TURN180
ENVIRONMENTAL CONSULTANTS
REGISTRATION NUMBER: 2018/110720/07

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

THE PROPOSED ESTABLISHMENT OF A PUBLIC FILLING STATION AND A GENERAL BUSINESS AREA ON AGRICULTRUAL HOLDING 312 IN THE VAAL-HARTS SETTLEMENT B, HARTSWATER, NORTHERN CAPE PROVINCE

JUNE 2023

Prepared By:

Turn 180 Environmental Consultants

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Applicant:

Thula ya Batho (Pty) Ltd

Applicant Contact Person	Mr. GP Olivier
Postal Address	P.O. Box 789 Hartswater 8570
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Site Information:

Erf Number	Erf 312 – Vaal-Harts Settlement B
21 Digit Surveyors Code	C00700070000031200000
District Municipality	Frances Baard District Municipality
Local Municipality	Phokwane Local Municipality
Site coordinates (Centre of site)	27°47'21.29"S 24°43'3.49"E

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2 Introduction

The Environmental Management Programme is intended to provide environmental specifications to put measures in place to mitigate, manage and minimise potential environmental impacts arising from the construction and operational phases of the establishment of fuel filling station, truck stop, ablution facilities, convenience store, restaurant and take-away shop on Agricultural Holding 312 of the Vaal-Harts Settlement B. This EMPr enables the key role players to use a pro-active approach by addressing potential impacts beforehand, thus limiting the corrective measures needed during the construction and operational phases of the project.

2.1 Project Description

The project entails the establishment and operation of a filling station, truck stop, ablution facilities, convenience store and accompanying restaurant and take-away shop on the road between the towns Hartswater and Pampierstad in the Northern Cape Province, located in the northern parts of the Vaalharts irrigation scheme. The preferred location for this project is on the southern portion of Agricultural Holding 312 of the Vaal-Harts Settlement B. The site covers an area of 4.56 hectares (ha) and is located approximately seven kilometres (km) from the N18 towards Hartswater (10 km from Hartswater town) and four kilometres from Pampierstad in the Phokwane Local Municipality, an administrative area in the Frances Baard District of the Northern Cape Province. The site will be rezoned for the appropriate purposes (Business land use – Zone 3) with the Frances Baard District Municipality as it is currently zoned for agricultural land use.

The proposed project has the objectives to supply fuel (diesel, petrol, paraffin) to residents of Pampierstad, farmers and truck/bus drivers, provide a convenience store, restaurant and take-away shop to service the community and to provide a truck stop with 10 parking spaces for truck drivers as well as ablution facilities.

The development will consist of a filling station which, with supporting facilities, will have a footprint of 181 m^2 (0.0181 ha), canopies with a footprint of 252 m^2 (0.0252 ha), an ablution area of 94 m^2 (0.0094 ha) footprint, a convenience store, restaurant and take-away shop with a footprint of 1066 m^2 (0.1066 ha) and a paved area of 5 777 m^2 (0.5777 ha). In total, the development will have a direct footprint of approximately 7370 m^2 (0.737 ha). A portion of the site will be left undeveloped; however more than 2 ha of indigenous vegetation will likely be cleared.


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PORTION OF FARM 312
-27.790
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chool
Map of Proposed Filling Station on Agricultural Holding 312, Vaal-Harts Settlement B, Hartswater, Northern Cape Province
Legend
Contours
Development Footprint
Roads
Agricultural Holding 312
0 20 40 m
1: 1 500
Coordinate System
WGS 84/Pseudo Mercator
Site coordinates:
27° 47' 22.40592" S;
24° 43' 4.83488" E
MAP PREPARED BY:
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2.2 Objectives of the EMPr

The EMPr aims to fulfill the requirements as specified in Appendix 4 of Regulations No. R. 982 (4 December 2014), as amended, in terms of the National Environmental Management Act (Act 107 of 1998), with the following objectives:

- To identify, predict and evaluate actual and potential impacts on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits and promoting compliance with the principles of environmental management;
- To identify and employ the modes of environmental management best suited to ensuring that the activity is pursued in accordance with best environmental management practices;
- To be able to respond to unforeseen events;
- To provide feedback on compliance.

This EMPr deals with the phases as set out below:

Planning Phase

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures to ensure that potential harmful impacts are limited and avoided as far as possible. Furthermore, by implementing this EMPr during the planning phase, the necessary corrective actions can be taken to limit future potential impacts which could be detrimental to the environment.

Construction Phase

The majority of impacts during the construction phase will pose immediate effects (e.g., noise, dust etc.). The site must be monitored on a regular basis during the entire construction phase to identify and mitigate impacts as they occur. These impacts can then be managed effectively using the measures as set out in this EMPr.

Operational Phase

Pro-active measures used during the planning and construction phases can be used to minimise potential environmental impacts during the operational phase of the project. These measures will also limit the risks related to certain impacts and reduce the intensity of monitoring during the operational phase. Operational phase mitigation measures are therefore aimed mainly at waste and stormwater management, as well as storage and handling of chemicals.

2.3 Roles and Responsibilities

Formal responsibilities are necessary to ensure that procedures and EMPr measures are executed throughout the construction and operational phase by each responsible party. For the construction phase, responsible parties for this project include the following: Applicant, Project Manager, Site Manager, an on-site Environmental Control Officer, Contractors, Environmental Auditor and construction workers.

Applicant

The Applicant remains ultimately liable for the implementation of the EMPr and EA conditions and requirements. It is the Applicant's responsibility to ensure the EMPr and conditions of the Environmental Authorisation are implemented during all phases of the development.

It is the Applicant's responsibility to ensure the Project Manager, Contractors, and other parties involved in any phase of the project are aware and provided with the EMPr and conditions laid out in the EA.

Project Manager

- Ensure that the on-site contractors or employees are aware of all specifications, legal aspects, and standards of procedure relating to the construction phase in terms of environmental protection.
- Ensure that all EMPr measurements and guidelines are communicated to and adhered to by all parties on site.
- Monitor the implementation of the EMPr throughout the construction phase through regular monitoring, inspections, and meetings with all applicable parties on site.
- Be completely familiarised with the Basic Assessment (**"BA"**), including the EMPr for the project, the conditions of the Environmental Authorisation (**"EA"**), and other relevant environmental legislation.
- Appoint a Dedicated Environmental Officer for the duration of the construction phase of the project.

Site Manager

- Be familiar with the BA for the project.
- Be familiar with the conditions of the EA for the project.
- Have sound knowledge of and be familiar with the EMPr.
- Be aware of all specifications, legal aspects, and standards of procedure relating to the construction and operational phase in terms of environmental protection and ensure compliance with these.
- Have an overall responsibility to implement measures as set out in this EMPr.

- Ensure the relevant audits take place to ensure compliance with this EMPr.
- Continuously liaise with the project manager, the environmental control officer and other role players on matters concerning the environment.
- Prevent actions that will harm or may cause harm to the environment and take steps to prevent any form of pollution on the site.
- Confine related activities to the demarcated site.

Environmental Control Officer

- Conduct daily inspections to determine compliance with the EA and EMPr using checklists.
- Submit monthly audit update reports and liaise with the External Environmental Compliance Officer and Project Manager, showing progress on findings.
- Facilitate reporting, recording, investigation, and follow-up of environmental related incidents.
- Facilitate and integrate relevant training programs for personnel covering all activities impacting the environment.
- Ensure that the environmental commitments in this EMPr, the EA and the WUL are complied with by the contractor, sub-contractors and all employees.
- Evaluate construction methods, techniques and procedures, identify environmental risks, draw conclusions and recommend possible solutions.
- Implement and manage the necessary construction and operational Environmental Management Measures.
- Proactively interpret and objectively analyse environmental data and initiate programs to mitigate against the environmental and related risks.
- Assume a leading role in performing environmental audits and guiding other staff in the performing of external and internal audits.
- Maintain the following on site:
    - A daily site register
    - A non-conformance register
    - A public complaint register
    - A register of audits
    - A register of incidents

Environmental Auditor

- Be fully familiar with the BA Report.
- Be fully familiar with the conditions of the EA.
- Be fully familiar with this EMPr.
- Be fully up to date with all relevant environmental legislation, policies, and procedures, and ensure compliance with them.

- Undertake periodic environmental performance audits on the project implementation, as required by the EA.
- Undertake comprehensive inspection of the site and surrounding areas to monitor compliance with the EMPr.
- Report to project manager.
- Discuss the contents of this EMPr in detail with the Project Manager and Contractor.
- Take appropriate action if the specifications contained in the EMPr are not followed.
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible.
- Ensure that activities on site comply with all relevant environmental legislation.
- Compile progress reports on a regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post-construction audit carried out by an independent auditor/consultant.
- Attendance of site meetings, where necessary;
- Advising the Project Manager and contractors on environmental issues within the defined work areas;
- Assisting in finding environmentally acceptable solutions to development and construction problems;
- Inspecting the site at a frequency determined by the stage of the project to establish compliance with environmental provisions;
- Reviewing the site logbook with regard to records of site activities that may pertain to the environment;
- Recommending corrective action to the Project Manager where construction activities are not in compliance with the EMPr;
- Keeping diligent records of communication with the Project Manager;
- Liaise with the Ecological and Heritage Consultants, if and when necessary;
- Run induction courses on environmental awareness for contractors' staff and supervisors;
- Provide assistance on environmental issues;
- Keep record of construction activities, problems identified and transgressions noted;
- Liaise with registered interested and affect parties during especially the construction phase of the project.

Contractors and Service Providers

All contractors (including subcontractors and staff) and service providers are ultimately responsible for:

- Complying with the environmental management specifications where applicable.
- Provide Environmental Method Statements to the Site Manager specifying how certain activities will be conducted on-site.

- Adhering to any environmental instructions issued by the Site Manager/Project Manager
- Submitting a report, in a format and frequency as decided upon by the Project/Site Manager, which will document all incidents that have occurred during the period before the site meeting.
- Arrange that all employees and those of the subcontractors receive training. Training must be appropriate for the level of the tasks and functions undertaken. Training should be project-specific and refer to the EA,and EMPr of this site.

3 Preparation of the EMPr

3.1 Persons who prepared the EMPr

Marguerite Cronje (EAP)

Education:

- B.Sc. (Zoology), University of the Free State, South Africa, 2002
- B.Sc. Honours (Zoology), University of the Free State, South Africa, 2003
- M.Sc. Diploma (Equine Science), University of Edinburgh, Scotland, UK, 2005
- Masters in Environmental Management, University of the Free State, South Africa, 2008

Experience:

- 15 years of environmental management experience through conducting Environmental Impact Assessments, compiling Environmental Management Plans and monitoring construction phases of various types of projects.

EAPASA Registration Number: 2020/682

Fébé Jansen van Vuuren

Education:

- B.Sc. (Geography and Environmental Sciences), University of the Free State, 2020
- B.Sc. Honours (Environmental Sciences), University of the Free State, 2021

Experience:

- Practical demonstrator at the UFS (Geography Department) and two years experience as an Environmental Consultant at Turn 180 Environmental Consultants focusing mainly on Environmental Compliance Audits and Monitoring and Data and GIS Management

4 Environmental Awareness Plan

All contractors and employees must be trained and should be informed about potential environmental impacts at the site and the prevention thereof. Workers should receive Induction for environmental safety and risk management and regular "Toolbox Talks" should commence to brief workers on potential environmental issues to prevent unnecessary environmental impacts from occurring.

The following aspects should be taken in consideration:

1. Ensure that development only takes place within the development footprint. Any area cleared or used for stockpiling, storage, parking, etc., outside the scope of the initial BA done for the project will trigger another activity in terms of the NEMA 2014 Regulations, as amended.
2. All watercourses and/or wetlands are regarded as sensitive areas and must be avoided as far as practically possible. No material/waste products may be dumped into a watercourse and/or wetland.
3. Should any artefacts or fossils be found on the site, the Site Manager and ECO must immediately be notified and the Chance Find Procedure should be followed.
4. Ensure that hydrocarbons (petrol, diesel, oil, and any lubricant) are stored and handled according to best practices.
5. Water utilized for the project may only be abstracted from authorized sources.
6. Ensure that sufficient pollution prevention measures are implemented at the construction area.
7. Good housekeeping on the site is very important. Ensure that the construction site is always clean and neat as this will determine the aesthetic impact on passing motorists.
8. General waste skips should be emptied at regular intervals to avoid contamination.
9. Dispose of all hazardous substances in the designated hazardous waste skip or bin.
10. Water conservation must be practiced.
11. Report any issues of concern to the Environmental Control Officer and Environmental Auditor.

5 Protection of the Environment

5.1 Geology and Soil

The soil on the site is mostly covered in fine-grained and loose deposits of aeolian sand with in-situ variations in composition and colour. The mineralogical composition of the sands is mainly quartz particles, which is resistant, along with micas and feldspars (clays) which are less resistant. This soil type is subject to collapse settlement when its moisture content increases, while it has high strength under dry conditions. The geology consists of Quatenary aeolian sand and underlain by Dwyka and Ventersdorp Group sediment.

- Topsoil (if any) will be removed before construction and stockpiled appropriately and in such a manner to prevent any loss thereof.
    - Topsoil will not be used for any construction purposes and will only be used for levelling of the site and garden purposes.
    - Stockpiles may not exceed a height of 1.5 m.
- Soil loss through erosion will be reduced by implementing thorough storm water management practices.
- Equipment and machinery on site will be maintained in a good condition and drip trays will be placed beneath stationary machinery/vehicles, nozzles, etc., to prevent spillages of petrochemical products which may cause contamination of soil. Any hazardous substances on the site will be stored in a bunded area which consists of an impermeable floor with walls and have the capacity to contain 110% of the volume of the substance stored therein.
- Any spills of hazardous substances will be cleaned immediately by disposing of the affected soil as hazardous waste.

5.2 Plant and Animal Life

According to the Ecological Assessment, the site falls within the Schmidtsdrif Thornveld vegetation type, which is classified as Least Threatened. However, the site is degraded. The groundcover consists of natural and alien/invasive vegetation. No visible signs of mammals or other animals were observed on site.

Plants:

- A qualified practitioner should undertake a walkthrough survey of the site prior to construction to identify, count and mark all protected trees and plants that may be affected by construction.
- Where protected species will be affected and will require removal, the necessary permits will have to be obtained. Protected species known to occur on site include *Vachelia erioloba* (Camel Thorn Tree) and *Harpagophytum procumbens* (a geophytic species).
- No open fires are allowed on the site.

Animals:

- Excavations may act as pitfall traps to mammals, reptiles and amphibians. Trenches should be monitored daily for trapped animals, which should be removed promptly and released in a safe natural environment.
- In the case of poisonous or venomous snakes or other dangerous animals encountered on site, an experienced and certified snake handler or zoologist must remove these animals from the site and re-locate them to a suitable area.

- No animals will be harmed, killed, or hunted on around the site. If any animals are encountered, they will be relocated to a safe and unaffected area.
- Adequate monitoring of weed and invasive species establishment and their continued eradication must be maintained.
- Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No. 43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.

5.3 Surface Water

There are no surface water features, including wetlands, on the proposed site. The Harts River and associated wetland runs approximately 500m to the North of the site. However, it is not expected that the river will be impacted by the proposed development. The site has a very gentle slope in a north-easterly declivity, which will be the direction in which natural drainage of the site will take place.

- A comprehensive storm water management system should be implemented during the construction and operational phases to accommodate runoff during rain events.
    - All clean water should be diverted around the development to the surrounding drainage basins. Berms will be constructed around the site, especially at the western border, to divert clean water around the site to drain into the natural drainage lines of the environment.
    - Stormwater generated on site may not drain into the natural drainage lines as the site is regarded as a dirty area. Trenches or stormwater channels conducting potentially dirty runoff into a temporary storage area should be implemented, especially at the eastern and northern borders.
    - An oil separation system should be designed and implemented to ensure that contaminated stormwater is treated on site before being released into the natural drainage system.
    - The stormwater management system (including all structures and mitigation measures) should be maintained throughout the lifetime of the development.
- Any hazardous substances will be stored in a bunded area with a capacity to contain 110% of the volume of the substance.
    - The bunded area will have a controlled outlet from which rainwater collected therein can be drained and managed as hazardous waste.
- Spillages of hazardous substances will be cleaned by removing the spill and contaminated soil and disposing of it as hazardous waste.
    - Any incidents on surface water resources during construction will be reported to the relevant authorities within 24 hours of the incident.

- The site will be kept clean and tidy to prevent general waste and littering from occurring in the surrounding surface water resources.
- The site will be monitored for any erosion trenches. Trenches will be rectified, and erosion control measures will be implemented.

5.4 Groundwater

Groundwater will be used as the main water source during the construction and operational phase of the activity.

- A comprehensive monitoring programme for the detection of leakages or contamination of groundwater should be implemented to prevent spillages and groundwater contamination.
- Spillages of hydrocarbons will be prevented by using drip trays.
- Spillages of any potentially hazardous substances should be cleaned by removing the spill and the contaminated soil and disposing thereof as hazardous waste.
- Potentially hazardous substances will be stored on an impermeable surface in an underground bund to prevent seepage of the substance and pollution of the groundwater.
- Leakage detection units will be installed in the storage tanks or bunds for early-on detection of leaks.
- Bunds and storage tanks will regularly be inspected for leaks or defects.

5.5 Air Quality and Regulation of Noise Levels

The proposed project will contribute minimally to atmospheric emissions. Emissions include those from vehicle exhausts and dust generation. Construction activities will contribute towards higher noise levels.

Dust suppression should be implemented on the site during construction to reduce emissions of dust from the site, especially from the movement of vehicles.

- Dust control measures must adhere to Dust Control Regulations.
- Construction and operational activities, especially activities contributing to dust emissions should be avoided during windy conditions.
- Vehicle movement and speeds at which vehicles travel on the site will be kept to a minimum.
- Waste will not be burned on site and open fires will not be permitted.
- Construction and operational activities contributing to elevated noise levels will be restricted to normal working hours.

5.6 Protection of Site and Surrounding Land Use

The site is degraded. It contains a disused homestead and is adjacent on two sides to cultivated land. On the western side it borders natural vegetation of better condition. The site will lose all other

potential land uses as a result of this development.

- Construction and operation activities will take place within the delineated area to limit disturbance.
- The surrounding area has natural vegetation and needs to be protected.
- It must be ensured that general and/or construction waste is stored in the correct locations on the site to keep the site clean and tidy.
  - The site must be equipped with the necessary waste bins.

5.7 Protection of Cultural, Archaeological and Palaeontological Heritage

A First Phase Heritage Impact Assessment and a Palaeontological Impact Assessment were undertaken for the site. It concluded that the site is unlikely to contain heritage resources and that the site is in an area of low significance regarding heritage resources.

According to the recommendations by the Paleontological specialist report, the following mitigation measures will be implemented:

- If any fossil remains are discovered during any phase of construction, the ECO or site manager should be notified immediately and the Chance Find Procedure (Philips, 2023) should be consulted and followed.
- The discoveries must be secured, and the ECO or site manager should notify SAHRA so appropriate mitigation can be undertaken by a professional palaeontologist. A collection permit from SAHRA will be required.
- Fossil material must be curated in an approved collection and all fieldwork and reports must meet the minimum standards for palaeontological impact studies developed by SAHRA.
- If any archaeological artefacts are found, the ECO or site manager must be notified immediately. Work will stop immediately and SAHRA and the heritage specialist will be notified, or as per recommendation by the heritage specialist.
- Activities will proceed as recommended by the heritage specialist or SAHRA.

5.8 Aesthetics (Visual Exposure)

During the construction phase, the site may have a negative aesthetic effect. However, it is expected that the operational phase will not be unsightly. It has a relatively small footprint and is adjacent to cultivated land on the east and natural vegetation on the west, and is diagonally across the road from a school. A negative aesthetic impact is only expected for the construction phase.

- Alien vegetation should be cleared regularly.
- Waste should regularly be disposed of in the correct manner.
- Separate skips and/or bins should be available for the separate waste streams.
- Any spills and/or leakages should be cleaned immediately in the correct manner.
- The site should be kept orderly and clean.

6 Compliance and Monitoring

Ongoing and regular reporting of the progress of implementation of this EMPr will be done. Inspections and monitoring shall be carried out on both the implementation of the EMPr and the impact on plant and animal life. Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

6.1 Environmental Monitoring Reports / Audits

- An independent Environmental Auditor will be appointed to monitor all the environmental management measures and ensure compliance with the EMPr.
- Audits will be undertaken by monthly during the construction phase and once during operation to verify compliance with the EMPr and the EA, or as stipulated by the EA.
- Any changes to the layout or technology will be submitted to the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform for approval.
- Reports confirming compliance with various points identified in the EMPr will be kept and made available when requested.
- Any emergency or unforeseen impact will be reported within 12 hours after identification to the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform telephonically and confirmed in writing.

6.2 Non-conformance and Corrective Action

Issues of non-conformance noted by the ECO will be communicated to the Project Manager, who will be responsible for ensuring that the relevant parties are informed of the non-conformance and that appropriate corrective actions are taken where necessary.

Environmental issues will be addressed at regular site meetings between the ECO, Project Manager, Environmental Auditor and Contractor. The ECO will present verbal reports of any environmental concerns or issues that have arisen, and corrective actions that have been taken. Outstanding corrective actions will be discussed and agreed at these meetings. Issues relating to complaints or comments received from the public will also be discussed at these meetings.

6.3 Internal Review

Internal review of the EMPr will take place on an on-going basis by the ECO. Based on observations during site inspections and issues raised at the site meetings, the ECO shall determine whether any procedures require modification in order to improve the efficiency of the EMPr. Any changes or adjustments to the EMPr shall be registered in the records of the ECO. Therefore, adjustment and update of the original EMP document is not required when these ad hoc changes are made. The ECO's records shall be available to the relevant authority, the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform throughout the process and copies will be provided on request.

6.4 Close-out Report

Once construction activities have been completed and rehabilitation of the site has been undertaken, a final Environmental Monitoring Report will be compiled by the Environmental Auditor and submitted to the Project Manger. It will outline the implementation of the EMPr, especially the site clean-up and rehabilitation undertaken by the contractors before site handover.

7 Decommissioning / Closure

It is not anticipated that the proposed project will undergo decommissioning and/or closure. However, should it be decided to rehabilitate the site in future, the site will be rehabilitated to its original state as far as practicable possible, depending on the end land use to be decided upon at that time. The final rehabilitation of the site will, amongst others, include the following activities:

- All buildings, infrastructures, equipment, and other items used during the operational period will be removed from the site.
- Fuel tank decommissioning will take place according to best practices by an experienced contractor to prevent any spillage, contamination, fire hazards or any other environmental threat.
- Scrap metal will be sold to be recycled.
- Waste material of any description, will be removed entirely from the site and disposed of at a recognised landfill facility in the area.
- Waste will not be permitted to be buried or burned on the site.
- Any concrete surface will be removed and compacted areas will be ripped.
- The site will be profiled with acceptable contours and erosion control measures.
- Topsoil will be returned to its original depth over the area.

8 EMPr Summary and Checklist

Table 1 Mitigation measures and monitoring, responsible person(s) and time frames during the Construction Phase

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
Clearance of site (vegetation and topsoil)	Erosion Loss of topsoil Contamination of soil Establishment of invasive alien plant species Negative aesthetic impact on passing motorists Unearthing of significant heritage resources	• Ensure protected plant and tree species are identified and removed, with the necessary permits, once construction activities commence. • Limit construction activities and movement of construction vehicles to the site under construction. • Stockpile topsoil in an area not prone to erosion for re-use during rehabilitation or for levelling purposes after construction. • Topsoil stockpile heights may not exceed 1.5m. • Topsoil will not be used for construction purposes. • Any hazardous substances on the site will be stored in a bunded area which consists of an impermeable floor with walls which will have	ECO	No erosion Minimum soil loss No loss of heritage resources	During construction phase

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		the capacity to contain 110% of the volume of the substance stored therein. • Any spills of hazardous substances will be cleaned immediately by disposing of the affected soil as hazardous waste. • The site will always be kept clean and neat by housekeeping. • Removal of alien plant species on a regular basis. • Removal of alien plants must adhere to the Alien and Invasive Species Regulations. • If any objects of archaeological or palaeontological significance are found, SAHRA must be notified immediately and all work must stop.			
Protection of animals	Potential loss of animal life.	• Monitor site for sensitive species that will have to be relocated. PLEASE NOTE: No sensitive species were identified during the Ecological Assessment. • Relocation of all animal life on site.	ECO	All sensitive species safely relocated from site.	During construction phase

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		• The hunting, capturing and trapping of fauna should be prevented by making this a punishable offense during the construction phase of the development. • Open trenches may act as pitfall traps to mammals, reptiles and amphibians and trenches should be daily monitored for trapped animals which should be removed promptly. • In the event of poisonous snakes or other dangerous animals encountered on the site an experienced and certified snake handler or zoologist must remove these animals from the site and re-locate them to a suitable area.			
Waste Management	Littering General and construction waste Aesthetic impact	• Building material and general waste must be disposed of at an authorised landfill site and may not be dumped in the veld or on site. • The site will always be kept clean and neat by correct waste disposal measures and housekeeping.	ECO	No pollution and/or littering	During construction phase

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		• Separate waste skips or bins for the different waste streams must be available on site. Where possible they should be lined and covered.			
Storm Water Management	Contamination and siltation of surface water Erosion	• Implement appropriate storm water measures. • Channels, diversion berms, and/or culverts will be constructed (especially on the western border) to prevent any pollution or erosion and to divert any storm water around construction sites.	ECO	No erosion No contamination and/or siltation of surface water	During construction phase
Construction of infrastructure	Construction activities may lead to dust and noise generation Negative aesthetic impact on passing motorists Unearthing of significant heritage resources.	• Cement mixing should be confined to an impervious and contained area. • Excess waste concrete should be disposed of at a licensed landfill site. • Construction should be limited to normal working hours in order to limit the significance of the noise levels • A speed limit will be enforced on construction vehicles	ECO	Minimal noise and dust. Reduced aesthetic impact.	During construction phase

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		• Dust control measurements will be investigated if nuisance dust generation proves to be problematic • Dust control measures must adhere to Dust Control Regulations. • The site will always be kept clean and neat by correct waste disposal measures and housekeeping. • If any objects of archaeological or palaeontological significance are found, SAHRA must be notified immediately and all work must temporarily cease.			
Storage and Handling of Hazardous Substances	Contamination of soil and water	• Store all hazardous substances in bunds with impermeable surfaces. • Inspect bunds and containers regularly to ensure there are no leaks. • Vehicles and machinery should be serviced regularly to prevent spills. • Handle petrochemical substances on impermeable surfaces.	ECO	No spills No contamination of soil or water	Ongoing during construction

Construction Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		• All stationary vehicles should be fitted with drip trays to contain potential spills. • Any spills should immediately be cleaned by removing the contaminated soil, cleaning the contaminated surface, and disposing it as hazardous waste to prevent it from washing into the surface water system or seeping into the groundwater system.			
Abstraction of Groundwater	Decrease in groundwater reserve	• Practice water conservation. • Install infrastructure that contributes to water conservation. • Regulate water abstraction to prevent over abstraction and ensure continual recharge.	ECO	Monitor groundwater abstraction volumes required for construction activities	Ongoing during construction.
EMPr compliance monitoring: Construction Phase	N/A	Environmental compliance assessment to verify compliance with the EMPR during construction.	Independent Environmental Auditor	Full compliance with the EMPr and EA, Minimum environmental impacts	Monthly

Table 2 Mitigation measures and monitoring, responsible person(s) and time frames during the Operational Phase

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
Waste Management	Littering Contamination of soil / water Aesthetic impact	• Separate bins for the disposal of general and recyclable waste should be available on site for customers and employees to separate and dispose of their waste to prevent waste from entering the surrounding environment and potentially contaminating the surface water system. • General waste must be disposed of at an authorised landfill site and may not be dumped in the veld or on site. • The site will always be kept clean and neat by correct waste disposal measures and housekeeping. • Any hazardous waste should be stored in a designated skip or in bins inside a bund to prevent its seepage into the soil. • Hazardous waste skips or bins should be emptied frequently by a certified service provider that can dispose of the waste at	ECO	No pollution and/or littering	Ongoing during operation

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		the appropriate site in the appropriate manner.			
Wastewater Management	Contamination of soil / water	• The conservancy tank will regularly be serviced and emptied to prevent it from overflowing as good housekeeping practices. • The conservancy tank will regularly be inspected for leaks which will be fixed as a matter of urgency upon occurrence as good housekeeping practices. • Wastewater from other activities will go through an oil separator before it is collected in a wastewater tank where it will be stored and serviced similarly to the conservancy tank to prevent water contamination. • Stormwater management measures (channels, culverts) should be in place and maintained to divert clean stormwater around the site to prevent it from becoming contaminated. Dirty stormwater should be	ECO	No spills No contamination of surface water	Ongoing during operation

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		contained on site to prevent the dirty water from entering the surface water system. • Stormwater management measures should be implemented to manage runoff generated on site. This runoff should be contained on site to prevent contaminants from leaving the site. • Oil separators should be installed on site. • Dirty stormwater must go through oil separators to remove contaminants before it leaves the site. • The site should be levelled to prevent any ponding from occurring on the site.			
Storm Water Management	Contamination and siltation of surface water Erosion	• Implement appropriate storm water measures. • Channels, diversion berms, and/or culverts will be constructed (especially on the western border) to prevent any pollution or erosion and to divert any storm water around the site.	ECO	No erosion No contamination and/or siltation of surface water	Ongoing during operation

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		• Stormwater management measures (channels, culverts) should be in place and maintained to divert clean stormwater around the site to prevent it from becoming contaminated. • Dirty stormwater should be contained on site to prevent the dirty water from entering the surface water system. • Stormwater management measures should be implemented to manage runoff generated on site. This runoff should be contained on site to prevent contaminants from leaving the site. • Oil separators should be installed on site. • Dirty stormwater must go through oil separators to remove contaminants before it leaves the site.			
Storage and Handling of Hazardous Substances	Contamination of soil and water	• Store hazardous substances (petrol, diesel, paraffin) in underground bunds with	ECO	No spills No contamination of soil, water or groundwater	Ongoing during operation

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
		impermeable surfaces that has the capacity to store 110% of the total tank volume. • When refueling storage tanks, prevent spills by using drip trays to contain any small spillages. • When a spill or leak is noticed in the tank, bund or on the ground, immediately implement containment and clean-up measures (remove contaminated soil and dispose as hazardous waste) and rectify the leak as a matter of great urgency to prevent hazardous substances from reaching the groundwater source. • Inspect nozzles, pipes and valves for defects before refueling storage tanks. • Ensure all employees are familiar with procedures of refueling safely without spilling. • Regularly inspect pump, nozzles, and valves for defects.			

Operational Phase					
Activity	**Potential Impact**	**Mitigation**	**Responsible Person**	**Performance Indicators**	**Time Frame**
Abstraction of Groundwater	Decrease in groundwater reserve	• Practice water conservation. • Install infrastructure that contributes to water conservation. • Regulate water abstraction to prevent over abstraction and ensure continual recharge.	ECO	Monitor groundwater abstraction volumes required for construction activities	As per the Water Use Licence requirements
EMPr compliance monitoring: Operational Phase	N/A	Environmental compliance assessment to verify compliance with the EMPr during operation.	Independent Environmental Auditor	Full compliance with the EMPr and EA	Once during operation