

OPERATIONS OF THE EXISTING FUEL RETAIL FACILITY OF MALENA PROPERTIES IN KATIMA MULILO

ENVIRONMENTAL MANAGEMENT PLAN




Assessed by:



Assessed for:

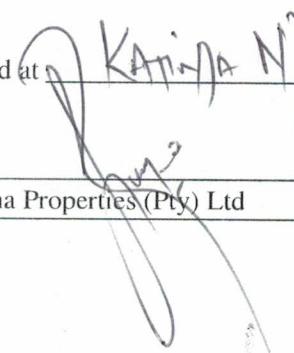
Malena Properties (Pty) Ltd

March 2020

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| Project: | UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR THE OPERATIONS OF A FUEL RETAIL FACILITY OF MALENA PROPERTIES IN KATIMA MULILO | |
| Report Version/Date | Final March 2020 | |
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| Report Approval |  André Faul | |

I SHIRAZ BHANJEE acting as the representative of Malema Properties, hereby confirm that we approve the Environmental Management Plan as presented in this document. All material information in the possession of the proponent that reasonably has or may have the potential of influencing the Environmental Management Plan was provided to the consultant.

Signed at KATIMA MULILO on the 18 day of MARCH 2020.


 Malena Properties (Pty) Ltd


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1 OBJECTIVES OF THE EMP

Malena Properties (Pty) Ltd requested Geo Pollution Technologies (Pty) Ltd to update their existing environmental management plan (EMP) in order to renew their existing environmental clearance certificate (ECC). The renewed ECC is required for operations and construction (care and maintenance) of their existing fuel retail facility in Katima Mulilo. The EMP provides options to ensure impacts of operations and maintenance are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The EMP acts as a stand-alone document, which can be used during the various phases (planning, construction / maintenance, operational and decommissioning) of the facility. All employees, contractors and sub-contractors taking part in the construction and operation of the facility should be made aware of the contents of the EMP, so as to plan the relevant activities accordingly in an environmentally sound manner.

The objectives of the EMP are:

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

The operators of the Fuel Facility may choose to implement an Environmental Management System (EMS). An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an ISO 14001 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.

2 THE EMP

The following general guidance for the EMP is based on the findings of the initial EIA and risk assessment carried out by Geo Pollution Technologies (Botha et al. 2014).

2.1 Land Use, Planning, Construction and Operation – Identified Impacts

The following is the summary of the identified impacts:

- ◆ The fuel facility does not breach any of the requirements in the Namibian laws or any of the codes regulating the use of hazardous material.
- ◆ The current zoning designates the area as suitable for the continued operations of the fuel facility;
- ◆ The risk of an accident/incident causing fires or explosions is possible. Human factors are still being considered and the best engineering has been employed to create a safe fuel retail

facility. If a fire or explosion was to occur and the necessary engineered structures were not in place there would be a significant possible impact on the adjoining industrial properties.

2.2 Land Use, Planning, Construction and Operation – Mitigating Measures

The following is a summary of the proposed EMP, which will make the fuel facility safe taking into consideration all the risk perceptions raised by all stakeholders:

- ◆ To prevent product loss where rupture of pipeline or hose might occur during the offloading operation, all nozzles on the road tankers tanks are fitted with excess flow check valves. These are designed to allow only specific flow rates and the moment it exceeds this, the process is stopped. Small quantities lying in the hose that could leak will be captured by spill containment structures.
- ◆ Firefighting equipment are present on site.
- ◆ Training of personnel and regular fire fighting exercises should be carried out pertaining to the location and use of existing fire fighting equipment and safety controls, like emergency shut down switches, extinguishers etc. This would reduce the risk of fire and its spread to neighbouring properties.

3 THE IMPLEMENTATION OF THE EMP

Error! Reference source not found. to Table 4 outline the management of the environmental elements that may be affected by the different activities, grouped in each phase of development. These groups are as follows:

- ◆ Planning Phase
- ◆ Construction Phase (Construction for purposes of this document include any minor care and maintenance aspects)
- ◆ Operational Phase
- ◆ Decommissioning Phase

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 tables below act as a guideline for the EMP to be established by the proponent. Impacts addressed and mitigation measures proposed are seen as minimum requirements which have to be elaborated on. Delegation of mitigation and reporting activities should be determined by the proponent and included in the EMP.

All monitoring results must be reported on as indicated and submitted to the Ministry of Environment and Tourism as per their regulations and requirements. These are required for any future renewals of the environmental clearance certificate.

Table 1. Planning for Construction, Operations and Future Decommissioning of the Project

| Activity | Objective | Action | Timing | Proof of Compliance | Responsible Body |
|---------------------|--|--|---|---|-------------------------|
| Compliance | To comply with all legal requirements for operations and construction activities of the facility in Namibia. | Ensure all necessary permits from the various ministries, local authorities and any other bodies that governs the operational and construction activities remain up to date. | During operations and prior to commencement of construction | All contracts, permits, certificates and other legal documents on file. | Proponent |
| Appointments | To appoint reputable contractors and operational personnel and establish the EMP, a legal requirement that forms part of the contract with the contractor and employees. | Appoint a contractor and employees and enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractor, sub-contractors, employees and all personnel who will be present on site. | During operations and prior to commencement of construction | Contracts on file | Proponent; Contractor |
| Management | Establish a management system to implement and monitor Health, Safety and Environment. | 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 in place to deal with all emergencies: Risk Management / Mitigation / Environmental Management Plan/ 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. | During operations and prior to commencement of construction | Documentation on file Personal Protection Equipment (PPE) on site Signage related to restricted areas, dangerous areas, and PPE requirements on site Emergency response material on site | Proponent; Contractor |
| Restoration | To establish a fund/insurance | To establish a fund for future ecological | During operations | Financial statements | Proponent; |

| Activity | Objective | Action | Timing | Proof of Compliance | Responsible Body |
|--|--|--|--|---|--|
| Fund/Insurance | for future environmental restoration or pollution remediation if ever required. | restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required. | and prior to commencement of construction | restoration fund/insurance | Independent Specialist Consultant |
| Reporting | To establish a reporting system to report on monitoring aspects of construction, operation and decommissioning as outlined in the EMP. | Establish a reporting system to report on aspects of construction, operation and decommissioning as outlined in the EMP. Submit bi-annual reports to the Ministry of Environment and Tourism. Reporting is required for ECC renewal applications. | During operations and construction as well as possible future decommissioning of the development | Monitoring Reports | Proponent; Contractor |
| Environmental Clearance Renewal | To renew the Environmental Clearance Certificate every three years. | Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the ECC | Prior to expiry of ECC | Renewed Environmental Clearance Certificate | Proponent; Independent Specialist Consultant |

Table 2. The Construction (care and maintenance) Phase

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|--|--|---|---|-----------------------|
| Enhanced skills and technology transfer to Katima Mulilo and subsequent promotion of economic development | People need skills to perform their jobs. The technology to do something is often not found locally. Development of people and technology are key to economic development. | Contractors must be sourced locally and local businesses supported as far as is practically possible. | Proof of appointment of local contractors on file. | Proponent |
| Increased spread of HIV/AIDS; Increased influx to Katima Mulilo; Increased informal settlement and associated problems; Reduced property values | New and existing developments attract people who seek work. This in turn can increase the extent of informal settlements and its associated problems. The increased trucking and distribution of goods from Katima Mulilo could contribute to the spread of HIV / AIDS. It is possible that these can affect property prices in the area depending on the proximity to a residential site. | Appointing reputable contractors who implement educational program on HIV/AIDS for all the staff, in particular the truck drivers, is imperative. Restricted employment for local people only should be practiced. Deviations from this practice should be justified appropriately. Training of local people should be considered from the start. These measures will reduce the influx of newcomers to the town and thereby reduce growth in the informal settlement and maintain property prices. | Proof of appointment of local contractors on file. | Proponent |
| Employment | Construction activities often requires the employment of contractors as well as employment and training of staff for the facility. | Employment and contractors should first be sourced locally, then regionally and then nationally. Deviations from this should be justified. | Proof of appointment of local contractors on file. | Contractor; Proponent |
| Traffic | The site is situated at the corner of Malena and Greenwell Streets in Katima Mulilo. Construction may have some impact on the movement of traffic onto the site when equipment and materials must be delivered. | When significant impacts on traffic is expected (e.g. during delivery of new storage tanks and materials), the contractor must liaise with the relevant traffic department to ensure that traffic flow along the affected route is minimally disrupted. The placement of signs to warn and direct traffic will | Receive a weekly planning sheet from contractor to know when traffic authorities and the general public need to be informed of possible obstructions Any traffic related incidents and complaints received should be | Contractor; Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|----------------------------------|---|--|---|-----------------------|
| Fire and Explosion Hazard | Construction activities near existing storage tanks and fuel lines, as well as the removal thereof, which may contain residual fuel may pose risks of fire and explosion. | <p>mitigate traffic impacts.</p> <p>All equipment and tools must comply with standards which allow certain tools and equipment near flammable sources. Safety distances must be adhered to as well as safe work procedures. Safety talks and job hazard analysis to be done before work starts.</p> <p>Firefighting measures as per the Material Safety Data Sheets of the product should be adhered to.</p> <p>In addition to this, all personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the construction. Regular inspections should be carried out to check for these materials at the site.</p> <p>All fuel storage and handling facilities in Namibia must comply with strict safety distances as prescribed by South African National Standards (SANS). SANS is adopted by the Ministry of Mines and Energy as the national standard. If the setting-out of the site and the safety distances to the nearest adjacent property were adhered to, then any development can be safely built on the neighbouring property. It is specifically appropriate to comply with these standards, as Malena Properties has no control on the future placement of facilities around the facility.</p> <p>It must be assured that sufficient firefighting resources are available. A holistic fire protection and prevention plan is needed. This holistic plan must include an emergency response plan and firefighting plan. Regular surveys of the fire-fighting equipment and water supply should be carried out.</p> | <p>recorded in a bi-annual report together with steps taken to mitigate the impacts.</p> <p>Supervision of work is required and reports of safe and unsafe practice to be brought to the attention of the HSE.</p> <p>Any incidents reported must be recorded together with steps taken to mitigate the impacts.</p> <p>All information and reporting to be included in a bi-annual report.</p> | Contractor; Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|---|---|--|---|------------------------------|
| | | <p>Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of fire fighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires. An integrated fire prevention plan should be drafted before construction commence.</p> | | |
| <p>Health, Safety and Security</p> | <p>During construction activities, construction personnel will access the site. Excavation, earthmoving and transport equipment may be required. This increases the possibility of injuries. A risk to site security and personnel health and safety exists during this period.</p> | <p>The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site.</p> <p>The Contractor should be obliged to adhere to the following:</p> <ul style="list-style-type: none"> ● All Health and Safety standards specified in the Labour Act; ● Selected personnel should be trained in first aid and a first aid kit must be available on site. <p>Adequate emergency facilities and the contact details of all emergency services must be readily available;</p> <ul style="list-style-type: none"> ● Provide all employees with required and adequate personal protective equipment (PPE). ● In consultation with the Katima Mulilo Traffic Department prepare and submit a traffic management programme for sections of the roads to be closed or traffic diverted if necessary during the delivery of equipment; ● Equipment that are locked away on site must be placed in a way that does not encourage criminal activities; ● Induction training for contractors or staff operating on the site is required; and ● Security personnel to prevent unauthorised entry of the construction site. | <p>A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat itself.</p> <p>First aid and firefighting training certificates on file.</p> <p>All information and reporting to be included in a bi-annual report.</p> | <p>Contractor; Proponent</p> |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|------------------------------|---|--|--|-----------------------|
| Underground Utilities | <p>If any excavations are required for construction activities, underground utilities like telecommunications, water supply and sewers are at risk of being damaged.</p> <p>These impacts may result in sections of Katima Mulilo being left without amenities.</p> | <p>Refer to the SANS document, Material Safety Data Sheets (MSDS) and management system manuals.</p> <p>Appointing qualified and reputable contractors is essential. Proper training of construction personnel would reduce the possibility of the impact occurring.</p> <p>The contractor must determine exactly where amenities and pipelines are situated before construction commences (utility clearance e.g. ground penetrating radar surveys). Liaison with the Town Council and suppliers of services is essential.</p> <p>Emergency procedures and contact details of emergency response teams for dealing with the possible consequences of this impact must be in place before construction commence.</p> | <p>Maps and location information of existing underground amenities on file.</p> <p>A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat itself.</p> <p>All information and reporting to be included in a bi-annual report.</p> | Contractor; Proponent |
| Noise | <p>Noise pollution may exist if heavy vehicles is required for construction activities. Audible warning noises from equipment. Compaction, cement mixing, drilling and excavating may be required, this will further contribute to noise pollution.</p> | <p>Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.</p> <p>Construction workers to be issued with hearing protection where needed.</p> | <p>A complaints register must be maintained in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</p> <p>All information and reporting to be included in a bi-annual report.</p> | Contractor; Proponent |
| Waste Production | <p>The ability of products and building rubble to act as a waste which must be cleaned up or removed off-site.</p> <p>Construction activities at the facility may produce waste in the form of domestic waste, building rubble or any other waste as a result of spillage or leakage from cleaning and painting materials.</p> <p>Any soil / waste contaminated</p> | <p>Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.</p> <p>Ensure adequate disposal storage facilities are available that ensures waste cannot be blown away by wind and prevent scavenging (human and non-human) of waste storage.</p> <p>Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, and other contaminated material such as</p> | <p>Regular visual inspection.</p> <p>A register of hazardous waste produced and disposal methods should be maintained.</p> <p>All information and reporting to be included in a bi-annual report.</p> | Contractor; Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|---|---|--|--|---|
| | <p>hydrocarbons that may be encountered during the construction phase should be treated as hazardous waste.</p> | <p>contaminated rugs, paper water and soil). Hazardous waste may not be mixed with other waste streams and should be disposed of as hazardous waste at an appropriately classified facility. See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers. The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of appropriately. Surfactants (soap) may not be allowed to enter the oil water separator Liaise with the town council regarding waste disposal and handling of hazardous waste. Spilled hydrocarbons may not be washed off the forecourt area using surfactants like soap. Surfactants will cause the oil/water separator to malfunction leading to hydrocarbons entering the sewers.</p> | | |
| <p>Groundwater, Surface Water and Soil Contamination</p> | <p>Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table either at the site of spill or after being washed away by surface flow. Leakages from existing tanks and pipelines and construction vehicles, accidental spills of fuel, paints and other chemicals might occur. Groundwater might spread pollutants to neighbouring receptors and may create an impact on underground infrastructure.</p> | <p>All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Appointing qualified and reputable contractors is essential. Proper training of construction personnel would reduce the possibility of the impact occurring. Any spill of fuel of 200 l or more must be reported to the Ministry of Mines and Energy and remediation action taken. Polluted soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site. Polluted soil can be remediated. Confirm MSDS information for any fuels, oils,</p> | <p>A soil pollution baseline study must be carried out before construction on the sites commence. If pollution is present a clean-up and remediation plan must be established. The baseline will allow assessment and comparison of the condition of soil substrate during operational and after decommissioning phases. Report form for all spills or leaks during construction is to be completed by Contractor and submitted to the HSE department.</p> | <p>Contractor; Independent Consultant Proponent; Specialist</p> |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|--------------------------|--|---|---|------------------|
| Cumulative Impact | Possible cumulative impacts associated with the operational phase include increased traffic in the area. This will have a cumulative impact on traffic flow on surrounding streets | <p>lubricants or chemicals that must be discarded.</p> <p>Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.</p> <p>Reviewing biannual 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</p> | <p>All information and reporting to be included in a bi-annual report.</p> <p>Bi-annual reports based on all impacts will give an overall assessment of the impact of the construction phase.</p> | |

Table 3. The Operational Phase

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|---|--|--|--|------------------|
| Skills, Technology and Development | During the operational phase training is provided to a portion of the workforce to be able to maintain and operate various features of a fuel retail facility according to the required standards. 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. | 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. | Record should be kept of training provided. Ensure that all training is certified or managerial reference provided (proof to the employees) inclusive of training attendance, completion and implementation. | Proponent |
| Demographic and Community Health | New and existing developments attract people who seek work. This in turn can increase the extent of informal settlements and its associated problems. It is possible that these can affect property prices in the area depending on the proximity to a residential site. The trucking and distribution of fuel to Katima Mulilo could contribute to the spread of HIV / AIDS. | Restricted employment for Katima Mulilo residents only should be practiced. Deviations from this practice should be justified appropriately. Training of local people should be considered from the start. These measures will reduce the influx of newcomers to the town and thereby reduce growth in the informal settlement and maintain property prices. | Facility inspection sheet for all areas which may present environmental health risks, kept on file. Report based on educational programmes and training conducted. Report and review of employee demographics. | Proponent |
| Employment | An increase of skilled and professional labour has and will continue to take place due to the operations of the facility. | 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 | Bi-annual summary report based on employee records. | Proponent |
| Secure Supply Fuel | The operation of the facility will aid in securing fuel supply to locals, travellers and the transport industry. | Regular tank dips and fuel volume reconciliation to ensure fuel is ordered before it is depleted. Plan in advance for peak tourist seasons and holidays when | Fuel volume reconciliations on file. | Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|----------------------------------|--|--|--|------------------|
| Traffic | <p>The site is situated at the corner of Malena and Greenwell Streets in Katima Mulilo. Traffic to The Facility varies with fluctuations in fuel demand and possibly following announcements of fuel price increases.</p> <p>Vehicles fuelled are mostly small to medium sized cars and some larger trucks</p> | <p>the demand for fuel increase.</p> <p>During periods of increased fuel demand such as prior to fuel price increases and in peak tourist season enough attendants must be on duty to prevent cars waiting for refuelling and potentially causing traffic impacts.</p> | <p>Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.</p> <p>A bi-annual report should be compiled of all incidents reported, complaints received, and action taken.</p> | Proponent |
| Fire and Explosion Hazard | <p>Products kept on site are flammable and therefore a fire risk exists.</p> | <p>The following controls are typical measures for mitigating the threat of spillage of hazardous chemicals and possible fire outbreak:-</p> <ul style="list-style-type: none"> ● A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan. ● Special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990). ● Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices). <p>Fire Fighting and Fire Prevention:</p> <ul style="list-style-type: none"> ● Ensure all chemicals are stored according to MSDS and SANS instructions. ● Maintain regular site, mechanical and electrical inspections and maintenance. ● Clean all spills / leaks. ● Special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990). ● Follow SANS standards for operation and | <p>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.</p> <p>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</p> | Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|------------------------------------|---|---|---|------------------------|
| | | <p>maintenance of the facility.</p> <ul style="list-style-type: none"> ● All dispensers must be equipped with devices that cut fuel supply during fires. ● The proponent should liaise with the local Fire Brigade to ensure that all fire requirements are met. This includes, but is not limited to SANS 10400 T: 2011. | | |
| Health, Safety and Security | <p>During operational times all procedures for offloading, storage and dispensing of fuel presents risks to employees and clients. These risks are assessed in terms of the predicted impact if realised. Typical examples are:-</p> <ul style="list-style-type: none"> ● Breathing in excessive fumes ● Slipping on wet surfaces ● Product contact with eyes and skin ● Staff not wearing protective clothing ● Carcinogenic effects of some petroleum products | <p>All Health and Safety standards specified in the Labour Act should be complied with.</p> <p>Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes:-</p> <ul style="list-style-type: none"> ● Operational and procedural manuals ● Health and safety training ● Housekeeping rules ● Colour coding areas, pipes, equipment and substances ● Signage for personal protective equipment (e.g. protective clothing like safety boots and hard hats) ● Safe work procedures and permits to work ● Clearance certificates for confined spaces ● Emergency response plans ● Material Safety Data Sheets (MSDS) ● First aid treatment and training ● Medical procedures and emergency services ● Daily safety moments and/or drills <p>Implementation of maintenance register for all equipment and fuel/hazardous substance storage areas.</p> <p>The MSDS give health related medical responses for personnel assisting staff who are exposed to the fuels.</p> | <p>Any incidents must be recorded with action taken to prevent future occurrences.</p> <p>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.</p> | Proponent |
| Noise | <p>Noise pollution will exist due to vehicles accessing the site to offload fuel or refuel.</p> | <p>Follow World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.</p> <p>All machinery must be regularly serviced to ensure minimal noise production.</p> | <p>WHO Guidelines.</p> <p>Maintain a complaints register.</p> <p>Report on complaints and actions taken to address</p> | Proponent; Contractors |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|-------------------------|---|---|--|------------------------|
| Air Quality | <p>Fuel vapours are released into the air during refuelling of bulk storage tanks as well as at filling points. Prolonged exposure may have carcinogenic effects. Dust may be generated should any construction take place</p> | <p>Keep volume of public address systems on a level where neighbours are not impacted. Manage noise caused by clients – loud music etc. Personnel issued with appropriate masks where excessive vapours are present. Employees should be coached on the dangers of fuel vapours. Vent pipes must be properly placed as per SANS requirements.</p> | <p>Any complaints and prevent future occurrences. Any complaints received regarding excessive fuel vapours should be recorded with notes on action taken. All information and reporting to be included in a bi-annual report</p> | Proponent; Contractors |
| Waste Production | <p>Waste is produced during normal operations. These can be soils that become contaminated with fuel, domestic waste from bins, offices and ablution facilities. Contamination of fuel through accidental mixing of products results in hazardous waste. Any contaminated material (soils, building rubble and empty chemical containers) should be treated as hazardous waste.</p> | <p>Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate. Ensure adequate disposal facilities are available that ensures waste cannot be blown away by wind and prevent scavenging (human and non-human) of waste storage. 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). Hazardous waste may not be mixed with other waste streams and should be disposed of as hazardous waste at an appropriately classified facility. See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers. The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of appropriately. Surfactants (soap) may not be allowed to enter the oil water separator Liaise with the town council regarding waste disposal and handling of hazardous waste. Spilled hydrocarbons may not be washed off the forecourt</p> | <p>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. The oil water separator must be regularly inspected and all hydrocarbons removed once detected. Outflow water must comply with effluent quality standards. All information and reporting to be included in a bi-annual report.</p> | Proponent |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|---|--|--|---|---|
| <p>Groundwater, Surface Water and Soil Contamination</p> | <p>Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table. The surface substrate is a porous.</p> <p>Due to the level surface and sandy soils, limited surface runoff from the site is expected and pooling with infiltration into the ground will occur rapidly. Runoff of pollutants from the site is not expected to reach any nearby river due to the spill control structures in place and the design of The Facility. It is unlikely that a release of fuel would cause an impact on any nearby surface water.</p> <p>Groundwater should be protected. Nearby geological structures may provide preferential pathways to sensitive groundwater sources and this should be prevented at all cost.</p> <p>Proper containment mechanisms installed should contain any release that might take place from spillages during operation of The Facility.</p> | <p>Mitigation</p> <p>area using surfactants like soap. Surfactants will cause the oil/water separator to malfunction leading to hydrocarbons entering the sewers.</p> <p>The following measures must be employed / maintained to prevent spillage into surface water drainage channels and groundwater sources:-</p> <ul style="list-style-type: none"> ● Spill control structures and procedures must be in place according to SANS standards or better. ● All fuelling should be conducted on surfaces provided for this purpose. E.g. Concrete slabs with regularly maintained seals between slabs. ● The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, including the correct use of sumps and regular reporting of spillages must be audited and corrections made where necessary. ● Proper training of operators must be conducted on a regular basis. ● Any spillage of more than 200 l must be reported to the Ministry of Mines and Energy and remediation instituted. ● Spill clean-up means must be available on site as per the relevant MSDS. | <p>Inspection holes at the ends of the tanks must as a minimum be inspected every 14 days and evaluated if liquid is present.</p> <p>If large spills occurred or leaks are expected in reticulation or tanks, a pollution survey must be conducted to determine the extent of pollution.</p> <p>A bi-annual report should be compiled of all spills or leakages reported. The report should contain the following information:</p> <ul style="list-style-type: none"> ● date and duration of spill ● product spilled ● volume of spill ● remedial action taken ● comparison of pre-exposure baseline data with post remediation data (e.g. soil hydrocarbon concentrations) ● copy of documentation in which spill was reported to Ministry of Mines and Energy | <p>Proponent; Independent Specialist Consultant</p> |
| Ecological | The effect of operational activities on | Report any extraordinary sightings to the Ministry of | A record should be kept of | Proponent |

| Criteria Impact | Nature | Mitigation | Monitoring | Responsible Body |
|--------------------------|--|---|--|------------------|
| | the ecosystem functioning and biodiversity. | <p>Environment and Tourism.</p> <p>Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.</p> <p>Avoid scavenging of waste by fauna.</p> <p>The establishment of habitats and nesting sites at the facility should be avoided where possible.</p> | <p>any extraordinary fauna sightings or encounters on site.</p> <p>All data to be compiled in a bi-annual report.</p> | |
| Visual Impact | This is an impact that affects the aesthetic appearance. | 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. | <p>A maintenance record should be kept.</p> <p>A bi-annual report should be compiled of all complaints received and actions taken</p> | Proponent |
| Cumulative Impact | Possible cumulative impacts associated with the operational phase include increase in traffic frequenting the site and along the sections of roads near the facility. An increase in emissions from these vehicles will decrease the air quality around the facility. Wear and tear on the roads and increased risks of road traffic incidences could increase. Additional traffic and operational noise would further increase noise impacts in the area. | <p>Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.</p> <p>Reviewing biannual 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..</p> | <p>Bi-annual summary report based on all other impacts must be created to give an overall assessment of the impact of the Operational Phase.</p> | Proponent |

Table 4. Decommissioning Phase

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|--------------------------|--|---|--|-----------------------|
| Waste Production | <p>The ability of product to act as a waste which must be cleaned up.</p> <p>Upon decommissioning waste will be produced in the form of building rubble, obsolete equipment and structures, obsolete or residual products and equipment or structures that can be used elsewhere or sold as scrap.</p> | <p>To reduce the amount of waste all re-usable pipelines, pumps, tanks, valves and other equipment must be removed to another site or sold. Storage tanks may not be sold to anyone other than to a scrap metal dealer for recycling purposes.</p> <p>Those items that cannot be used again must be scrapped in the appropriate manner.</p> <p>Upon demolition of the buildings and concrete the rubble must be removed from the property and taken to an approved designated dumpsite.</p> <p>Rehabilitations if necessary are to be done using funds designated for the purpose.</p> | <p>Regular visual inspection.</p> <p>A register of waste produced and disposal methods should be maintained.</p> | Proponent; Contractor |
| Ecological Impact | <p>Operations spanning many years may create new habitat for fauna and flora.</p> <p>Upon decommissioning these habitats will be destroyed.</p> | <p>No new habitat should be created for flora and fauna. Before decommissioning every structural facility must be inspected to ensure that the dismantling and removal of any structure would not affect any organism that has become dependent on those structures for survival, shelter or breeding.</p> <p>Where new habitats were created, that is now occupied by fauna or flora, MET must be contacted, or other appropriate organizations, to establish the conservation status of it.</p> <p>The possibility of relocating the fauna or flora must be investigated and executed. Should the species be listed as vulnerable to extinction, or worse, a meeting should be held with MET in order to determine the appropriate handling of the situation.</p> | <p>A bi-annual report should be compiled of any fauna and protected flora that established itself on the premises. The report should include all actions taken to relocate or deal with the situation.</p> | Proponent; Contractor |
| Dust | <p>Dust will be generated during the Decommissioning Phase and might be aggravated during periods of strong winds.</p> | <p>It is recommended that regular dust suppression be included in the Decommissioning Phase, when dust becomes an issue.</p> <p>Personnel should be issued with dust masks for health and safety reasons.</p> <p>Accumulation of rubble should not be allowed and must be taken to the dumpsite within reasonable time.</p> | <p>Regular visual inspection.</p> <p>A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if</p> | Proponent; Contractor |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|--|--|--|---|--|
| Noise | Noise pollution will exist due to heavy vehicles accessing the site to collect rubble from demolished building materials. Cranes may be used for removing the storage tanks. Hammers, diggers and drills will be used. | The World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment can be followed during the decommissioning phase. This limits noise levels to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. | A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. | Proponent; Contractor |
| Visual Impact | This is an impact that affects the aesthetic appearance | Visual impact could pose one of the most significant impacts. Visual impacts could be limited through keeping all decommissioned areas clean and orderly at all times. Good housekeeping also reduces the risk of injuries. Notice of the start of the decommissioning should be given to the local authorities with an invitation to give feedback at any time with regards the visual impact. | A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. | Proponent; Contractor |
| Groundwater, Surface Water and Soil Contamination | Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table. | <p>All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Leakages from vehicles might occur especially if they are serviced on site. Care must be taken to avoid contamination of soil and groundwater. Groundwater might spread pollutants to neighbouring receptors and may create an impact on underground utilities (i.e. fresh water supply to buildings, sewerage system). Pollutants in the soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site.</p> <p>Confirm MSDS information for any remaining fuels, oils or lubricants that must be discarded.</p> <p>Regulations on sewerage discharge and the chemicals that may and may not be put into the sewerage system must be followed.</p> | <p>Report form for all spills or leaks is to be completed by the Contractor</p> <p>A baseline study must be carried out after the decommissioning. This is to assess the condition of soil substrate and any groundwater present. Comparisons with pre-construction baseline data is to be made and any discrepancies must be addressed before the site can be signed over.</p> | Proponent; Contractor; Independent Specialist Consultant |
| Health, Safety and Security | During the Decommissioning Phase similar risks to human beings as with previous phases will be present. Once the tanks and pipelines have been emptied completely of their contents residual | The decommissioning of a Fuel Facility can cause serious health and safety risks to workers on site. Occupational exposures are normally related to dermal contact with fuels and inhalation of fuel vapours during handling of such products. For this reason adequate measures must be brought | A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do | Proponent; Contractor |

| Criteria | Nature | Mitigation | Monitoring | Responsible Body |
|----------------------------------|--|---|--|-----------------------|
| Fire and Explosion Hazard | amounts of fuel might exist. All other risks associated with demolitions must be considered. | <p>in place to ensure safety of staff on site, and includes: (Provide forms for all end users who monitor)</p> <ul style="list-style-type: none"> ● Proper training of operators; ● First aid treatment; ● Medical assistance; ● Emergency treatment; ● Prevention of inhalation of fumes (fuel); ● Protective clothing, footwear, gloves and belts; safety goggles and shields; ● Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated material safety data sheets become available; Risks might be lower but still exist especially if tanks must be entered for inspections. Confined Space Training will be required. ● 24-hour security surveillance in case of opportunistic activities. | not repeat it self. | |
| | Residual Hydrocarbons could be present and might pose a risk to the teams dismantling the various structures. Fire and/or explosion events are still possible. | <p>Various international occupational health and safety performances should be consulted for specific regulations regarding the decommissioning of the facility to ensure all risks are mitigated. All relevant regulations and precautions should be in place as it was during the Operational Phase. In addition to this, all personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the fuel storage facility. Regular inspections should still be carried out to inspect and test fire fighting equipment and pollution control materials at the fuel storage facility. All fire precautions and fire control at the fuel storage facility must be in accordance with SANS, or better. The holistic fire protection and prevention plan should still be utilised. Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of fire fighting equipment, but more importantly, it involves premeditated</p> | 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 it self. | Proponent; Contractor |

| Criteria | Nature | Mitigation measures and activities to timeously prevent, curb and avoid conditions that may result in fires. | Monitoring | Responsible Body |
|----------|--------|---|------------|------------------|
| | | | | |

4 CONCLUSIONS

The above EMP, if properly implemented will ensure adverse impacts on the environment is continually mitigated and prevented. Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts. To ensure the relevance of this document to the specific stage of project, it needs to be reviewed throughout all phases.

The EMP should continue to be used as an on-site reference document during all phases of the existing facility. Parties responsible for transgressing of the environmental management plan should be held responsible for any rehabilitation that may need to be undertaken. The proponent could use an in-house Health, Safety, Security and EMS in conjunction with the environmental management plan. All operational personnel must be taught the contents of these updated documents.

Monitoring reports must be submitted to the Ministry of Environment and Tourism on a 6 monthly basis to allow for future renewal applications for environmental clearance certificates.

5 REFERENCES

Botha P, Faul A, Shilongo T; 2014 February; Environmental Impact Assessment for a New Fuel Retail Facility of Malena Properties in Katima Mulilo