Project Name:	***ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED CONSTRUCTION OF FACILITIES AND STORAGE AND HANDLING OF OIL AND PETROLEUM PRODUCTS IN ARIAMSVLEI, //KHARAS DISTRICT***
The Proponent:	**XBFS (Extreme Bulk Fuel Services)** ***P.O. Box 4152*** ***Walvis Bay***
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1. INTRODUCTION

According to the Environmental Management Act (2007), the proposed construction of facilities and storage and handling of oil and petroleum products on Portion 1 of the Remainder of Portion 36 of the Farm Ukumas No. 69, located in the Village of Ariamsvlei, //Kharas District are part of the listed activities for which an Environmental Impact Assessment (EIA) has to be conducted and which needs an Environmental Clearance (EC) from the Ministry of Environment and Tourism (MET) before implementation of the project. The MET indicated that they will consider the Environmental Clearance for XBFS (Extreme Bulk Fuel Services) upon the submission of an Environmental Management Plan (EMP).

The proponent, XBFS (Extreme Bulk Fuel Services), appointed *Green Earth Environmental Consultants* to prepare an Environmental Management Plan (EMP) to guide the operations and activities of the proposed project. The EMP was prepared from information gathered from the proponent and knowledge of the site (based upon several site visits) as well as from experience with EIA's and EMP's conducted for other similar operations. The assessment concluded that the proposed activities will not pose any long term or irreversible threats to the receiving or surrounding environment if the operations are conducted along the guidelines of this EMP.

The EMP included in this document contains practical measures that should be taken and maintained by the Developer and Manager of the project in order to prevent potentially negative impacts on the environment, both from the ecological and social perspective. The EMP assigns rules, regulations and responsibilities and can be used by the MET and other relevant authorities as checklist to monitor compliance at the site. The idea is to minimize any negative impacts or to completely avoid it if possible, in the operation of the proposed project.

The actions stated in this document (EMP) should be diligently followed in order to maintain a safe and healthy sustainable environment for future generations residing on the site and immediate environment. The proponent is responsible to oversee that the EMP is implemented and adhered to at all time. MET is kindly requested to consider and approve the EMP below and to issue a Clearance Certificate.

In order to legalize the proposed activities that will take place on the site an Environmental Clearance (EC) from the Ministry of Environment and Tourism (MET) is required before implementation of the project. The MET indicated that they will consider the Environmental Clearance for the Activities upon the submission of an Environmental Management Plan (EMP).

2. BACKGROUND AND SITE INFORMATION

The EMP included in this document is based on the principle that the relevant authorities with the MET as responsible Ministry, through their Environmental Control Officer's (ECO) with the proponent of the project as responsible person, should ensure that:

- The necessary environmental authorizations and permits have been obtained and are in use;
- Open and direct communication between the proponent and Interested and Affected Parties (I&APs) with regards to environmental and ecological matters are maintained;
- Regular site inspections of constructed areas and operations is conducted to ensure compliance with the EMP of the site;
- By complying with the guidelines of the EMP, the impact on the receiving environment is kept to a minimum or avoided;
- Immediate action is taken if EMP specifications are not followed or adhered to;
- The manager needs to find environmentally responsible solutions;
- All new personnel should be informed on the stipulations of the EMP and that environmental awareness is regarded as a high priority;
- Level of implementation and adherence to the EMP is audited on a regular basis.

There should be a clear message to the management and staff/workforce of the proposed activities that non-adherence to or non-compliance with the EMP can lead to the withdrawal of the Clearance Certificate and might lead to the closure of the operations. It is against this background that the EMP had been drafted.

3. RECOMMENDATION

The following measures are recommended:

- The proposed activities on the site be granted approval by the DEA. In addition it is also essential that the environmental assessment of the proposed service station continue as a remainder of the project even after approval.
- This Environmental Management Plan (EMP) should be implemented to mitigate potential impacts which are associated with the operational phase of the project.
- When building infrastructure, consider green building designs and environmentally sustainable design principles in the layout plans of the development for example make use of solar panels, rainwater tanks, recycling depots, etc.
- All developments on the site should be undertaken in such a way as to enhance the natural landscape and considers the visual impacts and benefits.
- Any activities that could potentially contribute to the pollution of any water courses will have to be directed away from sensitive zones.
- Specific consideration should be given to services such as fire brigades.
- The risks of fuel spillage or leakage on both surface and ground water sources; leakage detection system should be adopted/included to minimise the risks of fuel leakages/spills and must be regularly monitored.

- Storm water management: uncontrolled surface and storm water runoff that has been polluted with petroleum/diesel products has the potential to impact negatively on the surrounding environment if not managed properly. There is therefore a need for a storm water management plan.
- Traffic implications should be considered and measures drawn to cater for cars making use of the roads.
- Fire and explosion impacts: due to the flammable nature of the products to be handled and stored, there exist an opportunity for a fire/explosion due to the presence of vapours. This should be kept in mind, prevented and fire extinguishers should be placed where required.
- Air pollution: possible emission of fumes/airborne compounds should be controlled.

An Environmental Management Plan (EMP) will have to be conducted in order for the recommendations to be fully stated and taken in consideration by the proponent and manager.

4. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The proposed EMP has been drawn to give guidance to:

- Planning of future extensions or replacing of infrastructure, equipment and services **(Planning Phase)**;
- Constructing and developing any infrastructure on the site **(Construction Phase)**;
- Operations concerning the daily management and running of the activities **(Operational phase);**
- Decommissioning of the activities **(Decommissioning Phase).**

4.1. PLANNING PHASE

The location and design of any additional infrastructure must fit into the surrounding environment. The manager of the activities and the leaseholder must ensure that the sense of place be kept in accordance with the surrounding areas.

Specific actions are required to ensure the negative effects or impacts are minimized on the site. The following measures should be followed:

4.1.1. Addressing of Aesthetic and Visual Issues	
Responsible Person	**Measures**
The Proponent, Developer, Architect or Builder	a. The building shapes of the infrastructure must not contrast too much of the area namely high rising buildings in future should rather be avoided. b. The use of certain African or earthy colours (paint) on the buildings where possible, are strongly recommended. c. Should there be any development regarding communication masts, solar panels, water tanks and other prominent features, it must be placed or constructed at spots that prohibits visual destruction or minimize visual impact. d. Tourists or any persons driving past the proposed activities/operations/buildings should not be able to notice visually unpleasing objects on the site. e. Avoid any neon or non-earthy signs that will reduce the sense of place. f. All additional or new pipes and cables must be buried underground and not be visible to the public.

4.1.2. Ensuring water consumption efficiency	
Responsible Person	**Measures**
The Developer and Builder	a. Any addition of lawns or cultivated gardens on the site must be limited since it makes use of sparse clean water. The cultivation or enhancements of locally adapted natural grasses which can survive the natural conditions are preferred. b. Grey water from any newly created showers and basins must be drained into a soak away area and this could be developed as a reed-bed. c. Drainage systems and channels must be kept open to conserve the environment and flow of water. d. Water efficient systems/equipment which limit the use of water or make recycling of water possible should be introduced.

4.1.3. Ensuring energy consumption efficiency	
Responsible Person	**Measures**
The Developer or Builder	a. Preference must be given to the implementation of energy conserving and efficient systems. Renewable energy sources like gas produced from household waste or solar should be considered to replace the current commercially supplied electricity. b. Devices or equipment which conserves energy must be introduced and used.

4.1.4. Limiting creation of solid waste	
Responsible Person	**Measures**
The Manager	a. Consumables and containers which can be recycled or which are biodegradable must be introduced in order to limit the creation of solid waste which has to be taken out of the area to be managed and handled at another site.

4.2. CONSTRUCTION PHASE

Construction is generally characterized by various activities that will take place on the site namely landscaping of the site, earthworks for the construction of bulk services and infrastructure, construction of buildings, removal, relocation and planting of grasses/shrubs etc. All these activities have an unavoidable effect on the natural environment. Various actions must thus be undertaken to minimize the effect on the receiving and surrounding natural environment. The responsible persons in the entire process will be the proponent of the project, the developer, project manager, subcontractors, etc. The developer takes the ultimate responsibility during the construction.

MET can ensure that the operations adhere to the EMP stipulations through regular site inspections. The manager must ensure that the developer are aware of the EMP stipulations and enforces it on site. Throughout any construction it will be the project manager's and architect's obligation to inspect the site at least once per month to make sure that all the mitigation measures are followed, adhered to and implemented. The project manager must do a final inspection and evaluation once the development is completed. The project manager must also issue the building contractor with a completion letter once he or she is satisfied that the project has been done in accordance with the Environmental Management Plan. A copy of the final letter must be sent to the Director of Environmental Affairs (DEA).

Damage to the environment during construction has a few origins that differ to large degree: accidental, negligent, spillage, vehicles, earthmoving equipment, generators, workshops and plant areas. There are mitigation measures that must be followed in order to minimize or avoid damage and pollution. The following measures are based on the Ministry of Environment and Tourism (MET) regulations and must strongly be adhered to:

4.2.1. Spillages of potentially toxic materials	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. Possible emission of fumes/airborne compounds should be managed and minimised. a. Fuel spillage or leakage on both surface and ground water sources should be monitored. A leakage detection system should be adopted or included to minimise the risks of fuel leakages/spills and must be regularly supervised. b. Any spillages of potentially toxic materials, whether by accident or through negligence, must be reported and the corrective action must be undertaken to 'clean' and to remove the evidence of the spillage. c. Make use of design structures and transfer equipment so as to avoid spillage as far as possible. d. Train the staff members on how to make use of diesel/fuel transfer and to avoid spillage. e. Any spill must be cleaned up immediately by removing the spill together with the polluted soil and disposing of it at a recognized dumping site or facility. f. When there is made use of diesel generators on site it must be placed on concrete slabs. g. When a workshop is introduced, the entire work area must be lined by concrete. h. Any runoff from the work areas either arising from wash downs or rainfall must be channeled into a pollution control pond. i. There must be a weekly monitoring of all equipment namely a visual check; there must also be a weekly monitoring of work areas.

4.2.2. Emergency Plan and Fire Prevention/control	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. An emergency plan should be available for major / minor spills and fire fighting at the activities during construction activities (with consideration of air, groundwater, soil and surface water). b. All pollution incidents must be reported to the relevant authorities within 24 hours of occurrence. Record(s) of environmental related incidents should be maintained. c. Due to the flammable nature of the products to be handled and stored on site, there exist an opportunity for a fire/explosion due to the presence of vapours. d. Smoking must be prohibited in the vicinity of flammable substances. e. The availability of sufficient firewater tie-in points, fire extinguishers and requirements of Local Authorities must be ensured. f. Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision, in such a manner as to minimise the risk of fires and/or injury to staff. g. Training should be provided to the staff members in the use of the appropriate firefighting equipment. h. There should be close co-operation with the local fire authority to ensure that they know the layout of the facility, what equipment and facilities are available, where they are located, and how they are used.

4.2.3. Illumination	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. No spotlight should be directed to the residential area. b. Lighting systems should not flicker or cause stroboscopic effects.

	c. The receiver should not receive direct illumination. d. The signage should not allow the light to shine directly into the properties.

4.2.4. Labour and social issues	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. The criteria for and selection of labourers, contractors and suppliers for the project should demonstrate preference for the local community. Such requirements should be included in contract documents and be monitored. b. Contractors must ensure proper supervision of employees at all times, undertake regular inspections of the workplace, enforce the wearing of safety equipment/clothing and ensure compliance with all relevant rules and procedures. c. Staff should be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training. d. The provision and proper utilisation, maintenance and management of toilet, wash and waste facilities for staff during construction must be ensured. e. Machine/vehicle operators should receive clear instructions to remain within demarcated access routes. f. Suitable control measures over the contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented. g. Contractors must adhere to normal working hours and ensuring that all machinery is in a good state of maintenance to mitigate noise. h. Ensure the provision and proper utilisation, maintenance and management of toilet, wash and waste facilities for staff. i. Raise awareness under staff to the need to refrain from indiscriminate waste disposal and/or pollution

	of local soil and water resources. j. All employees must undergo the necessary safety, health and environmental training and wear the necessary protective clothing. k. Adherence to normal working hours and ensuring that all machinery is in a good state of maintenance would mitigate noise.

4.2.5. Noise disturbance	
Responsible Person	**Measures**
The Developer, Contractor, Builders and Workforce	a. The construction contractor must ensure that construction and other noise generating activities are restricted to normal working hours, unless otherwise approved in consultation with I&APs. b. The presence of work force may create noise, which should be mitigated by using as far as feasible local work force and ensuring that equipment is in a good state of maintenance, during construction and operational phase. c. The Managing Contractor during construction must ensure the correct layout of the site to address the potential noise impact from the facility. d. Staff should not make excessive noise especially during late hours. e. Equipment used in the operation of the facility must be kept in good state of maintenance so that noise is minimised.

4.2.6. Underground Storage tanks and Equipment	
Responsible Person	**Measures**
The Developer, Contractor, Builders and Workforce	a. The Managing Contractor should ensure that, at locations where conditions of high ground water or flood water are known to exist or likely to occur, the tank is safeguarded against movement or floating by means of a reinforced concrete slab cast on top of the tank or by means of concrete saddles. The permeability of soils must be taken into consideration when installing the tank(s). b. Where required by the Local Authority, the tanks must be installed in brick lined or concrete pits. c. The Managing Contractor to ensure that the design include: • A filler box, which can contain the contents of a bulk delivery vehicle, discharge hose. • Earthing and snap-tight-quick-coupling for loading of material into tanks to minimise risk of fires and prevent spillage and loss of material. • An overfill protector fitted on the tanks. • A leak detector on all submersible pumps that automatically checks the integrity of the pipework on the pressure side of the pump. • That the pipelines do not retain product after use and no joints are made underground. d. The Managing Contractor must ensure that the underground storage tanks are thoroughly inspected prior to installation for fracture and damage and that the inspection authority has issued test certificates. Leak and pressure tests must be conducted on tanks and pipelines to ensure integrity prior to operation and the inspection authority must issue pressure test certificates. An Emergency shut-off valve must be supplied between the supply pipeline and dispenser inlet. e. A monitoring well must be placed at each corner of the excavation for each underground tank prior to backfilling. In sensitive areas, a plastic sheet, which slopes towards the monitoring wells, must be provided below the tank. f. The drive way, pump island and area under the canopy should be filled up in order to prevent any

	flooding. g. The manager/contractor must ensure that a groundwater-monitoring plan is in place prior to the initiation of construction activities on site. This plan should address a strategy for the management of any groundwater contamination detected as part of the groundwater monitoring strategy, and should include the frequency of monitoring, as well as details of stock reconciliations. h. Regular monitoring (three-monthly) of the monitoring wells must be undertaken to prevent pollution. Should contamination be detected, monitoring must be extended to the monitoring boreholes as identified during the hydro census. If contamination is detected in the extended borehole survey, a rehabilitation plan must be compiled and executed. i. The leak detectors must be regularly tested and records kept. j. All machinery must be maintained in good working order as to prevent soil or water pollution from oil, fuel or other leaks.

4.2.7. Site Preparation	
Responsible Person	**Measures**
The Developer, Builders and Architect	a. Before any workers, equipment or building materials are brought in; the developer must set out the entire plan. The corners of every building, walkway, driveway, parking area, water installation, power generator, etc must clearly be marked. b. The marked out area must be inspected and approved by the architect before any construction is started. c. The building contractor must demarcate the area with metal droppers and hazard tape so that there will be no confusion about which area may be disturbed for development and which areas will strictly be off-limits.

4.2.8. Building Materials	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. All the materials needed for construction namely bricks, sand, cement, poles, roofing, etc., must be brought into the site from outside. b. In the case of items that are not brought from a registered shop for example poles, the contractor must ensure that the harvesting of these materials did not cause any serious impacts at the place which they came from. c. Sand that will be used for building may only be collected from a site that is not visible to tourists and preferably a nearby farm, but not from the rivers/ocean nearby. d. No materials, including rocks for building purposes may be collected from the environmentally sensitive areas pointed out in the report.

4.2.9. Facilities for Workers	
Responsible Person	**Measures**
The Proponent, Developer and Builders	a. All workers that need to reside on the site while construction is in progress will have to be housed in temporary structures like tents or caravans to limit the impact on the environment. The majority of the workforce will consist of people already living in the area and therefore minimum impact on the environment is expected. b. The workforce residing on the site must be provided with water, proper toilets and washing facilities. c. The toilets established on the site must preferably be flush type toilets that are mounted over a septic tank or a dry toilet system that is similar to the units used during road construction projects.

	d. Cooking on the site must be done on gas or open fires. When the workers make use of open fires, these must be made in a designated spot so that there will be no possibility for a veldt fire occurring. e. Although the surrounding settlers collect wood in the area, construction workers working or residing on site should not be allowed to collect wood for cooking purposes. The manager or developer must provide them with wood/charcoal preferably from intruder bush from outside sources.

4.2.10. Waste Management	
Responsible Person	**Measures**
The Contractor, Developer and Builders	a. Should the developer and sub contractors make use of combustible waste for example empty cement bags, it must be burnt in a drum and the necessary care must be taken to avoid any possibility of starting a veldt fire. b. All non-combustible waste must be removed from the site at least once a week. c. Any waste that is stored temporarily on the site must be secured in refuse bags stored in a fenced in area to avoid it being blown into the veldt. d. Measures must be taken to prevent waste that attracts scavengers for example jackals or vultures. e. All waste must be dumped at a properly managed rubbish dump site. f. No paint, solvents, thinners, diesel, oil or any other harmful substances may be poured onto the ground. The substances must be collected in containers and be removed from the site for proper disposal.

4.2.11. Water Use	
Responsible Person	**Measures**
The Developer, Builders and Workforce	a. Water must at all times be used sparingly in the construction period as well as in all the other phases. b. All tapes, pipes and tanks that will be constructed must be maintained and managed so that they do not leak. c. Water pipelines laid to the site shall be done in such a manner that the surface and natural vegetation are not unduly disturbed. d. Weekly visual checks on possible spillages must be conducted. e. Effluent water from washing facilities must be disposed of in a properly constructed sewage system. f. There must be weekly inspections of drains. g. If concrete reservoir walls are built, it must be painted in a camouflage colour to aid in concealing it. h. When reservoirs are built, it must be covered to reduce evaporation. i. No reservoirs must be visible from the main road. j. There must also be weekly visual checks of the reservoirs and it must be supervised on site by the managers. k. Water must be recovered if used for cutting, cooling or washing. l. The workforce must be advised to use water sparingly for human consumption. m. Water consumption must be checked on a three monthly basis.

4.2.12. Wildlife	
Responsible Person	**Measures**
The Workforce, Builders	a. No wild animals on the site may be trapped or killed for any reason whatsoever by the workers, builders

and Contractors	or contractors.

4.2.13. Fuel, Transport and Storage	
Responsible Person	**Measures**
The Vehicle Drivers, Builders, Contractors	a. Vehicles that transport materials to and from the site must be road worthy. b. All drivers that transport materials must have a valid driver's license and must at all times adhere to traffic rules and regulations. c. Vehicles carrying loads must be properly secured in order to completely avoid items falling off the vehicle at any time. d. The materials used in the construction process for example cement, bricks, poles, etc., must be stored at a central storage area on the site in order that the site be neat and orderly and to avoid a situation where materials are lying all over the place. e. Fuels, paints, solvents and chemicals must be stored in watertight containers that will ensure it cannot react with each other or be spilled onto the ground.

4.2.14. Vehicles, Trucks, Roads and Tracks	
Responsible Person	**Measures**
The Vehicle Drivers, Builders and Contractors	a. Any haphazard driving of any vehicles on the site where there are no existing routes must be avoided. b. Minimize the use of fix routes that will reduce the visual impact and decrease the need for the rehabilitation of tracks. c. Vehicles, trucks and earthmoving equipment with headlights must switch their headlights on at all

	times. d. No vehicles or trucks that move in the area may exceed 40km/h with warning, and speed signs must be positioned at relevant locations. e. All the personnel responsible for the driving of transport vehicles must be in possession of a valid driver's license. f. No littering is allowed along the road, dumping of waste and scrap, etc. and all drivers must be made aware of this. g. Daily or weekly visual checks are required and all drivers must be supervised. h. The safety of surrounding residents and land users, other motorists and animals should not be compromised by the vehicle associated with the constructional operation.

4.2.15. Vegetation	
Responsible Person	**Measures**
The Builders, Contractors and Workforce	a. There must be an overall preservation of vegetation communities to ensure minimal disruption of important vegetation communities and valuable plant specimens. b. At all times, clearance of vegetation for firewood must be avoided. c. Alternative fuel and/or power sources must be made available namely paraffin stoves and diesel-driven generators if workers are accommodated on the site. d. No trees or shrubs may be damaged for the purpose of obtaining firewood. e. No protected or endangered trees or shrub species may be harmed or be removed without the required procedures and licenses. f. Daily inspections must be carried out and weekly checks whether the stock of alternative sources is sufficient. g. The developers or constructors must ensure the maximum use of local plant material for rehabilitation

	processes. h. Before new site construction begins, the upper level of the soil must be stripped and stockpiled separately so that this layer can be utilized in the rehabilitation process. i. There must also be a visual check on the wind erosion on a monthly basis.

4.2.16. Fauna	
Responsible Person	**Measures**
The Developers, Contractors, Residents and Workforce	a. No hunting and trapping of resident animals will be allowed on the site. b. The developers or contractors must fence off waste pit storage areas to prevent animals from falling in or getting entangled in waste. c. The fences must be sufficient to control the access of large/small animals. d. There must be a weekly visual check of the fences and staff must report to the managers.

4.2.17. Noise	
Responsible Person	**Measures**
The Workforce, Contractor and Builders	a. If a generator is used, it must be positioned away from neighbouring residential developments and must have boarding to help suppress noise. b. There must be limited impacts on adjacent sites and on the workforce. c. There must be a weekly noise check of the generator and other equipment namely of trucks and construction machinery.

4.2.18. Dust	
Responsible Person	**Measures**
The Developers, Constructors and Builders	a. The impact of dust on the air quality in general and on the fauna and flora must be limited. b. The general speed limit on the haul road and construction site must be kept below 40km/h to limit dust generated by construction traffic. c. There must be daily visual monitoring of transport activities and dust generation in the area.

4.2.19. Visual Impacts	
Responsible Person	**Measures**
The Proponent, Developer, Contractor, Architect and Builders	a. The height of the buildings must be in line with the urban design proposal to ensure that the development is aesthetically pleasing. Waste and stockpile dumps must not be visible from the road or neighbours. b. The developer and architect must ensure that all structures on site are blending with the surrounding landscape. c. The urban design and architectural concepts proposed in the planning phase must be adhered to and implemented to ensure that the development is in harmony with the surrounding natural environment.

4.2.20. Historical, archaeological and cultural heritage	
Responsible Person	**Measures**
The Contractor, Developer and Builders	a. No archaeological or cultural heritage sites had been identified or observed during the environmental assessment. However the developer and his sub contractors must carefully examine on the area before any construction is undertaken. b. If any archaeological or cultural heritage sites are found on the site, the manager must immediately advise the National Monuments Council to ensure that steps are taken for the preservation of the site or artefacts.

4.2.21. Accommodation and Sanitation	
Responsible Person	**Measures**
The Constructors, Developers and Builders	a. If space is required for a camp or office site, it must be kept to a minimum. b. Chemical toilet facilities are preferred by the Ministry of Environment and Tourism. Other approved toilet facilities such as a septic drain must be used and located on the camp site in a way that it does not cause any water or other pollution.

4.2.22. Health	
Responsible Person	**Measures**
The Builders, Workforce,	a. The workforce should receive an induction course on awareness and spreading of HIV/AIDS. b. The workers should be informed that prevention is better than cure however condoms should be

Constructors, Developers and Residents	made available to the workers. c. The Ministry of Health and Social Services can be consulted to inform the workers of the dangers regarding the disease. d. HIV/AIDS's negative impacts/aspects should be discussed and the workers should know the dangers regarding the disease for instance sickness, loss of energy and eventually death.

4.2.23. Rehabilitation of site after completion of construction phase	
Responsible Person	**Measures**
The Builders, Workforce, Constructors, Developers and Residents	a. Before any final rehabilitation is started on the site, the Ministry of Environment and Tourism must be advised to set certain terms and conditions. b. Qualified or accredited personnel from the constructing or developing companies must refill pits alternately with waste and not saleable stockpiled blocks and smaller fragments of larger blocks. c. Refilled rock waste must be covered with saved topsoil and complemented if necessary by scraping the area adjoining the pit on the condition that no vegetation is cleared for this operation. d. All rehabilitated areas must be monitored over a 4 year time period from the onset of the rehabilitation procedures. (The frequency of monitoring suggested is dependent on satisfactory performance. If however the requirements are not being met, the frequency of the monitoring must be increased). e. Unwanted materials, all waste namely domestic related must be collected. Remaining domestic waste on site must be collected and transported to a recognised disposal facility. f. All weedy species present on the site must manually be removed. g. Monitoring must be conducted when grasses are flowering. h. Upon the completion of all construction activities, remove workshops, surrounding fencing, generators and any scrap materials in the vicinity of the work area. i. Seal all petrol, diesel, oil and grease containers and remove it from the site to a recognised storage

	facility. j. Break up all unnecessary concrete slabs and structures on the site and transport the fragments to a suitable site for disposal or dump it in one of the pits.

4.2.24. Storage Construction, General Substances and Materials	
Responsible Person	**Measures**
The Builders, Workforce, Constructors, Developers and Residents	a. Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully. b. Storage areas must be designated, demarcated and fenced if necessary. c. Choice of location for storage areas must take into consideration prevailing winds, distance to water bodies and general on site topography. d. Storage areas should be secure so as to minimise the risk of crime. They should be safe from access by children and animals etc. e. Fire prevention facilities must be present at all storage facilities. f. Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are: diesel, petroleum, oil, bitumen, cement, solvent based paints, lubricants, explosives, drilling fluids, pesticides, herbicides, LPG. g. Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes. g. Hazardous storage areas must be bunded with an impermeable liner to protect groundwater and soil from contamination. The Contractor shall submit a method statement to the Engineer for approval.

	h. Storage areas containing hazardous substance / materials must be clearly sign posted. i. The proximity of houses, schools etc should be taken into consideration when deciding on storage areas for hazardous substances. j. Residents/workers living/working adjacent to the construction site must be notified of the existence of the hazardous storage area. k. Staff dealing with these materials / substances must be aware of their potential impacts and follow appropriate safety measures. l. Contractors shall submit a method statement and programmes for the storage of hazardous materials and emergency procedures. m. Materials must be sourced in a legal and sustainable way to prevent off-site: Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, etc.) and submit these to the Engineers for approval prior to commencement of any work.

4.2.25. Stormwater Damage Prevention	
Responsible Person	**Measures**
The Builders, Workforce, Constructors, Developers and Residents	b. Stormwater Management: uncontrolled surface and stormwater runoff that has been polluted with petroleum/diesel products has the potential to impact negatively on the surrounding environment if not managed properly. A stormwater management plan should be introduced. c. Serious financial and environmental impacts can be caused by unmanaged stormwater. d. To prevent stormwater damage, the increase in storm water runoff resulting from the construction activities must be estimated and the drainage system accessed accordingly. A drainage programme must be submitted to the Engineer for approval.

	e. During site establishment, stormwater culverts and drains are to be located and covered with metal grids to prevent blockages if deemed necessary by the Engineer. f. Temporary cut-off drains and berms maybe required to capture stormwater and promote infiltration, or to divert stormwater flow to avoid gulley erosion. g. Maintenance of Water Quality: Incorrect disposal of substances and materials and polluted run-off can have serious negative effects on groundwater quality. h. Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. i. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimise pollution risk and reduced bunding capacity. j. A designated, bunded area is to be set aside for vehicle washing and maintenance. Materials caught in this bunded area must be disposed of to a suitable waste site or as directed by the Engineer. k. Provision should be made during set up for all polluted runoff to be treated to the Engineers approval before being discharged into the stormwater system (this will be required for the duration of the project).

There must be photographic evidence at different rehabilitated places with a camera providing dates on the prints. These photographs must be taken every year around the same period at the same places.

4.3. THE OPERATIONAL PHASE

Steps to be taken in the daily management and running of the operations and activities are stated in the following section. To ensure that the activities are operated on an environmentally sustainable manner the following **general guidelines** are included in the EMP:

a. The operations must be managed with minimal disturbance to the surrounding natural environment.
b. It must be ensured that visitors to the site behave in an appropriate manner that does not impact negatively on the environment.
c. The conservation of the natural and human environment must be regarded as high priority.
d. An “environmental friendly behavior” must be cultivated and maintained amongst all people involved in the operations.
e. The entire operation on the site must ideally conform to the standards usually ascribed to “eco-tourism”.
f. The job description for the manager must include his/her responsibilities and duties towards the implementation and adherence to the EMP.

The following specific environmental management issues which require daily operational attention from management and staff are included in the EMP:

4.3.1. Human Waste Management	
Responsible Person	**Measures**
The Proponent, Developer, Contractor and Builders	a. All the toilets must be flush-type toilets and must drain into septic tanks or the municipal sewage system. b. Notices must be placed in each toilet indicating that staff members, workers, visitors or customers should not flush foreign objects down the toilet to ensure a healthy environment and the sustained functioning of the drains. c. Biodegradable toilet cleaners that do not kill the bacteria in the tanks/drains are recommended.

4.3.2. Solid Waste Management	
Responsible Person	**Measures**
The Proponent, Manager and Residents	a. It must be a priority to reduce waste therefore they must buy supplies in large biodegradable containers in order to avoid too many empty bottles, tins, etc. b. At the end of each day waste must be taken to a dedicated waste management area. c. The bins or drums must be washed after having been emptied. The bins must return to the site clean and dry. d. Cans, bottles or beverage containers must either be recycled or reused, or taken to the waste management area. The cans, bottles and containers must not accumulate on the site either near the buildings or anywhere on the site.

4.3.3. General Regulations	
Responsible Person	**Measures**
The Proponent, Manager and Residents	a. No waste of any kind may be burned at the site. b. All the chemicals used to clean the surfaces namely basins, floors, tables, etc., must be biodegradable.

4.3.4. Water Management	
Responsible Person	**Measures**
The Proponent, Manager and Residents	a. The manager must ensure water consumption is kept below 100 liters of water per day per person for both the staff members and the workforce. b. The manager must place notices in the bathrooms that inform customers and workers about the importance of saving water on a daily basis. c. All pipes must be well maintained and leaks must be repaired immediately. d. All taps must be turned off after it had been used. e. Floors must be cleaned with mops and not with a hosepipe. f. A water meter must be installed and it must be checked regularly to keep a register of water consumption and to monitor trends.

4.3.5. Energy Management	
Responsible Person	**Measures**
The Proponent, Contractor, Builders, Manager and Residents	a. Electricity must be obtained from approved electrical suppliers like NamPower to ensure efficiency of generation and use as well as sustainability of supply. b. Gas must be used as alternative to electricity in kitchens due to its efficiency and low pollution factor. c. A generator as emergency source of electricity may be used as continues operation thereof normally creates additional noise, require the bulk storage of fuel and oil which can have a negative impact on the environment if not managed properly. d. When fires are used on the site, the workforce must make use of alien-invasive wood that is readily available for example wood that comes from bush encroaching species for example *Acacia melifera*. The workers must avoid using mopane, leadwood or other species that might be harvested unsustainably. e. The workers and manager may not buy wood from the local people since that might lead to increased deforestation by cutting down protected species or the natural forests.

4.3.6. Visitor Management	
Responsible Person	**Measures**
The Proponent, Manager, Residents and Visitors	a. Information/notices must be placed in each room in which workers, customers and visitors must be informed about the importance of conserving water. b. Customers, workers and visitors must receive information on how to use energy efficiently. c. Certain rules must be communicated and enforced regarding the feeding of animals.

	d. Visitors, customers and workers must also be informed to rather control pests by removing them or asking management assistance to remove it than to control them by spraying: for example that they must rather hit a fly than spray insecticide. e. Visitors, customers and workers must be informed not to throw foreign objects down the toilets. f. Visitors, customers and workers must refrain from making a noise and playing radios or musical instruments, etc.

4.3.7. Nature Conservation	
Responsible Person	**Measures**
The Proponent, Manager and Residents	a. Management must adopt pest control measures as also noted earlier in this EMP. b. They must have adequate waste management control. c. They must have adequate water management control. d. The manager may not approve or allow any pets to be held on the site. e. The workforce must refrain from planting alien plants. f. A general environmental awareness must be established amongst staff members and workers.

4.3.8. Maintaining Sense of Place	
Responsible Person	**Measures**
The Proponent, Manager and Residents	Sense of place is seen as the style of the area, the atmosphere present when entering the site and the general “vibe” of the place. The “sense of place” normally differentiates one area from the other and therefore management must avoid the following:

	a. The manager may not make use of any inappropriate décor for example bright or clashing colours, unattractive murals or art, unnecessary statues, etc. b. No shabbiness may be experienced on the site; management must make sure that they abstain from untidiness, un-emptied ashtrays, rubbish bins etc. c. The manager must repair and maintain all infrastructure since un-repaired infrastructure creates a poor impression. d. Noise pollution must be avoided as far as possible namely no radio's, televisions, hi-fi's, noisy staff members, revving vehicles, lawnmowers, air conditioners, low-flying aircrafts, motorcycles, quad bikes, etc. e. Waste must be properly managed on the site; visitors and residents may not smell rubbish bins. The manager must keep drains clean in order to avoid unpleasant smells. f. Buildings may not have unnecessary signs or objects that distract tourists or residents driving past the site from the natural beauty of the area. g. No scrap metal for example old vehicles or equipment may lie around in various states of disrepair, the site must be clean and neat. h. The manager may not allow overcrowding at the site since this will destroy sense of place. i. There may be no people loitering around at the site, whether visiting staff or looking for work.

4.3.9. Community Relations	
Responsible Person	**Measures**
The Proponent, Manager and Residents	a. The proponent and personnel must have sound relations with neighbours in the vicinity of the site. b. They may not damage any cultural or archaeological sites.

	c. The manager must employ as many local people as possible for all levels of operation. d. They must make use of dispute resolution methods and labour practices that are within the law and cultural norms. e. Staff must be trained in order that they have the knowledge to do their work properly. f. The manager must provide opportunities for career advancement and skills development.

4.4. DECOMMISSIONING/CLOSURE PHASE

The decommissioning phase follows the operational phase. This is a site-specific plan developed to ensure that appropriate environmental management practices are followed during the decommissioning phase of this project and to detail remediation, site control, and monitoring activities that will continue once the project/infrastructure is no longer required/needed.

The decommissioning phase:

- Provide effective, site-specific, and implementable procedures and mitigation measures to monitor and control environmental impacts throughout this phase of the project, such that the related activities do not adversely impact amenity, traffic, or the environment in the surrounding area.
- Establish long-term management of the project site for its next intended use, detailing plan for site assessment, remediation of contamination, and ecological restoration activities.
- Eliminate the long-term liability issues related to the site for the proponent or owner of the facility or project site.

The decommissioning/closure of this specific project is not anticipated. However, should this be required for any reason, the following conditions are generally required.

4.4.1. Equipment	
Responsible Person	**Measures**
The Proponent, Manager and the Environmental Control Officer	a. An investigation on the soil and groundwater contamination must be conducted to determine the presence, nature and extent of any contamination. This will provide information as to the current status of the site in terms of the level of contamination, which will influence the level or type of remediation that needs to be undertaken. b. Prior to the infrastructure being destroyed, all residue products must be carefully removed for recycling or safe disposal. c. Solid materials must be used for filling. Only clean soil should be used for filling purposes.

4.4.2. Stormwater and Wastewater Management	
Responsible Person	**Measures**
The Proponent, Manager and the Environmental Control Officer	a. Water used for flushing the pipes and tanks must be disposed off safely if it is not suitable for disposal via the sewer system. The relevant department must be contacted with regard to the discharge of water containing waste to the sewer system. b. The water containing waste must pass through a separator prior to discharge through the sewer system. c. Any water containing waste should not contaminate clean storm water.

4.4.3. Waste Management	
Responsible Person	**Measures**
The Proponent, Manager and the Environmental Control Officer	a. Solid waste generated from the removal of the tanks must be handled according to the precautionary principle meaning that waste (including soils, metals and other material) should be treated as hazardous unless proven otherwise. b. Contaminated soil and other waste material must be disposed of at an authorized/permitted landfill site. c. Waste must not be allowed to be stockpiled on the site for extensive periods but must be disposed off as generated/soon as possible. d. If waste material is stockpiled temporarily on site, it must be adequately protected from the environment to prevent leaching of potentially harmful contaminants.

4.4.4. Spillage	
Responsible Person	**Measures**
The Proponent, Manager and the Environmental Control Officer	a. Spillages during the decommissioning must be reported to the relevant authorities.

4.4.5. Remediation	
Responsible Person	**Measures**
The Proponent, Manager and the Environmental Control Officer	a. Clean-up or remediation of any contamination must be done. b. The owner of the land, the person in control of land or the person who occupies or uses the land on which pollution has occurred is not absolved from the responsibility of any further and/or associated pollution arising from this property. c. Should there be a risk to downstream users or the environment from this site in the future, it would be requested that further remedial measures be instituted at this site.

5. ENVIRONMENTAL STATEMENT/AGREEMENT

After all assessing was done and information available was reviewed, the conclusion was reached that the site allocated to XBFS (Extreme Bulk Fuel Services) for the proposed construction of facilities and storage and handling of oil and petroleum products namely Portion 1 of the Remainder of Portion 36 of the Farm Ukumas, No. 69, located in the Village of Ariamsvlei, //Kharas District, will have a low significance impact rating. The activities associated with the operations will exert a general low impact on the environment and are easily manageable as long as the impact on the environment is mitigated through the implementing of the Environmental Management Plan (EMP) as proposed in this document. Management actions prescribed and recommended in this EMP are especially designed to minimize or manage the impacts exerted by the activities.

It should however be noticed that the management activities should further be strengthened with continuous and well orchestrated monitoring of the implementation of the given EMP. The manager on the site needs to understand the severity of the situation and all efforts should be made to ensure that the message is conveyed to the workforce and customers.

It should further be noted that the proposed EMP will have little or no value in managing the impact of the operations on the environment if it is not implemented by the proponent and not monitored by the responsible authorities. It is thus suggested that the level of implementation of the EMP is audited at regular intervals by the Environmental Control Officer of the MET or Tourism Board in order to ensure that remedial actions are taken on time and on a continues basis.

The Ministry of Environment and Tourism is herewith requested to accept and approve the EMP for the proposed construction of facilities and storage and handling of oil and petroleum products on Portion 1 of the Remainder of Portion 36 of the Farm Ukumas No. 69, located in the Village of Ariamsvlei, //Kharas District and to issue the site with an Environmental Clearance Certificate.

List of References:

Basic Assessment for the Proposed Petroleum Filling Station, Harding, Kwazulu-Natal (2012). South Africa: Terratest. 8 – 26.

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