BRUKKAROS HYDROPONIC FARMING (PTY) LTD

ENVIRONMENTAL MANAGEMENT PLAN (EMP) REPORT

This EMP Report is prepared to Support an Application for Environmental Clearance Certificate (ECC: APP-001028) to construct and operate an Aquaponic Greenhouse Farming with Complete Solar Plant in Keetmanshoop, //Karas Region, Namibia

BRUKKAROS
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1. INTRODUCTION

This EMP (Environmental Management Plan) details how the proponent will incorporate environmental protection while undertaking various project activities during construction and operation phases.

An EMP is similar to a policy and for companies that have environmental policies it is usually easy to implement EMPs.

1.1 OBJECTIVES

Purpose of this EMP is to demonstrate how the proponent intend to implement the EMP by providing a clear and concise baseline environmental monitoring plan.

Specific objectives are to:

- List documentations (e.g. permits, methods statement, SOPs, etc) required for constructing and operating a pipeline;
- Establish baseline environmental conditions before and after construction, and
- Monitor environment during the operation phase.

2. ENVIRONMENTAL CERTIFICATIONS AND DOCUMENTATIONS

Environmental certifications will include permits and certificates needed to authorize construction and operation of a pipeline as well as undertake all activities as required by law. Documentations will be communicable materials that will be required to describe, explain or instruct and communicate information regarding the pipeline operational procedures.

Before commencement of the proposed development, the following environmental certifications and documentations shall be required:

Table 1: permits and authorization.

Certification and documentation	**Institution/competent authority**	**Contact person/details**
Environmental clearance certificate (ECC)	Ministry of Environmental, Forestry and Tourism	Environmental Commissioner

Domestic and industrial wastewater and effluent discharge permits	Ministry of Agriculture, Water and Land Reform	Department of Water Affairs
Baseline environmental monitoring plan.	Ministry of Environment, Forestry and Tourism	Department of Environmental Affairs

3. GRIEVANCE MECHANISM

The procedure the management will apply to deal with the employees' grievances will be enforced as follows:

Timely Action

The first and foremost requisite in grievance handling shall be immediate settlement as they arise. The sooner a grievance is settled, the lesser it will affect employees' performance. This requires the first line supervisors to be trained in recognizing and handling a grievance properly and promptly.

3.1 Accepting the Grievance

The supervisor shall recognize and accept the employee grievance as and when it shall be expressed. Acceptance shall not necessarily mean agreeing with the grievance; it rather shows the supervisor's willingness to look into the complaint objectively and dispassionately.

3.2 Identifying the Problem

The grievance expressed by the employee shall be at times simply emotional, over-toned, imaginary or vague. The supervisor, therefore, shall be required to identify or diagnose the problem stated by the employee.

3.3 Collecting the Facts

Once the problem is identified as a real problem; the supervisor should, then, collect all the relevant facts and proofs relating to the grievance. The facts so collected shall be separated from the opinions and feelings to avoid distortions of the facts.

3.4 Analysing the cause of the Grievance

Having collected all the facts and figures relating to the grievance, the next step involved in the grievance procedure shall be to establish and analyse the cause that led to grievance. The analysis of the cause shall involve studying various aspects of the grievance such as the employees past history, frequency of the occurrence, management practices, union practices, etc. Identification of the cause of the grievance helps the management to take corrective measures to settle the grievance and also to prevent its recurrence.

3.5 Taking Decision

In order to take the best decision to handle the grievance, alternative courses of actions shall be worked out. These are, then, evaluated in view of their consequences on the aggrieved employee, the union and the management. Finally, a decision taken should best suite a given situation. Such decision should serve as a precedent both within the department and the company.

3.6 Implementing the Decision

The decision shall be immediately communicated to the employee and also implemented by the competent authority.

In case, it is not resolved, the supervisor once again needs to go back to the whole procedure step by step to find out an appropriate decision or solution to resolve the grievance.

4. MITIGATION ACTIONS

All activities during construction will be temporary and their impacts negligible. The following environmental impacts were of particular concern:

- Dust;
- Current water shortage, and
- Increase in business development activities and possible impacts on the people's livelihood.

Mitigation actions that are required to reduce or minimize negative impacts are described in ***table 1.***

4.1 Risk preparedness and response plan

Risk is an event that may or may not happen; whereas an impact is what will happen if a risk occurs. Risks poses a significant impact on people, the environment or and property. Although they may not happen, there is a need to be prepared to respond to risks at all times during construction and operation phase of the project.

All response actions should be geared toward the following priorities and in the order below:

- ***Safety*** of people (always **First**);
- ***Protection*** of the Environment, and
- ***Protection*** of Assets or equipment.

Emergence preparedness and response management involves 5 basic steps as follows:

- **Preventive actions** are taken to avoid an incident.
- **Mitigation measures** are actions taken to prevent an emergency, reduce the chance of an emergency happening, or reduce the damaging effects of unavoidable emergencies.
- **Preparedness** increases the proponent's ability to respond when a risk occurs. Typical preparedness measures include developing a method statement and emergence exit procedures, awareness and training for both response personnel and affected parties and conducting drills to reinforce training and test capabilities.
- **Response** is an action carried out immediately before, during, and immediately after a hazard impact, which is aimed at saving lives, reducing economic losses, and alleviating suffering. Response actions may include activating the emergency operations center, evacuating threatened employees or equipment, opening shelters and providing mass care, emergency rescue and medical care.
- **Recovery**. These are actions taken to return to normal or near-normal conditions, including the restoration of basic services and the repair of environmental, social and economic damages. Typical recovery actions include debris cleanup, financial assistance to individuals, rebuilding of infrastructures and key facilities, and sustained mass care for displaced marine animal populations.

5. EXTERNAL COMMUNICATIONS

External communications shall be handled in line with company procedures.

6. REPORTING

Baseline monitoring and environmental monitoring should be reported to the Ministry of Environment, Forestry and Tourism.

Table 1: EMP and mitigation.

Receiving environment	**Valued environmental component**	**Issue**	**Mitigation actions**	**Performance indicator**	**Responsible institution/ personnel**
Air	Technosphere	Dust maybe localized and reduction in air quality will be temporary.	Dust will be reduced by using water trucks to spray unpaved roads and exposed dirt surfaces; Covering all dump trucks leaving the work zone to prevent dust and debris from blowing, avoiding excavation work if the wind speeds exceed 30 mph. Record measurements of dust particles and gaseous concentrations. Various dust particle measuring devices are used to measure outdoor air quality. For example, the PCE-RCM 15 enables the measurements of Carbon dioxide, Carbon monoxide, fine dust, temperature and humidity.	Method statement. The method statement should provide SOPs, equipment used and mitigation measures to reduce environmental impacts.	The proponent
Land		Removal of topsoil could affect local geology and landform Solid waste resulting from site preparation include tree stumps and rubble.	Restored during landscaping. Waste disposal will be managed by ensuring the use of trash bins to put in all waste from construction.	The method statement should provide SOPs, equipment used and mitigation measures to reduce environmental impacts.	MEFT and the proponent

Ecology and biodiversity	Effect on local biodiversity	Herbaceous plants destroyed such as grass, bush or shrubs during these activities negatively influence biodiversity. The main concern are less mobile diversity of reptile, amphibians, and small mammals. Birds may be affected but less because they are more mobile.	The Proponent shall submit the monitoring plan and SOPs to MEFT and Municipality detailing how pollution will be prevented and mitigated. Identify habitats of each species and how they utilise them. Removal of species of certain ecological value should not be done without approval from relevant authority. Species of certain ecological value should be removed and planted or relocated elsewhere.	Baseline Environment Monitoring Plan and SOPs.	Proponent
Human environment	Safety, health and evironment	Employees may suffer from dust and exhaust emissions,	Personal protective gear should be provided for safety reasons. Construction workers will be given health education trainings and they will be staying on site	Baseline Environment Monitoring Plan and SOPs.	Proponent and IEC
	Noise from vehicles and equipment	Public health will be affected by dust and exhaust emissions.	Noise will be reduced by using less noisy equipment; Utilizing muffler systems that can help to reduce the noise from internal combustion engines; Dampeners will be used to minimize possible noise caused by vibration.	SOPs	Proponent and IEC
Water resources	Water consumption and use	Freshwater needed for construction will be extracted from the nearby water sources.	Precautionary measures will be implemented to ensure wise us of water. Where possible and necessary use of sewage water will be encouraged (e.g, watering roads, etc).	SOPs	Proponent and IEC

		Water is a scarce commodity.	Use of hydroponic and aquaponics that contained within greenhouses are [proved to be water efficient and will be expected to save a lot of water. Install water efficient appliances. Fit appliances with water efficient devices.		

Table: baseline environmental monitoring plan.

Activity	Description	Frequency	Responsible
Solid waste	Ensure that all solid waste is contained within containment drum: • Add probiotic if required. • Ensure labelling is completed and in order. • Seal drum. Ensure collection by registered waste operator and transfer to Municipal approved landfill site.	All cleaning operations.	Proponent
BASELINE ENVIRONMENTAL MONITORING	Specific analysis of water quality and operations is to be undertaken at individual stations using the multi parameter probe as well as taking samples for further analysis as per SOPs.	Every 4 months	IEC
	All sampling requiring laboratory analysis should be transferred to commercial/accredited laboratory under instruction of IEC.	Every 4 months	IEC

MONITORING REPORTS	Present/submit report on analysis on 7th day of every quarter after analysis.	Every 4 months	Proponent

7. DISCUSSIONS, CONCLUSIONS AND RECOMMEDATIONS

As often argued in literature, an EIA as a tool for sustainable development is not sufficient in evaluating development projects because it has its weaknesses. These weaknesses include the fact that the scope of an EIA is limited when measured on a temporary scale as it merely provides a snapshot overview of baseline conditions of a development project and fail to consider indirect environmental impacts or cumulative impacts that may result as result of a development.

Therefore, to make up for this the EMA (no. 7 of 2007) and its regulations (of 2012) require preparations of the EMP and environmental monitoring & evaluation plan.

An EMP is similar to policy and it is where a company or proponent commits to undertake all measures necessary to prevent, control and mitigate negative environmental impacts.

In order to design an effective EMP and implementan environmental monitoring & evaluation plan, there was a need to probe all negative impacts and assess them and determine how they should be managed. This was done during impacts evaluation and it was found that those impacts that were significant were either regional, localised and mitigatable.

It is recommended that the ECC should be approved, provided that the Proponent:

- Strictly adhere to the EMP and undertake baseline environmental monitoring;
- Data from baseline environmental monitoring should be kept,
  and availed to authorities whenever requested.