



Scoping Assessment

A Scoping Assessment to Support of an Application for an
Environmental Clearance Certificate (ECC) to Allow for
the Construction and Operation of a Fuel Service Station
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Linyanti Settlement, Zambezi Region

December 2023

INFORMATION SHEET

Project Title Name : A Scoping assessment Report in Support of an Application for an Environmental Clearance Certificate (ECC) for the Construction and Operation of Fuel Service Station

Linyanti Settlement, Zambezi Region

MEFT Application No. : APP-002569

Applicant : Bedzo Investments CC
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Namibia

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ABBREVIATIONS

BAT	-	Best Available Technology
BID	-	Background Information Document
EC	-	Environmental Clearance
ECC	-	Environmental Clearance Certificate
EIA	-	Environmental Impact Assessment
EIAR	-	Environmental Impact Assessment Regulations
EMA	-	Environmental Management Plan
EMP	-	Environmental Management Plan
IAPs	-	Interested and Affected Parties
KM	-	Katima Mulilo
LCC	-	Linyanti Constituency Council
LOI	-	Letter of Internet
MEFT	-	Ministry of Environment, Forestry and Tourism
MHSS	-	Ministry of Health and Social services
MME	-	Ministry of Mines and Energy
MURD	-	Ministry of Urban and Rural Development
MWALR	-	Ministry of Water Agriculture and Land Reform
NamRA	-	Namibia Revenue Agency
NHC	-	National Heritage Council
NSA	-	Namibia Statistics Agency
NSI	-	Namibia Standards Institute
PPE	-	Personal Protective Equipment
SAREP	-	Southern Africa Regional Environmental Programme
SHE	-	Safety, Health and Environment
URPB	-	Urban Regional Planning Board
UST	-	Underground Storage Tank
ZRC	-	Zambezi Region Council

DEFINITION OF TERMS

Assessment	The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.
Builder's Waste	Means any waste generated during the building, construction, repair, alteration, renovation, excavation or demolition of any road, surface, structure, building or premises, and includes builders rubble, earth, vegetation and rock displaced during such building, construction, repair, alteration, renovation, excavation or demolition.
Business Waste	Means any waste generated on any premises used for non-residential purposes, but excluding agricultural properties and small holdings, and does not include general waste, household hazardous waste, garden waste, bulky waste, builder's waste, industrial waste, hazardous waste and health care risk waste.
Council Site	Means any waste management, collection, processing, satellite or disposal site operated and/or owned by DVC.
Cumulative Impacts	In relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Disposal	Means the discharge, depositing, dumping, spilling, leaking, placing of waste on or at any premises or place set aside by the DVC for such purposes, and "dispose" shall have a similar meaning.
Dump	Means to dispose of waste in any manner other than a manner permitted by law and includes, without derogating from the generality of the foregoing, to deposit, discharge, spill or release waste, whether or not the waste is in a container or receptacle, in or at any place whatsoever, whether publicly or privately owned, including but not limited to vacant land, waterways, catchments and sewage and stormwater systems. The act of "littering", which retains its ordinary meaning, is excluded from the definition of "dump".
Environment	As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values".
Environmental Clearance Certificate	A certificate and associated conditions issued in terms of the Environmental Management Act, authorizing a listed activity to be undertaken.
Environmental Impact	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Environmental Management Plan	A working document which contains site project specific plan developed to ensure that environmental management practices to eliminate and control environmental impacts are followed during the developmental phase of that site, project and or facility and would normally consist of construction phase, operational phase and decommissioning phase.
General waste	Means any waste generated on or at any premises used – (a) for residential purposes, and includes agricultural properties and small holdings; or (b) (b) as public and/or private facilities and institutions but does not include garden waste (unless specifically determined or authorised by the HNTC subject to any conditions or limitations that maybe imposed), bulky waste, business waste, builder's waste, industrial waste, hazardous waste and health care risk waste

Hazardous waste	Means - (a) any waste containing, or contaminated by, poison; (b) any corrosive agent; (c) any flammable substance having an open flash-point of less than 90 degrees Celsius; (d) an explosive or radioactive material and substance; (e) any chemical or any other waste that has the potential even in low concentrations to have a significant adverse effect on public health or the environment because of its inherent toxicological, chemical, ignitable, corrosive, carcinogenic, injurious and physical characteristics; (f) any waste consisting of a liquid, sludge or solid substance, resulting from any manufacturing process, industrial treatment or the pre-treatment for disposal purposes of any industrial or mining liquid waste, which in terms of any law, order or directive relating to drainage and plumbing may not be discharged into any drain or sewer; (g) the carcass of a dead animal; and (h) any other waste which may be declared as such by DVC or in terms of any other applicable law
Household hazardous waste	Means any waste, excluding garden or bulky waste, generated as a result of housekeeping, maintenance or repair activities on or at any premises, or accumulated, stored or deposited on such premises, used – (a) for residential purposes, and includes agricultural properties and small holdings; or (b) as public and/or private facilities and institutions. which by reason of its nature, composition, toxicity, type, quality, quantity or volume causes or may cause a nuisance, public health risk or pollution.
Industrial waste	Means any waste generated as a result of business, commerce, trade, wholesale, retail, professional, manufacturing, maintenance, repair, fabricating, processing or dismantling activities, but does not include general waste, garden or bulky waste, builder's waste, business waste, hazardous waste or health care risk waste.
Minerals	Means any substance, whether solid, liquid or gaseous form occurring naturally in, on or under any land and having been formed by or subjected to, a geological process.
Non-compliance	Issues that are in direct non-compliance with the requirements, commitments and/or management measures as approved in the EMP.
Pollution	Means any change in the environment caused by – (a) any waste, substance or matter; or (b) noise, odour, dust or heat, emitted from or caused by any activity, including the storage or treatment of any waste, substance or matter, building and construction, and the provision of any service, whether engaged in by any person or an organ of state if that change has an adverse effect on public health or well-being or on the composition, resilience and productivity of a natural or managed ecosystem (both short term and long term), or on material useful to people, or will have such an adverse effect in the future.
Recovery	Means the process or act of reclaiming or diverting from waste any materials, products or by-products for the purposes of being reused, or collected, processed and used as a raw or other material in the manufacture of a new, recycled or any other product, but excluding the use for purposes of energy generation.
Recyclable waste	Means waste which has been separated from the waste stream, and set aside for purposes of recovery, reuse or recycling.
Recycling	Means the process or act of subjecting used or recovered waste materials, products or by-products to a process or treatment of making them suitable for beneficial use and for other purposes, and includes any process or treatment by which waste materials are transformed into new products or base materials in such a manner that the original waste materials, products or by-products may lose their identity, and which may be used as raw materials for the production of other goods or materials,

	but excluding the use for purposes of energy generation, and “recycle” shall have a similar meaning.
Recycling Facility	Means a facility which receives any waste, materials, products or by-products for the purposes of recovery, reuse or recycling, and includes a buy-back centre.
Reduction	Means the process or act of reducing the nature, type, quality, quantity, volume or toxicity of any waste generated, and “reduce” shall have a similar meaning.
Refuse container	Means any receptacle or other container, including a skip, stipulated or approved by the DVC from time to time, whether supplied by the Council or not, for the storage, depositing and disposal of waste.
Re-use	Means the process or act of sorting and separating, at the point of origin, different materials found in any waste in order to promote and facilitate recovery, reuse and recycling of materials and resources, and “separate” shall have a similar meaning.
Separation	Means the process or act of sorting and separating, at the point of origin, different materials found in any waste in order to promote and facilitate recovery, reuse and recycling of materials and resources, and “separate” shall have a similar meaning.
Storage	Means the temporary storage or containment of any waste for a period of less than 90 days after its generation and prior to its collection for recovery, reuse, recycling, treatment or disposal.
Waste	Means any substance or matter whether solid, liquid or any combination thereof, irrespective of whether it or any constituents thereof may have value or other use, and includes – (a) any undesirable, rejected, abandoned or superfluous matter, material, residue of any process or activity, product, by-product; (b) any matter which is deemed useless and unwanted; (c) any matter which has been discarded, abandoned, accumulated or stored for the purposes of discarding, abandoning, processing, recovery, reuse, recycling or extracting a usable product from such matter; or (d) products that may contain or generate a gaseous component
Waste Disposal Site	Means any facility or site which receives waste for treatment or disposal, and which is authorised to accept such waste, or if such a facility is an incinerator, subject to the provisions of regulation 20, and any possible registration or other permission as may be required by any other applicable law.
Waste generator	Means any person whose activities produce any waste and, if that person is not known the person who is in possession and/or control of that waste.
Waste Management Plan	Means a structured document that sets out to record/eliminate/reduce/reuse/recycle the amounts and the types of all waste that is generated in an area or facility.
Waste Minimisation	Means any activity, process or act involving the prevention, elimination or reduction of the amount, nature, type, quality, quantity, volume or toxicity of waste that is generated, and in the event where waste is generated, the reduction of the amount, nature, type, quality, quantity, volume or toxicity of waste that is disposed of.

1. BACKGROUND INFORMATION

1.1 Introduction

The promoter whose name and particulars are presented in **Table 1** below, would like to construct and to operate a modern fuel service station – a listed activity in terms of the Environmental Management Act (EMA) and Environmental Impact Assessment (EIA) regulations. Listed activities may not be undertaken without an Environmental Clearance Certificate (ECC) having been obtained from the Environmental Commissioner (EC) in terms of EMA. The office of the EC is in the Ministry of Environment, Forestry and Tourism (MEFT).

The proposed fuel service station will be complemented by related services that are often associated with such developments – a convenience shop or mini market, banking facilities (ATMs), tyre repair services, car wash, etc.

The promoter has appointed Ekwao Consulting to handle the environmental prerequisites to obtain an ECC for its proposed development.

Table 1: Particulars of the Applicant

Company Details	
Name	Bedzo Investments CC
Registration Numbers	CC/2016/01769
Company Representative	Libetwa Bedzo (Mr)
Designation	Managing Member
Postal Address	Box 513 GWEZE
Physical Address	Linyanti Village Off C49 Highway LINYANTI Zambezi Region
Contact Details	Mobile: 081 283 9510 Email: bedelnyazo@gmail.com

1.2 Project Location

The project site is at Linyanti, a peri-urban settlement situated about 80 km southwest of Katima Mulilo in the Zambezi Region. The site is along tourist route C49 on the left hand side when approaching the settlement from the Katima Mulilo. and abutting the and accessed via C49 . Thanks to the Namibia government, the 212 km road has been recently upgraded to bitumen standard and runs from Kongola in the south eastern direction connecting several settlements and villages in the region to the administrative capital where most goods and services are available including air flight services at Katima Mulilo airport.

1.3 Project Justification

The photographic view of C49 is presented in Figures 1 & 2 which shows all the villages and settlements served by this tourist route from Katima Mulilo to Kongola a distance of over 200 km. There is no single service station along this road and any motorist who needs to fill up has to drive either to KM or to Kongola covering distances of 80 km and 120 km respectively. This includes communal farmers who use tractors to work their lands, public institutions (e.g. clinics, schools, churches, police satellite stations) and lodges dotted along the rivers.

Linyanti itself is a big settlement with a health center, primary school, churches and a police charge office.

1.4 Project Phases

Three phases are normally involved in a project of this nature. These are:

- the planning phase;
- construction phase, and
- operational / maintenance phase.

1.4.1 THE PLANNING PHASE

During this phase, the role of the promoter starts with the procurement of the land (project site) followed by conducting a detailed site viability assessment which is submitted to the energy division in the Ministry of Mines and Energy (MME). During the site viability process, consultation is often held with fuel companies to attract their interest in the site. After MME has carried out its assessment of the proposed site, a **Letter of Intent** (LoI) is issued to the promoter or the proposal rejected. If MME rejects the site, the planning phase normally ends there.

If the promoter receives a LoI from MME, the planning phase proceeds to the EIA stage. Drawings for the filling station are also prepared during this time. This phase does not involve any impacts on the environment but the promoter is spending funds by paying for professional service providers to prepare the project to move to the implementation stage.

1.4.2 CONSTRUCTION PHASE

Activities involved during the implementation of this phase that are likely to have some impacts on the environment are:

- site preparation (potential impacts : removal of plants and trees);
- earth works or civil work required to install infrastructure (potential impacts - dust, noise, contamination of groundwater, etc.);
- construction activities for fuel facilities (likely impacts - noise, dust, loss of sense of place, etc.), and
- excavations to install underground fuel storage tanks (potential impacts: dust, noise, contamination of groundwater, etc.

1.4.3 OPERATION / MAINTENANCE PHASE

Activities involved during the operational and maintenance phases are:

- delivery of fuel to the service station;
- filling of underground storage tanks (UST) from road transport fuel tankers;
- dispensing of fuel to client vehicles;
- day-to-day operational and maintenance works associated with the fuel facility, and
- ongoing maintenance of safety and security at the filling station for employees and the public.

A risk assessment has been undertaken to determine potential impacts associated with the design /planning, construction, operational/ maintenance phases of this project on the environment.

1.5 Project Land

The particulars of the land earmarked for the development are presented in **Table 2** below while an aerial view is presented in Figure 1 and lies along C49 highway at the settlement of Linyanti.

Table 2: Project Land Details

Property Details	
Situate	Linyanti Settlement or Village along C49 highway
Land Owner	Mwafe Traditional Authority
Registration Division	'B'
Magisterial District	Katima Mulilo
Regional Authority	Zambezi Regional Council
Land Size	±6 000 m ² (0.6 ha)
Current Use	Vacant
Services	Water and electricity are available around the site, promotor has to provide for a septic tank to handle the effluent from the facility
Proposed Zoning	None, land is leased to the promotor
Proposed Activities	Construction, Operation and Maintenance of a fuel service station and related services
GPS Coordinates	-18.067429 South & 24.020289 East

1.6 Project Screening

A background information document (BID) on the project was prepared and presented to the office of the EC who allocated the application this number: **APP-002569**.

Based on the screening notice issued by MEFT, these reports should be prepared and submitted to the office of the EC:

- Scoping Assessment;
- Environmental Management Plan (EMP), and
- Public Consultation Process

1.7 Triggered Activities

A brief review of the Environmental Impact Assessment Regulations (EIAR), as gazetted in the Government Gazette No. 4878 of February 2012, has shown that the proposed project has triggered listed activities as tabulated in **Table 3**, below.

Table 3: Triggered Activities

Activity Category	Expansion
Energy Generation, Transmission and Storage Activities	Paragraph 1(b) The transmission and supply of electricity – the development will require the supply of electricity which has to be supplied to the project site.
Waste Management, Treatment, Handling and Disposal Activities	Paragraph 2.3 Temporary storage of waste generated during construction activities for the installation of services: water, sewerage and electricity, etc. Handling of waste during the operational phase of the oil refinery.

Land Use and Development Activities	<p>Paragraph 5.1(a) The land was previous used as a communal Rezoning of land in this case from Undetermined to Industrial to allow for the construction and operation an Oil Refinery.</p>
Hazardous Substance Treatment, Handling and Storage	<p>Paragraph 9.1 The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974</p> <p>Paragraph 9.2 Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation terms of law governing the generation or release of emissions, pollution, effluent or waste.</p> <p>Paragraph 9.5 Construction of filling stations or any other facility for the underground and aboveground of dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin.</p>
Infrastructure	<p>Paragraph 10.1 The construction of oil, water, gas or other bulk supply pipelines to the proposed development.</p>

1.8 Aim and Objectives

The aim of the scoping assessment is to identify potential risks on the physical, biological and socio-economic environments, and to propose mitigation measures as management tools to address any potential impacts. The objectives are:

- Ensure that the impacts of the project on different environmental receptors, interested and affected parties (IAPs), any social groups are understood, recorded and considered.
- Identify environmental and social risks to the IAPs and suggest risk mitigation options.
- Promote positive and counteract negative impacts, throughout the construction and operational phases of the project, through implementations an Environmental Management Plan (EMP).
- To provide a baseline of management information essential to the long-term viability of the project, including monitoring and review requirements.

1.9 Assumptions and Limitations

This scoping report is based on a several assumptions and is therefore subject to certain limitations that are summarised here:

- The information provided to **Ekwao** (EIA Consultant) by the promoter is assumed to be accurate and correct.
- The assessment has been confined to an un-surveyed and unserved land parcel measuring about 6 000 m² shown to the EIA Consultant by the promoter in the company of the Village Headman.
- The assessment of impacts has been confined to those associated with the planning or design phase, the construction and operational/maintenance phase.
- It has been assumed that the developer will in good faith implement the mitigation measures recommended in the EMP, commit sufficient resources to the project and to hire suitably qualified

personnel for any construction work that may be required. It is further assumed that all construction work will be carried out in a professional manner by complying with all local standards, bylaws and international best practices

Notwithstanding the above, **Ekwao** is confident that these assumptions and limitations do not compromise the overall findings of the report.

1.10 Parameters for the Study

In carrying out the Scoping and Environmental Impact Assessment for the proposed development, Ekwao has:

- Critically looked into the location and suitability of the site for the proposed activity.
- Provided a detailed description of the baseline information and listed the national environmental legislative and regulatory frameworks which have bearings on the development.
- Provided detailed descriptions of the potential environmental impacts which the development of the fuel service station will bring to bear to the physical, biological (ecological) and socio-economic aspects.
- Presented an evaluated the technology, procedures and processes to be used in the implementation of the project.
- Conducted a Public Participation Process (PPP) by placing adverts in two local newspapers over two consecutive weeks and erecting a Notice Sign on the site including sending BIDs to key identified stakeholders.
- Formulated an Environmental Management Plan (EMP), outlining the measures to be taken to eliminate and to minimize adverse impacts on the environment during the construction and operational phases of the service station.

1.11 Approach to the Study

Ekwao has adopted an investigative approach which took into account the existing environment and the possible impacts which the envisaged development will bring to bear on the physical and socio-economic environments. The assessment was made by way of:

- physical observations;
- visual surveying;
- taking of photographic images;
- talking to the proponent and the residents in the immediate vicinity of the development;
- conducting a public consultation process, and
- desk studies.

A description of the property (land) has been provided and its location assessed for suitability to the proposed development. Additionally, the national legislations, policies and guidelines applicable to the planned development have been highlighted.

Mitigation measures for identified impacts were considered over the two phases of the development which are:

- The Construction Phase which includes the pre-construction, construction and post construction activities, and
- The Operational Phase which entails the day-to-day operational activities of the development.

Mechanism for monitoring and evaluation of compliance were proposed and included in the EMP.

2. THE PROJECT DESCRIPTION

The project entails the development of a modern fuel service and related amenities.

2.1 Existing Services and Infrastructure

2.1.1 ACCESS TO THE SITE

Access to the project site is provided via tourist route C49 as more or less depicted in Figures 1 & 2. C49 is about 210 km and a vital road linking Katima Mulilo to Kongola via several villages including Linyanti – the project site. A short access road of approximately 40 m from C49 to the fuel service station will be required.

Potential Impacts:

The number of vehicles using C49 is variable from time to time, but traffic congestion on C49 around the project site is not expected during the construction and operational phases of the proposed fuel service station.

2.1.2 WATER AVAILABILITY AND SUPPLY

Potable water is available at the settlement. In fact, a water pipeline is running adjacent the stand where the service station will be developed. Harvesting rainwater from rooftops of the facility should be considered to supplement potable water sourced from the Rural Water Supply Scheme. Such water can be used for cleaning purposes and watering of plants around the facility. Recycling of water used at the car wash facility should also be considered.

Potential Impacts:

No negative impacts are expected. The water required for the proposed development will not impact negatively on the available water sources or lead to water shortages.

2.1.3 ELECTRICITY SUPPLY

Grid power is available at the settlement and in close proximity to the proposed project. The existing power supply is sufficient to cater for the proposed development. In the long term, solar panels installed on the rooftops of the buildings can supplement the energy requirements of the filling station. This will reduce the energy bill of the service station considerably.

Potential Impacts:

Overall, the energy requirement for the project is not expected to have any negative impacts on the current electricity demands of the settlement.

2.1.4 SEWERAGE SYSTEM

There is no sewerage system installed at the settlement. The developer will be required to provide sewerage system – preferably a green septic system that protects the environment. It is recommended that a suitable sewerage system should be designed by a professional civil engineering consulting company and installed by an experienced construction company.

Potential Impacts:

Neglect to install a suitable sewerage system could lead to leakage of sewerage effluent with the potential to contaminate groundwater and surface water in the area.

2.1.5 SITE SURFACE DRAINAGE

The site has a gentle fall to the southwestern and during the rainy season most of the rainwater is expected to drain in this direction. C49 to the northwest of the site (**Figures: 1, 2 & 6**) is slightly elevated such that rainwater from the tarmac surface will drain towards the filling station.

On average, the site receives about 800 mm of rainfall per year, a suitable drainage system has therefore to be provided for, in the design phase of the project in order to divert surface run-off and storm water from the site during the operational phase.

A serious challenge with a poorly constructed drainage system in areas that received massive amount of rainwater is erosion and scouring. Rapid moving water can cause soil erosion, resulting from soil above or around the UST system being carried away by wind and floodwaters and scour, resulting from velocity of flowing water removing soil cover and supporting backfill materials around the UST system. Exposing the system to stresses from flood water pressure or floating debris could make the UST system vulnerable and can collapse.

During a flood situation water and other debris can enter an UST system through openings such as fill pipes, vent pipes, gaskets, loose fittings, covers, sumps and damaged tank walls. As water and debris settle on the bottom of the UTS, product will rise and float on top until it exists the tank through openings, releasing product to the environment.

Potential Impacts:

A poorly constructed drainage system could lead to water flooding the site causing chaos leading to accidents and or serious incidents. Extended flooding can also cause damage to electrical equipment leading underground storage tank (UST) system failure with the potential to release hydrocarbon to the environment.

2.1.6 WASTE HANDLING

There is no waste management at the settlement and the promoter will be expected to develop a waste management plan (WMP) for the fuel service station and to ensure that employees are trained and acquainted with the said WMP once developed and implemented.

All wastes (solid and liquid) have to be handled as provided for in the Environmental Management Plan (EMP) section of the EIA. Suitable waste skips have to be provided, emptied and cleaned on a regular basis. The entire project site was littered with unsightly windblown papers and plastics making the surroundings a visual nuisance.

Potential Impacts:

Poor waste management especially at a fuel service station can be a great threat to the air, water and land. Soil contamination occurs when hazardous products spill or leak into the natural environment. Groundwater could also be contaminated by spills and or leaks of hydrocarbons.



Figure 1: Project Location – Regional Context



Figure 2: Proposed Project Site – Local Context



Figure 3: Project site looking northwest (Note vegetation)



Figure 4: Project Site looking Northeast with power line along the site.



Figure 5: Project site looking to the south



Figure 6: The C49 behind the Project Site

2.2 Details of the Proposed Activity

The study area consists of a site measuring $\pm 6\,000\text{ m}^2$ as shown in **Fig. 2**. The proposed development will entail the construction of a fuel service station integrated with what have become standard facilities at modern fuel retail service stations.

- canopied forecourt housing fuel pumps;
- convenience store and take-away;
- related administrative offices;
- banking automatic teller machines (ATMs);
- a tyre repair workshop;
- a car wash;
- ablution facilities;
- adequate paved parking bays.

At the time of the scoping assessment, specific details of the exact design and layout of the proposed filling station were unavailable, as the entire project is still in the concept design phase. However, considering the details presented by the proponent, a modern filling station is envisaged.

Typically, such filling station will make provision for underground storage tanks (USTs) of unleaded petrol and diesel. The typical tank allocation is on a four storage tank facility, using two tanks for the storage of petrol and two tanks for the storage of diesel. However, this is depended on the anticipated sales volume for each fuel product.

A modern filling station will have a canopied forecourt with three or four dispensing islands on which pumps for the dispensing of fuel from the underground storage tanks are located. The standard industry practice is for the area under the canopy to be slightly raised above the level of the remainder of the service area and sealed with an impervious layer.

2.3 Local Standards for Fuel Service Stations

Since Namibia is still in the process of developing its own standards, the current standard practice used is that of SABS 089:1999. The installation of the fuel tanks and pipelines at the filling station are to be in line with SABS Standards (SANS 10089: Parts 1-3).

In terms of these standards:

- underground Fuel Storage Tanks (USTs) should be a minimum composite tanks fiber-reinforced resin coated steel tanks;
- installation requirements for USTs as prescribed in terms of the SABS codes;
- filler point containment measures for the containment of spillage during tank filling as prescribed in terms of the SABS codes; and
- supply pipeline types, containment measures and installation requirements are specified.

The tanks are filled from a common filler. The filler point is surrounded by secondary sleeving to prevent surface water and soil from entering the filler box. The fuel tanker operator will pump out any spillage into this filler box at the time of fuel delivery.

From these tanks, fuel is pumped through underground pipelines, which are laid to the forecourt area, where it is finally dispersed into customers' vehicles. Dispensing pumps will be fitted with emergency cut off valve as per legislation and standards.

All storm water that may potentially be contaminated by fuel or oil spills is directed to a separator unit prior to exiting the site. In addition, waste water from the carwash facility is drained through a separator before discharging such waste water into the sewerage system of town council.

2.4 CONSIDERATION FOR PROJECT ALTERNATIVES

Alternatives to this proposed development have been assessed from the environmental and socio-economic perspectives. The alternative considered were:

- Alternative Site Scenario;
- No Action Alternative/Scenario; and
- Comparisons of Alternatives.

2.4.1 THE ALTERNATIVE SITE OPTION

The proponent owns the land granted to him by the Mwafe Traditional Authority (MTA) in terms of the Communal Land Reform Act. A traffic count was also conducted by the Road Fund Administration (RFA) to determine the site viability. The relocation option to a different site was therefore not explored and assessed by Ekwao in any great measures. The reason for this was that the selection of a site intended for use as a fuel retail service station, is made based on evaluations of a number of factors: such as traffic volumes (already done by RFA), site accessibilities, availability of services (water, electricity, sewerage, waste disposal,) etc.

In consideration of the above factors and assessment of the current site, the option for an alternative site is not a feasible proposition at this stage.

2.4.2 THE 'NO ACTION' ALTERNATIVE

The 'No-action Alternative' in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective, because it ensures non-interference with the existing conditions. However, the need for such a development is high and the anticipated environmental impacts resulting from the construction and operational phases can be effectively mitigated.

This option involves several losses, both to the project proponent, the Linyanti Settlement, (no development which is strategic and an absolute necessity to the settlement), the Namibian community at large (no employment) and Central Government in that no tax will be paid to State coffers.

The land will remain undeveloped and under-utilized or neglected. The 'no project' option is the least preferred option from the socio-economic, and partly environmental perspective because, if the project is not done, then:

- The economic benefits especially during the construction phase, i.e. provision of jobs for skilled and non-skilled workers will not be realised.
- There will be no generation of income by the developer and the Linyanti Settlement will remain undeveloped.
- The social-economic status of Namibia and the local people would remain unchanged.
- The available local skills would remain underutilised.
- No employment opportunities will be created for Namibians who will otherwise work at the fuel retail service station after the construction has been successfully completed.
- The scenario of no-action clearly sends out a negative vibe and discourages investors both local and foreign from pursuing economic opportunities in the local oil industry.

From the above explanations, it is obvious that the 'No Project Alternative' is not a desirable alternative from the socio-economic perspectives, since no benefits will accrue to anyone, including the promoter, the settlement, the youths roaming around the streets looking for employment and central Government (no taxes, etc.).

However, from the environment conservation perspective, the 'No Action Alternative' will be beneficial in that any potential negative impacts associated with the project implementation will be avoided.

The "No Action Alternative" should not be adopted, as there is a fundamental need to encourage sustainable development as long as such developments are conducted in line with the provisions of the Environmental Management Act and abiding by the provisions outlined in the Environmental Management Plan (EMP) for such a development.

2.4.3 COMPARING OF ALTERNATIVES

Under the 'Development Alternative/Scenario' the proposed development would provide direct and indirect employment to the local people. During the Construction Phase, jobs will be provided to the construction workers in trades such as bricklayers, plasters, joiners, electricians, pavers, carpenters, plumbers, etc.

The Construction Phase will be followed by the Operational Phase (business phase) in which jobs in the form of fuel jockeys, shop attendants, cleaners, security/guards, cashiers, etc. will be provided. Employees will be drawn from the local community, hence combating the scourge of unemployment.

In the event of a 'No Action Alternative/Scenario' development will not take place. There would be no benefit derived from the site and nor would there be the insignificant environmental impacts.

Provided the environmental impact mitigation measures as proposed in the EMP are adhered to, the development will have minimal negative to insignificant impacts to the environment.



Figure 7: Primary school & primary health centre at the settlement – Note water channel



Figure 8: View of the village with traditional residential units



Figure 9: Youth on the premises of a local church

3. THE LEGAL AND POLICY FRAMEWORKS

To protect the environment and achieve sustainable development, the implementation of all projects, programs and policies deemed to have adverse impacts on the environment are required to have been preceded by an EIA, conducted in accordance with the Namibian legislation. Listed in the Table below are the legislations that govern the EIA process in Namibia, pertaining to the proposed activity:

Table 4: Legislative Framework

Legislation	Main Aspects
Environmental Management Act (Act. No. 7 of 2007)	a) It defines what the environment is and encourages sustainable management of the environment when natural resources are being exploited/extracted for the benefit of the residents/citizens. b) It also provides for a process of assessment and control of activities that are likely to pose significant effects on the receiving environment.
Environmental Management Regulations (Gazetted on 12 February 2012)	a) Heralded the implementation of the Environmental Management Act almost five years after the Act was approved by the legislature. b) Presents a list of activities that require an ECC prior to commencement. c) Regulates and provides guidelines on how EIAs must be conducted.
Petroleum Products and Energy Act (Govt Gazette No, 5222, 14 June 2013)	<p>The Act regulates the licensing and certification of fuel outlets including related facilities such as LGP bottling plants.</p> <p>Section 3 (1) states that No person shall</p> <ul style="list-style-type: none"> a) operate a retail outlet or conduct the business of a wholesaler, unless authorised to do so under a retail licence or wholesale licence, b) operate a consumer installation, inless authorised to do so under a certificate, and c) shall possess or store any fuel <p>(2) No person shall possess or store any fuel except under authority of a licence or a certificate, excluding</p> <p>Minister of Mines and Energy has under regulation 44 of the Petroleum Products Regulations approved the use in Namibia of these specifications, standards and code of practice:</p> <p>the American Standards Institute (ASI) the British Standards Institute (BSI) the South African Bureau of Standards (SABS) the South African National Standards (SANS) and the United Kingdom Ministry of Defense (UKMoD)</p> <p>SABS 0131-1 : 1977 – The storage and handling of liquid fuel Part 1 – Small consumer installations</p> <p>SABS 0131-2 : 1979 – Storage and handling of liquid fuel Part 2 – Large consumer installations</p> <p>SABS 0131-3 : 1982 – The storage and handling of liquid fuel Part 3 – Bulk low-flash point fuel storage and alied facilities at large consumer installations.</p> <p>SABS 0108 – Classification of hazardous locations and selection of apparatus for use in such locations.</p>
Communal Land Reform Act	a) Provides for the allocation of rights in respect of communal land b) Establishes the Communal Land Board

(Act 2 of 2005)	c) Provides for the powers of Chiefs and Traditional authorities
Labour Act (Act 11 of 2007 as amended)	<p>a) The Act contains extensive and detailed provisions relating to the basic employment conditions, rules regarding termination of employment, dismissals and disciplinary action.</p> <p>b) It also provides for the prevention of trade disputes, unfair labour practices, regulates and controls collective job action, employment agencies and all matters incidental thereto.</p> <p>c) The Act also provides the right to the employees to speak about work conditions, the right to say no to unsafe work, the right to be consulted about safety in the workplace and the right to workers compensation.</p>
Public and Environmental Health Act (Act No. 1 of 2015)	<p>a) The Act provides for a legal framework for a structured more uniform public and environmental health system and for matters incidental thereto.</p> <p>b) It deals and provides guidelines on noise generation and control thereof within an urban environment.</p> <p>c) Also deals with waste management, handling or collection, waste disposal, waste recycling, sanitation, etc.</p>
Public Health Covid-19 General Regulations (as amended throughout 2020 to 2022)	<p>a) Provides for a framework on how to deal with the challenges occasioned by the outbreak of the Covid-19 pandemics and includes issues related to restrictions on gathering, testing, contact tracing, quarantine facilities, public transport, sanitation at the work place, etc.</p> <p>b) It also provides for burial protocols to be followed for those who succumbed to the pandemic.</p>
Social Security Act Act 34 of 1994 Employees' Compensation Act (as amended)	<p>a) Compels employers and employees to make equal contributions to the Social Security Fund. Contribution is based on 0.9% of an employee's basic earnings with a minimum of N\$2.70 and a maximum of N\$81.00</p> <p>b) Requires employers to contribute to an insurance fund which covers injuries and accidents on duties.</p>
Hazardous Substances Ordinance (No. 14 of 1974)	<p>a) Provides for the control of hazardous substances with potential to cause harm, injuries and even death.</p> <p>b) Also provides for the manufacture, handling, storage, sale, use, disposal, etc. of hazardous substances.</p>
Atmospheric Pollution Prevention Ordinance (No. 11 of 1976)	<p>a) Provides control of noxious or offensive gases and matters incidental thereto.</p> <p>b) Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process.</p>
Water Resource Management Act (2004)	<p>The following permits are required in terms of the Water Act:</p> <ul style="list-style-type: none"> o water abstraction permits; o domestic effluent discharge permits (site offices, construction camp); industrial effluent discharge permits; o water use for dust suppression; and water reticulation permits (pipelines). <p>Will be superseded by Water Resources Management Act 2013 once the regulations are implemented in the future.</p>
National Heritage Act No. 27 of 2004	<p>No archaeological/heritage site or cultural remains may be removed, damaged, altered or excavated.</p> <ul style="list-style-type: none"> ▪ Section 48 sets out the procedure for application and granting of permits, such as the permit required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. ▪ Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council
Namibia Standard Act (Act No. 18 of 2005)	Responsible for the promotion of standardization and quality assurance in the industry, commerce and the public sector in Namibia, with the aim of improving product quality, industrial efficiency and productivity and promoting trade so as to achieve optimum benefit for the people of Namibia.
National Development Plans (NDP5)	NDP5 has its goal to reduce poverty such that by 2022, marginalized communities are integrated into the mainstream economy.
Harambee Prosperity Plan (HPP)	A government plan that is intended to prioritize the implementation of policy Programme that enhance service delivery, contribute to economic recovery and promotes economic growth

4. AN ANALYSIS OF THE BASELINE ENVIRONMENT

An analysis of the baseline environment is presented in Table 5, below. With respect to the receiving environment, the impacts which the envisaged development is likely to pose have been evaluated as described in this section. The study information was gathered through a number of sources such as:

- visual investigation of the site;
- discussions with the proponent;
- taking of photographs;
- discussions with communal traditional authority;
- observation of the current environmental and the immediate surrounds; and
- secondary information sources from desk studies.

Only those elements of the environment that have a direct bearing on the impact assessment process of the proposed development are presented. The severity of the potential impacts is largely determined by the state of the receiving environment.

Table 5: Baseline Environment Analysis

Particulars	Details	Environmental Impacts/Considerations
Project Location	Linyanti Settlement, Zambezi Region	
Nature of Land	Communal Land	
Land Ownership	Mwafe Traditional Authority	
Land Size	±6 000 square meters	
Zoning	Not applicable, land is communal	
Surrounding Land Use	Traditional residential housing units	
Longitude	-18.067429 South	
Latitude	24.020289 East	
Topography and Drainage	Flat with a slight fall towards the southwest	
Accessibility	Access is provided via C49 – a tarred road which links Katima Mulilo to Kongola via multiple villages including Linyanti.	A short access road of about 40 m is to be constructed to link C49 to the fuel service station. The project will not result in traffic congestion on C49.
Nearest towns	Katima Mulilo (80 km) Bukalo (100 km) Divundu (290 km)	Minimal employment will be created during the construction and operation phases of the project. No influx of people into the settlement is therefore expected as a result of the project implementation.
Nearest airport	Katima Mulilo Airport	
Nearest Hospitals	There is a Primary Health Facility at Linyanti. The biggest hospital is Katima Mulilo District Hospital – 80 km away.	
Communication	Mobile and land based telecommunication infrastructure are available at the site.	
Surface Waterbodies	The Linyanti River is a perennial river which is about 4 km from the project site. The river drains into the Zambezi River.	The natural drainage around the project site is towards the Linyanti River
Climatic Conditions	The climate is typically warm to hot with April to October regarded as dry months and November to March as wet months.	
	Rainfall: On average the project site receives between 650 and 800 mm of rainfall per year with	Rainfall events have the potential to wash away

	<p>most precipitation occurring between the months of November and April.</p> <p>Temperature & Wind Conditions : The mean summer temperature (December to February) is 25 °C while mean winter temperature (June to August) is 17 °C. Daily temperature ranges are highest in winter when frosts can occur.</p> <p>Winds around Linyanti are infrequent and the area experiences wind calm conditions at about 58% of the time. Winds mostly blow from the east and seldom reach speeds exceeding 10 km per hour. The windiest months are generally from January to April</p>	<p>pollutants present at the facility, especially from parking areas into the natural drainage and ultimately to the Linyanti River.</p> <p>Wind direction should be taken into account when stockpiling construction materials that are prone to wind erosion such as building sand.</p> <p>Handling of hazardous products (fuel offloading and discharging) should be suspended during strong wind conditions.</p>
<p>Floral Diversity</p>	<p>Two broad categories of vegetation are encountered – the aquatic vegetation associated with the water in the river and the terrestrial vegetation (woodland) that surrounds the river but does not necessarily depend on the water in the river. (<i>Mendelsohn et al., 2004</i>). The open woodland savanna is dominated by numerous hardwood species such as false mopane trees, mangetti, kiaat and thatch grass.</p> <p>Some of the plant species found in the region are used in a variety of commercial applications, i.e. timber and thatching in the construction sector, oil, (Vetter, 2001a).</p>	<p>The site has been virtually cleared of vegetation but big trees have been spared</p>
<p>Faunal Diversity</p>	<p>A variety of aquatic animal species ranging from fish, birds, hippos and crocodiles are associated with Linyanti River.</p> <p>Fish is caught by the residents for its protein as food. About 83 fish species are known to be present in the Zambezi River and in all tributaries. These species are common in the area (Linyanti Concession)</p> <ul style="list-style-type: none"> • Elephants • Giraffes • Hippos • Buffalo • Zebra • Wildebeest • White Rhino • Black Rhino <p>Occasionally, these animal species are encountered:</p> <ul style="list-style-type: none"> • Lions • Leopold • Cheetah • Hyaena • Wild dogs <p>Common bird species:</p> <ul style="list-style-type: none"> • Kori bustards • Ostriches • Secretary birds • African Skimmer • Slaty egret 	<p>The project site is in a settlement – reserved for human occupation. The project does not have any impacts on the faunal diversity.</p>

Soils	<p>Five major soil types are found in the Zambezi Region with these scientific names: <i>Anthrosol</i>, <i>Arenosol</i>, <i>Calcisol</i>, <i>Fluvisol</i> and <i>Solenetz</i>. (Hendelsohn et al., 2009)</p> <p><i>Anthrosol</i> is soil that has been formed or heavily modified due to long term human activities such as dry cropping, irrigation, addition of organic waste or wet-field cultivation used to create paddy fields. In general, Anthrosol soils can be formed from any parent soil, but are commonly found in areas where agricultural activities have been conducted for centuries. Based on the aforesaid description, Anthrosol would be the typical soil occurring at the project site.</p>	<p>The soil has poor drainage capabilities and any spill or leak of hazardous products can rapidly reach the groundwater.</p>
Geology	<p>The region is covered by sediments of the Kalahari Sequence which becomes thicker when one moves from the west end of the region, reaching thickness of about 300m towards the Kwando and Linyanti Rivers. From the Kwando River towards the north-east, the sand cover thins out to about 30 m. Outcrops of underlying rocks are scarce and the geology is only extracted from a few exploration boreholes.</p>	
Archaeological, Cultural and Heritage Aspects	<p>There are no known or recorded items of archaeological interest or of cultural heritages. In the unlikely event of such sites (artifacts, stone tools, pottery vessels, metal objects, weapons, human bones etc.) being unearthed during construction activities, the procedure as recommended in the EMP is to be followed.</p>	
Demographic Environment	<p>The data presented here has been sourced from the Population Census conducted by NSA in 2011:</p> <hr/> <p>Total Population in Zambezi Region : 90 756 (2011)</p> <p>Gender</p> <ul style="list-style-type: none"> • Male - 44 099 • Female – 46 499 <p>Urban/Rural Split</p> <ul style="list-style-type: none"> • Rural - 62 234 or 68.6% • Urban - 28 364 or 31.4% <p>Age groups</p> <ul style="list-style-type: none"> • 14% are under 5 years old • 25% are between 5 and 14 years old • 55% are between 15 and 59 years old • 6% are above 60 years old <p>Economic activities</p> <ul style="list-style-type: none"> • 50 490 people were economically active • 33 004 or 60.6% were employed • 21 486 or 39.4% were unemployed 	<p>The envisaged facility will provide employment opportunities to skilled, semi-skilled and non-skilled people during the construction and operational phases of the development.</p>

5. IMPACT ASSESSMENT

The objective for the assessment of impacts, is to identify and to assess all those possible impacts that are likely to arise from the implementation of the proposed development. Such impacts and the suggested mitigation measures are presented to the Environmental Commissioner (EC) so as to allow the EC to make an informed decision on whether the proposed activity should be:

- authorized;
- authorized with conditions; and or
- entirely rejected and refused.

In this sense, impacts are defined as changes in an environmental parameter that results from undertaking an activity. These changes are the difference between effects on an environmental parameter where the activity is undertaken compared to where the activity is not undertaken, and occur over a specific period and within a defined area (*EMA 2007*).

5.1 Types of Impacts

Different types of impacts both positive and negative can occur from the proposed development. Impacts are categorised as **direct** (primary), **indirect** (*secondary*) or **cumulative**.

Direct impacts are those caused directly by the activity and generally occur at the same time and at the place of the activity (for example, dust generated as a result of excavation for building foundations).

Such direct impacts are associated with the construction, operation and maintenance of the development or activity and are therefore obvious and quantifiable. However, indirect impacts are induced changes that may occur as a result of the activity (development). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

5.2 Identification of Impacts

The identification of potential impacts associated with an activity on the environment should include impacts that may occur during the construction, operational and decommissioning phases of such an activity. Included in the process of identification and assessment of impacts are, inter alia, the following:

- Determining current environmental conditions in sufficient detail so that there is a baseline against which impacts are identified and measured.
- Determining future changes to the environment that will occur if the proposed activity does indeed take place.
- Understanding the activity in great details so as to understand all consequences associated with such an activity.

5.3 Mitigation of Impacts

Once impacts have been identified or predicted for a particular activity, appropriate mitigation measures are established. Mitigation measures could take the form of modification of certain activities in such a way so as to reduce, eliminate and or to avoid the impacts on the environment.

The objectives of mitigation measures are:

- To find more environmentally sound ways of doing things.
- To enhance the environmental benefits of a proposed activity.
- To avoid, minimize or remedy negative impacts associated with the activity.
- To ensure that residual negative impacts are within acceptable levels.

When mitigation measures are considered for certain impacts, they are organized in a hierarchy of actions, namely:

- Avoid negative impacts through the use of preventatives.
- Minimize or reduce negative impacts to 'as low a level as practicable'.
- Remedy or compensate for negative residual impacts that are unavoidable, and cannot be reduced further.

The methodology used to assess identified impacts is presented in the **Table 6** below.

Table 6: Impact Assessment Methodology

The Status of the Impact		
Status	Description	
Positive:	A benefit on the environment	
Neutral:	No impact on the environment	
Negative:	A cost on the environment	
The Duration of the Impact		
Duration	Description	Score
Short term	Less than 2 years	2
Medium term	3 to 5 years	3
Long term	6 to 10 years	4
Permanent	10 years and longer	5
The Extent of the Impact		
Extent	Description	Score
Site specific	Within the site boundary	1
Local	Affects immediate surrounds	2
Constituency	Extend beyond site boundary	3
Regional	Extend beyond local jurisdiction	4
National	Affects countrywide	5
The Reversibility of the Impact		
Reversibility	Description	Score
Completely Reversible	Reverses with minimal rehabilitation	1
Reversible	Requires mitigation and rehabilitation to ensure reversibility	3
Irreversible	Cannot be rehabilitated completely/ rehabilitation not viable	5
The Affect (Severity or Beneficiary) of the Impact		
Severe/Beneficiary Affect	Description	Score
Slight	Little effect/negligible disturbance	1
Slight to Moderate	Effects observable – environmental impacts reversible with time	2
Moderate	Effects observable – environmental impacts reversible with rehabilitation	3
Moderate to High	Extensive effects – irreversible alterations to the environment	4
High	Extensive permanent effects with irreversible alterations	5

The Probability of the Impact occurring		
Rating	Description	Score
Unlikely	≤15% sure of an impact occurring	1
Possible	≥15% ≤ 40% sure of an impact occurring	2
Probable	≥40% ≤60% sure that an impact will occur	3
Highly Probable	≥60% ≤85% sure that an impact will occur	4
Definite	≥85% sure that an impact will occur	5

The **Consequence**
= Duration + Extent + Reversibility + Severity

The **Significance Rating (S)**
= Consequence x Probability

Table 7: Significance Rating

The Significance Rating	
Rating	Description
S ≤ 25 - Low Impact	The impact will not have a direct influence on the decision to the development
S ≥ 25 ≤ 50 - Medium Impact	The impact will influence the decision to the development unless it is effectively mitigated
S ≥ 50 – High Impact	The impact will have an influence on the decision process to the development irrespective of the mitigation measures proposed

5.4 Assessment

In the section below, all possible impacts associated with the proposed development are discussed in details while possible mitigation measures are suggested and presented in the EMP section of the Scoping assessment report.

5.4.1 EMPLOYMENT CREATION

The filling station proposed by Bedzo will help to combat unemployment as new job opportunities will be created in the settlement of Linyanti during both phases of the development – construction and operational. It is projected that a minimum of seventy (70) employment opportunities will be created during the construction phase followed by another fifty (50) during the operational phase.

5.4.2 BOOST TO THE ECONOMY OF THE SETTLEMENT

It is expected that, people from within the settlement of Linyanti will be hired to work at the service station and related business activities. This will contribute to the economy of the settlement in that employees will be spending their disposable incomes in the settlement, paying of school fees and buying of groceries and clothing from local shops hence boosting the regional economy.

During the construction phase, it is expected for the successful contractor to procure construction materials (cement, stones, bricks, brickforce, steel products, roofing, plumbing, tiling, electrical goods, etc.) required from local suppliers (Katima Mulilo).

As noted in the previous section of this report, energy plays a pivotal role in economic growth and development. The development of a filling station at Linyanti will help to improve accessibility of petroleum products to the settlement residents including the hundreds of daily visitors commuting from the neighbouring villages hence boosting the settlement economy.

5.4.3 IMPARTING OF NEW SKILLS

New employees will be hired, especially from the youth section of the population. Those employees without previous working experiences have to be coached and given on-the-job training and therefore helping them to acquire new useful skills and knowledge to help them throughout their working life.

5.4.4 CONTRIBUTION TO THE REGIONAL AND NATIONAL ECONOMY

As a local company, Bedzo is expected to source its petroleum products from fuel suppliers and distributors which pay taxes to the State. In addition, the promoter will also be sourcing merchandise for its convenience shop from other traders and as such, liable for tax payments (PAYE, company income tax, VAT, etc.) and other levies (social security commission, workmen's compensation, etc.) and therefore contributing to the regional coffer and ultimately to the national economy (transport of fuel from Walvis Bay or Grootfontein to Linyanti)

5.4.5 TRAINING OF EMPLOYEES

It is imperative that all employees who will be hired to work on this development undergo induction training on the EMP and on all aspects related to the environment, with emphasis placed on how their activities, the materials or products that they use and handle can harm the environment.

All impacts as identified in the scoping assessment and recommended mitigation measures proposed in the EMP should be conveyed to the workers during such training session.

The provisions of the EMP should be explained to all workers and any sub-contractors (electricians, artisans, plumbers, bricklayers, etc.) who may be hired by the main contractor. Where possible, translation should be provided for the benefit of those employees with limited understanding of the official language.

All employees who have undergone an environmental awareness induction are expected at the end of such training to be able:

- To define the terms associated with the environment.
- To understand the potential impacts that the project is likely to cause.
- To recognize what waste does to the environment.
- To demonstrate what can be done to help prevent harmful impacts to the environment.

The developer has to ensure that training has been offered prior to the workers starting with construction activities. A copy of the EMP should be provided to the Site Agent/Site Manager and that the content is well understood and conveyed to all employees including those employees by subcontractors.

The same training as described above should be offered to all those employees who will be hired and recruited by the promoter for the Operational Phase of the facility.

The nature of the impact is POSITIVE and significance rating is VERY HIGH.

Mitigation

- Employment should be provided to deserving employees without discrimination on the basis of race, origin, gender or political affiliation.
- People from marginalised communities should also be considered for employment.
- Disabled people should also be considered for suitable vacancies.

5.4.6 SOCIO AND ECONOMIC IMPACTS

Unemployment is a serious problem in Namibia particularly among the youths especially in the rural areas where economic activities are rather limited. The proposed development will create employment opportunities during its construction phase and the operational phase. It has been projected that a minimum of 50 people will be employed during the operational phase while the construction period is expected to provide employment opportunities to anything between 60 and 70 people.

The disadvantage which comes with this type of development is that, once the construction activities are observed on site, a large number of jobseekers will flock to the site in search of employment. This has an added disadvantage in that too many unemployed people will:

- Resort to the project site often resulting in the creation of informal accommodation facilities.
- Resort to drinking alcohol and to partake in illicit activities such as crimes, drugs, etc.

5.4.7 TRAFFIC CONGESTION

The proposed fuel service station is adjacent C46, but traffic congestion is not expected to occur when accessing or exiting the fuel service station. There is therefore no direct or indirect impacts resulting from the project. The significance rating is therefore very low with and without mitigation.

Mitigation:

- Entry and exit points to the filling station should be established and clearly marked.
- Adequate parking for both light and heavy duty vehicles should be provide within the service yard.

5.4.8 SEDIMENTATION AND DRAINAGE

Construction activities will disturb and loosen the soil structures and this could wash away during intense rainstorms and with storm water runoff. Silt could be deposited in the the natural drainage to the south of the site. Measures have to be taken to limit the extent of storm water runoff. Topsoil that has been removed from the construction sites should also be stored up slope so that it is not washed away. The direct and cumulative impacts are considered local, definite, low intensity and low impact.

The completed fuel site is expected to have an impervious surface to avoid water infiltration into the ground. Surface water from the paved areas is likely to contain amounts of oils and greases, the design should therefore ensure that used water from sections of the filling station where spills are anticipated, is directed to pass through a properly constructed oil interceptors. This will reduce surface runoff from impacting on the natural environment around the service station.

Lack of a proper site surface drainage will result in water clogging up and accumulating making movements of traffic and people cumbersome. The potential impact associated with surface runoff can be effectively mitigated.

Mitigation:

- Ensure an adequate and efficient drainage system is provided in the design.
- Provide adequate oil interceptors.
- Consideration should be given to harvest rainwater from the rooftops for cleaning purposes.

5.4.9 SOIL DISTURBANCES

The construction will include digging of foundations and levelling off of certain areas. This, unfortunately, will involve some disturbances of the soil profile and associated microbial communities. The flat slope of the land implies that minimal levelling will be needed and thus reduced soil disturbances. The underground tanks will require excavation of pits and the remaining materials not used in backfilling of the pits could be used for levelling and landscaping of the fuel retail station. The impact is NEGATIVE but the footprint is comparatively small.

Mitigation:

- Limit excavation activities to construction areas only.
- All foundation to be excavated should be clearly demarcated and the work carefully executed.

5.4.10 WASTE GENERATION AND MANAGEMENT

Various types of waste are expected to be generated during the construction and operational phases. Waste management has to include the management of both solid and liquid waste. Suitable waste skips have to be provided in which different types of waste is stored. Minimal waste collection is handled by the settlement officials.

Litter blown from the project site may accumulate in the surrounding areas resulting in visual nuisance. Sources of waste, anticipated volumes and recommended disposal/mitigation measures are as presented in the table below.

Table 8: Waste Generation and Management

Nature of Waste	Volume	Disposal & Mitigation Measures
Construction Phase		
Excavated soil	Moderate	<ul style="list-style-type: none"> • Use for levelling & landscaping. • Comply with the EMP.
Cement bags, paint containers, steel scraps, broken bricks, nails, building rubble	Moderate	<ul style="list-style-type: none"> • Re-use. • Sell to waste papers & scarp dealers. • Dispose of at an approved landfill site. • Separate waste & place in designated bins. • Comply with the EMP
Timber	Low	<ul style="list-style-type: none"> • Sell for firewood to the locals. • Cutting down of big trees may require permission from line ministry.
Operational Phase		
Solid waste : papers, bottles, cans, plastics, etc.	Moderate	<ul style="list-style-type: none"> • Develop an in-house waste management plan. • Procure adequate waste skips for the facility. • Train employees on waste types and handling. • Discourage littering by patrons. • Display prominently 'no waste signs'. • Keep premises tidy & clean at all times. • Comply with the EMP.
Liquid waste (water, fuel, oil, grease, etc.)	Moderate	<ul style="list-style-type: none"> • Ensure suitable stormwater drainage is constructed. • Install oil interceptors. • Monitor quality of effluent discharged frequently.
Emission from vehicles	Low	<ul style="list-style-type: none"> • Emitted directly into the air. • Ensure vehicles are switched off during refuelling. • Comply with the EMP.
Decommissioning Phase		
Metals, i.e. scraps	Low	<ul style="list-style-type: none"> • Sell or re-use. • Comply with the EMP.
Scrapped Equipment	Low	<ul style="list-style-type: none"> • Sell or re-use. • Comply with the EMP.
Unused concrete	Low	<ul style="list-style-type: none"> • Use for rehabilitation or re-use. • Comply with the EMP.
Soil	Low	<ul style="list-style-type: none"> • Use in rehabilitation of site. • Comply with the EMP

5.4.11 ENVIRONMENTAL POLLUTION

Possible environmental pollutions associated with this type of development are listed in the table below which also includes the proposed mitigation measures.

Table 9: Sources of Environmental Pollution

Sources	Mitigation Measures
Vehicular emissions	<ul style="list-style-type: none"> • Vehicles to be switched off when stationary. • Ensure the facility is spacious and well aerated. • Ensure rules at the facility are applied and enforced.
Fuel & oil spills	<ul style="list-style-type: none"> • Ensure employees are well trained. • Fit hoses with quick-acting leak-proof cocks or with approved nozzles • Ensure proper waste collection, handling and disposal
Lubricant containers and packaging materials	<ul style="list-style-type: none"> • Ensure suitable & adequate waste skips are provided • Encourage proper waste collection, handling & disposal • Ensure employees are well-trained • Comply with the EMP
Office & shop wastes	<ul style="list-style-type: none"> • Ensure adequate skips for different types of wastes are provided • Ensure proper handling, collection and disposal • Maintain a high standard of housekeeping • Ensure employees are well trained on the EMP
Waste water	<ul style="list-style-type: none"> • Construct a proper drainage water system • Treat water through oil interceptors before discharging into the environment • Install oil intercepts • Ensure employees are properly trained • Maintain high standard of housekeeping
Leakages	<ul style="list-style-type: none"> • All underground fuel tanks should satisfy local and international standards • Use only approved fuel tanks and monitor volumes to detect any possible leaks timeously • To prevent any fuel leaks from getting into the environment, the tanks should be properly treated • A layer of clay should be used to encase the tanks during installation • Follow the recommendation provided by the supplier • Ensure adequate training is provided to employees

5.4.12 NOISE IMPACTS

Noise is unwanted/undesirable sound that can affect job performance, safety and health of humans. Psychological effects of noise include annoyance and disruption of concentration. Physical effects include loss of hearing, pain, nausea and interference with communications when the exposure is severe.

The construction activities will involve the use of heavy machinery and other miscellaneous sources of noise for construction site (concrete mixers, trucks delivering construction materials such as bricks, sand, aggregate, etc.). This is not likely to cause any significant degradation of the local environment because it will be limited to the construction site. In addition, the noise levels produced are unlikely to exceed the background levels which will be for a short period of time.

Mitigation

- Construction activities must be limited to daylight hours only.
- Avoid unnecessary long idle, hooting & revving of construction vehicles.
- Construction vehicles should be well maintained to avoid excessive noise levels.

5.4.13 IMPACTS ON THE FLORAL AND FAUNAL DIVERSITY

The proposed development is in a village setting and as such the biodiversity has been degraded by human activities. The land has been almost cleared of vegetation and the site is expected to be

completely transformed after construction activities are completed. This will lead to the complete loss of any habitat of living creatures and vegetation. The nature of the impact is considered to be of medium significance. The cumulative impact is site specific, definitive, low intensity and of low impact.

Mitigation

- Give due regard to the protection of the ecosystem.
- Comply with the provisions of the EMP

5.4.14 VISUAL IMPACTS

The prominent man-made features observed around the project site are communication towers for MTC, Telecom, advertisement boards (billboards) and electrical powerlines. During the construction phase for this specific project, visual intrusion will take the form of overhead cranes, scaffolding and the general traffic at the construction site.

After the construction phase, a tall canopied forecourt structure will remain as a permanent feature intruding on the open view of the horizon. If littering and illegal dumping on the site are not controlled, this could increase the visual impact of the proposed development.

Mitigation

- train employees on good housekeeping;
- protect amenity values;

5.4.15 ARCHAEOLOGICAL AND CULTURAL HERITAGE

Desk studies and site observation did not reveal any items of known archaeological or areas of heritage and cultural interests on the project site itself or in the vicinity of the development. In the unlikely event of any such items being unearthed during the construction phase, work must be stopped and officials from the National Heritage Council and the Namibia Police summoned to the site. Work should only proceed once an all 'Ok' has been granted by NHC.

Mitigation

- give due respect to issues of cultural heritage;
- comply with the EMP;

5.4.16 FIRE RISK AND CONTROL

Petroleum products present significant risk to the environment due to their inflammable nature. This implies that the proponent must put adequate measures in place to prevent and control possible fire explosions. The nature of impact is NEGATIVE and the significance rating is MEDIUM with mitigation.

Mitigation

- Ensure the facility is kept clean and free from fire hazards and litters.
- Naked fire should be avoided – place notice signs prohibiting smoking within the fuel retail service station boundaries.
- All electrical installation on the premises should be carried out by qualified and certificated artisans.
- Install fire control appliances (portable fire extinguisher, both CO₂, dry powder and water types and sand buckets).
- Ensure employees are adequately trained in the use of firefighting devices and conduct regular fire drills at least once a year.

- Ensure all equipment and tools are regularly serviced and well maintained.
- Implement leakage detection mechanism.
- As cylinders (if the fuel service will sell LPG) should be kept outside in an open air (not inside a building) and regular leakages checks should be conducted.
- Observe safety measures (no use of cellphone, avoid smoking, etc. when on the fuel service station) .

5.4.17 HEALTH, SAFETY AND SECURITY

Safety is of paramount importance in the execution of any project activity. During the construction and operational phases, access to the project site has to be secured and restricted so as to ensure that the health & safety of employees, members of the general public who may visit the premises are protected and safeguarded.

This would include risks associated with operating construction machinery on site, excavating trenches and the installation and/or connection of services (water, sewer & electricity). Neglect to apply applicable industry safety standards could lead to incidents and accidents which are undesirable and often associated with costly consequences.

During the operational phase, exhaust emissions from fuel combustion is another safety hazard. Depending on the efficiency of the refinery process, combustion of petrol produces mainly CO₂ (±13%), water (±13%) and Nitrogen (±73%). A very small portion of N is converted to Nitrogen Oxide (NO_x) and some to Nitrate Hydrocarbons.

Incomplete combustion leads to the production of Carbon Monoxide (CO), Volatile Organic Compounds (VOCs) fuel, Nitrogen Oxides and Lead in thousands of compounds both in gas and particulate phases. VOCs are hazardous to human health, for instances, long exposure to Benzene could lead to cancer (EHC, 2003). NO_x cause irritation of respiratory track and may exacerbate asthma and may damage blood vessels. Extended exposure to Lead (Pb), could lead to several physiological disorders in man with the most sensitive parts being kidney, blood and the nervous system. The emissions may also contaminate the environment including soil and water.

Mitigation

CONSTRUCTION PHASE

- Enforce strict safety precautions during the construction. These should include provision of PPEs (overalls, helmets, dust masks, welding shielding/goggles, earmuffs, safety boots, etc.)
- Ensure supervision of works is carried out by competent staff that sees to it that correct materials are procured and used, that proper mixing of elements is adhered to and that a high standard of workmanship is maintained throughout the construction.
- Construction site should be sealed off from non-construction workers and the general public.
- Provide for first aid facilities and emergence response plan
- Provide toilet facilities and suitable change rooms for workers

OPERATIONAL PHASE

- Ensure that employees undergo regular medical check-ups (at least twice a year)
- Vehicles should be switched off to minimise emissions
- Ensure proper aeration within the premises
- PPEs should be provided to employees and wearing thereof enforced
- Install first aid facilities

- Develop a fire emergence response plan
- Develop an accident response plan
- Provide washroom facilities for the workers

Table 10: Summary of Impact Assessment – Both Phases

POTENTIAL IMPACTS		NATURE OF IMPACT	IMPACT SIGNIFICANCE	
			Unmitigated	Mitigated
Construction	Roads & Access to the Site	Negative	Medium	Low
	Training of Employees on Environment	Positive	Low	Medium to High
	Site Surface Drainage	Negative	Medium	Low
	Increased Traffic around the site	Negative	High	Medium to Low
	Impact on Environmental Pollution	Negative	Low	Low to very Low
	Noise Impacts	Negative	Low	Very Low
	Dust Impacts	Negative	Low	Very Low
	Waste Handling	Negative	Low	Very Low
	Visual Intrusion	Negative	Low	Low
	Archaeological, Heritage & Cultural Aspects	Negative	Low	Very Low
	Impacts on the Ecosystem	Negative	Low	Low
	Fire Risk & Control	Negative	Medium	Low to very Low
	Health & Safety	Negative	Medium	Low
	Socio-economic (Employment)	Positive	High	High
	Socio-economic (Social ills: drugs, alcohol)	Negative	Medium	Low
Operational	Training of Employees on Environment	Positive	Medium	High
	Fire Risk & Control	Negative	Low	Very Low
	Safety & Health	Negative	Low	Very Low
	Site Drainage	Negative	Low	Very Low
	Noise Impact	Negative	Low	Very Low
	Air Quality	Negative	Low	Very Low
	Dust Impact	Negative	Low	Very Low
	Waste Handling	Negative	Medium	Low
	Impact on the Ecosystem	Negative	Low	Very Low
	Visual Intrusion	Negative	Medium	Low
	Socio-economic (Employment)	Positive	High	High
	Socio-economic (social ills: drugs, alcohol)	Negative	Medium	Low
	Socio-economic (on Local Residents)	Positive	Medium	High

6. ENVIRONMENTAL ECONOMICS CRITERIA

6.1 Environmental Economic Criteria

A final qualitative assessment is considered in terms of the criteria used in the field of Environmental Economics. These criteria are explained by Stauth (1983), namely:

- Efficiency Criterion,
- Equity Criterion, and
- Intergenerational Equity Criterion.

6.1.1 EFFICIENCY CRITERION

A project is considered to be efficient if it brings about a net benefit to society. If some people are made better off without anyone else being made worse off, then a project is considered efficient in environmental economics terms.

This project will bring significant economic benefits to the residents of the small settlement of Linyanti and neighbouring communities including the growing number of tourists both local and foreign.

The project will create employment opportunities during its construction and operational phases and will further support secondary industries and commercial opportunities in the settlement and the region through the procurement of goods and services.

6.1.2 EQUITY CRITERION

The equity criterion relates to the distribution of costs and benefits in the affected society. A project is equitable if it brings about a situation in which the distribution of social well-being is improved.

The envisaged operation will benefit the local people without disadvantaging them in any way. They will not suffer any displacement or loss of land or be subjected to adverse health conditions.

Direct benefits will include remuneration to employees, while indirect benefits would include increased work opportunities in the supporting industries, i.e. transport companies, suppliers of building materials, etc.

6.1.3 THE INTERGENERATIONAL EQUITY (OR SUSTAINABILITY) CRITERION

This criterion considers the economic impacts on future generations, i.e. it extends the considerations of equity to future generations. Thus a project should be able to make the present generation better off without making future generations worse off. It should be able to provide benefits to future generations without degrading the resource base that the society depends on for its wellbeing. The development proposed by Bedzo Investments does not pose any significant threats to human health.

6.2 Conclusion and Recommendation

Overall the economic benefits that accrue from the proposed developed will, by far outweigh the negative impacts on the biological, natural and socio-economic environments. The fuel service station and related accessories are expected to perform positively in relation to the efficiency, equity and sustainability criteria.

It is recommended that an Environmental Clearance Certificate (ECC) be granted to Bedzo Investments CC for its proposed development at the Linyanti Settlement.

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