

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

PROPOSED NEW OXIDATION PONDS AT KAI//GANAXAB YOUTH CENTRE, MARIENTAL



Compiled by:



Matrix Consulting Services
P.O. Box 25824 Windhoek
Tel: +264-61 224197
Fax: +264-61 212165
info@matrixconsultingcc.com

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Compiled for:



NAMIBIA TRAINING AUTHORITY

Namibia Training Authority
PO Box 70407, Windhoek
Tel: (+264) 61 207 8565
Fax: (+264) 61 207 8137

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1. INTRODUCTION AND BACKGROUND

This Environmental Management Plan (EMP) serves as a managing tool for the construction, operation and decommissioning of the proposed new Kai//Ganaxab Oxidation Ponds (24.56868°S; 17.89703°E) at the Kai//Ganaxab Youth Skills Centre, in Mariental, Hardap Region. The EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development.

The EMP 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, the *Contractor (and its sub contractors)* refers to construction personnel responsible for the construction phase of the development, including maintenance activities.

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 Namibia Training Authority (NTA) 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 construction and operation phases of the proposed oxidation ponds:

- ✓ Site preparation.
- ✓ Excavation and construction of ponds.
- ✓ Construction of spill control measures.
- ✓ Reticulation of waste to oxidation ponds.
- ✓ Storage and handling of waste at the oxidation ponds.
- ✓ Progressive rehabilitation.

Possible decommissioning phase of the oxidation ponds:

- ✓ Removal of all infrastructure not reused during future use of land; and
- ✓ Rehabilitation of the land.

2. LEGISLATIVE FRAMEWORK

❖ *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.

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislation is relevant to this project.

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I. 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

II. 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.

III. 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

IV. 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 the private sector, should be subjected to the established EA procedure.

Line Ministry: Ministry of Environment and Tourism

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.

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

The proposed oxidation ponds at Kai//Ganaxab Youth Centre, 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.

VI. 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

VII. 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

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Line Ministry: Ministry of Health and Social Services

IX. Soil Conservation Act (No.76 of 1969)

The Act advocates for the prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

X. Public Health Act 36 of 1919 and Subsequent Amendments

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this ESA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.
- ✓ Potential impacts associated with the upgrade and operations are expected to include dust, air quality impacts, noise nuisance and smoke emissions.

Line Ministry: Ministry of Health and Social Services

3. ENVIRONMENTAL MANAGEMENT PLAN

3.1 Responsibilities for environmental management

NTA will be responsible for environmental control on site during the construction and operational phase. It is very important a pre-construction briefing meeting be held to reach an agreement on specific roles of various parties and penalties for non-compliance.

3.2 Training and induction

NTA is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily. The proponent should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMP and that they will comply. All senior staff should familiarise themselves with the full contents of the EMP and its implications. Senior staff is expected to train and assist the rest of the employees on the contents of the EMP.

3.3 Environmental incident reporting

All environmental incidents occurring at the proposed site must be recorded. The incident report will have to include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighbouring community should be directed to NTA and/or the management of Kai//Ganaxab Youth Skills Centre. Management should be able to respond to the complainant within a week (even if pending further investigation).

3.4 Environmental monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done in order to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command.

3.5 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.

3.6 EMP amendments

The EMP amendments can only be made with the approval of the DEA. Amendments to the EMP should be liaised to all employees and contractors.

3.7 Non compliance of the EMP

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.

3.8 Environmental Control Officer

The Environmental Control Officer for the site can be an independent environmental consultant (e.g. Matrix Consulting Services) appointed by NTA to monitor and review the on-site environmental management and implementation of this EMP.

3.9 Site Management

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

3.9.1 Access routes and work sites

Construction vehicles will access the proposed project site via existing roads. No new tracks/roads shall be established and only existing roads may be used. Work sites shall be clearly demarcated and road signs erected where needed. No students from the centre and/or general public should not have access to the work sites during construction.

3.9.2 Fire and safety management

No fire, whether for cooking or any other purpose, is to be made at the project site during both the construction and operational phase. The Contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire. This equipment shall include fire extinguishers. The Contractor should be prepared for such events.

The NTA management together with contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

3.9.3 Staff management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid.

3.9.4 Waste management

Both NTA and the contractor shall remove all waste off-site produced to designated waste disposal sites. Sufficient bins or containers on-site to store any solid or liquid waste produced should be provided. The bins and containers should be weatherproof and scavenger-proof.

3.9.5 Cement and concrete batching

Concrete mixing directly on the ground shall not be allowed and shall take place on an impermeable surface. All run-off from batching areas shall be strictly controlled, and cement contaminated water shall be collected, stored and disposed of at a licensed suitable waste disposal facility.

3.9.6 Hydrocarbons management

If any spillage occur during both construction and maintenance activities, contaminated soil shall be collected in a holding tray or drums and disposed off at a designated hazardous waste site. Any spillage of more than 200 litres must be reported to the Ministry of Mines and Energy as per the Petroleum Products Act.

The Contractor shall take all reasonable measures to prevent surface or groundwater pollution from the release of oils and fuels.

3.9.7 Flood management

Storm water management of the site should be a key aspect of flood management on site. All drainage lines and culverts should be kept clean to allow storm water to flow freely.

3.9.8 Management of environmental aspects during all phases of the project

Groundwater

Construction/Decommissioning phase	
Description	Groundwater quality could be impacted through leachate of petroleum, chemical, harmful and hazardous substances. In particular, oil leakages, diesel, lubricants and grease from construction vehicles, equipment and machinery utilised during the construction phase may occur. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ 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 temporary 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	Namibia Training Authority / Contractors

Surface Water

Operational phase	
Description	<p>Although the oxidation ponds will be equipped with impermeable containment layers that are designed to prevent wastewater from contaminating surface and groundwater resources; failure of this layers may occur, allowing the wastewater to potentially infiltrate these water resources. Leakages may also occur due to failure of reticulation sewer pipelines.</p> <p>Inflow of wastewater into these structures and formations would cause a pollution threat.</p>
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Proper containment mechanisms installed should be able to contain any leakages that might occur during the operation of the facility. ✚ Proper monitoring of the oxidation pond levels must take place to eliminate overfilling. ✚ Maintaining the installation in good operating order is of paramount importance in preventing ponds and equipment failure. ✚ During maintenance operations, remove leaking vehicles and/or equipment from project location immediately. ✚ 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 waterways and dispose of in a suitable manner to ensure proper drainage runoff. ✚ Ensure that stormwater management systems are regularly maintained and tested, and are in good working order. ✚ Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination from the ponds. ✚ Groundwater monitoring boreholes should be installed, sampled and analysed periodically.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Namibia Training Authority

Air quality (including dust)

Construction/Decommissioning phase	
Description	<p>Dust problems are expected to be localised and site specific. This may pose a slight nuisance to students on campus and nearby road users. Dust will be generated during the construction phase and might be worse during the winter months when strong winds occur. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.</p> <p>Release of various particulates and exhaust fumes from construction vehicles and machinery during construction activities is also expected to take place.</p>
Proposed Mitigation Measures	<ul style="list-style-type: none">✚ Ensure measures are in place to minimise dust generated during the construction phase.✚ Use appropriate dust suppression measures when dust generation is unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather.✚ Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.✚ Locate stockpiles of construction materials in sheltered areas where they are not exposed to erosive effects of the wind.✚ Ensure all vehicle, plant and equipment are in good condition.✚ Encourage reduction of engine idling.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Namibia Training Authority / Contractors

Operational phase	
Description	Air quality around the site could be impacted by bad smell from decomposition of organic matter. Odours from the wastewater ponds can result in complaints from neighbouring communities.
Proposed Mitigation Measures	<ul style="list-style-type: none">✚ Ensure frequent removal of waste solids from the settlement ponds.✚ Introduce aeration methods to increase decomposition when odours become unbearable.
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	Namibia Training Authority

Safety and Security

Construction/Decommissioning phase	
Description	Safety issues could arise from 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. Construction sites usually house construction building material and equipment on site which may attract criminal activities.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Provide suitable emergency and safety signage on site (manufactured of durable, weatherproof material). The signage signs should be placed at strategic locations to ensure awareness. ✚ Demarcate and barricade any areas which may pose a safety risk (including hazardous substances, deep excavations etc). These notices must be worded in English language. ✚ Enforce the use of appropriate Personal Protective Equipment (PPE) for the right task or duties at all times. ✚ Prevent illegal access to the construction site by implementing appropriate security measures. These security measures must not pose a threat to surrounding communities. ✚ Should a construction camp be necessary, it should be located in such a way that it does not pose a risk to the public. ✚ Equipment housed on site must be placed in a way that does not encourage criminal activities. ✚ Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used. ✚ The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times. ✚ Proper barricading and/or fencing around the work sites should be erected to avoid entrance of animals and/or unauthorized persons. ✚ Adequate lighting within and around the construction location should be erected, when visibility becomes an issue.
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	Namibia Training Authority / Contractors

Health and Safety

Operational phase	
Description	<p>The operations of the ponds can cause health and safety risks to workers on site. Employees could be exposed through to the skin contact with the potentially hazardous wastewater. The potential risk of someone falling and drowning in the ponds exists.</p> <p>Oxidation ponds can serve as breeding grounds for mosquitos, which are a risk to human heath. This is especially aggravated if there is vegetation growth in the ponds.</p> <p>Safety issues could also arise from the operational vehicles, equipment and tools that will be used on site during maintenance activities. This increases the possibility of injuries and all project personnel must be made aware of the potential risks of injuries on site. Unauthorised persons entering the pond premises are exposed to safety and health risks.</p>
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Staff must be properly trained and made aware of safety and hazardous nature of the ponds and wastewater. ✚ Fire fighting equipment and first aid kit should be made available at the project site and serviced regularly. ✚ Display contact details of emergency services in the area at strategic locations of the facility. ✚ Demarcate and place signage on any areas which may pose a safety risk (including trenches, excavations etc). ✚ The project personnel are advised to ensure that proper personal protective gear and first aid kits are available, at all times. ✚ Staff should be properly trained in first aid and safety awareness. ✚ Ensure no unauthorised entry to the ponds. Regularly inspect the perimeter security fence and repair immediately if there is any breach.
Proposed Monitoring	Regular inspection ponds and perimeter fence; and incident monitoring report evaluation.
Responsible Body	Namibia Training Authority

Noise Pollution

Construction/Decommissioning phase	
Description	An increase of ambient noise levels at the construction site is expected due to construction activities. Noise pollution due to heavy-duty equipment and machinery will be generated. It is not expected that the noise generated during construction will impact any nearby land or properties.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Ensure the use of construction vehicles and equipment that emit reduced noise levels. ✚ Ensure proper maintenance is conducted on vehicles to ensure the reduction of noise emission. ✚ The construction staff should be equipped with ear protection equipment. ✚ Audio equipment (if any) should not be played at levels considered intrusive by others. ✚ Construction activities will be limited to a period between 07h00 and 19h00.
Proposed Monitoring	Strict operational times. Regular inspection.
Responsible Party	Namibia Training Authority / Contractors

Waste Generation

Construction/Decommissioning phase	
Description	Waste material will be generated during the construction activities of the ponds. Waste in the form of rock cuttings, pipe cuttings, oil spills or leakages of petroleum products might occur during the construction phase.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Ensure that sufficient weather- and vermin-proof bins / containers are present on site for the disposal of solid waste. Waste and litter generated during this phase must be placed in these disposal bins. ✚ Empty bins regularly as required. ✚ Contractor shall institute a waste control and removal system for the site. ✚ All waste shall be disposed off site at an approved landfill site. ✚ No disposal of /or burying of waste on site should be conducted.

Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ No waste should be burned on site. ✚ The hazardous waste storage is to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members. ✚ Solid and liquid hazardous waste shall be stored in separate containers. Hazardous waste should be disposed of at the approved hazardous waste disposal site at Kupferberg. ✚ Regular inspection and housekeeping procedure monitoring should be maintained at all times. ✚ Awareness of the hazardous nature of various types of waste should be enforced.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the manager.
Responsible Body	Namibia Training Authority / Contractors

Operational phase	
Description	Waste such as contaminated soil, oil and litter will be generated during the maintenance activities. Waste solids will be removed regularly from the ponds during the operational phase.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Removed collected solids from the ponds using appropriate equipment. ✚ Ensure the use of proper equipment, containers and/or vehicles, and then dispose off the collected solids at an approved dumpsite. ✚ Ensure all workers wear proper personal protective equipment. ✚ Any waste generated must be contained and disposed off accordingly. ✚ Waste bins / containers must be readily available at the project site at all times.
Proposed Monitoring	Regular visual inspection.
Responsible Body	Namibia Training Authority

Traffic

Construction/Decommissioning phase	
Description	<p>Construction vehicles will access the project location from the nearby access and D1103 roads. Construction related activities are expected to have a minimal impact on the movement of traffic along these roads, due to the fact that construction vehicles will frequent the site only periodically.</p> <p>No diversion of traffic or closure of the road is expected, however a slight nuisance might be experienced by motorists using the road. This will most likely be caused by slow moving vehicles frequenting the construction site. It is however expected to be short-lived.</p>
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Install and maintain official traffic signalling (where necessary) along the access roads / intersection in conjunction with local or national traffic regulations. ✚ Speed limit warning signs must be erected to minimise accidents. ✚ Construction vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents. ✚ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.
Proposed Monitoring	Observations of the traffic flow along access roads
Responsible Party	Namibia Training Authority / Contractors

Heritage impacts

Construction/Decommissioning phase	
Description	There are no known heritage areas envisaged to be impacted by the new development; however the contractor might come across archaeological features or objects that possess cultural values during construction activities.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ If such remains or objects with cultural values (e.g. bones, weapons, ancient cutlery, graves etc) are uncovered at the project location or surrounding, it should be barricaded off, and ✚ The relevant authorities (i.e. the local police and National Heritage Council of Namibia) should be contacted immediately.
Proposed Monitoring	Regular site inspection.
Responsible Party	Namibia Training Authority / Contractors

Ecological impacts

Construction/Decommissioning phase	
Description	No conservation worthy vegetation exists at the site.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Limit clearing of vegetation to those areas within the footprint of construction site. ✚ Disturbance of areas outside the designated working zone is not allowed. ✚ No vegetation should be removed outside the designated project area
Proposed Monitoring	Regular site inspection.
Responsible Party	Namibia Training Authority / Contractors

Operational phase	
Description	The proposed facility operations will have minimal impacts on fauna and flora; however vegetation control in and around the ponds must be maintained.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ The operational activities would not exceed the demarcated area of the development. ✚ Regularly remove vegetation growth from the ponds and pond embankment walls and dispose of accordingly.
Proposed Monitoring	Regular site inspection.
Responsible Body	Namibia Training Authority

Erosion and Sedimentation

Construction/Decommissioning phase	
Description	Clearing of vegetation during earthworks is expected to take place and can make the project site susceptible to soil erosion especially during rainy seasons. The constant movement of heavy construction vehicles during construction also tend to compact the soil surface, which can reduce infiltration capability, and increase surface water runoff.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Avoid unnecessary removal of topsoil cover during construction. ✚ Ensure stockpiles are located within the boundary of the site and are protected from erosion. ✚ Stabilise cleared areas as soon as possible to prevent and control surface erosion. ✚ Limit clearing of vegetation to those areas within the footprint of construction. ✚ Minimise open areas and reduce the frequency of disturbance.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	Namibia Training Authority / Contractors

Social-Economic Aspects

Construction/Decommissioning phase	
Description	Temporary employment opportunities are anticipated to be created during construction, both directly through construction workers and indirectly through suppliers, service providers, and informal traders attracted to the project site.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Construction contractor(s) should be sourced from Mariental, and surrounding areas. ✚ Construction workers should be sourced from Mariental, and surrounding areas. ✚ Suppliers of construction materials should be sourced from Mariental, and surrounding areas. ✚ Locally source services required during the construction process, such as securities, rental of portable toilets, plant hire, etc. ✚ Designate an area outside the construction site for informal traders (if any), to allow them to trade.
Responsible Party	Namibia Training Authority / Contractors

Operational phase	
Description	The oxidation ponds will treat the wastewater, and allow for a safe sewage and sanitation system at the training centre. This represents an important positive impact on human well-being. The creation of new employment opportunities is eminent for construction and maintenance activities; and is considered to be a positive impact. At this stage, it is unclear how many temporary and permanent employment positions will be created but jobs will be created.
Proposed Mitigation Measures	<ul style="list-style-type: none"> ✚ Employment creation should be targeted at the immediate communities of the project site, or Mariental. ✚ Maintenance contractors should be sourced from Mariental, or the region at large. ✚ Locally source services required during the operational process, such as securities, plant hire, etc.
Responsible Body	Namibia Training Authority

4. 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 officer/consultant will need to monitor or audit the site throughout construction 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.

Matrix Consulting Services

M. Shippiki
Environmental Practitioner
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