

**CONSTRUCTION AND OPERATIONS OF A FUEL RETAIL  
FACILITY IN JOHANNES NAMPALA AVENUE, WALVIS BAY**

**ENVIRONMENTAL ASSESSMENT SCOPING REPORT**



**Assessed by:**




**Assessed for:**



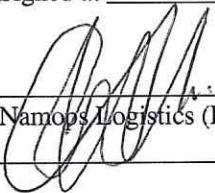
March 2020



<b>Project:</b>	<b>CONSTRUCTION AND OPERATIONS OF A FUEL RETAIL FACILITY IN JOHANNES NAMPALA AVENUE, WALVIS BAY: ENVIRONMENTAL ASSESSMENT SCOPING REPORT</b>	
<b>Report: Version/Date:</b>	Final March 2020	
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<b>Report Approval</b>	 <b>André Faul</b> Conservation Ecologist	

I GERHARD VISSER acting as a representative of Namops Logistics (Pty) Ltd 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 WALVIS BAY on the 23 day of MARCH 2020.

  
 Namops Logistics (Pty) Ltd

2019 / 0508  
 Business Registration/ID Number



## **EXECUTIVE SUMMARY**

Namops Logistics (Pty) Ltd requested Geo Pollution Technologies (Pty) Ltd to undertake an environmental assessment for the construction and operations of a proposed fuel and lubrication retail facility situated on erf 4605 in Johannes Nampala Avenue, Walvis Bay. The property is currently zoned for industrial purposes. The proposed facility will supply all kinds of lubricants as well as diesel from four 64 m<sup>3</sup> aboveground storage tanks via dispensers on a designated driveway and refuelling area. General operations will involve the receipt of fuel from road tankers, dispensing fuel to vehicles, operations of related infrastructure and day to day administrative tasks.

The environmental assessment is conducted to determine all environmental, safety, health and socio-economic impacts associated with the construction and operations of the facility. Relevant environmental data has been compiled by making use of secondary data and from a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report.

Due to the nature and location of the proposed facility, limited impacts can be expected on the surrounding environment, see summary impacts table below. The facility is surrounded by mostly industrial activities. It is however recommended that environmental performance be monitored regularly to ensure regulatory compliance and that corrective measures be taken if necessary. The operations of the fuel retail facility will play an important role in contributing to a reliable supply of fuel to the industrial sector of Walvis Bay and the transport industry.

The major concerns related to the construction and operations of the facility are that of potential groundwater, surface water and soil contamination and the possibility of fire. This will however be limited by adherence to South African National Standards and Material Safety Data Sheet instructions. Furthermore, noise pollution should meet the minimum requirements of the World Health Organisation standards. By appointing local contractors and employees and implementing educational programs the positive socio-economic impacts can be maximised while mitigating any negative impacts.

The environmental management plan included in Section 9 of this document should be used as an on-site reference document during all phases (planning, construction (care and maintenance), operations and decommissioning) of the 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 environmental management plan 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.

### **Impact Summary Class Values**

Impact Category	Impact Type	Construction		Operations	
Positive Rating Scale: Maximum Value		5		5	
Negative Rating Scale: Maximum Value			-5		-5
EO	Skills, Technology and Development	2		2	
EO	Revenue Generation and Employment	2		3	
SC	Demographic Profile and Community Health		-1		-2
EO	Fuel Supply			3	
SC	Traffic		-2		-2
SC	Health, Safety and Security		-2		-2
PC	Fire		-2		-2
PC	Air Quality		-1		-1
PC	Noise		-1		-1
PC	Waste Production		-2		-2
BE	Ecosystem and Biodiversity Impact		-1		-2
PC/BE	Groundwater, Surface Water and Soil Contamination		-2		-2
SC	Visual Impact		-1		-1
PC/SC	Impacts on Utilities, Infrastructure and Seabed Scouring		-3		-2
PC	Cumulative Impact				-3

BE = Biological/Ecological

EO = Economical/Operational

PC = Physical/Chemical

SC = Sociological/Cultural



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## **LIST OF ABBREVIATIONS**

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>BE</b>	Biological/Ecological
<b>DWA</b>	Department of Water Affairs
<b>DEA</b>	Directorate of Environmental Affairs
<b>EA</b>	Environmental Assessment
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act No 7 of 2007
<b>EMP</b>	Environmental Management Plan
<b>EMS</b>	Environmental Management System
<b>EO</b>	Economic/Operational
<b>ES</b>	Environmental Classification
<b>GPT</b>	Geo Pollution Technologies
<b>HIV</b>	Human Immunodeficiency Virus
<b>IAPs</b>	Interested and Affected Parties
<b>IUCN</b>	International Union for Conservation of Nature
<b>LNAPL</b>	Light Non-Aqueous Phase Liquids
<b>m/s</b>	Meter per second
<b>mbs</b>	Meters below surface
<b>MET</b>	Ministry of Environment and Tourism
<b>mm/a</b>	Millimetres per annum
<b>MSDS</b>	Material Safety Data Sheet
<b>NaCl</b>	Sodium chloride
<b>PC</b>	Physical/Chemical
<b>PPE</b>	Personal Protective Equipment
<b>ppm</b>	Parts per million
<b>SANS</b>	South African National Standards
<b>SC</b>	Sociological/Cultural
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>WHO</b>	World Health Organization



## **GLOSSARY OF TERMS**

**Alternatives** - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

**Assessment** - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

**Competent Authority** - means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

**Construction** - means the building, erection or modification of a facility, structure or infrastructure that is necessary for the undertaking of an activity, including the modification, alteration, upgrading or decommissioning of such facility, structure or infrastructure.

**Cumulative Impacts** - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

**Environment** - As defined in the Environmental Assessment Policy and Environmental Management Act - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, palaeontological or social values”.

**Environmental Impact Assessment (EIA)** - process of assessment of the effects of a development on the environment.

**Environmental Management Plan (EMP)** - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

**Environmental Management System (EMS)** - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, PR productivity and strategic planning. An EMS generally makes a positive impact on a company’s bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company’s financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

**Evaluation** – means the process of ascertaining the relative importance or significance of information, the light of people’s values, preference and judgements in order to make a decision.

**Hazard** - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

**Interested and Affected Party (IAP)** - any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

**Mitigate** - The implementation of practical measures to reduce adverse impacts.

**Proponent (Applicant)** - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an

activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.

**Public** - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

**Scoping Process** - process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

**Significant Effect/Impact** - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

**Stakeholder Engagement** - The process of engagement between stakeholders (the proponent, authorities and IAPs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term “public participation”.

**Stakeholders** - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (IAPs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

**Sustainable Development** - “Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations” – the definition of the World Commission on Environment and Development (1987). “Improving the quality of human life while living within the carrying capacity of supporting ecosystems” – the definition given in a publication called “Caring for the Earth: A Strategy for Sustainable Living” by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme and the World Wide Fund for Nature (1991).

## 1 BACKGROUND AND INTRODUCTION

Geo Pollution Technologies (Pty) Ltd (GPT) was appointed by Namops Logistics (Pty) Ltd to undertake an environmental assessment for the proposed construction and operations of a fuel retail facility on erf 4605 in Johannes Nampala Avenue, Walvis Bay. (Figure 1). Establishment of the fuel retail facility will involve:

- ◆ Site clearing, preparation and earthworks;
- ◆ Civil works required for new infrastructure;
- ◆ Construction of infrastructure for the fuel retail facility including driveway and refuelling area, aboveground tanks, pumps, reticulation, buildings, parking bays and driveways;
- ◆ Installation of associated electrical, water and sewerage utilities;
- ◆ Installation of spill control infrastructure.

Operations of the fuel retail facility will 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 fuel retail facility.

A risk assessment was undertaken to determine the potential impact of the operational and possible decommissioning phases of the project on the environment. The environment being defined in the Environmental Assessment Policy and 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 environmental assessment was conducted to apply for an environmental clearance certificate in compliance with Namibia’s Environmental Management Act (Act No 7 of 2007).

**Project Justification** – Walvis Bay host Namibia’s largest port and fishing industry and the industrial sector of Walvis Bay is constantly growing. With a the growing industrial as well as transport industry the demand for fuel is increasing. The fuel retail facility will contributes towards a reliable supply in this demand. The fuel retail facility will supply fuel mainly to the industrial and trucking sector of Walvis Bay, and as a result will reduce traffic congestion caused by large vehicles elsewhere in town.

Benefits of the fuel retail facility include:

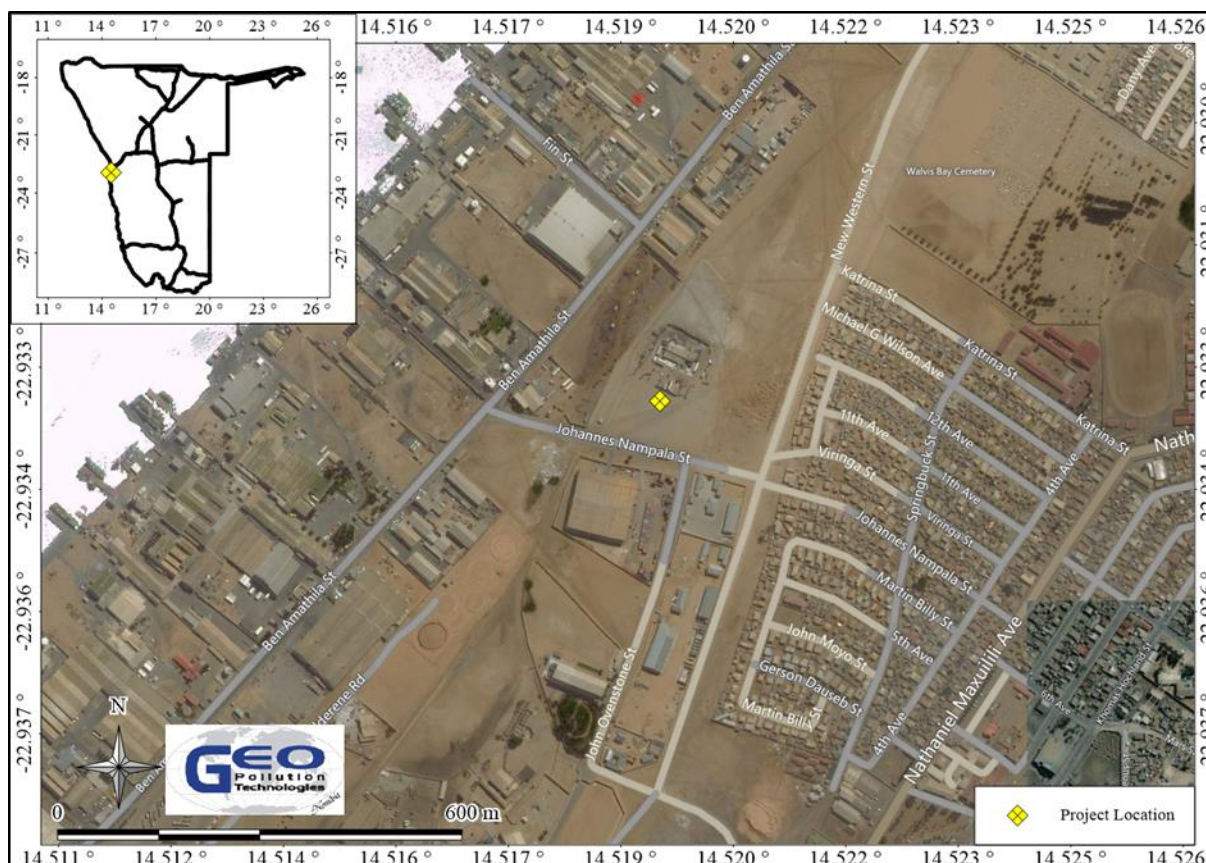
- ◆ Reliable supply of fuel to various sectors (e.g. industrial and commercial) and the local community,
- ◆ Employment and skills training,
- ◆ Support for potential additional investments and development in town.

## 2 SCOPE

The scope of the environmental assessment is to:

The aims and objectives of this report are to:

1. Determine the potential environmental impacts emanating from the operational and possible decommissioning activities of the fuel retail facility,
2. Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels,
3. Comply with the requirements of the EMA,
4. Provide sufficient information to the relevant competent authority and MET to make an informed decision regarding the construction, operations and possible decommissioning of the facility.



**Figure 1. Project location**

### 3 METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment due to the construction and operations of the facility:

1. Baseline information about the site and its surroundings was obtained from primary information, existing secondary information as well as from a reconnaissance site visit.
2. As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions all of which are presented in this report.
3. Potential environmental impacts emanating from the construction, operations and decommissioning of the facility were determined and possible enhancement measures were listed for positive impacts while mitigation / preventative measures were provided for negative impacts.
4. As per the findings of this scoping report, an environmental management plan (EMP) was incorporated into this report to be submitted to the Ministry of Environment and Tourism (MET).

## **4 FACILITY OPERATIONS AND RELATED ACTIVITIES**

It is anticipated that the construction of the facility will commence once an environmental clearance certificate has been issued by the MET and the various additional permits and licences, such as per the Ministry of Mines and Energy, have been issued by the various regulatory bodies.

### **4.1 PLANNED INFRASTRUCTURE**

The proposed fuel retail facility will be situated along and accessed from Johannes Nampala Avenue. The proposed facility is situated within the industrial area of Walvis Bay and will aim at supplying fuel to mainly the industrial local developments and trucking industry. The proposed site used to host a fishmeal plant but is currently utilised for logistics purposes.

The facility will have a driveway leading to a refuelling area with three pump islands (Figure 2). The pump islands will host two pumps each, and will be situated around 30 m apart, which will thus allow for two vehicles to be filled simultaneously per island. Four vertical, aboveground steel storage tanks of 64 m<sup>3</sup> each will be installed for the storage of 50 ppm diesel. Underground pipes will be installed for the reticulation of diesel from the tanks to pumps. The tanks will be situated in a bunded area as per industry standards which allows for a bunded volume of 110%. The driveway and refuelling area is proposed to be situated just outside of the southern property boundary, whilst all the other infrastructure will be within the property. This is to mitigate safety and security risks.

All surfaces for refuelling will be surfaced with concrete spill control slabs connected to an oil water separator with drains. The oil water separator overflow will be connected to the municipal sewer. Various lubricants will also be stored at the site on a temporary basis. Lubricants will be stored in a designated warehouse with sufficient concrete flooring to prevent any possible spills from entering the surrounding environment. Lubricants will mostly be in 20 l drums, and will be stored on pallets or racks.

Safety systems will include emergency shutoff systems, channelling of storm water in order to prevent its contamination with hydrocarbons, and firefighting equipment. Fire extinguishers and emergency stops will be placed throughout the facility and within easy reach of attendants. Additional infrastructure on site will include ablution facilities and a staff locker room already present on site.

The proposed layout of the facility can be seen in Figure 2. Minor changes may however be made to the layout during finalisation of the design. The facility will adhere to all Namibian legislation and to relevant South African National Standards (SANS), ensuring safety and environmental protection.

### **4.2 OPERATIONAL ACTIVITIES**

The facility will operate daily between 06:00 and 22:00. Diesel (50 ppm) will be received from tanker trucks and stored in the aboveground storage tanks. Fuel will be dispensed to customers via the dispensers on the pump islands by pump attendants as required. Regular reconciliation of fuel volumes will be performed to detect any possible leaks. The oil water separator will be inspected regularly and cleaned when needed. Any contaminated products will be disposed of at a registered waste oil recycler or approved hazardous waste disposal facility. Logistic activities on the site, not related to the fuel retail facility, will continue as normal during operations.

Additional operations of the facility may include daily administrative activities as well as general care and maintenance of the property. Any domestic waste produced will be stored in an enclosed, temporary waste storage area. From here it will be removed regularly and transported to, and disposed of at, an approved municipal waste disposal facility.





**Photo 1. Site entrance and proposed refuelling area and driveway**



**Photo 2. Proposed tank location**



**Figure 2. Proposed site layout**

## **5 ALTERNATIVES TO THE PROPOSED FACILITY**

Since the facility must adhere to SANS standards or better no alternatives in design parameters adhering to SANS is proposed.

All infrastructure of the facility is proposed to be inside property boundaries, while the driveway and refuelling area is proposed outside of the facility as seen in Figure 2. This may increase ease of access and reduce security risks to the facility itself, concerns were however raised that this might result in traffic and safety issues as the area is frequented by pedestrians.



An alternative to this will be to keep the same design, however move all activities to the inside of the property boundary and allow space for trucks waiting to collect fuel and turning of trucks (Figure 3). Trucks will then access and exit the site through the current access gates of the facility. This will reduce traffic impacts and risks to pedestrians in Johannes Nampala Avenue, reduce administrative and legal constraints, as well as reduce risks posed to subsurface utilities on the municipal managed pavement. Based on this, as well as comments from IAPs, this is the preferred alternative.

From an environmental perspective the environmental assessment did not find any reason why the facility may not continue at this site on condition that it complies with SANS standards or better as prescribed by Namibian legislation.



**Figure 3. Proposed site layout inside property boundaries**

## 6 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 1 to Table 4 govern the environmental assessment process in Namibia and/or are relevant to the facility.

**Table 1. Namibian Law Applicable to the Fuel Retail Facility**

Law	Key Aspects
<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> </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 the disposal of effluent</li> <li>◆ Numerous amendments</li> </ul>
<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>Law</b>	<b>Key Aspects</b>
<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 2. Municipal By-laws, Guidelines and Regulations**

<b>Municipal By-laws, Guidelines or Regulations</b>	<b>Key Aspects</b>
<b>Integrated Urban Spatial Development Framework for Walvis Bay</b>	<ul style="list-style-type: none"> <li>Overall vision to transform Walvis Bay to being the primary industrial city in Namibia</li> <li>Aims to ensure that appropriate levels of environmental management is enforced for all developments in Walvis Bay</li> </ul>
<b>Integrated Environmental Policy of Walvis Bay (Agenda 21 Project)</b>	<ul style="list-style-type: none"> <li>Indicates the directions that the Municipality of Walvis Bay will move towards in the forthcoming years to fulfil its responsibilities to manage the environment of Walvis Bay together with the town's residents and institutions</li> <li>Strong focus on conservation and protection of environment</li> </ul>
<b>Municipal By-law 19 and 20 on Effluents Entering Sewers</b>	<ul style="list-style-type: none"> <li>Regulates the discharge of effluent into sewers and prohibits the introduction of certain wastes or products including steam into the sewers system.</li> </ul>

**Table 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 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 project 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:

- 9.1 “The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.”
- 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.”
- 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.”
- 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.”

## 7 ENVIRONMENTAL CHARACTERISTICS

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

### 7.1 LOCALITY AND SURROUNDING LAND USE

The fuel retail facility is planned on erf 4605 in Johannes Nampala Avenue, Walvis Bay (22.9335°S, 14.5194°E) (Figure 1). The driveway and refuelling area of the facility is proposed to be situated outside of the property boundary as indicated in Figure 2, whilst all the other infrastructure of the property will be inside property boundaries. The property is situated within the municipal area of Walvis Bay and is zoned for industrial use (Figure 4). The greater area is generally classified as an industrial area with various industrial related activities from fish factories to container storage and logistics. There are no heritage or cultural sites located on or in close proximity to the site. The adjacent land uses are listed in Table 5.



**Photo 3. Southern Neighbour: Municipality of Walvis Bay**



**Photo 4. Eastern Neighbour: Erongo Logistics**

**Table 5. Direct Surrounding Land Use**

Direction	Land Use	Neighbour
East	Industrial	Erongo Logistics
South	Business	Walvis Bay Municipality, Section: Parks and Cemeteries
South	Industrial	Rennies Protea (Logistics and Transport)
West	Industrial	Alistair Logistics and Scrap Salvage
North	Industrial	Stone Marine Services

#### ***Implications and Impacts***

The site is situated in an area zoned mainly for industrial purposes. Fuel retail facilities are common within industrial areas and are allowed by the Walvis Bay Municipality's Town Planning Scheme. No significant land use impact is expected on nearby establishments.

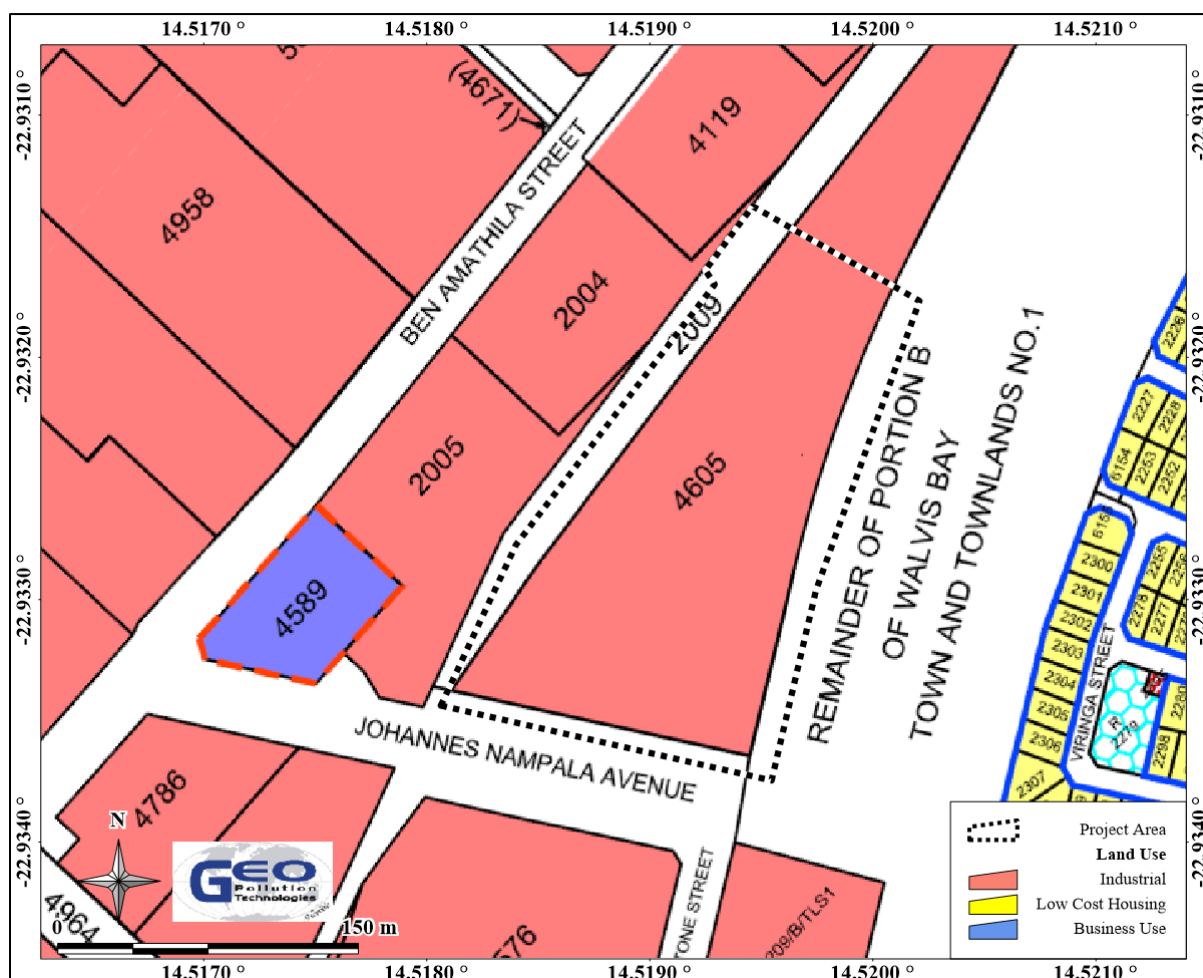


Figure 4. Surrounding land use

## 7.2 CLIMATE

Walvis Bay is centrally located on the Namibian coastline in the arid Namib Desert. The arid conditions are a result of dry descending air and upwelling of the cold Benguela Current.

Namibia is situated within an anti-cyclone belt of the Southern Hemisphere. Winds generated from the high-pressure cell over the Central Ocean blow from a southerly direction when they reach the Namibian coastline. As the Namibian interior is warm (particularly in summer), localised low-pressure systems are created which draws the cold southerly winds towards the inland desert areas. These winds manifest themselves in the form of strong prevailing south-westerly winds, which range from an average of 20 knots (37 km/h) during winter months to as high as 60 knots (110 km/h) during the summer. Winds near Walvis Bay display two main trends; high velocity and frequency south to south-westerly winds in summer and high velocity, low frequency east to north-easterly winds during winter. During winter, the east winds generated over the hot Namib Desert have a strong effect on temperature, resulting in temperature in the upper 30's degrees Celsius and tend to transport plenty of sand.

Thick fog or low stratus clouds are a regular occurrence in Walvis Bay. This is due to the influence of the Benguela Current and forms the major source of water for the succulent and lichen flora in the Namib Desert. Variation in annual rainfall is very high and most communities within this environment are dependent on regular fog occurrences. Months with the highest likelihood of rainfall is January to April.

**Table 6. Summary of Climate Data for Walvis Bay (Atlas of Namibia)**

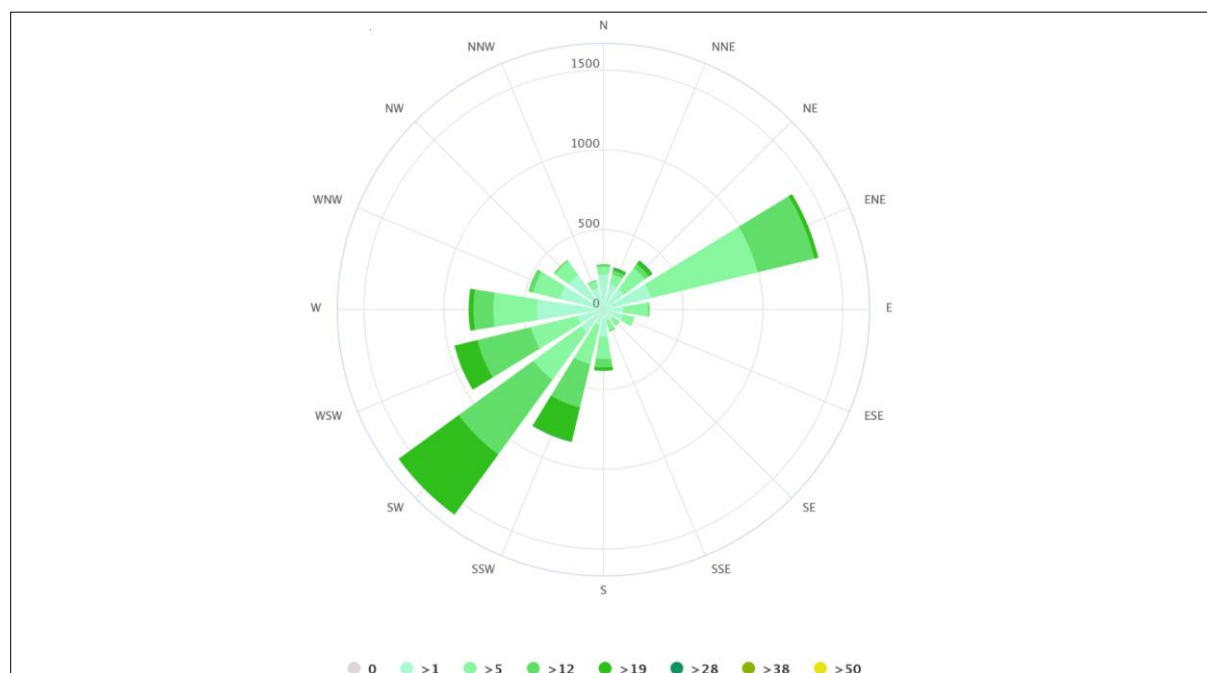
Table 6: Summary of Climate Data for Waikiki Bay (Peak of Rainfall)

Average annual rainfall (mm/a)	0-50
Variation in annual rainfall (%)	>100
Average annual evaporation (mm/a)	2,800-3,000
Water deficit (mm/a)	1,901-2,100
Average annual temperatures (°C)	18-19

Average Monthly Rainfall (mm)											
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0.2	0.3	0.5	0.8	1.1	0.4	6.3	5.4	13.1	4.2	1.1	0.9

Average Monthly Rainfall (mm)

Month	Rainfall (mm)
Jul	0.2
Aug	0.3
Sep	0.5
Oct	0.8
Nov	1.1
Dec	0.4
Jan	6.3
Feb	5.4
Mar	13.1
Apr	4.2
May	1.1
Jun	0.9

**Figure 5. Monthly Average Rainfall****Figure 6. Wind rose (Meteoblue, 2018)*****Implications and Impacts***

Water is a scarce and valuable resource in Namibia and Walvis Bay is characterized by low and extremely variable seasonal rainfall. This makes water an extremely vulnerable resource. The fuel retail facility must meet all prescribed SANS requirements and therefore should not pose any environmental threat due to Namibia's climatic conditions. Water resources would thus be safe under typical conditions and expected extremes. The operations of the facility should not be negatively affected by the typical weather experienced in Walvis Bay.



### 7.3 CORROSIVE ENVIRONMENT

Walvis Bay is located in a very corrosive environment, which may be attributed to the frequent salt-laden fog, periodic winds and abundance of aggressive salts (dominantly NaCl and sulphates) in the soil. The periodic release of hydrogen sulphide (H<sub>2</sub>S) from the ocean is expected to contribute to corrosion (see Table 6 for corrosion comparison data with other centres).

The combination of high moisture and salt content of the surface soil can lead to rapid deterioration of subsurface metal (e.g. pipelines) and concrete structures. Chemical weathering of concrete structures due to the abundant salts in the soil is a concern.

**Table 7. Average annual corrosion rate for various metals in different locations in southern Africa (from Nickel Development Institute: Stainless Steels in Architecture, Building and Construction. <http://www.nickelinstitute.org>)**

	Pretoria CSIR	Durban Bay	Cape Town Docks	Durban Bluff	Walvis Bay	Sasolburg
<b>Environment</b>						
Location Type	Rural, Very Low Pollution	Marine, Moderate Pollution	Marine, Moderate Pollution	Severe Marine, Moderate or Low Pollution	Severe Marine, Low Pollution	Industrial High Pollution
SO <sub>2</sub> Range µg/m <sub>3</sub>	6-20	10-55	19-39	10-47	NA	NA
Fog days/year	NA	NA	NA	NA	113.2	NA
Avg. rainfall (mm/year)	146	1,018	508	1,018	8	677
Relative humidity range %	26-76	54-84	52-90	54-84	69-96	49-74
Temp. Range °C	6-26	16-27	9-25	16-27	10-20	5-20
Unpainted galvanized steel life, years	5-15	3-5	3-7	3-5	0.6-2	5.-15
<b>Annual Corrosion Rate (mm/year)</b>						
<b>Stainless Steel</b>						
Type 316	0.000025	0.000025	0.000025	0.000279	0.000102	NA
Type 304	0.000025	0.000076	0.000127	0.000406	0.000102	NA
Type 430	0.000025	0.000406	0.000381	0.001727	0.000559	0.000107
<b>Aluminium Alloys</b>						
AA 93103	0.00028	0.00546	0.00424	0.01946	0.00457	0.00281
AA 95251	0.00033	0.00353	0.00371	0.01676	0.00417	NA
AA 96063	0.0028	0.00315	0.00366	0.020	0.00495	NA
AA 96082	0.00033	0.00366	0.0034	0.02761	0.00587	NA
AA 85151	NA	NA	NA	0.0246	0.00375	0.00317
<b>Copper</b>	0.00559	0.0094	0.00711	0.0246	0.0384	0.014
<b>Zinc</b>	0.0033	0.0231	0.029	0.111	NA	0.0152
<b>Weathering Steel</b>	0.0229	0.212	0.0914	0.810	1.150	0.107
<b>Mild Steel</b>	0.0432	0.371	0.257	2.190	0.846	0.150

#### **Implications and Impacts**

Corrosion levels may be high and must be kept in mind when planning the maintenance of the storage tanks and related infrastructure as well as for general maintenance.



#### 7.4 TOPOGRAPHY AND DRAINAGE

Walvis Bay is located in the Central Western Plain of Namibia. The Kuiseb River forms the southern boundary of this landscape group, with the Namib Dune Field being present south of the Kuiseb River. A bay is formed by a peninsula commonly known as Pelican Point. On the southern part of the bay is a lagoon which used to be the mouth of the Kuiseb River. Dune migration however forced the flow of the Kuiseb River to the north. This flow was stopped through the construction of a flood control wall to prevent flooding of the town of Walvis Bay, thus forcing the flood waters to move through the dune area to the lagoon. The Kuiseb River now rarely reaches the lagoon.

The topography is generally flat with a local gentle downward slope in a northerly direction. Drainage is poorly developed due to the lack of rainfall <50 mm/annum received in the area. A dune field is present southeast of Walvis Bay and also further to the northeast. These dunes generally migrate in a northerly direction. Further inland is the gravel plains of the central areas of the Namib Naukluft Park. Surface water around Walvis Bay is limited to the marine salt pans, lagoon and ocean as well as a man-made wetland formed as a result of the sewage treatment works. The site and surrounding areas are generally flat.



Figure 7. Drainage direction and slope

#### *Implications and Impacts*

Any pollutants that are not contained and are transported via surface water flow will be transported out of the site via the storm water drainage lines and potentially pollute the surrounding environment and the Atlantic Ocean. Therefore, the storage and use of fuel must be strictly controlled according to SANS 10089 standards.

## 7.5 GEOLOGY AND HYDROGEOLOGY

Northerly dune migration is forcing the Kuiseb River in a northerly direction, with Kuiseb River paleochannels being present as far south as Sandwich Harbour.

Following the breakup of West-Gondwana during the early Cretaceous (130 – 135 Ma ago), continental uplift took place, enhancing erosional cutback and the formation of the Namibian Escarpment. A narrow pediplain formed, mainly over Damara Age rocks. The South Central started filling in over the pediplain, with marine conditions established around 80 Ma ago. Towards the end of the Cretaceous (70 – 65 Ma ago) a relative level surface was created, on which later deposition of sediments took place. Marine deposition took place in the parts covered by the newly formed South Central Ocean, while terrestrial deposits took place on land. Further continental uplift moved the shoreline to its present position.

Northwards migration of sand covered parts of the exposed marine deposits, with Kuiseb floods also depositing material over the marine sediments. Depth to bedrock in Walvis Bay is expected to be deeper than 40 m below surface. Based on previous work conducted in the area, it is expected that the sediments under the project area would consist of medium to coarse grain sand with thin lenses of more clayey material and layers of shell material.

Groundwater in the area is expected less than 2 m below surface and most probably related to seawater intrusion.

### *Implications and Impacts*

Groundwater is not utilised in the area. Pollution of the groundwater is however still prohibited. Spill control structures installed and maintained to SANS specifications or better would successfully prevent pollution of groundwater, surface water or soil. Shallow groundwater will lead to rapid lateral spreading of hydrocarbon products spilled or leaked. This will further have potential impact on underground utilities and may cause impacts on neighbouring properties.

## 7.6 PUBLIC WATER SUPPLY

Public water supply to Walvis Bay and the surrounding developments is provided by NamWater from the NamWater Kuiseb Water Supply Scheme.

### *Implications and Impacts*

The fuel retail facility is not expected to have an impact on public water supply. Furthermore it must adhere to SANS standards which should successfully prevent any spills or leaks.

## 7.7 FAUNA AND FLORA

The site is located within a developed industrial area and has been cleared of all vegetation. No animals of particular significance is expected on site and will mostly include birds as a result of the nearby fish factories. The site is situated 550 m east of the Atlantic Ocean and fishing harbour.

Of note nearby (> 4 km southwest) is the Walvis Bay Lagoon, the salt works and the southern part of the bay west of the lagoon, which are the key components of the 12,600 ha Ramsar site (Wetland of International Importance). It is important both as an over-wintering area for Palaearctic migrant wader species as well as for African species such as Greater and Lesser Flamingos, Great White Pelican and Chestnut-Banded Plovers. The sewerage ponds, situated about 3 km southeast of the study area, are regarded as sensitive manmade wetlands. Although a manmade fresh water source, they are an attraction for pelicans and flamingos. These wetlands also support 53% of the duck and geese population in the area. The wetland is formed by the constant inflow of semi-purified water and supports extensive stands of reeds. There is also a flight path for birds between the sewerage ponds and the offshore bird breeding platform (Ghwano Island) 8 km north of the site.

***Implications and Impacts***

The proposed fuel retail facility is located within an already disturbed industrial area. Thus no immediate threat to biodiversity in the area is expected, however, uncontrolled pollution may and can cause damage to any biodiversity surrounding the site. Lighting used at night may blind or disorientate birds like flamingos that fly at night.

**7.8 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS**

At local level Walvis Bay has an urban population size of 62,096 (Namibia Statistics Agency, 2014) although the current estimate is around 90,000 to 100,000. Walvis Bay is the principal port of Namibia, and is an import/export facility for processed fish, mining products and beef. The area is linked to Namibia's air, rail and road network, making its port well situated to service Zambia, Zimbabwe, Botswana, Southern Angola and South Africa. The fishing industry is the major employer of low skilled workers on a permanent and seasonal basis. The total employment of this sector is estimated at 2% of the total Namibian workforce. Economic activities relate mostly to businesses within the area and around the site.

**Table 8. Demographic Characteristics of Walvis Bay, the Erongo Region and Nationally (Namibia Statistics Agency, 2011)**

	<b>Walvis Bay</b>	<b>Erongo Region</b>	<b>Namibia</b>
<b>Population (Males)</b>	30,500	79,823	1,021,912
<b>Population (Females)</b>	29,000	70,986	1,091,165
<b>Population (Total)</b>	62,096	150,809	2,113,077
<b>Unemployment (15+ years)</b>	N/A	22.6%	33.8%
<b>Literacy (15+ years)</b>	N/A	96.7%	87.7%
<b>Education at secondary level (15+ years)</b>	N/A	71.8%	51.2%
<b>Households considered poor</b>	N/A	5.1%	19.5%

***Implications and Impacts***

The facility will provide employment to people from the area. Some skills development and training will also benefit employees during the operational phase.

**7.9 HERITAGE, CULTURAL AND ARCHAEOLOGICAL ASPECTS**

There are no churches, mosques or related buildings in close proximity to the site. No known archaeological resources have been noted in the vicinity since the urbanisation of the area. No other structures, sites or spheres of heritage of cultural significance was determined to be in close proximity to the site.

**8 PUBLIC CONSULTATION**

Consultation with the public forms an integral component of an environmental assessment investigation and enables interested and affected parties (IAPs) e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the facility and to identify additional issues which they feel should be addressed in the environmental assessment.

Public participation notices were advertised twice in two weeks in the national papers The Namibian Sun and Die Republikein on the 18<sup>th</sup> and 25<sup>th</sup> of February 2020 respectively. A site notice was placed on site and notification letters delivered to neighbours. The Walvis Bay Municipality was also notified and a meeting was held to discuss the project. Minutes of the meeting is included and responded to in Appendix A of the report. See Appendix A for proof of the public participation processes, registered IAPs and municipal feedback.

## 9 MAJOR IDENTIFIED IMPACTS

During the scoping exercise a number of potential environmental impacts have been identified. The following section provides a brief description of the most important of these impacts.

### 9.1 HYDROCARBON POLLUTION

This section describes the most pertinent pollution impacts that are expected from the facility and its operations. Groundwater and soil pollution from hydrocarbon products are major issues associated with the storage and handling of such products. Both forms of pollution are prohibited in Namibia.

When a release of hydrocarbon products takes place to the soil, the Light Non-Aqueous Phase Liquids (LNAPL) will infiltrate into the soil and start to migrate vertically. LNAPL transport in the subsurface environment occurs in several phases, including bulk liquid, dissolved, and vapour phases. Mechanisms that influence transport include the physicochemical properties of the specific compounds present such as density, vapour pressure, viscosity, and hydrophobicity, as well as the physical and chemical properties of the subsurface environment, including geology and hydrogeology. Hydrocarbon liquids are typically complex mixtures composed of numerous compounds, each with its own individual physicochemical and, therefore, transport properties.

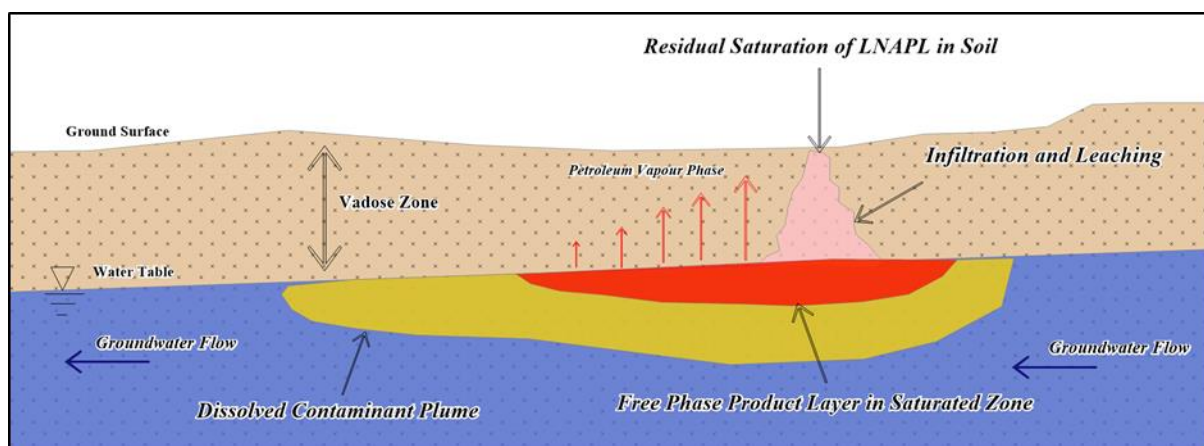
If small volumes of spilled LNAPL enter the unsaturated zone (i.e. vadose zone), the LNAPL will flow through the central portion of the unsaturated pores until residual saturation is reached. A three-phase system consisting of water, LNAPL, and air is formed within the vadose zone. Infiltrating water dissolves the components within the LNAPL (e.g., benzene, xylene, and toluene) and transports them to the water table. These dissolved contaminants form a contaminated plume radiating from the area of the residual product. Many components found in LNAPL are volatile and can partition into soil air and be transported by molecular diffusion to other parts of the aquifer. As these vapours diffuse into adjoining soil areas, they may partition back into the water phase and transfer contamination over wider areas. If the soil surface is relatively impermeable, vapours will not diffuse across the surface boundary and concentrations of contaminants in the soil atmosphere may build up to equilibrium conditions. However, if the surface is not covered with an impermeable material, vapours may diffuse into the atmosphere.

If large volumes of LNAPL are spilled, the LNAPL flows through the pore space to the top of the capillary fringe of the water table. Dissolved components of the LNAPL precede the less soluble components and may change the wetting properties of the water, causing a reduction in the residual water content and a decrease in the height of the capillary fringe.

Since LNAPL are lighter than water, it will float on top of the capillary fringe. As the head formed by the infiltrating LNAPL increases, the water table is depressed and the LNAPL accumulate in the depression. If the source of the spilled LNAPL is removed or contained, LNAPL within the vadose zone continue to flow under the force of gravity until reaching residual saturation. As the LNAPL continue to enter the water table depression, it spread laterally on top of the capillary fringe. The draining of the upper portions of the vadose zone reduces the total head at the interface between the LNAPL and the groundwater, causing the water table to rebound slightly. The rebounding water displaces only a portion of the LNAPL because the LNAPL remain at residual saturation. Groundwater passing through the area of residual saturation dissolves constituents of the residual LNAPL, forming a contaminant plume. Water infiltrating from the surface also can dissolve the residual LNAPL and add to the contaminant load of the aquifer.

Decrease in the water table level from seasonal variations may lead to dropping of the pool of LNAPL. If the water table rises again, part of the LNAPL may be pushed up, but a portion remains at residual saturation below the new water table. Variations in the water table height, therefore, can spread LNAPL over a greater thickness of the aquifer, causing larger volumes of aquifer materials to be contaminated.

Hydrocarbon products do biodegrade in the subsurface, although the effectiveness of this process depends on subsurface conditions. The type of hydrocarbon product plays a further role in the duration of biodegradation, with the longer chain components taking much longer to biodegrade.



**Figure 8. Conceptual LNAPL Release to the Vadose Zone**

## 9.2 NOISE IMPACTS

Construction noise will be related to concrete mixing, excavations and vehicles accessing the site. Some noise will exist due to vehicles accessing the site for delivering and collecting fuel during operations.

## 9.3 TRAFFIC IMPACTS

During operations some traffic impacts can be expected in the street and vicinity of the facility. Traffic flow may be impacted by trucks delivering fuel to the site and trucks waiting to be refuelled. The facility will in return have a positive impact on traffic flow in other areas of the town.

## 9.4 FIRE

Diesel will be stored at the site in large volumes. Although diesel is less flammable than more volatile fuels such as unleaded petrol, it still poses a fire risk if not handled according to Material Safety Data Sheet instructions and SANS requirements.

## 9.5 HEALTH

Hydrocarbons are carcinogenic and dermal contact and inhalation of fumes should be prevented.

## 9.6 SOCIO-ECONOMIC IMPACTS

Operations of the fuel retail facility will provide some employment opportunities to residents of Walvis Bay. The operational phase creates permanent employment opportunities and some training and skills development takes place.

# 10 ASSESSMENT AND MANAGEMENT OF IMPACTS

The purpose of this section is to assess and identify the most pertinent environmental impacts that are expected from the construction, operational and potential decommissioning activities of the proposed facility. An EMP based on these identified impacts are also incorporated into this section.

For each impact an environmental classification was determined based on an adapted version of the Rapid Impact Assessment Method (Pastakia, 1998). Impacts are assessed according to the following categories: Importance of condition (A1); Magnitude of Change (A2); Permanence (B1); Reversibility (B2); and Cumulative Nature (B3) (see Table 9)

Ranking formulas are then calculated as follow:

$$\text{Environmental Classification} = A1 \times A2 \times (B1 + B2 + B3)$$

The environmental classification of impacts is provided in Table 10.

The probability ranking refers to the probability that a specific impact will happen following a risk event. These can be improbable (low likelihood); probable (distinct possibility); highly probable (most likely); and definite (impact will occur regardless of prevention measures).

**Table 9. Assessment Criteria**

Criteria	Score
<b>Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect</b>	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
<b>Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition</b>	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
<b>Permanence (B1) – defines whether the condition is permanent or temporary</b>	
No change/Not applicable	1
Temporary	2
Permanent	3
<b>Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition</b>	
No change/Not applicable	1
Reversible	2
Irreversible	3
<b>Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion.</b>	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

**Table 10. Environmental Classification (Pastakia 1998)**

Environmental Classification	Class Value	Description of Class
72 to 108	5	Extremely positive impact
36 to 71	4	Significantly positive impact
19 to 35	3	Moderately positive impact
10 to 18	2	Less positive impact
1 to 9	1	Reduced positive impact
0	-0	No alteration
-1 to -9	-1	Reduced negative impact

-10 to -18	-2	Less negative impact
-19 to -35	-3	Moderately negative impact
-36 to -71	-4	Significantly negative impact
-72 to -108	-5	Extremely Negative Impact

### 10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the facility is 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 operation of the facility. This section of the report can act as a stand-alone document. 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 construction activities (upgrades, maintenance, etc.) and operations of the facility;
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- ◆ 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.

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

As depicted in the tables below, impacts related to the operational phase are expected to mostly be of medium to low significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature. Due to the nature of the surrounding areas, cumulative impacts are possible and include groundwater contamination and traffic impacts.



### 10.1.1 Planning

During the phases of planning for construction, operations and decommissioning of the proposed facility, it is the responsibility of the 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 construction activities and operations of the project are in place and remains valid. This includes the petroleum products licence and municipal approvals.
- ◆ Ensure that design parameters, where required, is approved by relevant authorities prior to construction of the facility. This includes approval from the Municipality for the construction of the driveway and refuelling area outside of the property boundaries.
- ◆ 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 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:
  - Risk management / mitigation / EMP/ 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.
- ◆ Establish and maintain a fund for future ecological 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 reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- ◆ Submit bi-annual reports to the MET to allow for environmental clearance certificate renewal after three years. This is a requirement by MET.
- ◆ Appoint a specialist environmental consultant to update the EA and EMP and apply for renewal of the environmental clearance certificate prior to expiry.



### 10.1.2 Skills, Technology and Development

During various phases of the facility, training will be provided to a portion of the workforce to be able to operate and maintain various features of a fuel retail facility according to the required standards. Skills are transferred to an unskilled workforce for general tasks. The technology required for the development of the facility is often new to the local industry, aiding in operational efficiency. Development of people and technology are key to economic development.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment, technological development and transfer of skills	2	1	2	3	1	12	2	Probable
Daily Operations	Employment, technological development and transfer of skills	2	1	2	3	2	14	2	Definite
Indirect Impacts	Transfer of skills and technological development	2	1	2	3	3	16	2	Definite

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

#### Actions

##### **Mitigation:**

- ◆ If the skills exist locally, contractors must first be sourced from the town, then the 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.
- ◆ The proponent must employ Namibians where possible. Deviations from this practise should be justified appropriately.

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

- ◆ Proponent
- ◆ Contractors

##### **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.

### 10.1.3 Revenue Generation and Employment

A change in land use will lead to changes in the way revenue is generated and paid to the national treasury. An increase of skilled and professional labour will take place due to the construction and operations of the facility. Employment will be sourced locally while skilled labour/contractors may be sourced from other regions.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment and contribution to local economy	2	1	2	2	2	12	2	Definite
Daily Operations	Employment contribution to local economy	3	1	3	3	2	24	3	Definite
Indirect Impacts	Decrease in unemployment, contribution to local economy	3	1	3	3	3	27	3	Definite

**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:**

- ◆ Summary report based on employee records.

#### 10.1.4 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phase. The scale of the project is limited and it is not foreseen to create a change in the demographic profile of the local community. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, associated with the trucking industry and possible foreign clients collecting fuel. An increase in foreign people in the area may potentially increase the risk of criminal and socially/culturally deviant behaviour.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	In-migration and social ills related to unemployment	2	-1	1	1	2	-8	-1	Probable
Daily Operations	In-migration and social ills related to unemployment	2	-1	1	2	2	-10	-2	Probable
Indirect Impacts	The spread of disease	2	-1	2	2	2	-12	-2	Probable

**Desired Outcome:** To prevent the in-migration and growth in informal settlements, prevent the spread of communicable disease and prevent / discourage socially deviant behaviour.

#### **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.
- ◆ Prohibit illegal parking on and around the site.

##### **Mitigation:**

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

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

- ◆ Proponent

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

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

### 10.1.5 Fuel Supply

The operation of the facility will aid in securing fuel supply to the transport industry and businesses in Walvis Bay.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Contribution to economy, contribution to the fuel supply in Walvis Bay	3	1	3	2	2	21	3	Definite
Indirect Impacts	Secure supply in fuel allowing travel and trade	2	1	2	2	2	12	2	Definite

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

#### **Actions**

##### **Mitigation:**

- ◆ Ensure compliance to the petroleum regulations of Namibia.
- ◆ Proper management to ensure constant supply.
- ◆ Record supply problems and take corrective actions.

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

- ◆ Proponent

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

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

### 10.1.6 Traffic

The facility may increase the traffic flow to the site through the provision of fuel. An increase in traffic to the and from the site may increase congestion and increase the risk of incidents and accidents. In turn, by providing fuel to trucks in the industrial area, where cargo is collected, the amount of trucks needing to refuel in town will be reduced, mitigating traffic impacts at the already congested fuel retail facilities in town.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Delivery of equipment and building supplies	2	-1	2	2	2	-12	-2	Probable
Daily Operations	Increase traffic, road wear and tear and accidents	2	-1	2	2	2	-12	-2	Probable

**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.

##### **Mitigation:**

- ◆ Tanker trucks delivering fuel and trucks collecting fuel should not be allowed park within Johannes Nampala Avenue or to obstruct any traffic of entrances / exists of facilities in surrounding streets.
- ◆ If any traffic impacts are expected, traffic management should be performed to prevent these.
- ◆ The placement of signs to warn and direct traffic will mitigate traffic impacts.
- ◆ Trucks entering and existing the facility should not be allowed to make sharp turns on Johannes Nampala Avenue, as this may result in traffic issues and damage to the road infrastructure.

##### **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 of all incidents reported, complaints received, and action taken.

### 10.1.7 Health, Safety and Security

Activities associated with the construction and operational phases are reliant on human labour and therefore exposes them to health and safety risks. Activities such as the operation of machinery and handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), poses the main risks to employees. Security risks are related to unauthorized entry, theft and sabotage.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Physical injuries, exposure to chemicals and criminal activities	1	-2	3	3	1	-14	-2	Probable
Daily Operations	Physical injuries, exposure to chemicals and criminal activities	1	-2	3	3	2	-16	-2	Probable

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

#### Actions

##### **Prevention:**

- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- ◆ Equipment that will be locked away on site must be 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.
- ◆ All Health and Safety standards specified in the Labour Act should be complied with.
- ◆ Implementation of maintenance register for all equipment and fuel/hazardous substance storage areas.
- ◆ Pedestrian management and safe walkways should be present to prevent safety risk to pedestrians travelling along Johannes Nampala Avenue.

##### **Mitigation:**

- ◆ 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, especially during cash in transit activities.
- ◆ Reduce the amount of cash kept on site to reduce the risk of robberies.
- ◆ Strict security that prevents unauthorised entry during construction phases.

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

- ◆ Proponent
- ◆ Contractors

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

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

### 10.1.8 Fire

Operational and maintenance activities may increase the risk of the occurrence of fires. The site is located developed area which may increase the difficulty of fighting fires. The facility will only store diesel and lubricants, which is not as flammable as more volatile fuels.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Fire and explosion risk	1	-2	2	2	1	-10	-2	Probable
Daily Operations	Fire and explosion risk	1	-2	2	2	1	-10	-2	Probable

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

#### Actions:

##### **Prevention:**

- ◆ Ensure all chemicals are stored according to MSDS and SANS instructions.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Clean all spills / leaks.
- ◆ 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).
- ◆ Follow SANS standards for design, operation and maintenance of the facility, this includes refuelling locations and distances from boundaries.
- ◆ All dispensers must be equipped with devices that cut fuel supply during fires.
- ◆ The proponent should liaise with the local Fire Brigade to ensure that all fire requirements are met. This includes, but is not limited to SANS 10400 T: 2011.

##### **Mitigation:**

- ◆ A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan.
- ◆ 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).
- ◆ Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices).

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

- ◆ Proponent
- ◆ Contractors

##### **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 of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

### 10.1.9 Air Quality

Fuel vapours are released into the air during refuelling of bulk storage tanks as well as at filling points. Prolonged exposure may have carcinogenic effects. Dust may be generated should any construction take place.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive dust generated from maintenance and upgrade activities	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Fuel vapours	1	-1	2	2	1	-5	-1	Probable

**Desired Outcome:** To prevent health impacts and minimise the dust generated.

#### **Actions**

##### **Mitigation:**

- ◆ Personnel issued with appropriate masks where excessive dust or vapours are present.
- ◆ A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary e.g. dust suppression.
- ◆ Employees should be coached on the dangers of fuel vapours.
- ◆ Vent pipes must be properly placed as per SANS requirements.

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

- ◆ Proponent
- ◆ Contractors

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

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



### 10.1.10 Noise

Construction (maintenance and upgrade) may generate noise. During operations, noise pollution will exist due to vehicles accessing the site to offload fuel or refuel. The facility will operate daily from 06:00 to 22:00. The facility is however situated in an industrial area, thus noise impacts are not expected to negatively affect neighbouring receptors and are mostly related to hearing loss.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise generated from construction activities – nuisance and hearing loss	1	-1	2	2	1	-5	-1	Probable
Daily Operations	Noise generated from the operational activities – nuisance	1	-1	2	2	2	-6	-1	Probable

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

#### Actions

##### **Prevention:**

- ◆ Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.
- ◆ Keep volume of public address systems on a level where neighbours are not impacted on.
- ◆ Manage noise caused by clients – loud music etc.

##### **Mitigation:**

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

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

- ◆ Proponent
- ◆ Contractors

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

- ◆ WHO Guidelines.
- ◆ Maintain a complaints register.
- ◆ Report on complaints and actions taken to address complaints and prevent future occurrences.

### 10.1.11 Waste production

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

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive waste production, littering, illegal dumping, contaminated materials	1	-2	2	2	2	-12	-2	Definite
Daily Operations	Excessive waste production, littering, contaminated materials	1	-2	2	2	2	-12	-2	Definite

**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 disposal storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of waste.
- ◆ All regulation and by-laws relating to environmental health should be adhered to.

##### **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).
- ◆ The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of appropriately. Surfactants (soap) may not be allowed to enter the oil water separator.
- ◆ See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the municipality 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.
- ◆ The oil water separator must be regularly inspected and all hydrocarbons removed once detected. Outflow water must comply with effluent quality standards.
- ◆ All information and reporting to be included in a bi-annual report.

### 10.1.12 Ecosystem and Biodiversity Impact

The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. No significant impact on the biodiversity of the area is predicted as the site is currently void of natural fauna and flora. Impacts are therefore mostly related to pollution of the environment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and flora. Loss of biodiversity	1	-1	3	2	2	-7	-1	Improbable
Daily Operations	Impact on fauna and flora. Loss of biodiversity	1	-1	3	2	2	-7	-1	Improbable

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

#### **Actions.**

##### **Mitigation:**

- ◆ Report any extraordinary sightings to the Ministry of Environment and Tourism.
- ◆ 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.
- ◆ Direct all lights down to working surfaces and use minimal lighting at night.
- ◆ The establishment of habitats and nesting sites at the facility should be avoided where possible.

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

- ◆ Proponent

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

- ◆ All information and reporting to be included in a bi-annual report.

### 10.1.13 Groundwater, Surface Water and Soil Contamination

Operations entail the storage and handling of various hydrocarbons (such as fuels and lubricants) which present a contamination risk. Contamination may either result from failing storage facilities, or spills and leaks associated with fuel handling.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contamination from hazardous material spillages and hydrocarbon leakages	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Contamination from hazardous material spillages and hydrocarbon leakages	2	-1	2	2	1	-10	-2	Probable

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

#### Actions

##### **Prevention:**

- ◆ 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.
- ◆ 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 litre 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.
- ◆ Any spill must be cleaned up immediately.
- ◆ The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of at a suitably classified hazardous waste disposal facility.
- ◆ Surfactants (soap) may not be allowed to enter the oil water separator e.g. soap usage on spill control surfaces.

#### Responsible Body:

- ◆ Proponent
- ◆ Contractors

#### Data Sources and Monitoring:

- ◆ 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.

#### 10.1.14 Visual Impact

This impact is not only associated with the aesthetics of the site, but also the structural integrity. The facility will form part of the industrial landscape associated with the area. The site should be kept clean, tidy and maintained to ensure it remains aesthetically pleasing and does not add the urban decay.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Aesthetic appearance and integrity of the site	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Aesthetic appearance and integrity of the site	1	-1	2	2	2	-6	-1	Probable

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

#### **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.

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

- ◆ Proponent
- ◆ Contractors

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

- ◆ A maintenance record should be kept.
- ◆ A report should be compiled of all complaints received and actions taken.

### 10.1.15 Impacts on Utilities and Infrastructure

Any damage caused to existing infrastructure and services supply like roads, pipelines, water and electricity where present. The proposed facility will require trucks delivering / collecting fuels to cross the underground fuel pipeline running towards the tank farms. Damage might be incurred to this pipeline should the correct infrastructure not be in place.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction Phase	Disruption of services and damage to infrastructure	2	-2	2	2	1	-20	-3	Probable
Daily Operations	Disruption of services and damage to infrastructure	2	-1	2	2	1	-10	-2	Improbable

**Desired Outcome:** No impact on utilities and infrastructure.

#### **Actions**

##### **Prevention:**

- ◆ Appointing qualified and reputable contractors is essential.
- ◆ The contractor must determine exactly where amenities and pipelines are situated before construction commences (utility clearance e.g. ground penetrating radar surveys).
- ◆ Where trucks will cross underground pipelines, the necessary infrastructure should be in place to ensure pipelines are not damaged.
- ◆ Liaison with the suppliers of services is essential.

##### **Mitigation:**

- ◆ Emergency procedures for corrective action available on file.

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

- ◆ Proponent
- ◆ Contractors

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

- ◆ A report should be compiled every 6 months of all incidents that occurred and corrective action taken.

### 10.1.16 Cumulative Impact

Possible cumulative impacts associated with the operational phase include increased traffic in the area. This will have a cumulative impact on traffic flow on surrounding streets.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	The build-up of minor impacts to become more significant	2	-2	2	2	2	-24	-3	Probable

**Desired Outcome:** To minimise cumulative all 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 biannual 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.

## 10.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the environmental clearance certificate. Decommissioning was however assessed as construction activities include modification and decommissioning. 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. 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 would not be used for future purposes. The Environmental Management Plan for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and implement guidelines and mitigation measures.

## 10.3 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

## 11 CONCLUSION

The fuel retail facility will not only have a positive impact on Walvis Bay, but also on the transport sector operational in the vicinity, see Table 11. In addition to reliable and convenient fuel supply, the fuel retail facility will contribute locally to skills transfer and training which in turn develops the local workforce during operations of the facility.

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 WHO 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.

The EMP (Section 10) should be used as an on-site reference document for the operations of the facility. Parties responsible for transgressing of the environmental management plan 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 environmental management plan. All operational personnel must be taught the contents of these documents.



Should the Directorate of Environmental Affairs (DEA) of the MET 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. Focus could be placed on Section 10, which includes an EMP for this project. It should be noted that the assessment process's aim is not to stop the proposed activity, or any of its components, but to rather determine its impact and guide sustainable and responsible development as per the spirit of the EMA.

**Table 11. Impact Summary Class Values**

Impact Category	Impact Type	Construction	Operations
<i>Positive Rating Scale: Maximum Value</i>		5	5
<i>Negative Rating Scale: Maximum Value</i>		-5	-5
EO	Skills, Technology and Development	2	2
EO	Revenue Generation and Employment	2	3
SC	Demographic Profile and Community Health	-1	-2
EO	Fuel Supply		3
SC	Traffic	-2	-2
SC	Health, Safety and Security	-2	-2
PC	Fire	-2	-2
PC	Air Quality	-1	-1
PC	Noise	-1	-1
PC	Waste Production	-2	-2
BE	Ecosystem and Biodiversity Impact	-1	-2
PC/BE	Groundwater, Surface Water and Soil Contamination	-2	-2
SC	Visual Impact	-1	-1
PC/SC	Impacts on Utilities, Infrastructure and Seabed Scouring	-3	-2
PC	Cumulative Impact		-3

BE = Biological/Ecological    EO = Economical/Operational    PC = Physical/Chemical    SC = Sociological/Cultural

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## **Appendix A: Proof of Public Consultation**



**Notified Interested and or Affected Parties**

<b>Designation/subdivision</b>	<b>Contact Person</b>
<b>Notified Authorities</b>	
Walvis Bay Municipality (WBM) – Office of the Mayor	Lelanie Coetzer
WBM – Environmental Department	John Esterhuizen
WBM – Environmental Department	David Uushona
WBM –Town Planning	<u>Ephraim Nambahu</u>
WBM –Town Planning	Jamie-Lee Lawrence
WBM – Technician, water	Kapalesa Katjomuise
WBM – Environmental Department	Lovisa Hailaula
WBM – Hazardous Waste Inspector	Riaan Archer
WBM – Health	Deville Dreyer
WBM – Fire protection	Tutaleni E Kathindi
WBM – Environmental Department	Nangula Amatsi
WBM – Environmental Department	Peter Etsebeth
<b>Notified IAPs</b>	
Municipality of Walvis Bay, Sector: Parks and Cemeteries	Madabela Howoses
Rennies Protea	Alta N. Mphahleni
Alistair Logistics	Thiaan Arangies
Stone Marine Services	Elizma Bosman
Erongo Logistics	Rodger Boon

**Registered IAPs**

<b>Designation/subdivision</b>	<b>Contact Person</b>
Transworld Cargo (Pty) Ltd	Anita Dreyer
Transworld Cargo (Pty) Ltd	Norbert Liebich
Transworld Cargo (Pty) Ltd	Olaf Liebich
Transworld Cargo (Pty) Ltd	Friederike Baur
Interested Party	Ms Dietlinde N Nakwaya
WBM – Environmental Department	David Uushona
WBM –Town Planning	<u>Ephraim Nambahu</u>
WBM –Town Planning	Jamie-Lee Lawrence
WBM – Technician, water	Kapalesa Katjomuise
WBM – Environmental Department	Lovisa Hailaula
WBM – Hazardous Waste Inspector	Riaan Archer
WBM – Health	Deville Dreyer
WBM – Fire protection	Tutaleni E Kathindi
WBM – Environmental Department	Nangula Amatsi
WBM – Environmental Department	Peter Etsebeth

**Minutes: Municipality of Walvis Bay Meeting**

TEL.: (+264-61) 257411 ♦ FAX.: (+264-61) 257411

CELL.: (+264-81) 1220082

PO Box 11073 ♦ WINDHOEK ♦ NAMIBIA

E-MAIL: gpt@thenamib.com

**Minutes of Meeting**

**Re:** Municipality Stakeholders Meeting: Environmental Assessment Scoping Report for the Construction and Operations of a Fuel retail facility in Johannes Nampala Avenue.

**Date:** Tuesday, 03 March 2020

**Time:** 10h00-10h40

**Venue:** Kuiseb Boardroom, Municipality of Walvis Bay WVE Management, Walvis Bay

**In attendance:**

WC	Wikus Coetzer	Geo Pollution Technologies
KK	Kapalea Katjomuise	Municipality of Walvis Bay – Technician, water
LH	Lovisa Hailaula	Municipality of Walvis Bay - Environmental Officer
RA	Riaan Archer	Municipality of Walvis Bay - Hazardous Waste Inspector
EN	Ephraim Nambahu	Municipality of Walvis Bay - Town Planning
DU	David Uushona	Municipality of Walvis Bay - Manager: SWEM
DD	Deville Dreyer	Municipality of Walvis Bay - Health
TT	Tuteleni E Kathindi	Municipality of Walvis Bay – Fire Protection
NA	Nangula Amatsi	Municipality of Walvis Bay – Environmental
PE	Peter Etsebeth	Municipality of Walvis Bay – SWEM

Ms. Nangula Amatsi welcomed the members present and opened the meeting.

Wikus Coetzer of Geo Pollution Technologies then proceeded with a presentation to provide background and information on the project and to elaborate on the proposed design and location of the facility. After the presentation the members present was invited to provide input to be considered in the EA and EMP. The following matters were discussed in detail:

LH	Mentioned that there is a pipeline running adjacent to the proposed driveway and refuelling area, further information was also requested on the shop mentioned.
WC	Noted that plans to include a shop was not finalised, and was included in the EIA to allow to proponent to construct a shop in the future, if they wish to. This section have however since been removed from the report.
DU	Recommended that the refuelling area should be within property boundaries, and not outside on municipal land as proposed. Operating outside of the boundaries poses risk to pedestrians, as that acts as a safe walkway to pedestrians.
WC	Discussed the reasons why the refuelling area was proposed on the outside, and not inside the property boundaries. This includes safety risk, traffic and ease of access.
DD	Further elaborated on the location of the pipeline, EN mentioned that there are barricades as well, and the concern is where trucks will be crossing the road, the current concrete slabs needs to be dug up and upgraded to accompany the additional traffic and area. It is recommended that the driveway and refuelling area be moved inside, and two driveways, for incoming and outgoing traffic be constructed with concrete slabs over the pipeline. He further noted that a big concern is trucks waiting in the roads to refuel, as this is an already congested area.
TK	Noted that trucks turning in the road will also be a concern, and that it might be impractical for a truck to turn there for refuelling.

Page 1 of 2

Directors:

P. Botha (B.Sc. Hons. Hydrogeology) (Managing)

WC	Mentioned that having the refuelling area at the proposed location will aid in this, as trucks will only enter and exit at a slight angle and will not be allowed to turn back to the way they came from.
DU	Once again recommended that the truck refuelling area as well as a waiting area be moved inside. PE elaborated on this and mentioned that the space inside the property can be utilised for a large parking and turning area.
EN	Recommended that Bruce Steward be contacted to get an understanding of the current zoning and planning for the site. He mentioned that any activities might take place inside the facility, there is however multiple restrictions which might come in play when construction is planned for outside of the property boundary.
DU	Recommended that the Environmental Scoping report advise that all activities of the facility be inside of the property boundaries. It was further elaborated that the road reserve in that area is important to allow for future widening of the road and allow for pedestrians to move freely.
WC	Mentioned that these concerns will be discussed with Namops, and moving all activities to the inside of the property will be included as a preferred alternative in the report.
DU	Stated that consent letters from the Municipality of Walvis Bay is required for all activities requiring an ECC, based on the Environmental Scoping report. He requested other members present to review to final draft report once forwarded to the, and comment where and if applicable on their specific sections. He further mentioned that with these meetings held with the Municipality to discuss the projects, the municipality and council have been effectively consulted and informed regarding the environmental scoping assessment for the project.

The meeting was concluded and no further comments were received.

**Proof of Notification: Neighbouring Properties**

**Public Consultation - Notification: Environmental Assessment for the Proposed  
Construction and Operation of a Fuel Retail Facility in Johannes Nampala Avenue  
Walvis Bay**

Name & Surname	Organisation / Address	Tel / Mobile	Email	Signature
Madabala Hwasej	Municipality Parks	Privacy Block	Privacy Block	Privacy Block
ALTA N. MPAHLENI	RENNIES PROTEA			
Thian Arangies	Alistair Logistics			
Elizma Boonem	Stone Marine			
Rodney Boonem	Energy Logistics			
Lebanie Coenja	Municipality			

Fuel Retail Facility – Walvis Bay – February 2020

Geo Pollution Technologies



**Proof of Municipal Notification**

TEL.: (+264-61) 257411 ♦ FAX.: (+264) 88626368

CELL.: (+264-81) 1220082

PO BOX 11073 ♦ WINDHOEK ♦ NAMIBIA

E-MAIL: gpt@thenamib.com

**To:** Interested and Affected Parties**10 February 2020**

**Re:** Environmental Scoping Assessment and Environmental Management Plan for the Construction and Operation of a Fuel Retail Facility in Johannes Nampala Avenue, Walvis Bay

Dear Sir/Madam

In terms of the Environmental Management Act (No 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice No 30 of 2012), notice is hereby given to all potential interested and/or affected parties that an applications will be made to the Environmental Commissioner for an Environmental Clearance Certificate for the following project:

**Project:** Environmental Scoping Assessment and Environmental Management Plan for the Construction and Operational Activities of a Fuel Retail Facility in Johannes Nampala Avenue, Walvis Bay.

**Proponent:** Namops Logistics (Pty) Ltd

**Environmental Assessment Practitioner:** Geo Pollution Technologies (Pty) Ltd

Namops Logistics plans to construct and operate a fuel retail facility on erf 4605 in Johannes Nampala Avenue, Walvis Bay. The proposed facility will supply diesel and lubricants to customers. Diesel will be supplied from four 64 m<sup>3</sup> aboveground storage tanks via dispensers on a forecourt area. General operations will involve the receipt of fuel from road tankers, dispensing fuel to vehicles, operations of a shop and related infrastructure and day to day administrative tasks.

Geo Pollution Technologies (Pty) Ltd was appointed by the proponent to conduct an Environmental Assessment for the proposed facility. As part of the assessment we consult with interested and affected parties. All Interested and/or Affected Parties (IAPs) are invited to register with the environmental consultant to receive further documentation and communication regarding the project. By registering, IAPs will be provided with an opportunity to provide input that will be considered in the drafting of the environmental assessment report and its associated management plan.

Please register as an IAP and provide comments by **05 March 2020**.

To register, please contact:

Email: [namops@thenamib.com](mailto:namops@thenamib.com)

Fax: 088-62-6368

Should you require any additional information please contact Geo Pollution Technologies at telephone 081-1452164 / 061-257411.

Thank you in advance.

Sincerely,

**Geo Pollution Technologies**

Wikus Coetzer  
Environmental Assessment Practitioner



Directors:

Page 1 of 2  
P. Botha (B.Sc. Hons. Hydrogeology) (Managing)

## Press Notice: The Namibian Sun 18 and 25 February 2020

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Sun

NEWS

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PUBLIC PARTICIPATION NOTICE

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A FUEL RETAIL FACILITY IN WALVIS BAY

Geo Pollution Technologies (Pty) Ltd was appointed by Namops Logistics (Pty) Ltd to undertake an environmental assessment for the construction and operations of a fuel retail facility on erf 4605 in Johannes Nampala Avenue, Walvis Bay.

<http://www.thenamib.com/projects/projects.html>

The environmental assessment will be according to the Environmental Management Act of 2007 and its regulations as published in 2012.

Namops Logistics plans to construct and operate a fuel retail facility on the said site. General operations will involve the receipt of diesel and unleaded petrol from road tankers, dispensing fuel to customers in the forecourt area, operations of a shop and related infrastructure and day to day administrative tasks.

All Interested and Affected Parties are invited to register with the environmental consultant. By registering you are provided with the opportunity to share any comments, issues or concerns related to the facility, for consideration in the environmental assessment. Additional information can be requested from Geo Pollution Technologies.

All comments and concerns should be submitted to Geo Pollution Technologies by **05 March 2020**.

**Wikus Coetzer**  
 Geo Pollution Technologies  
 Tel: +264-81-1452164 / 061-257411  
 Fax: +264-88626368  
 E-Mail: [namops@thenamib.com](mailto:namops@thenamib.com)

Let's MINGLE

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suits of the latest Labour Force Survey (LFS) showed that the unemployment figure was 33.4% or 349 383, while the statistics were even more grim for the youth, with a total of 265 770 or 46.1% of the youth unemployed.

This is just slightly worse than Botswana which has a comparable population to Namibia's.

The diamond rich country's unemployment rate grew by 1.6 percentage points from 25.1% in 2015/16 to 26.7% in the third quarter of 2019, according to a quarterly survey by Statistics Botswana.

In South Africa, a report released by the Centre for Development and Enterprise showed that 10.3 million people in that country are looking for work.

Finance minister Calle Schlettwein had in his 2019/20 budget statement motivated a pro-growth job creation budget, but would not comment when asked whether it had served its intended purpose. He however said signs of recovery in the economy prevailed.

A total of N\$7.9 billion had been set out from the development budget to spur job creation.

**Government is idle**  
 Labour commentator Herbert Jauch said government has not done anything to reduce the soaring unemployment.

Economist Klaus Schade echoed these sentiments.

"The LFS will most likely see an increase in unemployment because the economy contracted. We will most likely see job losses. It remains to be seen if there will be recovery in the agricultural sector. The other is the construction sector; it declined but might recover, but that may not be enough to see a recovery in employment," Schade said.

He added that interventions such as increased local procurement could help incentivise employment figures.

"Government has started some initiatives such as local procurement. Raising local procurement by government and the private sector [public entities] should encourage stabilisation," he said.

Schade also advised government not to underspend on the development budget. Money not spent in a fiscal year by offices, ministries and agencies is returned to the treasury to be reallocated.

"What is furthermore necessary is that government spends the development budget on infrastructure projects to create and sustain jobs in the construction sector. Government should expedite project management," he said, to see that the development budget allocated was spent as required.

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<https://www.facebook.com/namibiansun>

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Windhoek	08° / 25°	Aranos	05° / 24°	Gobabis	06° / 27°	Rehoboth	07° / 26°	Otjinene	0° / 25°	Okongo	09° / 28°
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Source in Windhoek: 06h54 Sunset in Windhoek: 18h15

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Sun

MOSHIWAMBO

TUESDAY FEBRUARY 25 2020

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PUBLIC PARTICIPATION NOTICE

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A FUEL RETAIL FACILITY IN WALVIS BAY

Geo Pollution Technologies (Pty) Ltd was appointed by Namops Logistics (Pty) Ltd to undertake an Environmental Assessment for the construction and operations of a fuel retail facility on erf 4605 in Johannes Nampala Avenue, Walvis Bay. More information is available at:

<http://www.thenamib.com/projects/projects.html>

The environmental assessment will be according to the Environmental Management Act of 2007 and its regulations as published in 2012.

General operations will involve the receipt of diesel from road tankers, storage of fuel in aboveground storage tanks, dispensing fuel to customers in the forecourt area, operations of related infrastructure and day to day administrative tasks.

All interested and affected parties are invited to register with the environmental consultant. By registering you are provided with the opportunity to share any comments, issues or concerns related to the facility, for consideration in the Environmental Assessment. Additional information can be requested from Geo Pollution Technologies.

All comments and concerns should be submitted to Geo Pollution Technologies by **05 March 2020**.

**Wikus Coetzer**  
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 E-Mail: [namops@thenamib.com](mailto:namops@thenamib.com)



**YA NDOPA:** Opoloyeka yomass housing oyi li oshiyetwapo shomuleli nale Hifikepunge Pohamba. ETHANO: LYA ZA MOOMPUNGULILO





Site Notice



## **Appendix B: Consultants' 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 70 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	:	17
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 (Learner 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 + 1 in preparation
Contract Reports	+80
Research Reports & Manuals:	5
Conference Presentations:	1

**ENVIRONMENTAL GEOLOGIST****Wikus Coetzer**

Wikus has 4 years' experience in environmental science related fields with 2 years' experience in conducting environmental impact assessments and preparation of environmental management plans. He holds an honours degree in Environmental Sciences – Environmental Geology from the Northwest-University Potchefstroom (NWU) South Africa. He first completed a B.Sc. degree in Geology and Botany in the required time also from the Northwest University Potchefstroom, South Africa. His honours project focused on the rehabilitation and phytoremediation of various tailings types and soils.

He has working experience as an environmental monitor / assisting environmental officer at Petra Diamonds, Cullinan Diamond Mine (CDM) where he gained a proper understanding of environmental monitoring responsibilities as well as legislations, regulations and the implementation of EMS/ISO14001. He started working at Geo Pollution Technologies in 2017, and regularly conducts/assists and report on environmental impact assessments, environmental management plans and pollution surveys.

**CURRICULUM VITAE WIKUS COETZER**

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	WIKUS COETZER
Profession	:	Environmental Geologist
Nationality	:	South African
Position	:	Environmental Geologist
Specialisation	:	Environmental Geology/ Geochemistry
Languages	:	Afrikaans – speaking, reading, writing English – speaking, reading, writing

**EDUCATION AND PROFESSIONAL STATUS:**

B.Sc. Environmental and Biological Sciences – Geology & Botany  
B.Sc. (Hons.) Environmental Sciences – Environmental Geology

: NWU Potchefstroom 2013  
: NWU Potchefstroom 2014

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

**AREAS OF EXPERTISE:**

Knowledge and expertise in:

- ◆ Phytoremediation
- ◆ Environmental Geology / Geochemistry
- ◆ Environmental Monitoring
- ◆ Environmental Compliance
- ◆ Environmental Impact Assessments
- ◆ Environmental Management Plans

**EMPLOYMENT:**

2017 - Date:                      Geo Pollution Technologies  
2015 - 2016:                      Petra Diamonds CDM – Environmental monitor / Assisting environmental officer  
2015:                                Petra Diamonds CDM – Graduate program: Environmental Officer  
2014:                                NWU Potchefstroom department of Geo and Spatial Sciences – Research assistant

**PUBLICATIONS:**

Contract Reports: +25