

2020

*J.N VAN DYK T/A PUMA PARADISE SERVICE STATION*

Final Report compiled by CONSERVER INVESTMENT CC

**Environmental Assessment Scoping report and EMP for Construction of proposed J.N Van Dyk T/A PUMA Paradise Service Station. ERF 1296, EXT 4, RUNDU, Kavango East Region, Namibia**

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**LIST OF ACRONYMS**

EMA:	ENVIRONMENTAL MANAGEMENT ACT
MET:	MINISTRY OF ENVIRONMENT AND TOURISIM
EIA:	ENVIRONMENTAL IMPACT ASSESMENT
EMP:	ENVIRONMENTAL MANAGEMENT PLAN
NSA:	NAMIBIA STATISTICS AGENCY
GHGs	GREEN HOUSE GASES
GIS	GEOGRAPHIC INFORMATION SYSTEMS
BID	BACKGROUND INFORMATION DOCUMENT
SHE:	SAFETY HEALTH AND ENVIRONMENT
TOR:	TERMS OF REFERENCE
UNDP:	UNITED NATIONS DEVELOPMENT PROGRAMME
EAP:	ENVIRONMENTAL ASSESMENT PRACTITIONER
EA	ENVIRONMENTAL ASSESMENT
MOHSS	MINISTRY OF HEALTH AND SOCIAL SERVICES

## **EXECUTIVE SUMMARY**

**Rundu Service Centre One Stop** is proposing to construct and operate a service station trading as **PUMA Paradise Service Station**. This proposed project development is foreseen to be an authorized service station which will support the **refurbishment** of an existing fuel retail facility which includes forecourt, steel canopy and underground fuel storage tanks as well as a Convenience shop for service station users. This will be located on serviced ERF 1296, in Rundu Industrial area.

The Project Environmental Impact Assessment (EIA) presents an assessment of the potential environmental, occupational health and safety, social and community impacts, mitigation measures and design enhancement for the Project. In order to verify and fully understand the true significance of the impacts of the proposed development on the landscape, a site visit was conducted by the Environmental Assessment Practitioner on the 5<sup>th</sup> and 6<sup>th</sup> of March 2020.

The proposed fuel retail station was once established and was operating, however the service station was sub-standard (non-compliance) against the Environmental Management Act 2007 and the regulations of 2012. Thus the proposed development will be in compliance with the EMA 2007 and its regulations having a positive social impact by creating employment opportunities, bringing much needed services closer to the local and surrounding communities. The proposed filling station will help motorists using Independence Avenue from Westley suburbs and Kavango West gate way to conveniently fuel up and maneuver. Amongst other services to be offered are petroleum products, lubricants, wheel pressure, ATMs, quick shop and toilets. The proponent will also contribute towards the economic growth of our nation through revenue collection and other relevant duties as may be imposed by authorities.

## **1.0. INTRODUCTION**

### **1.1. Background of the Study**

Conserver Investment cc, environmental consultant, has been appointed by Rundu Service Centre One Stop (project proponent) to undertake all the authorizations required for the construction and operation of the proposed facility. The proposed development will trade as Puma Paradise Service Station. It will be located on ERF 1296, in Rundu Industrial area.

The proposed development will involve removal of the currently operating substandard service station and leveling of the site. Excavations will be done to facilitate the laying of foundations and underground tanks. There will also be transportation of construction materials and associated wastes to and from the site respectively. The conclusion of the construction phase will be the establishment of a filling station comprising of features discussed earlier in this report. Since the change in the land surface will impact on the storm water flows, adequate drainage system will be put in place. The design of the project has been performed with due consideration of the existing topography of the proposed project site. In general, the design of the project will optimize the use of the best available technology to prevent or minimize potentially significant environmental impacts associated with the project and to incorporate efficient operational controls together with trained staff, to ensure high level business and environmental performances.

Independence Avenue has high traffic volume for residents of extension 4, Sauyemwa, Mellenium 2000, Kehemu, Queens Park and long distance taxis, which makes the site ideal for the proposed development.

### **1.2. The Environmental Assessment (EA) Process**

With reference to the guide of the Environmental Management Act No 7 of 2007, no one can carry out any listed activity without an environmental clearance certificate.

Environmental assessments serve the following purposes:

- Ensure that activities which may have a significant effect on the environment follow the principles of environmental management planning and development process;
- Analyze the possible environmental impacts of activities, and look at ways to decrease negative impacts and increase positive ones;

- Make sure that the environmental effects of activities are given adequate consideration before the activities are carried out and
- Provide an opportunity for public participation in considering the environmental impact of a project.
- These listed activities form part of the Scope of Works of the EA and are considered in all the phases of the project.

The Environmental Regulations procedure (GN 30 of 2012) stipulates that no fuel depot or service station may be established without an environmental clearance certificate. As such, an environmental clearance certificate must be applied for in accordance with regulation 6 of the 2012 environmental regulations. It is imperative that the environmental proponent must conduct a public consultation process in accordance with regulation 21 of the 2012 environmental procedure, produce an environmental scoping report and submit an Environmental Management Plan for the proposed fuel station.

Environmental baseline information is to be carried out and prepared as part of an Environmental Impact Assessment (EIA) study of the site. The competent authority is to undertake a review of the assessment scoping report and issue an Environmental Clearance Certificate (ECC) if they are satisfied that all aspects and hazards are addressed and proper and sufficient mitigation controls have been proposed.

In addition, it is the mandate of the competent authority to attach additional conditions to the ECC.

**The objective of the study is;**

- To provide highlights on operational guide lines, existing laws and regulations involved in operating the service station.
- To provide baseline study of the original status of the environment in the area chosen by the proponent as the site for the service station before the development of the project is started which will serve as a base reference for the implementation of the project.
- To develop the existing substandard service station to that of a higher standard.
- To identify and mitigate the impacts caused by establishing a fuel retail station on the proposed site.



- To brief the Project Proponent of the legal framework in which the intended project falls under.
- To identify the possible changes on physical and biological environment that might be as a result of project implementation in the area.
- To reveal various public and stakeholders concern that can help the National Environmental Action Planners, economist and concerned stakeholders to make decisions.
- To structure an effective environmental management plan for the construction and operation phases of the proposed project.

This report serves as a subscription to sustainable business development and environmental sensitiveness to maintain a balance in social development, economic sustenance and bio-physical environment.

#### **1.4. Approach to EA process**

The EA process was implemented following the Terms of Reference as emphasized by the EMAAct of 2007. The study will be limited to the immediate environment on and around the location of the service station at ERF 1296 in Rundu Extension 4 Kavango East Region.

The study will specifically look at the activities in the following phases;

##### **Construction phase**

- Excavation of trenches and pits for services and infrastructure
- Installation of engineering services, underground storage tanks, oil separator, spill control infrastructure, submersibles, generator and dispensing pumps
- Electrical reticulation above and below ground
- Construction of buildings, paving, pump islands, storm water drainage, site access streets and related infrastructure
- Transportation of equipment, components, machines and building material to site
- Site clean-up and housekeeping

##### **Operational phase**

- Decanting fuel to the underground storage tanks from street tankers
- Fuel dispensing into vehicles and approved containers
- Car wash operations
- Operations of a quick shop
- Site clean-up and housekeeping
- Running water management

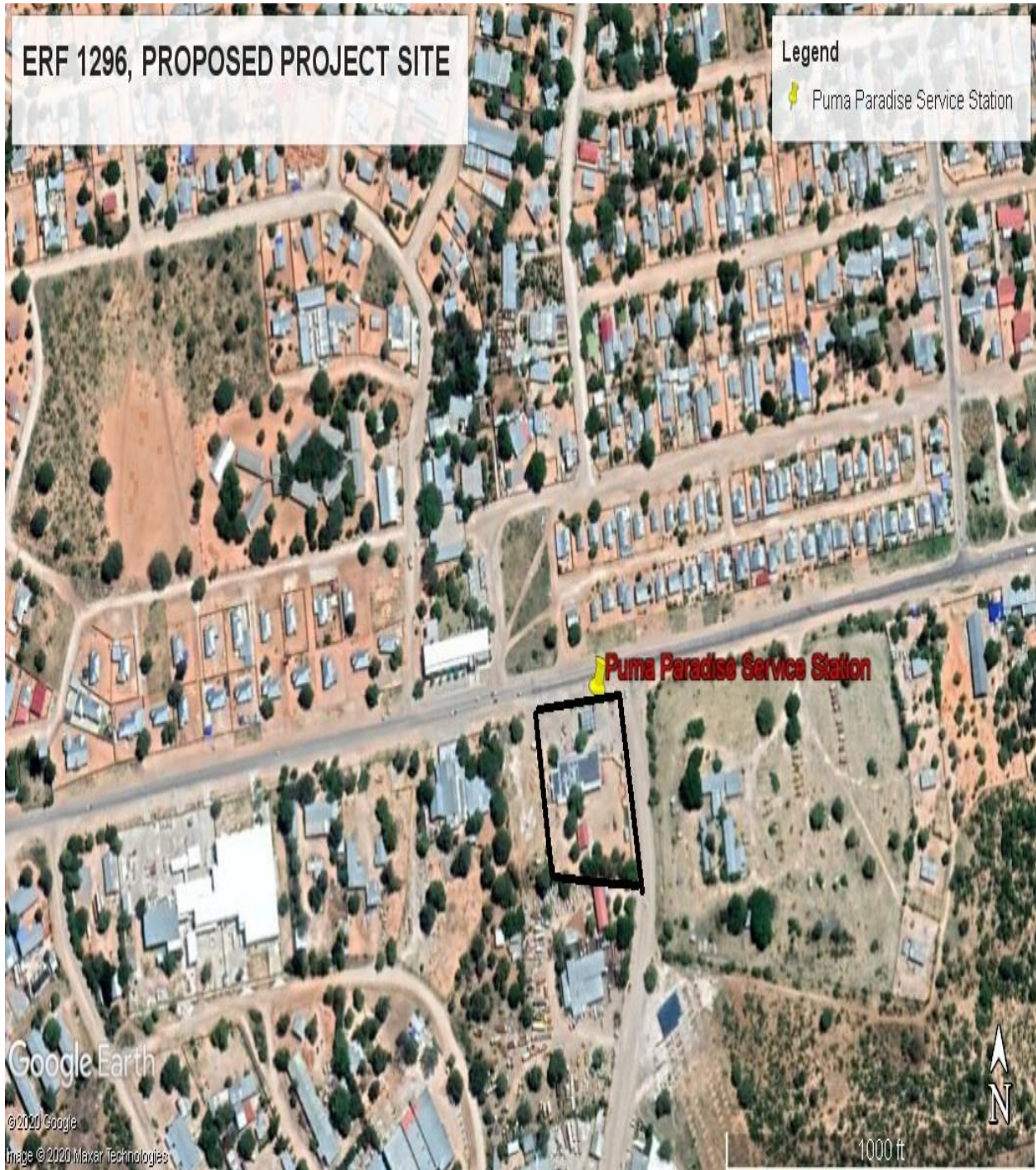
### **Decommissioning phase**

- Demolition and removal of physical structure not to be reused for further land use
- Site rehabilitation and clean-up

Stakeholder Consultation will be undertaken during all phases of the project to ensure a focused and effective public consultation process as required by the EMA Act and its regulations. Stakeholder consultation will form the basis of the entire EA process ensuring that all Namibians are informed and have an opportunity to participate in the process.

### **1.5. Project Location**

Rundu is situated in the north east of Namibia in the Kavango East region directly at the Okavango River and the Angolan border. With its 81,500 inhabitants Rundu is the second largest town after the capital of Windhoek. The town is the main Centre of the Kavango East Region. Although Rundu still counts to one of the poorest towns of Namibia it experiences an economic boom due to the finalization of the Trans-Caprivi-Highway. Rundu is also called the gate to the Caprivi. As the ‘capital’ of the Caprivi Strip, Katima Mulilo, is still about 500 kilometers away, one should stop over in Rundu to fill up on provisions as there are hardly any other shopping possibilities in between. Plate 1 overleaf shows the proposed site location.



*Plate 1: Proposed project site map- Source Google Earth Pro 2020*

## **1.6. Project Desirability or Drivers**

Rundu connects the harbor of Walvis Bay with Lusaka, the Capital of Zambia through Trans-Caprivi-Highway improving the connection of the Caprivi Strip to Central Namibia and the Atlantic coast immensely. The economy of Rundu is driven mainly by construction, retail, tourism, farming, education and transport. These Commercial activities are the reason that Rundu is dominated by local and long distance taxis, heavy transporting vehicles transporting their commodities and commuting residents to the western suburbs, informal settlements, nearest villages, towns and bordering countries to and from Rundu town peripheries.

The proposed development is operating and falls on a well-established route of Rundu town, thus civil services such as sanitation, water, storm water and electricity are already developed and will be seen as an advantage for further development. Alternatively, potential clients will visit the service station because it is in close proximity to their homes and the availability of services such as all major banks ATM's and a convenience store is a popular demand among consumers.

The proposed service station will supply local and long distance taxis, heavy vehicle drivers and private commuters with a safe and controlled area to stop, park and fill their tanks as well as employment opportunities to the inhabitants surrounding the proposed service station. Investing in a service station in an urban environment and on our highways is a lucrative trade but also an essential service for the surrounding communities as it helps them to get fuel and basic necessities at ease within their locations.

Part time employment will be created during construction of the development utilized low skilled employees from the surrounding community of Rundu town community and adding to skills development. The business will be operating 24 hours. Employment will be dependent on the success of the business going forward. The operations will contribute to more economic activities resulting in increased trade and industrial activity contributing to the economic development of Rundu and Namibia at large.

## **1.7. Land Ownership**

7478m<sup>2</sup> Portion of ERF 1296, in EXT 4, will be utilized for the construction a new fuel retail facility which includes forecourt, steel canopy and underground fuel storage tanks as well as a Convenience shop for service station users (Puma Paradise Service Station). Portion 1296 is

entrusted in the hands of J N Van Dyk operating under a Namibian registered company Rundu Service Centre, One Stop.

### **1.8. Topography**

The Kavango East Region is a gently undulating plain of unconsolidated sands, sloping gradually down northwards to the Kavango River and eastwards to the lowest areas along the river before it enters Botswana. The plains undulate from sculpting of the sand into long, low east-west oriented dunes that are rarely higher than 10 meters above the adjacent valleys, and that are not conspicuous from ground level as they are low and covered in vegetation.

### **1.9. Geology and Soils**

Soils in the Kavango East are completely dominated by sand, especially fine wind-blown sands deposited as a mantle across the region during much drier time's long ago. The loose sands also known as the Kalahari sand are usually as deep as one (1) meter. Apart from the sand, which generally makes up than 70% of the body of the soil, the Kavango region also consists of less than 10% of the soil consists of clay and silt. Sands of the Kalahari Basin comprise the substrate of most of Kavango. The predominant soil type is aerosol, the sandy, porous texture allows quick infiltration of water and quick loss, leaving little moisture in the soil and holding few nutrients. As a result, suitability for crops is generally low. The loose structure of the sand means there is very little run-off and soil erosion.

### **1.10. Fauna and Flora**

Vegetation type of any area is influenced by both soil type and the climate conditions of the area. Kavango East region is home to a more diverse community of plants and animals than most other areas in Namibia. Most of the diversity in the region is linked to the variety of habitats along and near the Okavango River. The plant and wildlife especially within the national parks along the Okavango is very abundant. Along the large flood plains of the Okavango impressive woodlands and individual baobabs can be found. Amongst the abundant wildlife consists of elephant, buffalo, zebra, giraffe, and hydrophilic antelopes like Rietbok and Letchwe, not to forget crocodiles and hippopotamus.

The proposed service station was once operating illegally and the structures were substandard, thus site is already cleared, compacted, supplied with bulk services running through it. The promoter only needs to upgrade the service station to that of a higher standard.

### **1.11. Climate**

Rundu has a hot semi-arid climate (Köppen: *BSh*), with hot summers and relatively mild winters (with warm days and chilly to cool nights). Even though it has a hot semi-arid climate, the area experiences high diurnal temperature variation during the winter with average high temperatures at roughly 26 ° C (79 ° F) and average low temperatures at 6 ° C (43 ° F). This large swing in daily temperature is more commonplace among areas with cold semi-arid climates. During the summer, the diurnal temperature variation is less pronounced. The average annual precipitation is 571 mm (22 in).

### **1.12. Socio economic status**

The socio-economic status in Rundu Town in the Kavango East region where the proposed project site is situated is characterized by Agro Marketing and Tourism industry. Large numbers of tourists are recorded to visit Rundu and its neighboring tourist's attraction areas. Attraction features like wildlife national parks and Okavango River which favors aquatic ecosystems contribute to a socio economic status of Rundu town. It is also a transport networking town from Angola, Botswana and Zambia. Furthermore, it is also Kavango East regional administrative capital. The town is considered as one of the poorest towns due to low income earners, rapid population growth, under development and unutilized large vast tracts of land.

#### **1.12.1. Socio-Economic Benefits**

Once the site is developed it will result in a positive socio-economic contributor through job creation during construction and operation as well as provide much needed services and spin off industries in the immediate vicinity. Land development is the source of livelihood (directors and employees) of the owner(s) and partners hence such honest sources of livelihood should be encouraged and supported.

### **1.13. Hydrology (surface and ground water)**

The most conspicuous and important feature in the region is the perennial Kavango River, making up 350 km of Namibia's northern border before crossing the Regions and flowing into Botswana. The main Rio Cubango provides just over half the total runoff, and flows are quite variable from season to season and year to year, depending on rainfall. The Rio Cuito joins the Kavango about 100 km downstream of Rundu, and has a more even flow rate and later flood peak (MAWF 2002). The average total runoff in the river as it leaves Namibia is about 9,800 Mm<sup>3</sup> (Mendelsohn & El Obeid, 2003). The river is the major source of water for rural communities that are concentrated along it. Water is also abstracted to supply Rundu and smaller towns and agricultural schemes. The flat landscape and high permeability of the sandy soil produce very little surface drainage. Rarely, water collects and flows in some of the shallow *omiramba* (dry riverbed), but these events are short-lived because of vegetation and sediments in the river courses. In some areas, rain accumulates in pans in shallow depressions.

Therefore, mitigation measures to address the soil and hydrological conditions and potential impacts must be taken into consideration. The following minimum precautionary measures must be implemented:

- Sealing of the forecourt areas where fuel products are handled to prevent infiltration of petroleum products into the soil/rocks underlying the site;
- Storm water draining from the surfaces areas should be collected in a sealed sump to be treated or removed;
- Preventative measures should be installed to prevent the storm water or other liquids draining into the soil;
- Subsurface fuel tanks must be placed in concrete encasements with a sump system to prevent spilled fuel from entering the bedrock or aquifer;

#### **1.14. Services and Infrastructure**

The proposed development falls on a well-established route of Rundu town, thus civil services such as sanitation, water, storm water and electricity are already developed.

##### **1.14.1 Infrastructure**

The provision of bulk services will be the sole responsibility of Council through initiatives such as PPP joint venture (Council and Infrastructural development). However, all bulk services will

be designed and constructed up to the satisfaction of the Standard Engineering regulations of Council.

#### **1.14.2 Roads**

PUMA Paradise Service Station on Erf 1296, ext. 4, Rundu will be connected to the existing road and street network.

#### **1.14.3 Water**

The proposed service station will be connected to the existing bulk water service network of the Rundu town Council and will be used during construction and operational phases of the filling station.

#### **1.14.4. Electricity**

The site will be connected to the existing electricity main line of CENORED, which will be in all phases of the project. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to. The User Pays Principle will be implemented against electricity use on site.

#### **1.14.5. Solid Waste/ sewerage**

Solid waste collection Centre for the entire station will be located strategically and covered on top and on the sides to protect against weather and scavengers as per the Public Health and Environmental regulations. The waste will then be collected by private waste collectors for disposal at the approved dumping sites. Waste bins will be provided for each section for temporarily holding of waste before delivery into the central solid waste collection area. This report recommends the construction of a three pit oil water interceptor tank, where all runoff water will be directed to before being discharged into the main drainage system.

### **1.15. The potential impacts of the proposed development**

The main potential impacts of the proposed project development in all phases include the following:

- Air pollution (Noise, dust and Vibration)
- Landscape and Visual changes (Soils, Geology, soil erosion)
- Fire explosion



- Water quality issues (surface and ground water)
- Socio Economic and human geography (employment creation, traffic increase)
- Increased Solid waste generation (general waste)
- Occupational Safety, Health and the Environmental related issues (for construction and general workers)
- Oil spillage and transportation
- Increase in traffic

### **1.16. Project Location Alternative**

#### **Alternative 1: Without Project Scenario**

Without the project PUMA Paradise Service Station on Erf 1296, ext. 4, Rundu shall continue its business as usual with the existing substandard services and infra structure. This is most likely to contribute to several environmental negative effects (oil spillage, water and land pollution) and non-compliance.

**Alternative 2: With Project Scenario** – PUMA Paradise Service Station on Erf 1296, ext. 4, Rundu.

With the project scenario, the development will promote employment creation, increased GDP per capita income with business agglomeration and increased infrastructural development within Rundu urban, Kavango East at large.

### **1.17. Funding Status**

The project developer Rundu Service Centre One Stop will ensure funding and administration means are in place for the smooth running of the project from planning phase up to operational phase.

### **1.18. Planning Phase**

The planning phase will be characterized with the planning of development activities which involves site identification and surveying, drawing of the site plan, site pegging, infrastructure designing and feasibility studies (researches).

### **1.19. The Development Activities**

Construction activities are currently planned to commence as soon as Environmental clearance is issued, and are anticipated to last on a continuous basis. The availability of resources and natural events like weather will determine the speed of development.

No clearing of land is going to be undertaken as the site has already been cleared and compacted and the Proponent acquired a site ready for construction.

#### **Critical work to be done is;**

- Construction of access road works, paving and parking
- Excavation of trenches for underground services, oil separator, storage tanks, office and ancillary buildings foundations
- Excavation for and Installation of Underground Storage Tanks
- Installation of oil separator
- Generator installation
- Electrical kiosk construction
- Internal Electrical reticulation
- Internal sewer reticulation
- Internal water reticulation
- Internal storm water reticulation and construction of drainages
- Construction of buildings
- Construction of steel canopy
- Installation of double fueling islands
- Installation of dispensing pumps (petrol and diesel) on the islands
- Installation of submersibles and valves
- Installation of air gauges and compressor

- Installation of air-conditioning, data communication systems and signage
- Installation of electrical fence
- Landscaping

### **1.20. Surface Water**

Drainage Storm drains shall be constructed to cater for surface drainage during rainfalls. Storm drains and gutter play an important part in curbing soil erosion in the sense that it reduces spread of surface flow. As surface flow increases, the velocity of the flow is most likely to increase and so will be the erosive power of the water flow. The drainage design shall follow the principles of Sustainable Drainage Systems (Su.DS), which will limit the surface water runoff from the development. The drainage design will provide a series of treatment systems, which combine to ensure that surface water runoff entering the receiving watercourse is of a high level in water quality.

### **1.21. Conclusion**

The proposed filling station will help motorists plying along that route to fuel their vehicles and provide them with petroleum products, lubricants, service their vehicles etc. The proponent will also contribute towards the economic growth of our nation through revenue collection and other relevant duties as may be imposed by authorities.

The potential negative impacts associated with the proposed filling station project are expected to be low to medium in significance, apart from air quality, traffic, solid waste and some social impacts. The relevant mitigation measures need to be successfully implemented by the proponent. The project will have significant positive economic impacts that would benefit the local, regional and national economy of Namibia.

## **2.0. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

### **2.1. Introduction**

Of importance to the proposed development is the need to identify Policies and legislations which will need compliance for the development activities in respect to the area and region of the

proposed development. Combined, policy, legal and administrative frameworks, facilitates sustainable development.

Table 1: Shows acts and policies that have relevance to the establishment of a new service station in Rundu extension 4, Kavango East Region.

Legislation	General Provisions
<p><b>The Environmental Management Act 7 of 2007</b></p>	<p>The regulations that accompany this act lists a number of activities that may not be undertaken without an environmental clearance certificate issued in terms of the Act. The act further states that any clearance certificate issued before the commencement of the act (6 February 2012) remains in force for one year. If a person wishes to continue with activities covered by the act, he or she must apply for a new certificate in terms of the Environmental Management Act.</p>
<p><b>Environmental Impact Assessment Regulations 2012</b></p>	<p>These regulations are very important in the implementation of the Project because this project fall under prescribed projects that has to have an Environmental Impact Assessment undertaken before the project is given a green light for implementation. This Act and its regulations should enlighten and guide this EIA process. Cost and benefits analysis of the project are weighed systematically to find suitability of the project in terms of economic, social and bio-physical environmental.</p>
<p><b>Water Resources Management Act of 2004</b></p>	<p>Line Ministry: Ministry of Agriculture, Water and Forestry                      The act provides for the management, protection, development, usage and conservation of water resources; to provide for the regulation and monitoring of water resources and to provide for incidental matters.</p>
<p><b>Nature conservation ordinance, ordinance No. 4 of 1975,</b></p>	<p>Line Ministry: Ministry of Environment and Tourism                      The Nature Ordinance 4 of 1975 covers game parks and nature reserves, the hunting and protection of wild animals (including reptiles and wild birds), problem animals, fish, and the protection of indigenous plants. It also establishes a nature conservation board. The basic set of regulations under the ordinance is contained in GN 240/1976 (OG 3556).</p>

Legislation	General Provisions
<b>Petroleum Products and Energy Act No. 13 of 1990</b>	Line Ministry/Body: Ministry of Mines and Energy The act regulates the importation and usage of petroleum products. The act reads as "To provide measures for the saving of petroleum products and an economy in the cost of the distribution thereof, and for the maintenance of a price thereof; for control of the furnishing of certain information regarding petroleum products; and for the rendering of services of a particular kind, or services of a particular standard; in connection with motor vehicles; for the establishment of the National Energy Fund and for the utilization thereof; for the establishment of the National Energy Council and the functions thereof; for the imposition of levies on fuel; and to provide for matters incidental thereof".
<b>Atmospheric Pollution Prevention Ordinance (1976)</b>	Line Ministry/Body: Ministry of Health and Social Services This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, with the exception of East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.
<b>Hazardous Substance Ordinance, No. 14 of 1974</b>	Line Ministry/Body: Ministry of Safety and Security The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage and handling.
<b>Namibian Water Corporation (Act 12 of 1997)</b>	Line Ministry/Body: Namibian Water Corporation The act caters for water rehabilitation of related areas, environmental impact assessments and for minimizing or preventing pollution.
<b>Climatic Change Polices</b>	2.5.1 National Climate Change Strategy & Action Plan 2013 – 2020 The climate change action plan which identifies Climatic Change (CC) as a critical threat to sustainable development. Therefore, it must be addressed in a holistic and multisector manner.
<b>Soil Conservation Act 76 of 1969</b>	The soil Conservation Act makes provision for the prevention of soil erosion. It promotes the protection and up keeping the soil structure and vegetation and all natural resources in the soil of the Republic of Namibia

Legislation	General Provisions
<b>Labor Act 1992. (Government Gazette No. 388)</b>	Part XI focuses on Health and Safety and Welfare at Work of Employees. Section 96 expresses those Duties of employers on health, safety and welfare at work of employees. (1) It shall be the duty of every employer or person in charge of any premises or place where employees are employed to take, free of charge to such employees, all such steps as may be prescribed by regulation under section 101, in order to ensure the safety, health and welfare at work of all employees in his or her employment.
<b>Public And Environmental Health Act, 2015</b>	AIM: To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters. The objects of this Act are to - (a) Promote public health and wellbeing; (b) Prevent injuries, diseases and disabilities; (c) Protect individuals and communities from public health risks; (d) Encourage community participation in order to create a healthy Environment; and (e) Provide for early detection of diseases and public health risks .
<b>Pollution and Waste Management Bill (draft)</b>	The draft of Pollution and waste management bill clearly defines different types of pollution. It also notifies on how the Government intends to control different types of pollution to uphold a clean and safe environment for all. The bill expresses the mandatory for everyone to comply with waste management to reduce pollution in any form. The failure to comply with the obligatory is considered as an offense which is punishable.
<b>Waste Management Regulations: Local Authorities ACT (1992)</b>	Waste Management Regulation: Local Authorities of 1992 provides guidelines on waste management, it mandates the occupier of properties must provide a secure, hygienic, adequate and readily accessible waste storage place or area on the premises.

Legislation	General Provisions
<p><b>Machinery and Occupational Safety Act, (Act No. 6 of 1983).</b></p>	<ul style="list-style-type: none"> <li>- 135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users of machinery about the structure of such buildings of otherwise in order to prevent or extinguish fires, and to ensure the safety in the event of fire, of persons in such building;" (Ministry of Labour and Social Welfare).</li> <li>- This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair Labour practices.</li> </ul>



### **2.3. Key Industry Standard Requirements**

Below are the best environmental best practice, engineering design controls and standards that must be adhered to and required by Oil Companies and the Ministry of Mines and Energy (MME) in order to mitigate the risk that service stations pose;

- SANS 100131 (1977): The storage and Handling of Liquid Fuel. Part 1: Small Consumer Installations;
- SANS 100131 (1979): The storage and Handling of Liquid Fuel. Part 11: Larger Consumer Installations;
- SANS 10400 (1990): The application of the National Building Regulations
- SANS 10089-1 (1999): The petroleum industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations;
- SABS 0131 (1999): The petroleum industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations;
- SANS 10089-2 (2002): The petroleum industry Part 2: Electrical installations in the distribution and marketing sector;
- SANS 1186-1 (2003): Symbolic safety signs Part 1: Standard Signs and General Requirements; □ SANS 10142-1 (2003): The wiring of the premises Part 1: Low-voltage installations; □ SANS 1535 (2003): Glass-reinforced polyester-coated steel tanks for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally.
- SANS 10131 2004, Above-ground storage tanks for petroleum products;
- SANS 10089-3 (2010): The petroleum industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.
- SANS 1020 (2013): Power-operated dispensing devices for flammable liquid fuels

## **2.4. Legislative process**

The proposed development and construction activities require compliance with the EIA Regulations of 6 February 2012 Government Notice No 28, 29 and 30, promulgated in terms of the EMA, Act no. 7 of 2007.

The proposed activity requires an EMA EIA Scoping Process in terms of the activities below. GN NO. R4878 Activity no.:

- ❖ 9.1 The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.
- ❖ 9.4 The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- ❖ 9.5 Construction of service stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin.

## **2.5. Conclusion**

These acts and policies should be adhered to throughout all the project phases (construction, operation and decommissioning). Any deviations from these policies, regulations and administrative frameworks may have disastrous results to the environment and to Humanity. These laws if adhered to will result in rational work ethics that support the protection of the environment. Hence, strict monitoring by relevant authorities will bring about sound environmental practices.

### **3.0. PUBLIC AND STAKEHOLDERS CONSULTATIONS**

#### **3.1. Introduction**

Involvement of the public and stakeholder's consultations is one of the fundamental principles of a successful EIA process. It does not only provide an opportunity to those directly affected by a project to express their views on the environmental and social impacts of the proposal but also brings about transparency in the environmental approval system.

#### **3.2. Public Participation for EIA**

The principles of the Environmental Management Act, No. 7 of 2007 and the Environmental Impact Assessment Regulations 2012 govern the process of Environmental Impact Assessment, which includes Public Participation.

Effective public involvement is an essential component of many decision-making structures, and effective community involvement is the only way in which the power given to communities can be used efficiently. The Public Participation Process is designed to provide sufficient and

Effective public involvement is an essential component of many decision-making structures, and effective community involvement is the only way in which the power given to communities can be used efficiently. The Public Participation Process is designed to provide sufficient and accessible information to interested and affected parties (I&AP's) in an objective manner to assist them to:

- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been captured;
- Verify that their issues have been considered by the technical investigations; and
- Comment on the findings of the Basic Assessment Report (BAR).

### **3.3. Notification of Public and Stakeholders**

Rundu Town Council as a major Stakeholder/ responsible authority was conducted in writing and their response was electronically recorded in form of a questionnaire. The involvement of the public will be done prior to the fulfillment of the EMAct and the comments will be recorded electronically and manually. Notices were placed in the **New Era** and **Confidente** national newspapers dated 19<sup>th</sup> to 25<sup>th</sup> March and 26<sup>th</sup> March 2020 inviting the public for submitting comments or attending the meeting which was set on the 04<sup>th</sup> April 2020. The set dates did not allow a public meeting to be held as advertised because of the restrictions posed as a result of COVID-19 pandemic outbreak. So as a result the assessment team re advertised the availability of scoping report inviting public comments on the proposed project. Re advertisement was done on the 28<sup>th</sup> to 03<sup>rd</sup> June and 04<sup>th</sup> to 10<sup>th</sup> June 2020 in the respective newspapers. The 19<sup>th</sup> of June 2020 was the deadline for submission of comments. Site notices were also made available during the given consultation period.

#### **3.3.1. Background Information Document**

A background Information Document (BID) for the proposed development was made available during the public consultations. It was made available upon request by interested parties.

#### **3.3.2. Newspaper adverts**

Notification of interested and affected parties was done through the newspapers twice in the New Era and the Confidente. This was done prior to the fulfillment of the EMAct.

#### **3.3.3. Site and Public notices**

Site notices were placed all around Rundu notice boards and public places calling interested and affected parties to comment.

### **3.4. Public meeting**

A public meeting was initially set to be held on the 4<sup>th</sup> April 2020. The meeting was put on hold due to the national lockdown a State of Emergency for the whole country on account of Covid-19, however the scoping report will be made available to all interested and affected parties for comments. The extraordinary measure has been adopted with the dual purpose of protecting the health, security and safety of Namibians and the economy in light of the Covid-19 pandemic (MOHSS, 2020).

### **3.5. Conclusion**

Most of the information that is needed to make a decision on whether the project will be given a go ahead or not is mostly obtained through public and stakeholder consultations. Thus, it will be done in respect to the EMAct and the outcomes will determine whether or not a green light for the project implementation.

## **4.0 ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS ASSOCIATED WITH THE PROPOSED PROJECT IMPLEMENTATION**

### **4.1. Introduction**

The sale of fuel (petrol, diesel, liquid, petroleum, gas or paraffin) is the major activity in service stations. Though, additional services may also be provided such as washing and polishing of vehicles, retailing activities, filling up the radiator, checking tyre pressure, lubrication and vulcanization services.

Health, Safety, Environment and Socio-economic impacts assessment take into consideration the relationship between operational activities and social life. This relationship is interlinked by the dependence of social activities on economic activities and economic activities on social activities. In most cases the focus is on the social impacts due to economic changes which, could elicit a change in an entire society.

The significance of Health, Safety, Environment and socio-economic impacts associated with the proposed service station are listed below:

- Health and Safety Impacts
- Noise Impacts
- Traffic Impacts;
- Impact of Fuel Spillage or Leakage;
- Fire and explosion Impacts;
- Compressed Air System Impacts;
- Solid and Liquid Waste Generation and Management Impacts;
- Storm water Management Impacts;
- Air Quality Impacts;
- Reduction in land value and real estate properties in proximity of service stations;
- Visual impacts
- Potential impacts on community health as a result of volatile organic compounds (VOC's) emissions and;

- Employment & economic enhancement

## **4.2. Impact Assessment**

### **4.2.1. Checklists**

Checklists are a list of questions or criteria, which represent the impact areas of an impact assessment or which divide them into their main fields of application. By providing a checklist it is ensured that all relevant impact areas are taken account of by the IA analyst. Thus, the use of checklist in this study. In addition, they bring structure to gathering and classifying information, to identifying potential environmental impacts, and to thinking about possible mitigation options. Furthermore, they help in achieving tentative decisions on the extent of environmental impact. Checklists are widely used in EIA processes to guide decision-making, especially during the pre-feasibility and planning phases of the project lifecycle, when it is most critical to anticipate adverse impacts and to include mitigating measures in projects.

Checklists are designed in such a manner that they provide:

- Help to identify important undesirable impacts by providing right questions to ask regarding several project activities and respective environmental components that may be affected by the proposed project. Checklists can be used to determine environmental impact thresholds, therefore indicating whether a full-scale EIA process is needed for a particular project.
- Guidance for conducting the analysis by pointing out issues those are likely to be affected, including those that may be less obvious but may still be relevant.

- A systematic approach to the environmental screening of development projects. A checklist forces the assessment to consider a standardized set of activities or effects for each proposed action, thus bringing uniformity to the assessment process;
- To indicate how and why certain project activities have environmental impacts which will allow planners to transfer those principles to the screening of projects not specifically addressed by the checklists;
- Assist in identifying appropriate mitigation measures to be incorporated into the project design; and,
- To increase environmental awareness and understanding of the relationship between environmentally sound practices and sustainable development.
- Checklists provide variety of methods varying in complexity and characteristics and all share the common basis of development activities, and they are as follow: Simple checklists, Descriptive checklists, Questionnaire checklists, Weighting-scaling checklists. Of which simple checklist was used in this study.

### **Advantages of Simple Checklists**

- Used as ‘aide memoir’ to identify impacts
- Can provide structure to initial part of scoping stage
- Used as ‘aide memoir’ to identify impacts
- Can provide structure to initial part of scoping stage

### **Limitations when using Simple Checklists**

- Provide assessor with a list of factors to be considered, but no information provided on:
- Specific data needs
- Methods of assessing importance of impacts
- Ways of measuring change to environmental factors



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Table 2: Potential Impacts of the construction and operation phases of the proposed service station obtained as a result of using simple checklists.

Impact		Construction phase	Operation Phase
Ecological impacts	Fauna	X	X
	Flora	X	X
Quality aspects	Air pollution	XX	X
	Visual pollution	XX	X
	Solid waste	X	XX
	Soil pollution	X	XX
	Run off pollution	X	XX
	Fire explosion	X	XX
Socio economic and human geography	Traffic conjunction	XX	XX
	Employment	XX	X
	Urbanization	X	XX
Key	Significance of impacts		
	X = single chance		
	XX = double chance		

### 4.3. Overview of Impacts Associated with the Project

Table 3: Summarizes the potential impacts that that results from the reconstruction of PUMA Paradise Service Station. ERF 1296, EXT 4, RUNDU construction and operational phase.

KEY: E – ENVIRONMENTAL, -VE- NAGATIVE, H- HEALTH , SE- SOCIO-ECONMIC , +VE- POSITIVE

Construction phase						
Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Waste generation	<ul style="list-style-type: none"> <li>• Pollution of the environment due to a lack of proper waste management practices, and an increase in trips for waste removal due to an increase in construction waste.</li> <li>• Illegal dumping of construction waste, attracts vagrants</li> </ul>	H	-VE	likely	Moderate	<ul style="list-style-type: none"> <li>• All construction workers should be made aware of their responsibility in waste management and of the correct means of disposing of waste.</li> <li>• Waste bins with lids should be provided at strategic locations on site for all general waste.</li> <li>• All general waste is to be removed by the contractor at least once a week or more if the need arises.</li> <li>• All general waste shall be disposed of at a suitably registered landfill site as agreed with the town council.</li> </ul>
Traffic Congestion	<ul style="list-style-type: none"> <li>• Construction vehicles or even abnormal vehicles or freight could disrupt current traffic flows.</li> <li>• During this phase possible traffic congestion or increase in congestion, temporary obstructions in the roadway and the influence on adjacent developments must be considered.</li> </ul>	SE	-VE	likely	Minimal	<ul style="list-style-type: none"> <li>• Construction personnel should make use of main roads in as far as is reasonably possible and construction vehicles should be as few as reasonably possible.</li> <li>• The detail design of the proposed filling station should adhere to the prescribed specifications (and subsequent approval) of the applicable road authorities;</li> <li>• Care should be taken relating to the placing of signage in the proximity of access points to the proposed service station;</li> </ul>

Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Noise pollution	<ul style="list-style-type: none"> <li>Increase in ambient noise levels can cause annoyance to people living in close proximity of the development.</li> <li>Disturbance of surrounding residents through noisy machinery and general construction noises.</li> </ul>	H	-VE	likely	Moderate To extreme	<ul style="list-style-type: none"> <li>Construction work should be limited to working hours between 07:00 am to 17:00 pm on Weekdays and,</li> <li>if work takes place over weekends noisy work should be limited to Saturday mornings between 08:00 am and 12:00pm.</li> <li>If any noisy work is to be scheduled outside of the permitted times prior permission should be obtained from the town council and notices should be placed prominently to notify neighbors.</li> </ul>
Dust generation	<ul style="list-style-type: none"> <li>Suspended dust from construction activities and rubble removal can potentially cause irritation to neighbors.</li> </ul>	H	-VE	Most likely	Moderate to extreme	<ul style="list-style-type: none"> <li>Dampening soil and excavations during work to reduce the likelihood of dust becoming suspended.</li> <li>Providing all operators of cutting and grinding equipment with the necessary personal protective equipment.</li> <li>Limiting dust generating activities to times when winds are strong.</li> <li>Spraying trucks down with water to prevent dust particulates from being suspended while being transported</li> </ul>
Safety and Health risks	<ul style="list-style-type: none"> <li>Safety and health risks can cause injuries, health risks to construction workers and the nearby residents.</li> <li>Solid waste pickers, electricians, brick layers, painters, drivers and other general workers during construction phase are subjected to potential health and safety risks.</li> </ul>	H	-VE	Likely	Moderate	<ul style="list-style-type: none"> <li>Provide workers with protective clothing.</li> <li>Promote Safety, health education and create awareness to all the workers.</li> <li>Appoint a site Safety and Health practitioner.</li> </ul>

Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Visual pollution	<ul style="list-style-type: none"> <li>Construction will cause temporary loss of visual quality due to construction activities.</li> </ul>	E	-VE	Most likely	Moderate To extreme	<ul style="list-style-type: none"> <li>The construction site should be kept very neat and organized to reduce visual pollution.</li> </ul>

Operational phase						
Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Service station operation	<ul style="list-style-type: none"> <li>• Increase in traffic volumes during fuel scarcity periods.</li> <li>• Contamination of ground and surface water, and transportation of contaminants downstream.</li> <li>• Increased hardened surfaces and runoff thereby creating soil erosion in vulnerable areas.</li> <li>• Service station operation Disturbance of surrounding residents through 24hr service station.</li> <li>• Permanent sight illumination from onsite lighting causing light pollution.</li> <li>• Temporary illumination from accessing vehicles.</li> </ul>	SE	-VE	More likely	moderate	<ul style="list-style-type: none"> <li>• An inclusive noise control policy should be compiled and implemented.</li> <li>• Storm water catchment and oil separators should be installed onsite to capture runoff and separate hydrocarbons.</li> <li>• Lights should be projected inward and downwards thereby reducing the potential negative impact of light pollution for the surroundings.</li> <li>• Minimal vegetation onsite to increase in site improvement and adding value to the local community.</li> </ul>
Local Development	Development of local infrastructures	SE	+VE	Most likely	Moderate	<ul style="list-style-type: none"> <li>• No mitigation measures are proposed as the impact is positive.</li> </ul>
Employment opportunities	<ul style="list-style-type: none"> <li>• The proposed development will create job and contribute to poverty eradication.</li> <li>• Additionally, the development will build positive participation from the unemployed populace</li> </ul>	SE	+VE	Most likely	Moderate	<ul style="list-style-type: none"> <li>• No mitigation measures are proposed as the impact is positive.</li> </ul>

Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Product spillages and runoff	<ul style="list-style-type: none"> <li>Groundwater and soil pollution</li> </ul>	E	-VE	likely	Minimal	<ul style="list-style-type: none"> <li>All areas that generate potentially contaminated storm water should discharge via the oil/water separator.</li> <li>Sealing of the forecourt areas where fuel products will be handled to prevent infiltration of petroleum products into the soil underlying the site;</li> <li>Storm water draining from the surfaces areas should be collected in a sealed sump to be treated; Preventative measures should be installed to prevent the storm water or other liquids draining into the soil;</li> <li>Subsurface fuel tanks must be placed in concrete encasements with a sump system to prevent spilled fuel from draining into the soil.</li> <li>Fuel lines and dispensers should be rendered leak-proof and are recommended to be place in encasements;</li> </ul>
Fuel Vapour Emissions	<ul style="list-style-type: none"> <li>Release of vapors into the surrounding environment during the refilling of the UST, vehicle replenishing, fuel spillage and motor vehicle exhausts.</li> </ul>					<ul style="list-style-type: none"> <li>The petrol station should be designed to release petrol vapour into the air, soil and water using pipes connected from (USTs).</li> <li>Ensure safe transportation of fuel to and from site and avoid spillage.</li> </ul>
Safety and Health risks	<ul style="list-style-type: none"> <li>Safety and health risks can cause injuries, health risks to workers, customers and nearby residents.</li> </ul>					<ul style="list-style-type: none"> <li>All Personnel must be trained in basic first aid and firefighting and what to do in the case of an emergency such as onsite fire or explosion;</li> <li>All employees should be familiar with Total's Emergency Plan which documents all safety procedures;</li> <li>The service station should also be managed in accordance with legislative requirements and, as per the EMP which, includes detailed mitigation and management measures.</li> </ul>

Impact	Description	Class	Type	Likelihood	Extent	Mitigation
Storage and transfer of fuel	<ul style="list-style-type: none"> <li>• Storage and transfer of fuel by either delivery vehicle to Underground Storage Tanks (UST) or by attendants to customers' vehicles could result in spillage.</li> <li>• The storage and transfer of fuel can result in on-site fires and explosions.</li> <li>• Storage of fuel in Underground Storage Tanks (UST) could result in the contamination of soil and subsequent contamination of surface runoff.</li> <li>• People exposed to spilled / leaked fuel. Catastrophic surface spillage leading to safety hazard</li> </ul>					<ul style="list-style-type: none"> <li>• Ensure the safe transportation of fuel to and from site.</li> <li>• The service station should be operated in strict accordance to requirements as set out by head SANS standards;</li> <li>• The petrol station is designed to release petrol vapor into the air, soil and water using pipes connected from (USTs).</li> <li>• Ensure all fire-fighting equipment are readily available, accessible and functioning.</li> <li>• Ensure that relevant signage e.g. no smoking, is displayed in potentially dangerous areas and is abided by everyone;</li> <li>• All employees and sub-contractors onsite must be aware of the relevant HSE policy and implementation thereof, in addition to an Emergency Plan and the EMP and;</li> </ul>

#### **4.4 Decommissioning phase**

The activities at the decommissioning phase of the fuel station will include; demolition of superstructures, careful removal of the fuel dispensers, careful excavation and removal of the underground fuel storage tanks after emptying the fuel therein, appropriate treatment of any contaminated soil as necessary, backfilling of the excavations with suitable material such as pebbles or construction dug out soil, proper disposal of decommissioned facilities and other wastes using a licensed waste collector and landscaping at the project site planting of grass and trees. The main aim of this phase will be restoration of the affected environment, proper disposal of dismantled material and protection of public health and safety.



## **5.0. CHAPTER 5: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

The proposed establishment of a new service station will result in land use change. The operation of the proposed project should be done in accordance with sound environmental sustainable technologies and methods, constant monitoring should be carried to ensure the operations are done in a sustainable and environmental friendly manner. The project implementation is a good initiative to the economy and the society but research has revealed that land use changes if improperly accomplished it will damage the environment in a way that can be detrimental to the survival of humans and animals in the locality.

### **5.2 Recommendations**

The following recommendations should be strictly adhered to. In order to alleviate any negative impacts that may emanate from the construction and operation phases of the proposed project development under discussion.

- Relevant and cost effective management, which ensures hiring of qualified personnel; on serviceable components like electricity, fuel pumps, underground tanks, contracted personnel and waste recycling companies,
- Mitigation measures should be put in place always,
- Consulting Environmental Engineers, Manufacturing and installing Engineers and the Town council on issues that arose during Project life cycles and
- In the cases of decommissioning of the project, an application for decommissioning should be done with a qualified Environmental Engineer or consultant to the Ministry of Environment and Tourism.

## **REFERENCE**

- Allison, Ian. (2010). *The science of climate change: questions and answers*. Canberra: Australian Academy of Science.
- Kirchner, J., Baumle, R., Bittner, A., Bockmuhl, F., Botha, P., Dierkes, K., . . . Van Wyk, A. (December 2001). *Groundwater in Namibia: an explanation to the Hydrogeological Map*. MAWF, DWA, NamWater, BGR, Geological Survey of Namibia.
- MAWF. (2013). *Ministry of Agriculture, Water and Forestry*. Retrieved from Ministry of Agriculture, Water and Forestry.
- Mendelsohn, J., & El Obeid, S. (2003). *Sand and Water: A Profile of the Kavango Region*. Struik Publishers & RAISON.
- Kapia, S. (2018). *Detection of Leptospira and seasonal prevalence of fleas collected from small mammals in Mukwe constituency, Kavango East region of Namibia* (Doctoral dissertation, University of Namibia).
- <http://www.mhss.gov.na/>

## **APPENDIX I: ENVIRONMENTAL MANAGEMENT PLAN**

## **APPENDIX II: TERMS OF REFERENCE**

## **APPENDIX III: BACKGROUND INFORMATION DOCUMENT**

**APPENDIX IV: COMPANY REGISTRATION, MAPS, SITE PLANS AND  
STRUCTURAL LAYOUTS**

## APPENDIX V: PUBLIC CONSULTATION TEMPLATES

## APPENDIX VI: CONSULTANT RESUME