire risks are increased when permit requirements for the storage and handling of used oil are not met.

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

Actions:

Prevention:

- ◆ Ensure all hazardous substances are stored according to permit conditions, MSDS and SANS instructions.
- ◆ Locate tanks away from heat and other sources of ignition. Ensure heating coils are always covered with product (minimum 15 cm).
- ◆ Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Clean all spills / leaks.
- ◆ Special note must be taken of the relevant regulations stipulated in sections 47 and 48 of the regulations (Government Notice 155 of 2000) of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990).
- ◆ Follow SANS standards for operation and maintenance of the facility as per the requirement of the permit for refining used mineral oil, storage and handling.
- ◆ Clearly indicate no smoking areas and ensure all staff adhere to the restrictions.
- ◆ A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan.
- ◆ Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices).

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.

2.3.9 Air Quality

The heating tank and boiler are the principal emitters of air pollutants and of key concern are the “exhaust” gases: nitrous oxides, sulphurous oxides, hydrocarbons, carbon monoxide, carbon dioxide, as well as unknown volatiles and particulate matter, which are all considered to be significant sources of air pollution. Gases emitted from the stack contribute to the greenhouse effect while also being detrimental to employee and community health. An initial air quality assessment was conducted (Appendix B) while an additional mitigation measure in terms of an air scrubber purification system was installed on the heating tank stack.

Vapours may also be released into the air during refilling of bulk storage tanks. Prolonged exposure may have carcinogenic effects. Dust may be generated should any construction take place.

Desired Outcome: To prevent health impacts and minimise the dust generated.

Actions

Prevention:

- ◆ Personnel issued with appropriate masks where excessive dust or vapours are present.
- ◆ A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary e.g. dust suppression.
- ◆ Employees should be coached on the dangers of hydrocarbon vapours.
- ◆ All infrastructure must be according to SANS requirements as per the Ministry of Mines and Energy permit.
- ◆ Regular maintenance of the boiler systems should be conducted, to ensure that emissions do not become excessive.
- ◆ Develop an air quality management plan and make the necessary adjustments to the boilers to reduce emissions if required.
- ◆ Quality checks should be conducted on the LFO used in boiler operations. Good quality LFO will reduce emissions.
- ◆ All venting systems and procedures have to be designed according to required standards or industry best practice.
- ◆ Include vapour recovery systems and carbon filters on vents.
- ◆ Continued used and maintenance of the air scrubber purification system.
- ◆ Regular monitoring of emissions from both stacks for particulate matter, sulphur dioxide, nitrogen oxide and volatile organic compounds. Monitoring schedule to be in line with noxious industry consent use and should also conform to World Bank and the International Finance Corporation’s standards.
- ◆ All emissions release should adhere to the Labour Act 1992 Regulation relating to the health and safety of employees at work.
- ◆ Develop procedural guidelines and policy related to the operation of the wet scrubber. The policy should include at minimum a communication plan with affected neighbours and disciplinary actions listed for individuals who are responsible for the non-conformance.
- ◆ Carry out periodic health survey among the workers and liaise with local health facilities to conduct passive surveillance among nearby residents for ailments related to these emissions.

Mitigation:

- ◆ If emissions results indicate continued elevated values (for three monitoring cycles) the Proponent should employ additional air purification measures such as selective catalytic, or non-catalytic reduction systems and increasing of stack height as per good international industry practise for stack height.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Monitoring results to be kept on file.
- ◆ Any complaints received regarding dust, fuel vapours or emissions should be recorded with notes on action taken to address concerns.
- ◆ Incidents log to be kept of all non-conformance related to the operation and management of the wet scrubber (such as not engaging the system during operations)
- ◆ Air quality management plan to be documented and include monitoring.
- ◆ All information and reporting to be included in a bi-annual report.

2.3.10 Noise

Noise pollution will exist due to heavy motor vehicles accessing the site to offload oil and load fuel. Construction (maintenance and upgrade) may generate excessive noise.

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

Actions

Prevention:

- ◆ Follow Health and Safety Regulations of the Labour Act and / or World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment and nuisances.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.

Mitigation:

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

2.3.11 Waste Production

Various waste streams are produced during the operational phase. Waste may include hazardous waste associated with the handling and re-refining of waste oil and domestic waste.

Sludge from the re-refining process and water from the air scrubber purification system are considered hazardous along with all hydrocarbon polluted material such as soil, etc. Main contaminants in effluent water (from the re-refining process) are oil, phenols, sulphides and ammonia which all result from contact with the hydrocarbon product processed. 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 by hydrocarbon products.

Desired Outcome: To reduce the amount of waste produced, and prevent pollution, contamination 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 waste storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of stored waste.
- ◆ Effluent disposed into municipal sewers from the re-refining process should comply with municipal permit conditions and be sampled regularly to ensure no hydrocarbons are present.
- ◆ All hydrocarbon handling to be conducted on impermeable surfaces.
- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (hydrocarbon residues, empty chemical containers, contaminated rugs, paper water and soil) that must be discarded at the hazardous waste disposal facility of the Municipality (liaise with the municipality regarding waste and handling of hazardous waste).
- ◆ See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- ◆ Surfactants (soap) may not be allowed to enter any oil water separation processes.
- ◆ Waste water, waste generated from the oil re-refining plant (sludge and effluent) and sewage must be disposed of according to their relevant permit requirements. Permits should specify waste types and estimated volumes.

Mitigation:

- ◆ In the event of effluent discharge not meeting municipal standards, the effluent should be treated prior to release into the municipal system.

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.
- ◆ Compliance to the municipal effluent permit conditions and testing as may be prescribed by the municipality.
- ◆ Document any effluent treatment conducted.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ All monitoring results should be kept on file and included in a bi-annual report.
- ◆ All information and reporting to be included in a bi-annual report.

2.3.12 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. This being an existing site, no impact on flora is expected. Impacts on fauna is mostly related to birds. Excessive lighting used at night and especially those that are directed upwards blinds 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.

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

Actions.

Mitigation:

- ◆ Report any extraordinary faunal 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.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ The establishment of habitats and nesting sites at the facility should be prevented where possible.
- ◆ Lights used at site should be directed downwards to the working surfaces.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Report on any extraordinary faunal sightings and/or bird collisions.
- ◆ All information and reporting to be included in a bi-annual report.

2.3.13 Groundwater, Surface Water and Soil Contamination

Operations entail the storage and handling of waste oil, HFO and LFO which present a contamination risk. Contamination may either result from failing storage facilities, pumps and pipelines, spills and leaks associated with overfilling or human error, or incorrect disposal of waste. Such spills may contaminate surface water, soil and groundwater. Storage and handling of products outside of bunded areas present a pollution risk

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

Actions

Prevention:

- ◆ Spill control structures and procedures must be in place according to permit conditions, SANS standards or better.
- ◆ All storage of hydrocarbons must occur in suitably bunded areas with concrete floors.
- ◆ All handling of hydrocarbons should be on spill proof surfaces connected to an oil water separator.
- ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- ◆ Proper training of operators must be conducted on a regular basis (hydrocarbon products handling, spill detection, spill control).
- ◆ Contaminated water must be prevented from entering the municipal sewers or environment, and treated as hazardous waste.
- ◆ Contaminated run-off should be kept separate from relatively clean run-off.

Mitigation:

- ◆ Any spillage of more than 200 litre should be reported to the Ministry of Mines and Energy as well as the local municipality.
- ◆ Spill clean-up means must be readily available on site and spills must be cleaned up immediately.
- ◆ Surfactants (soap) may not be allowed to enter the spill catchments or any oil water separation process e.g. soap usage on spill control surfaces.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Groundwater monitoring for petroleum hydrocarbons must be conducted annually and remediation instituted where needed.
- ◆ A report should be compiled bi-annually of all monitoring and spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, groundwater monitoring results, remedial action taken, etc., and a copy of documentation in which spill was reported to Ministry of Mines and Energy.

2.3.14 Visual Impact

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility.

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.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

2.3.15 Cumulative Impact

Possible cumulative impacts associated with the operational phase include increased traffic in the area and emissions release. This will have a cumulative impact on traffic flow in 4th Street East. Being located in an industrial area, cumulative air quality impacts can be expected as a result of boiler operations.

Desired Outcome: To minimise 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 reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in assessing if the existing mitigations are insufficient.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Review bi-annual reports to identify recurring concerns and or areas of improvement..

2.4 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. 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 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.

2.5 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; and
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.
- ◆ The EMP

3 CONCLUSION

The above management measures, if properly implemented will help to continually minimise adverse impacts on the environment while promoting positive impacts. Where negative impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts. To ensure the relevance of this document it must be reviewed on a regular basis.

This EMP should continue to be used as an on-site reference document during all phases of the proposed project, and auditing should take place in order to determine compliance with the EMP for the proposed site. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken. Monitoring reports and rehabilitation plans and results must be submitted to the Ministry of Environment, Forestry and Tourism on a bi-annual basis to allow for future renewal of the ECC, this is a requirement of the Ministry.