

APP-002662

**EXISTING BULK STORAGE FACILITY AND FILLING
OPERATIONS FOR LIQUEFIED PETROLEUM GAS, SOUTHERN
INDUSTRIAL, WINDHOEK
UPDATED ENVIRONMENTAL MANAGEMENT PLAN**



Prepared by:



Prepared for:



November 2023


Project:	UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR THE EXISTING BULK STORAGE FACILITY AND FILLING OPERATIONS FOR LIQUEFIED PETROLEUM GAS, SOUTHERN INDUSTRIAL, WINDHOEK.
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LIST OF ABBREVIATIONS

API	American Petroleum Institute
BLEVE	Boiling Liquid Expanding Vapour Explosion
CO₂	Carbon dioxide
dBA	A-weighted decibel
DWA	Department of Water Affairs
ECC	Environmental Clearance Certificate
EMP	Environmental Management Plan
EMS	Environmental Management System
GPT	Geo Pollution Technologies
HSE	Health, Safety & Environment
kWh/m²/day	Kilowatt hour per square meter per day
LPG	Liquefied Petroleum Gas
MEFT	Ministry of Environment, Forestry and Tourism
mm/a	Millimeters per annum
MME	Ministry of Mines and Energy
MSDS	Material Safety Data Sheet
NO₂	Nitrogen dioxide
PPE	Personal Protective Equipment
SANS	South African National Standards
TDS	Total Dissolved Solids

1 BACKGROUND, INTRODUCTION AND JUSTIFICATION

Geo Pollution Technologies (Pty) Ltd was appointed by Triple J Energies (Pty) Ltd (the Proponent) to update their environmental management plan (EMP) for their existing liquefied petroleum gas (LPG) bulk storage facility and filling operations, GasIt, in the Southern Industrial Area, Windhoek (Figure 1-1). The update is required to address construction and decommissioning activities planned on the site in order to improve the operational and safety standards. The updated EMP will be used to apply for amendment of their existing environmental clearance certificate (ECC) which was issued in 2021.

The ECC amendment application will be made in terms of the Regulations of the Environmental Management Act of 2007.

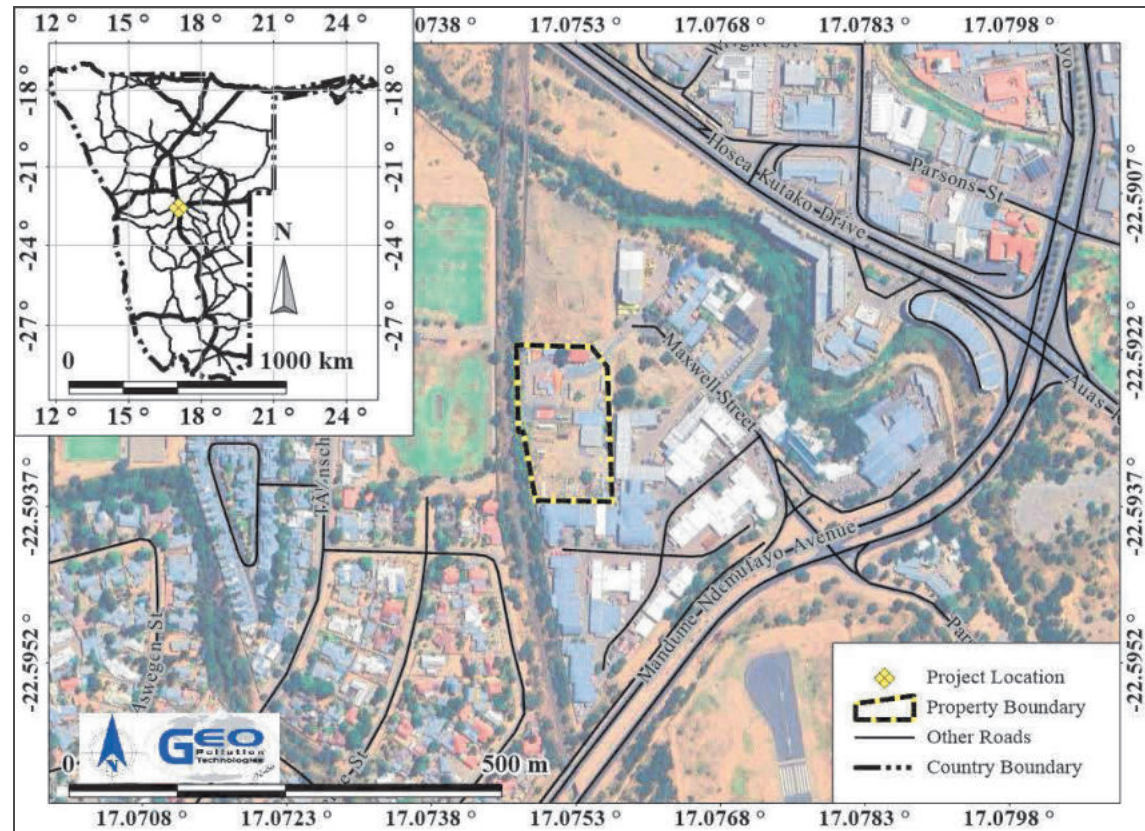


Figure 1-1 Project location

2 PROJECT DESCRIPTION

Triple J Energies has been operating the LPG bulk storage facility and filling operation known as GasIt since 2014. Two bulk LPG storage tanks on site are filled by tanker trucks, travelling via road from South Africa. The railway siding is currently not being used for deliveries. On average, two trucks per week deliver gas to the facility. From the bulk LPG storage tanks, the gas is dispensed to smaller cylinders and supplied to clients. In addition to the LPG operations, a small mobile carbon dioxide (CO₂) tank is located underroof at a CO₂ filling and storage area. See Figure 2-1 for the current site layout map.

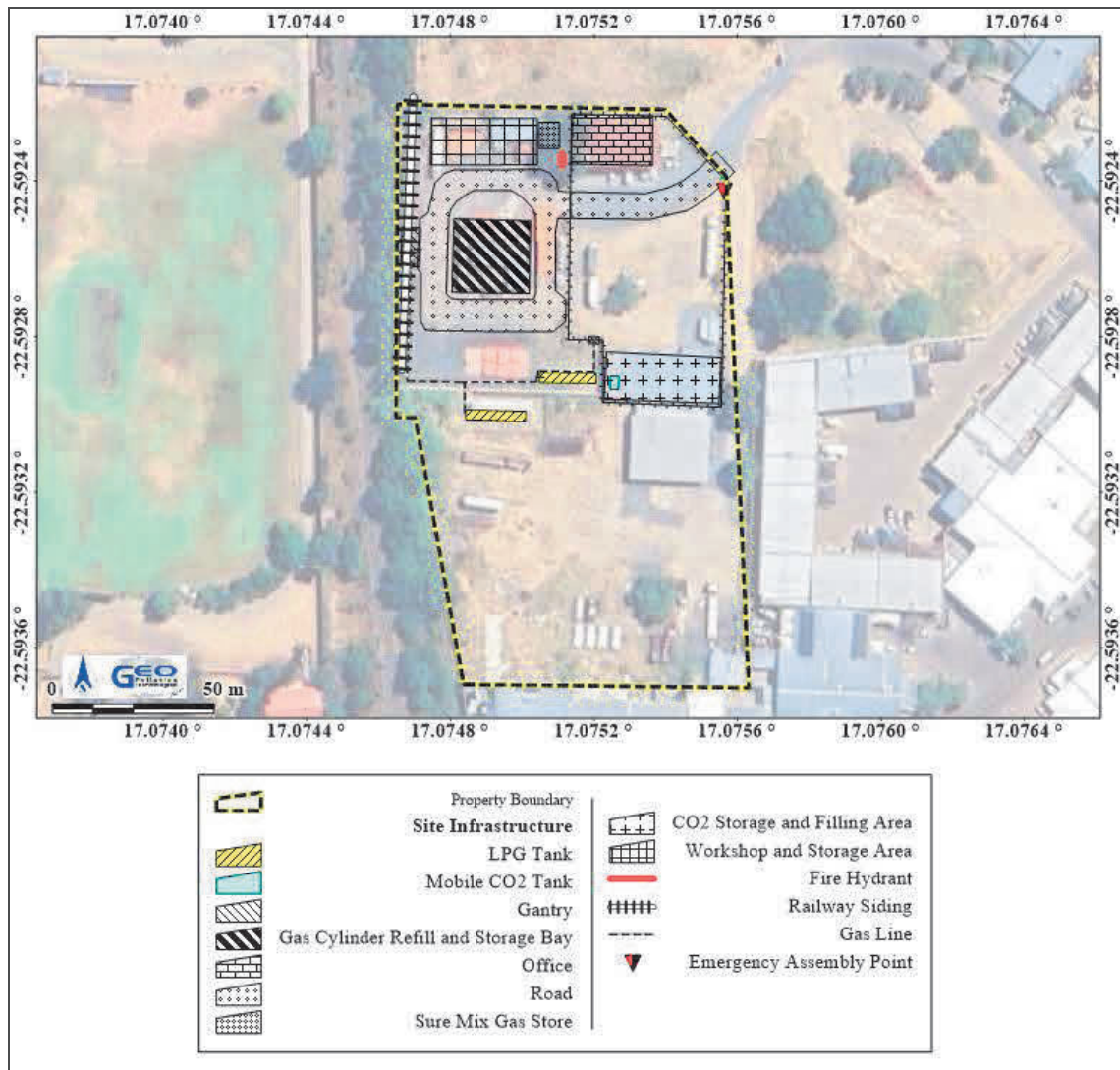


Figure 2-1 Site layout



Photo 2-1 LPG Storage tanks with fire protection



Photo 2-2 Mobile CO₂ tank



Photo 2-3 Gantry for offloading LPG

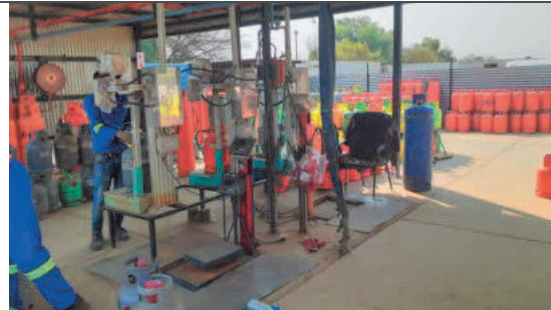


Photo 2-4 Gas Cylinder filling bay



Photo 2-5 Fire hydrant



Photo 2-6 Emergency assembly point

To upgrade the site, some of the existing infrastructure will be decommissioned and removed. This includes the previously used carbon dioxide filling area, the workshop and storage area, and the existing LPG storage tanks. Two new LPG storage tanks will be installed with the possibility to add a third tank in future. A new LPG loading and unloading gantry will be constructed as well as a new LPG cylinder storage and filling area. Firefighting infrastructure will be upgraded and two firewater storage tanks will be constructed to allow for sufficient backup firewater availability. Support infrastructure will also be put in place, including firewater pumps, cylinder washing and repair areas as well as a spare parts storage area. See Figure 2-2 for the proposed future site layout.

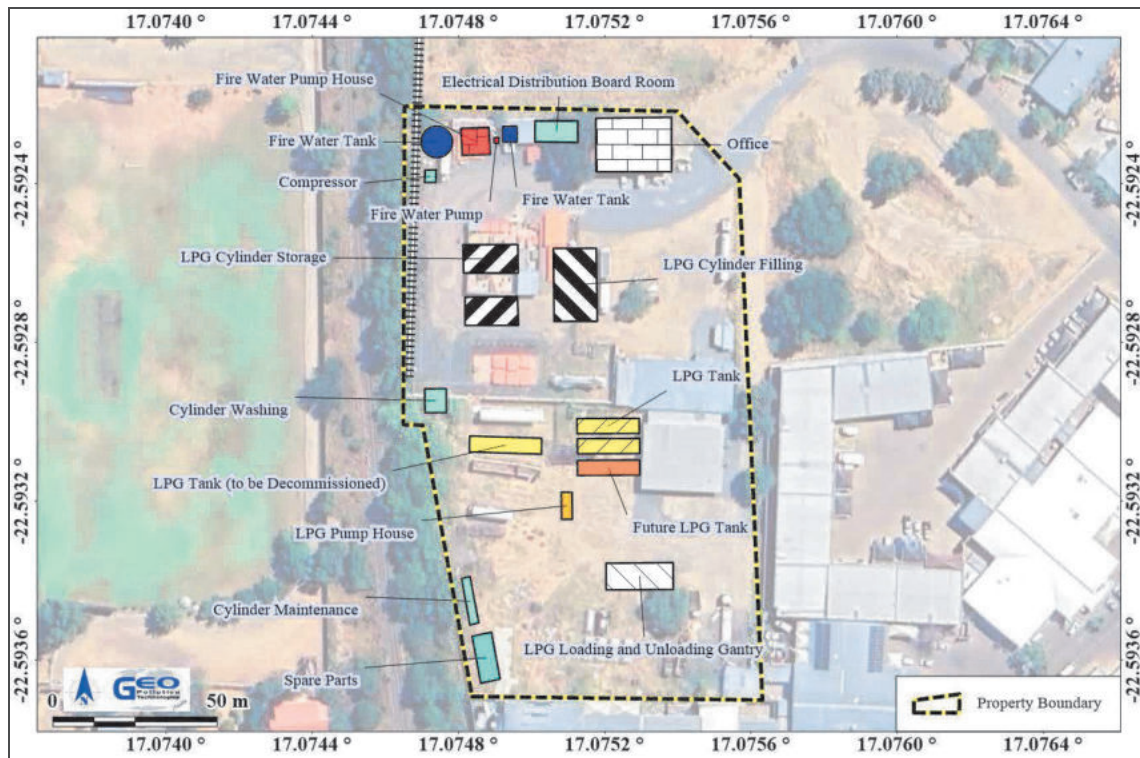


Figure 2-2 Proposed future site layout

3 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 3-1 to Table 3-4 govern the environmental assessment process in Namibia and/or are relevant to the facility.

Table 3-1 Namibian law applicable to the LPG bulk storage facility

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ Promote the welfare of people ◆ Incorporates a high level of environmental protection ◆ Incorporates international agreements as part of Namibian law
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> ◆ Defines the environment ◆ Promote sustainable management of the environment and the use of natural resources ◆ Provide a process of assessment and control of activities with possible significant effects on the environment

Law	Key Aspects
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ Commencement of the Environmental Management Act ◆ List activities that requires an environmental clearance certificate ◆ Provide Environmental Impact Assessment Regulations
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	<ul style="list-style-type: none"> ◆ Regulates petroleum industry ◆ Makes provision for impact assessment ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) ◆ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002) ◆ Used Mineral Oil Regulations (Government Notice No. 48 of 1991) ◆ Regulations relating to the purchase, sale, supply, acquisition, possession, disposal, storage, transportation, recovery and re-refinement of used mineral oil
Water Resources Management Act Act No. 11 of 2013	<ul style="list-style-type: none"> ◆ Provide for management, protection, development, use and conservation of water resources ◆ Prevention of water pollution and assignment of liability
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils ◆ Regulates discharges into sewers
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> ◆ Provides for Labour Law and the protection and safety of employees ◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	<ul style="list-style-type: none"> ◆ Governs the control of noxious or offensive gases ◆ Prohibits scheduled process without a registration certificate in a controlled area ◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	<ul style="list-style-type: none"> ◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	<ul style="list-style-type: none"> ◆ Not in force yet ◆ Provides for prevention and control of pollution and waste ◆ Provides for procedures to be followed for licence applications

Table 3-2 City of Windhoek regulations, plans and policies

Item	Key Aspects
Groundwater Protection Regulations	<ul style="list-style-type: none"> ◆ Provides for the protection of groundwater, landscape and vegetation sensitivity ◆ Requires an EIA and EMP for projects that may potentially impact on groundwater ◆ Identifies three groundwater control zones: medium, high and very high
Windhoek Environmental Structure Plan and Environmental Policy	<ul style="list-style-type: none"> ◆ Integrates spatial planning decision-making, environmental planning and environmental impact management
Town Planning Scheme	<ul style="list-style-type: none"> ◆ Enables the comprehensive management of all property and related public sector functions across the city. ◆ Provides for the protection of groundwater and the environment ◆ Prohibits any sewer, septic tank, pit latrine, VIP or French drain within 500 m of any private or production borehole without council's consent ◆ Sets the Southern Development Limit for Windhoek
Municipal Council of Windhoek: Noise Control Regulations General Notice No. 77 of 2006	<ul style="list-style-type: none"> ◆ Resolution 215/09/2006 dealing with noise ◆ Impose various noise limits for residential commercial and industrial areas for day and night time. ◆ Restricts noise reaching single residential areas at 55 dBA during the day and 45 dBA at night.
Drainage and Sewage Regulations	<ul style="list-style-type: none"> ◆ Regulates discharges into sewer systems ◆ Provides standards to which effluents entering a sewer system must adhere ◆ Regulates storm water run-off

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

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

Table 3-4 Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	<ul style="list-style-type: none"> ◆ Defines rules to ensure safe use of LPG ◆ Prevents risks to human health and the environment ◆ Provides a framework for storing LPG ◆ Guidelines for installation and operations

The LPG bulk storage facility is listed as an activity requiring an ECC as per the following points from Section 9 of Government Notice No. 29 of 2012:

Hazardous Substance Treatment, Handling and Storage

- ◆ 9.1 “The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.” (The facility stores and handles hazardous substances in the form of LPG.)
- ◆ 9.2 “Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste.” (The facility stores and handles hazardous substances in the form of LPG which is permitted by the Ministry of Mines and Energy.)
- ◆ 9.4 “The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.” (Total LPG storage capacity is more than 30 m³).
- ◆ 9.5 “Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin.” (The facility is a refill station that stores LPG above ground.)

4 ENVIRONMENTAL CHARACTERISTICS

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

4.1 LOCALITY AND SURROUNDING LAND USE

The facility is situated in Maxwell Street in the Southern Industrial Area of Windhoek (22.592628°S; 17.075118°E) (Figure 1-1). The site is surrounded by businesses, the Pionierspark residential area and vacant land.

4.2 CLIMATE

According to the Köppen-Geiger Climate Classification system the project is located in a hot semi-arid climate (BSh) (<http://koeppen-geiger.vu-wien.ac.at/present.htm>). This means that the area receives precipitation below potential evapotranspiration, but not as low as a desert climate and has a mean annual temperature of at least 18 °C. Average rainfall received is 300-350 mm/a with a variation of 30-40%. Monthly rainfall peaks in February. The potential evapotranspiration is 2,400 to 2,500 mm/a. By dividing the mean annual potential evapotranspiration into the mean annual precipitation, an aridity index value for the area was computed as 0.14, which indicates the area to be arid. The average annual minimum temperature is 4-6 °C, while the average annual maximum temperature is 30-32 °C, with an average annual temperature range of 24-26 °C. An average diurnal temperature (difference between daily minimum and maximum temperature) for this area is around 14-16 °C. Direct normal solar irradiance for the area is 7.793 kWh/m²/day.

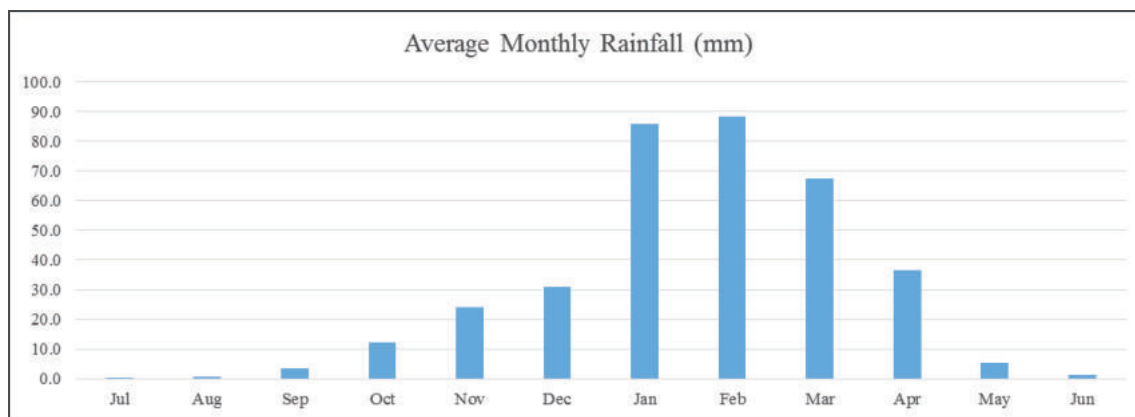


Figure 4-1 Monthly average rainfall (Atlas of Namibia Project, 2002)

4.3 TOPOGRAPHY AND DRAINAGE

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

The site itself is relatively flat, as a result of earthworks conducted in preparation for construction of the service station. Storm water drains from the facility via storm water channels. The Arrebusch River is located 140 m northeast of the site and forms part of the Swakop River catchment.

4.4 GEOLOGY AND HYDROGEOLOGY

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

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

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

The project location is situated on biotite schist from the Kuiseb Formation. The Kuiseb Formation formed during the Namibian Age and forms part of the Khomas Subgroup of the Swakop Group. Other rock types found in the area consists of mica schist, minor quartzite,

graphitic schist and marble. The risk of groundwater pollution is therefore considered to be comparatively low.

Water is utilized in the area, with 28 boreholes known of within a 5 km radius. Table 4-1 presents groundwater statistics the boreholes. The groundwater information was obtained from Department of Water Affairs (DWA) borehole database. This database is generally outdated and more boreholes might be present. The average depth of the 24 of the 28 boreholes is 193 m below surface and the yield of 23 of the 28 boreholes ranges between 0 and 91 m³/h. The average groundwater level of 23 of the 28 known boreholes is 46 m below surface, ranging between 9 and 104 m below surface.

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

Table 4-1 Groundwater statistics

	Depth (m)	Yield (m ³ /h)	Waterlevel (m)	Waterstrike (m)	TDS (ppm)	SO ₄ (ppm)	NO ₃ (ppm)	F (ppm)
Datapoints	24	23	23	28	20	18	8	19
Minimum	77	0	9	0	30	50	0.1	0.2
Average	193	40	46	43	544	148.2	6.9	0.8
Maximum	524	91	104	128	1439	500	36.0	3.8
Group A	<i>0-50</i>	<i>>10</i>	<i>0-10</i>	<i>0-10</i>	<i>0-1000</i>	<i>0-200</i>	<i>0-10</i>	<i>0-1.5</i>
	0	20	3	9	19	15	6	17
Group B	<i>50-100</i>	<i>5-10</i>	<i>10-50</i>	<i>10-50</i>	<i>1000-1500</i>	<i>200-600</i>	<i>10-20</i>	<i>1.5-2.0</i>
	3	1	12	6	1	3	1	1
Group C	<i>100-200</i>	<i>0.5-5</i>	<i>50-100</i>	<i>50-100</i>	<i>1500-2000</i>	<i>600-1200</i>	<i>20-40</i>	<i>2.0-3.0</i>
	11	1	7	9	0	0	1	0
Group D	<i>>200</i>	<i>0-0.5</i>	<i>>100</i>	<i>>100</i>	<i>>2000</i>	<i>>1200</i>	<i>>40</i>	<i>>3</i>
	10	1	1	4	0	0	0	1

28 boreholes in a 5.0 km radius from 22.59273°S 17.07513°E

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

Group A: Water with an excellent quality

Group C: Water with low health risk

Group B: Water with acceptable quality

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

4.5 PUBLIC WATER SUPPLY

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

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

4.6 FAUNA AND FLORA

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

The LPG storage and filling facility is an existing site which has been cleared of most vegetation during the initial establishment of the site.

4.7 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

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

5 OBJECTIVES OF THE EMP

The EMP provides management options to ensure any negative impacts during any construction and operational activities are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The EMP acts as a stand-alone document, which can be used during the various phases (planning, construction, operational and decommissioning) of any activity or development. All contractors and sub-contractors taking part in the operations of this facility should be made aware of the contents of the EMP, so as to conduct relevant activities accordingly in an environmentally sound manner.

The objectives of the EMP are:

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

Triple J Energies may choose to implement an environmental management system for the GasIt facility. 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.

5.1 IMPLEMENTATION OF THE EMP

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

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

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

5.1.1 Planning

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

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

5.1.2 Revenue Generation and Employment

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

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

Actions

Enhancement:

- ◆ 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
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.3 Skills, Technology and Development

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

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

Actions

Enhancement:

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

Responsible Body:

- ◆ Proponent
- ◆ 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.
- ◆ Bi-annual summary reports on all training conducted.

5.1.4 Demographic Profile and Community Health

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

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

Actions:

Prevention:

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

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.5 Traffic

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

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

Actions

Prevention:

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

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.6 Health, Safety and Security

Activities associated with the construction and operational phases relies on human labour and therefore will expose them to health and safety risks. LPG can rapidly result in asphyxiation when inhaled. Skin or eye contact with LPG leaking or escaping from high pressure vessels can result in frostbite or irritation. Lifting of heavy cylinders or equipment can result in injuries. Access to site by unauthorised persons with the intent of arson, theft or sabotage of product or equipment.

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

Actions

Prevention:

- ◆ Manuals and training regarding the correct handling of LPG should be in place and updated as new or updated material safety data sheets become available. Ensure that all personnel receive adequate training on operation of equipment/handling of hazardous substances.
- ◆ 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, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (personal protective equipment (PPE), flammable etc.).
- ◆ Develop emergency response plans for all possible health, safety and security impacts and appoint responsible personnel in key positions to activate and oversee such plans when required.
- ◆ 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.
- ◆ All health and safety standards specified in the Labour Act should be complied with.
- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products, especially during the construction phase.
- ◆ Provide all employees with required and adequate PPE.
- ◆ Implementation of maintenance register for all equipment and gas / hazardous substance storage areas.
- ◆ Security procedures and proper security measures must be in place to protect workers and clients.
- ◆ Equipment on site must be locked away or placed in a way that does not encourage criminal activities (e.g. theft).

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.7 Fire

Construction and operational activities may increase the risk of the occurrence of fires. LPG are extremely flammable and a fire or boiling liquid expanding vapour explosion (BLEVE) risk exists. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

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

Actions:

Prevention:

- ◆ Storage and handling of LPG and other gases must be according SANS 10087.
- ◆ All LPG storage and handling facilities in Namibia must comply with strict safety distances and fire precautions and control as prescribed by API Standards and/or SANS. SANS is adopted by the Ministry of Mines and Energy as the national standard.
- ◆ A holistic fire protection and prevention plan must be developed for the site and it should specifically take into account flammable products stored on site. This plan must include an emergency response plan, firefighting plan and a spill recovery plan and should have dedicated assigned personnel to oversee their development and implementation.
- ◆ Firefighting equipment must be maintained and regularly serviced.
- ◆ All pressure release valves should regularly be inspected and serviced.
- ◆ Regular personnel training (firefighting, fire prevention and responsible housekeeping practices).
- ◆ Ensure all chemicals are stored strictly according to MSDS and SANS instructions. This include segregation of incompatible products.
- ◆ Maintain regular site, mechanical and electrical inspections and perform regular maintenance.

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ 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 bi-annually of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

5.1.8 Air Quality

The operational phase release LPG vapours into the air during refilling of bulk storage tanks as well as at dispensing points. LPG can have serious health effects and can lead to rapid asphyxiation. Construction and refurbishment activities may cause dust where soil surfaces are exposed.

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

Actions

Mitigation:

- ◆ Employees should be informed about the dangers of LPG vapours.
- ◆ All filling of cylinders should take place in a well ventilated area.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.9 Noise

Noise pollution may be generated due to heavy and light motor vehicles accessing the site for construction purposes and to offload LPG or refill cylinders during operations. Construction and refurbishment activities may result in a temporary increase in noise levels.

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

Actions

Prevention:

- ◆ Follow Labour Act and Municipal Council of Windhoek: Noise Control Regulations - General Notice No. 77 of 2006 to prevent hearing impairment and a nuisance at nearby receptors.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.
- ◆ Manage noise caused by clients including loud music.

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Labour Act Health and Safety Regulations and the Municipal Council of Windhoek: Noise Control Regulations - General Notice No. 77 of 2006
- ◆ Maintain a complaints register.
- ◆ Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

5.1.10 Waste production

Waste is produced during the operational phase. Waste may include hazardous waste and domestic waste. Waste presents a contamination risk and when not removed regularly may become a fire hazard. During the upgrade of the site, construction waste in the form of obsolete equipment and rubble will be produced.

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

Actions

Prevention:

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

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.11 Ecosystem and Biodiversity Impact

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

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

Actions.

Prevention:

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

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.12 Groundwater, Surface Water and Soil Contamination

Leakages from vehicles and accidental fuel, oil or hydraulic fluid spills can result in groundwater, surface water and soil contamination in the area.

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

Actions

Prevention:

All construction and or maintenance machines should be maintained to be in a good working condition during operation.

Employ drip trays and spill kits during construction when onsite servicing/repairs of equipment are needed.

- ◆ 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 (gas handling, spill detection, spill control).

Mitigation:

- ◆ All hydrocarbon based fluids must be removed from site and disposed of at a recognised hazardous waste disposal facility.
- ◆ Spill clean-up means must be readily available on site as per the relevant MSDS and all spills must be cleaned up immediately.

Responsible Body:

- ◆ Proponent
- ◆ 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, and comparison of pre-exposure baseline data (previous pollution conditions survey results) with post remediation data (e.g. soil / groundwater hydrocarbon concentrations).

5.1.13 Visual Impact

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

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

Actions

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

5.1.14 Cumulative Impact

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

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

Actions

Mitigation:

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

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Review bi-annual reports to determine the overall impact of the operational phase

5.2 DECOMMISSIONING AND REHABILITATION

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

5.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an 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;
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS; and
- ◆ The EMP.

6 CONCLUSIONS

The bulk LPG storage facility, and its associated cylinder filling operations, has a positive impact on the various businesses operational in the town and on the surrounding community who uses LPG for cooking and heating. In addition to reliable and convenient LPG supply the facility contributes to employment, skills transfer and training which in turn develops the local workforce. Regular upgrades and refurbishment will ensure the operations remain compliant with legislative requirements, and aid in securing a constant and reliable supply of LPG.

Negative impacts can successfully be mitigated. SANS standards relating LPG storage and handling must be followed during all operations of the bulk storage facility and filling operations. Noise pollution should at all times meet the City of Windhoek's noise limits and the Labour Act's Health and Safety Regulations 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 should be used as an on-site reference document for the operations of the facility. Parties responsible for transgressing of the EMP should be held responsible for any rehabilitation that may need to be undertaken. The Proponent could use an in-house health, safety, security and environment

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

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

7 REFERENCES

Atlas of Namibia Project. 2002. Directorate of Environmental Affairs, Ministry of Environment and Tourism (www.met.gov.na). [Accessed from http://www.unikoeln.de/sfb389/e/e1/download/atlas_namibia/index_e.htm]

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Appendix A: Existing ECC

ECC- 01751

Serial: 2uj9Qr1751



REPUBLIC OF NAMIBIA
MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental
Management Act (Act No. 7 of 2007)

TO

Triple J Energies (Pty) Ltd.
P. O. Box 9843, Windhoek.

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

THE OPERATION OF THE EXISTING BULK STORAGE FACILITY FOR
LIQUEFIED PETROLEUM GAS IN SOUTHERN INDUSTRIAL, WINDHOEK,
KHOMAS REGION.

Issued on the date: **2021-11-23**

Expires on this date: **2024-11-23**

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Appendix B: Consultant's Curriculum Vitae

ENVIRONMENTAL SCIENTIST**André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 190 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 : 22
 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/Biochemistry : 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 : OSH-Med, 2022
 Basic Fire Fighting : OSH-Med, 2022

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Environmental Assessment 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, Department of Biological Sciences, University of Namibia
 2001-2004 : Laboratory Technician, Department of Biological, University of Namibia

PUBLICATIONS:

Publications: 5
 Contract Reports +190
 Research Reports & Manuals: 5
 Conference Presentations: 1