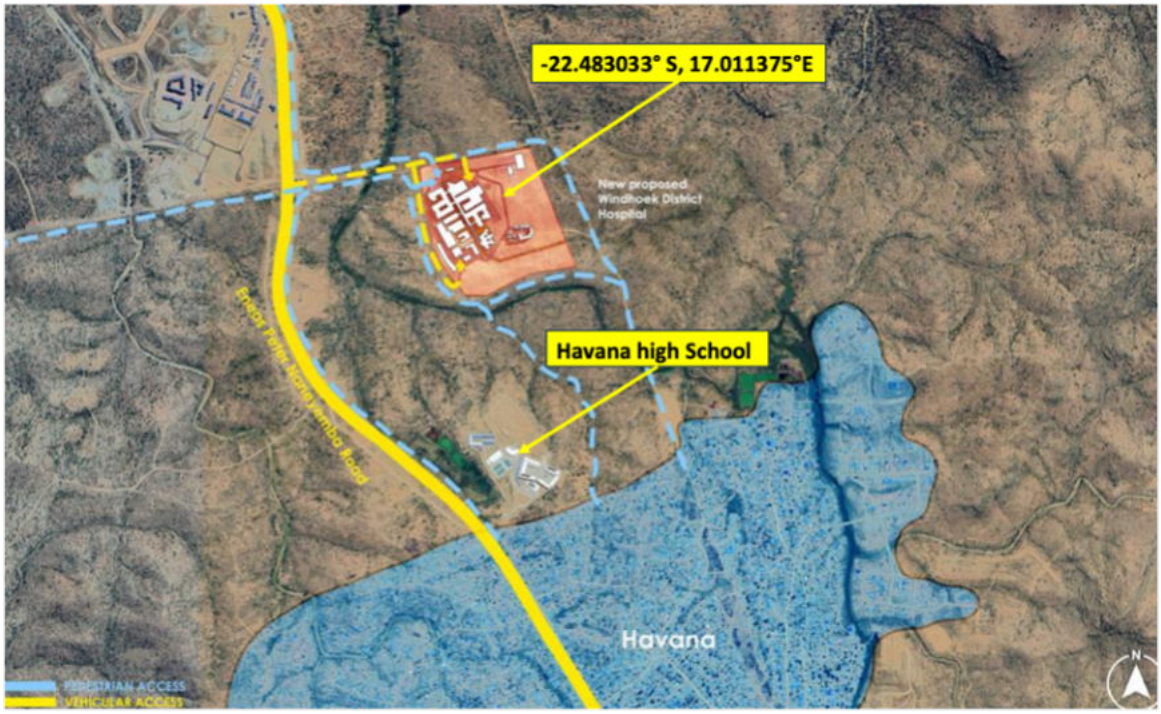
The Republic of Namibia
Ministry of Health and Social Services
&
Ministry of Works and Transport

APP: 003952

ENVIRONMENTAL SOCIAL MANAGEMENT PLAN FOR THE PROPOSED CONSTRUCTION AND OPERATION OF THE WINDHOEK DISTRICT HOSPITAL



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The Republic of Namibia
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&
Ministry of Works and Transport

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CoW	City of Windhoek
CSR	Corporate Social Responsibility
CSSD	Central Sterile Services Department
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act 2007 (Act No. 7 of 2007)
ESMP	Environmental Social Management Plan
GRN	Government Republic of Namibia
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Parties
KMC	Kangaroo Mother Care
MEFT	Ministry of Environment Forestry and Tourism
MoHSS	Ministry of Health and Social Services
MTEF	Medium Term Expenditure Framework
MWT	Ministry of Works and Transport
PPC	Puncture Proof Container
TB	Tuberculosis
WDH	Windhoek District Hospital
WHO	World Health Organization

EXECUTIVE SUMMARY

(i) Introduction

The Ministry of Health and Social Services together with the Ministry of Works are constructing a new Windhoek Class C District Hospital (WDH). The WDH will be a 500-bed hospital that will provide the package of service for a class C hospital with some specialized services to support Windhoek Central Hospital.

(ii) Statutory Requirement

The proposed construction of the hospital is a listed activity under the Environmental Management Act 2007, (Act No 7 of 2007) that may not be undertaken without an Environmental Clearance Certificate (ECC) (**See Table below**).

Environmental Management Act, 2007 (Act No 7 of 2007) and ESIA Regulation Government Gazette 6 February 2012 No. 4878	
List of Activities	**Applicability to the project**
ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES 1. The construction of facilities for - (a) the generation of electricity	The project intends to use photovoltaic panels to provide grid tied electricity as well as to charge the UPS batteries during daytime
WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste	The hospital will involve the construction of Bio-Medical Incinerator and Autoclave for sterilization
2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.	Atmospheric emissions from the hospital Incinerator
HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE 9.1 The manufacturing, storage, handling, or	Handling of Chemical, Medicines, Human Anatomical Parts, Linen contaminated with human blood etc.

processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974	
INFRASTRUCTURE 10.1 The construction of- (a) oil, water, gas, and petrochemical and other bulk supply pipelines; (b) public roads;	The project will involve the construction of bulk water supply pipeline and public access road

(iii) Project Description

The hospital will comprise of the following;

Clinical Capacity	Clinical Profile	Clinical Support Services	Hospital Support Services
1. 500 District bed hospital **Spaces that do not count as beds** 1. 20 bed Day Surgery facility 2. 40 bed Mother Lodge (for neonates and pediatrics) 3. 16 bed Pregnant mothers waiting lodge 4. 6 Birthing rooms 5. 6 Resuscitation 6. Emergency Centre: o Resuscitation bays x 5 adults	1. Medicine 2. General Surgery 3. Day Procedures - Surgical and Internal Medicine 4. Maternity and Neonatal (incl. Kangaroo Mother Care (KMC)) 5. Paediatrics incl. Critical Care (High Care) 6. Adult Inpatient services: Surgical, Medical (incl. Tuberculosis (TB), 7. Acute Psychiatry 8. Emergency Medicine and Observation	1. Allied (Rehabilitation Services: Dietetics, Social Services, Speech and Hearing, Physiotherapy, Occupational Therapy, Dentistry). 2. CSSD 3. Diagnostic Radiology Department (Digital X-Rays) 4. Emergency Centre (Emergency medicine) 5. Operating theatres x 5 (1 x emergency theatre, 3 x general theatres, 1 x septic theatre)	1. Cafeteria 2. Engineering and Maintenance (Workshops) 3. Food Services 4. Main Kitchen 5. Student dining room 6. Ground Cleaning Services 7. Housekeeping & cleaning 8. Linen Bank 9. Lodging facilities 10. On Call Facilities 11. Plant Rooms 12. Portering 13. Registry and Reprographics 14. Security

Clinical Capacity	Clinical Profile	Clinical Support Services	Hospital Support Services
○ Resuscitation bays x 4 Pediatrics 7. Staff accommodation for both staff and students	9. Clinical Forensics 10. Outpatient Services (OPD) 11. Ambulatory Rehabilitation Services 12. Diagnostic Radiology	6. Obstetric operating theatre unit – 2 x theatres, 1 x minor theatre 7. Day unit – minor theatres x 2, 1 x endoscopy theatre 8. Laboratory and Blood bank services to support the hospital and the clinics in the area 9. Mortuary 10. Incinerator 11. Outpatients 12. Dental OPD with training facilities 13. Pharmacy 14. Clinical Training Centre	15. Staff Facilities 16. Staff Accommodation 17. Supply Chain Management 18. Bulk Stores 19. Condemned equipment 20. Transport – Patient and Government 21. Parking 22. Waste Management

The 500-hospital bed plan is provided in the Table below.

Discipline	Distribution	Bed number	Total Beds	%
MEDICAL	Male Medical	30	**60**	**12,4**
	Female Medical	30		
FRAIL CARE	Male Frail	12	**24**	**4,8**
	Female Frail	12		
INFECTIOUS DISEASES	Infectious Diseases	20	**20**	**4,0**
TUBERCULOSIS (TB)	General TB	16	**28**	**5,6**
	TB High care with ICU capacity	4		
	MDR-TB	4		
	XDR-TB	4		
SURGERY	Male Surgical	32	**64**	**12,8**
	Female Surgical	32		
ADULT CRITICAL CARE	Adult High Care	8	**8**	**1,6**
	Adult ICU	6	**6**	**1,2**
PAEDIATRICS	General Paediatrics	24	**84**	**16.8**
	Gastro Paediatrics	24		
	Malnutrition Paediatrics	24		
	Paediatric High care	8		
	Paediatric ICU	4		
NEONATES	Neonatal ICU	20	**28**	**5,6**
	Neonatal High Care	6		
	Neonatal Isolation	2		
OBSTETRICS	Antenatal & High Risk	32	**108**	**21,6**
	Post-natal (2 x32 bed)	64		
	Kangaroo Mother Care	6		
	Obstetric High Care	4		
	Obstetric ICU	2		
GYNAECOLOGY		24	**24**	**4,7**

MENTAL HEALTH ACUTE	Observation	6	**46**	**8,9**
	Low secure	10		
	Medium secure	24		
	High Secure	6		
		500	**500**	**100**

(iv) Description of the affected environment

The hospital will be constructed within Windhoek Townlands, on an approximately 15ha of virgin land on the outskirts of Havana Informal Settlement.

(v) Methodology of Environmental Impact Assessment

Potential impacts were identified and assessed following extensive literature review, site assessment and public participation process; using the criteria in the table below.

Risk Event	Rating	Description of the risk that may lead to an Impact
Probability	The probability that an impact may occur under the following analysis	
	1	Improbable (Low likelihood)
	2	Low probability
	3	Probable (Likely to occur)
	4	Highly Probable (Most likely)
	5	Definite (Impact will occur irrespective of the applied mitigation measure)
Confidence level	The confidence level of occurrence in the prediction, based on available knowledge	
	L	Low = limited information
	M	Medium = moderate information
	H	High = sufficient information
Significance (Without Mitigation)	0	None (Based on the available information, the potential impact is found to not have a significant impact)
	L	Low (The presence of the impact's magnitude is expected to be temporal or localized, that may not require alteration to the operation of the project
	M	Medium (This is when the impact is expected to be of short term moderate and normally regionally. In most cases, such impacts require that the projects is altered to mitigate the impact or alternative method of mitigation is implemented)
	H	High (The impact is definite, can be regional or national and in long term. The impact could have a no-go implication unless the project is re-designed or proper mitigation can practically be applied)
Mitigation	The applied measure / alternative to reduce / avoid an impact	

Risk Event	Rating	Description of the risk that may lead to an Impact
Significance (With Mitigation)	0	None (Based on the available information, the potential impact is found to not have a significant impact)
	L	Low (The presence of the impact's magnitude is expected to be temporal or localised, that may not require alteration to the operation of the project
	M	Medium (This is when the impact is expected to be of short term moderate and normally regionally. In most cases, such impacts require that the projects is altered to mitigate the impact or alternative method of mitigation is implemented)
	H	High (The impact is definite, can be regional or national and in long term. The impact could have a no-go implication unless the project is re-designed or proper mitigation can practically be applied)
Duration	Time duration of the impacts	
	1	Immediate
	2	Short-term (0-5 years)
	3	Medium-term (5-15 years)
	4	Long-term (more than 15 years
	5	Permanent
Scale	The geographical scale of the impact	
	1	Site specific
	2	Local
	3	Regional
	4	National
	5	International

Furthermore, the significance of an impact was determined using a five-by-five risk matrix as indicated in the table below, where the impact severity was categorised and assigned scores from 1 to 5 as follows Improbable=1, Low=2, Medium=3, High=4 and Severe=5. Similarly, the likelihood was assigned scores as follows; improbable=1, Low Likely=2, Probable=3, High Probability=4, Definite=5. The impact rating was determined by multiplying the impact severity and likelihood.

LIKELIHOOD						
	5 Definite	5 Low	10 Medium	15 High	20 Severe	25 Severe
	4 High Probability	4 Low	8 Medium	12 High	16 High	20 Severe
	3 Probable	3 Low	6 Medium	9 Medium	12 High	15 High
	2 Low	2 Low	4 Low	6 Medium	8 Medium	10 Medium
	1 Improbable	1 Negligible	2 Low	3 Low	4 Low	5 Low
		1 Negligible	**2 Minor**	**3 Medium**	**4 High**	**5 Severe**
		IMPACT SEVERITY / CONSEQUENCE				

Negligible	Low	Medium	High	Severe

The summary of the impacts and their significance rating is presented in the table below.

Impact	Summary of impact	Impact Type	Probability	Impact Significance		Duration	Scale	Confidence level
				Without mitigation	With mitigation			
CONSTRUCTION PHASE								
Employment creation and skill transfer	Employment opportunity during construction of the hospital	P	5	M	L	2	2	H
Increase in local economy	Procurement of goods and services will stimulate local economy	P	5	M	L	2	2	H
Loss of biodiversity	Destruction of flora and loss of habitat for fauna from clearing of area	N	5	M	L	2	2	H
Traffic congestion and road safety	Reduced Level of Service by slow flow of traffic and potential increase of road accidents.	N	5	H	L	2	2	H
Noise and vibration	Noise by construction vehicles and other activities	N	5	H	M	2	2	H
Dust emission	Dust from movement of heavy vehicles, excavation, crushing and transportation of sand and concrete	N	5	H	L	2	1	H
Land Degradation	Movement of vehicles and machine on and around the site	N	4	M	L	2	1	H

Impact	Summary of impact	Impact Type	Probability	Impact Significance		Duration	Scale	Confidence level
				Without mitigation	With mitigation			
Exhaust emission	Greenhous gas emission from construction vehicles	N	4	M	L	2	2	H
Occupational health and Safety Risk	Injuries and health risks to employees during working hours as well as to public such as accidents from falling objects, collision of construction vehicles, falling from heights, deaf risks from excessive noise, respiratory risks from dust inhalation	N	5	H	L	2	2	H
General waste and pollution	Building rubbles and offcuts from building materials	N	5	M	L	2	1	H
Hazardous waste	Oil, fuel, and Lubricant leaks from machinery and constructing vehicles and cements from mixers	N	4	M	L	2	1	H
Visual impact	Poor housekeeping on site and uncoordinated painting for the buildings	N	3	M	L	2	1	H
Unsustainable use of water	Increased water demand	N	4	M	L	2	1	H
Heritage and Archaeological Resource	Potential destruction of Heritage and Archaeological Materials during digging and excavation	N	2	M	L	2	1	M

Impact	Summary of impact	Impact Type	Probability	Impact Significance		Duration	Scale	Confidence level
				Without mitigation	With mitigation			
OPERATIONAL PHASE								
Employment creation	Employment of health practitioners and support staff such as drivers, cleaners and maintenance workers etc.	P	5	L	L	5	4	H
Improved land value	Establishment of infrastructure on the virgin land increases land value.	P	5	L	L	5	1	H
Health care provision	Increase provision of adequate public health care	P	5	M	L	5	3	H
Inadequate handling and disposing of health care waste	Risk of environment pollution and sewer contamination	N	3	H	L	5	2	H
Potential water and soil contamination	Risk of soil and water pollution from uncontrolled disposal of healthcare.	N	4	H	L	5	1	H
Air pollution from incinerators	Risk of air pollution from waste incineration	N	3	H	L	5	2	H
Risks of occupational health and Safety	Risk of health workers exposure to dangers such contagious diseases and injury at work place.	N	4	H	L	5	1	H
Fire Risk	Fire accident in laboratories and electrical shock.	N	3	M	L	5	1	H

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1. INTRODUCTION

1.1 Proponent

The Ministry of Health and Social Services (MoHSS – end user) together with the Ministry of Works and Transport (MWT) are planning to construct a new 500-bed Class C[1] Windhoek District Hospital (WDH-the project).

1.2 Regulatory Requirement

Section 27 (2) (b) of the Environmental Management Act 2007, (Act No 7 of 2007) (EMA) and annexures of its Environmental Impact Assessment (EIA) Regulation has listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC). In this regards, the proposed construction and operation of the WDH includes various listed activities that may not be undertaken without an ECC.

Table 1: Triggered Listed Activities

Environmental Management Act, 2007 (Act No 7 of 2007) and ESIA Regulation Government Gazette 6 February 2012 No. 4878	
List of Activities	**Applicability to the project**
ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES 1. The construction of facilities for - (a) the generation of electricity	The project intends to use photovoltaic panels to charge the UPS batteries during daytime.
WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES 2.1 The construction of facilities for waste sites,	The hospital will involve the construction of Bio-Medical Incinerator and Autoclave for sterilization

[1] Type C Hospitals are basic district hospitals. In-patient and out-patient services are provided in general medicine, surgery, and child and maternity care. Basic X-ray and laboratory services are usually available.

treatment of waste and disposal of waste	
2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.	Atmospheric emissions from the hospital Incinerator
HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE 9.1 The manufacturing, storage, handling, or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974	Handling of Chemical, Medicines, Human Anatomical Parts, Linen contaminated with human blood etc.
INFRASTRUCTURE 10.1 The construction of- (a) oil, water, gas, and petrochemical and other bulk supply pipelines; (b) public roads;	The project will involve the construction of bulk supply pipeline and public access road

This ESMP follows an ESIA that was undertaken for the project.

2. PURPOSE THE ESMP

This ESMP is meant to be a risk strategy that provide logical framework and guideline to be undertaken by the project proponent during the construction and operation of the project in order to mitigate environmental threats during construction and operational phase of the project. The ESMP allocate roles and responsibilities to parties and develop monitoring framework for the implementation of mitigation measures.

The ESMP is a living document subjected to change of environmental conditions or statutory requirement hence it is flexible for addendums to allow for adjustments when new information is discovered that requires new mitigations measures or where unforeseen impacts arise (impacts that were not identified during the initial project design). ESMP should also be reviewed and updated upon the renewal of the Environmental Clearance Certificate which expires after every three years of being issued.

2 COMPLIANCE TO ESMP

This ESMP is a legally binding document as per the provisions of the EMA. The Proponent, contractors and employees are required to adhere to this document. Thus it is critical that all personnel involved in this project are made aware of this ESMP.

3 ROLES AND RESPONSIBILITY

3.1 The Proponent

The Proponent, Ministry of Health and Social Services and Ministry of Works and Transport shall take overall responsibility for proper implementation of this ESMP. It is the responsibility of the Proponent to appoint key personnel for the implementation of the ESMP such as Site Manager and ensure that all employees and contractors are conversant with the ESMP. Overall, the Proponent shall ensure that;

- An induction session is conducted with all site employees and contractors to ensure that they are adequately informed and conversant with the ESMP requirements;
- Ensures that a procedure exists for reporting incidents and resolving problems rapidly;
- Maintains records relating to the compliance/non-compliance and submits these as requested for by the competent authority.
- Bi-annual environmental auditing are undertaken for purposes of environmental monitoring and performance.
- Update the ESMP and renewal of the ECC certificate upon expiry

3.2 Site Manager

The Site Manager (SM) represents the Proponent on site. He/she shall be responsible for daily activities in ensuring environmental protection. All communication with regard to the implementation of ESMP must be channelled through the SM

3.3 Employees and Contractors

It shall be responsibility of employees and contractors to adhere to the provision of ESMP at all times.

3.4 Environmental Compliance Officer

Compliance to ESMP is enforced by the environmental inspector as provided for by EMA. The ECO shall be a representative of the Ministry of Environment Forestry and Tourism (MEFT) responsible for environmental inspection and monitoring. Alternatively the Ministry of Health may assign an Environmental Health Officer to ensure compliance to the ESMP during the construction process.

4 DISCIPLINARY ACTION

This ESMP is a legally binding document, non-compliance to the ESMP is punishable in accordance to the provision of EMA.

5 THE ESMP

The ESMP is structured to address potential impact in structured into three main categories to ESMP awareness, Biophysical, Health and Safety and Social Environment as provided in **Table *2*** below.

Table 2. Structure ESMP

Impact	**Aspects**	**Project Phase**
Lack of ESMP awareness and general communication	Induction to ESMP	Construction & Operation
	Communications	Construction & Operation
	Loss of Biodiversity	Construction

Impact	Aspects	Project Phase
Bio-Physical Environment	Land Degradation	Construction
	Visual Impacts	Construction
	Waste generation (hazardous and non-hazardous)	Construction and operation
	Soil and water pollution	Construction and operation
	Noise and dust pollution	Construction
	Air pollution	Construction and operation
	Excess water use	Construction
Health and Safety	Traffic congestion and road safety	Construction and operation
	Health risks	Construction and operation
	Hazardous impact	Construction and operation
	Occupational health and safety	Construction and operation
	Dust and noise pollution	Construction
	Fire	Construction and operation
Social Environment	Employment opportunities	Construction and operation
	Alcohol and Drug abuse	Construction and operation
	Health provision	Operation
	Skills enhancement	Construction and operation
	Infectious Diseases	Construction and operation
	Heritage resources / artefacts	Construction

5.1 SECTION A: CONSTRUCTION PHASE

5.1.1 ESMP awareness

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring program		
				Aspect to monitor	**Monitoring Frequency**	**How**
ESMP awareness	To ensure that all staff / employees are conversant with the requirements of the ESMP	1. Undertake induction for all workers / employees on the provisions of the ESMP before work commencement. 2. Ensure that a copy of the ESMP is kept on site and accessible to all.	Proponent and Contractors	Induction Minutes and Attendance Register, Signed by each and every staff member.	Monthly	Induction meeting attendance registers Physical verification of ESMP on site
Communication	To ensure effective communication during construction	1. Develop a communication strategy 2. Where necessary, translate critical aspects of the ESMP into infographic (pollution, health and safety). 3. Place site contact numbers for Site managers and other emergency response team such as police and ambulances.	Site Environmental Officer	Communication Strategy Emergency number place on site and clearly seen Radio communication	Bi-Annually	Communication strategy ESMP translated into infographics Physical observation of emergency number

5.1.2 Biophysical Environment

Environmental / Social Impact	**Objective**	**Proposes Mitigation Measures**	**Responsibility**	**Monitoring Program**		
				Aspect to monitor	**Monitoring frequency**	**How**
Loss of Biodiversity	Protect and conserve biodiversity	1. Only remove shrubs that are on demarcated site for the construction and access 2. Do not kill animals 3. Workers must not leave food unattended as it will attract monkeys in the surrounding	Proponent and Contractors	Indiscriminatory clearing Report of killed animals	Quarterly	Physical observation Report of killed animals
Dust emission	Prevent and reduce dust pollution	1. Apply dust suppression measures such as water spraying. 2. Spray water on stockpiles of aggregate and rock dust 3. Movement of heavy vehicles must strictly be restricted on site. 4. Adhere to the minimum speed limit of 30 or 40km/hour. 5. Do not excavate and/or offload sand during heavy winds. 6. Trucks carrying sand must be covered. 7. Sand stockpiles must be covered or	Site Environmental Officer	Dust plumes Public complaints Water truck (s) Concrete mixers Truck carrying sand covers	Daily	Physical observation Public Complains

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Monitoring frequency	How
		regularly water sprayed with water. 8. On site where soil is loosened by vehicle movement, apply dust a suppression method such as water spraying. 9. Install an onsite concrete batching plant 10. Cement and concrete must be mixed with concrete mixers and not manually in the open. 11. Cement bags must be stored and disposed of properly and may not be shaken in the open.				
Land degradation / Soil erosion	Prevent land degradation and enhance soil conservation	1. Movement of heavy vehicles must be coordinated and restricted to be within the site and access roads 2. Loosen soil must be sprayed with water and compacted 3. Pits must be well rehabilitated to avoid formation of gullies	Proponent and Contractors Site Environmental Officer	Undesignated tracks by heavy vehicles	Bi-Weekly	Physical observation
Noise and vibration	Avoid excessive noise pollution and protect	1. Maintain low speed on project sites 2. All vehicles must be well serviced to prevent excessive noise 3. Do not hoot unnecessary	Proponent and Contractors	Records of vehicle service records	Daily	Physical observation Public Complains

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Monitoring frequency**	**How**
	employee's health	4. Do not rev the vehicle engines 5. Switch off engine off vehicles when not in use. 6. No employees must be exposed to noise levels above the 85dB (A) limit over a period of 8 hours. Should the noise level be higher than 85dB (A), the employer must implement a hearing conservation program such as noise monitoring; 7. Stationary vehicles and machines must be switched off at time 8. Warn public and employee on blasting times. 9. Blasting site / areas must be free of people. 10. Use approved contractor to undertake blasting	Site Environmental Officer	Complaints of noise from employees and general public		
Traffic emission		1. Ensure that vehicles are well serviced and road worthy 2. Stationary vehicles must be switched off	Proponent and Contractors Site Environmental Officer	Records of vehicle service records Black smoke from exhaust	Monthly	Vehicle service records Physical observation

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Monitoring frequency	How
Waste generation	Prevent litter and pollution	1. Develop a construction phase waste management plan 2. Develop a biological temporary onsite wastewater treatment plant / equal alternative 3. Ensure good house keeping 4. Provide dustbins and ensure waste segregation to enable recycling. 5. Designate a storage area for building rubbles. 6. Provide labelled household waste drums for household solid waste. 7. Ensure separate ablution facilities for men and women. 8. Construction sites generate garbage, refuse and building rubbles. Therefore, waste generated from the construction site should be classified into different categories, e.g. Material Waste (Wood, steel, corrugated iron, etc.), Building Rubble (concrete, bricks etc.), Garden Waste (tree	Proponent and Contractors Site Environmental Officer	Scatter litter, Wastewater treatment plant / temporally ablution facilities, Labelled household dustbins, Skip bins, Waste collection records, Designated hazardous waste bins,	Weekly	Scattered waste, Physical observation of monitoring indicators

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Monitoring frequency	How
		stumps, branches, etc.), Domestic Waste (Litter – cans, plastics, tissue, plastics etc.) 9. Each category should be collected separated disposed of, in the most suitable and environmentally acceptable manner 10. All waste produced on site should be contained and disposed as required by law 11. There must be sufficient skip containers at the site for building rubbles 12. There must be sufficient temporally ablution facility at the site for designated for males and female. Waste generated must be disposed of at approved sites 13. No onsite burying, dumping or burning of waste material shall be permitted. 14. Ensure appropriate waste collection				

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Monitoring frequency	How
		and removal from the site and dispose at appropriate waste disposal site. 15. There must be sufficient waste bins. Colour segregated for different waste; 16. General waste must be separated from hazardous waste; 17. Hazardous waste must be disposed of at an approved site; 18. The Waste Bin for oil cans must be clearly marked Hazardous;				
Hazardous waste	Avoid pollution	1. Vehicles must be well survived to avoid oil spills and excessive emissions 2. All hydrocarbons must be stored in an enclosed environment. 3. Fuelling of site bound equipment such as excavators must be done on bunded structure 4. Parked vehicles must be provided with drip trays	Proponent and Contractors Site Environmental Officer Random check by designated law environmental / health inspector	Vehicle service records Drip Trays Bonded storage areas	Bi-Weekly	Service records Physical observation of places of hydrocarbons storages Drip trays

5.1.3 Impact on Health and Safety

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
Occupational Health and Safety	Ensure sure employees and public health and safety by avoiding spread of disease and injuries	1. Develop a healthy and safety plan / policy. 2. Provide awareness to the employees on dangers of HIV/AIDS, alcohol and drug abuse 3. All employees must be screen with the breathalyser to avoid intoxicated personnel on site 4. Provide condoms on site 5. All employees must go through a health and safety induction. 6. Only licensed employees should be allowed to operate specialized vehicle 7. All heavy vehicles must have a rotating flushing light installed for visibility 8. Ensure that all vehicle are well serviced and roadworthy 9. All employees must be provided with adequate Personal Protective Equipment (PPE)		Health and Safety Policy Drunk / misbehaving employees monitor presence of alcohol at the construction site Injuries at work Personal Protective Equipment Availability of the first aid kit onsite Driver's licenses Minutes of training Warning signs First aid training attendance register Rotating flushing lights on heavy and construction vehicles	Daily Weekly Quarterly	Health and Policy Breathalyzer report Accident at work PPE Condom on site Attendance registers, Random interviews with employees.

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		10. No employee must be allowed to be at work station without adequate PPE 11. There must be a first aid kid with adequate medicine 12. Provide adequate gender sensitive ablution facility 13. Provide clean drinking water. 14. Erect warning signs at designated sites to alert public of potential dangers 15. Trucks carrying sand and aggregate must be covered to avoid material flying off 16. Truck must maintain a five-kilometre in-between distance to avoid traffic congestion 17. Transportation of construction material at night is not allowed 18. Adhere to the Labour act, non-toxic human dust exposure levels may not exceed 5mg/m3 for respiratory dust and 15mg/m3 for total dust. 19. Abide by the Occupational Health and Safety and Labour Act of Namibia and		Poof of HIV-AIDS and substance abuse awareness raising		

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		other statutory requirement such as International Labour Practise (ILO) 20. Supervisors must undergo an occupational health and first aid course, 21. Train employees on the possible health hazards to avoid potential risks 22. Cordon off the construction areas / sites				
Traffic congestion and road safety	Ensure smooth traffic flow and prevent road / traffic accidents	1. Place a traffic law enforcement at the intersection during peak hours (06:00am – 09:00am and 16:00pm – 19:00pm) to regulate traffic flow during construction phase until traffic signals are installed. 2. Abnormal vehicles should be escorted to ensure the road is cleared for their passages. 3. All construction vehicle must be roadworthy and fitted with reflectors and rotating lights 4. Ensure all drivers are in possession of drivers licences and are screened with an alcohol breathalyser for alcohol.	Proponent and Contractors Site Environmental Officer	Traffic officer at selected intersection Record of escort of abnormal vehicles Roadworthy certificates Approved new roads by CoW	Daily Monthly Quartey	Physical inspection at intersections Records of traffic escort for abnormal vehicles Record of approved plans for new roads

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		5. Provide workers with safe and liable passenger transport 6. Ensure heavy vehicles are within the road capacity payload 7. Ensure the design guidelines for new access roads are in accordance with the City of Windhoek Standard Drawings, the CSIR Red Book and the Urban Transport Guidelines (UTG) manuals. 8. Ensure the new road has provisions for NMT and emergency vehicles 9. Ensures sufficient parking bay in accordance to National Requirement 10. Designate special parking for emergency vehicles 11. Designate parking for bi-cycles				

5.1.4 Social Environment

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
Visual impacts		1. Ensure the building paints reflect the surrounding to blend in. The use of earth colours is advised 2. Ensure good house keeping	Proponent and Contractors	Building paint in relation to the environment	Annually	Physical observation
Employment creation	To enhance employment opportunities and promote local hiring	1. Unskilled labour must all be reserved for local 2. Only employ foreigners where skills and expertise in not in Namibia 3. Abide by the labour act 4. Provide contract to employees 5. Support local training to develop capacity.	Proponent Site Environmental Officer Labour inspector	Employment contract Training and capacity building programs Workshop and Training attendance registers Employees certificate of attendance	Quarterly	Employment records On-site inspection and interviews with employees
Increase in local economy	To enhance local procurement	1. Procure from local supplier 2. Subcontract SME 3. Ensure Corporate Social Responsibility	Proponent and Contractors	Procurement contracts No SME subcontracted Evidence of CSR	Bi-Annual	Procurement records Records of SME subcontracted Documentation od CSR

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
Increased demand for water	To promote water conservation	1. Ensure optimal utilization of water 2. Use as far as possible approved grey water for dust	Proponent and Contractors Site Environmental Officer	Dripping water storage tanks Use of grey water for dust suppression Water wastage	Daily	Physical observation at water storage areas
Heritage and Archaeological Resource	To prevent damage to heritage and archaeological materials	1. Workers must be trained on the possible find of archaeological material in the area 2. Establish a "Chance Find Procedure" where if any archaeological finding (Heritage (rock painting and drawings), human remains or artefacts) is encountered; 3. The activity must be stopped immediately and the operation manager of that activity be informed; 4. The manager must ensure the cordoning off the area with a danger tape and take appropriate records and pictures	Proponent and Contractors Site Environmental Officer	Report of Archaeological material	Daily	Incidental reports

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		5. The manager must immediately report the findings to the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).				

5.2 Section B: Operational Phase

5.2.1 ESMP Awareness

Same as construction phase

5.2.2 Bio-physical environment

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
Inadequate handling hospital waste water	To prevent pollution and contamination by hazardous healthcare waste	1. Waste water must be chemically disinfected before taken into the municipal sewage system. Applicable permits must be obtained from relevant authorities 2. The treated effluent must be disposed of in line with relevant laws 3. Sewage from the hospital must never be re-used for any other purpose (e.g. watering loans, as a dust suppression at construction sites, road construction etc) 4. Use approved sewage pipes that are corrosive resistant and leakage proof	Ministry of Health and Social Service Environmental Officer	Waste water treatment reports Applicable permits for effluent disposal Service and maintenance reports	Monthly	Review of waste water report Reports Permits for healthcare waste disposal Service and maintenance reports

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		5. Continuous monitoring to ensure that Sewage discharge pipes are not broken and not leaking				
Inadequate handling of hospital solid waste	To prevent environmental pollution and contamination by healthcare waste	1. The generated solid hazardous waste must be segregated in accordance with applicable laws and health practices (e.g., WHO[2] standards) 2. Medical waste containers must be colour coded for ease of segregation 3. Solid waste must be stored in a secure place with restricted access, only authorized personnel may enter the place. The place must have impermeable concrete bund. The place must have a drainage system leading to the disinfectant chamber for purposes of cleaning. 4. Infectious waste must be package in leak-proof materials with adequate strength.	Ministry of Health and Social Service (MoHSS) Hospital Management	Waste segregation plan Applicable permits for solid waste disposal from health care facility Storage area for solid waste Impermeable concrete bund and storage areas Puncture proof containers for sharp objects	Monthly	Solid waste management report Permits for healthcare solid waste disposal Physical observation of Waste labels Transportation of waste Health care solid waste treatment.

[2] WHO – World Health Organization

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		5. Sharp objects must be packed in puncture-proof containers. 6. Waste should be labelled properly, stating the substance class, packaging symbol (e.g. infectious waste, radioactive waste), waste category, mass / volume, place of origin within hospital, and final destination; 7. Waste intended for off-site treatment facilities should be transported in accordance with the guidelines for transporting hazardous waste / biomedical waste 8. Biomedical waste should be transported by approved vehicles with clear signs and the vehicle compartments carrying waste must be sealed. 9. Implement a biomedical solid waste treatment plant		Adequate labelling waste Clear marked signs on vehicle transport hazardous waste Biomedical solid waste treatment plant		
Air pollution from incinerators	To avoid air pollution	1. The incinerator must be installed in accordance to relevant laws;	MoHSS Environmental Inspector	Penalties and warning from authorities	Daily	Black smoke Temperature

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
		2. Incinerator emissions should be monitored on regular intervals; 3. The incinerator must be placed at an open fields or hilltops without trees; 4. Valleys, areas near ridges, wooded areas should be avoided as these tend to channel winds and/or plumes tend to impinge on elevated surfaces or downwash under some conditions 5. Areas near the incinerator should not be populated, e.g., containing housing, athletic fields, markets or other areas where people congregate 6. Areas near the incinerators should not be used for agriculture purposes, e.g., leafy crops, grasses or grains for animals.		Public complaint Nearby agricultural activities		Location of the incinerator

5.2.3 Health and Safety

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
Risks of occupational health and Safety	To protect the health and safety of employees and public	1. Ensure smooth operation of Water reticulation system and correct electricity connections 2. Adhere to relevant health and safety legal frameworks 3. Develop a Health and Safety Policy in accordance with relevant legal framework 4. Employees must be provided with adequate Personal Protective Clothing and enforce the use of PPE. 5. Ensure that all employees undergoes proper training and are orientated with associated risks. Train employees for basic first aid, fire safety training, and Occupational Safety and Health through approved training institutions	MoHSS Hospital Management Ministry of Labour	Health and Safety Policy for the hospital PPE for workers Emergency assembly areas Firefighting equipment Emergency numbers (Police, Fire Department etc) Training and capacity development Functioning emergency shower Danger signs at restricted entry	Quartey	Health and Safety Policy Document and physical observation of indicators

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		6. Provide firefighting equipment at strategic sites; 7. Conduct drills at reasonable intervals to test the disaster preparedness level at the workplace, using the results to improve the response mechanisms; 8. Set up emergency evacuation points and develop evacuation procedures. 9. Provide emergency showers close to all workstations 10. Materials handling should follow the instructions of use given by the manufacturer 11. Unauthorized personnel must be restricted to enter high risk areas i.e. radiation rooms, surgery rooms; 12. Radiation equipment must be operated in accordance with relevant laws.				

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		13. Use visible signage to warn staff or visitors of dangerous places. Signs must be put on doors and areas.				
Fire Risk	To prevent fire risk	1. Provide appropriate Personal Protective Equipment (PPE) to each employee which includes helmets, overalls, safety shoes, etc 2. Ensure that every employee goes through an induction course about safety 3. Staff must be properly trained on how to react and handle fire 4. There must be automatic fire alarm system installed at the site 5. Firefighting equipment must be on site 24hours and regularly inspected to ensure that they are working 6. Emergency response numbers must be on clear and visible space 7. There must be clear hazard signs "NO OPEN FIRE" "NO	MoHSS Hospital Management	Fire assembly point Firefighting equipment Automatic fire alarm (i.e. smoke detectors) PPE Fire safety signs Fire response drill	Quarterly	Inspect firefighting equipment Physical observation of PPE Fire signage at designated places Fire drill report

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	Frequency	How
		SMOKING" "SWITCH ENGINE OFF" 8. There must be drills to test staff about their readiness to fight the fire				

5.2.4 Social Environment

Environmental / Social Impact	Objective	Proposes Mitigation Measures	Responsibility	Monitoring Program		
				Aspect to monitor	**Frequency**	**How**
Health care provision	To ensure administering of high standard and quality health care	1. Equip the hospital with equipment of modern technology 2. Ensure the hospital has sufficient medicines 3. Employ qualified health professional 4. Ensure a conducive environment by implementing adequate occupational health and standards	MoHSS	Modern and effective hospital equipment Sufficient medicines Qualified and fit for work health profession	Quarterly	Inspection ages of equipment Inspection of medicine inventory Inspection of qualification for health professional and their fitness
Employment creation	To enhance job creating and promote local hiring	1. Only employ foreigners where skills and expertise in not in Namibia 2. Abide by the labour laws of Namibia 3. Implement skills development and training programs to enhance capacity.	MoHSS	Employment contracts Report of labour unrest or employment dissatisfaction Number of trainings to enhance skill development	Bi-Annual	Inspection of employment contract Certificates of attendance by trainees / training minutes

6 MANAGEMENT OF HEALTH CARE WASTE

Table 3. Management of biomedical waste (Source: World Health Organization)

Category 1	**Human Anatomical Waste** (human tissues, organs, body parts)	Incineration@@
Category 2	**Animal waste** (animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals/ colleges, discharge from hospitals, animal houses)	Incineration@@
Category 3	**Microbiology & Biotechnology waste and other laboratory waste** (wastes from clinical samples, pathology, bio-chemistry, haemotology, blood bank, laboratory) cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biological, toxins, dishes and devices used for transfer or cultures)	Disinfection at source by chemical treatment@ or by autoclaving / microwaving followed by mutilation/ shredding## and after treatment final disposal in secured landfill or disposal of recyclable wastes (plastics or glass) through registered or authorized recyclers.
Category 4	**Wastes sharps** (needles, glass syringes or syringes with fixed needles, scalpels, blades, glass etc., that may cause puncture and cuts. This includes both used and unused sharps)	Disposal in secured land fill or Incineration @@
Category 5	**Discarded medicines and Cytotoxic drugs** (wastes comprising of outdated, contaminated and discarded medicines)	Disposal in secured land fill or Incineration @@
Category 6	**Soiled Waste** (Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, linen, beddings, other material contaminated with blood)	Incineration @@
Category 7	**Infectious Solid Waste** (Wastes generated from disposable items other than the waste sharps such as tubings, hand gloves, saline bottles with IV tubes, catheters, glass, intravenous sets etc.)	Disinfection by chemical treatment @ or Autoclaving or Microwaving followed by mutilation or shredding## and after treatment final disposal through registered or authorized recyclers
Category 8	**Chemical Waste** (Chemicals used in production of biological, chemicals used in disinfection, as insecticides etc.)	Chemical treatment @ and discharge into drains meeting the norms notified under these rules and solids disposal in secured landfill.

@ Chemical treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

@@ There will be no chemical pre-treatment before incineration. Chlorinated plastics/ bags shall not be incinerated

Mutilation/ shredding must be such that so as to prevent unauthorized reuse.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Developing countries are faced with major health challenges. Establishment of health facilities or improvement thereof is crucial to address health challenges. The development of WDH is line with government developmental goals.

This ESMP provides a logical framework and guidelines to ensure the construction and operation of WDH is socially and environmentally sustainable. This ESMP is a living document, hence it can be amended to accommodate changes in designs during implementation phases.

7.2 Recommendations

The study recommends the following;

i. That MEFT, the Environmental Commissioner in particular, approves the project and issue the project with the ECC.
ii. The Proponent should ensure to appoint of fulltime environmental officer during construction.
iii. The Proponent should ensure adequate implementation of the ESMP
iv. The Proponent should undertake bi-annual environmental performance and submit environmental audit report to the MEFT

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