APP - 002358
SUBDIVISION OF PORTION 224 OF THE FARM AUSSENKJER 147

ENVIRONMENTAL MANAGEMENT PLAN

Assessed by:

Assessed for:

Orange River Vineyard Investments (Pty) Ltd

October 2023

Project:	**SUBDIVISION OF PORTION 224 OF THE FARM AUSSENKJER 147: ENVIRONMENTAL MANAGEMENT PLAN**	
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Table of Contents

1 BACKGROUND & INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Orange River Vineyard Investments (Pty) Ltd (the Proponent) to undertake an environmental assessment for the subdivision of Portion 224 of the Farm Aussenkjer 147 for purposes of establishment of a residential development. The project is located in Aussenkehr in the ǁKaras Region. The farm belongs to the Proponent who has previously established houses on the land, serving as accommodation for employees on the farm. Through the subdivision, the Proponent intends to formalise the residential area and allow the residents to obtain ownership of the respective erven, if they so desire. The Proponent plans to establish 39 portions and the remainder. Some of these erven already have established houses while empty erven will be developed in future.

2 ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the project. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the project should be made aware of the contents in this section, so as to plan the project accordingly and in an environmentally sound manner.

- The objectives of the EMP are:
- to include all components of construction activities (including future upgrades, maintenance, etc.) and operations of the project;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- to monitor and audit the performance of construction and operational personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible construction and operational personnel.

2.1 IMPLEMENTATION OF THE EMP

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

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

2.1.1 Planning

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

- Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction activities and operations of the project are in place and remains valid. This includes fuel permits where needed.
- Ensure that design parameters, where required, are approved by relevant authorities prior to construction.

- Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- Make provisions to have a health, safety and environmental (HSE) coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site. Provision should be made for monthly environmental performance audits and reports during the initial phases.
- Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
    - Risk management / mitigation / EMP/ emergency response plan and HSE manuals
    - Adequate protection and indemnity insurance cover for incidents;
    - Comply with the provisions of all relevant safety standards;
    - Procedures, equipment and materials required for emergencies.
- If one has not already been established, establish and maintain a fund for future ecological restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years, if required. This is a requirement by MEFT.
- Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the environmental clearance certificate prior to expiry, if required

2.1.2 National Development Goals

The housing development pins down key development goals and challenges which were identified as part of the Namibian development goals. It may be considered as a rural development project aiming to provide serviced housing to local employees. In addition, the project is located in line with the regional planning initiatives which identified the location as an area for rural development. The project is unique in being one of only a handful housing developments in Aussenkehr and the Region. The project is considered a long term project.

Desired Outcome: Continued sharing of activity plans with IAPs and governing agencies. Maintaining an open door policy with neighbours and employees.

Actions

Mitigation:

- Information sharing about the project's progress should be made available to governmental agencies and the IAPs. The Proponent and affected parties should use the information generated during the environmental assessment to realistically plan for future growth and optimisation of servicing efforts. Open communication regarding future development, if any, should be maintained.
- The Proponent should consider partnering with NGO's and other governmental agencies in establishing partnerships for project component development, conservation and social upliftment.
- The Proponent must employ local Namibians where possible. Deviations from this practise should be justified appropriately.
- A community liaison officer should be appointed, especially to facilitate community grievances and concerns.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Progress reports on implementation kept.

2.1.3 Ideals and Aspirations

During the environmental assessment, public consultation was conducted with Ausenkehr residents and interested and or affected parties. During previous environmental assessments and a social impact assessment conducted. Concerns about the lack of un-serviced informal settlement area was raised, especially related to sanitation. Information about this project and surrounding environmental features was also shared with institutions which have vested interests in the new development. Aspirations for business development and growth are impacted by updated information related to possible environmental constrains and challenges. Perceived growth in the housing sector is associated with additional pressure which may by exerted onto governmental agencies for service delivery. The overall concern was related to the provision of services to the local community.

Desired Outcome: Continued sharing of activity plans with IAPs and governing agencies. Maintaining an open door policy with neighbours and employees.

Actions

Mitigation:

- Information sharing about the project's progress should be made available to governmental agencies and the IAPs. The Proponent and affected parties should use the information generated during the environmental assessment to realistically plan for future growth and optimisation of the distribution system. Open communication regarding future development should be maintained.
- Contractor's tenders to include best practise requirements for construction safety, security and environmental management for any future development. Pollution, poaching and unauthorised habitat destruction to carry contractual penalties.
- The Proponent must employ Namibians where possible. Deviations from this practise should be justified appropriately.
- A community liaison officer should be appointed during the construction phase especially to facilitate community grievances and concerns.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Records kept of all information shared with authorities, neighbours and employees,

2.1.4 Revenue Generation and Employment

The initial construction phase required a dedicated workforce which was contracted by the Proponent. Semiskilled and unskilled labour made up the largest segment of the labour force. Such labour was easily sourced from the nearby informal settlement. Through the remuneration of professional services, as well as the general labour force, revenue streams related to the construction industry was boosted and will be boosted upon the building of the access road and future additional houses. During the operations phase, employment will be created in the form of domestic work, maintenance, etc.

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

Actions

Mitigation:

- The Proponent must employ local Namibians and contractors where possible.
- If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- Deviations from this practice must be justified.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Summary report based on employee records

2.1.5 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phases. An initial and temporary change of the demographic profile during the construction phase will be replaced by a different and more permanent change to the demographic profile of the constituency during the operational phase. Increased access to services, housing and related amenities will result in an in-migration to the area. This is a strongly cumulative aspect considering all developing initiatives in Aussenkehr and the recent NamWater development. It is further expected that that the migration will be from existing other urban centres in Namibia, as well as partially from rural communities.

Access to formal sanitation and housing as well as electricity and potable running water will greatly benefit those residing in the houses when compared to the living conditions of the informal settlement. Access to such services may further reduce the potentially risk of criminal and socially/culturally deviant behaviour. A significant improvement for those living in the housing development was achieved.

Desired Outcome: To increase access to potable water, proper sanitation services and electricity as well as to prevent / discourage criminal and or socially deviant and destructive behaviour.

Actions:

Prevention:

- Construction workers should always be supervised.
- Workers' conduct should be guided by a code of conduct to be developed by the contractors when conducting any maintenance work for any further housing construction.
- The construction areas should be fenced to avoid unauthorized entry.
- Employ only local people from the area, deviations from this practice should be justified appropriately.
- Consultations with and involvement of local communities in project planning and implementation.
- Mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws.
- Adopt of develop by-laws relating to environmental health.
- All provisions of the Labour Act must be adhered to.
- Construction teams and related workforce to be easily identifiable and distinguishable.
- Educational programmes for employees on HIV/AIDS and general upliftment of employees' social status.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Project inspection sheet for all areas which may present environmental health risks, kept on file.
- Summary report based on educational programmes and training conducted.
- Summary report based on any theft related incidents.
- Employment records kept on file.

2.1.6 Traffic

The construction phase increased traffic flow to the site. An increase in traffic to and from the site during the operational phase, may increase the risk of incidents and accidents and road degradation (where access is gained onto the existing tar road). Construction activities may require sections of internal roads to be closed off during the maintenance of service infrastructure. Vehicle movement of the road will result in dust.

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

Actions

Prevention:

- Sensitive environmental features should be demarcated and no off-road driving should be allowed around these sites. No construction vehicles should be allowed to enter these sites.
- Where relevant, erect clear signage, regarding parking and access and exit points around construction sites and at the construction camps.
- Additional provision should be made and agreed upon, with the Roads Authority, should any construction be timed during the peak packing seasons.
- During the planning phase, all connections to national roads must be approved by the Roads Authority.
- Road safety training to be provided to all construction staff and should be implemented by any contractors used (included in tender documentation).
- During any maintenance of infrastructure which may necessitate partial or complete road closure of traffic flow disruptions, clear communication should be available to the public and should include timing of maintenance.

Mitigation:

- Construction vehicles delivering material should not be allowed to obstruct any traffic or entrances / exists of erven without prior arrangement and proper signage where such measures apply.
- If any traffic impacts are expected, traffic management should be performed to prevent these.
- Measures should be in place to prevent (or repair) damage to road surfaces during the construction phase, especially during wet conditions.
- It must be ensured that a backlog of traffic does not develop at access points during peak hours, through the implementation of an efficient and effective access control system.
- Internal speed limits should be set for the construction and operational phases.
- Tender documentation to clearly specify the requirements of road worthy vehicles to be used during the construction phase by contractors while also stipulating the requirements for the transport of employees etc.

Responsible Body:

- Proponent

Data Sources and Monitoring:

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

2.1.7 Health, Safety and Security

Activities associated with the construction and operational phases are reliant on human labour. As such, labourers are exposed to health and safety risks. Some activities, especially associated with the operation of heavy equipment, machines and heavy motor vehicles and or hazardous chemicals, poses the main risks to employees. In addition to these expected risks, severe climatic characteristics of the area (extreme heat conditions) may contribute to conditions such as sunstroke, fatigue, dehydration and related symptoms. Security breaches are another concern which relates to the development of properties, as well as any construction camp. A construction workforce presents the opportunity of ill-intending persons to pose as project team members for nefarious and criminal reasons. Constructions sites are often targeted by criminal elements and the site will therefore increase the risk of crime within the local area, should additional housing units be established. Theft or damage of construction materials and properties is an important local risk.

In terms of the operational phase, the Proponent has an obligation to ensure that the large infrastructure components (electrical supply, water and sewerage mains), as well as the service infrastructure associated with the project, are constructed to best practice public safety standards. Maintenance of infrastructure components may however be required to ensure continued safe operation of structures. As an example, the Proponent will have a mandate to ensure all general waste is collected to prevent risks of contamination and health impacts.

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

Actions

Prevention:

- All health and safety regulations specified in the Labour Act should be complied with.
- Clearly label dangerous and restricted areas as well as dangerous equipment and products during the construction phase as well as during maintenance of infrastructure.
- Equipment that will be locked away on site (during the construction phase) must be placed in a way that does not encourage criminal activities (e.g. theft).
- Provide all employees with required and adequate personal protective equipment (PPE).
- Ensure that all personnel receive adequate training on operation of equipment / handling of equipment and/or hazardous substances.
- Implementation of a maintenance register for all equipment and hazardous substance storage areas.
- Implement a maintenance schedule for all infrastructure components.
- Adopt local policies and procedures for dealing with all forms of waste, including possible effluent as well as community health aspects such as noise etc.

Mitigation:

- In terms of contracted parties, selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- Implement and maintain an integrated health and safety management system for all businesses, to act as a monitoring and mitigating tool, which includes: operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, material safety data sheet (MSDS) and signage requirements (PPE, flammable etc.).

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

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

2.1.8 Fire

Fires outside of designated areas, especially near laydown and material storage areas, may increase the risk of the occurrence of uncontrolled fires. Chemicals and fuels stored and used for general construction activities may be flammable. Improper waste burning or discarding of cigarette butts around accumulated waste, or in the vicinity of hazardous chemicals, further increases fire risks.

During the operational phase, a significantly increased fire risk will be present as related to homeowners and business. Any member of the public can accidentally, or intentionally, cause a fire. However, with the availability of electricity, the use of electrical appliances as opposed to open fires, candles and paraffin/gas lamps or stoves, will reduce the risk to fires for occupants. The site is located in a densely developed area with no fire brigade or related trained persons, which will increase the difficulty of fighting fires. Currently, if there is a fire in Aussenkehr, the local business responds with mobile fire fighters and water tankers to assist the community in extinguishing the fire. The provision and maintenance of fire extinguishers/ hydrants throughout the development as well as training on the use thereof remains paramount.

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

Actions:

Prevention:

- Prepare a holistic fire protection and prevention plan. This plan must include evacuation plans from the site and signage, an emergency response plan and a firefighting plan as part of maintenance and operational plans.
- Personnel training (safe operational procedures, firefighting, fire prevention and responsible housekeeping practices) should form part of all contractor's tender requirements for further construction work.
- Establish a maintenance schedule for all fire related infrastructure as constructed and or managed by the Proponent.
- Ensure all/any flammable chemicals and fuels are stored according to MSDS and SANS instructions and all spills or leaks are cleaned up immediately.
- Maintain regular site, mechanical and electrical inspections and maintenance.
- Ensure the maintenance of firefighting equipment and promote good housekeeping.
- No open and unattended fires should be allowed during the construction phase or close to the water treatment facility.
- Any LPG gas cylinders should be stored in an enclosed, secure area and serviced regularly with fire extinguishers readily available.
- The Proponent should liaise with the nearest fire brigade to ensure that all fire requirements are met and that contractors adhere to all requirements related to fuel storage and handling during the construction phase.

Mitigation:

- Implement the fire protection and firefighting plan in the event of a fire.
- Quick response time by trained staff will limit the spread and impact of fire.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat themselves.
- A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

- Record when fire drills were conducted and when firefighting equipment were tested and training given.

2.1.9 Air quality

Particulate matter is a known health concern related to air quality. Specific parameters were developed by the World Health Organisation (WHO) relating to the safe limits of particulate matter in ambient air. Future construction and or maintenance activities could entail earth moving activities which may temporarily suspend material in the air. Frequent travelling of HMV over un-surfaced areas may increase soil disturbance resulting in finer particles which are more easily suspended in the air. An increase of dust settling on adjacent properties may impact the table grape sector and or the informal settlement. However, considering prevailing south-westerly wind conditions, the impact has a lower significance rating.

The sewerage plant is located more than 110 m from the nearest residential unit. The biological waste water treatment plant is a closed plant that emits no or very limited foul smelling odours. The distance from the plant to the housing development still acts as a buffer in the event of some odours being present and thus the plant is not considered to impact on the nearby residents.

The possible impacts, which may emanate from the project, will be on a local scale. It is not foreseen that the greenhouse gas emissions (GHG) from such activities will have a significant impact on the community health.

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

Actions

Mitigation:

- Personnel issued with appropriate masks where excessive dust are present.
- Mitigation measures should be in place, such as dust suppression where excessive dust generation is expected.
- A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary.
- Notice to be given to nearby receptors prior to activities generating excessive dust which cannot be mitigated, if any.
- If feasible, consider covering the road with a natural dust suppressant or wet as required.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

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

2.1.10 Noise and Vibration

Construction or maintenance noise, which may constitute high volume and repetitive noises, are known to impact human health. Excessive noise may result in a nuisance to nearby receptors and possible hearing loss in staff.

Noise standards have been developed by the Health and Safety Regulations of the Labour Act and WHO to protect workers and communities against the health impacts and nuisances of noise. The project had a construction period which could have cause periods of noise experienced by nearby residents (in those areas initially established). A similar impact may be experience should additional construction be required / conducted. Mechanical excavations will increase the intensity of the construction noise generated.

During the operational phase, numerous and almost all aspects associated with the development will be noise emitting.

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

Actions

Prevention:

- Follow the Health and Safety Regulations of the Labour Act for limits on noise in the workplace and World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment and not to cause a nuisance.
- Allow for a community grievance mechanism.
- All machinery must be regularly serviced to ensure minimal noise production.
- Notification to nearby receptors (through a community liaison officer) of construction commencement.
- To reduce vibration levels, it is recommended that all machinery and vehicles be maintained in a good condition and that a maintenance record be kept.
- Any machinery and vehicles that cause excessive vibrations (indicative of possible malfunction) should be given defect notices and taken off site immediately. Machinery and/or vehicles may only be used again on site once they have been serviced and approval has been granted by the site supervisor.
- Unnecessary vibrations can be minimised by ensuring that no machinery or vehicles are left idling when not in use.
- The appropriate and correct placement of specific work activities can ensure the reduction of handling of machinery that cause heavy vibrations.
- Ensure personnel running the equipment are trained accordingly so that machinery is used properly.
- Pre assessment to allow for mitigation measures for any elevated levels of vibrations should take place if there is any suspicion that there may be excessive vibration levels on site during construction. These mitigation measures should then be in accordance with local regulations and standards.
- Should any blasting be conducted, a related survey of all properties will have to be conducted and an amendment to the environmental assessment and related environmental management plan will have to be submitted to MEFT.

Mitigation:

- Hearing protectors as standard PPE for workers in situations with elevated noise levels.
- An assessment of the vibrations from within premises where complaints are recorded can help determine better mitigation measures.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act and WHO Guidelines.
- Maintain a complaints register.
- Report on complaints and actions taken to address complaints and prevent future occurrences.

2.1.11 Waste Production

Waste production during the construction and operational phases are very different and require unique waste management measures to address related impacts and prevent contamination. Construction waste may have a greater component of building rubble, discarded materials and hydrocarbon-contaminated materials, with less general and domestic waste in comparison. The latter two types of waste, along with sewage and effluent, should be managed by the contracting agent responsible for construction within a specific area. Wind may blow waste, such as old cement bags (which is a hazardous waste), plastic bags and polystyrene, from the site to beyond the site boundaries. Construction waste may present physical pollution as well as chemical contamination.

During habitation, a greater volume of general and domestic waste will have to be managed. Any form of waste, may not only result in contamination and pollution risks, but also present health and fire risks. Uncollected domestic and general waste, not contained in suitable disposal units, may attract vermin and wild animals. Waste handling and storage, albeit temporarily, may present pollution and contamination risks. Sewage is also a form of waste. The biological waste water treatment plant will treat sewage effluent to a standard suitable for release into the environment. The sludge waste produced will be of an organic nature and will be contained within the reclamation plant until removed. The Proponent will be responsible for the removal of the waste to an appropriately licensed facility. Waste will be removed every two or three years or once it has accumulated to 600 mm (or as specified by the plant manufacturer). Only dry sludge may be disposed of.

Desired Outcome: To reduce the amount of waste produced, and prevent pollution and littering as well as safety risks associated with accumulated waste.

Actions

Prevention:

- A waste management system should be adopted and presented for the construction phase and should include measures related to construction waste handling and management.
- All construction related tender documentation should include the waste management system and should include contractual penalties for failing to adhere to the waste management requirements.
- A waste management system should be adopted for the proposed development and should include disposal to a landfill site.
- Ensure adequate temporary waste storage facilities are available for different types of waste during the operational phase.
- Ensure waste cannot be blown away by wind during all phases of the project.
- Prevent scavenging (human and non-human) of waste.
- Adopt or formulate regulations and by-laws relating to waste management, storage and handling.
- All construction waste produced must be removed on a weekly basis.
- Weekly site inspections should be conducted by a representative of the Proponent to ensure implementation of the waste management plan and compliance to the EMP.
- An independent waste and EMP management audit should be conducted on a monthly basis for the duration of construction contracts.
- The sewage treatment plant must be serviced regularly to ensure efficient functioning and adequate treatment of sewage.
- The sewage treatment plant must be operated according to requirement from the MAWLR as well as any requirements stipulated in any permit (such as the disposal permit, for which an application was submitted).
- All maintenance requirements of the water treatment plan should be adhered to. Failing any stipulated requirement of the MAWLR, maintenance must be conducted according to Section 6 (Operation and Maintenance) of the Department of Water Affairs & Forestry Code of Practice: Volume 3; Biological Filtration Systems – General guidelines. Or, any subsequent or more recent publication in this regard, by the MAWLR.

- All sampling and analysis should be conducted as per the disposal permit requirements. Failing any stipulated requirement of the MAWLR, maintenance must be conducted according to Section 7 (Sampling and Analysis) of the Department of Water Affairs & Forestry Code of Practice: Volume 3; Biological Filtration Systems – General guidelines. Or, any subsequent or more recent publication in this regard, by the MAWLR.

Mitigation:

- Waste, including sludge waste, should be disposed of at appropriately classified disposal facilities. This includes hazardous material disposal (empty chemical containers, contaminated rags, paper, water and soil) and the sludge from the waste water treatment plant.
- See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- Liaise with the regional council regarding waste and handling of hazardous waste.
- Empty chemical containers that may present a contamination/health risk must be treated as hazardous waste. Workers should not be allowed to collect such containers for purposes of storing water or food. This can be achieved by puncturing or crushing such containers prior to disposal.
- Report all fuel spills greater than 200 litres to the Ministry of Mines and Energy and enact emergency response plans for fuel spills.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/project.
- Waste management plan, weekly and monthly audit reports kept on site.
- Operational and maintenance record kept on site.
- All results of any sampling related to the waste water treatment should be kept on file and/or provided to the MAWLR as per disposal or guideline requirements.
- Any complaints received regarding waste should be recorded with notes on action taken.
- All information and reporting to be included in a bi-annual report.

2.1.12 Flora

Construction related activities presents the greatest risk to habitats within the area associated with the Orange River, since the project location is void of vegetation. However, this site is located far removed from the Orange River and therefore is highly unlikely to affect the flora associated with the river. Construction and operational activities can create habitat for flora species to establish e.g. disturbed soil is favourable for the establishment of weeds and invader species. Illegal collection of plant materials may occur. Employees should not be allowed to harvest any flora without the required permission.

Although the operational phase is not planned to have direct physically altering activities on or around sensitive habitat areas, deviant or criminal social behaviour may result in damage to flora resources or vineyards.

Desired Outcome: To avoid pollution and negative impacts on these sensitive habitats.

Actions.

Prevention:

- All dumping of waste material in the environment, especially bricks and contaminated materials or soils, must be prevented.
- No storage of vehicles or equipment will be allowed outside of the designated area.
- Educate all contracted and related employees on the value of biodiversity and strict conditions prohibiting harvesting of flora must be part of employment contracts. Include prohibitions or regulations on the collection of firewood, etc.
- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.

Mitigation:

- For construction activities, contain construction material to a designated laydown area and prevent movement out of areas earmarked for clearing and construction.
- Take disciplinary action against any employees failing to comply with contractual conditions related to harvesting of flora.
- Implementation of an alien vegetation management plan for the site is required. This is especially in areas that have been disturbed.

Responsible Body:

- Contractor
- Proponent

Data Sources and Monitoring:

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

2.1.13 Fauna

Construction activities could lead to the displacement of faunal communities due to habitat loss and disturbance (noise, dust and vibration) and/or direct mortalities. However, the site was void of vegetation and related habitats with very little, if any, fauna species present. During the operational phase, the housing development may present suitable habitat for various fauna species ranging from snakes to birds. Impacts may therefore extend to human-wildlife conflict such as chance encounters with snakes or scorpions. Poaching of animals may occur. Employees should not be allowed to poach animals such as birds or collect or injure any exotic species such as scorpions.

Although the operational phase is not planned to have direct physically altering activities on or around habitat areas, deviant or criminal social behaviour may result in damage to protected fauna species.

Desired Outcome: To avoid the negative impacts on fauna and loss of biodiversity

Actions.

Prevention:

- Prior to further construction or during maintenance, do systematic site walkover to as best possible, locate and remove ant slow moving animals.
- For the construction phase, instruct workers to not deliberately injure or kill any animals perceived as dangerous, like scorpions and reptiles which may be present on site. Rather encourage reporting of such animals and arrange for the relocation of the animals to safe habitats.
- Educate all contracted and related employees on the value of biodiversity and strict conditions of prohibiting the poaching of fauna must be part of employment contracts.
- Report any extraordinary animal sightings to MEFT.
- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- Prevent scavenging of waste by fauna.
- Direct all lights down to working surfaces and use minimal lighting at night.

Mitigation:

- For construction activities contain construction material to a designated laydown area and prevent movement in areas earmarked for conservation.
- Report any extraordinary animal sightings, conflict or incidents to the MEFT.
- Take disciplinary action against any employees failing to comply with contractual conditions related to poaching and the environment.

Responsible Body:

- Contractor
- Proponent

Data Sources and Monitoring:

- All information and reporting to be included in a bi-annual report.
- Report any extraordinary animal sightings to the MEFT.

2.1.14 Groundwater, Surface Water and Soil Contamination

Contamination risks may be linked to the construction and operational phases. Sources of contamination can be spills and leaks from construction vehicles, chemicals used during construction such as paints and sewage. Shallow groundwater may lead to rapid dispersion of pollutants, and may potentially negatively impact surrounding underground utilities of infrastructure (considering the phased approach). Changes in the soil structure due to site excavation, clearance and especially ground breaking may lead to trenches along which contamination may travel.

During the operational phase, various risks of contamination may be associated with any portion of the infrastructure failing, such a leaking sewerage lines. Improper storage of hazardous materials, etc., may further pose risk to soil and groundwater contamination.

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

Actions

Prevention:

- Leaking equipment shall be repaired immediately or be removed from site to facilitate repair.
- Any possible contamination of topsoil by hydrocarbons, concrete or concrete water must be avoided and an emergency spill kit must always be available on site.
- Proper training of operators of construction machinery and vehicles and employees must be conducted on a regular basis (fuel and chemical handling, spill detection, spill control).
- Spill control measures, such as drip trays, should be in place where refuelling of construction machinery is required on the site.
- All construction machines should be maintained to be in a good working condition during operations.
- Employ drip trays and spill kits when servicing / repairs of equipment are needed.
- Where relevant, determine locations of any underground structures per erven to prevent damage to underground utilities which may lead to contamination.
- Prevent off-road driving or movement of earthmoving equipment outside of areas designated for clearing.
- No dumping of rocks and removed soil in environmentally sensitive areas. Where possible it can be used to fill erosion ditches or old quarries, if any are present.
- Regular inspection of the waste water treatment plant to detect any leaks which must be repaired without delay.
- Regular maintenance of the waste water treatment plant to ensure efficient treatment of sewage to standards acceptable for the release of treated effluent into the environment.
- The residents of the houses connected to the waste water treatment plant must regularly be informed of what may and may not be allowed to enter the sewerage system.

Mitigation:

- Any fuel spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- Spill clean-up means must be readily available on site as per the relevant MSDS and any spill must be cleaned up immediately.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, and a copy of documentation in which spill was reported to Ministry of Mines and Energy. The latter is only for fuel spills of 200 litres or more.

2.1.15 Visual Impact and Landscape Character

Changes in the landscape character occurred during the construction phase and subsequently also during the operational phase. Formalised housing is distinctly different from the informal settlement as well as the vineyards. A diversification of the landscape character in this way adds to the perceived organised development of Aussenkehr and therefore is considered to contribute positively to the landscape character. Furthermore, the housing development should be kept clean, tidy and maintained to ensure it remains aesthetically pleasing.

Desired Outcome: To minimise aesthetic impacts associated with the establishment.

Actions

Mitigation:

- Construction activities must be restricted to the construction site to minimize the impacts of the construction phase.
- Storm water discharge points should be designed to minimize erosion.
- Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- All contractors' camps to be clearly demarcated, fenced off and kept neat.
- Active construction areas to be clearly indicated, demarcated and kept neat.
- Construction to be approached in a systematic manner to ensure uniform and methodical completion of construction areas.
- Construction planning to be shared with IAPs.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

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

2.2 DECOMMISSIONING AND REHABILITATION

The residential units and associated support infrastructure are considered permanent structures with a lifespan of many decades and as such decommissioning of these structures are not foreseen. For purposes of the EMP, decommissioning rather refers to the removal of construction phase related infrastructure such as construction camps or selected operational infrastructure that may have broken or became obsolete and has to be replaced. Should such decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure not to be used in future, including underground infrastructure. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within the health and safety regulations of the Labour Act and/or WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste project and not dumped in the surrounding areas. Depending on the scale of decommissioning, the EMP for the project may have to be reviewed at the time of decommissioning to cater for changes made to the site and implement guidelines and mitigation measures.

3 CONCLUSION

The EMP should be used as an on-site reference document during all phases of the housing development. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

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