

FINAL ENVIRONMENTAL MANAGEMENT PLAN FOR THE HARVESTING AND MANAGEMENT OF *PROSOPIS* SPECIES AT THE GIBEON PILOT SITE IN HARDAP REGION

CLIENT:

Ministry of Environment, Forestry and Tourism



APRIL 2023







PROJECT INFORMATION

PROPONENT:	Ministry of Environment, Forestry and Tourism (Directorate of
	Forestry)
PROJECT TITLE:	Harvesting and Management of Prosopis Species at the Gibeon
	Pilot Site in Hardap Region, Namibia
PROJECT TYPE:	Environmental Management Plan
PROJECT LOCATION:	Gibeon, Hardap Region, Namibia
COMPETENT AUTHORITY:	Office of the Environmental Commissioner
	(Ministry of Environment and Tourism)
ENVIRONMENTAL	Nevunduko Consulting Services
ASSESSMENT	Mr. Olavi Makuti
PRACTITIONERS (EAPs)	Cell: +264 81 1405033
	E-mail: <u>olavi.makuti@gmail.com</u>
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ABBREVIATIONS/ACRONYMS

CBA	Cost Benefit Analysis
DoF	Directorate of Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GEF	Global Environmental Facility
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ORASECOM	Orange- Senqu River Commission
PPSC	Prosopis Project Steering Committee
SADC	Southern African Development Community
SAP	Strategic Action Programme
SMEs	Small and Medium Enterprises
UNDP	United Nations Development Programme
VMP	Vegetation/Forest Management Plan

1. INTRODUCTION AND BACKGROUND

The Ministry of Environment, Forestry and Tourism with financial support from the Orange-Senqu River Commission (ORASECOM) intends to support a projectat the Gibeon Pilot Site that will include the sustainable harvesting of *Prosopis* species. Furthermore, the project will also advocate for the economic utilization of the harvested *Prosopis*. The sustainable utilization of the *Prosopis* vegetation is intended to enhance the flow of water in the Orange-Fish Basin where *Prosopis* is known to block water channels.

ORASECOM serve as the technical advisor of the Parties (four member states: Botswana, Kingdom of Lesotho, Namibia and South Africa) on matters relating to the development, utilization and conservation of the water resources of the Orange- Senqu River Basin. As part of its obligations, ORASECOM also from time to time avails resources and technical support to respective Governments to carry out projects aimed at promoting equitable and sustainable development of resources in the basin. This project, therefore, forms part of the support given by ORASECOM to member states.

ORASECOM, with support from United Nations Development Programme (UNDP), secured financial support from the Global Environmental Facility (GEF) to implement selected priority activities of the Strategic Action Programme (SAP). The UNDP-GEF project titled, Support to the Orange-Senqu River Strategic Action Programme (SAP) Implementation, the project will be implemented by UNDP and executed by ORASECOM.

It is against this background that the Proponent (Ministry of Environment, Forestry and Tourism) through ORASECOM has commissioned this EIA project to conform to the Namibia Environmental Management Act(No. 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice 30 of 6 February 2012) and obtain Environmental Clearance Certificate (ECC) for the proposed project.

According to the Environmental Management Act (No.7 of 2007) and the Environmental Impact Assessment Regulations the following activities may not be undertaken without an Environmental Clearance Certificate:

FORESTRY ACTIVITIES - The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorization in terms of the Forest Act,

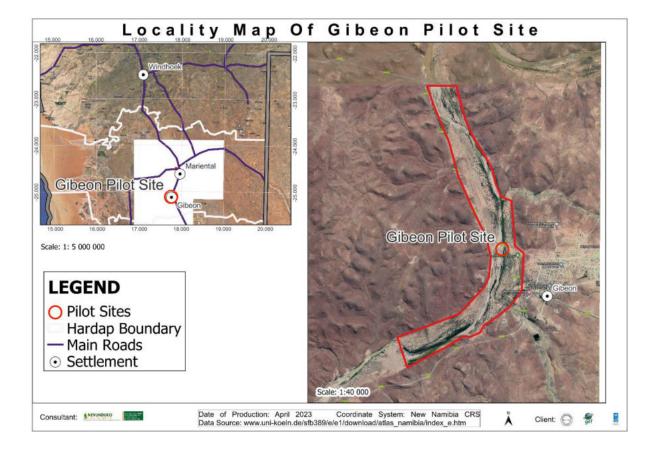
2001 (Act No. 12 of 2001) or any other law.

Nevunduko Consulting Services was appointed by ORASECOM, the financiers of the Environmental Impact Assessment (EIA) to carry out the EIA process.

Prosopis has become the dominant vegetation species along Fish River because of its high adaptive capacity and has resulted in the reduction of species diversity in the area. There is therefore a strong need to control the proliferation of *Prosopis* in the Hardap Region and the broader Orange-Fish River basin by harvesting it and replacing it with indigenous vegetation.

If it is not managed properly, *Prosopis* has the capacity to double every five years as the population expands at a rate of 18% per annum.

The project will be undertaken at the Gibeon pilot site that is located in the Hardap Region of Namibia as shown in the figures below. The site at Gibeon covers an area of 400 ha. This site occurs along the riparian zone of the Fish River and its tributaries (17.4600; -25.0705).



Key project activities will include the following:

• Prosopis harvesting

All *Prosopis* plants, including saplings, in the demarcated compartment will be removed. Thepilot areas will be demarcated into compartments (operational land units). It is planned that thesite will be demarcated into blocks or compartments of 100m x 100m which will translate to 1 ha per compartment. A 15m wide access road will be established at the site that will be used for the transportation of harvested materials, equipment and personnel. The access roads will serve fire breaks for incidental fires, especially for the management of the revegetation.

This means the price quotes at the time of implementing this plan will be based on 1 ha harvested and the density (stocking) of the *Prosopis* and sizes of the trees being harvested.

• Harvesting methods

Many methods are available throughout the world with practical experiences from neighbouring South Africa. These include Mechanical, Manual combined with hand-operated machines, Chemical applications, Biological and fire. The choice is based on many factors particularly on the objective of harvesting and in most applications the use of more than one of these methods needs to be deployed for effective results.

In the case of the Gibeon Pilot area, the main objective of harvesting is to sustainably manage the *Prosopis* trees while promoting the regrowth and revegetation of indigenous tree species, which have been outcasted by *Prosopis*. To achieve this, the Project will use a combination of Manual with hand-operated machinery reinforced with the use of approved chemicals for killing the stumps.

However, the use of chemicals will be assessed and verified by this EIA process. Stumps are killed by either an approved chemical and saplings/regeneration are removed manually on an annual basis during the winter season, when the cambium tissue is not very active or growing. The removal of coppices in winter ensuresthat not much coppicing takes place from the same areas.

• Management of natural regeneration

The project will use the natural approach method for regenerating the harvested areas. This will start with ensuring that maximum care is taken to protect the indigenous trees found growing together with *Prosopis* during harvesting.

2. EMP OBJECTIVES

An Environmental Management Plan (EMP) describes the processes that the proponent (Ministry of Environment, Forestry and Tourism) and associates will follow to maximize compliance and minimize harm to the environment. This plan will also help the Directorate of Forestry map out progress toward achieving continual improvements. The EMP comprises a list of actions needed to mitigate the potential negative environmental impacts identified in the EIA process.

The development of an EMP is a requirement for any EIA project as per Namibia's Environmental Management Act No.7 of 2007. Therefore, this EMP is a legal document that must accompany the EIA Report before an Environmental Clearance is issued.

The main purpose of this EMP is to:

- a. Minimize adverse impacts on the environment;
- b.Protect the environmental quality of the site;
- c. Meet the requirements of all national and local legislations;
- d. Outline guidelines for the Prosopis harvesting activities;
- e. Provide feedback for continual improvement in environmental performance; and
- f. Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment.

3. LEGAL REQUIREMENTS

As part of the implementation of this EMP, the proponent must comply with the requirements of various national legislations and municipal by-laws as outlined in the Scoping Report and as presented in the table below.

LEGISLATION	PROVISION	REGULATORY	APPLICATION TO THE
		AUTHORITY	PROJECT
The	Article 91 (c) and 95 (i)	Government of	The project should not pose a
Constitution of	commit the state to	the Republic of	threat to the natural and human
the Republic of	actively promote and	Namibia	environment.
Namibia	maintain the		
	environmental welfare of		
	all Namibians by		
	promoting		
	sustainable development		
Environmental	Provides a list of listed	Ministry of	An Environmental Clearance
Management Act	activities that may not be	Environment,	will be required before the
No.7 of 2007 and	undertaken	Forestry and	project
EIA Regulations	witho	Tourism (Office of	Commences.
(2012)	ut environmental	the	
	clearance	Environmental	
		Commissioner)	
Water Act 54 of	Control of disposal of	Ministry of	Project activities should not pose a
1956	sewage, the purification of	Agriculture, Water	threatto water resources.
	effluent, theprevention of	and Land Reform	
	surface and groundwater	(Department of	
	pollution, and the	Water Affairs)	
	sustainable use of		
	waterresources.		

Table 1: Legal framework of the project.

The Water	Control of disposal of	Ministry of	Project activities should not pose a
Resources Act 24	sewage, the purification of	Agriculture, Water	threatto water resources.
of 2004	effluent, theprevention of	and Land Reform	
	surface and groundwater		
	pollution, and the		
	sustainable use of water		
	resources.		
Forestry Act No.	The Act affords	Ministry of	The provision of this Act must be
12 of 2001	protection to certain	Environment,	observed during the harvesting of
	indigenous plant	Forestry	Prosopis spp.
	species.	and Tourism	
		(Directorate of	
		Forestry)	
Nature	Chapter 6 provides	Ministry of	Biodiversity at the project site
Conservation	for legislation	Environment,	must be protected as per the
Ordinance no. 4	regarding the	Forestry	provisions of this
of 1975	protection of indigenous	and Tourism	ordinance.
	plants		
Soil Conservation	Combating and	Ministry of	The proponent should ensure that
ActNo 76 of 1969	preventing soil erosion,	Agriculture, Water	soil erosion and soil pollution are
	the conservation,	and Land Reform	avoided during the
	improvement and manner		implementation of the project.
	of use of the soil and		
	vegetation		
	and the protection of the		
	watersources		
Atmospheric	Part II - control of	Ministry of Health	Atmospheric pollution should be
Pollution	noxious or offensive	andSocial Services	minimised at all costs.
Prevention	gases, Part III -		
Ordinance No 45	atmospheric pollution		
of 1965	by		
	smoke, Part IV - dust		
	control,		

	and Part V - air pollution		
	by		
	fumes emitted by vehicles.		
Local Authorities	The Local Authorities	Ministry of Urban	The harvesting of <i>Prosopis</i> within
ActNo. 23 of 1992	Act prescribes the	and Rural	a municipal area must comply
	manner in which a town	Development	with provisions of the Local
	or municipality		Authorities Act.
	should be managed by		
	the Town or Municipal		
	Council.		
The Labour	Employees are subject	Ministry of	Given the employment
Act of 1992	to the terms of the	Labour, Industrial	opportunities presented by
	Labour Act. Theact also	Relation and	Prosopis harvesting
	contains the Health	Employment	compliance with the labour
	and Safety Regulations.	Creation.	law is
			essential.
Public and	This Act (GG 5740)	Ministry of Health	Project activities should not
Environmental	provides a framework for	andSocial Services	pose athreat to public health.
HealthAct of 2015	a structured uniform		
	public and environmental		
	health system in Namibia.		
	It covers notification,		
	prevention and control of		
	diseases and sexually		
	transmitted infections;		
	water and food supplies;		
	waste management;		
	health nuisances; public		
	and environmental health		
	planning and reporting. It		
	repeals the Public Health		
	Act 36 of 1919		
	(SA GG 979)		

National Heritage	This Act calls for the	National	Should any objects of heritage
Act, 2004 (Act	protection,	Heritage	significance be found on the
N0.27 of	conservation and	Council of	project site, the provisions of
2004)	registration of places	Namibia	this Act mustapply.
	and objects of heritage		
	Significance.		
Atmospheric	This Ordinance	Ministry of	Atmospheric pollution
Pollution	generally provides for	Environment,	should be minimized at all
Prevention	the prevention of the	Forestry and	costs.
Ordinance(1976)	pollution of the	Tourism.	
	atmosphere. Part IV of		
	this ordinance deals with		
	dust		
	control.		
Plant Quarantine	This Act and its	Ministry of	The project must comply
Act No.7 of 2008 &	Regulations provide for	Agriculture, Water	with the provisions of this
Plant Health	the preventing,	and Land Reform	Act and Regulation
Regulations	monitoring, controlling		
	and eradication of plant		
	pests; to facilitate the		
	movement of plants,		
	plant products and other		
	regulated articles within		
	and into or out of		
	Namibia.		

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 EMP ADMINISTRATION

In order to successfully implement the provisions of this EMP, there is a strong need to clearly outline the roles and responsibilities of all stakeholders. There is also a need for the proponent and project managers/contractors to appoint an overall responsible person (Environmental Compliance Officer) to ensure the successful implementation of the EMP. The Environmental Compliance Officer (ECO) needs to be someone who has a basic understanding of EMP administration. Under the management actions, each action is allocated to a responsible entity to ensure that the specific action is managed and documented properly.

Furthermore, all key role players such as contractors who will be involved during the construction of the lodge must be informed about the contents of this EMP and activities to be undertaken to mitigate the potential impacts identified.

The table below outlines the key parties to this project and their responsibilities in terms of this EMP.

KEY PARTY	RESPONSIBILITIES
The Proponent	• Implement the final EMP after approval by MEFT and ensure the project complies
(represented by	with the conditions therein.
ProjectManager)	• Provide environmental training and awareness of the EMP to all contractors and
	employees of the project.
	• Notify the Competent Authority (MEFT) and EAP of any proposed changes to the
	proposed project.
	• Ensure that all contractors (SMEs) sign the EMP before the commencement of
	project activities.
	• Ensuring that the necessary legal authorizations and permits have been obtained.
	• Assist the contractors (SMEs) in finding environmentally responsible solutions to
	problems.

Table 2: Roles and responsibilities of key parties

	• To audit the implementation of the EMP regularly.
	• Compile and submit Environmental Reports to the
	Authority.
SMEs involved in the	• Ensure all their workers understand and adhere to
harvesting	the provisions of this EMP through training in the
	employees' languages.
	• To undertake their activities in an environmentally
	sensitive manner and within the context of this EMP.
	• To undertake good housekeeping practices during
	the duration of their specific project activity.
Authorities	• Provide authorization for the project to commence.
	• Conduct compliance monitoring and evaluation of
	the project's environmental performance.
Environmental Assessment	• Submission of Environmental Reports to the
Practitioner (EAP)	competent Authority (MEFT).
	• Provide information on this project to stakeholders.
	• Provide training on this EMP on appointment by the
	proponent.
	• Should be available to make amendments or
	additions to this EMP should it be required by the
	authorities.

4.2 TRAINING

All key Stakeholders who will be involved during the harvesting of *Prosopis* must be informed about the contents of this EMP through structured training programs, this can form part of the regular site meetings. It is recommended that the EMP form part of the Terms of Reference for all stakeholders to be involved in the project.

4.3 ENFORCEMENTS: NON-COMPLIANCE AND PENALTIES

This document is considered a legally binding document upon the issuance of an

Environmental Clearance Certificate for the project to commence. In cases of transgressions and non-compliance to the EMP, the transgressor should be liable to a penalty fine. Transgressions should be recorded in a dedicated register and should be submitted with the biannual reports to the Ministry of Environment, Forestry and Tourism. The Proponent shall issue the penalties in terms of the severity of the environmental damages.

4.4 ENVIRONMENTAL RECORDS AND REPORTS

MEFT should initiate and maintain an updated filing system for the project whereby method statements, environmental incident reports, training records, audit reports and public complaints register. It is recommended that photographs of the site should be taken as a visual reference.

4.5 MANAGEMENT ACTIONS OF ENVIRONMENTAL ASPECTS

DESCRIPTION	The harvesting of <i>Prosopis</i> in areas where it is the dominant species might facilitate water and wind erosion as the natural regeneration of indigenous vegetation will take some years before it can play the role of stabilizing the riverbanks.
MITIGATION MEASURES	 Any indigenous vegetation found under the canopy of <i>Prosopis</i> should not be disturbed to promote the natural regeneration of indigenous vegetation and in turn, promote soil conservation. Limit vehicular movement to avoid disturbing the substrate.
MONITORING	 The riverbanks in the project area must be visually monitored for any signs of erosion monthly. Ensure that 100% of vehicular traffic in the project area is confined to designated tracks by visually monitoring tracks at the end of each harvesting day. Any non-compliance should be documented, corrective action taken and reported within the week of occurring.
RESPONSIBLE PARTY	Ministry of Environment, Forestry and Tourism

• Increased erosion

• Traffic disturbance

DESCRIPTION	The movement of vehicles to take harvesters to the site and collect the harvested biomass might cause disturbance to the environment.
MITIGATION MEASURES	 Traffic must be confined to designated two-track roads. Limit speed in the project area to a maximum of 40 km/h to avoid the generation of dust and disturbance of the substrate. Limit movement of vehicles to daytime only.
MONITORING	 Ensure that 100% of vehicular traffic in the project area is confined to designated tracks by visually monitoring tracks at the end of each harvesting day. Ensure that no project activities are undertaken after sunset by ensuring that all vehicles leave the project area at the end of each working day. Any non-compliance should be documented, corrective action taken and reported within the week of occurring.
RESPONSIBLE PARTY	Project Manager and SMEs (appointed to do the harvesting).

• Disruption of ecosystem services

DESCRIPTION	At the moment, <i>Prosopis</i> plants in the project area provide various ecosystem goods and services such as microclimate regulation, improvement of soil fertility, habitat and food to various animal species and provide income to local communities. Removal of <i>Prosopis</i> might reduce these goods and services as the natural regeneration of indigenous vegetation may not provide these necessary ecosystem functions in the short term.
MITIGATION MEASURES	 Develop <i>Prosopis</i> Harvesting Protocols and train all personnel that will be involved in the harvesting on how to identify and protect indigenous vegetation during the harvesting process. Ensure that no indigenous vegetation is harvested

MONITORING	 Ensure that indigenous vegetation in the harvested areas is protected through visual inspection at the end of each harvesting day. Ensure that incidences of accidental cutting of indigenous vegetation are maintained at 0% and all offenders in this regard should be punished. Undertake an annual third-party audit of the project to ensure compliance with EMP provisions and environmental best practices.
RESPONSIBLE PARTY	Project Manager

• Loss of livelihood opportunities

DESCRIPTION	Livelihood opportunities such as the collection of <i>Prosopis</i> pods for animal fodder and for sale might be lost if <i>Prosopis</i> is completely		
	harvested.		
MITIGATION	• Improve the marketing of harvested <i>Prosopis</i> products to		
MEASURES	generate an alternative source of income for the		
	community that relies on Prosopis.		
	• Ensure the local community gets employment		
	opportunities to harvest Prosopis during the project		
	implementation.		
	• The Hardap Regional Council must promote investment in		
	other economic sectors to create alternative business and		
	employment opportunities for the residents.		
MONITORING	• Keep records of the socio-economic benefits that emanate from the		
	implementation of this project (records of the number of people		
	employed, the quantity of biomass harvested, income earned from		
	selling Prosopis products and other relevant statistics)		
RESPONSIBLE	Project Manager		
PARTY			

• Health and safety hazards

DESCRIPTION	Occupational health hazards are expected particularly concerning	
	the workers who will be harvesting the Prosopis.	
MITIGATION MEASURES	 Movement of the harvesters should have been confined to the projectsite and block harvested at that time as far as possible to limit encounters with wild animals. First Aid kits should be kept on-site to attend to any injured workers. The workers that will be involved in the harvesting of <i>Prosopis</i> must be equipped with appropriate Personal Protective Equipment. Provide training to all stakeholders on potential occupational health and safety risks and how to mitigate them. Ensure that there is a safety representative who is equipped with first aid knowledge at the harvesting site. 	
MONITORING	 Keep fire extinguishers in all vehicles at the project site. Ensure that 100% of accidents on site are recorded and corrective measures undertaken with immediate effect. Ensure that 100% of the activities of the harvesters are confined within the project boundaries through visual inspections on an ongoing basis. Ensure that an adequately equipped First Aid Kit is available on site before work commences every day through the daily checklist and visual inspection. Inspect all workers daily for PPE compliance. Ensure that a safety training session is held once a month. 	
RESPONSIBLE PARTY	Project Manager in collaboration with SMEs involved in the harvesting.	

• HIV/AIDS

DESCRIPTION	Projects that bring many people together such as the proposed	
	harvesting of Prosopis, create an environment where workers have the	
	opportunity to interact with the local community, a significant risk is	
	created for the development of social conditions and behaviours that	
	contribute to the spread of HIV/AIDS.	
MITIGATION	Hold HIV/AIDS Awareness sessions as part of the scheduled site meetings.	
MEASURES	• Ensure that the workers have access to condoms and other forms of	
	protection.	
	• Promote correct and persistent use of male and female condoms.	
	• Provide care and support for the infected and affected.	
	• Ensure that 100% of HIV/AIDS training sessions are conducted as	
	agreed.	
MONITORING	• Ensure that condom supply to the harvesters is always stocked	
	through visual inspections weekly.	
	• Keep records of HIV/AIDS support provided to workers e.g.	
	counselling is documented and follow-up action undertaken.	
RESPONSIBLE	Project Manager and SMEs (appointed to do the harvesting).	
PARTY		

• Waste generation

DESCRIPTION	Various waste streams will be generated during the harvesting of	
	Prosopis. This will include litter from the harvesters and biomass that	
	cannot be utilized for economic purposes.	

MITIGATION	• The harvesters must be equipped with refuse bags where	
MEASURES	they will put all their litter.	
	• The litterbags must be removed from the site and disposed	
	of at an appropriate disposal site at the end of each day to	
	avoid the bags being torn by wild animals.	
	• Biomass waste must be gathered and shredded as animal	
	fodder or allowed to dry far from the river course.	
	• Any human waste on site must be properly covered.	
MONITORING	• Ensure that 100% of waste is removed from the project site through	
	daily visual inspection at the end of each harvesting day.	
	• Any non-compliance should be documented and corrective action	
	taken within the same day to avoid litter that has been blown by the	
	wind to other areas.	
RESPONSIBLE	Project Manager in collaboration with SMEs involved in the	
PARTY	harvesting.	

• Pollution from herbicides

DESCRIPTION	The use of herbicides that are not enviro-friendly will cause harm to	
	the ecosystem and might pollute the valuable water resources of the	
	Fish River.	
MITIGATION	Only registered herbicides should be applied to the	
MEASURES	stumps immediately after harvesting, to prevent further	
	regeneration of the vegetation. The PSC must ensure that	
	all the herbicides procured for this project are approved	
	for use in Namibia.	
	The following herbicides are recommended by the	
	working for Water Programme for clearing the Prosopis	
	1. Turbodor 29 mpa	
	2. Astra 360 SL	
	3. Confront *360 SL	
	4. Gallon 480 EC	

MONITORING	 Ensure that Project Manager must approve 100% of the herbicides used in this project. Conduct visual inspection daily to ensure that only approved herbicides are used to control <i>Prosopis</i>. Any non-compliance should be documented, corrective action taken and reported within the week of occurring.
RESPONSIBLE PARTY	Project Manager in collaboration with SMEs involved in the harvesting.

5. EMERGENCY RESPONSE PLAN

The proponent should consider the following emergency plan during the implementation phase of the project.

Table 3:	Emergency Response Plan
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ASPECT OF	RESPONSE PLAN	RESPONSIBILITY
DANGER		
Fire	• Use available fire extinguishers to fight	Project Manager
	the fire	
	• Call the Police (+264 (63) 251 003)	
	• Call Gibeon Village Council (+264 (63)	
	251 014)	
	Call Project Manager	

	Workers to assemble at a safe Fire Assembly Point	
Injuries or loss	Apply First Aid	Project Manager
of life	• Call the Police (+264 (63) 251 003)	
	• Call Gibeon Clinic (+264 (63) 251 026)	
	Call Project Manager	
Theft or	• Call the Police (+264 (63) 251 003)	Project Manager
Robbery	• Call Gibeon Clinic (+264 (63) 251 026)	
	Call Project Manager	

6. CONCLUSION

The successful implementation of this EMP is dependent on the collaboration of all stakeholders who are involved at all levels of project implementation. The ultimate responsibility lies with the Project Manager, to ensure that all the contents of this document are clearly understood and implemented by all stakeholders. To ensure that it is legally binding to all parties, all agreements entered into by the project must incorporate the contents of this EMP.

The proponent is liable to submit regular (bi-annually) reports to the Ministry of Environment, Forestry and Tourism during the life span of the project, provide uptsannually, and renew the ECC every three years.

Nevunduko Consulting Services believes that a comprehensive assessment of the proposed project has been achieved and that this EMP covers all pertinent components of the project that need to be mitigated. It is therefore recommended that the Environmental Clearance Certificate can be awarded to the project.