ENVIRONMENTAL MANAGEMENT PLAN (EMP) REPORT

FOR THE CONSTRUCTION AND OPERATIONS OF A NEW FUEL BULK STORAGE AND HANDLING FACILITY (DEPOT) AT ONIIPA IN OSHIKOTO REGION, NAMIBIA

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ACRONYMS

DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EAR	Environmental Assessment Regulations
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
ECC	Environmental Clearance Certificate
ESA	Environmental Scoping assessment
I&AP	Interested and affected parties
MME	Ministry of Mines and Energy
NGS	Nam Geo-Enviro Solutions

1. Introduction

Environmental management plan (EMP) is a comprehensive approach designed to identify, mitigate, and manage potential environmental impacts associated with a particular project that has potential significant environmental impact. The EMP outlines measures to minimize negative effects on the environment, while maximizing the positive impacts.

This Environmental Management Plan (EMP) document was formulated specifically for the proposed construction and operations of a new fuel bulk storage and handling facility (depot) at Oniipa in Oshikoto region. An EMP report is an onsite working document, and all contractors and subcontractors taking part in the project should be made aware of the contents of the EMP.

2. Objectives

The environmental management plan (EMP) aims to take a pro-active route by addressing potential significant environmental impacts before they occur. The objectives of the EMP are:

- To outline mitigation measures to manage environmental and socio-economic impacts associated with the project
- Provide a framework for implementing the management actions.
- To ensure that the project will comply with relevant environmental legislations of Namibia and other requirements throughout its operation.
- To promote sustainable development

3. Legal Framework: Legislations, Policies and Guidelines

This section outlines the regulatory framework relevant to the proposed project. All identified crucial pieces of legislation should be adhered to, as indicated in their respective pieces of legislation. In cases where external assistance is required to ensure compliance, the project proponent is encouraged to seek guidance from qualified and certified professionals.

The Environmental Management Act No. 7 of 2007 is the primary custodian of the environment which aims to; promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment; to provide for a process of assessment and control of activities which may have significant effects on the environment and to provide for incidental matters. However, this section does not only focus on the EMA, but also looks at other relevant legislatives.

The table below outlines regulatory framework relevant to the project

Table 1: Regulatory framework relevant to the project

Aspect	Regulations	Relevant provisions	Relevance to the project
The Constitution	***The constitution of Namibia (1990)* First Amendment Act 34 of 1998**	-"The State shall actively promote and maintain the welfare of the people by adopting policies that are aimed at maintaining ecosystems, essential ecological processes and the biological diversity of Namibia. -It further promotes the sustainable utilisation of living natural resources basis for the benefit of all Namibians, both present and future." (Article 95(I)).	Through implementation of the EMP, the proponent should ensure conformity to the constitution in terms of environmental management and sustainability.
Environment	***Environmental Management Act no. 7 of 2007***	-Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). -Requires adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions about a project (Section 2(b-c)). -According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister. Details principles which are to guide all EIAs.	This Act and its regulations should inform and guide this EIA process. The project proponent should ensure that all provisions of the EMP are implemented, and regular environmental compliance monitoring and evaluation are conducted

	EIA Regulations GN 2007 (no.30 of 2012)	-Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). -Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15).	These regulations should inform and guide this EIA process.
Oil and Gas	***Petroleum Products & Energy Act (1990)***	-The Act requires that the operation of the Fuel depot and storage facility obtains a retail license from the relevant ministry. -The Act requires incident reporting of major spillages occurring on site for pollution control.	The proponent should obtain a wholesale license from the Ministry of Mines and Energy before the operations of the fuel depot.
	South African National Standards SANS 10089-3	-Part 3: The installation of underground storage tanks, pumps/dispensers and pipe work at fuel consumer installation and storage facilities and consumer installations.	The fuel depot should be constructed according to SANS standards.
Biodiversity	***National Biodiversity Strategy and Action Plan (NBSAP2)***	-The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together the management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	Forming part of the EIA and EMP for this project, the proponent should consider all associated impacts, both acute and long term, and should propose methods and ways to sustain the local biodiversity.
Soil	***Soil Conservation Act 76 of 1969***	- This act makes provision for combating and for the prevention of soil erosion, it promotes the conservation, protection and improvement	Fuel depots are mainly associated with fuel spillages which can contaminate soil. This document aims at guiding

		of the soil, vegetation, sources, and resources of the Republic of Namibia.	the proponent during operation and perhaps decommissioning to prevent soil erosion and contamination during operation of the depot.
Waste	***Hazardous Substance Ordinance 14 of 1974***	-Provisions for hazardous waste are amended in this act as it provides "for the control of substances which may cause injury or ill-health to or death of human beings, as a result of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance; and to provide for matters connected therewith"	The proponent shall separate waste at the site. The proponent shall ensure that all possible "hazardous" categorised substances and waste shall be handled by a certified hazardous waste handler.
	Pollution and Waste Management Bill (draft)	-This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment. - The bill also describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements is considered an offence and punishable.	The project should be conducted in a manner which is advised by the bill, to minimize the generation of waste at the site. - A waste management strategy that follows recycling, reuse and reducing should be commissioned throughout the operations.

	Atmospheric Pollution Prevention Ordinance 11 of 1976	-The Act requires that there is a need to register a controlled area with certificate to operate air polluting activities. The retail/wholesale license covers all elements and requirements of this Act.	The proponent should comply with this act.
Water	***Water Act 54 of 1956***	-The Water Resources Management Act 24 of 2004 is currently without regulations; therefore, the Water Act No 54 of 1956 is still in force: -A permit application in terms of Sections 21(1) and 21(2) of the Water Act is required for the disposal of industrial or domestic wastewater and effluent. -Prohibits the pollution of underground and surface water bodies (S23 (1). -Liability of clean-up costs after closure/ abandonment of an activity (S23 (2)). -Protection from the surface and underground water pollution.	The proponent should comply to the provisions of this act.
Health and Safety	***Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work'.***	-135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users of machinery about the structure of such buildings of otherwise to prevent or extinguish fires, and to ensure the safety in the event of a fire, of persons in	The proponent will employ several people and shall ensure securing a safe environment and preserving the health and welfare of employees at work. This will include applying appropriate hazard management plans and enforcing Occupational Health and Safety (OHS) enforcement by contractors

		such building;" (Ministry of Labour and Social Welfare). -This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices.	
	Public Health and Environmental Act, 2015	-Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The proponent should ensure compliance with the terms of the Act.
Road	***Road Ordinance 1972 (Ordinance 17 0f 1972)***	-Width of proclaimed roads and road reserve boundaries (S3.1) -Control of traffic during operational activities on the trunk and main roads (S27.1) -Infringements and obstructions on and interference with proclaimed roads. (S37.1) -Distance from proclaimed roads at which fences are erected (S38).	The project will ensure compliance with the terms of the Road Ordinance.
Local authority	***The Regional Councils Act (No. 22 of 1992)***	-This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described	The relevant Regional Councils are I&APs and must be consulted during the Environmental Assessment (EA) process.

		in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment. -The main objective of this Act is to initiate, supervise, manage, and evaluate development.	

3.1. International conventions and protocols relevant to the project

It is vital to note that there are international conventions and protocols which aim to protect the environment to which Namibia is a signatory. These various international conventions and protocols which relate to the project are listed below:

- Vienna Convention for the protection of the ozone layer, 1985.
- United nations framework convention on climate change 992.
- Convention of Biological Diversity (1992).
- African Convention on the Conservation of Nature and Natural Resources (1968)

3.2. Sustainability principles relevant to the project

Apart from the above-mentioned regulatory framework, the following sustainability principles need to be taken into consideration, particularly to achieve proper waste management and pollution control.

3.3. Cradle to grave responsibility

This principle states that those who manufacture potentially harmful products should be liable for their safe production, use, and disposal. Those who initiate potentially polluting activities should be legally responsible for their commissioning, operation, and decommissioning.

3.4. Precautionary principle

This principle states that if there is any doubt about the effects of a potentially polluting activity, a cautious approach should be adopted.

3.5. The polluter pays principle

A person who generates waste or causes pollution on the environment should pay the costs of pollution including the costs of preventing further damages.

4. Certifications required for the project

Permits and licenses are required as part of compliance and authorization. All permits and licenses should be obtained before commencement of the project.

The table below shows key licenses required for this project:

Table 2**:** certifications required for the project

Certification	Authority	Status
Wholesale retail licence	Ministry of Mines and Energy	Acquired
Consent letter of Road construction	Road Authority (Ministry of Work and Transport)	Acquired
Lease agreement for land ownership	Local Authority	Acquired
Consent letter from fuel supplier	Puma Energy Namibia (Pty) Ltd	Acquired
ECC	Ministry of Environment, Forestry and Tourism	Scoping in progress

5. Roles and responsibilities

This section outlines the roles and responsibilities of the primary stakeholders engaged in formulating, executing, and evaluating the EMP for the proposed project. It is essential for the proponent to designate competent individuals, including an Environmental Control Officer, Project Manager, and Health and Safety Officer, to ensure the successful implementation EMP.

5.1. Competent authorities

The Ministry of Mines and Energy and Department of Environmental Affairs: Ministry of Environment, Forestry and Tourism are the competent authorities for this project. They are responsible for reviewing the EMP and issuing of the ECC.

5.2. Proponent (Transpetro Group Namibia Pty Ltd)

- Transpetro Group Namibia Pty Ltd should delegate suitably qualified person(s) with the responsibility to ensure implementation of the EMP.
- Protect and rehabilitate the environment.
- Give warnings and impose fines and penalties on the Contractor if the Contractor neglects to implement the EMP satisfactorily.
- Make sure that a copy of the EMP is readily available on-site and that all site staff are aware of its content.

5.3. Appointed contractors

- The contractor is responsible for the implementation of the EMP.
- Should be aware of any environmental matters as deemed necessary by the contractor.
- The ccontractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements as described in the EMP.
- Acquire a basic understanding of the key environmental features on site and its immediate environs.
- Make sure that a copy of the EMP is readily available on-site and that all site staff are aware of its content.

5.4. Fuel supplier (Puma Energy Namibia Pty Ltd)

- Comply to the cradle to grave responsibility and polluter pays principle.
- Supply fuel to the site.

5.5. Project manager

- Liaising directly with the Environmental Control Officer (ECO) concerning the preparation and implementation of the EMP and meeting the conditions documented in the environmental clearance certificate.
- Bear the overall responsibility for managing the project contractors and ensuring that the environmental management requirements are met.
- Inform the contractors of the EMP and Environmental clearance certificate obligations.
- Approve all decisions regarding environmental procedures and protocols that must be followed.
- Have the authority to stop any activities in contravention with the EMP.
- Issue fines for transgressions of basic conduct rules and/or contravention of the EMP.

- Maintain open and direct lines of communication between the proponent and Interested and Affected Parties (I&APs) about environmental matters.
- Attend regular site meetings and inspections where required.

5.6. Environmental Control Officer

- Required to conduct inductions of the EMP and ensure implementation of required measures and conditions.
- Conduct environmental monitoring as per EMP requirements.
- Monitor the performance of the contractors and ensure compliance with the EMP.
- Maintain, update, and review the EMP.
- Communicate all amendments of the EMP to the relevant stakeholders.
- Liaison between the contractor, authorities, and other key stakeholders on all environmental concerns.

5.7. Occupational Health and Safety Officer

- Ensure that safety is practiced for all activities on site.
- Conducting incidents investigation as well as coming up with corrective and preventative actions.
- Prepare and implement safety procedures.
- Communicate all safety-related issues.
- Carry out any incident/accident investigations at the site.
- Conduct training on safety.
- Record accidents and incidents at the site.
- Issuing PPE to employees
- Carry out Safety Health and Environmental awareness inductions, the following topics, at least but not limited to, should be covered, (the importance of complying with the relevant Namibian and International legislation, roles, and responsibilities including emergency preparedness, basic rules of conduct the Do's and Don'ts.)

6. Management of the project impacts on the environment

In this section, project impacts and their mitigation measures are stipulated. The proponent and all appointed contractors should ensure proper implementation of these measures.

Before commencement of any work, all staff should be informed of the content of the EMP. The proponent, contractor, project manager and HSEO have the responsibility for implementing the EMP and ensuring their staff members comply with the guidelines.

6.1. Negative impacts

6.1.1. Impact on biodiversity

Biodiversity loss is likely to occur during construction phase due to earthworks. Animal habitats (vertebrates and invertebrates) might be affected; however, this impact will be localised.

Mitigation measures:

- Massive clearing of vegetation shall not be allowed.
- Avoid the killing of species viewed as dangerous such as various snakes – when on site.
- Off-road driving should not be allowed, and only existing tracks should be used to avoid trampling of organisms of conservation concern.
- The base camp should be set up in a less ecological sensitive area.
- Stick to speed limits.
- No capturing of animals and littering.
- Remove and relocate slow-moving vertebrate fauna (e.g., tortoise, chameleon, etc) to suitable habitat elsewhere on the property.
- Avoid introducing ornamental plants, especially potential alien species as part of the landscape of the campsite, but rather use localized indigenous species, should landscaping be attempted, which would also require less maintenance.
- The machinery and equipment which emit excessive noise should be limited and restricted to certain hours only.
- No campsite should be permitted outside designated areas.
- No operation of any kind should be allowed after dusk.

6.1.2. Noise

During construction, heavy machinery like excavators and bulldozers are commonly used, generating significant noise levels especially near residential or sensitive areas. Fuel depots experience high vehicle traffic, including delivery trucks, transport vehicles, contributing to noise, especially during acceleration, deceleration, or heavy braking. Generators and power equipment used for continuous operation also emit noise.

Employees, animals, and nearby residential areas are directly impacted by this noise. ISO 18001 standards mandate that workers should not be exposed to noise levels exceeding 85 decibels per 8 hours.

Mitigation measures:

- Employees should be equipped with ear protection equipment such as earmuffs and plugs.

- Employees should be limited to working hours only at most 8 hours per day.
- Noise pollution should be addressed and mitigated at an early stage.
- Noise from operation vehicles and equipment on-site should be reduced to acceptable levels.
- Ensure regular maintenance of machinery and equipment.
- Noise levels should be checked regularly.
- Noise levels should not be equal to or exceed 85dBA for workers working an 8-hour shift (according to ISO 18000).

6.1.3. Dust

Dust will be produced during construction phase. This might affect the workers and adjacent areas. Dust particles can penetrate the human body and can cause respiratory tract irritation, illness (such as asthma attack, cough, and bronchitis), and eczema if they are exposed to high amounts of dust.

Mitigation measures:

- Personnel are required to wear personal protection equipment such respirator if excessive dust is created for prolonged working periods.
- Use of dust suppression method such as sprinkling of water.
- Speeds limits on-site should be restricted to below 40km/hr to generate minimal dust.
- As per World Health Organisation (WHO), the dust particulate matter should be in the range of 150-230 µg/m^3 on an annual average and 60-90 µg/m^3on a 24-hour average.
- Construction warning signs and heavy vehicle visibility methods should be implemented during construction period to alert people and traffic frequenting the area.

6.1.4. Contamination of surface soil and water

The primary threats to soil and surface water pollution at fuel depots are fuel spillages and leaks. These incidents typically happen during fuel dispensing into vehicles and when fuel tanker trucks unload fuel into storage tanks. Surface spillages are mainly caused by overfilling tanks, leaks, and pipe bursts.

If surface spillages are not properly managed, they have the potential to pollute surface soils. Soil contaminated by petroleum substances can negatively impact soil health by harming soil microorganisms, decreasing their population and activity. Additionally, surface spills can lead to contamination of surface water bodies, as they may be carried into rivers and streams by floods and rain, thereby increasing the risk of further groundwater contamination.

Mitigation measures

- proper training of staff on fuel storage and handling.
- There should be a spill containment slab at forecourt and filler Points, covering the surfaces where fuels are handled to prevent groundwater pollution.
- Spillage control procedures must be in place according to SANS 10089-1:2008 and SANS 100131-2 standards, or better.
- contaminated soil shall be collected in a holding tray or drum, and which will then disposed at a licensed hazardous waste site.
- Spillages on site must be cleaned up immediately and if the spill is more than 200L it must be reported to the Ministry of Mines and Energy.
- An emergency response plan to give guidelines on spillages or leakages.
- All waste must be disposed of at approved disposal sites.
- No burial of any waste or burning should be done on-site.
- Sand buckets should be available on site to clean up minor oil spills.
- Standby oil cleaners and absorbents should be available during the decommission stage.
- All operational surfaces at the fuel retail facility must be installed with spill containment areas as per the relevant SANS standards (or better).

6.1.5. Contamination of underground water

The potential risk to underground water at a fuel depot primarily arises from the possibility of fuel leaks or spillages seeping into the ground and contaminating the groundwater. Leakage from storage tanks, pipelines, or equipment failure can result in the infiltration of petroleum products into the soil, eventually reaching and polluting underground water sources. This contamination poses significant environmental and public health concerns, as groundwater is a vital source of drinking water for many communities. Moreover, poorly constructed, or aging tanks are more prone to corrosion, increasing the risk of fuel seepage into the groundwater.

Contamination of underground water by a sewer system at a fuel depot can have serious environmental and health implications. When a sewer system is not properly designed, constructed, or maintained, it can lead to leaks or breaks in the infrastructure, allowing sewage to seep into the surrounding soil and potentially reach the groundwater.

Mitigation measures

- Proper training of staff and installation of suitable containment structures.
- Install oil interception system.
- Install isolating surface drainage system.
- There should be a spill containment slab at forecourt and filler Points, covering the surfaces where fuels are handled to prevent groundwater pollution.

- Storm water drainage system should be installed.
- The condition of the fuel reticulation system should be checked regularly and repaired to prevent leakages.
- All waste must be disposed of at approved disposal sites.
- All operational surfaces at the fuel retail facility must be installed with spill containment areas as per the relevant SANS standards (or better).

6.1.6. Hydrocarbon waste

During fuel handling and transfer, spills and leaks can occur due to equipment failure, human error, or accidents. Storage tanks may develop leaks over time, requiring maintenance like welding or cleaning, generating hydrocarbon waste. Tanker trucks need cleaning to remove residual hydrocarbons post-delivery, producing waste. Soil, rainwater, or runoff that comes into contact with stored fuel can become contaminated with hydrocarbons. This water needs to be properly managed to prevent environmental pollution.

Mitigation measures

- Hydrocarbon waste management is vital among employees and management.
- Use of absorbents are essentially recommended for containing spillages.
- Adequate supplies of absorbents should be readily available at all times.
- Waste separation should be implemented to avoid mixing of contaminated waste and general waste
- Proper monitoring of the product levels in the tank must take place to eliminate overfilling
- Appointment of a certified waste handling contractor to handle all hydrocarbon waste
- Waste minimization policy. bioremediation of contaminated soil
- Frequently cleaning of oil/ water separator
- Construct spill containment slabs around the pump
- The site should have spillage bins and clean up kits
- Construct oil/water separators

6.1.7. Emission of hydrocarbon vapours

Hydrocarbons released during fuel handling and storage contribute to greenhouse gas emissions, particularly carbon dioxide and methane. These gases trap heat in the atmosphere, leading to global warming and climate change.

Certain hydrocarbons, such as benzene and toluene, are classified as air toxics or hazardous air pollutants. Prolonged exposure to these substances, even at low levels

can cause serious health effects, including cancer, neurological disorders, and reproductive issues. Some hydrocarbons have strong odors, which can be a nuisance to nearby residents and workers at fuel depots.

Mitigation measures

- All venting systems and procedures should be designed according to SANS standards and placed in a sensible manner.
- Vent pipes should be placed in such a manner as to prevent impact on potential receptors.
- Vehicle idling time should be minimized by putting up educative signs.

6.1.8. Risk of fire and explosions

Lack of proper maintenance and inspection of equipment, storage tanks, pipelines, and electrical systems can lead to equipment failure or leaks. Leaks or spills of flammable liquids can create an explosive atmosphere, increasing the risk of fire and explosions. Improper handling of flammable materials, incorrect procedures, inadequate training, or negligence can result in accidents that trigger fire and explosions at fuel depots.

Mitigation measures

- Sufficient water should be made available on site for firefighting purposes.
- Ensure that all fire-fighting devices are in good working order.
- Regular inspections and services should be carried out to inspect and test firefighting equipment.
- All personnel must be sensitised about fire protection measures and good housekeeping such as the removal of flammable materials.
- All fire precautions and fire control at the fuel retail facility must be in accordance with SANS 10089-1:1999, or better.
- The Emergency Response Plan should be implemented.
- Signs of “no’’ smoking and use of cell phones should be displayed on site.
- Fire guards must also be constructed at the site to prevent the spread of fires.
- Fuel tanks should be established away from potential neighbouring fire points.
- All fire precautions and fire control at the service station must be in accordance with SANS 10089-1:2008, or better.

6.1.9. Occupational Health Safety and Security

Fuel depots store flammable and volatile materials, which can pose health risks to workers if they are exposed to fumes, vapours, or spills. This exposure can lead to respiratory problems, skin irritation, or long-term health effects. Fuel depot operations, such as pumping, loading, and unloading, can generate high levels of noise and

vibration, which can impact workers' hearing and overall well-being if not properly managed.

Generally, projects attract people from different locations and backgrounds. Some anti-social behaviour such as alcohol and drug abuse may be practised. The presence of construction equipment and all associated tools may encourage theft.

Mitigation measures

- Comply with all health and safety standards specified in the Labour Act.
- Train workers how to use the equipment safely and effectively.
- Offer training on occupational health and safety.
- Safety talks to be done every day before the commencement of work.
- Emergency response plans should be present.
- Safety officer to be stationed at the site.
- Formulation of a safety health and environment workers committee.
- A fully stocked first aid kit should permanently be available on site as well as an adequately trained staff member in a position to administer first aid.
- All workers should have access to the appropriate Personal Protective Equipment (helmets, gloves, respirators, work suits, earplugs, safety goggles, and safety shoes where applicable).
- Proper ablution facility should be used and clearly marked for males and females.
- Use dust suppression measures.
- Maintain good housekeeping.
- Reduce noise exposure by isolating noisy equipment and rotate tasks.
- Conduct hazard identification and risk assessments.
- Any leakage/spillage shall be immediately attended and provision of urgent cleaning.
- Work area should be monitored to maintain work environment free from any hazards.
- Provisions of immediate accident/incident reporting and investigation.
- Safety posters and signages should be exhibited at conspicuous places.

6.1.10. Generation of waste on site

Waste found on site is typically in the form of food leftovers, plastics, cigarette butts, waste dumped on site by employees and motorists fuelling up. Cleaning solvents, degreasers, and other chemicals used for equipment cleaning or maintenance purposes can also contribute to the waste generated at fuel depots.

Mitigation measures

- Waste disposal systems should be implemented on site.
- Strictly no burning of waste on the site.
- Place water and scavenger proof bins around the site.

- Contaminated wastes in the form of soil, litter, and other material must be disposed of at an appropriate disposal site at the nearest town.
- Good housekeeping should be maintained.

6.1.11. Impact on traffic

Fuel stations require vehicles to enter and exit the premises, which can result in increased turning movements. Drivers manoeuvring in and out of fuel stations may slow down the traffic flow, especially if the entry and exit points are not designed to handle large volumes of vehicles efficiently. Additionally, fuel depots often receive regular deliveries of fuel by tanker trucks. These trucks need to access the depot, which can lead to increased truck traffic in the surrounding area.

Mitigation measures

- Designate separate entry and exit lanes for vehicles accessing the fuel depot to prevent traffic bottlenecks.
- Implement parking management strategies for depot employees and visitors to ensure efficient use of available parking spaces and minimize on-street parking.
- Install advanced warning signs along major roads leading to the fuel depot to alert drivers of upcoming entrances, exits, and potential traffic conditions, helping to manage traffic flow.

6.1.12. Archaeological impact

During the construction phase, historical resources protected under the National Heritage (27 of 2004) may be encountered during excavations. Nevertheless, the project site is not located at any known or documented archaeological site.

Mitigation measures

- If any archaeological features or objects (e.g., Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves, etc) that possess cultural values are found, they should be barricaded off and the Namibian Heritage Council (NHC) office should be informed immediately.
- The site location where archaeological features might be found should be marked with flag tape and the GPS coordinates should be recorded.
- The proponent should adopt the Chance Finds Procedure: “a person who discovers any archaeological object must as soon as practicable report the discovery to the Council”, so that if buried archaeological remains which are not visible to surface survey may be handled in accordance with the provisions of Part V Section 46 of the National Heritage Act (27 of 2004).

6.1.13. Risk and spread of HIV/AIDS

Migration of workers to projects like this often from areas with different HIV rates can increase risky sexual behaviours and contribute to HIV spread. Challenges accessing HIV services the situation. Limited time for workers to visit partners may lead to seeking new ones locally, and workplace condom availability may be insufficient.

Mitigation measures

- Allocate time for workers to visit their families.
- Sensitization campaign to the staff on HIV/AIDS and other STDs.
- Free distribution of condoms on site.
- Free counselling to those already affected by the virus.

6.1.14. Cumulative impacts

Cumulative impacts occur when the effects of an action combine with other effects in a specific place and time, leading to environmental degradation. It involves the incremental changes caused by past, present, or foreseeable actions alongside the project. For instance, extensive vegetation clearing reduces plant species abundance, diminishing food production for fauna and allowing invasive species to dominate. Contamination of ground and surface water lowers quality, leading to bioaccumulation and contamination in the food web, posing health risks.

Mitigation measures

- Cleared vegetation should be compensation by planting more than cleared.
- The protected and endemic species should be re-introduced in the area.
- Off-road driving should not be allowed, and only existing tracks should be used to avoid trampling of organisms of conservation concern.
- No burial of any waste or burning should be done on-site since all waste must be disposed of on approved disposal sites.
- There should be a proper ablution facility.
- Usage of drip trays to prevent spillage of oil and lubricants which can affect the soil and water and groundwater pollution.
- Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by an authorized hazardous waste handler.

6.2. Positive impacts

6.2.1. Employment creation

Employment will be created during the lifespan of the project. The types of jobs will range from skilled, semi-skilled and unskilled. This will improve the wealth and livelihood of people.

Enhancement measures:

- Employ locals in all casual labour in both phases.
- Gender equality, transparency should be ensured when recruiting.
- In terms of human resources development and capacity building; the contractor is to enforce training programmes that skilled workers should always train workers, when necessary, for them to enhance their performances and to gain more knowledge that they might demonstrate at other levels in the future.

6.2.2. Generation of revenue

- According to the law of Namibia, operating companies are required to pay tax to the government. The revenue generated benefit the nation at large given that money generated from tax is diverted to the public by the government.

Enhancement measure:

- Continuous payment of taxes due as regulated in the Namibian laws.

6.2.3. Local development and improvement of general welfare

- Project investors are believed to bring development to communities where they are operating as a form of enhancing social responsibility. The general welfare of locals should also be improved.

Enhancement measure:

- The proponent should be engaged in community development projects.

7. Environmental monitoring

Environmental monitoring serves as a tool to address the adverse impacts of a project on the environment throughout its lifespan and to establish guidelines for best practices. Having an environmental monitoring plan is essential as it provides valuable information and helps in detecting any unwanted environmental developments, thus allowing for the implementation of appropriate control measures. Key parameters to monitor include air quality, pollution by hazardous substances, surface and underground water contamination, risk of fire and explosions, occupational health safety and security, and waste generation.

It should be noted that bi-annual monitoring and evaluation should be conducted by an independent EAP to monitor and evaluate the environmental performance of the project as stipulated in the the EMA no.7 of 2007 and its Regulations of 2012.

The table below outlines sensitive impacts of the project and their required monitoring frequencies.

Table 3**:** Monitoring of sensitive impacts

Impact	**Type of monitoring**	**Monitoring frequency**
Surface soil and water contamination	• Proper spill clean-up. • Fuel reconciliation.	Daily
Underground contamination	• Inspection of possible storage tanks leakages.	Regularly
Emission of hydrocarbon vapours	• Proper PPE always. • Air quality tests	Daily Bi-annually
General waste	• Disposal of waste bins.	Daily
Hazardous waste	• Site inspections of oil spills. • Proper spill clean-up. • Site inspection of housekeeping. • Proper training of fuel attendants.	Daily Regularly
Risk of fire and explosions	• Regular testing and servicing of firefighting equipment.	Regularly
Occupational health, safety and security	• Conducting hazard and risk Assessments. • Safety procedures evaluation.	Daily and when necessitated

	• Health and safety incident monitoring. • Security inspection on site. • Regular supply of appropriate PPE to employees.	

8. DECOMMISSIONING AND SITE CLOSURE

Considering the environmental impacts of decommissioning any development is crucial, regardless of the uncertainty surrounding the timing of the decommissioning phase. The decommissioning phase is regarded as a separate activity that should be dealt with on its own. Therefore, it will be addressed in an Environmental Impact Assessment (EIA) conducted prior to site closure.

During the decommissioning phase of the project, the following recommendations should be considered:

- The proponent should develop a closure plan to be updated on an annual basis at least 5 years or more prior to anticipated decommissioning.
- The closure plan should outline rehabilitation methods for the site closure.
- The proponent should consider specialists input to provide direction on the closure plan to ensure best practice.
- Various stakeholders should be engaged as early as possible in the closure planning to ensure that their inputs are considered.
- The environmental commissioner should grant a successful rehabilitation for decommissioning to be considered complete.

Other recommendations are listed below:

- Removing of equipment on site.
- Removal of associated infrastructures.
- Rehabilitation of all areas impacted by the associated infrastructures.
- Planting of vegetation on site.
- Notify staff about the planned decommissioning and provide them with references to pursue work elsewhere.

9. Conclusion

This EMP document was formulated specifically for the proposed project, to identify mitigation measures of the potential project's impacts on the environment, and where impacts occur, immediate actions must be taken to reduce the escalation of effects associated with these impacts. An EMP is formulated to ensure that the activities of the project will be carried out in an environmentally sound manner.

The Environmental Management Plan report should be utilized as a practical guide on-site throughout the operational phase. It is the responsibility of Transpetro Group Namibia Pty Ltd (the proponent) and appointed contractors to actively implement the EMP, taking all necessary measures to minimize adverse environmental impacts. All contractors and subcontractors involved in the project should familiarize themselves with the contents of the EMP and plan their activities in an environmentally responsible manner.

Regular environmental monitoring is crucial to assess the environmental performance of the project. Evaluating monitoring processes on a consistent basis is crucial for enhancing performance. Any parties found to be in violation of the EMP should be held accountable for non-compliance. Rehabilitation measures should also be in place and enforced.

10. References

I. Government of Namibia. (2008). Government Gazette of the Republic of Namibia. Government notice No.1: Regulations for Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA)-Windhoek.

II. Government of Namibia. (2012). Environmental Management Act no. 7 of 2007. Windhoek: Directorate of Environmental Affairs, Ministry of Environment and Tourism.

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IV. Mendelson, J., Jarvis, A., Roberts, C., and Robertson, T. (2002). Atlas of Namibia: A portrait of the land and its people. Windhoek, Namibia: Ministry of Environment and Tourism.