

**APP-002788**  
**OPERATIONS OF OSHAKATI SERVICE STATION IN**  
**WINDHOEK**  
**ENVIRONMENTAL MANAGEMENT PLAN**



**Assessed by:**




**Assessed for:**




June 2021



<b>Project:</b>	<b>OPERATIONS OF OSHAKATI SERVICE STATION IN WINDHOEK: ENVIRONMENTAL MANAGEMENT PLAN</b>	
<b>Report: Version/Date:</b>	Final June 2021	
<b>Prepared for: (Proponent)</b>	Puma Energy Namibia (Pty) Ltd P O Box 3594 Windhoek	
<b>Lead Consultant</b>	Geo Pollution Technologies (Pty) Ltd PO Box 11073 Windhoek Namibia	TEL.: (+264-61) 257411 FAX.: (+264) 88626368
<b>Main Project Team:</b>	<b>André Faul</b> (B.Sc. Zoology/Biochemistry); (B.Sc. (Hons) Zoology); (M.Sc. Conservation Ecology); (Ph.D. Medical Bioscience) <b>Wikus Coetzer</b> (B.Sc. Geology/Botany); (B.Sc. (Hons) Environmental Sciences) <b>Stefan Short</b> Health and Safety Supervisor/GIS Technician	
<b>Cite this document as:</b>	Faul A. Coetzer W, Short S; 2021 June; Operations of Oshakati Service Station in Windhoek: Environmental Management Plan	
<b>Copyright</b>	Copyright on this document is reserved. No part of this document may be utilised without the written permission of Geo Pollution Technologies (Pty) Ltd.	
<b>Report Approval</b>	  <b>André Faul</b> <b>Conservation Ecologist</b>	

I, Shannon Leung, acting as representative of Puma Energy Namibia, hereby confirm that the project description contained in this report is a true reflection of the information which the Proponent provided to Geo Pollution Technologies. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report and the report is hereby approved.

Signed at Windhoek on the 09 day of July 2021.

  
 Puma Energy Namibia (Pty) Ltd

1978/00193/07  
 Business Registration/ID No.



## TABLE OF CONTENTS

<b>1</b>	<b>BACKGROUND AND INTRODUCTION</b> .....	<b>1</b>
<b>2</b>	<b>SCOPE</b> .....	<b>2</b>
<b>3</b>	<b>METHODOLOGY</b> .....	<b>2</b>
<b>4</b>	<b>PROJECT DESCRIPTION</b> .....	<b>3</b>
<b>5</b>	<b>ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS</b> .....	<b>4</b>
<b>6</b>	<b>ENVIRONMENTAL CHARACTERISTICS</b> .....	<b>7</b>
6.1	LOCALITY AND SURROUNDING LAND USE .....	7
6.2	CLIMATE .....	7
6.3	TOPOGRAPHY AND DRAINAGE .....	7
6.4	GEOLOGY AND HYDROGEOLOGY .....	8
6.5	PUBLIC WATER SUPPLY .....	9
6.6	FAUNA AND FLORA .....	10
6.7	DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS .....	10
<b>7</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN</b> .....	<b>10</b>
7.1	IMPLEMENTATION OF THE EMP .....	10
7.1.1	<i>Planning</i> .....	11
7.1.2	<i>Revenue Generation and Employment</i> .....	12
7.1.3	<i>Skills, Technology and Development</i> .....	13
7.1.4	<i>Demographic Profile and Community Health</i> .....	14
7.1.5	<i>Fuel Supply</i> .....	15
7.1.6	<i>Traffic</i> .....	16
7.1.7	<i>Health, Safety and Security</i> .....	17
7.1.8	<i>Fire</i> .....	18
7.1.9	<i>Air Quality</i> .....	19
7.1.10	<i>Noise</i> .....	20
7.1.11	<i>Waste production</i> .....	21
7.1.12	<i>Ecosystem and Biodiversity Impact</i> .....	22
7.1.13	<i>Groundwater, Surface Water and Soil Contamination</i> .....	23
7.1.14	<i>Visual Impact</i> .....	24
7.1.15	<i>Cumulative Impact</i> .....	25
7.2	DECOMMISSIONING AND REHABILITATION .....	26
7.3	ENVIRONMENTAL MANAGEMENT SYSTEM.....	26
<b>8</b>	<b>CONCLUSION</b> .....	<b>26</b>
<b>9</b>	<b>REFERENCES</b> .....	<b>27</b>

## **LIST OF APPENDICES**

APPENDIX A: CONSULTANT’S CURRICULUM VITAE.....	28
--	----

## **LIST OF FIGURES**

FIGURE 2-1. PROJECT LOCATION .....	2
FIGURE 4-1. SITE LAYOUT .....	3
FIGURE 6-1. MONTHLY AVERAGE RAINFALL (ATLAS OF NAMIBIA) .....	7
FIGURE 6-2. HYDROGEOLOGY MAP .....	9

## **LIST OF TABLES**

TABLE 4-1. STORAGE TANK DETAILS .....	4
TABLE 5-1. NAMIBIAN LAW APPLICABLE TO THE FUEL RETAIL FACILITY.....	4
TABLE 5-2. CITY OF WINDHOEK REGULATIONS, PLANS AND POLICIES.....	5
TABLE 5-3. RELEVANT MULTILATERAL ENVIRONMENTAL AGREEMENTS FOR NAMIBIA AND THE DEVELOPMENT.....	6
TABLE 5-4. STANDARDS OR CODES OF PRACTISE .....	6
TABLE 6-1. SUMMARY OF CLIMATE DATA FOR THE AREA (ATLAS OF NAMIBIA) .....	7
TABLE 6-2. GROUNDWATER STATISTICS .....	9

## 1 BACKGROUND AND INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Puma Energy Namibia (Pty) Ltd (the Proponent) to prepare an environmental management plan (EMP) for the continued operations of their existing fuel retail facility on erf 790, Windhoek, in the Khomas Region (Figure 2-1). The facility has been in operation for many years and the Proponent intends to continue supplying fuel to customers. Together with daily operations, some maintenance and upgrades are performed on a regular basis to ensure that the facility remains compliant to industry standards, specifically South African National Standards (SANS) as prescribed by Namibian law. The Proponent plans some refurbishments for the site and once complete will supply fuel from three underground storage tanks with a combined capacity of 138 m<sup>3</sup>. The forecourt area will have four pump islands underneath a canopy. All surfaces where fuel is handled will be covered with concrete slabs connected to spill catchment pits draining to an oil water separator. Operations of the facility include:

- ◆ Filling of the storage tanks with fuel from road transport tankers.
- ◆ Dispensing of fuel to customers.
- ◆ Tank dips and fuel volume reconciliation.
- ◆ General operational activities and maintenance procedures associated with the facility.

In order to comply with Namibian legislation, and to adhere to all codes and standards applied in their operations, the Proponent wishes to develop an Environmental Management Plan (EMP) for their operations in Windhoek. The EMP provides management options to ensure environmental impacts of the facility is minimised. The environment being defined in the Environmental Management Act as “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”.

The EMP is thus a tool used to take pro-active action by addressing potential problems before they occur. This limits potential future corrective measures that may need to be implemented and allows for application of mitigation measures for unavoidable impacts. This document should be used as an on-site reference document during all phases (planning, construction (care and maintenance), operations and decommissioning) of the fuel retail facility. All monitoring and records kept should be included in a report to ensure compliance with the environmental management plan. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken. A Health, Safety, Environment and Quality policy as well as Environmental Policy could be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. Municipal or national regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

The EMP will be used to apply for an environmental clearance certificate in compliance with Namibia’s Environmental Management Act (Act No 7 of 2007) (EMA).

**Project Justification** – Local businesses and residents and the public transport industry require fuel for their daily operations and travels. Oshakati Service Station thus plays an important role in the Wanahede area of Windhoek by ensuring the availability of a reliable supply of fuel.

Benefits of the fuel retail facility include:

- ◆ Reliable supply of fuel.
- ◆ Lower congestion at other fuel retail facilities in the area.
- ◆ Employment, skills development and training.
- ◆ Increase in economic resilience in the area through support for diversified business activities and opportunities.

## 2 SCOPE

The scope of this EMP, in compliance with the requirements of EMA, is to:

- ◆ Provide a brief overview of all components and related upgrade and operations of the fuel retail facility.
- ◆ Summarise the legal and regulatory framework within which the project operates.
- ◆ Provide a brief overview of the environment, i.e. the physical, biological, social and economic conditions, potentially impacted by the project.
- ◆ To identify potential impacts of the project on the environment.
- ◆ Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels.
- ◆ To provide sufficient information to the relevant competent authorities and the Ministry of Environment, Forestry and Tourism to make informed decisions regarding the development.

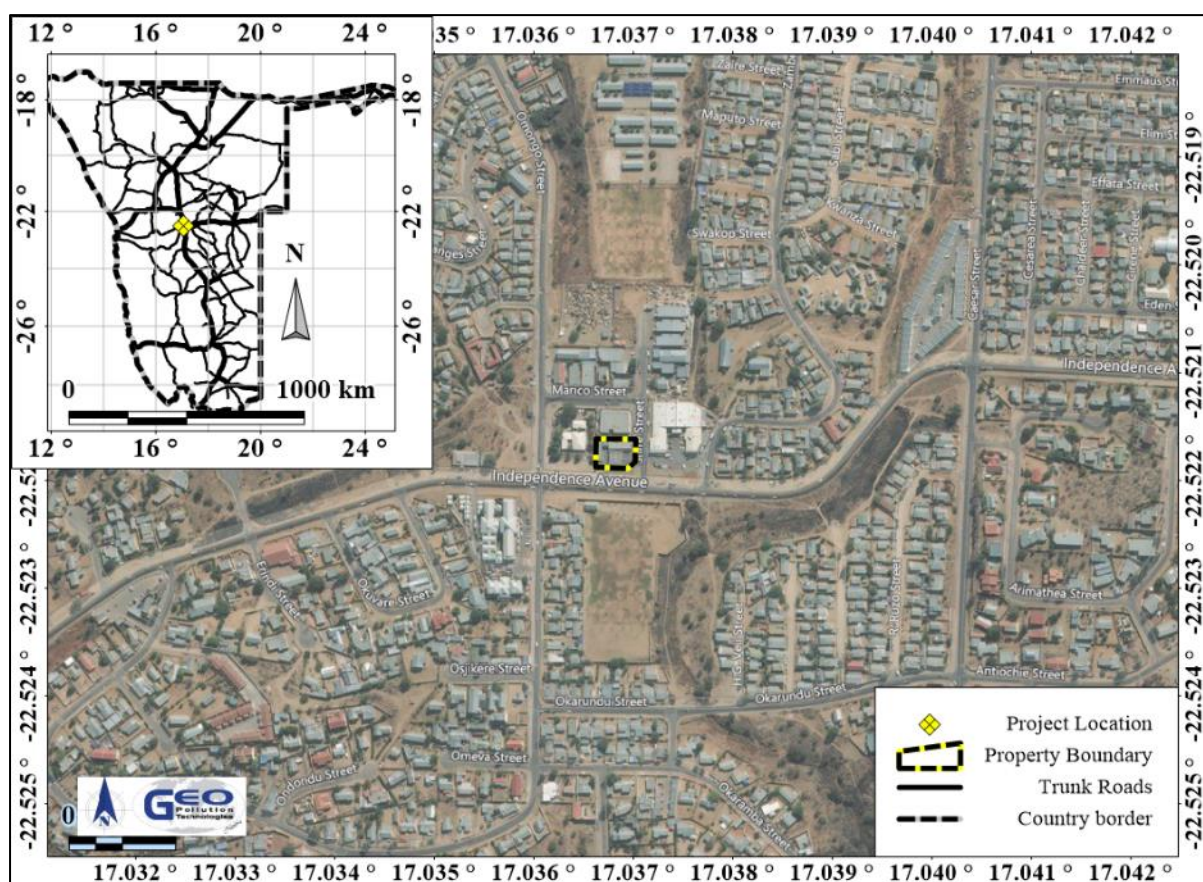


Figure 2-1. Project location

## 3 METHODOLOGY

The following methods were used to prepare the EMP:

1. Baseline information about the site and its surroundings was obtained from existing secondary information.
2. Potential environmental impacts emanating from the operations, construction / maintenance and decommissioning of the facility were considered and possible enhancement measures were listed for positive impacts while mitigation /preventative measures were provided for negative impacts as part of the EMP.



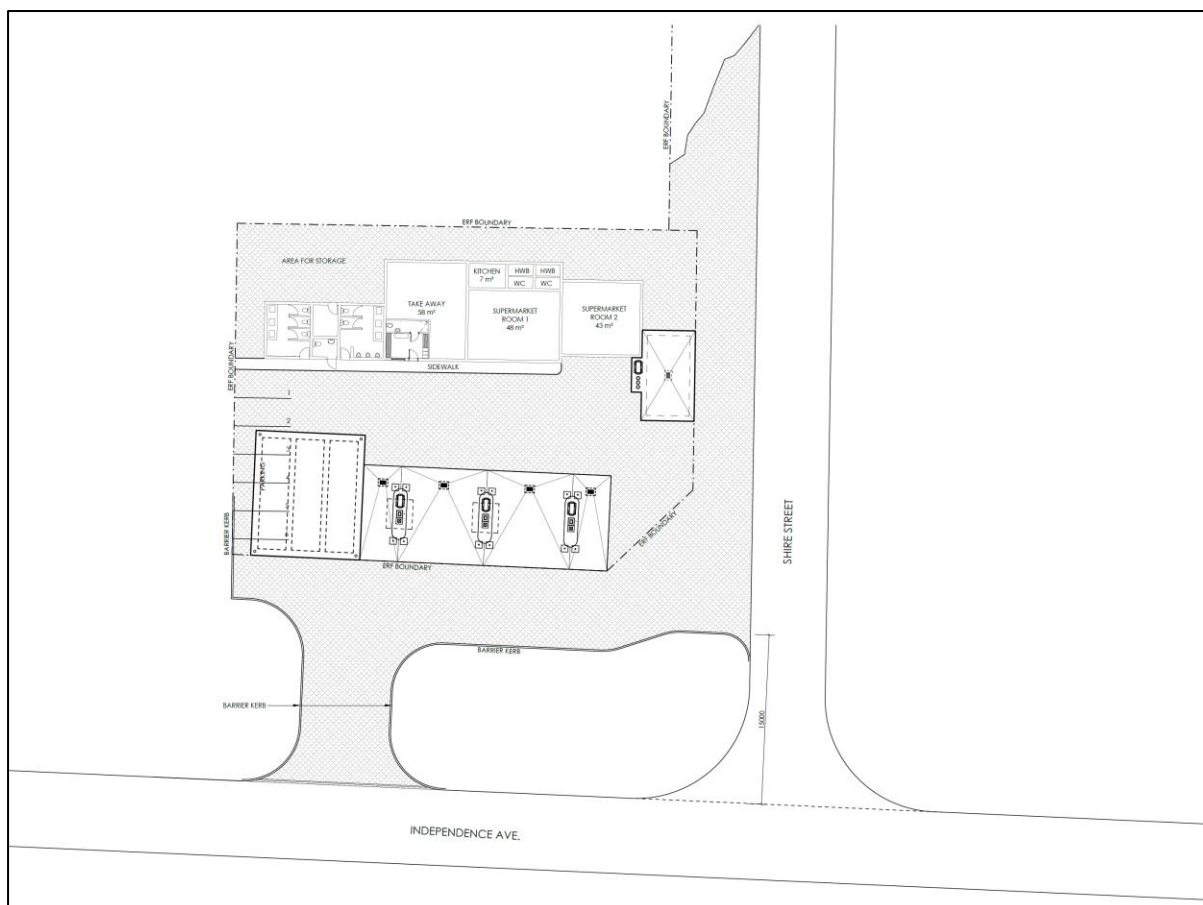
## 4 PROJECT DESCRIPTION

Oshakati Service Station is an existing site that has been in operation for many years. As part of its current operations, upgrades and refurbishments occur on a regular basis, to ensure that the facility continues to meet the required industry standards for safety and environmental protection. In line with this, some upgrades and replacements of infrastructure are planned. This include the installation of three 43 m<sup>3</sup> below ground storage tanks (Table 4-1), upgrade of the forecourt area and pump islands and upgrade of ablution facilities.

The forecourt area host three pump islands with dispensers underneath a canopy. A fourth, separate and uncovered pump island, will have one dispenser for the refuelling of trucks. The tank filler points will also be situated on this island. Fuel will be supplied to the pump islands from the below ground storage tanks. All surfaces where fuel is handled will be covered with concrete spill control slabs and spill catchment pits draining to an oil water separator. See Figure 4-1 for the site layout.

Buildings and infrastructure on site include offices, a small convenience store, a workshop and ablution facilities. The premises is serviced with water and electricity from the City of Windhoek and is connected to a waterborne sewer system.

Operations of the facility entail receipt of unleaded petrol and diesel by means of tanker trucks, storage of such fuel in the underground storage tanks and the dispensing of the fuel by pump attendants in the forecourt area. Daily tasks include cleaning and maintenance of the site, administrative tasks, shop operations, daily tank dips, as well as fuel volume reconciliations to detect any product losses and to ensure timely fuel delivery requests.



**Figure 4-1. Site layout**

**Table 4-1. Storage tank details**

	<b>T1</b>	<b>T2</b>	<b>T3</b>
<b>Product</b>	Unleaded Petrol	Unleaded Petrol 1	Diesel
<b>Capacity (m<sup>3</sup>)</b>	46	46	23
<b>Aboveground / Below Ground</b>	Below Ground	Below Ground	Below Ground
<b>Material</b>	Composite	Composite	Composite
<b>Spill Control</b>	Concrete Surface Connected to Oil Water Separator	Concrete Surface Connected to Oil Water Separator	Concrete Surface Connected to Oil Water Separator
<b>Filler Point No.</b>	FP 1	FP 2	FP 3

## 5 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an environmental assessment, as per the Namibian legislation. The legislation and standards provided in Table 5-1 to Table 5-4 govern the environmental assessment process in Namibia and/or are relevant to the facility.

**Table 5-1. Namibian law applicable to the fuel retail facility**

<b>Law</b>	<b>Key Aspects</b>
<b>The Namibian Constitution</b>	<ul style="list-style-type: none"> <li>◆ Promote the welfare of people</li> <li>◆ Incorporates a high level of environmental protection</li> <li>◆ Incorporates international agreements as part of Namibian law</li> </ul>
<b>Environmental Management Act</b> Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> <li>◆ Defines the environment</li> <li>◆ Promote sustainable management of the environment and the use of natural resources</li> <li>◆ Provide a process of assessment and control of activities with possible significant effects on the environment</li> </ul>
<b>Environmental Management Act Regulations</b> Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> <li>◆ Commencement of the Environmental Management Act</li> <li>◆ List activities that requires an environmental clearance certificate</li> <li>◆ Provide Environmental Impact Assessment Regulations</li> </ul>
<b>Petroleum Products and Energy Act</b> Act No. 13 of 1990, Government Notice No. 45 of 1990	<ul style="list-style-type: none"> <li>◆ Regulates petroleum industry</li> <li>◆ Makes provision for impact assessment</li> <li>◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) <ul style="list-style-type: none"> <li>○ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)</li> </ul> </li> <li>◆ Used Mineral Oil Regulations (Government Notice No. 48 of 1991) <ul style="list-style-type: none"> <li>○ Regulations relating to the purchase, sale, supply, acquisition, possession, disposal, storage, transportation, recovery and re-refinement of used mineral oil</li> </ul> </li> </ul>
<b>The Water Act</b> Act No. 54 of 1956	<ul style="list-style-type: none"> <li>◆ Remains in force until the new Water Resources Management Act comes into force</li> <li>◆ Defines the interests of the state in protecting water resources</li> <li>◆ Controls water abstraction and the disposal of effluent</li> <li>◆ Numerous amendments</li> </ul>

<b>Law</b>	<b>Key Aspects</b>
<b>Water Resources Management Act</b> Act No. 11 of 2013	<ul style="list-style-type: none"> <li>◆ Provide for management, protection, development, use and conservation of water resources</li> <li>◆ Prevention of water pollution and assignment of liability</li> <li>◆ Not in force yet</li> </ul>
<b>Local Authorities Act</b> Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> <li>◆ Define the powers, duties and functions of local authority councils</li> <li>◆ Regulates discharges into sewers</li> </ul>
<b>Public Health Act</b> Act No. 36 of 1919	<ul style="list-style-type: none"> <li>◆ Provides for the protection of health of all people</li> </ul>
<b>Public and Environmental Health Act</b> Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> <li>◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters</li> <li>◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation</li> </ul>
<b>Labour Act</b> Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> <li>◆ Provides for Labour Law and the protection and safety of employees</li> <li>◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)</li> </ul>
<b>Atmospheric Pollution Prevention Ordinance</b> Ordinance No. 11 of 1976	<ul style="list-style-type: none"> <li>◆ Governs the control of noxious or offensive gases</li> <li>◆ Prohibits scheduled process without a registration certificate in a controlled area</li> <li>◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process</li> </ul>
<b>Hazardous Substances Ordinance</b> Ordinance No. 14 of 1974	<ul style="list-style-type: none"> <li>◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export</li> <li>◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings</li> </ul>
<b>Pollution Control and Waste Management Bill (draft document)</b>	<ul style="list-style-type: none"> <li>◆ Not in force yet</li> <li>◆ Provides for prevention and control of pollution and waste</li> <li>◆ Provides for procedures to be followed for licence applications</li> </ul>

**Table 5-2. City of Windhoek regulations, plans and policies**

<b>Groundwater Protection Regulations</b>	<ul style="list-style-type: none"> <li>◆ Provides for the protection of groundwater, landscape and vegetation sensitivity</li> <li>◆ Requires an EIA and EMP for projects that may potentially impact on groundwater</li> <li>◆ Identifies three groundwater control zones: medium, high and very high.</li> </ul>
<b>Windhoek Environmental Structure Plan and Environmental Policy</b>	<ul style="list-style-type: none"> <li>◆ Integrates spatial planning decision-making, environmental planning and environmental impact management</li> </ul>
<b>Town Planning Scheme</b>	<ul style="list-style-type: none"> <li>◆ Enables the comprehensive management of all property and related public sector functions across the city.</li> <li>◆ Provides for the protection of groundwater and the environment.</li> <li>◆ Prohibits any sewer, septic tank, pit latrine, VIP or French drain within 500 m of any private or production borehole without council's consent.</li> <li>◆ Sets the Southern Development Limit for Windhoek.</li> </ul>

<b>Municipal Council of Windhoek: Noise Control Regulations</b> General Notice No. 77 of 2006	<ul style="list-style-type: none"> <li>◆ Resolution 215/09/2006 dealing with noise</li> <li>◆ Impose various noise limits for residential commercial and industrial areas for day and night time.</li> <li>◆ Restricts noise reaching single residential areas at 55 dBA during the day and 45 dBA at night.</li> </ul>
<b>Drainage and Sewage Regulations</b>	<ul style="list-style-type: none"> <li>◆ Regulates discharges into sewer systems.</li> <li>◆ Provides standards to which effluents entering a sewer system must adhere.</li> <li>◆ Regulates storm water run-off.</li> </ul>

**Table 5-3. Relevant multilateral environmental agreements for Namibia and the development**

<b>Agreement</b>	<b>Key Aspects</b>
<b>Stockholm Declaration on the Human Environment, Stockholm 1972.</b>	<ul style="list-style-type: none"> <li>◆ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment</li> </ul>
<b>1985 Vienna Convention for the Protection of the Ozone Layer</b>	<ul style="list-style-type: none"> <li>◆ Aims to protect human health and the environment against adverse effects from modification of the Ozone Layer are considered</li> <li>◆ Adopted to regulate levels of greenhouse gas concentration in the atmosphere</li> </ul>
<b>United Nations Framework Convention on Climate Change (UNFCCC)</b>	<ul style="list-style-type: none"> <li>◆ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention</li> </ul>
<b>Convention on Biological Diversity, Rio de Janeiro, 1992</b>	<ul style="list-style-type: none"> <li>◆ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity</li> </ul>

**Table 5-4. Standards or codes of practise**

<b>Standard or Code</b>	<b>Key Aspects</b>
<b>South African National Standards (SANS)</b>	<ul style="list-style-type: none"> <li>◆ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities</li> <li>◆ SANS 10089-3:2010 is specifically aimed at storage and distribution of petroleum products at fuel retail facilities and consumer installations <ul style="list-style-type: none"> <li>○ Provide requirements for spill control infrastructure</li> </ul> </li> </ul>

The fuel retail facility is listed as an activity requiring an environmental clearance certificate as per the following points from Section 9 of Government Notice No. 29 of 2012:

#### Hazardous Substance Treatment, Handling and Storage

- ◆ 9.1 “The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.” (The facility store and handle hazardous substances in the form of fuel.)
- ◆ 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 in terms of a law governing the generation or release of emissions, pollution, effluent or waste.” (The facility store and handle hazardous substances in the form of fuel which is permitted by the Ministry of Mines and Energy.)
- ◆ 9.4 “The storage and handling of a 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.” (Total storage capacity for fuel will be 115 m<sup>3</sup>).

- ◆ 9.5 “Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin.” (The facility is a filling station that stores diesel and unleaded petrol below ground.)

## 6 ENVIRONMENTAL CHARACTERISTICS

This section lists pertinent environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

### 6.1 LOCALITY AND SURROUNDING LAND USE

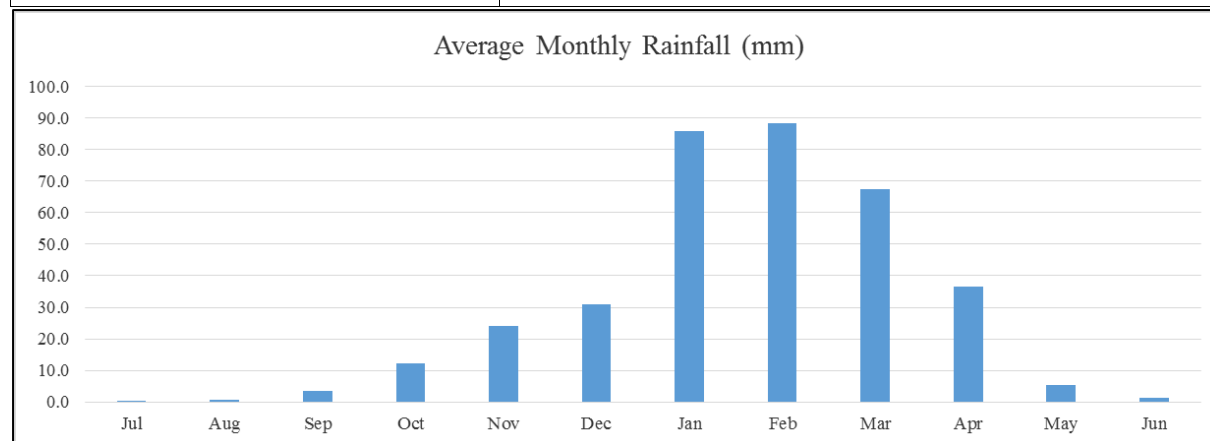
The facility is situated on erf 790, on the corner of Independence Avenue and Shire Street in Wanahede, Windhoek, in the Khomas Region (22.5218 °S; 17.0369 °E)(Figure 2-1). Access to the site is gained from both Shire Street and Independence Avenue. Nearby properties currently consist of mixed land use which mainly include commercial and residential activities.

### 6.2 CLIMATE

The project location is part of a semi-arid highland savannah region. Heavy rainfall in this region is mostly common between January and March, peaking mostly in February, whilst May to September have little or no rainfall. See Table 6-1 for a summary of climate data. The aridity of the region causes water resources to be a scarce commodity that has to be conserved and protected from pollution. Groundwater is an important source of water in Namibia.

**Table 6-1. Summary of climate data for the area (Atlas of Namibia)**

Average annual rainfall (mm/a)	300 – 350
Variation in annual rainfall (%)	30 – 40
Average annual evaporation (mm/a)	3,000 – 3,200
Water deficit (mm/a)	1,701 – 1,900
Average annual temperatures (°C)	19 – 20



**Figure 6-1. Monthly average rainfall (Atlas of Namibia)**

### 6.3 TOPOGRAPHY AND DRAINAGE

The regional topography of the area can be described as a wide graben valley sloping north inside the surrounding hilly terrain. The valley floor is relatively flat compared to the surrounding terrain (Khomas Hochland to the west and Eros Mountains to the east) where moderate to steep slopes are the norm. A very distinct mountain range (Auas Mountains) cuts across the valley south of the city and divides the valley into two parts, with the southern part draining to the south.

The site itself is relatively flat, and drains in south easterly direction. The site is located within the catchment of the Swakop River, an ephemeral river, draining in a Western direction.

#### **6.4 GEOLOGY AND HYDROGEOLOGY**

The complex geology of the Windhoek area is a result of numerous folding and faulting episodes, including thrusting and rifting, to which the area has been subjected. Metasedimentary rocks of the Swakop Group, which is part of the Damara Sequence, constitute the Windhoek Aquifer. A number of north to north-westerly striking faults and joints found in Windhoek form the major underground water conduits and therefore determine the conditions of the aquifer. Secondary porosity giving rise to high aquifer transmissivity is best developed in faults with post hydrothermal alteration brecciation in quartzitic environments. Moreover host rock fracturing along fault planes results in better development of secondary porosity in quartzite compared to schistose terrain such that the aquifer reaches its maximum potential in this type of setting. The metasedimentary formations of the study area strike in an east-north-easterly direction and dip 15-35° to the north-northwest.

The more competent quartzite is subject to brittle deformation and thus exhibits relatively high secondary porosity and permeability due to jointing. The joints of the quartzite show evidence of fluid flow by carbonate and quartz infill and iron staining. The micaceous schist on the other hand, which is prone to plastic deformation rather than brittle fracturing, exhibits significantly lower secondary porosity and permeability and therefore a lower risk of groundwater pollution.

Two main aquifer types are found in the area, namely secondary (fractured rock) aquifers hosted in the mica schist of the Kuiseb Formation, and primary (unconsolidated sediment) aquifers formed in the Klein Windhoek River valley alluvial (Qa). Windhoek has a regional groundwater flow from south to north. Groundwater flow is expected to take place through primary porosity in the surface cover, while it is expected to flow along fractures, faults and other geological structures (secondary porosity) present within the underlying formations (hard rock formations).

The project location is situated on biotite schist from the Kuiseb Formation, see Figure 6-2. The Kuiseb Formation formed during the Namibian Age and forms part of the Khomas Subgroup of the Swakop Group. Other rock types found in the area consists of mica schist, minor quartzite, graphitic schist and marble. Figure 8 indicates the Geological Sensitivity of the area to be low, mainly as a result of the presence of mica schist formations. The risk of groundwater pollution is therefore considered to be comparatively low.

Water is utilized in the area, with 15 boreholes known of within a 5 km radius. Table 6-2 presents groundwater statistics of boreholes contained in the Department of Water Affairs database. Note that this database is generally outdated and more boreholes might be present.

The project area is located within the Okahandja Groundwater Basin. Groundwater flow at the site can be expected in a northerly direction. Local flow patterns may vary due to groundwater abstraction. The project area also falls within the Windhoek-Gobabis Subterranean Water Control Area (Extension) as per Government Notice 47 of 26 March 1976. This means that Government controls groundwater usage and development in this area.

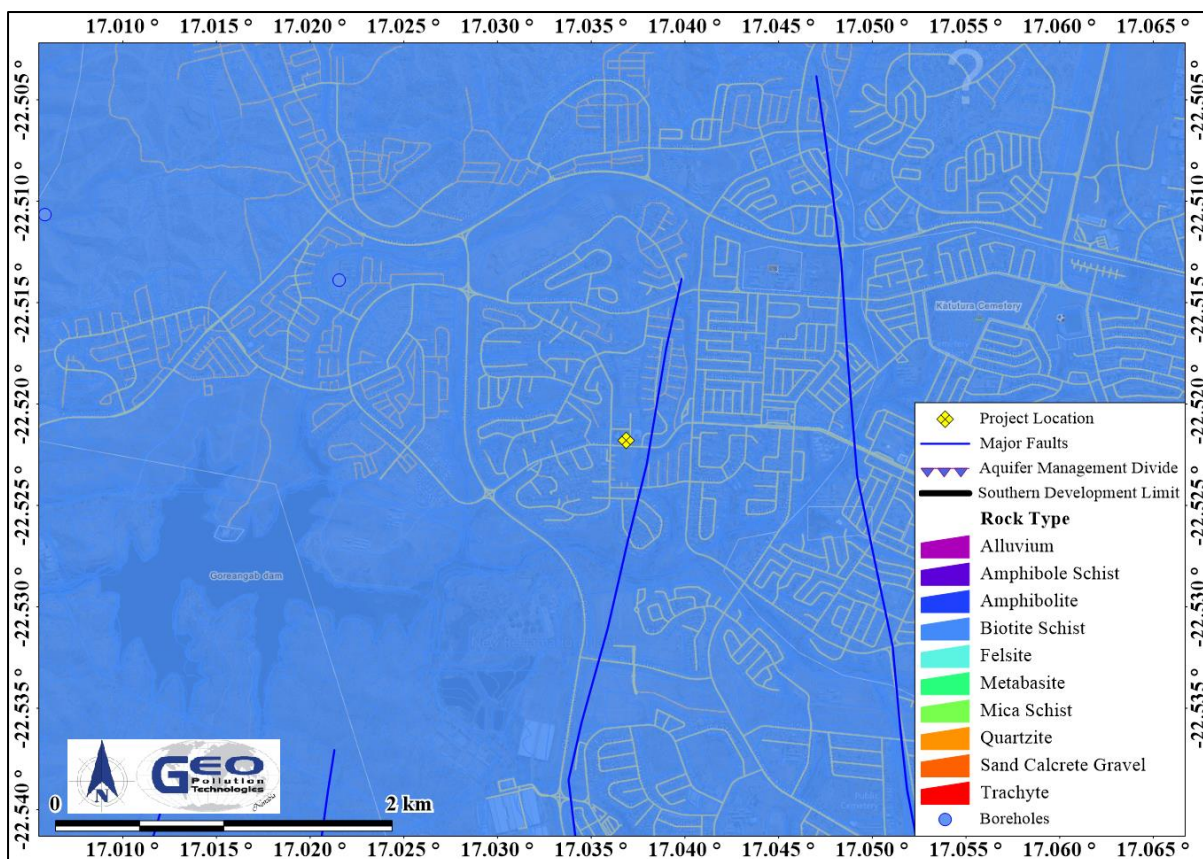


Figure 6-2. Hydrogeology map

Table 6-2. Groundwater statistics

Query Centre: Oshakati Service Station; -22.5218°S; 17.0369°E		Query Box Radius: 5.0km										
GEO Pollution Technologies		NUMBER OF KNOWN BOREHOLES	LATITUDE	LONGITUDE	DEPTH (mbs)	YIELD (m <sup>3</sup> /h)	WATER LEVEL (mbs)	WATER STRIKE (mbs)	TDS (ppm)	SULPHATE (ppm)	NITRATE (ppm)	FLUORIDE (ppm)
<b>Data points</b>		15			9	7	7	5	13	13	10	12
<b>Minimum</b>			-22.476804	16.988189	24	3	8	64	164	5	0	0
<b>Average</b>					81	29	40	204	756	99	3	1
<b>Maximum</b>			-22.566796	17.085611	116	72	64	760	2567	510	24	4
<b>Group A</b>					11.11%	71.43%	28.57%	0.00%	84.62%	84.62%	90.00%	75.00%
<i>Limit</i>					50	>10	10	10	1000	200	10	1.5
<b>Group B</b>					77.78%	14.29%	28.57%	0.00%	7.69%	15.38%	0.00%	8.33%
<i>Limit</i>					100	>5	50	50	1500	600	20	2.0
<b>Group C</b>					11.11%	14.29%	42.86%	80.00%	0.00%	0.00%	10.00%	0.00%
<i>Limit</i>					200	>0.5	100	100	2000	1200	40	3.0
<b>Group D</b>					0.00%	0.00%	0.00%	20.00%	7.69%	0.00%	0.00%	16.67%
<i>Limit</i>					>200	<0.5	>100	>100	>2000	>1200	>40	>3

Statistical grouping of parameters is for ease of interpretation, except for the grouping used for sulphate, nitrate and fluoride, which follow the Namibian guidelines for the evaluation of drinking-water quality for human consumption, with regard to chemical, physical and bacteriological quality. In this case the groupings has the following meaning:

Group A: Water with an excellent quality

Group C: Water with low health risk

Group B: Water with acceptable quality

Group D: Water with a high health risk, or water unsuitable for human consumption

## 6.5 PUBLIC WATER SUPPLY

Water consumption in Windhoek is well managed by means of water demand management. Nevertheless available water is one of the city’s most scarce resources and represents a constraint for sustainable development in future. Consumption will increase with the soaring influx of people to the city.

Listed in order of resource development, Windhoek receives its water from boreholes in and around town, reclaimed water (New Goreangab Water Reclamation Plant), and a NamWater Scheme that transfers water from the Von Bach Dam, the Swakoppoort Dam, the Omatako Dam and the Grootfontein Karst Area. The city has also started with artificial recharge of the Windhoek aquifer and is planning to extend this scheme through the installation of new recharge boreholes as well as the development of deeper abstraction boreholes, 400 to 500 m deep. This clearly illustrates the value of the aquifer. The boreholes are the second most important water resource of the city and the sustained use of the aquifer needs to be assured. The project is located within the Swakoppoort Dam catchment which is important in terms of public water supply for the central areas of Namibia.

## **6.6 FAUNA AND FLORA**

The site lies in the Savanna Biome with a thornbush shrubland vegetation type. Trees such as *Acacia hereroensis*, *Combretum apiculatum*, *Acacia reficiens*, *Acacia hebeclada*, *Ziziphus mucronata*, *Rhus* species and a variety of other trees are characteristic of this vegetation type.

The fuel retail facility is an existing site which has been cleared of all vegetation during the initial establishment of the site.

## **6.7 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS**

The project area falls within the Khomas Region and lies in Windhoek, the capital of Namibia. Windhoek is the largest town in Namibia with more than 300,000 people. It is the economic and business centre of the country. The Hosea Kutako International Airport situated east of Windhoek, links Windhoek with the rest of the world, while the B1, B2 and B6 highways links Windhoek to the rest of Namibia and southern Africa.

# **7 ENVIRONMENTAL MANAGEMENT PLAN**

The EMP provides management options to ensure impacts of the facility are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operations of the facility. All personnel taking part in the operations of the facility should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- ◆ to include all components of operations, maintenance and possible decommissioning of the facility,
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the facility,
- ◆ to monitor and audit the performance of operational personnel in applying such controls; and
- ◆ to ensure that appropriate environmental training is provided to responsible operational personnel.

## **7.1 IMPLEMENTATION OF THE EMP**

The section below outline the management of the environmental elements that may be affected by the different activities. Impacts addressed and mitigation measures proposed are seen as minimum requirements which have to be elaborated on. Delegation of mitigation measures and reporting activities should be determined by the proponent and included in the EMP. The EMP is a living document that must be prepared in detail, and regularly updated, by the proponent as the project progress and evolve.

The EMP and Environmental Clearance Certificate (ECC) must be communicated to the site managers. A copy of the ECC and EMP should be kept on site. All monitoring results must be reported on as indicated. Reporting is important for any future renewals of the ECC and must be submitted to the Ministry of Environment, Forestry and Tourism. Renewal of ECC will require six monthly reports based on the monitoring prescribed in this EMP.



Various potential and definite impacts will emanate from the operations and decommissioning phases. The majority of these impacts can be mitigated or prevented. The prevention and mitigation measures are listed below.

### 7.1.1 Planning

During the phases of planning for construction (upgrades, maintenance etc.) continued operations and possible future decommissioning of the facility, it is the responsibility of Proponent to ensure they are, and remain, compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to, and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the operations of the facility are in place and remains valid. This includes the petroleum products licence.
- ◆ Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- ◆ Make provisions to have a health, safety and environmental (HSE) coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- ◆ Have the following emergency plans, equipment and personnel on site, where reasonable, to deal with all potential emergencies:
  - EMP, risk management, mitigation, emergency response plan and HSE manuals
  - Adequate protection and indemnity insurance cover for incidents;
  - Comply with the provisions of all relevant safety standards;
  - Procedures, equipment and materials required for emergencies.
- ◆ If one has not already been established, establish and maintain a fund for future restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- ◆ Establish and/or maintain a bi-annual reporting system to report on aspects of operations, maintenance and decommissioning as outlined in the EMP.
- ◆ Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years. This is a requirement by MEFT.
- ◆ Appoint a specialist environmental consultant to update the EMP and apply for renewal of the environmental clearance certificate prior to expiry.

### **7.1.2 Revenue Generation and Employment**

Continued operations and maintenance of the facility relies on employment. Skilled and unskilled labourers are employed or contracted for various tasks of operations and maintenance. Unskilled labour may be sourced locally while it is expected that skilled contractors within Namibia will be used for specialised work. The presence of the facility therefore contributes to employment creation in the skilled and unskilled labour sector. Retailing of fuel contributes to revenue generation which is paid to the national treasury while also contributing to the local economy in terms of increased spending power of employees as well as the sourcing of goods and services.

**Desired Outcome:** Contribution to national treasury and provision of employment to local Namibians.

#### **Actions**

##### **Mitigation:**

- ◆ The Proponent must employ local Namibians where possible.
- ◆ If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- ◆ Deviations from this practice must be justified.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Bi-annual summary report based on employee records.

### **7.1.3 Skills, Technology and Development**

During operations of the facility, training is provided to a portion of the workforce to be able to perform their duties according to the required standards. Skills are transferred to an unskilled workforce for general tasks. Development of people and technology are key to economic development of the town, region and nationally.

**Desired Outcome:** To see an increase in skills of local Namibians, as well as development and technology advancements in the fuel industry.

#### **Actions**

##### **Mitigation:**

- ◆ If the skills exist locally, contractors and employees must first be sourced from the town, region, and then nationally. Deviations from this practice must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.
- ◆ Employees to be informed about parameters and requirements for references upon employment.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Record should be kept of training provided.
- ◆ Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- ◆ Bi-annual summary reports on all training conducted.

#### **7.1.4 Demographic Profile and Community Health**

The facility relies on labour for operations. The scale of the project is limited and it is not foreseen that it has or will in future create a change in the demographic profile of the local community. Exposure to factors such as communicable disease like HIV/AIDS as well as alcoholism / drug abuse are often associated with the trucking industry. Spills and leaks may present risks to members of the public especially if groundwater is polluted.

**Desired Outcome:** To prevent the in-migration and growth in informal settlements and to prevent the spread of diseases such as HIV/AIDS.

#### **Actions:**

##### **Prevention:**

- ◆ Employ only local people from the area, deviations from this practice should be justified appropriately.
- ◆ Adhere to all municipal by-laws relating to environmental health which includes, but is not limited to, sand and grease traps for the various facilities and sanitation requirements.

##### **Mitigation:**

- ◆ Educational programmes for employees on HIV/AIDs and general upliftment of employees' social status.
- ◆ Appointment of reputable contractors.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Facility inspection sheet for all areas which may present environmental health risks, kept on file.
- ◆ Bi-annual summary report based on educational programmes and training conducted.
- ◆ Bi-annual report and review of employee demographics.

### **7.1.5 Fuel Supply**

The facility contributes to ensuring a reliable and convenient supply of fuel to the town, local businesses and residents and the transport industry. The proposed upgrades will aid in ensuring the supply remains uninterrupted.

**Desired Outcome:** Ensure a secure fuel supply remains available.

#### **Actions**

##### **Mitigation:**

- ◆ Ensure compliance to the petroleum regulations of Namibia which specify adherence to SANS standards for fuel retail facilities.
- ◆ Proper management to ensure constant supply.
- ◆ Record supply problems and take corrective actions.
- ◆ Communicate any fuel shortages and expected delays in supply at a visible location on site.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Record supply problems and corrective actions taken and compile a bi-annual summary report.

### **7.1.6 Traffic**

The presence of the facility increase traffic flow in the area. This may increase the risk of incidents and accidents especially during the fuel deliveries. Construction activities (upgrades) may result in temporary traffic impacts as a result of large vehicles accessing the site for delivery and collection of equipment and machinery.

**Desired Outcome:** Minimum impact on traffic and no transport or traffic related incidents.

#### **Actions**

##### **Prevention:**

- ◆ Erect clear signage regarding access and exit points at the facility.
- ◆ Tanker trucks collecting and delivering fuel should not be allowed to obstruct any traffic.

##### **Mitigation:**

- ◆ If any traffic impacts are expected, traffic management should be performed.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A report should be compiled bi-annually of all incidents reported, complaints received, and action taken.

### 7.1.7 Health, Safety and Security

Activities associated with the construction and operational phases relies on human labour and therefore will expose them to health and safety risks. Health and safety risk associated with the construction activities include excavation activities during tank removal and installation, falling from heights and moving vehicles. Handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), will pose the main risks to employees during the operational phases. Security risks will be related to unauthorized entry, theft and sabotage.

**Desired Outcome:** To prevent injury, health impacts and theft.

#### **Actions**

##### **Prevention:**

- ◆ All health and safety standards specified in the Labour Act should be complied with.
- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products, especially during the construction phase.
- ◆ Equipment on site must be locked away or placed in a way that does not encourage criminal activities (e.g. theft).
- ◆ Provide all employees with required and adequate personal protective equipment (PPE).
- ◆ Ensure that all personnel receive adequate training on operation of equipment/handling of hazardous substances.
- ◆ Implementation of maintenance register for all equipment and fuel / hazardous substance storage areas.
- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Security procedures and proper security measures must be in place to protect workers and clients.
- ◆ Develop emergency response plans for all possible health, safety and security impacts and appoint responsible personnel in key positions to activate and oversee such plans when required.

##### **Mitigation:**

- ◆ For all emergency situations, the appropriate emergency response plan must be implemented as soon as possible in order to minimize the magnitude of impacts or prevent such impacts from developing into more severe impacts.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ A report should be compiled bi-annually of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

### 7.1.8 Fire

Construction and operational activities may increase the risk of the occurrence of fires. Unleaded petrol is extremely flammable and being a static accumulator may ignite if handled incorrectly.

**Desired Outcome:** To prevent property damage, possible injury and impacts caused by uncontrolled fires.

#### **Actions:**

##### **Prevention:**

- ◆ A holistic fire protection and prevention plan must be developed for the site and it should specifically take into account flammable products stored on site. This plan must include an emergency response plan, firefighting plan and a spill recovery plan and should have dedicated assigned personnel to oversee their development and implementation.
- ◆ Firefighting equipment must be maintained and regularly serviced.
- ◆ Regular personnel training (firefighting, fire prevention and responsible housekeeping practices).
- ◆ Ensure all chemicals are stored strictly according to MSDS and SANS instructions. This include segregation of incompatible products.
- ◆ Maintain regular site, mechanical and electrical inspections and perform regular maintenance.
- ◆ Clean all spills/leaks without delay and dispose of any contaminated material according to their MSDS requirements and at suitable locations to prevent the accumulation of flammable or explosive products on site.
- ◆ For fuel storage, special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990) and SANS standards for operation and maintenance of the consumer fuel installation should be followed.

##### **Mitigation:**

- ◆ For any fire related emergency situation, the appropriate emergency response plan must be implemented as soon as possible in order to minimize the magnitude of impacts or prevent such impacts from developing into more severe impacts.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.
- ◆ A report should be compiled bi-annually of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.



### 7.1.9 Air Quality

The operational phase release fuel vapours into the air during refuelling of bulk storage tanks as well as at dispensing points. Prolonged exposure may have carcinogenic effects. Construction and refurbishment activities may cause dust where soil surfaces are exposed.

**Desired Outcome:** To prevent health impacts related to reduced air quality.

#### **Actions**

##### **Mitigation:**

- ◆ Employees should be informed about the dangers of fuel vapours.
- ◆ Vent pipes must be properly placed as per SANS requirements.
- ◆ Dust masks should be provided to employees where dust impacts are expected and dust suppression by means of water implemented.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Any complaints received regarding fuel vapours or dust should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

### **7.1.10 Noise**

Noise pollution may be generated due to heavy and light motor vehicles accessing the site to offload fuel or refuel. Construction and refurbishment activities may result in a temporary increase in noise levels.

**Desired Outcome:** To prevent any nuisance and hearing loss due to noise generated.

#### **Actions**

##### **Prevention:**

- ◆ Follow the City of Windhoek guidelines for limits to noise pollution (Council Resolution 215/09/2006) to prevent hearing impairment and a nuisance at nearby receptors.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.
- ◆ Manage noise caused by clients including loud music.

##### **Mitigation:**

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Council Resolution 215/09/2006
- ◆ Maintain a complaints register.
- ◆ Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

### **7.1.11 Waste production**

Waste is produced during the operational phase. Waste includes hazardous waste associated with the handling of hydrocarbon products and servicing of vehicles. Maintenance waste may include building rubble and discarded equipment contaminated by hydrocarbon products. Contaminated soil and water is considered as hazardous waste. Domestic waste will be generated by the facility and related operations. Waste presents a contamination risk and when not removed regularly may become a fire hazard.

**Desired Outcome:** To reduce the amount of waste produced and prevent pollution and littering.

#### **Actions**

##### **Prevention:**

- ◆ Waste reduction measures should be implemented and all waste that can be re-used/recycled must be kept separate.
- ◆ Ensure adequate waste storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of stored waste.

##### **Mitigation:**

- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- ◆ See the MSDS available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the town council regarding waste and handling of hazardous waste.

##### **Responsible Body:**

- ◆ Proponent
- ◆ Contractors

##### **Data Sources and Monitoring:**

- ◆ A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

### **7.1.12 Ecosystem and Biodiversity Impact**

The site has previously been developed and is mostly devoid of vegetation. The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. Ecosystem or biodiversity impacts are mostly associated with pollution of the environment.

**Desired Outcome:** To avoid pollution of, and impacts on, the ecological environment.

#### **Actions.**

##### **Prevention:**

- ◆ Educate all contracted and permanent employees on the value of biodiversity.

##### **Mitigation:**

- ◆ Contain construction material and activities on site.
- ◆ Report any extraordinary animal sightings to the MEFT.
- ◆ Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- ◆ Avoid scavenging of waste by fauna.
- ◆ The establishment of habitats and nesting sites at the facility should be avoided where possible.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Any ecologically significant events or sightings to be included in a bi-annual report.

### **7.1.13 Groundwater, Surface Water and Soil Contamination**

Operations entails the storage and handling of various hydrocarbons (such as fuels and lubricants). Such material may contaminate surface water, soil and groundwater. Contamination may either result from failing storage facilities and reticulation, or spills and leaks associated construction activities and with fuel handling such as overfills and spills.

**Desired Outcome:** To prevent the contamination of water and soil.

#### **Actions**

##### **Prevention:**

- ◆ All construction and or maintenance machines should be maintained to be in a good working condition during operation.  
Employ drip trays and spill kits during construction when onsite servicing/repairs of equipment are needed.
- ◆ Spill control structures and procedures must be in place according to SANS standards or better and connection of all surfaces where fuel is handled, with an oil water separator.
- ◆ Surfactants (soap) should not be allowed to enter the oil water separator as this will decrease its efficiency.
- ◆ All fuelling should be conducted on surfaces provided for this purpose. E.g. Concrete slabs with regularly maintained seals between slabs.
- ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- ◆ Proper training of operators must be conducted on a regular basis (fuel handling, spill detection, spill control).

##### **Mitigation:**

- ◆ Any spillage of more than 200 l must be reported to the Ministry of Mines and Energy.
- ◆ Spill clean-up means must be readily available on site as per the relevant MSDS and all spills must be cleaned up immediately.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Daily tank inspections and dips to detect product loss due to leaks as soon as possible.
- ◆ A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, comparison of pre-exposure baseline data (previous pollution conditions survey results) with post remediation data (e.g. soil / groundwater hydrocarbon concentrations) and a copy of documentation in which spill was reported to Ministry of Mines and Energy.

#### **7.1.14 Visual Impact**

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility. The general upkeep and maintenance of the facility will not only reduce any negative visual impacts, but also ensure the longevity of the structures and buildings. Proposed upgrades will have a positive visual impact.

**Desired Outcome:** To minimise aesthetic impacts associated with the facility and prevent lighting from being a visual disturbance.

#### **Actions**

##### **Mitigation:**

- ◆ Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- ◆ Lighting should be directed towards the facility and away from residents where possible.
- ◆ Minimum lighting necessary for operations to be used at night. The installation of auto-dimming lights when no movement is detected are desirable.

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ A report should be compiled every bi-annually of all complaints received and actions taken.

### **7.1.15 Cumulative Impact**

Possible cumulative impacts associated with the operational phase include increased traffic and noise in the area.

**Desired Outcome:** To minimise all cumulative impacts associated with the facility.

#### **Actions**

##### **Mitigation:**

- ◆ Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.
- ◆ Reviewing bi-annual and annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient

##### **Responsible Body:**

- ◆ Proponent

##### **Data Sources and Monitoring:**

- ◆ Annual summary report based on all other impacts must be created to give an overall assessment of the impact of the operational phase.

## 7.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the environmental clearance certificate. Decommissioning was however assessed. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure. Any pollution present on the site must be remediated. A soil conditions survey should be conducted to detect any hydrocarbon pollution and to implement remediation measures. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land will not be used for similar future purposes. The EMP for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and to implement guidelines and mitigation measures.

## 7.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;
- ◆ An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.
- ◆ The EMP.

## 8 CONCLUSION

---

The fuel retail facility has a positive impact on the various sectors operational in the town and surrounding community. In addition to reliable and convenient fuel the Proponent contributes to employment, skills transfer and training which in turn develops the local workforce. Proposed upgrades and refurbishment will ensure the operations remain compliant with legislative requirements, and aid in securing a constant and reliable supply of fuel.

Negative impacts can successfully be mitigated. SANS standards relating to the petroleum industry and prescribed by Namibian law must be followed during all operations of the fuel retail facility. Noise pollution should at all times meet the prescribed Council Resolution 215/09/2006 requirements to prevent hearing loss and not to cause a nuisance. Fire prevention should be adequate, and health and safety regulations should be adhered to in accordance with the regulations pertaining to relevant laws and internationally accepted standards of operation. Any waste produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site. Spill containment infrastructure is key in preventing pollution of the environment and includes drip trays and suitably surfaced areas where fuel is handled.

The EMP should be used as an on-site reference document for the operations of the facility. Parties responsible for transgressing of the EMP should be held responsible for any rehabilitation that may need to be undertaken. The Proponent could use an in-house Health, Safety, Security and Environment



Management System in conjunction with the EMP. All operational personnel must be taught the contents of these documents.

Should the Directorate of Environmental Affairs (DEA) of the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, an environmental clearance certificate may be granted to the Proponent. The environmental clearance certificate issued, based on this document, will render it a legally binding document which should be adhered to.

## **9 REFERENCES**

---

Digital Atlas of Namibia Unpublished Report. Ministry of Environment & Tourism

Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.

Namibia Statistics Agency. Namibia 2011 Population and Housing Census Main Report.



## **Appendix A: Consultant's Curriculum Vitae**



**ENVIRONMENTAL SCIENTIST****André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 150 Environmental Impact Assessments including assessments of the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

**CURRICULUM VITAE ANDRÉ FAUL**

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	20
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

**EDUCATION AND PROFESSIONAL STATUS:**

B.Sc. Zoology	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology)	:	University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

First Aid Class A	EMTSS, 2017
Basic Fire Fighting	EMTSS, 2017

**PROFESSIONAL SOCIETY AFFILIATION:**

Environmental Assessment Professionals of Namibia (Practitioner)

**AREAS OF EXPERTISE:**

Knowledge and expertise in:

- ◆ Water Sampling, Extractions and Analysis
- ◆ Biomonitoring and Bioassays
- ◆ Biodiversity Assessment
- ◆ Toxicology
- ◆ Restoration Ecology

**EMPLOYMENT:**

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

**PUBLICATIONS:**

Publications:	5
Contract Reports	+150
Research Reports & Manuals:	5
Conference Presentations:	1