ENVIRONMENTAL MONITORING AND EVALUATION REPORT FOR THE OPERATIONS OF THE EXISTING MUNITENGE SERVICE STATION IN WINDHOEK, KHOMAS REGION

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1.INTRODUCTION

An environmental monitoring and evaluation provides a delivery mechanism to address adverse impacts that a project's activities may have on the environment during its operation and decommissioning phase. An environmental monitoring assists in detecting the development of any unwanted environmental situation and enhancing project compliance with relevant policies, acts and regulations so that the project continues to operate in an environmentally sound manner.

Munitenge service station was constructed before the Environmental Management Act No.7 of 2007 came into effect; hence it has been operating without an Environmental Clearance Certificate (ECC). Puma Energy Namibia therefore intends to regularize the operation of the existing Munitenge service station in accordance with Section 9 of the Environmental Management Act No. 7 of 2007.

Request for Environmental Clearance and Environmental Management Plan (this report) –

The following environmental monitoring and evaluation report was compiled by Nam Geo-Enviro Solutions (NGS) on behalf of Puma Energy Namibia to assess the current environmental conditions on site and to apply for an ECC for the continuous operations of the existing Munitenge service station in Windhoek.

Nam Geo-Enviro Solutions has thus also compiled an Environmental Management Plan (EMP) for the service Station that will be used as a site-specific plan to manage adverse impacts of the project.

Detailing environmental impacts of the existing facilities, assessment of existing controls and recommendations for environmental management to ensure the project continues its operations in an environmentally sound manner.

1.1 Listed activities

According to the Environmental Management Act (2007) and its Regulations (2012) the existing development requires an Environmental Clearance Certificate as specified in the following sections of the Act outlined in Table 1 below.

TABLE 1: LISTED ACTIVITIES RELEVANT TO THE PROJECT

ACTIVITY	RELEVANT SECTIONS
9.Hazardous substance treatment, handling, and storage	**9.2** Any process or activity which requires a permit, licence or other forms of authorization, or the modification of or changes to existing facility for any process or activities which requires and amendment of an existing permit, licence, or authorization or which requires a permit, licence, or authorization in term of a law governing the generation or release of emission, pollution, effluent, or waste. **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 filling stations or any other facility for the underground or aboveground storage of dangerous goods including petrol, diesel, liquid, petroleum, gas, or paraffin.

2. OBJECTIVES

- Provide a detailed description of existing site infrastructure and activities.
- Conduct a comprehensive and all-encompassing legislative and other requirements assessment based on the proposed activities.
- Consider the potential environmental and social impacts of the operations and decommissioning of the existing fuel station.
- Identification of any mitigation action to be taken to minimize predicted adverse impacts and provide associated costs where applicable and practical. This will include the development of an environmental monitoring plan which will ensure that the mitigation measures are adhered to during the operation and decommissioning phases of the project.
- Compile an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts for the continuing operations of the service station.

3.ENVIRONMENTAL MONITORING AND EVALUATION METHODOLOGY

The methodology adopted for this monitoring included.

- Physical inspections of environmental aspects in relation to the operational site and its installation.
- Assessment of standard pollution mitigation measures implemented on site
- Assessment of health and safety measures in place
- Assessment of legal compliance with relevant laws, regulations, and by-laws

A physical inspection of the site was conducted on 07th October 2022.

4.PROJECT DESCRIPTION

Munitenge service station is located on Erf 239, along the Mandume Ya Ndemufayo Avenue Road, in Windhoek, Khomas region. The site falls in the following geographic coordinates: S 22.5620291; E 17.0819405.

The service station currently operates the following facilities on site:

- Operation of fuel retail facilities to public.
- Distributor bottled LPG gas to public
- A mini grocer and fast-food shop (Puma Express shop)

4.1 Fuel storage tanks and installation details currently on site

The installations at Munitenge service station consists of three (3) underground fuel tanks, of which two are Petrol (ULP 95) and one diesel tank (50ppm).

Table 2 below indicates the fuel storage and installation details on site.

TABLE 2: FUEL STORAGE AND INSTALLATION DETAILS ON SITE

FUEL STORAGE DETAILS			
Tank no:	**T1**	**T2**	**T3**
Product (petrol/diesel)	Petrol	petrol	diesel
Capacity (L)	46000L	23000L	23000L
Type of material (AG-aboveground UG: underground)	UG	UG	UG
INSTALLATIONS			
No. of islands	4		
No. of pumps	8		
No. of dispensers	24		
Oil & water interceptor on forecourt	Available		
Oil & water interceptor on filler points	Available		
Oil & water separator pit	Available		
Spill containment slab	Available		

5. POLICY AND LEGISLATORY COMPLIANCE

This section outlines the legislative compliant requirements that the service station is required to comply to in respect to acquiring an Environmental Clearance Certificate (ECC).

Table 3 below outlines relevant policies, acts and regulations to the project and its compliance status to the relevant guidelines and standards.

TABLE 3: LEGAL AND OTHER REQUIREMENTS COMPLIANCY APPLICABLE

Aspect	Legislation	Type of Requirement	Compliance Status	Comments
Environmental	Namibian Constitution First Amendment Act 34 of 1998	The constitution requires sustainable utilisation of natural resources basis for the benefit of all Namibians, both present and future." (Article 95(l)).	**Compliant**	-Fuel sold at the service station is imported therefore natural resources are not affected. However, there is need for continuous monitoring, so as to prevent groundwater contamination.
	Environmental Management Act 7 of 2007	Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27).	**Non-Compliant**	-The Service Station is operating without an Environmental Clearance Certificate (ECC) because the site was already existing before the EMA (2007) came into force, hence with this application, Puma Energy Namibia seeks to comply with the Act.
	Pollution and Waste Management Bill (draft)	All waste has to be handled by qualified waste handling contractors and disposed of on approved sites.	**Compliant**	-A certified contractor is contracted by Puma Energy Namibia to handle hazardous waste. -General waste is collected by Jimmy Refuse Collection and

				disposed of at certified waste dump sites.
Soil	Soil Conservation Act 76 of 1969	Section 3 (n) of the Act guards against erosion, denudation, and any forms of pollution to the soil. Accordingly, the operations of the service station should not result in the pollution or erosion or degradation of the soil around	**Compliant**	-The following has been implemented as a way to prevent soil pollution on site: a) Spill containment slab and paving of the surrounding area to avoid erosion. b) Oil/water separator pits to collect spills and wash-offs from fuel handling areas
Air	Atmospheric Pollution Prevention Ordinance 11 of 1976	The Act requires that there is need to register a controlled area with certificate to operate air polluting activities. The retail license covers all elements and requirements of this Act.	**Compliant**	-The Service station has obtained a retail license from Ministry of Mines and Energy having met required construction standards,
Water	Water Act 54 of 1956	A discharge license for wastewater from the oil and separator pit has to be obtained. Section 21(2) stipulates that purified effluent is to be returned as close as possible to the point of abstraction of the original water.	**Compliant**	-Oil and water separator pit purifies water from hydrocarbons pollution. --A certified contractor is contracted by Puma Energy Namibia to clean the oil/water separator pit.

	Water Resources Management Act No 24 of 2004 (still to be enforced)	The act looks at protection of underground water resources and continuous monitoring of water quality in the presence of potentially polluting activities.	**Compliant**	-There is need for periodic sampling/monitoring of groundwater water on site.
Health and Safety	Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work'.	-As a requirement on site, a Safety and Health representative on site has to be appointed. -The employer shall report all incidents occurring on site to the Ministry and accordance to the regulations.	**Compliant**	-There are trained OHS representatives on site. -All accidents and incidents are investigated and recorded in the incident register.
	Public Health and Environmental Act, 2015	-(1) A person who intends to conduct on a premises activity which generate special, industrial, hazardous, or infectious waste must be registered for that purpose with the local authority concerned -(3) A person or local authority engaged in activities contemplated in subsection (1) or (2) must ensure that the waste generated on the	**Compliant**	-The Service station is registered with City of Windhoek and all waste is managed in accordance to the provisions of the City of Windhoek By-Laws

		premises concerned is kept and stored (a) under conditions that causes no harm to human health or damage to the environment; and (b) In accordance with applicable laws. (4) All waste contemplated in this section must be stored in approved containers and for the maximum period determined by the head of health services or the chief health officer		
Oil and Gas	Petroleum Products and Energy Act 13 of 1990	-The Act requires that for the operation of the Service station a retail license has to be obtained from the relevant ministry -Adding on the Act requires incident reporting of major spillages occurring on site for pollution control.	**Compliant**	-Munitenge Service Station is authorised to sell petroleum products. -A spill register is kept in place to record and report all accidental spillages on site.
	Hazardous Substances Ordinance 14 of 1974 Sections 3 and 27	The Act requires that a license has to be obtained for the storage and distribution of a classified hazardous	**Compliant**	-Labelling of all Hazardous containers and or facility on site with danger or warning signs.

		substance with the relevant Authority.		
SANS/SABS	South African National Standards (SANS) 10089-3 of 2008	SANS 10089-3 highlights on the following: The installation, modification and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations. Additionally, the following items are also highlighted: fire precautions & fire control in bulk depots, protection & welfare of personnel, maintenance of & extension to the Service Station, pollution control and transportation of petroleum products by road & by rail.	**Compliant**	-Munitenge service station is constructed, and it is operating according to SANS standards

6.ASSESSMENT OF ENVIRONMENTAL IMPACTS AND MEASURES CURRENTLY IMPLEMENTED ON SITE

This section outlines the impacts associated with fuel storage and handling on site and their current mitigation measures implemented on site.

6.1. On site pollution management

Most pollutants and hazards associated with service stations are caused by hydrocarbon fuels that are stored and handled on site. Possible hydrocarbon pollution impacts on site are highlighted below:

Surface water and soil contamination

Fuel spillage and leakages are the highest risks of pollution sources of soils and surface water contaminations at service stations. This type of contamination usually occurs during dispensing fuel into customers vehicles and when fuel tanker trucks offload fuel into the underground storage tanks. Over-filling of tanks, leaking and pipe bursts are the cause of most surface spillages.

During the site assessment, minor oil stains were observed around the vehicle dispensing pump area. surface spillages if not contained can contaminate the surface soils. Soils contaminated by petroleum contaminants can affect soil health and harm soil microorganisms, reducing their number and activity. Surface spills can also contaminate surface water bodies as they can be washed into rivers and streams by floods and rain, thus can result in further underground water contamination.

Current mitigation measures implemented on site

- A concrete containment slab covering the forecourt and off-loading areas where pumping activities occur to contain the spills and prevent them from penetrating to underground.
- The service station has a canopy to prevent rain from washing of spills into surface water bodies and prevent surface water contamination.
- Spill register to record major spills and leakages is kept on site.

See photos in figure 1 below of surface pollution control measures currently on site

Image 1: A Canopy installed on site

Image 2: A concrete slab around the tanks filler area and fuel dispensing points for surface spills containment.

FIGURE 1: SURFACE POLLUTION CONTROL MEASURES CURRENTLY ON SITE

Underground contamination

Spillages in the form of petrol and diesel products can be generated during refuelling of fuel into customer vehicles. Fuel spillages can also be produced on site during off-loading of fuel into the storage tanks at the filler points. Furthermore, leakages can occur from possible damages to underground tanks and pipes which can consequently contaminate groundwater.

Current mitigation measures implemented on site

- There is a concrete slab covering the surface where fuels are handled to prevent fuel from infiltrating underground and contaminating undergroundwater.
- Oil & water interceptors at filler points to collect wastewater and oil spills from the forecourt and offloading to the oil & water separator pits that are installed on site.
- The site is surrounded by interlocks to minimize surface and underground contamination.

See photos in figure 2 below of underground pollution control measures currently on site.

Image1: Oil and water interceptor to collect wastewater and oils from the forecourt to the water and oil separator pits

Image 2: Oil and water separator pits emptied regularly by certified contractors.

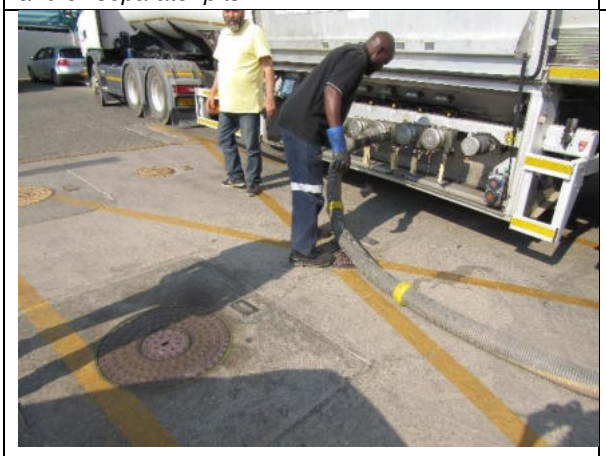

Image 3: *Minor oil spills occurring on site, sand is used as an absorbent and remaining oils washed into the oil & water interceptor.*

Image 4: Interlock surrounding the site

FIGURE 2: UNDERGROUND POLLUTION CONTROL MEASURES CURRENTLY ON SITE

Hydrocarbon vapours and odours

Dispensing of fuel into vehicles can produce hydrocarbon gases. Prolonged exposure to these hazardous gases can result into inhalation which can consequently cause carcinogenic diseases. In addition, physical contact with fuel can have health effects on people. Immediate atmospheric environment may be affected by fuel odors during refilling process

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Current mitigation measures implemented on site

- Vent pipes have been installed on site (at least 3m high) to release vapors above the immediate atmosphere to enhance pollution attenuation.
- Two working shifts a day to prevent workers from prolonged exposure to hydrocarbon vapors.

See photos in figure 3 below of hydrocarbon vapours and odours pollution control measures currently on site

Image 1: Vent pipes have been installed on site (3m) to release vapors above the immediate atmosphere to enhance pollution attenuation.

FIGURE 3: HYDROCARBON VAPOURS AND ODOURS POLLUTION CONTROL MEASURES CURRENTLY ON SITE

6.2 On site waste management

Waste management involves the regular collection, transportation as well as processing and disposal or recycling and monitoring of different types of waste materials. Different types of waste can be generated at the service station such as general waste and hazardous waste.

General waste

General waste on site is produced mainly by customer in form of plastics, papers, cigarette butts and bottles of cool drinks from the shop. Waste is also generated from the kitchen.

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Current mitigation measures implemented on site

- General Waste is collected by Municipality.
- Waste disposal bins are available.
- Good housekeeping is maintained.

See photos in figure 4 below of general waste pollution control measures currently on site

Image 1: waste bins on site

Image 2: Good housekeeping

FIGURE 4: GENERAL WASTE POLLUTION CONTROL MEASURES CURRENTLY ON SITE

Hazardous waste

Hazardous wastes on site are usually minor oil spills on the surface. Hazardous waste should be separated from general waste and kept in hazardous bins to be discarded at approved disposal sites or should be handled by certified contractors.

During the site assessment, no hazardous waste management measures were observed.

6.3 Fire and safety management

The monitoring and evaluation also focused on the health and safety of the workers.

Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

No fire or any source of fire ignition is to be allowed at the service station during any of the two phases (operational and decommissioning). Puma Energy Namibia shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall always ensure sufficient fire-fighting equipment on site.

Current mitigation measures implemented on site

- Firefighting equipment are present at the Service Station and in good working condition.
- Safety signs forbidding smoking, use of cell phones, use of explosives etc, are displayed.
- Water is available at the Service Station.
- A first aid kit is available on site
- Workers have personal protective clothing (PPE).
- Staff are trained on handling of fuel and firefighting.

See photos in figure 5 below of fire and safety control measures currently on site.

Image 1: one of the fire extinguishers on site.

Image 2: safety signs forbidding smoking, switching off running engines and no cell phone usage during filling up.

Image 3: workers personal protective clothing (safety boots, overall)

Image 4. Hose pipe on site

FIGURE 5: FIRE AND SAFETY CONTROL MEASURES CURRENTLY ON SITE

7.MONITORING OUTCOMES AND RECOMMENDATIONS

Monitoring Outcomes

The focus of this monitoring and evaluation report is on key environmental and legislative compliance in respect to the service station's operations. Compliance was categorized as follows:

a. Non-Compliance (NC)
b. Partial compliance (PC)
c. Compliant(C)

TABLE 4:MONITORING OUTCOMES

IMPACT	COMPLIANCE STATUS	COMMENTS
Surface water and soil contamination	**C**	-A canopy installed, concrete spill containment slab on site.
Underground contamination	**C**	-oil and water separator pits available on site and cleaned by a certified contractor.
Risk of fire explosion	**C**	-warning signs on use of explosives on site displayed, fire extinguishers, hose pipes.
Hydrocarbon vapours and odours	**C**	-Vent pipes installed on site.
Health and safety	**C**	-first aid kit and PPE.
Hazardous waste	**PC**	-There are no hazardous waste bins and oil absorbents on site.
General waste	**C**	-water proof waste bins available, waste is collected by Jimmy Refuse Collection.

RECOMMENDATIONS

- Hazardous waste should be separated from general waste, the service station should have hazardous waste bins on site.
- Installation of monitoring wells to detect underground tank leakages.
- Adequate supply of absorbents (sand) on site.
- A clear and detailed fire emergency response plan should be implemented on site and known by all employees.

8. CONCLUSION

The environmental monitoring and evaluation findings indicate that the service station is compliant with most of the relevant acts and regulations. Installations on site are according to SABS/SANS standards which complies with our national and international standards for service station construction. However, there is a need for installation of monitoring wells to detect underground tank leakages and cleaning of oil and water interceptors at fuel dispensing areas. The service station thus also need to acquire an ECC to comply with the EMA No.7 of 2007. The critical potential impacts of the project include surface and underground contamination, hydrocarbon vapours and odours, risk of fire explosion, hazardous waste, and general waste.

The compiled Environmental Management Plan (EMP) should be used as an on-site reference document during operation and perhaps decommissioning phase. Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts.

NOVEMBER 2022

9. REFERENCES

I.Constitution of the Republic of Namibia (1990).

II.Environmental Management Act (2007).

III.Petroleum Products and Energy Act of Namibia (1990)

IV.South African National Standard 10089 (2010).

V.Water Resources Management Act 11 (2013).