



Nasr Company for Civil  
works



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# Environment & Social Management Plan (ESMP)

For

Arua Water and Sanitation Project in Arua Municipality and other Seven Sub  
Counties

## Submitted to;

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Guidance

**This document is to be read alongside ESIA, 2013; Supplementary ESIA, 2014; ESMP For camp site, 2015; ESMP Single pump station, 2015 and Project Brief Batching Plant, 2015**

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## LIST OF ACROYNOMS

DEO:	District Environment Officer
EIA:	Environment Impact Assessment
ESMP:	Environment Social Management Plan
EIS:	Environmental Impact Statement
FIG:	Figure
LC:	Local Council
Ltd:	Limited
MoH:	Ministry of Health
MoLG:	Ministry of Local Government
MoLHUD:	Ministry of Lands, Housing and Urban development
MoWE:	Ministry of Water and Environment
NWSC:	National Water and Sewerage Corporation
NEMA:	National Environment Management Authority
OHS:	Occupational Health & Safety
PPE:	Personal Protective Equipment
UIA:	Uganda Investment Authority
URA:	Uganda Revenue Authority
UP:	Uganda Police

## UNITS

Unit Symbol	Unit Description
0 <sup>c</sup>	Degrees Celsius
%	Percent
dBA	Decibel
g	Grams
kV	Kilovolts
m	Meter



## GLOSSARY OF TERMS

Term	Definition
Environmental audit	Evaluations intended to identify environmental compliance and management system implementation gaps, along with related corrective actions.
Environmental Impact Assessment	A formal process used to predict the environmental consequences of a plan, policy, program, or project prior the implementation decision, it proposes measures to adjust impacts to acceptable levels or to investigate new technological solution.
Environmental management plan	A comprehensive plan for the implementation of mitigation measures prescribed in the environmental impact assessment.
Fauna	The total animal population in a given area.
Flora	The total vegetation assemblage in a given area.
Cumulative effects	Impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones
Mitigation	Prescribed actions taken to prevent, avoid, reduce or minimize the impacts, or potential adverse effects, of a project.
Water quality	A measurement of the purity of water, or drinking water.

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## **1.0 INTRODUCTION**

### **1.1 Project Background**

N.C.C.W & DOTT SERVICES LTD (JV) are managing a water and sanitation project in Arua municipality under the agreement with National Water and Sewage Corporation (NWSC) with NEMA Clearance EIA Certificate number NEMA/EIA/4942. The Arua Water Supply and Sanitation Project aims at improving water and sanitation services in Arua Municipality and the surrounding seven sub-counties in the project area. The Project covers Arua Municipality and seven sub-counties of Dadamu, Manibe, Vurra, Katrine, Ajia, Oluko and Pajulu.

The project targets Rehabilitation and expansion of the water treatment works (WTW); Construction of up to seven boreholes to augment the current water source; Transmission line from the boreholes to either the water treatment works, or a storage tank; Construction of an additional storage tank and enlargement of the existing tank; Improvements and extensions to the existing water network; Construction of waste stabilisation ponds (WSP) and sewage pumping/lifting station, Construction of a sewerage system for central Arua and transmission to the WSP; Construction of water and sanitation facilities (public toilets) in informal settlements; Catchment management and source protection, and Access roads and power supply to waste stabilization ponds and other facilities.

The implementation of the project has to be conducted in accordance with the international and national environmental laws and guidelines with the aim of enhancing the positive impacts while minimizing the negative effects. In particular, this environmental and social management plan (ESMP) has been drafted in accordance with the National Environment regulations and World Bank safeguard policies.

### **1.2 Objectives of ESMP**

The overall objective of the ESMP is to ensure that the environmental and social issues likely to arise from the project activities comprehensively identified and appropriate mitigation actions are suggested and integrated into the project implementation. The aim is to ensure that the project does more good and less harm to the environment. The ESMP outlines the institutional arrangements relating to: (i) identification of environmental and social impacts arising from the operation of the water and sanitation project (ii) the implementation of proposed mitigation measures (iii) monitoring of mitigation measures, (iv) capacity building of relevant staff and, (v) the budgetary allocations for implementation of proposed mitigation measures. This ESMP has been prepared to achieve the following specific objectives:

- a. Examine the project in terms of its major activities and identify the aspects associated with the project operation which generate environmental and social impacts,
- b. Identify the environmental and social issues associated with the major activities,
- c. Develop mitigation measures for the aspects identified as having environmental and social impacts,
- d. Incorporate environmental and social mitigation measures into operation schedules and activities and develop corrective actions through regular and effective monitoring.
- e. Define the specific actions required, roles and responsibilities for these actions, timetable for implementation, and associated costs.

- f. Describe capacity building and training requirements for the implementation of the ESMP, and
- g. Define a proposed institutional structure to govern the implementation of the ESMP.

In addition to the above, this ESMP has also been prepared with the objective to:

- a. Comply with existing national environmental policies, laws and regulations;
- b. Comply with international obligations and good practices including the World Bank Safeguard Policies.
- c. Decrease short- and long-term liabilities of N.C.C.W & DOTT SERVICES LTD (JV);
- d. Improve relations with national regulatory authorities; and
- e. Improve N.C.C.W & DOTT SERVICES LTD (JV) 's public image by complying with local laws and regulations, which seeks to ensure that construction work, does not adversely affect the environment and social community resources.

Therefore, this ESMP identifies the aspects of construction and operation activities which have environmental issues associated with them; it proposes mitigation measures to minimize resultant impacts and serves as a basis to further examine and improve the performance of this project with respect to environmental and social safeguards..

### 1.3 ESMP Structure and Organization

The ESMP is structured as follows:

1. Chapter one is the introduction and gives information on the background and objectives of the study;
2. Chapter two summarizes the potential environmental impacts of the proposed project
3. Chapter three discusses the environmental and social management plan for both construction and operation phases;
4. Chapter four presents enhancement and mitigation program;
5. In chapter 5, a presentation of implementation and reporting is described;
6. Chapter 6, presents an environmental and monitoring frame work for both construction and operation phases including internal and external monitoring;
7. Estimation costs for implementation ESMP is presented in chapter 7
8. Public disclosure outline is in chapter 8
9. Chapter nine presents capacity building and training plan;
10. Chapter ten outlines the general emergency response steps; while
11. Chapter eleven presents chance finds procedure.

Other assessments that have been conducted in support of this ESMP include;

- o In November 2013 an Environmental and Social Impact Assessment was undertaken for the same project and was approved by NEMA..



## 2.0 SUMMARY OF KEY ANTICIPATED ENVIRONMENTAL IMPACTS

While water and sanitation projects have provided significant impetus to growth, it is well known that such developments present a number of economic, environmental and social concerns. The EIA that was conducted in 2013 had presented a number of socio-economic impacts and this section entails impacts likely to be generated during the Implementation of Project.

### 2.1 Preparation and Construction Phase

#### 2.1.1 Positive impacts

- Job Creation: It is expected that the project will avail short-term jobs to skilled, semi-skilled and casual workers. Most probable persons to be employed include Hydrologists, Geologists, Environmentalists, Architects, Engineers, Mansons and Porters. These will benefit from the salaries and wages they earn from working on the project. At the moment, Hydrologists, Geologists, Engineers and Environmentalists have already benefited from the project; and
- Income Generation: Procurement of construction materials like sand, gravel, steel bars, timber and cement will be required during construction. The purchase of these materials from suppliers in the area would have a positive impact on the local economy.

#### 2.1.2 Negative Impacts

##### Wastewater Treatment Plant (Waste stabilization ponds)

- Air pollution associated with vehicle exhaust emissions and construction equipment.
- Noise generation from vehicles and equipment to sensitive receptors
- Water pollution from inappropriate management of waste, dredging activities, accidental spillage of fuel and lubricants
- Possibility of increases in soil erosion due to inappropriate construction practices and soil protection measures which may lead to possible pollution and siltation downstream
- Loss of vegetation may compromise aesthetic value of the sites; domestic waste from camps could be an eye sore and may contaminate soil and water resources
- Excavations and transportation of equipment, site workers and debris and movement of heavy equipment may pose a safety risk to the general public. Pools of stagnant water may form in pits, holes and excavated ditches which can create suitable habitats for insect disease vectors such as mosquitoes. People may fall in ditches and be injured,
- Improper storage of raw materials. Large quantities of construction material will be involved, for example, cement, steel, oil fuel, pipe materials (e.g. PVC, uPVC, concrete and/or steel). Also, large quantities of local materials, e.g. sand, gravel will be involved. If not well stored and utilized, as well as instituting management measures for waste materials, they can contaminate the environment
- Possibility of exposing workers to occupational health and safety hazards from activities such as: excavations; working with heavy equipment; working under noisy conditions, working in confined spaces; lifting of heavy objects; storage, handling and use of hazardous substances and wastes
- Likelihood of increase in number of accidents within and around the vicinity of water works area

- Construction sites, if not well managed, have impacts on aesthetics of the surroundings with the possibility to affect the neighbouring residents of the WTW with moderate view point.
- Possibility to disturb and interrupt commercial and social activities.
- Influx of people in the area may affect the local economy, cause alteration of culture and introduce behavioural changes

**Construction of transmission lines from the boreholes to either the WTW, or a storage tank**

- Noise pollution from heavy vehicles and construction equipment may cause nuisances to sensitive receptors.
- Water pollution may result from wastewater from construction camps; accidental spillage of fuels, lubricants and other chemicals; siltation of water courses from runoff laden sediment and dust
- Soil erosion and contamination due to site clearance of vegetation and excavation works using heavy equipment which may induce/accelerate soil erosion and siltation of water courses and gardens. Contamination may occur as a result of accidental or structural spillage of fuels, lubricant chemicals, sanitary wastewater, etc., as well as from leakage from inadequately protected solid waste storage facilities and sites
- Solid waste generated from clearing of trees and bush on pipeline route as well as excess soil or garbage dumped along the trenches and from household wastes from construction camps can cause soil and water pollution as well as compromising aesthetic value
- Impacts on flora and fauna due to removal of natural vegetation may lead to potential habitat loss of its associated fauna.
- Public health problems may occur in the case of badly managed construction camps and work sites.
- Safety problems at the construction sites may arise from excavations, transportation and movement; manually executed works expected to dominate the pipeline laying will take a longer construction time leading to prolonged safety risks such as falling into trenches
- Laying of pipelines may have a negative impact on aesthetics of the surroundings such as the soils from the trenches that will be dumped along the trenches
- Improper laying of pipelines may cause traffic disruptions and congestion, resulting in temporary disturbance and interruption of commercial and social activities. It may also cause damage to infrastructure (roads, utility lines) and disruption of public services
- Workers may be exposed to occupational health and safety hazards from project activities such as: accidents in excavations; working with heavy equipment; working under noisy conditions., working in confined spaces; lifting of heavy objects; storage, handling and use of dangerous substances and waste

**General construction environmental impacts**

- Construction and establishment of the project including water source points, treatment plant, booster tanks, reservoir tanks and transmission lines (supply lines) may involve loss of land and property. Loss of land may either be permanent or temporal depending



on the use it is put to. Putting structures for water supply project will lead to permanent loss of land due to establishment of treatment plant, Reservoir/storage area preparation while work camp site, quarries and borrow pits is temporal;

- Vegetation will be lost due to site clearance to provide space for project components. Construction of the access roads, distribution lines, batching plant may also lead to destruction of vegetation. Loss of vegetation could also lead to decreased land, decreased productive capacity, loss of potential income, loss of biodiversity or habitat;
- Sourcing of earth materials such as murram, sand and gravel needed for the construction may create borrow pits and quarry sites at the source. Water may impound in these quarry pits thus becoming breeding grounds for mosquitoes and other disease vectors or pose risk of injury to animals and humans who fall into them. This increases community safety risks, loss of biodiversity off site and environmental degradation.
- Activities, operations and machinery needed for the operation of the project could injure workers when appropriate safety measures are not in place. The injuries can range from minor ones to possible loss of life. This is a compromise to personal health and safety
- There is likelihood of increase in turbidity and sedimentation of River Enyau due to soil erosion from activities conducted along this river, thereby affecting its ecology. This will arise due to site vegetation clearance creating space for project components thus leaving bare ground susceptible to agents of soil erosion such as wind and rain. Construction of workers' camps, access road, and reservoirs and distribution lines all have the potential to strip the ground bare.
- Big number of workers needed for the construction of the power plant may lead to social drift in the project area. These workers may place an additional strain on the already limited infrastructure and public services in the area such as health and sanitation facilities. Their continuous movement from place to place keeps them away from their wives, husbands and families rendering them susceptible to commercial sex, which normally exposes them to the risk of HIV/AIDS or other sexually transmitted diseases (STDs);
- Noise may be generated during construction of the project. Equipment or machinery likely to generate noise at the site include; bull dozers, excavators, concrete mixers and generators while activities likely to generate high levels of noise are rock blasting and quarrying. Such noise will have impact to local villagers with discomfort, livestock breeding and wildlife;
- There may be generation of significant amounts of non-hazardous and hazardous solid waste. Non-hazardous wastes likely to be generated include rubble from the blasted rocks, excess fill materials from excavation activities, cut vegetation from site clearances, scrap wood and metals, and small concrete spills. Hazardous waste may mainly include used oil and grease from maintenance of equipment. This may lead to decreased air quality that can impact construction workers, local villagers and surrounding environment. If such wastes are not adequately managed, it may have impact to ecosystems (water, soils, vegetation, etc.) through storm water or direct deposit.
- Inadequate provision of sanitary facilities like toilets for use by workers can inconvenience workers and even lead to improper disposal of human waste,

- During construction phase there is likelihood of increase in traffic flow thus traffic disruption. This will lead to dust creation, deterioration of roads, and noise and vibration; and;
- Construction activities may be associated with accidents and unplanned events. This increases risk to personal health and safety during construction activities.

## **2.2 Operation Phase**

### **2.2.1 Positive Impacts**

- Increase in water supply and improved sanitation: Operation of the project will increase quality water supply coverage in the project area. It will supply water to the Arua municipality and other seven sub counties. Construction of a sewer line will greatly improve on sanitation status of Arua municipality;
- Employment: Employment opportunities will be availed to people, especially those employed to maintain the different components such as engineers and technicians. Other jobs will include security personnel, landscapers, among others;
- Induced area development: The project area has been constrained to growth and development because of inadequate water supply and poor sanitation. Operation of the project will automatically support local production. Water supplied by this project will therefore lead to increased productivity in sectors like manufacturing, agro-processing, health and education by lowering costs;

### **2.2.2 Negative Impacts**

#### **Wastewater Treatment Plant (Waste stabilization ponds)**

- Air pollution due to car exhaust emissions and standby generators
- Noise pollution generated from standby generators and operating machines
- Possibility of water pollution due to accidental discharge of sludge from sedimentation tanks, containing alum; backwash water may contain silt and dirt; insufficiently treated effluents may pollute receiving water bodies
- Inadequate solid waste management including collection, sorting, storage and disposal for example, used containers and packaging of alum and chlorine
- Discharge of sludge, back wash water and treated waste water effluent may affect flora and fauna
- Inappropriate storage and handling of chemicals especially alum and chlorine may rust their holding metallic containers, and even rooftops, if they are made of iron.
- Exposure of workers to occupational health and safety hazards from working with chemicals, cleaning and disposal, closing and opening of valves
- Obnoxious smells resulting from dysfunctional waste stabilization ponds may smell, especially when there is wind blowing towards residential areas and roads
- Concerns related with public health of people and animals: for example animals and people (especially children) may play around the area of waste stabilization ponds. Animals may feed on grass growing on the embankments of the waste stabilization ponds

#### **Boreholes**



- Groundwater abstraction may lead to lowering of local water table levels hence reduction in water supply which may pose a serious risk of conflicts between various water uses such as for domestic, irrigation use and other purposes
- Noise from pumps can be a nuisance to sensitive receptors such as local communities (immediate households) and/or fauna.
- Risks involved with public health from contaminated water due to natural hazards, accidental fuel/grease/oil spillage and structural failure can cause health risks to water users. This may be from pit latrines, poor waste disposal practices, agro-chemicals or from the rocks forming the aquifers.

**Laying of transmission lines from the boreholes to either the WTW, or a storage tank**

- Disturbance of drainage patterns of streams such as Oshow and Azita may be altered by laying of the pipelines; water flows may also be blocked which may affect other water users
- Domestic waste from camps and spilt oils , chemicals during maintenance may contaminate soil and water resources
- Emissions from vehicles and equipment used in maintenance may pollute air
- Water pollution may result from wastewater from operation of camps; accidental spillage of fuels, lubricants and other chemicals
- Soil erosion may lead to contamination of water and soil from oils, lubricants and chemicals during maintenance
- Public health problems may arise from diseases related with maintenance activities
- Occupational health and safety due to exposure of workers to occupational health and safety hazards
- Possibility to interfere with commercial and social activities



### 3.0 ENVIRONMENTAL AND SOCIAL IMPACT MANAGEMENT

A comprehensive ESIA for the proposed water and sanitation project was undertaken in 2013 and subsequently approved by NEMA. It identified environmental and social impacts with specific mitigation and management measures. More specific mitigation measures are described in Table 1 below in the EMP.

**NOTE: Mitigation measures have been discussed in general not per component. Major components like camp site, batching plant and fuel dispensing station have been assessed separately and separate ESMPs prepared for each component**

#### 3.1 Construction

Proposed mitigation measures for minimizing, avoiding and eliminating the impacts during the construction phase of the Project are shown in Table 1. More detailed construction specifications for environmental and social impact management are presented in ESIA.

Table 3.1: Mitigation Measures/enhancement for Impacts during Construction

Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
Job creation	Pay workers promptly	Reduced possibility of internal conflict arising	Number of complaints received from workers	Throughout the construction period	Contractor	None
Income to Construction Material Suppliers	Suppliers should promptly be paid	Reduced possibility of conflict arising	Number of complaints received from suppliers	Throughout the construction period	Contractor	None
Loss of land and property	Land acquisition should be carried out in accordance with the National Resettlement Policy, the Constitution, the Land Act and the Land Acquisition Act as well as World Bank	No loss of land, assets or livelihoods (Project Affected Persons should be left in the same or better state than they	Number of complaints	During preparation	MWE	Environmental and Social Safeguard Clinics



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
Loss of vegetation and habitat	Operational Policy 4.12 on Involuntary Resettlement Enter into a mutual agreement with owner of the land or property	were found				
	Site clearance should only be limited to areas where project components or structures are going to be set up.  Transmission lines should be aligned within the road reserve to avoid any further vegetation destruction; and after construction, the developer should re-vegetate and landscape site areas that would have been affected by construction activities.	Minimal loss of vegetation/habitat	Proportion of area cleared	During site preparation	Contractor	None
Contamination of Watercourses	Develop and implement a site construction waste and wastewater management plan;  Safe and proper storage, handling, use, cleanup, and disposal of oils, fuels and other chemicals;	Properly managed solid and liquid waste	Change in water color/turbidity  Increased Suspended Solids	During site preparation	Contractor DWRM	Safe and proper storage, handling, use, cleanup, and disposal of oils, fuels and other chemicals



ESMP for Arua Water and Sanitation Project in Arua Municipality and other Seven Sub Counties

Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	Develop spill response plan including equipment and training;  Install wastewater treatment facilities to treat wastewater from workers' camp.					
Creation of quarries and borrow pits	Use existing borrow pits and quarries, wherever possible with operating licences from regulatory authorities like NEMA.  Fence off quarries and borrow pits during the construction period to protect livestock and people.  Restore borrow pits immediately after construction.	Restored areas of quarries and borrow pits	Number of quarries and borrow pits restored	Throughout the construction period	Contractor	None
Occupational Hazards	Personnel should be provided with special PPE for use,  A safety specialist with training in first aid and first aid boxes should be available on site to handle minor	A safe working environment	Record of injuries and near misses	Throughout the construction period	Contractor	Training in accident prevention, emergency response and first aid techniques



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	accidents,  Ensure that at all times there are quick means of safety and quickly delivering victims to the nearest health facilities					
Soil Erosion And Sedimentation	Place retaining structures to control and manage the stockpiled earth materials.	No water pollution	Color of water; Turbidity	Throughout the construction period	Contractor	Soil erosion and sedimentation prevention practices.
	Coffer dam that may be used during construction should be protected from water waves by sand bags.		Complaints from water users			
	Monitor the quality of the river water visually on a daily basis during the construction period.					
Pressure on Social Infrastructure	Provide services like sanitary facilities and health care to workers so as not to cause pressure on local services.  Whenever possible priority should be given to local people when hiring workers.	No strain on social infrastructure	Number of workers coming from other areas	Throughout the construction period	Contractor	
Increase of Disease Rate	Develop a strict code of conduct for workers to	No epidemics or disease spread	Record of diseases cases	Throughout the	Contractor	Disease risk awareness,



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
such as HIV	regulate their behaviour, Develop and implement an HIV/AIDS or generally STDs prevention programme for the construction workers.	attributable to the project		construction period		control and prevention measures
Generation of Noise	Use well maintained equipment.	Zero noise	Record of complaints	Throughout the construction period	Contractor	Noise control, elimination and prevention measures
Generation of solid waste	Designate appropriate waste storage areas, collection and removal schedule	No litter	Waste collection facilities	Throughout the construction period	Contractor	Proper waste management practices including general good housekeeping practices
Dust and Other Air Emissions	Trucks used for ferrying construction materials should be fitted with tailgates that close properly and covered with tarpaulins Use properly serviced machinery	Permissible emission levels	Record of complaints	Throughout the construction period	Contractor	Traffic regulation and code of driving including speed limits.
Traffic Accidents	Drivers must be trained to appreciate the likely social behaviour of rural inhabitants	No accidents	Record of accidents	Throughout the construction	Contractor	Drivers' code of conduct



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	towards vehicles			period		

### 3.2 Operation Phase

At operation stage of the proposed project, the anticipated environmental and social impacts were discussed in the ESIA conducted in 2013. Table 3.2 below discusses the mitigation measures against the identified impacts for the operation of water and sanitation project.

Table 3.2: Mitigation Measures during Operation

Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
Increased water supply and improved sanitation	Ensure Regular maintenance of all project components including transmission lines	Continuous supply of water	Amount water abstracted and supplied	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV)	None
Employment Opportunities	Ensure Prompt Payment	Reduced possibility of internal conflict arising	Number of complaints registered	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV)	None
Induced Area Development	Improve service delivery	Increased range, variety and volume of businesses	Improved service delivery	Throughout the operation period	Business Community	None
Generation of Revenue	Ensure Prompt Payments	Increase government's and utility company's	Amount of money paid to government and Lead	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV)	None



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
Disruption of river flow	Acquire abstraction permits from DWRM	revenue Minimal change in water flow	authorities Quantity of environmental flow	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV), Project management, NEMA, DWRM	None
Fire Risk	<p>Areas with risks of fire outbreaks should have fire extinguishers;</p> <p>Project workers should have basic training in fire control.</p> <p>Electrical installation shall conform to acceptable national safety standards</p> <p>Acquire the requisite clearances to ensure the safe storage of hydrocarbons to be used for fueling project machinery</p> <p>Develop a fire</p>	<p>No fire outbreak</p>	<p>Number of fire outbreaks</p> <p>License for storage of hydrocarbons from Ministry of Energy and Mineral Development</p>	Throughout the operation period	<p>Project management. Uganda Police Fire Brigade, DEO.</p>	<p>Fire prevention and control measures, Emergency response</p>



ESMP for Arua Water and Sanitation Project in Arua Municipality and other Seven Sub Counties

Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	prevention and response plan					
Visual Disruption	Project components should be implemented with due consideration to landscape views and important environmental and community features	Minimal visual disruption of the natural beauty	Well blended project sites	Throughout the operation period	Project management	None
Occupational Health And Safety	<p>Planning work site layout to minimize the need for manual transfer of heavy loads;</p> <p>Cleaning up excessive waste debris and liquid spills regularly;</p> <p>Using of slip retardant footwear;</p> <p>Training and use of temporary fall prevention devices, such as rails or other barriers when working at heights equal or greater than two meters;</p>	Good and safe working environment	Record of injuries, misses and complaints	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV), DEO, MoGLSD, NEMA	Occupational health and safety measures



Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	<p>Evacuating the existing structures during demolition;</p> <p>Providing workers with protective gear such as safety glasses with side shields, face shields, hard hats, and safety shoes;</p> <p>Ensure that at all time there are quick and safe means of delivering victims to the nearest health facilities; and</p> <p>Ensuring that a Health and Safety Specialist with experience in first aid techniques and first aid boxes are on site to handle minor accidents and to administer first aid in case of serious accidents before the victims are transferred</p>					



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Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
	to the nearby health facilities for extensive medical attention.					
Waste Generation	Develop a waste management plan	No improperly managed waste	Availability of waste collection facilities	Throughout the operation period	Project management	Proper waste management practices including general good housekeeping practices
Introduction of Invasive Species	Undertake periodic biodiversity monitoring	No ecosystem disruption	Record of invasive species	Throughout the operation period	Project management	None
Traffic Disruption	Transportation of materials to and waste from the site shall be scheduled for off-peak traffic hours, as far as possible.  Install warning signs e.g. of heavy truck loads turning, reduce speed limit, narrowed road/access.  Deploy flagmen to control and direct other road users	No traffic disruption and accidents	Record of traffic accidents Record of complaints  Availability and adequacy of appropriate traffic signs  Availability of flagmen	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV),	Driver's code of conduct, Defensive driving



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Impact	Mitigation/Enhancement Measure	Desired Outcome	Indicator (s)	Timing	Responsibility	Capacity Building Requirements
Resource consumption	Practice resource conservation techniques	Reduction in utility bills	Increasing utility bills	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV),	Resource Conservation Skills
Improper Sewage Disposal	Construct onsite septic tanks	Minimal sewage disposal	Over flow of septic tanks	Throughout the operation period	N.C.C.W & DOTT SERVICES LTD (JV),	None

## **4.0 ENHANCEMENT AND MITIGATION PROGRAM**

### **4.1 Introduction**

This ESMP is to be submitted to financial supporters and other stakeholders for review. The review comments will be highlighted and shared with the client and consultant for improvement. The project developer (N.C.C.W & DOTT SERVICES LTD (JV)) will be responsible for overseeing the ESMP while the contractor will be responsible for implementing the ESMP with close supervision of NWSC and World Bank. The developer could contract an Environmental Management and a Social Development Specialist who will be responsible for overseeing the implementation of environment, gender and social aspects of the project. It is mandatory under National Environment Act to undertake Environmental Audit of the Project one year after the start of its implementation.

The essence of an Environmental Audit is to identify and rectify environmental issues during the period of project implementation and propose compliance interventions for such concerns. The environmental audit provides a major enhancement of mitigation measures designed for the project.

The ESMP recommends that, the Contractor or Developer undertakes proper decommissioning of ancillary facilities including the workers' camp, sanitary facilities and workshops. A decommissioning plan must include ways of relocating all un-used equipment to recommended storage sites, rehabilitation/restoration of the site, disposal of the generated waste in accordance with the waste management plan and both national and international waste management regulations. The plan should as well include the handover of site to previous land owners if it was under lease agreement and withdrawal of all project equipment.

### **4.2 Monitoring Program**

The monitoring programme aims at ensuring that all proposed/designed mitigation measures for the project are implemented effectively and sufficiently. It also ensures that, project activities comply and adhere to environmental provisions and standards set at both national and international level. The aim is to ensure that less harm and more good is done to environment and social aspects of the project area while implementing the project. The monitoring program will be a responsibility of the contractor (N.C.C.W & DOTT SERVICES LTD (JV)), NEMA, MWE, Ministry of Gender, Labor and Social Development, Ministry of Energy and Mineral Development and District officials. To ensure effective monitoring of the implementation of mitigation measures, the contractor should engage in capacity building of both the Environmental Management and Social Development Specialist in environmental monitoring techniques. This ESMP highlights key monitoring indicators which include; water quality parameters, soil erosion, occupational health and safety, waste management, fire outbreak, unexpected break down of the project components, social impacts and outbreak of communicable diseases.



## 5.0 IMPLEMENTATION SCHEDULE AND REPORTING

### 5.1 Institutional Arrangements

N.C.C.W & DOTT SERVICES LTD (JV) will be responsible for implementing the ESMP during project execution. The Project Director will be the overseer of the project, including finance sourcing and approval financial demands for the project. The Project Director will be assisted by Project Manager, Project Coordinator, Health and Safety Officer, Environmental Management Officer, Social Development Officer and site managers in monitoring the ESMP implementation. The Health and Safety Officer, Environmental Management Officer, Social Development Officer and Site Managers will be specifically responsible for implementation of mitigation measures in all project components and activities. They will conduct regular visits to the field for monitoring the ESMP compliance. They will also be required to carry out regular monitoring of ESMP implementation and providing progress report to N.C.C.W & DOTT SERVICES LTD (JV) managing board committee.

Also N.C.C.W & DOTT SERVICES LTD (JV), will hire external consultants specialized in environmental health and safety to carry out regular monitoring of the project during its operation. The consultant may be required to undertake necessary trainings on ESMP and health and safety management to all the project staff associated with project implementation to enhance their capacity on environmental and social issues and proposed mitigation plan. The progress report of ESMP implementation will be shared with the lead agencies such as NWSC and other stakeholders.

### 5.2 Implementation Responsibilities

The following staffs related to the project have been designated for ESMP implementation and monitoring with the following roles and responsibilities during project execution though some responsibilities are already highlighted in Tables 3.1 & 3.2 of impact and mitigation plan.

Table 5.1: List of Contractor Staff, other institutions and their respective responsibilities

No	Organization	Designation	Responsibility
1	N.C.C.W & DOTT SERVICES LTD (JV),	Project Director (PD)	Overseer of ESMP implementation and sharing of quarterly report with Financers.
2	N.C.C.W & DOTT SERVICES LTD (JV),	Health and Safety Officer	Responsible for monitoring the proposed mitigation plan and safety management plan and reporting to Project Director or Project Manager or Project Coordinator.
3	N.C.C.W & DOTT SERVICES LTD (JV),	Environmental Management Officer	Responsible for supervision and routine monitoring of ESMP and Mitigation measures;  Development of various plans including waste management plan;  Supervising the contractor's works and ensuring compliance with environmental and social safeguards as stated in the contract.



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No	Organization	Designation	Responsibility
			<p>Ensuring adequate training and education of all staff involved in environmental supervision</p> <p>Making recommendations to the N.C.C.W &amp; DOTT SERVICES LTD (JV), regarding ESMP performance as part of an overall commitment to continuous improvement.</p>
4	N.C.C.W & DOTT SERVICES LTD (JV),	Social Development Officer	<p>Responsible for community liaison and complaints management</p> <p>Ensuring the proper management of cross cutting issues such as HIV and AIDS, Child labor, Employment Contracts, Sexual harassment, Conflict etc.</p>
5	N.C.C.W & DOTT SERVICES LTD (JV),	Project Manager	Overall Supervision of the ESMP implementation and report to Project Director.
6	N.C.C.W & DOTT SERVICES LTD (JV),	Site Manager	<p>Preparation and implementation of the Environmental Supervision Plan during construction;</p> <p>Reporting any incidents or non-compliance with the ESMP.</p> <p>Ensuring adequate training and education of all staff involved in environmental supervision</p> <p>Management of emergency issues such as accidents, fires, strikes etc.</p>
7	Construction Contractor	Site Engineer	<p>Preparation and implementation of the Construction Plan;</p> <p>Prepare and maintain records and all required reporting data as stipulated by the ESMP, for submission to the Supervising Engineer Consultant;</p> <p>Ensure that all construction personnel and subcontractors are informed of the intent of the ESMP and are made aware of the required measures for environmental and social compliance and performance;</p>



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No	Organization	Designation	Responsibility
			<p>During construction, maintain traffic safety along access roads, with special emphasis on high trafficked areas;</p> <p>Providing all workers with the most appropriate protective gadgets.</p> <p>Liaising with the respective stakeholders e.g. MWE, NWSC, NEMA and local authorities to ensure their active involvement in supervision and monitoring of the project.</p>
8	External Consultant	Environment Health and Safety	Monitoring of ESMP and Environment health and safety plan
9	Local Authorities	District Officials	Monitoring of the ESMP; Local authorities, communities and individuals shall take part in the supervision of both the ESIA and ESMP, where applicable
10.	NEMA	Environmental Inspector	Site inspection to ensure compliance with national policies, laws and regulations.

Table 5.2: Primary Responsibilities of the Arua Water and Sanitation Project ESMP

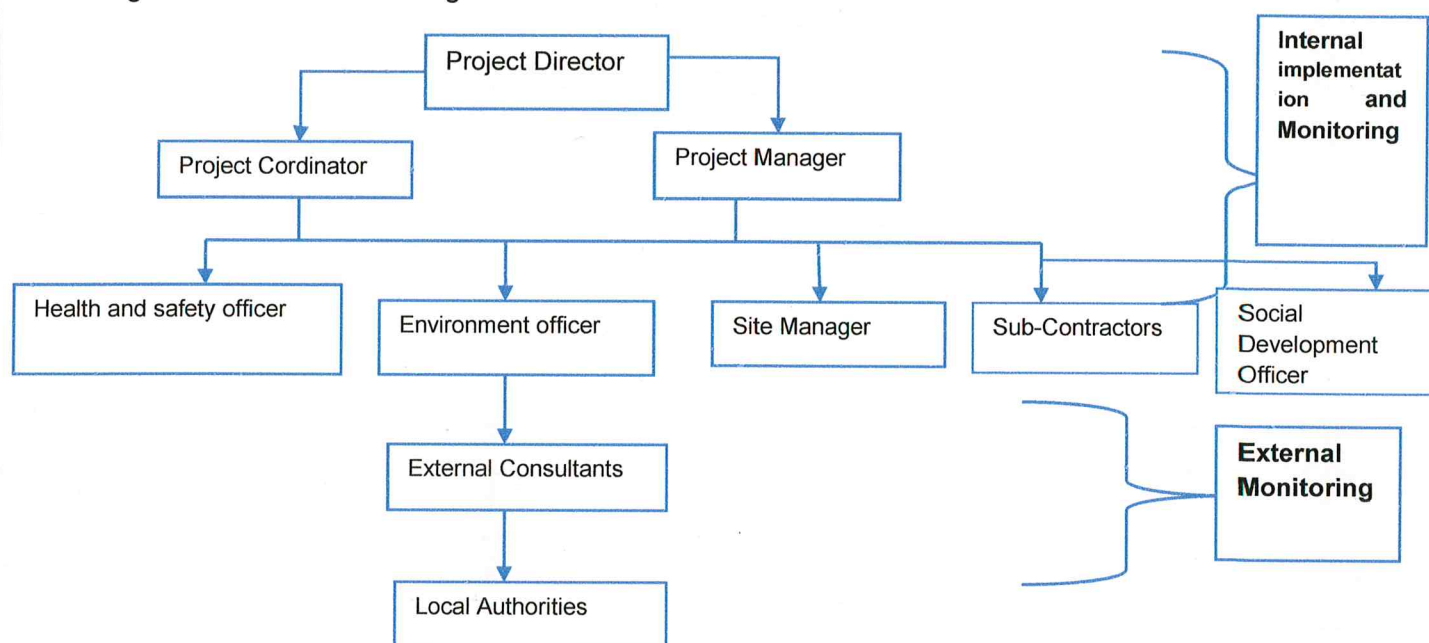
Plan	Sub-Plan	Primary Responsibility for Implementation			
		Client/ NWSC	Site Engineer	Contractor N.C.C.W & DOTT SERVICES LTD (JV),	NEMA
Construction and Worker Camp Management Plan	Worker Camp Management Plan			Yes	
	Construction Management Plan		Yes	Yes	
	Waste Management Plan			Yes	
	Pollution Prevention Plan			Yes	
	Safety during construction		Yes	Yes	
	Environmental training of construction workers		Yes	Yes	
Biodiversity and Protected Areas Management Plan	Biodiversity Inventory	Yes		Yes	
Water Treatment Plan cleanup		Yes			
Environmental Monitoring Plan	Environmental Sampling			Yes	Yes
	Overseeing	Yes	Yes		Yes
Community Relations and Community Safety Plan		Yes		Yes	
Public Health Management Plan	Construction Worker Health Management Plan	Yes		Yes	
Physical Cultural Resources Management Plan		Yes		Yes	
Training and capacity building		Yes	Yes	Yes	Yes
Erosion and sedimentation plan				Yes	



Plan	Sub-Plan	Primary Responsibility for Implementation			
Resettlement Action Plan		Yes			
Raw Material Management Plan				Yes	

The proposed institutional arrangements for ESMP implementation and hierarchy of reporting line is given in Figure 1 below:

Figure 1: Institutional Arrangement for ESMP



### 5.3 Communication and Reporting

Progress report of ESMP monitoring will be shared with all stakeholders. The responsible monitoring personnel will be responsible for report writing and the reports will be submitted to the project manager. The project manager will directly report to the Project Director. Monthly or Quarterly progress reports will be submitted to the stakeholders or financiers. Third Party Validation reports will be submitted to Regulating Authorities such as NEMA and other stakeholders. The reporting frequency for different tier of monitoring will be as follows:

Table 5.3: Reporting Responsibility

Reporting Frequency	Reporting Responsibility	Review and Decision By
Daily	Site Managers	Project Manager
Monthly	Environment and safety officers	Project Manager
Annual	Contractor and External Consultant	Regulatory Authorities – NEMA

## **6.0 ENVIRONMENTAL MONITORING FRAMEWORK**

A comprehensive monitoring plan for ESMP comprising monitoring parameters, frequency and responsibility of monitoring is given in Table 6.1 & 6.2. Compliance to the proposed monitoring plan will be effected through the following types of monitoring mechanism to achieve the objectives of ESMP.

### **6.1 Internal Monitoring**

The Environment Officer, Social Development Officer and Health and Safety Officers will carry out regular monitoring of the project activities related to the ESMP implementation. They will be assisted by site supervisors in monitoring of ESMP in their respective sectors and areas of jurisdiction. Non compliances pertaining to ESMP implementation will be reported to the Project Manager who will in turn report to the Project Director. The prescribed monitoring parameters, frequency and time schedule will be followed to ensure smooth implementation of proposed mitigation measures for various components and activities such as site identification, construction and operation stages. Monitoring will be done on daily basis and reporting could be done on monthly and quarterly basis.

### **6.2 External Monitoring / Third Party Validation**

External monitoring also known as Third Party Validation will be carried out through an independent monitoring consultant on annual basis to evaluate the quality of work and validate the data pertaining to overall ESMP implementation progress, and to ensure that the mitigation measures are implemented as per mitigation plan. In case of any deviation, corrective actions will be taken where necessary. For Third Party Validation, well qualified and experienced environmental and social scientists shall be hired to conduct thorough analysis of the data collected from the field and desk review of all quarterly progress reports to validate and identify gaps and weaknesses, if any, in the ESMP implementation. The External Monitoring Team will submit their report to the Project Financers, Regulating Authorities such as NWSC or NEMA and other stakeholders including Local authorities. The third party monitor will be engaged by N.C.C.W & DOTT SERVICES LTD (JV).

### **6.3 Construction Phase**

The major objective of the monitoring plan during construction phase is to periodically evaluate the result of proposed mitigation measures while collecting more data in order to compare baseline environmental conditions with conditions during construction.

Routine monitoring of implementation of mitigation measures shall be undertaken by site construction supervisors. Proper courses of actions shall be proposed if any proposed mitigation measures are not significantly leading to compliance with national and international regulations or if the proposed mitigations were not adequate enough to properly reduce and/or eliminate environmental and/or socio-economic impacts.

N.C.C.W & DOTT SERVICES LTD (JV) will form an environmental unit to carry out environmental sampling and monitoring of all environmentally related issues regarding the construction activities. If necessary, it will hire outside consultants to undertake monitoring. Table 6.1 identifies the monitoring activities to be carried out during the Construction Phase.



Table 6: Monitoring activities for Construction Phase

Issue	Responsibility	Frequency	Parameter	Location:	Procedure
<b>Water Resources</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Monthly	Amount of water available	Bore holes	Monthly reporting
	DWRM	Quarterly		Surface water abstraction points	Consultation with project-affected communities
<b>Noise</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Daily Observation	Frequency of disturbance to local villagers	Construction Sites	Daily Reporting; Monthly Measurements;
	District Authorities NEMA;	Monthly Tests/Measurements	Level of noise/vibration emitted from machinery	Adjacent Communities	Records of Community and workers' complaints
<b>Occupational safety and Health issues</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Daily	Record of injuries and near misses	Construction sites	Daily Reporting;
	District Authorities NEMA		Availability of PPE  Usage and handling of PPE		
<b>Water quality</b>	N.C.C.W & DOTT SERVICES LTD (JV),  DWRM	Monthly testing/sampling	Water quality standards in construction projects (BOD, pH, COD, TSS, dissolved oxygen, temperature, Coliforms, etc.)	Waste water discharge points,	Monthly Sampling including observation &  Quarterly reporting



Issue	Responsibility	Frequency	Parameter	Location:	Procedure
<b>Vegetation</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Quarterly	Exploitation of Natural Resources; Cut trees	Access roads; Transmission lines; Workers camps.	Visual Observation
<b>Air quality</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Monthly	Amount of dust Generated and Machinery emissions	Construction site; Access roads;	Visual, Measurements using handheld equipment.
<b>Chance Finds Of Culturally Significant Artifacts Or Sites</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Daily	Unexpected unearthing of culturally significant artifact or site	Borrow sites for construction materials;  Excavation sites for reservoir, transmission trench etc.;	Apply Chance Find Procedures
<b>Sedimentation and erosion</b>	N.C.C.W & DOTT SERVICES LTD (JV),	Daily	Sediment volumes in adjacent Water bodies especially Waki River.	Construction Sites	Visual, assess levels of turbidity in receiving water bodies

#### 6.4 Operation Phase

Operation of this water and sanitation project would need a close monitoring to comply with the proposed mitigation measures and standards. Some impacts may persist from construction phase to operational stage and they need to be eliminated to levels permissible by regulations. Among the parameters that need to be monitored include; Aquatic Biodiversity, Sedimentation, and Water Quality; among many others.

Table 6.2: Monitoring activities for Operation Phase

Issue	Responsibility:	Duration:	Parameter:	Location:	Procedure:
<b>Noise</b>	N.C.C.W & DOTT SERVICES LTD (JV)  NWSC	Quarterly reporting	Noise created operating Installed equipment like water pumps and generators.	Pump stations  Generator houses  Lift pump	Regular Measurements Reporting forms
<b>Erosion</b>	N.C.C.W & DOTT	Quarterly reporting	Erosion impacts downstream	Buildings, and un restored	Visual Photos; Reporting forms;



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Issue	Responsibility:	Duration:	Parameter:	Location:	Procedure:
	SERVICES LTD (JV NWSC			borrow pits	Complaints from Community members.
<b>Conflicting demands for water use</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	Monthly reporting by Environmental Inspectors and engineers	Numerous parameters which may include: water volumes of other water points adjacent to the water intake etc.	Water intake points.	Weekly measurements and recording
<b>Public health risks from contaminated water</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	Monthly and Quarterly	Public complaints, record of complaints  Quality of water	Reservoir/storage tanks	Record keeping
<b>Solid waste generation</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	Monthly	Type of waste generated, corresponding amounts, disposal methods and storage facilities used	Camps, water treatment plants etc	Record keeping
<b>Occupational health and safety</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	monthly	Record of injuries with their severity	Camps, intake point, water treatment plants, lifting station sites etc	Maintain an accident log
<b>Storage and handling of chemicals</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	Monthly	Type of chemical, amount, disposal and storage facilities	water treatment plants etc	Record keeping
<b>Obnoxious smells</b>	N.C.C.W & DOTT SERVICES LTD (JV NWSC	Monthly	Record of complaints	waste stabilization pond sites	Record keeping

### 7.0 Estimated Cost

A special budget will have to be set aside to ensure that the ESMP is efficiently and effectively implemented. This should be integrated into the project overall costs. The intervention cost incurred will be due to water parameter monitoring, restoration/rehabilitation costs, capacity building, tree planting, and public stakeholder meetings. The table 7.1 below presents the additional and distinctive environmental and social mitigation costs:

Table 7.1: Estimated Costs

No.	Mitigation Measure/Plan/Activity	Cost (UGX)
01.	Environmental Monitoring	100,000,000 (for about 3-5 years)
02	Emergency Responses	100,000,000 (Standby )
03.	Environmental Audit costs	105,000,000 ( for about 3-7 years )
04.	Institutional Strengthening, Training and Capacity Building <ul style="list-style-type: none"> <li>• Formation of environmental unit</li> <li>• Local authorities, communities and other stakeholders</li> <li>• On-site training</li> <li>• Offsite training</li> <li>• Local capacity building</li> <li>• Equipment and logistics including PPE</li> </ul>	200,000,000 (for about 2-5 years )
	<b>TOTAL</b>	<b>505,000,000/=</b>

The total project cost for the implementation of the environmental and social measures in the project is estimated to be Five Hundred Five Million Uganda Shillings (505,000,000/=) which will be incorporated in the overall project costs.



## 8.0 PUBLIC CONSULTATIONS AND DISCLOSURE REQUIREMENTS

Public disclosure of the project and consultation was conducted during formulation and preparation of this ESMP. It aimed at enabling affected communities and other key stakeholders to present their views and concerns that contributed to the formulation and refinement of the project design.

Consultations were held with some staff of Arua Municipal Council, NEMA, Ministry of Gender and Social Development and some community local leaders. The stakeholder comments reveal the enthusiasm they have in the project. Most views indicated the expected benefits including supply and distribution of water in an area. Stakeholders pointed out benefits such as provision of employment opportunities to residents of the project area and stimulation of other industries in the area like processing industries. More benefits were described in the ESIA.

Stakeholders further identified negative impacts which needed to be addressed by ESMP. These included; high influx of people into the area, loss of land and property and pollution of water resources among many others.

N.C.C.W & DOTT SERVICES LTD (JV) will submit hard copies and a soft copy of the ESMP to financiers & NWSC or World Bank for review. It is expected that the Dott services will share/disseminate copies of the ESMP to lead agencies that include NWSC, District officials and public libraries. This is one way of sharing the ESMP with key stakeholders including communities that are likely to be impacted upon by the project.

## 9.0 CAPACITY BUILDING AND TRAINING PLAN

Capacity building of the Project ESMP Implementers and other implementing partner organizations will be carried out through environmental trainings and training on health and safety management. These trainings will help enhance awareness level of the staff and other stakeholders and contractor staff on all matters relating to the environmental and social safeguard management. These trainings will ensure that the requirements of the ESMP are clearly understood and followed by the staff and contractor throughout the project period. Capacity building is a key component of success of ESMP implementation.

The primary responsibility for providing trainings to all project personnel will be that of N.C.C.W & DOTT SERVICES LTD (JV). The project Manager will coordinate and arrange capacity building trainings on ESMP during the implementation stage of the project, well before any site works are commenced.

The training scope should cover a wide range of issues including environmental and social mitigation guidelines, general environmental and social awareness, legislative aspects of environmental and social compliance and effective house-keeping during the construction as well as operation of activities, in order to minimize the adverse environmental and social impacts of the project. The training on health and safety issues should be able to cover health and safety management during works and to train the workers and contractor staff on using the personal protective equipment in order to ensure safety of workers during project activities. Particular focus should be placed on the cross cutting issues such as HIV/AIDS awareness and prevention, the use of child labor in executing project works, the need to comply with national labor laws and regulations and the need to consider gender aspects while implementing project components.

Capacity building and training will target N.C.C.W & DOTT SERVICES LTD (JV) staff. It requires an environmental and social expert to implement the training while health and safety expert will be required for health and safety training.

N.C.C.W & DOTT SERVICES LTD (JV) shall form an environmental management unit which shall oversee the preparation, implementation and oversight of the ESMP and its associated sub plans. The environmental unit shall be provided with enough technical and financial resources to complete this oversight role; external resources or contractors may be required.

It is inevitable to hire construction contractors. They need to undergo basic environmental training to ensure contractor and all subcontractor compliance with ESMP requirements. The construction contractor shall maintain training records, including attendance lists of specific courses/seminars conducted, for inspection by the NWSC and World Bank.

Specific training to the environmental unit shall include but not be limited to;

- Principles and procedures for environmental Management Systems including impact assessment



- Compliance assessment, monitoring and follow-up with regard to national and international standards including the World bank safeguard Policies;
- Environmental audits for compliance to set standards;
- Social impact assessment and public consultation;
- Grievance Redress Mechanisms/complaints handling procedures;
- HIV/AIDS prevalence and awareness;
- Fundamentals of aquatic ecology and environmental flows associated with construction and operation of project including trained expertise in water quality testing and analysis).
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management procedures;
- Fuel and hazardous materials management; and
- Construction camp management.

It is important to note that everyone involved in this project construction and operation should have a bit of environmental management training.

## 10.0 OUTLINE OF EMERGENCY RESPONSE PLAN

An emergency is any unplanned occurrence caused by either natural or man-made events which can lead to deaths, significant injuries, cessation of operations, physical or environmental damage and economic losses. Numerous events can lead to emergencies. These include:

- Earthquakes;
- Fires;
- Communications failure;
- Chemical spills;
- Structural failure (dam failure); and/or
- Civil disturbance.

Emergency management is therefore critical to planning, mitigating, responding and recovering from the potential impacts of these events.

The emergency management process however is very site specific and varies according to type of operations, geographic location, proximity to neighbouring communities and the history of such occurrences. Therefore, one of the first stages in developing an Emergency Response Plan (ERP) would be the identification of the potential hazards or threats to the facility.

The Emergency Response Plan must be documented and cover all the area mentioned above.

- The plan must identify the person(s) responsible for Emergencies and Safety. This person will keep the documentation updated (at least annually) and ensure that it is disseminated to all relevant persons.
- The plan must speak to the preparatory actions that must be taken in case of emergencies with forewarning such as facility failure and responsibilities must be assigned.
- The plan should include actions that must be taken when a spill or fire occurs.
- The plan must include for firefighting equipment to be checked on a specified frequency by a competent entity.
- The plan must speak to cleanup measures after the emergency.

The Emergency Response Plan must be developed in consultation with the Office of Disaster Preparedness to ensure that it meets their requirements. The Emergency Response Plan for this project should be incorporated in general Emergency Response Plan for N.C.C.W & DOTT SERVICES LTD (JV).



#### 11.0 OUTLINE OF CHANCE FIND PROCEDURE

During excavation and construction activities for the proposed water and sanitation project, there could be chances of unexpected discovery of historical remains, antiquities or any other object of cultural or archaeological importance. When such a discovery occurs, the following procedures shall be adopted by the N.C.C.W & DOTT SERVICES LTD (JV).

- The initial and very first step is to stop the activity immediately after identifying any of the chance findings
- Map out the area of concern and demarcate it or blockade it;
- Secure the site to prevent any damage or loss of removable objects. In case of removable antiquity or sensitive remains, a night guard shall be deployed at the site until a responsible authority takes over the site for protection and preservation;
- The responsible authorities would take over the charge of protecting and preserving the site or area further;
- The Ministry of Energy and Mineral Development, Ministry of Tourism, Wildlife and Antiquities or relevant archaeological departments will perform an evaluation of the finding. The significance and importance of the findings will be assessed according to various criteria and laws relevant to cultural and archaeological heritage including historic, social, cultural and economic values by the concerned authorities;
- Decision on how to handle the finding will be made on the basis of assessment and could include changes in the project site, relocation, layout (in case of finding an irrevocable remain of cultural or archaeological importance), conservation, preservation, restoration or salvage;
- Decision of the concerned authority will be implemented regarding the management of discovery;
- Excavation and construction work on the site shall be resumed after permission is given from the relevant authorities, whichever is applicable; and
- In case of relocation of the site, the NWSC will decide to acquire alternate location.