ENVIRONMENTAL MANAGEMENT PLAN (EMP)

PROPOSED UPGRADE AND CONTINUED OPERATION OF THE EXISTING WATERBERG PETROLEUM FUEL WHOLESALE FACILITY IN OTJIWARONGO, OTJOZONDJUPA REGION

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Compiled for:

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REPORT STATUS:	**FINAL**

1. INTRODUCTION AND BACKGROUND

An Environmental Management Plan (EMP) has been commissioned by Waterberg Petroleum Cc (Proponent) for the proposed storage alterations and upgrade of the existing Waterberg Petroleum fuel wholesale facility, in Otjiwarongo (Otjozondjupa Region). This EMP serves as a managing tool for the proposed upgrade and operational activities at the site.

The site was constructed in 1993, long before the Environmental Management Act, 2007 (Act No. 7 of 2007) and its regulation of 2012 was promulgated. No environmental clearance certificate (ECC) was ever obtained for the site. Waterberg Petroleum Cc has now taken over the site and plans on developing it into a modern fuel wholesale facility. A partial rebuild of the site will take place which will entail the construction and installation of new fuel dispensing points, reticulation pipelines, spill control systems and a new canopy.

As VIVO Energy Namibia Ltd is envisaged to be the fuel supplier to the facility, the proposed sites upgrade forms part of VIVO Energy's commitment to world-class standards of operation in safety, reliability and the environment.

The EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development. The document serves as a guiding tool for the contractors and workforce on their roles and responsibilities concerning environmental management on site, and also provides an environmental monitoring framework for all project phases of the development. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

In this report,

a) the Contractor (and its sub-contractors) refers to construction personnel responsible for the *site upgrade* and/or *maintenance activities* of the development.

b) the Project Personnel refers to the employees, staff and suppliers responsible for the *operations activities* of the development.

The purpose of the EMP is to:

- ✓ Train employees and contractors with regard to environmental obligations.
- ✓ Promote and encourage good environmental management practices.
- ✓ Outline responsibilities and roles of Waterberg Petroleum fuel wholesale facility and the contractor in managing the environment.
- ✓ Describe all monitoring procedures required to identify environmental impacts.
- ✓ Minimise disturbance of the natural environment.
- ✓ Develop waste management practices.
- ✓ Prevent all forms of pollution.

- ✓ Protect the natural environment.
- ✓ Prevent soil and water erosion.
- ✓ Comply with all applicable laws, regulations and standards for environmental protection.

The proposed upgrade; and operations of the wholesale facility entails:

- ✓ Removal of all existing fuel infrastructure.
- ✓ Installation of new fuel storage tanks and associated vent pipes.
- ✓ Installation of associated reticulation pipelines, dispensing points and filler points.
- ✓ Installation of associated spill containment system and oil-water separator.
- ✓ Installation of associated electrical supply.
- ✓ Transport of fuel supply with road transport tanker trucks.
- ✓ The dispensing of fuel to vehicles, and suitable containers.

1.1. Locality and Land Use

The project site (20.45638°S; 16.64673°E) is situated on Erf no. 1585 Industria Road, in Otjiwarongo, Otjozondjupa Region. See Figure 1 and 2 for layout and locality maps.

The site occupies a plot, which has an approximate land size of 4,150m^2. Directly north and west of the site are railway servitudes. East of the site is Petrosol Namibia, with OBM Engineering & Petroleum situated south of the site. The site is generally flat with a gentle slope towards the north. Land use in the area is classified as industrial.

Figure 1. Layout of the site

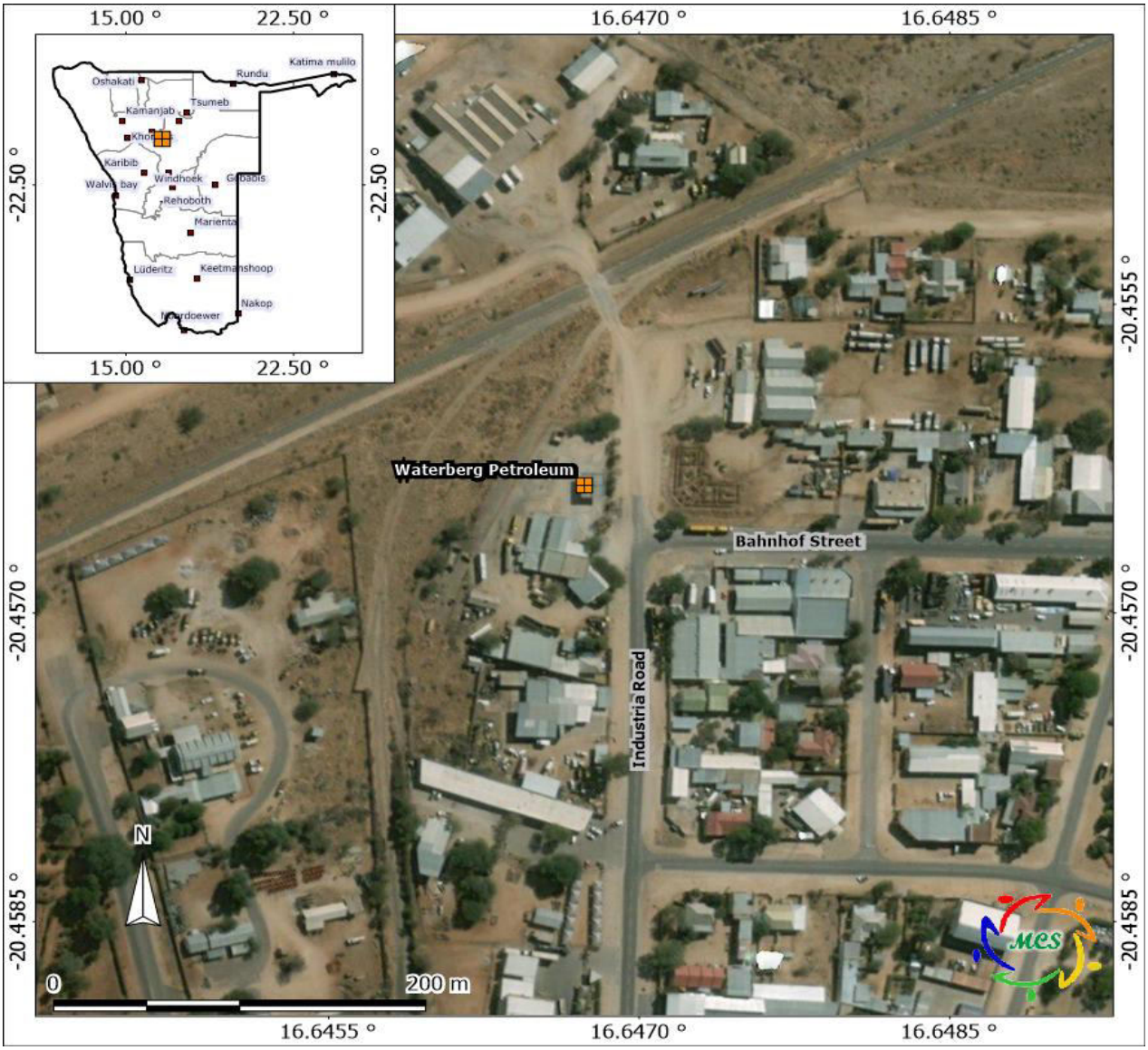

Figure 2. Project Location (20.45638°S; 16.64673°E)

2. LEGISLATIVE FRAMEWORK

I. The Namibian Constitution

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

II. Environmental Management Act No.7 of 2007

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural

resources and 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.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

(a) to make sure that people consider the impact of activities on the environment carefully and in good time

(b) to make sure that all interested or affected people have a chance to participate in environmental assessments

(c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

Line Ministry: Ministry of Environment and Tourism

III. The Water Act (Act No 54 of 1956)

The Water Act No. 54 of 1956 as amended, aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users.

The Act broadly controls the use and conservation of water for domestic, agricultural, urban and industrial purposes; to control, in certain respects, the use of sea water; to control certain activities on or in water in certain areas; and to control activities which may alter the natural occurrence of certain types of atmospheric precipitation.

IV. Water Resources Management Act of Namibia (2004) *(Guideline only)*

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

V. Environmental Assessment Policy of Namibia (1995)

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's)

is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or private sector, should be subjected to the established EA procedures.

Apart from the requirements of the Environmental Assessment Policy, the following sustainability principles needs to be taken into consideration, particularly to achieve proper waste management and pollution control:

- ✓ **Cradle to Grave Responsibility**

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

- ✓ **Precautionary Principle**

  There are numerous versions of the precautionary principle. At its simplest it provides that if there is any doubt about the effects of a potentially polluting activity, a cautious approach should be adopted.

- ✓ **The Polluter Pays Principle**

  A person who generates waste or causes pollution should, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

- ✓ **Public Participation and Access to Information**

  In the context of environmental management, citizens should have access to information and the right to participate in decisions making.

Line Ministry: Ministry of Environment and Tourism

VI. Petroleum Products and Energy Act of Namibia (Act No. 13 of 1990)

The Act makes provision for impact assessment to be conducted for new fuel facilities and petroleum products known to have detrimental effects on the environment.

VII. Draft Pollution Control and Waste Management Bill *(Guideline only)*

The proposed upgrade of fuel wholesale facility in Otjiwarongo, only applies to Parts 2, 7 and 8 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

Part 8 calls for emergency preparedness by the person handling hazardous substances, through emergency response plans.

VIII. Atmospheric Pollution Prevention Ordinance of Namibia No. 11 of 1976

The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. A certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process. Best practice would be to notify the line Ministry about emissions but it is not a legal requirement.

Line Ministry: Ministry of Health and Social Services

IX. Hazardous Substances Ordinance No. 14 of 1974

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

3. INSTALLATIONS AND RELATED ACTIVITIES

3.1. Existing UST and Pump Specifications

The aboveground infrastructure consists of a canopy partially covering the forecourt area, with four (4) pump islands and associated dispensing pumps, and one (1) customer own collection (COC) point.

The underground infrastructure at the site consists of eight (8) UST's (underground storage tanks), namely;

- 2 x Tank – 83 m^3 diesel UST (50ppm),
- 2 x Tank – 23 m^3 unleaded petrol (ULP),
- 3 x Tank – 14 m^3 diesel UST (50ppm),
- 1 x Tank – 14 m^3 Illuminating Paraffin,

All of the above installations will be flushed, filtered and pressure tested for reuse.

All new tanks will be double walled underground perma- tanks, which will be constructed according to the latest VIVO Energy standards. The following alterations as per below will also be conducted:

- New canopy and forecourt area will be constructed,
- New pump islands with associated multi-dispensing pumps will be installed.
- New spill containment structures with associated drainage systems will be installed, and
- 3-Chamber separator pit will be constructed.

The new canopy, forecourt and pump islands will be configured in such a way as to allow safe and ease of traffic flow at the site. See Figure 3 for a site layout map. The upgrade and alterations at the facility will be constructed and operated according to relevant SANS standards (or better), with special emphasis on SANS 10089-1, SANS 10089-2, SANS 10089-3.

4. RECEIVING ENVIRONMENT

This section lists the most important environmental characteristics of the project area and provides a statement on the potential environmental impacts.

4.1. Climate

Classification of climate:	Semi-arid climate
Average rainfall:	Rainfall in the area is averaged to be between 400 to 450mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be between 30 to 40% per year.
Average evaporation:	Evaporation in the area is averaged to be between 2800 to 3000mm per year.
Water Deficit:	Water deficit in the area is averaged to be between 1500 and 1700mm per year.
Temperatures:	Temperatures in the area are averaged to be between 20 and 21°C per year.
Precipitation:	Sporadic and unpredictable, high intensity, highly localised storm events between October and April does occur. Evaporation exceeds precipitation by approximately 90%.

The Otjiwarongo area and its surroundings can be classified as a water deficit area with annual evaporations exceeding the mean annual rainfall by far. Summer rainfall dominates precipitation in the form of thundershowers and seasonal run off events might occur in the form of flash floods.

The aridity of the region causes the water resource to be a scarce commodity and has to be conserved and protected from pollution at all cost. Groundwater in the area is an important source of potable water for the town.

4.2. Topography and Drainage

The site is relatively flat with a gentle slope towards the north. The landscape is classified as being in the Central-western plains, which is characterized as an area of dissection and erosional cutback. The site is located within the catchment of the Ugab River, an ephemeral river draining in a western direction.

Drainage from the site is well developed and runoff takes place northward. The relief of the town's stormwater system remains intact, and allows good drainage from site and its surroundings. Proper drainage systems however should be developed at the facility itself, in order to control the flow of surface water run-off from the site. Storm water management systems should form part of the engineering designs.

4.3. Hydrogeology

Granite of the Cambrian Age (Egd) underlies a thin (less than 1m) surface soil cover at the site. All of the underlying formations are classified as hard rock formations. Groundwater flow would be mostly along fractures, faults (secondary porosity) and other geological structures present within the formations.

Groundwater flow from the site can be expected into a southwesterly direction; however local drainage patterns may vary due to groundwater abstraction. According to the Department of Water Affairs (DWA) database, water is utilized in the area with 2 boreholes known of within a 2km radius. Local flow patterns may vary due to groundwater abstraction. Depth to water table is expected to be less than 10m below ground level (mbgl).

Otjiwarongo relies on water supply from the Otjiwarongo Water Supply Scheme via pipelines. The Scheme consists of two well fields referred to as northeast and southwest, which are mainly located in the marble aquifers. The Northeast well field comprises of the Omarassa boreholes, which can be grouped per compartment in Drukwerk-Brunnental, Nebraska-Horseshoe, Omarassa-Okaputa, Janhelpman and Phase 5. The Southwest comprises of the Omatjene, Buffelhoek, Otjitazu, Hoasas and Kilo 9 compartments. All of the well fields are outside the municipal boundaries of Otjiwarongo.

This area falls within the Otjiwarongo-Otavi Subterranean Water Control Area. - Proclamation 18 of 4 February 1977. This means that Government controls groundwater usage and exploration thereof. See Figure 4 below for the hydrogeological map.

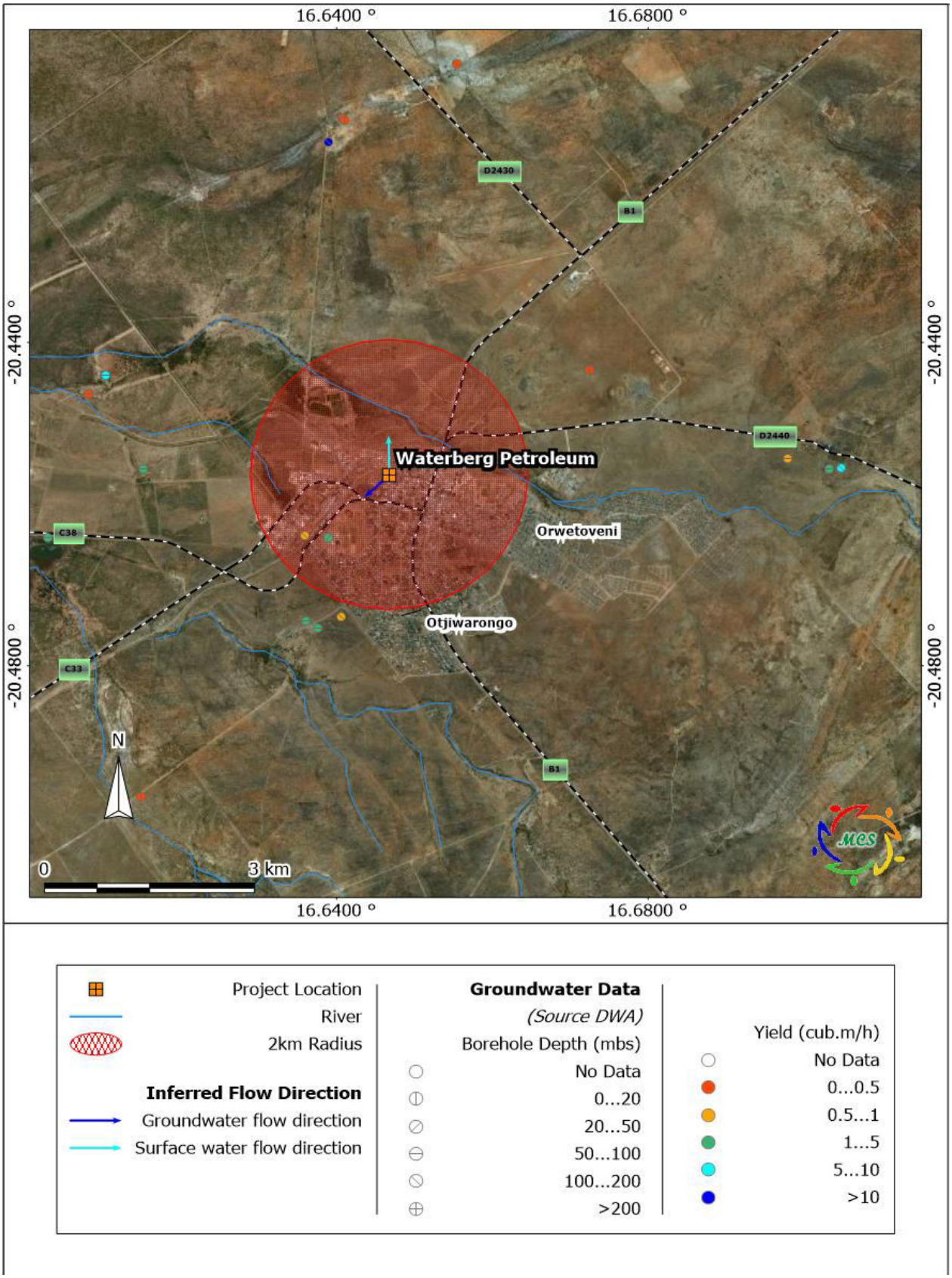

Figure 3. Hydrogeological map

4.3.1. Surface- and Groundwater Management

Surface water and groundwater systems are connected in most landscapes. Streams interact with groundwater in three basic ways, *i.e. streams gain water from inflow of groundwater through the streambed, streams lose water by outflow through the streambed, or they do both depending upon the location along the stream*. It is the groundwater contribution that keeps streams flowing between precipitation events.

Groundwater and surface water are therefore essentially one resource, physically connected by the hydrologic cycle. As a result, groundwater and surface water pollution monitoring must form an integral part of the Environmental Management Plan (EMP). Surface water pollution on site will be mitigated by the construction of proper surface water run-off drainage systems with built-in oil-water separator pits. Visual inspection of surface water pollution should be adopted, with support of water sampling at specific locations as guided by visual inspections.

It is recommended that groundwater pollution be monitored through the strategic installation of three (3) shallow monitoring boreholes around the fuel facility. The purpose of these boreholes will be to quantify levels of pollution in the subsurface and to monitor any migration of pollution off site. Baseline water samples should be collected from the boreholes immediately upon inception of the monitoring programe.

5. ENVIRONMENTAL MANAGEMENT STRUCTURES

The Contractor and / or its agents will be responsible for environmental management on site during the site upgrade and operational period. For the purpose of this report,

- the Contractor (and its sub-contractors) refers to construction personnel responsible for the *site upgrade activities* and/or *maintenance activities* at the project site.
- the Project Personnel refers to the employees, staff and suppliers responsible for the *operations activities* of the project site.

A pre-construction meeting is recommended in order to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMP. In addition surrounding residents, tenants or land owners must be notified in advance of any potentially disturbing activities.

An independent environmental consultant will be appointed to act as the ECO; and conduct inspections of the upgrade activities; and EMP implementation throughout the duration of construction. After each inspection, the ECO will produce a monitoring report that will be submitted to the environmental manager (and Ministry of Environment and Tourism (Department of Environmental Affairs) if required). Relevant sections of the minutes of site meetings will be attached to the monitoring report.

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective environmental management through implementation of the EMP.

5.1.1. Responsibility Matrix

The responsibility matrix table below will be assigned and completed before any work commences.

Table 1. Responsibility Matrix

Function	Name / Mobile Number	Responsibility
Environmental Manager (EM)	**Waterberg Petroleum Cc / Vivo Energy Namibia**	▪ Overall management of project and EMP implementation. ▪ Oversees site works, liaison with Contractor, ESO and ECO.
Environmental Control Officer (ECO)	**Matrix Consulting Services**	▪ Implementation of EMP and liaison between Waterberg Petroleum Cc, Department of Environmental Affairs (MET), local authority, Contractor and Landowners/stakeholders
Environmental Site Officer (ESO)	To be appointed	▪ Interaction with ECO, landowners and labourers. Must understand the EMP
Contractor	To be appointed	▪ Implementation and compliance with recommendations and conditions of the EMP, Appoints dedicated person (ESO) to work with ECO

Management shall provide resources essential to the implementation and control of the EMP including: human resources, technology, and financial resources. The general roles and responsibilities of various parties during the site upgrade phase of the project are outlined below.

5.1.2. Roles of the Environmental Manager (EM)

The EM (employer's representative) will act as the employer's on-site implementing agent and has the responsibility to ensure that the Client's responsibilities are executed in compliance with the relevant legislations. Any on-site decisions regarding environmental management are ultimately the responsibility of the EM. The on-site EM shall assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMP:

- ✓ Be fully knowledgeable with the contents of the Construction EMP;
- ✓ Review and authorise updates to the EMP.
- ✓ Ensure resource allocation for implementation of the EMP requirements.
- ✓ Ensure that environmental requirements are integrated into project plans, work method statements, tender and contract documents.
- ✓ Ensure necessary support to the ESO for implementation of the EMP.
- ✓ Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
- ✓ Participate in environmental performance verification activities to verify the level of compliance with the EMP in delivering the legal and environmental obligations.
- ✓ Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.
- ✓ Participate in incident investigations (as required).
- ✓ Initiate external audits (as required).

5.1.3. Roles of the Environmental Control officer (ECO)

The ECO for the site is an independent environmental consultant appointed by Waterberg Petroleum Cc to monitor and review the on-site environmental management and implementation of this EMP on the construction site.

The duties of the ECO:

- ✓ Ensure that all construction or decommissioning activities on site are undertaken in accordance with the EMP;

- ✓ Undertake compliance audits against the EMP and conditions of the Environmental Authorisation (where required).
- ✓ Provide support and advice to the project team, contractor and all subcontractors in the implementation of environmental management procedures and corrective actions.
- ✓ Report significant incidents internally and externally as required by law and the conditions of authorisation.
- ✓ Ensure that monitoring programs, which assess the performance of the EMP, are implemented.
- ✓ Assist in the investigation of incidents and non-conformances and confirm in conjunction with the ESO that corrective and preventive action is taken and is effective.
- ✓ Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.
- ✓ Facilitate the amendment of the EMP in conjunction with the Environmental Manager (as required).
- ✓ Provide environmental training for key project personnel (in communication with Environmental Manager).
- ✓ Prepare audit reports (and submit reports to the relevant authority as required).

5.1.4. Roles of the Environmental Site Officer (ESO)

The ESO is expected to administer and control all environmental matters relating to the upgrade and operations of the fuel wholesale facility. The ESO will conduct the following:

- ✓ Ensure implementation of the EMP.
- ✓ Ensure that the latest EMP documents are filed and readily accessible as required.
- ✓ Ensure communication of EMP requirements to relevant project, contractor and sub-contractor personnel as required for EMP implementation.
- ✓ Monitor compliance of EMP implementation and compliance of all contractors and sub-contractors.
- ✓ Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the EMP. This includes identifying additional project training requirements and implementing the training programme.
- ✓ Maintain training records for all project personnel including contractors.

- ✓ Maintain environmental incidents and stakeholder complaints register.
- ✓ Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
- ✓ Report significant incidents internally and externally as required by law and the conditions of authorisation.
- ✓ Investigate incidents and recommend corrective and preventative actions.
- ✓ Provide support and advice to the contractor and all sub-contractors in the implementation of environmental management procedures and corrective actions.
- ✓ Ensure that monitoring programs, which assess the performance of the EMP, are implemented.
- ✓ Ensure maintenance of site document control requirements.
- ✓ Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.

5.1.5. Roles of the Contractor

The ECO, will be responsible for monitoring compliance with the Environmental Management Plan, and liaising with the EM. The contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the EMP. Failure by any employee of the Contractor, Sub-contractor, Suppliers etc. to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ESO to instruct the EM to have the employee removed from the site. The EM will also order the removal of equipment from the site that is causing continual environmental damage (e.g. leaking oil and diesel). Such measures will not replace any legal proceedings the Client may institute against the Contractor.

The EM shall order the contractor to suspend part or all of the works if the contractor and/or any sub-contractor, suppliers, etc., fail to comply with both the EMP and the construction procedures supplied by the Contractor. The suspension will be enforced until such time as the offending procedure or equipment is corrected and/or if required remedial measures are put in place. No extension of time will be granted for such delays and all costs will be borne by the Contractor

By virtue of the environmental obligations delegated to the Contractor through the Contract Document, all staff (including subcontractors and staff), suppliers, and service providers appointed for the project would be responsible for:

- ✓ Ensuring adherence by providing adequate staff and provisions to meet the requirements of the EMP;
- ✓ Ensuring that Method Statements are submitted to the Environmental Manager for approval before any work is undertaken, and monitor compliance with the EMP and approved Environmental Method Statements;
- ✓ Ensuring that any instructions issued by the ESO and/or EM are adhered to;
- ✓ Ensuring the representation of a report at each site meeting, documenting all incidents that have occurred during the period before the site meeting;
- ✓ Undertake daily, weekly and monthly inspections of the work area(s);
- ✓ Ensuring that a register of all the transgressions issued by the ESO is kept in the site office;
- ✓ Ensuring that a register of all public complaints is maintained; and
- ✓ Ensure that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the success full implementation of the environmental requirements of the Contract.
- ✓ Report and record any environmental incidents caused by the Contractor or due to the Contractor's activities;
- ✓ obtain required corrective action within specified time frames and close out of environmental incidents;
- ✓ Provide weekly checklists to the EM and ESO.

The Contractor will nominate an Environmental Site Officer (ESO) who will be responsible for ensuring that the requirements of the EMP and the associated documents are complied with on the construction site on behalf of the Contractor. The ESO shall:

- ✓ Identify areas of non-compliance and recommend measures to rectify them in consultation with the Project Manager, the EM and the ECO as required;
- ✓ Ensure that environmental problems are remedied timeously and to the satisfaction of the Project Manager, the EM and the ECO as required;
- ✓ Set up activity based method statements prior to the start of relevant construction activities and submit these to the Project Manager, the EM and the ECO as required;
- ✓ Perform ongoing environmental awareness training of the Contractor's site personnel.

6. IMPLEMENTATION AND MONITORING

6.1. Site Upgrade Phase Procedures

6.1.1. Environmental Awareness Training

Waterberg Petroleum Cc / Vivo Energy Namibia Ltd. have the responsibility to ensure that all persons involved in the project are aware of, and are familiar with, the environmental requirements for the project. All project personnel, including contractors and sub-contractors are required to receive training of a type and level of detail that is appropriate for the environmental aspects of their work. Training shall be held during normal working hours, preferably on site. All attendees shall remain for the duration of the training and, on completion, sign an attendance register that clearly indicates participants' names. A copy of the register shall be handed to the ECO. As a minimum, all personnel are required to complete the training requirements stipulated in Table 2 below.

Table 2. Environmental Training Requirements

Training and Induction Requirements		
Training Requirement		**Frequency**
Site Induction - the purpose of the induction is to ensure that, as a minimum, all on-site personnel understand the EMP in terms of:		**Site upgrade and Operational activities**: prior to commencement of work by staff and / or contractors.
	Key issues relating to the project.	
	Relevant conditions of the Environmental Authorisation.	
	Location and protection of environmentally sensitive areas (if any).	
	Waste management and minimisation.	
	Minimising potential impacts to air, noise and water quality.	
	Surface and groundwater contamination.	
	Spill control measures.	
	Environmental Emergency Plan.	
	Incident reporting procedures.	
	Roles and responsibility relating to environmental management.	
Pre-Start Meeting – Pre-start meetings should be undertaken prior to commencement of a new activity in order to discuss the planned work and operational aspects of the tasks. Health, safety and environmental issues and controls should be discussed and understood.		**Site upgrade and Operational activities**: As required.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EMP. They shall know and understand the specifications of the EMP and be able to assist other staff members in matters relating to the EMP.

6.1.2. Method Statements

The EMP provides the overall project strategy for management of environmental issues; however, a Construction Method Statement (CMS) will address environmental management issues at a site level. The CMS provides an environmental manual for use by management and construction staff involved in the works. It addresses the environmental issues that are specific to an activity and/or site. CMS's should be produced for all major upgrading activities, and will typically provide detailed descriptions of items including, but not necessarily limited to:

- ✓ Nature, timing and location of activities;
- ✓ Procedural requirements and steps;
- ✓ Management responsibilities;
- ✓ Material and equipment requirements;
- ✓ Transportation of equipment to and from site;
- ✓ Develop methods for moving equipment/material while on site;
- ✓ How and where material will be stored;
- ✓ Emergency response approaches, particularly related to spill containment and clean-up;
- ✓ Response to compliance/non-conformance with the requirements of the EMP; and;
- ✓ Any other information deemed necessary by the EM/ECO.

The contractor shall not commence the activity until the Method Statement has been approved and shall, except in the case of emergency activities, allow a period of one week for approval of the Method Statement by the ECO and EM. Such approval shall not unreasonably be withheld.

The ECO and EM may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the ECO and EM, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The contractor shall carry out works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract.

Based on the specifications in this EMP, the following Method Statements are required as a minimum (but not limited to these):

- ✓ Site clearing;
- ✓ Site layout and establishment;
- ✓ Hazardous substances;
- ✓ Cement and concrete batching (for each operation)
- ✓ Traffic accommodation;
- ✓ Solid waste control system;
- ✓ Wastewater control system;
- ✓ Fire control and emergency procedures.

6.2. Site Establishment and Construction

6.2.1. Demarcation of the Site

The 'site' here refers to all areas required for upgrade and site alteration purposes. Prior to any such activities on site the approved site shall be demarcated for the development.

The site will be properly demarcated and/or temporarily fenced off as agreed with the ESO. The method of demarcation shall be determined by the contractor and agreed to by the EM or ESO prior to any work being undertaken. The contractor shall maintain the demarcation line and ensure that materials used for upgrade and alterations of the site do not blow on or move outside the site and environs, or pose a threat to people. The boundaries of the site shall be demarcated prior to any work commencing on the site. The site boundary demarcation fence shall be removed when all construction work is completed.

The contractor shall ensure that all his plant, labour and materials remain within the boundaries of the site, unless otherwise agreed in writing with EM. Failure to do so may result in the EM requiring the contractor to fence the boundaries of the site with wire mesh at his own expense to the satisfaction of the EM and the local town council. It will be the responsibility of the contractor to decide on an appropriate system of protective fencing for the site.

The contractor shall be responsible to ensure that building materials such as sand is not blown away and take the necessary precautions to prevent sand from being blown by the wind.

6.2.2. Movement of Construction Personnel and Equipment

The contractor shall ensure that all construction personnel and equipment remain within the demarcated construction site at all times. Where construction personnel and/or equipment wish to move outside the boundaries of the site other than normal access to the road for loading and access purposes, the contractor shall obtain written permission from the EM and/or ESO.

6.2.3. Location of Construction Camps

Construction camps include workshops, temporary stockpile sites, temporary fuel installations, other storage and work areas, required by the contractor, sub-contractors and suppliers. All construction camps (if any) will be positioned in demarcated areas approved by the ESO.

6.2.4. Ablution Facilities

The contractor shall provide the necessary temporary ablution facilities (where required) for all site personnel. The sitting of toilets shall be agreed with the EM. The contractor shall supply an adequate number of chemical or other suitable and approved toilets throughout the site where construction personnel will be operating. The toilets shall be secured to prevent them from blowing over, and the doors shall be provided with an external closing mechanism to prevent toilet paper from being blown out. Toilets shall be cleaned and serviced regularly.

The contractor shall ensure that any chemicals and/or waste from the toilets is not spilled on the ground at any time. Should there be spillage of chemicals and/or waste, the EM shall require the contractor to place the toilets on solid base or containment structures with sumps. The contractor will be required to provide a suitable and approved and to remove accumulations of chemicals and waste from the site and dispose of it at an appropriate waste disposal site or sewage plant base at his own expense.

Abluting anywhere other than in the toilets shall not be permitted. The contractor shall be responsible for cleaning up any waste deposited by personnel.

6.2.5. Eating Areas

The contractor shall, in agreement with the EM, designate specific areas for eating and shall provide adequate refuse bins at all places. The refuse bins shall be cleaned regularly.

6.2.6. Provision of Water

The contractor shall be responsible for providing construction, drinking and washing water for his staff. Construction water shall be obtained from locations as agreed with the ESO and EM.

6.3. Material Handling and Storage

6.3.1. Refuelling of Equipment

Where reasonably practical, plant shall be refuelled at a designated re-fuelling area or at the workshop as applicable. If it is not reasonably practical then the surface under the temporary refuelling area shall be protected against pollution with proper spill containment materials. The contractor shall ensure that there is always a supply of containment materials and absorbent material readily available to contain/absorb/breakdown and where possible is designed to encapsulate minor hydrocarbon spillage. The quantity of such material shall be able to handle a minimum of 200 litre of hydrocarbon liquid spill.

6.3.2. Chemical, Harmful and Hazardous Materials

All project personnel and contractors shall comply with all relevant national and local legislation with regard to storage, transport, use and disposal of chemical, harmful and hazardous substances and materials. The contractor shall obtain the advice of the manufacturer with regard to the safe handling of such substances and materials.

The contractor shall provide the ESO and EM with a list of all chemical, harmful and hazardous substances and materials on site, together with storage, handling and disposal procedures for these materials.

The contractor shall ensure that information on all chemical, harmful and hazardous substances are available to all personnel on site. The contractor shall furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposal. A dangerous material datasheet should be available on site. The contractor shall submit method statements detailing the substances / materials to be used, together with the storage, handling and disposal procedures of the materials.

6.4. Solid Waste Management

Waterberg Petroleum Cc (and its Contractors) shall institute a waste control and removal system for the site that is acceptable to the ESO. The Contractor shall not dispose of any waste and/or construction debris by burning, or by burying. All waste shall be disposed off site at an approved landfill site. Consultation with the Otjiwarongo Municipality should be conducted in this regard.

Where necessary, the Contractor shall supply waste bins/skips where construction personnel are working. The bins shall be secured in such a manner as to prevent their contents blowing out. The Contractor shall ensure that all personnel immediately deposit all waste in the waste bins for removal by the Contractor. Waste shall be properly contained in a scavenger, water and wind-proof containers until disposed of at an approved landfill. Bins

shall be emptied and waste removed at least once a week from the site. The bins shall not be used for any purposes other than waste collection.

Petroleum, chemical, harmful and hazardous waste throughout the site shall be stored in enclosed, bunded areas, the location of which shall be determined on site in conjunction with the ESO. The bunded areas shall be clearly marked. Such waste shall be disposed offsite at an appropriate hazardous waste disposal site.

All contaminated soils must be removed from the site and disposed off or treated at a suitable facility. Unfortunately, no hazardous waste disposal facility exists in Otjiwarongo, or the region at large, therefore a controlled bioremediation facility should be developed for any contaminated soil produced.

6.5. Cement and Concrete Operations

The contractor is advised that cement and concrete are regarded as materials that are potentially damaging to the natural environment on account of the very high pH of the material, and the chemicals contained therein. The contractor shall ensure that all operations that involve the use of cement and concrete are carefully controlled. Concrete mixing shall only take place in agreed specific areas on site.

Water and slurry from concrete mixing operations shall be contained to prevent pollution of the ground surrounding the mixing points. Old cement bags shall be placed in wind and spill proof containers as soon as they are empty. The contractor shall not allow closed, open or empty bags to lie around the site.

Where exposed aggregate finishes are specified the contractor shall collect all cement-laden water and store it in conservancy tanks for disposal off site at an approved disposal site.

All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed.

All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. No cement or concrete laden water will be permitted to be drained directly into any surface water source.

6.6. Lighting Management

The Contractor shall ensure that any lighting installed on the site for his activities does not interfere with road traffic, or cause an avoidable nuisance to the surrounding properties, or other users of the area. Lighting installed shall, as far as practically possible, be energy efficient. Lighting utilized on site shall be turned off when not in use.

6.7. Waste Water Treatment

6.7.1. Discharge of Construction Water

Construction water in this report, refers to all water affected by construction activities. The Contractor shall construct and operate the necessary collection

facilities to prevent pollution. The Contractor shall dispose of collected waste water in a manner agreed with the ESO.

The Contractor may discharge "clean" water overland and allow this water to filter into the ground. However, he shall ensure that he does not cause erosion as a result of any overland discharge. No water shall be allowed to drain onto neighbouring properties or directly into any nearby surface water source.

No washing of plant, equipment, concreting equipment etc. shall be permitted on site unless approved by the ESO based on a method statement which deals specifically with the issue of potential pollution of any surface water or stormwater systems.
Should it be necessary to dispose of contaminated water into the municipal sewer or storm water system, written permission is required from the relevant Otjiwarongo Municipality.

A Method Statement is required from the Contractor detailing the management of contaminated water. The Contractor shall notify the ESO/EM immediately of any pollution incidents on Site.

6.7.2. Prevention of Soil, Surface-and Groundwater Pollution

The Contractor shall take all reasonable precautions to prevent the pollution of the ground and/or surface water resources on and adjacent to the site as a result of his activities. Such pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage and waste products, etc. Water pollution can be reduced through the establishment of rules and regulations set by the ESO on water usage which will guide workers and visitors during operation and construction.

The Contractor shall obtain oil absorbent pads, booms and spill kits, or similar designed products or materials to soak up oil, petrol and diesel. These materials shall be readily available for use wherever construction equipment is working. This should also be available at work stations where fuel and lubricants is being offloaded, stored, equipment is filled and serviced. The Contractor shall ensure that he is familiar with the correct use and disposal of any materials designed to soak up petroleum products. Environmental friendly methods will be used during construction e.g.

- ✓ cement batching on boards, no wash water allowed to run off,
- ✓ paint washing in containers to be removed to licensed site,
- ✓ use of environmental friendly paints with low toxicity,
- ✓ use sand filters for paint brush washing and contain cement bags,
- ✓ waste water from paints with potential high environmental impact must be disposed of in accordance with an agreed method with the ESO.

The Contractor shall ensure that no oil, petrol, diesel, etc. is discharged onto the ground. Pumps and other machinery requiring oil, diesel, etc. that are to remain in one position for longer than two days shall be placed on drip trays or other similar suitable containment structures. These containment structures shall be watertight and shall be emptied regularly and the contaminated water disposed off-site at a facility capable of handling such waste liquid. Drip trays shall be cleaned before any possible rain events that may result in the drip trays overflowing, and before long week ends and holidays.

The Contractor shall remove all oil, petrol, diesel-soaked soil immediately and shall dispose of it as hazardous waste.

6.8. Site Clean Up and Rehabilitation

6.8.1. Site Clean Up

The Contractor shall ensure that all waste, temporary structures, equipment, materials and facilities used for construction activities are removed upon completion of the project. The Contractor shall clear and clean the construction site to the satisfaction of the ESO and EM upon completion of the project.

6.8.2. Rehabilitation

The developer will undertake all rehabilitation of areas disturbed as a result of activities on site. Especially areas outside the designated project site. Expenses incurred in rehabilitating these areas shall be for the Contractor's account. The estimated cost of rehabilitation will be provided to the Contractor prior to the rehabilitation work commencing.

Due to the urban setting of the project location, very little vegetation is present in the area. However, if deemed necessary, revegetation of disturbed construction areas shall take place as soon as possible after construction work is completed.

6.9. Emergency Procedures

6.9.1. Fire

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of activities on site. The Contractor shall report all fires immediately to the relevant authorities and EM.

The Contractor shall be liable for any expenses incurred by any organizations called to assist with fighting fires and for any costs relating to the rehabilitation of burnt areas and/or property, and/or persons should the fire be caused by activities on the site. No open fires for heating or cooking shall be permitted on site.

The Contractor is advised that sparks generated during operations involving welding, cutting of metal or gas cutting can cause fires. Such operations and the use

of such equipment are prohibited near potential sources of combustion. The Contractor shall be responsible for providing the necessary basic fire-fighting equipment. All equipment shall be maintained in good operating order.

The Contractor shall supply all site offices, workshop areas, materials, stores and any other areas identified by the ESO and/or EM with suitable tested and approved fire fighting equipment. The Contractor shall appoint members of his staff as the fire officer and fire-fighting team. The contractor will train the fire officer and the fire-fighting team. All expenses incurred shall be for the Contractor's account.

The following measures will be followed to reduce the intensity of fires during construction and operation:

- ✓ Inform workers to perform construction activities carefully (e.g. some machines create sparks)
- ✓ Restrict smoking to designated areas,
- ✓ Provide fire extinguishers,
- ✓ Restrict fires to designated areas,
- ✓ Emergency response plan related to fuel storage,
- ✓ Emergency fire plan for visitors and staff.

6.9.2. Accidents on Site

The Contractor shall comply with the Occupational Health and Safety Act and any other national, regional or local regulations with regard to safety on site. The Contractor shall ensure that contact details of the local medical services are available to the relevant construction personnel prior to commencing work.

6.9.3. Petroleum, Chemical, Harmful and Hazardous Materials

The Contractor shall ensure that he is familiar with the requirements for the safe storage, handling and disposal of petroleum, chemical, harmful and hazardous materials.

The Contractor shall be responsible for establishing an emergency procedure for dealing with spills of release of these substances. He shall also ensure that the relevant construction personnel are familiar with these emergency procedures.

The Contractor shall submit his emergency procedure to the EM prior to bringing on site any such substances. All spills or accidents involving such materials are to be recorded. The clean up of spills and any damage caused by the spill shall be for the Contractor's account.

6.9.4. Adverse Weather Conditions

The Contractor may consider collection points to prevent their filling with rainwater. The measures to be implemented to prevent contamination from wastewater and or

polluted storm water shall be addressed in a method statement. The Contractor shall also ensure that rainwater does not run off areas containing pollutants and thus result in a pollution threat. Stockpiles of the fine material such as sand, topsoil material, cement, etc. must also be protected from rain runoff and wind. The Contractor shall ensure that a procedure is established for dealing with potentially polluted rainwater.

In case of adverse weather conditions, the ESO or EM will determine if the work can continue without endangering the health and safety of the field workers. The ESO will monitor the weather during morning and afternoon hours and will document it in the field logbook.

Some of the items to be considered prior to determining the continuance of work are:

- ✓ Potential for heat/cold stress and heat/cold-related injuries,
- ✓ Dangerous weather-related working conditions (high winds, dust storms),
- ✓ Limited visibility.

6.9.5. Emergency Advisory Procedures

The Contractor shall ensure that there is an emergency advisory procedure on site before commencing any operations that may cause damage to the environment. The Contractor shall also ensure that site staffs are familiar with all emergency procedures to be followed.

The Contractor shall ensure that lists of all emergency telephone numbers/contact people are kept up to date, and that all numbers and names are posted at relevant locations at all times.

6.10. Compliance Monitoring

6.10.1. Procedures

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ESO and to impose a penalty. In the event of non-compliance the following recommended process shall be followed:

- ✓ The ESO shall issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the EM.
- ✓ The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- ✓ The Contractor shall provide the ESO with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to

mitigate its effects and the expected results of the actions. A copy shall be provided to the EM.

- ✓ In the case of non-compliance giving rise to physical environmental damage or destruction, the ESO shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- ✓ The EM shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

Any non-compliance by the contractor under instructions of the applicant will be regarded as non-compliance by the applicant and the contractor will not be held liable for such action.

6.10.2. Offences and Penalties

Any avoidable non-compliance with the conditions of the EMP shall be considered sufficient ground for the imposition of a penalty. Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- ✓ Unauthorized entrance into no-go areas e.g. wetlands outside designated construction site;
- ✓ Unauthorized damage to natural vegetation;
- ✓ Unauthorized camp establishment (including stockpiling, storage, etc.);
- ✓ Hydrocarbons, hazardous material: negligent spills or leaks;
- ✓ Ablution facilities: non-use, insufficient facilities, insufficient maintenance;
- ✓ Insufficient solid waste management (including clean-up of litter, unauthorized dumping etc.);
- ✓ Erosion due to negligence, non-performance;
- ✓ Excessive cement, concrete spillage, contamination;
- ✓ Insufficient fire control and unauthorized fires;
- ✓ Preventable damage to water courses or pollution of water bodies; and
- ✓ Non-induction of staff.

6.10.3. Environmental Monitoring

Periodic inspections will be performed by the ECO. These will consist of formal reviews of conformance against policies and procedures stated in this document. Inspections will occur on a monthly basis (or as required). Supervisors in all work areas will conduct performance and compliance reviews, using the EMP as guideline to ensure compliance.

6.10.4. EMP Administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

6.10.5. EMP Amendments

The EMP amendments can only be made with the approval of the EM and ECO, and if required ultimately the DEA. Amendments to the EMP should be liaised to all employees and contractors.

6.10.6. Non-Compliance

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

The ESO is responsible for reporting non-conformance with the EMP, to the ECO. The ESO, in consultation with the ECO must, thereafter, undertake the following activities:

- ✓ Investigate and identify the cause of non-conformance.
- ✓ Implement suitable corrective action as well as prevent recurrence of the incident.
- ✓ Assign responsibility for corrective and preventative action.
- ✓ Any corrective action taken to eliminate the causes of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

6.10.7. Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent neighbours. It should also contain information relating to actions taken. Any party on site may complete the register, however, it is envisaged that the EM, ESO and the contractor(s) will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

6.10.8. Site Management

Areas outside the designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the project location.

6.10.9. Access Routes and Work Sites

Vehicular movement during both construction and operational phase will access the project site from the Industria Road and Bahnhof Street. No new roads shall be established and only existing roads may be used. During construction, work sites

shall be clearly demarcated and road signs erected were needed. The general public should not have unauthorised or uncontrolled access to the construction site.

Vehicle access will be limited to a single entrance (where necessary) to facilitate control. The entrance will be manned during the operation hours, but will be locked during non-operational hours to prevent unauthorised entry.

A notice board, in two languages or more, must be erected at the entrance and must state the most pertinent site health and safety issues, the operator/responsible person and emergency telephone numbers. Suitable signs must also be erected on the approach roads and on-site, to direct drivers and to control speed.

Furthermore, on-going controls, such as fencing and policing, must be implemented.

6.10.10. Staff Management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid. Training records must be kept for future references.

7. ENVIRONMENTAL MANAGEMENT MEASURES DURING SITE UPGRADE AND OPERATIONAL PHASES

This section will look at the potential environmental impacts, which may arise during the site upgrade and operational activities of the Waterberg Petroleum fuel wholesale facility (*i.e.* short and long-term impacts).

Groundwater

Construction/Decommissioning phase	
Description	Groundwater contamination can be caused by leakages and spills of petroleum products (i.e. oil leakages, hydrocarbon fuel, lubricants and grease) from machinery and heavy-duty vehicles during construction and decommissioning phase. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	➢ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. ➢ No major servicing and maintenance of vehicles and/or equipment should be conducted at the site. ➢ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery. ➢ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems. ➢ Should portable toilet facilities be necessary, adequate containment systems should be erected at the site for use during the construction phase. ➢ Waste should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed off at a suitable sewage disposal site. Run-off from these toilets due to overflows should be avoided at all cost. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Groundwater quality could be impacted through leachate of oil leakages, hydrocarbon fuel, lubricants and grease from trucks and vehicles frequenting the facility. Spillages may also occur during fuel delivery to the above ground storage tanks from road transport tanker trucks. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	▪ All operational surfaces and fuel storage facilities must be installed with spill containment areas as per the relevant SANS standards (or better). Special emphasis is placed on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999. ▪ Proper monitoring of the product levels must take place to eliminate overfilling. ▪ All operational surfaces at the facility must be installed with spill containment areas. ▪ Ensure that any petroleum products, such as grease, waste oils and lubricants are contained in containment structures (e.g. plastic liners, drip trays etc.). ▪ Avoid discharge of pollutants (such as cement, concrete, lime, chemicals, contaminated waste water or leachate) into stormwater channels and water courses. ▪ Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained as to how to use the equipment and briefed about reporting procedures. ▪ Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination to the water resources. ▪ Groundwater monitoring boreholes installed should be sampled and analysed periodically. ▪ Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage. ▪ The condition of the fuel reticulation system will have to be checked regularly and repaired to prevent leakages.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Surface Water

Construction/Decommissioning phase	
Description	The site is located within the catchment of the Ugab River, an ephemeral river, draining into the western direction. Drainage in the area is well developed and run-off takes place to the north. Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction vehicles, machinery and equipment may occur during the construction phase. Oil Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could be impaired. Care must be taken to avoid contamination of soil and any nearby surface water present in the area.
Proposed Mitigation Measures	➢ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up and disposed off at the designated disposal facility. ➢ Drip trays and/or plastic sheeting should be used to contain any leaks emanating from the construction plant. ➢ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into nearby water ways and courses. ➢ Direct run-off from areas with high risk of accidental releases of contaminants (e.g. fuelling or fuel transfer locations, concrete swills etc.) into containment basins or conservancy tanks should be achieved, and dispose of contaminated water at an approved site. ➢ Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water. ➢ Stabilise cleared areas as soon as possible to prevent and control surface erosion. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis. ➢ An emergency plan should be in place on how to deal with spillages and leakages during this phase.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Spillages might occur during fuel delivery to the underground storage tanks from road transport tanker trucks. This may also occur during filling of vehicles. Spillages and/or leakages of various possible contaminants might occur due to failure of reticulation pipelines or storage tanks. Contaminated soil might pose a risk to surface water.
Proposed Mitigation Measures	➢ Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility. ➢ All spills should be cleaned up as soon as possible. ➢ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently. ➢ Ensure all stormwater drains or channels are clear of litter or obstructing material. ➢ Remove all excess sedimentation, rubble and any other waste material present in the waterway and dispose of in a suitable manner to ensure proper drainage runoff.
Proposed Monitoring	Regular visual inspection. Surface water monitoring sampling for hydrocarbon pollution.
Responsible Party	Proponent / Contractors.

Air Quality (Dust Pollution)

Construction/Decommissioning phase	
Description	Dust may be produced during the construction and decommissioning phase; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a slight nuisance to any neighbouring residence and business. Possible air pollution in the form of emissions from construction vehicles and equipment can also deteriorate air quality in the area.
Proposed Mitigation Measures	➢ It must be ensured that all vehicles entering the site and machinery used in construction activities are in good working order to prevent unnecessary emissions. ➢ Vehicles should not be allowed to idle for unnecessarily long periods of time. ➢ Excavation, handling and transport of materials must be avoided under high wind conditions.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Air quality around the site could be impacted by exhaust fumes from the vehicles accessing the facility. Hydrocarbon vapours will be released during delivery and dispensing, as liquid displaces the gaseous mixture in the tanks. In terms of fuel storage tanks, the vapours will be released through vent pipes on the tanks.
Proposed Mitigation Measures	• Vehicle idling time shall be minimised by putting up educative signs. • All venting systems and procedures have to be designed according to SANS standards (SANS 1929:2011) and placed in a sensible manner. • In terms of fuel storage tanks, the vapours will be released through vent pipes on the tanks. Vent pipes should be placed in such a manner as to prevent impact on potential receptors.
Proposed Monitoring	It is recommended that regular air quality monitoring be conducted at the facility. A complaints register regarding emissions/smell should be kept and acted on if it becomes a regular complaint.
Responsible Body	Proponent / Contractors.

Health and Safety

Construction/Decommissioning phase	
Description	Safety issues could arise from the construction vehicles, earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site.
Proposed Mitigation Measures	• Equipment and machinery operators should be equipped with ear protection equipment. • Operations should be strictly between 07H00 to 19H00. First aid and safety awareness training for contractors. • Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. • The construction staff must be properly trained on safety and health issues of the project. • Workers should be fully equipped with personal protective equipment gear. • The site must be clearly demarked and fenced off to prevent unauthorised persons from accessing the site, who could get injured on site.
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The operations of the fuel wholesale facility can cause health and safety risks to workers on site. Occupational exposures are normally related to inhalation of fuel vapours and physical contact with fuels.
Proposed Mitigation Measures	▪ Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ▪ Operators must be properly trained on safety and health issues of the project. ▪ Well stocked first aid box which is readily available and accessible should be provided within premises. ▪ Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. ▪ Workers should be fully equipped with personal protective equipment gear.
Proposed Monitoring	Regular inspection and incident monitoring report evaluation.
Responsible Body	Proponent / Contractors.

Noise Pollution

Construction/Decommissioning phase	
Description	Although noise pollution already exists in the area due to operations in the industrial area, noise will also be generated from construction vehicles and equipment. As the project site is within an industrial area, it is expected that the noise generated will not have a significant impact on any third parties.
Proposed Mitigation Measures	▪ Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. ▪ Ensure engines of construction machinery are fitted with mufflers. ▪ Equipment and machinery operators should be equipped with ear protection equipment. ▪ Operations should be strictly between 07H00 to 19H00.
Proposed Monitoring	Strict operational times. Regular inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Noise pollution may be generated by vehicles, trucks and people frequenting the site.
Proposed Mitigation Measures	▪ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00). ▪ Loud music from vehicles fuelling up should be restricted. ▪ Maintain the grievance mechanism to capture public perceptions and complaints with regard to noise impacts, track investigation actions and introduce corrective measures for continuous improvement.
Proposed Monitoring	Strict delivery and collection times. Observation of on-site noise levels by the Manager or Supervisor.
Responsible Body	Proponent / Contractors.

Waste Generation

Construction/Decommissioning phase	
Description	This can be in a form of rock cuttings, building rubble, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products might occur during the construction phase.
Proposed Mitigation Measures	▪ Ensure that sufficient weather- and vermin- proof bins / containers are present on site for the disposal of solid waste ▪ Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. ▪ Existing ablution facilities at the company premises should be used by the contractor during this phase. No urinating outside these designated facilities. ▪ Waste must be disposed off at a suitable waste disposal site. Clear dumping area with the Otjiwarongo Municipality.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the manager.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Waste such as contaminated soil, litter, empty cans of engine oil will be generated during the operational phase.
Proposed Mitigation Measures	▪ Any contaminated soil generated must be removed and disposed off at a suitable waste disposal site. ▪ Waste bins must be available at the fuel wholesale facility at all times. Waste must be appropriately collected and disposed off at an approved appropriate waste disposal site. ▪ Oil-water separator effluent originating from storm water runoff, tank bottoms and washing activities should be separated before disposal of the water. ▪ Regular monitoring of the oil-water separator outflow must be conducted. Water containing soaps and other detergents must ▪ Care should be taken when handling contaminated material. The cradle to grave principal should be kept in mind during waste disposal. ▪ Any non-biodegradable hazardous material (i.e. oil cans and containers etc.) generated should be properly stored in containment structures, collected and transported to the nearest approved hazardous waste disposal facility.
Proposed Monitoring	Regular visual inspection. Containment area inspections and monitoring of the oil/water separators.
Responsible Body	Proponent / Contractors.

Traffic

Construction/Decommissioning phase	
Description	The site is situated along Industria Road in Otjiwarongo. Construction related activities are expected to have a minimal impact on the movement of traffic along this road.
Proposed Mitigation Measures	▪ It is recommended that if the need arises for traffic diversion road closure, the contractor should liaise with the relevant authorities. ▪ Speed limit and construction site warning signs must be erected to minimise accidents. ▪ Construction vehicles must be tagged with reflective signs or tapes to maximise visibility of the vehicles and avoid accidents.
Proposed Monitoring	Observations of the traffic flow along Industria Road and surrounding roads in the area.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Traffic around the fuel wholesale facility
Proposed Mitigation Measures	➢ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00).
Proposed Monitoring	Strict delivery times monitoring. Observation of traffic by the Manager or Supervisor.
Responsible Body	Proponent / Contractors.

Ecological impacts

Construction/Decommissioning phase	
Description	No conservation worthy vegetation is present at the proposed site.
Proposed Mitigation Measures	➢ Limit clearing of vegetation to those areas within the footprint of construction, minimise open areas and reduce the frequency of disturbance. ➢ No vegetation should be removed outside the designated zones.
Proposed Monitoring	Regular site inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The proposed facility operations will have minimal impacts the fauna and flora.
Proposed Mitigation Measures	➢ The operational activities would not exceed the demarcated area of the fuel wholesale facility.
Proposed Monitoring	Regular site inspection.
Responsible Body	Proponent / Contractors.

Overfilling of tanks and vehicles

Operational phase	
Description	Overfilling of vehicles and trucks during fuel dispensing; and delivery of fuel into underground storage tanks may take place.
Proposed Mitigation Measures	➢ This impact can be reduced by the installation of spill containment areas around the pumps and through proper training of the operators. ➢ Proper monitoring of the product levels in the tanks must take place to eliminate overfilling. ➢ Proper training of the operators on site is vital.
Proposed Monitoring	Regular inspection of the level of fuel in tanks.
Responsible Body	Proponent / Contractors.

Visual / Nuisance Impacts

Construction/Decommissioning phase	
Description	Aesthetics and inconvenience caused to person trying to access/exit the site, and surrounding areas.
Proposed Mitigation Measures	➢ The construction supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment. ➢ Construction workers should be attentive to the importance of not littering. Littering is unsightly and has a negative visual impact. ➢ Sufficient waste bins must be provided onsite and must be emptied regularly. ➢ Any building rubble generated should not be allowed to accumulate onsite, but must at regular intervals be removed to a suitable landfill disposal site or to other construction sites where it may be used as fill.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	Proponent / Contractors.

Fire and explosion hazard

Operational phase	
Description	Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations and conditions are flammable.
Proposed Mitigation Measures	➢ There should be sufficient water available for fire fighting purposes. ➢ Ensure that all fire-fighting devices are in good working order and they are serviced. ➢ All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site.
Proposed Monitoring	Regular inspections should be carried out to inspect and test fire fighting equipment.
Responsible Body	Proponent / Contractors.

8. CONCLUSIONS

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental control officer will need to monitor or audit the site throughout the site upgrade and operations to ensure that the EMP is fully implemented and complied with. The EMP caters for all project phases, but will need to be reviewed during all phases of project, especially when revisions are made to the project development plans.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed project. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken. It is the Proponent's responsibility to initiate the update of the EMP once it has expired after 3 years from the issue date of the environmental clearance.