Government of the Republic of Malawi

Ministry of Health

EBOLA PREPAREDNESS PLAN

Environmental and Social Management Plan for the proposed Construction of an Ebola Virus Diseases Quarantine Centre at Karonga District Hospital

06 May 2016
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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>DPPD</td>
<td>Department of Planning and Policy Development</td>
</tr>
<tr>
<td>DEHO</td>
<td>District Environmental Health Officer</td>
</tr>
<tr>
<td>EHO</td>
<td>Environmental Health Officer</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
</tr>
<tr>
<td>ESMP</td>
<td>Environmental and Social Management Plan</td>
</tr>
<tr>
<td>EVD</td>
<td>Ebola Virus Disease</td>
</tr>
<tr>
<td>GoM</td>
<td>Government of Malawi</td>
</tr>
<tr>
<td>IPC</td>
<td>Infection Prevention Control</td>
</tr>
<tr>
<td>KCH</td>
<td>Kamuzu Central Hospital</td>
</tr>
<tr>
<td>MGDS II</td>
<td>Malawi Growth and Development Strategy II</td>
</tr>
<tr>
<td>MNREM</td>
<td>Ministry of Natural Resources, Energy and Mining</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>NCIC</td>
<td>National Construction Industry Council of Malawi</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
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<tr>
<td>NEAP</td>
<td>National Environmental Action Plan</td>
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<tr>
<td>NCE</td>
<td>National Council for the Environment</td>
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<tr>
<td>NEP</td>
<td>National Environmental Policy</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>TCE</td>
<td>Technical Committee on the Environment</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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EXECTUTIVE SUMMARY

Introduction

The Government of Malawi, with support from the World Bank, is implementing Ebola Virus Disease (EVD) preparedness activities, which include infection control interventions, particularly provision and use of Personal Protective Equipment (PPEs); and construction of EVD quarantine and/or treatment centres. The project is being implemented in selected border districts and referral hospitals. Karonga is one of the border districts whereby an EVD quarantine Centre will be constructed at Karonga District Hospital.

The project is important for Malawi as during the Ebola outbreak of 2014, worst hit countries were those with a weak health-care system and poor infrastructure, thus unprepared. In addition, with the Ebola threat still existing in other countries, Malawi is at risk of an Ebola Virus Disease outbreak due to migration.

Objectives of the ESMP

The proposed construction of the Karonga EVD quarantine centre is likely to result in moderate environmental and social impacts, hence this ESMP. The ESMP is in line with the World Bank’s category B projects, within which this project is classified. The ESMP is also prepared in response to the “Environment Management Act, 1996” and the “Guidelines for Environmental Impact Assessment (EIA) for Malawi, 1997”, which recommend an ESMP for projects with moderate environmental and social impacts. The main objective of the ESMP is to provide measures to minimize adverse effects on the biophysical and socio-economic environment during construction and operation of the Karonga EVD quarantine/treatment centre.

Methodology for the study

In order to predict the impacts of construction of the EVD quarantine centre at Karonga District Hospital, field investigations were conducted at and around the construction site to appreciate the extent of impact of the project activities and determine their environmental and social footprint. The field investigations were also made to collect biophysical and socio-economic data and hold discussions with relevant stakeholders. In addition, literature review was conducted; including the review of World Health Organisation Ebola Guidelines for Environmental Management and Infection Control in Ebola Units.

Impacts of the Project

Potential environmental and social impacts for the Karonga EVD centre will emanate from the project activities during the construction, operation and maintenance and decommissioning phases. The following are identified as potential positive impacts of the project:

i. Increase in knowledge and skills in infection control and prevention
ii. Employment opportunities
iii. Acquisition of skills in construction of prefabricated buildings
iv. Income to material/equipment suppliers
v. Increased rooms for medical services

On the other hand, potential negative impacts that are likely to occur include:

i. Accidents to workers, staff and public on construction sites
ii. Noise disturbances
iii. Increased costs for electricity and water
iv. Waste generation
v. Water pollution
vi. Removal of vegetation
vii. Fear of being infected
viii. Increased air pollution from incineration of wastes
ix. Creation of stagnant water pools
x. Increased work load/pressure on health worker
xi. Occupation safety and health risks
xii. Air, land and water contamination
xiii. Risk of infection from contaminated equipment and waste

Management of the Impacts
In view of the negative impacts outlined above, this document has presented an environmental and social management plan (ESMP) in Chapter 6, which outlines mitigation measures that must be implemented by the Ministry of Health and other key stakeholders in order to eliminate or mitigate the impacts on the biophysical and socio-economic environment. A monitoring plan, which outlines responsibilities for the Ministry of Health and other key stakeholders; along with verifiable monitoring indicators for each of the mitigation measures, has also been provided. It is expected that if the ESMP is effectively and efficiently implemented, the negative impacts will be reduced to low or will be eliminated; such that the Karonga EVD quarantine centre project can be implemented sustainably.
CHAPTER 1 INTRODUCTION

1.1. PROJECT BACKGROUND

Ebola virus disease (formerly known as Ebola haemorrhagic fever) is a severe, often fatal and highly infectious disease. The virus is transmitted to people from wild animals and spreads in humans through direct contact with the blood, body fluids and tissues of infected people. Severely ill patients require intensive supportive care. During an outbreak, those at high risk of infection are health workers, family members and others in close contact with the sick and deceased.

The recent Ebola Virus Disease (EVD) outbreak started in March 2014 in the West African countries of Liberia, Guinea and Sierra Leone. A few cases were also reported in Italy, Mali, Nigeria, Senegal, Spain, United Kingdom and United States of America as a result of migration. Since the outbreak began, there have been approximately 28,602 cases of the virus, causing 11,301 deaths (WHO, 2016). The worst hit countries were Liberia and Sierra Leone due to a weak health-care systems and a lack of infrastructure. The countries have been declared Ebola Free but enhanced surveillance is continuing.

Ebola preparedness and response planning has been in effect since shortly after the outbreak in Western Africa in 2014. Ebola infection prevention and control training has been administered across the entire country based on World Health Organization (WHO) guidance. Training included nurses and clinicians (doctors/clinical officers) and focused on clinical management of Ebola patients based on WHO training materials. A training-of-trainers program was also established by the WHO in Brazzaville, Congo to provide a foundation on which to administer more regular Ebola response training.

With regards to Ebola waste management, specific Infection Prevention and Control (IPC) is built on already existing hospital IPC infrastructure. There is an IPC Unit in the Ministry of Health and the National Focal Officer is part of the team of Trainers on Ebola.

Ebola response equipment is also already in place at all the hospitals where EVD treatment centres are being constructed as part of this project. This includes vehicles (ambulances, double cabin 4X4 utility vehicles and motor cycles) washing machines, patient beds, mattresses and blankets. The different supplies and logistics necessary for IPC personal protective equipment (PPEs-coveralls, aprons, N-95 mask, gumboots, goggles, etc) have also been supplied to all district hospitals.

According to the WHO, the introduction of an EVD case into unaffected countries remains a risk as long as cases exist in any country. With adequate preparation, however, such an introduction can be contained through a timely and effective response. Therefore, the Government of Malawi (GoM), with support from the World Bank, is implementing EVD preparedness activities, which comprise construction of EVD quarantine/treatment centres and Infection Control Interventions.

The EVD quarantine centres being proposed at Karonga, Dedza, Mchinji and Mwanza Districts are inside the fences of the respective District Hospitals. In these locations, the major activity will be screening and isolation of suspected cases. Treatment for confirmed cases will be provided at the referral centres to be constructed in the major cities of Malawi – Lilongwe (the capital city), Blantyre and Mzuzu. In Lilongwe the EVD Treatment Centre will be at Kamuzu Central Hospital (KCH). In Mzuzu the Centre will be at Mzuzu Central Hospital and in Blantyre the facility will be at an undeveloped site owned by the government, along the M1 road after Kameza Roundabout, near the Kamuzu College of Nursing complex.

Karonga, Mwanza, Mchinji and Dedza are border districts. Karonga borders with Tanzania to the North of Malawi; Mwanza boarders with Mozambique to the east; and Mchinji and Dedza border with Zambia and Mozambique to the west of Malawi. A map showing the districts for the EVD quarantine/treatment centres is provided in figure 1.1.
1.2. NATURE OF THE PROJECT

EVD preparedness activities for Malawi aim to develop infrastructure and strengthen the health-care system in readiness for an outbreak. The activities started during the recent outbreak in East Africa and the World Bank is supporting the following two components:

**Component 1:** This Component will focus on Infection Control Interventions, specifically provision and use of Personal Protective Equipment (PPEs). Under this component, health-care workers will be trained in the use of PPEs, provision of care and treatment to Ebola patients, infection prevention and control and waste management. This component will also provide $20,000 for each of the seven districts where the project’s Ebola component is being implemented to increase capacity for district health authorities and the community to manage infectious disease response, including Ebola. This includes developing and implementing training of trainer programs with district health authorities where the EVD treatment centres are being constructed. Front-line staff are also being recruited and trained as part of this effort to investigate suspected cases, provide early warning and community level response. The community will also be targeted with social behaviour change communication programs to increase knowledge, shift attitudes and cultural norms and produce changes in a wide variety of behaviours. These activities are separate from the project’s Health Care Waste Management Plan (HCWMP).

**Component 2:** Construction EVD quarantine/treatment centres.

Seven Ebola Virus Disease quarantine/treatment centres are proposed to be constructed in Karonga, Mzuzu, Dedza, Mchinji, Mwanza, Lilongwe and Blantyre districts. Karonga, Dedza, Mchinji and Mwanza have been proposed because they are border districts. In these districts, health-care workers will be working with immigration officers at the borders to identify suspected cases and isolate them in the quarantine centres, in addition to surveillance of cases within the districts. When a suspected case is confirmed to be Ebola infected, the person will be referred to Blantyre, Lilongwe or Mzuzu EVD treatment centres. In Lilongwe the EVD treatment centre is being constructed at Kamuzu Central Hospital (KCH) by the Ministry of Health (MoH).

The scope of the project for all the sites, except Lilongwe include construction of the EVD pre-fabricated structure on a concrete base, construction of septic tanks, installation of incinerators, construction of ash pits and the construction of a safety fence around the treatment centre. For the Lilongwe EVD centre, the scope of work includes construction of a septic tank and an ash pit in addition to provisions for Ebola centre furniture.

As a requirement for all World Bank supported infrastructure development projects; and in consideration of the highly infectious nature of EVD, the project was screened for potential environmental and social impacts. The results showed that the construction activities of the EVD quarantine/treatment centres and the activities in the operation and maintenance phases will have moderate environmental and social impacts. The project was assigned to the World Bank’s category B projects. Hence, preparation of the Environmental and Social Management Plans (ESMPs) was recommended for all the seven sites. The screening and the preparation of the ESMP are also in line with the “Guidelines for Environmental Impact Assessment (EIA) for Malawi, 1997”.

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1.3. **OBJECTIVE OF THE ESMP**

The main objective of the ESMP is to provide measures to minimize adverse effects on the biophysical and socio-economic environment; during construction and operation of the Ebola Virus Disease (EVD) quarantine centre for Karonga District. The ESMP predicts and describes impacts of the project; and outlines the enhancement and mitigation measures to be implemented by Ministry of Health and other key stakeholders. These impacts were determined through consultations and field investigations carried out on and around the site earmarked for erection of the pre-fabricated Ebola quarantine centre; as well as key stakeholder consultations and input from the surrounding communities.

1.4. **SCOPE OF THE ESMP STUDY**

This ESMP is specifically for the identification of impacts related to construction and operation activities at the Ebola Quarantine Centre for Karonga; focusing on waste management during operation and maintenance phases. Preparation of the ESMP included the following activities:

- review of project reports, relevant literature and government regulations;
- identification and analysis of potential environmental and social impacts, which the project activities are likely to trigger and generate within and around the project site;
- determination of appropriate mitigation measures to minimize undesirable effects resulting from the proposed development;
- determination of costs of environmental management activities;
- preparation of an ESMP which details the negative effects of the proposed project activities on the biophysical and socio-economic environment; and
- recommendations for future environmental protection during operation and maintenance of the EVD quarantine centre at Karonga.

1.5. **ASSESSMENT METHODOLOGY FOR THE ESMP**

The following assessment methods were employed in order to prepare the ESMP:

a) field surveys to the construction site for the Karonga EVD quarantine centre, to appreciate the magnitude of project activities and determine their environmental and social footprint. The surveys facilitated the collection of biophysical and social data, and discussions with relevant stakeholders for Karonga District Hospital;

b) survey of the waste management facilities at the hospital (incinerators, placenta pits and solid waste disposal sites) to appreciate the existing waste management and infection control practices;

c) literature review on the policies, regulations and environmental standards for the ESMP preparation. The purpose of reviewing such documents was to develop a comprehensive and guided policy and legal framework so that the ESMP is responsive and aligned with government’s and financiers’ policies;

d) interviews with key stakeholders, including Karonga District Hospital Officer, Environmental Health Officer and Officers from the Karonga District Council;

e) interviews with key informants from the surrounding communities, affected directly or indirectly by the project; and

f) assessment of the socio-economic and the health-care systems data and prevailing national regulations, policies and standards.
CHAPTER 2 POLICY AND LEGAL FRAMEWORK FOR THE PROJECT

2.1 POLICIES

In Malawi, the overarching legislation is the 1996 Environment Management Act, currently under revision. The Malawi Guidelines for Environmental Impact Assessment were developed in 1997 and are also under revision. The Environmental Affairs Department determines whether an ESIA is required or not, for all projects. The Technical Committee on the Environment (TCE) reviews environmental impact assessment reports and makes recommendations to the Director, who reports to the National Council for the Environment (NCE). The NCE considers the recommendations and advises the Minister for approval and issuing the environmental certificate for the project to proceed. The Malawi national policies relevant to the activities for EVD preparation include:

2.1.1 The Constitution of the Republic of Malawi, 1995

The Constitution of the Republic of Malawi is supreme over any legal policy or Act in Malawi. Any Act of Government or any law that is inconsistent with the provisions of this Constitution shall, to the extent of such inconsistency, be invalid (Section 5). Hence the policies and legislation, relevant to the project activities have to be in line with the constitution.

In relation to the project, section 13 (c) dictates the provision of adequate health-care, commensurate with the health needs of the Malawian society and international standards of health-care. This is what the project as well as management of medical waste for the EVD aim to achieve. The proposed project must help improve rural life (section 13e).

Sections 13 (d) defines the role of the State as to manage the resources responsibly in order to prevent degradation of the environment, provide a healthy living and working environment for the people of Malawi, accord full recognition to the rights of future generations by means of environmental protection and sustainable development of natural resources and biodiversity of Malawi.

The proposed project at Karonga District Hospital must sustainably safeguard the people’s rights to a healthy living environment and protection of natural resources by ensuring that adverse impacts (particularly from medical wastes) on people and natural resources are avoided; and that mitigation measures are implemented for those impacts that cannot be avoided.


The Malawi Growth and Development Strategy II (MGDS II) is a decisive and strategic single reference document to achieve wealth creation through sustainable economic growth and infrastructure development. It acknowledges that a healthy population is key to increased productivity and sustainable economic growth. The following challenges facing the health sector are highlighted in the MGDS II: prevalence of preventable diseases, high mortality...
rates, high prevalence of HIV, high incidence of malaria cases, high incidence of TB cases, limited access to maternal health services, low institutional capacity and inadequate supply of essential drugs and health infrastructure.

The project will improve infrastructure in readiness for EVD and improve capacity in infection control and provision of health interventions. All these are in line with the MGDS II.

2.1.3 The National Environmental Policy, 2004

The National Environmental Policy (NEP) developed in 1996 and revised in 2004 advocates for sustainable social and economic development through sound management of the environment and natural resources. Areas of priority include efficient utilization and management of natural resources; through involvement of the private sector, NGOs and communities for sustainable environmental management. The policy empowers communities to protect, conserve and sustainably utilize the nation’s natural resources and advocates for enhancement of public awareness and promotion of public participation.

In line with the requirements of the NEP, the proposed project has included participation of the local communities in the identification of potential impacts and development of appropriate mitigation measures.

2.1.4 The National Environmental Action Plan, 2002

The National Environmental Action Plan (NEAP) of 1994, updated in 2002, provides a framework for integrating the environment into all socio-economic development activities of the country. It documents and analyses major environmental issues and measures to alleviate them; promote sustainable use of natural resources in Malawi; and develop an environmental protection and management plan. The NEAP identifies the following as key environmental issues to be addressed, in relation to the proposed project: soil erosion, water resources degradation, air pollution and climate change. The NEAP also outlines actions to be undertaken to ensure adequate environmental protection. Hence the project must aim to protect the environment by avoiding as many of the significant impacts as possible in the first place; and where this is not possible, mitigation measures are to be implemented through management plans and monitoring has to be done effectively.

2.1.5 The National Water Policy, 2005

The overall goal of the National Water Policy 2005 is to provide an enabling framework for sustainable management and utilization of water resources, to provide water of acceptable quality and in sufficient quantities; and to ensure availability of efficient and effective water and sanitation services for every Malawian. In line with this policy, the project developers and administrators must: advocate for efficient utilization and management of water resources; participate or support efforts towards water resources conservation, harvesting and protection; ensure and promote proper management and disposal of wastes; properly dispose material that can pollute water resources; promote public awareness on guidelines and standards for water quality, public health and hygiene as well as pollution control.
2.1.6 Guidelines for Environmental Impact Assessment (EIA), 1997

The EIA Guidelines of 1997 outline the process for conducting ESIA to ensure compliance with the ESIA process as required in the Environment Management Act 1996. The Guidelines contain a list of prescribed projects for which ESIA is mandatory and those that may require an ESIA; hence they assist in environmental screening. The Guidelines require that no licensing authority issues any license for a project unless the Director of Environmental Affairs (DEA) has given consent to proceed, on the basis of a satisfactory ESIA or non-requrement of an ESIA. The EVD quarantine centre for Karonga is being developed within the fenced and existing hospital premises. Hence it is an addition to the existing buildings and will comprise a pre-fabricated structure on a small area of land. An ESIA is not necessary in the case of this subproject.

2.1.7 National Construction Industry Policy, 2015

Construction of EVD quarantine centre triggers the Construction Industry Policy, whose broad policy goals include to promote environmental sustainability in implementation of construction projects. In accordance with the policy goal, project implementers must ensure that the contractor protects the environment, in line with national and international policies for environmental sustainability. Other focus areas include disaster risk management; occupational health and welfare; gender; and HIV and AIDS.

2.1.8 Infection Prevention and Control Policy, 2006

This policy was formulated to guide health facility operators in development and implementation of infection prevention and control programs. It emphasises infection prevention and control programs at various levels of health-care delivery system for the public and private sectors. The policy also stipulates that all health-care facilities in Malawi shall have an active IPC program in place; aimed at promoting IPC practices and surveillance focusing on clients, patients, health-care personnel and the environment. Infection control measures to be enforced in the event of EVD must be in line with the existing infection prevention and control programs in the respective hospitals.

2.1.9 National Sanitation Policy, 2007

The policy stipulates the need for delivery of improved sanitation services in Malawi. Some of the strategies for accomplishing this objective include: (1) providing adequate wastewater disposal facilities at all wastewater generation points and (2) ensuring adequate provision of wastewater treatment and disposal facilities for all new piped water supply connections. One of the specific goals in the National Water Policy (NWP), is to ensure water of acceptable quality for all needs in Malawi. Wastewater and solid waste will be generated in the EVD quarantine centre. The Ministry of Health must therefore ensure that there are adequate wastewater disposal facilities.
2.1.10 Decentralization Policy, 1998

The Decentralization Policy was adopted in 1998 to:

- Devolve administration and political authority to the district level;
- Integrate governmental agencies at the district and local levels into one administrative unit, through the process of institutional integration, manpower absorption, composite budgeting and provision of funds for the decentralized services;
- Divert the centre of implementation responsibilities and transfer these to the districts;
- Assign functions and responsibilities to the various levels of government; and
- Promote popular participation in the governance and development of districts.

Through the Decentralisation Policy, some of the roles of the authority at district level are to implement or facilitate development projects; to ensure development projects in their area are implemented in a sustainable manner; and to mobilize masses for socio-economic development at the local level. Therefore, for effective implementation of the project, the MoH must work closely with the Karonga District Council. The Decentralisation Policy also provides for provision of environmental services such as refuse disposal, sewage removal and disposal, environmental reclamation, and environmental education. MoH must use the existing environmental services where they are not in capacity.

2.1.11 Revised Decentralized Environmental Management Guidelines, 2012

The Decentralized Environmental Management Guidelines (DEMG) were adopted in 2012 to address gaps and inconsistencies from other previous guidelines including the DEMG, 2002 and help ensure that Councils include emerging and critical environmental issues in the preparation of district plans and actions. The DEMG aims at guiding stakeholders to manage the environment and natural resources in a sustainable manner.

In line with the Decentralization Policy, the DEMG promotes local level environmental management, including planning, implementation, monitoring and evaluation.

2.1.12 Malawi Standards (MS) 615: 2005: Waste within health-care facilities, handling and disposal (code of practice)

This standard provides criteria for segregation, collection, movement, storage and on-site disposal of waste within health-care units and biological research facilities, among others. These standards must be observed at the EVD quarantine centre. The hospital incinerators are being procured by the MoH in accordance with established international standards and no permits are required to have them installed or operated.

2.2 LEGAL FRAMEWORK

2.2.1. The Environment Management Act, 1996
The Act is the legal basis for protection and management of the environment; and the conservation and sustainable utilization of natural resources. Section 24, specifies the types and sizes of activities that require an ESIA before implementation. The Act further outlines the ESIA process to be followed in Malawi; and requires compliance with the process. Non-compliance with the ESIA requirements is an offence and attracts penalties.

The Act also recognises that improper waste disposal can impact various environmental and social resources and therefore regulates the management, transportation, treatment and recycling; as well as safe disposal of waste. The project, therefore, has to be implemented in an environmentally responsible manner to ensure protection of the environment and sustainable utilization of natural resources.

2.2.2. Public Health Act, 1966

The Public Health Act 1966 seeks to preserve public health through the following provisions relevant to the project:

- Parts III, IV, V, VI and VII discuss infectious and epidemic diseases and how to handle them. The Act dictates notifying the Ministry of Health, when diseases such as T.B., Cholera and Measles are identified. A full list of notifiable diseases is presented in Part III. Medical personnel, project managers and family members have to follow the provisions given in the Act, which among others include isolating the patients and allowing medical personnel to attend to the patients.
- Part IX of the Act relates to sanitation and prohibited nuisances. Contractors have to ensure that there are sanitary structures; vehicles and that any other materials used are not in a state that can cause accidents; machine smoke cannot cause injuries to health; and that all material defined as nuisance are not in the work place.
- Part X has provisions for conservancy; sewerage and drainage; and encourages new buildings to have sewage systems, either private or public (connecting to the local authority sewerage). The Act also guides the protection of sewerage systems by preventing the throwing or emptying of waste that may injure the sewer, affect free flow of contents or affect treatment of sewage.

The provisions of the Public Health Act are to be followed and any deviation from the Act is punishable by fines and imprisonment. The Act gives the local authorities the right to inspect any premises for compliance with the Act.

2.2.3. The Water Resources Act, 2013

The Water Resources Act of 2013 supersedes the 1969 Water Resources Act and aims at improving on already existing water resources management efforts in the country. The Act is administered by the Water Resources Authority under the Ministry of Agriculture, Irrigation and Water Development. The Act requires any developer discharging wastewater (effluent) into surface water ecosystems to have an “Effluent Discharge” permit. One of the conditions in the permit is the need to comply with discharge quality limits for effluent, in accordance with applicable Malawi Standards or any relevant international standards.
2.2.4. Occupational Safety, Health and Welfare Act, 1997

The Occupational Safety, Health and Welfare Act has provisions for the registration of a workplace and the regulation of the conditions of employment in workplaces; with regard to the safety, health and wellbeing of employees. The Act provides for inspection of plant and machinery, for the prevention of accidents in the workplaces, including government establishments and operations, as well as building and civil engineering construction works (Section 5). It requires that employees are provided with appropriate protective clothing and equipment to prevent accident and injury.

The project will comply with the Occupational Safety, Health and Welfare Act. Workers will have to be provided with appropriate protective clothing to prevent accidents related to the construction and operation functions; and breathing masks, ear muffs and goggles where they will be exposed to potential risks and offensive substances; as required by Sections 58, 59, 60.

2.2.5. National Construction Industry Act, 1996

The Act provides for the establishment of the National Construction Industry Council of Malawi (NCIC), for the promotion and development of the construction industry, registration of persons engaged in the construction industry in Malawi, co-ordination of training of persons engaged in the construction industry and general matters incidental thereto. The NCIC is responsible for regulating the construction industry in Malawi through among others: registering consultants and construction firms, standardising quality control, codes of practice, procurement process; and legal contractual procedures in liaison with other organisation. In accordance with the Act, the NCIC must be involved in identifying the contractors, ensuring that a quality contract is in place, resolving conflicts between contractor and client and ensuring that quality structures are developed.

2.2.6. The Local Government Act, 1998

The Local Government Act was enacted to further democratic principles, accountability, transparency and participation of the Malawian people in the decision making and development process. According to the Act, District Councils have the mandate to: promote infrastructure and economic development (Section 6 (c)); establish, maintain and manage services for the collection, removal and disposal of solid and liquid waste (second schedule 2(a). Construction and operation of the EVD quarantine centre will generate both solid and liquid waste; hence there is need for the developer and contactors to work with the relevant district councils in waste management and disposal in the project areas, in line with the provisions of the Act. During the operation phase medical and domestic wastes will be generated. It will be important to involve the respective district councils in the managing of these wastes.

The Local Government Act also provides for local governance structures through which this Environmental and Social Management Plan must be implemented. These include:

- The District Executive Committee (DEC), which is responsible for implementation of all aspects of the District Development Planning System (DDPS).
• The District Environment Sub-Committee (DESC), which is the focal point on issues of the environment. It acts as a multi-disciplinary forum for environmental management and comprises environmental and natural resources management sector district officers. Some of the functions of the DESC include appraising micro-projects and facilitating their development; conducting awareness campaigns on environmental and natural resources management; and developing capacity on sustainable environmental management at community level so that issues of environment are integrated into decision-making process and planning systems.

2.3 ADMINISTRATIVE FRAMEWORK

The mission of the Ministry of Health (MoH) is to raise the level of health of all Malawians by reducing incidences of illness and death of the population. To achieve this, the major objective of MoH is to deliver health services and disseminate health information to the general public. The MOH has the directorate of Administration, Finance, Technical Support Services, Planning and Policy Development, Clinical Services, Nursing Services, Reproductive Health, Physical Assets Management, Pharmaceutical Services and Preventive Health Services (PHS); and a number health institutions throughout Malawi.

The health institutions are categorised into referral (major) hospitals, district hospitals, health centres and clinics. MoH is headed by the Minister of Health who handles policy issues, while operational issues are handled by the Principal Secretary. At district level, there is the District Health Officer (DHO) who is responsible for effective and efficient delivery of quality health services in the district and the District Medical Officer (DMO) in charge of medical services.

Construction activities for the Karonga EVD quarantine centre are being implemented by the Department of Planning and Policy Development (DPPD) in the MoH, working hand in hand with the Ebola Coordination Unit under the directorate of Preventive Health. Management of the EVD quarantine centre during the operation phase will be done by the District Health Office, together with the Local Council and with assistance from the Ebola Coordination Unit.

2.4 THE WORLD BANK SAFEGUARD POLICIES

The World Bank has keen interest in protection of the environment, for investment projects they support, in line with its ten environmental safeguards policies. These policies provide guidelines aimed at preventing and mitigating undue harm to people and the environment, when implementing development projects.

The environmental safeguard policies which provide a platform for the participation of stakeholders in project design and implementation, are:

a) Environmental Assessment (OP/BP 4.01)

b) Forests (OP/BP 4.36)

c) Involuntary Resettlement (OP/BP 4.12)

d) Indigenous Peoples (OP/BP 4.10)
This project triggers OP 4.01 on Environmental Assessment. This is because moderate environmental and social impacts are anticipated, since the construction works and waste management activities will be primarily confined to within the existing hospital building premises.

2.4.1. Environmental Assessment (OP/BP 4.01)

The objective of Environmental Assessment Operational Policy is to ensure that project activities are environmentally sound and sustainable; and that decision-making is improved through appropriate analysis of actions and mitigation of their likely environmental and social impacts. This policy is triggered if a project is likely to have potential adverse environmental and social risks and impacts in its area of influence. *Construction of the EVD Treatment Centre may have negative environmental impacts, which require mitigation. Hence this ESMP has been prepared for management of the anticipated impacts.*
CHAPTER 3  DESCRIPTION OF THE PROJECT AND COMPONENTS

3.1 THE EVD QUARANTINE CENTRE FOR KARONGA

The Ebola Virus Disease preparedness activities in Malawi include the development of Ebola Virus Disease quarantine centre and dedicated septic tank, high temperature incinerator, ash pit and security fence at Karonga District Hospital. The centre will be used to screen and isolate suspected EVD cases. When the suspected cases are confirmed, they will be transferred to the referral centre which will be constructed in Mzuzu Central Hospital for treatment.

The EVD quarantine centre has been designed by the Ministry of Health (MoH) by adapting World Health Organisation specifications for Ebola quarantine/treatment centres. The main consideration in the design is infection prevention and control. Hence careful attention has been paid to isolation (case – case, patient-health care worker, case – visitor), ventilation of the facility, hand hygiene, safe water supply, sanitation and waste management. This is supported by fund allocations under Component 1 of this project for infectious disease management training and surveillance programs targeting district health officials, frontline staff and community.

It will have a floor area of 20.565 by 13.260 meters and the main rooms in the facility are as provided in table 3.1.

Table 0.1: Main rooms in the Karonga EVD Quarantine Centre

<table>
<thead>
<tr>
<th>No.</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Nurses Station</td>
<td>To be used as an office for nurses. The room has no direct door to the isolation ward as an infection control measure.</td>
</tr>
<tr>
<td>2.</td>
<td>Change room</td>
<td>Nurses, doctors and other staff will be using the room to change from their clothes and wear personal protective kit (e.g. the Ebola Suit)</td>
</tr>
<tr>
<td>3.</td>
<td>Decontamination Room</td>
<td>To be used for decontamination of the PPE after attending to suspected/confirmed cases</td>
</tr>
<tr>
<td>4.</td>
<td>Isolation Ward</td>
<td>It is divided into two parts – for 3 confirmed cases and 3 suspected cases. The beds will be isolated from each other using curtains.</td>
</tr>
<tr>
<td>5.</td>
<td>Drug store</td>
<td>For keeping drugs</td>
</tr>
<tr>
<td>6.</td>
<td>Sluice Rooms</td>
<td>For sluicing used linen and other items before being dispatched from out of the isolation ward.</td>
</tr>
<tr>
<td>7.</td>
<td>Toilets</td>
<td>A number of toilets are included in the design. 1 for nurses, 2 for suspected cases and 1 for confirmed cases. 4 Hand washing basins have also been included in the designs.</td>
</tr>
<tr>
<td>8.</td>
<td>Stores</td>
<td>For keeping materials for use in the centre.</td>
</tr>
</tbody>
</table>

The centre will not have laboratories. Hence, specimen will be transported to the referral centres. The floor plan for the EVD quarantine centre is given in figure 3.1.
Figure 0.1: Ebola shelter in border District
3.2 WASTE DISPOSAL SYSTEMS

3.2.1. Liquid Waste Disposal

According to the WHO guidelines, all liquid waste from an EVD quarantine/treatment centre is not supposed to go into the public sewerage system. Therefore, a separate septic tank will be constructed for the EVD Centre at Karonga District Hospital.

The septic tank is the typical two chamber septic tank and a soak-pit. The design provides for specifications which are to be strictly adhered to during construction. Among others, these specifications include the size of the tank, cement mix ratios, walls thickness, materials to be used and the suitability of different types of soils for effluent disposal. Coarse sand or gravel with no clay silt is specified for disposal of effluent from the soak-pit. The specifications in general, aim at ensuring that there are no pollution effects. The design of the septic tank is provided in figure 3.2.
Figure 2: Designt of Septic Tanks
3.2.2. Solid Waste Disposal

All solid waste from the EVD Quarantine Centre is considered infectious. Hence, all the solid wastes will be treated in an incinerator and the ash will be disposed in a well-covered ash pit to be constructed near the incinerator. The architectural design of the ash pit is provided in annex 4.

It is recommended that international industry best practices related to hazardous waste incineration are followed in accordance with the World Bank Group’s environmental, health, and safety technical (EHS) guidelines for health care facilities as well as the General EHS Guideline. Considering the infectious nature of the wastes, the expected volume and the air pollution impacts of incineration, the following specifications have been proposed for the incinerator.

Table 0.2: Specifications of the incinerator for the EVD Treatment Centre

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational temperature</td>
<td>950 - 1320°C</td>
<td>To be able to incinerate various type of wastes</td>
</tr>
<tr>
<td>Chambers</td>
<td>2 chambers, the second chamber equipped with an afterburner</td>
<td>The second chamber will allow for re-burn of harmful emissions</td>
</tr>
<tr>
<td>Chimney</td>
<td>High, designed in accordance with Good International Industry Practice – See General EHS Guideline Annex 1.1.3</td>
<td>To ensure that smoke does not have a negative impact in the surrounding buildings.</td>
</tr>
<tr>
<td>Waste loading</td>
<td>Top loading</td>
<td>To allow for retention of liquids</td>
</tr>
<tr>
<td>Operation</td>
<td>Mechanical and air controlled</td>
<td>To ensure optimal combustion</td>
</tr>
<tr>
<td>Suggested batch size</td>
<td>150 – 200 kg</td>
<td>To be able to take in a large volume of waste that would be expected during an outbreak.</td>
</tr>
<tr>
<td>Burn rate</td>
<td>100kg per hour</td>
<td>In the event that there is a lot of waste, a quick burning rate will ensure that the waste storage time is minimised.</td>
</tr>
<tr>
<td>Average fuel consumption</td>
<td>Efficient</td>
<td>To ensure operational costs are minimised</td>
</tr>
<tr>
<td>Average emissions</td>
<td>According to European Union standards as provided in table 3.3</td>
<td>To reduce air pollution</td>
</tr>
</tbody>
</table>

2 The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group’s EHS Guidelines for Health Care Facilities can be found at: http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169 and the General Environmental Health and Safety Guideline can be found at http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES
Table 0.3: Average emissions/EU standards on basic incinerators (with secondary chamber)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limits (1/2 hr. avg.)</th>
<th>Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dust</td>
<td>30 mg/m³</td>
<td>12 mg/m³</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>200 mg/m³</td>
<td>24 mg/m³</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>400 mg/m³</td>
<td>60 mg/m³</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>100 mg/m³</td>
<td>78.3 mg/m³</td>
</tr>
</tbody>
</table>

3.3 CONSTRUCTION MATERIALS

Construction Materials for the EVD Quarantine Centre as specified by the Architect includes the following:

Table 0.4: Construction Materials for the EVD Quarantine Centre

<table>
<thead>
<tr>
<th>Structure</th>
<th>Characteristic feature</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>Concrete slab with cement finish</td>
<td>cement, sand, concrete, wire mesh, damp proof membrane</td>
</tr>
<tr>
<td>Wall</td>
<td>Windows and wall</td>
<td>Prefabricated panels, steel windows, and Insulators</td>
</tr>
<tr>
<td>Roof</td>
<td>Roof sheets and trusses</td>
<td>Corrugated iron sheets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steel trusses</td>
</tr>
</tbody>
</table>

The prefabricated materials including windows and still framework have been imported from South Africa; whereas sand, paints, cement, concrete, wire mesh and damp proof will be sourced locally.

3.4 CONSTRUCTION WORKS

Construction activities at the site started in December but were stopped after the construction of the slab (see figure 3.3), to ensure that the environmental and social management plans are in place. The construction activities were planned for a 4 Months period; but another 4 months have been added.

Figure 0.3: Concrete floor slab for the Karonga EVD Treatment Centre
3.5 LABOUR FOR CONSTRUCTION
One international contractor has been engaged by the Ministry of Health to construct the EVD treatment/quarantine centres in all the sites except at Kamuzu Central Hospital in Lilongwe District. The contractor has subcontracted a local construction company to construct the concrete slabs.

Considering the small size of the EVD quarantine centre and that prefabricated materials are being used, a small team is engaged for the construction activities. About 10 locals will be employed as labourers for the Karonga District Hospital EVD centre project.

CHAPTER 4 ENVIRONMENTAL AND SOCIAL SETTING

4.1 BIO-PHYSICAL CHARACTERISTICS

4.1.1. Location of the project

Karonga District is located in the Northern Region of Malawi about 226 Kilometres from Mzuzu City, the largest urban centre in the Northern Region; and is about 590 kilometres North of Lilongwe, the Capital City of Malawi. It is bordered by the districts of Rumphi to the South, Chitipa to the West, Lake Malawi to the East and the United Republic of Tanzania to the North (See figure 1.1 on page 3). The proposed site for the EVD Quarantine Centre is within the premises of Karonga District Hospital at the Boma. Figure 4.1 shows the map of Karonga and the location of the district hospital. The site is at approximately 36L 599884m E and 36L 8899567m S coordinates. Figure 4.2 is the Satellite image of Karonga District Hospital and the proposed site.

![Figure 4.1 Map of Karonga and the location of the district Hospital.](image)
4.1.2. Site Accessibility and Selection

The hospital is accessible through an unnamed road that branches to the west of the M1 road and goes to Karonga Airport. It is about 0.5 km from the M1 road and the distance from the hospital to Karonga Airport is about 2 km.

The site for the proposed EVD Quarantine Centre is inside the fence of the district hospital and at the back of the hospital. The District Health Office selected the site upon considering accessibility of medical staff to the EDV Quarantine Centre and isolation of EVD cases. Since it is inside the hospital, it would be easy for medical staff to access it; and at the same time, the site is away from the patients’ wards; hence it would be easy to isolate Ebola cases. There was limited community involvement in the selection of the site.

An alternative site at Iponga, near the border post to Tanzania was considered during the recent EVD outbreak in East Africa but was never developed. Communities were involved during the assessment of this site, which was generally favoured as there are no nearby settlements. However, the site within the hospital premises was considered more favourable as it is easily reachable by the hospital staff for case management. In this regard,
it is important to explain to the communities, the reasons for selecting this site and there is need to sensitize them on how the Ebola Virus spreads and how it can be controlled.

4.1.3. Topography

Karonga District is characterised by the three topographical zones of:

1. The Karonga Lakeshore Plain – a flatter area at an altitude of 473 m – 550 m between Karonga Town and Mwangurukuru Trading Centre;
2. Songwe Valley at the north – an area characterised by floodplain and swamps, which are waterlogged almost throughout the year; and
3. Karonga Escarpment, where the altitude increases from east to west, starting from 500m above sea level where it borders the lakeshore plain and reaching 1,500m to the west.

Karonga District Hospital is in the lakeshore plain at an average elevation of 499m above sea level. The project site is flat and this will result in reduced landscaping activities; hence reduced costs and soil erosion. Figure 4.3 is the topography map for the area.

![Figure 4.3: Topography of Karonga Town and the proposed site](image)

4.1.4. Seismicity
Both the Karonga Lakeshore Plain and Songwe Valley fall within the floor of the East African Rift Valley. This is an area characterised by tectonic rifts and earthquakes. The 2009 December earthquake reached a magnitude of 6 on the Richter scale and displaced 3000 people. At Karonga District Hospital the earthquake damaged the water storage tank shown in figure 4.4. Hence the EVD Quarantine Centre must be designed and constructed with consideration of earthquake impacts.

Figure 0.4: A water tank damaged by the 2009 earthquake

4.1.5. Water Resources

Major rivers in the district, among others, include Songwe, Kyungu, Lufira, North Rukuru, Lwasyo, Was and Kasimbi. These rivers flow from the high areas in the west to the east, draining into Lake Malawi. There are no major rivers or streams within a kilometre of the project site. Considering the size of the project, it is therefore anticipated that any impact of the project activities on surface water resources will be moderate and manageable.

According to the hydrological map for Malawi in figure 4.5, Karonga lies in a moderate to very high aquifer area. The water table depth is mainly between 5m and 10m below the ground surface. The water table at the site for the proposed EVD Quarantine Centre is high and impact on ground water is highly possible.

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3 Map source: http://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Malawi
4.1.6. Soil

The project area is characterised by alluvial soils, grey to brown in colour. They are non-stony and non-rocky on the surface, deep (about 150 cm deep) and moderately drained (permeable). The soils are also characterised by moderate ponding which may occur during the operational phase of the project. Chemical properties include a pH ranges of 5.5 to 6.5, non-saline, low phosphorus and nitrogen and medium potassium.

4.1.7. Vegetation

The project site is characterised by grass, Cassius trees (*Senna siamea*) and ornamental shrubs. There is also an *Adansonia digitata* (baobab) tree near the slab for the structure as can be seen in figure 4.6.

Three (3) Cassius trees were removed during the site clearing activities for the slab. Since trees have been cut down as a result of activities related to the EVD treatment centre construction, replacement trees must be planted on a two for one basis. Site clearing for
other structures such as car park and access road is expected to result in insignificant impacts on the vegetation.

4.1.8. Air Quality

The air quality for Karonga Town is generally good as there are no major industries and the number of cars is small as compared to the Cities in Malawi. However an increase in cross-border trade between Malawi and Tanzania and the increase in the importation of Japanese used vehicles contribute to the increase in the number of vehicles transiting from the Dar es Salaam port of Tanzania to Lilongwe and other parts of Malawi. Karonga town has recently been developing fats due to the mining activities at the Kayekera uranium mine. These activities could contribute to increased air pollution. At the district hospital, localised air pollution results from smoke from the incinerator and from burning of wastes in an open pit.

4.1.9. Climate

The climate for Karonga District is tropical, with the highest rainfall in the summer. The average annual temperature is 25.1 °C, November being the warmest month with an average temperature of 27.8 °C. July the coldest month with 22.3 °C as the average temperature.

The annual precipitation is about 1170mm. The driest month is September, when the district receives about 1mm of precipitation. The wettest month on the other hand is March when precipitation reaches its peak, with an average of 315mm. Figure 4.7 shows average monthly rainfall and temperatures for Karonga District.
During the rainy season, high rainfall events (up to 24 hours of rain) are usually expected in Karonga District. These burst the river banks of North Rukuru and Songwe, resulting in flooding; displacing people and destroying property. While the floods do not reach the Boma, the hospital operations are affected as staff has to attend to the flood victims and those affected by water related diseases. The hospital must therefore be well prepared for such incidences and ensure activities of the EVD Centre are not compromised.

4.2 SOCIO-ECONOMIC CHARACTERISTICS

4.2.1. Population

As at the 2008 census, Karonga District had a total population of 269,890; of which 139,591 were males and 139,299 were females. The population is distributed among the Traditional Authorities (TA), Sub Traditional Authorities (STA) and Karonga Town as in table 4.1. The project site is in the area of TA Kyungu.

<table>
<thead>
<tr>
<th>TA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA Kilupula</td>
<td>61,648</td>
</tr>
<tr>
<td>STA Mwakaboko</td>
<td>19,360</td>
</tr>
<tr>
<td>TA Kyungu</td>
<td>66,318</td>
</tr>
<tr>
<td>TA Wasambo</td>
<td>54,015</td>
</tr>
<tr>
<td>STA Mwirangómbe</td>
<td>28,215</td>
</tr>
<tr>
<td>Karonga Town</td>
<td>40,334</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>269,890</td>
</tr>
</tbody>
</table>

The population is increasing and according to the National Statistical Office (NSO), the 2016 projected total population is 348,110 (170,793 males and 177,317 females). While the EVD Quarantine Centre is designed for 6 cases, it is anticipated that the population size and growth will not result in immediate problems as the Centre will mainly be used for screening
and isolation of cases. However, in the case there is an outbreak, the EVD preparedness activities have included tents which can be quickly erected.

4.2.2. Migration

From the 2008 NSO population census, the net-lifetime number of migrants in Karonga District was -6,198. This means there were more out-lifetime migrants than in-lifetime migrants. The National Statistical Office defines lifetime inter-district migration as migration that has occurred between birth and the time of the census within the country. According to the NSO, many people migrate to the four Cities of Mzuzu, Lilongwe, Blantyre and Zomba.

Common reasons for migrating within the country include work, business, farming, mining, school and marriages. People in Karonga migrate due to similar reasons. Political conflicts in the Eastern African countries of Somalia and Burundi have also contributed to migration of people seeking refuge and political asylum. There is a temporary shelter at Karonga Border for refugees, from where they are sent to Dzaleka Refugees Camp in Dowa District.

The border post in Karonga is at Songwe and it lies side by side with the Kasumulu Border Post on the side of Tanzania. The border post, which is a gateway to Tanzania and East Africa, registers a large number of inflows and outflow of people mainly for business. Dar es Salaam, the largest port city in Tanzania, is an important trading destination for Malawian importers. However some people use unchartered routes to enter or leave Malawi illegally.

The Karonga District Health Office has a health worker at Songwe Border post, to be conducting EVD screening on people entering and leaving Malawi. However, illegal immigrants may pose a threat to this program. Therefore the EVD preparedness activities must include sensitizations to encourage the locals to report any suspected illegal immigrants.

4.2.3. Economy

Karonga District economy is based on agriculture, fisheries, forestry, mining, commerce and industry, labour /employment and tourism. Karonga Town has banks, lodging houses, markets, government offices and non-governmental organizations offices. The construction and operation activities of the project will have an insignificant impact on the economic activities in the district as the construction team is very small and most of the prefabricated construction materials are imported.

4.2.4. Electricity, Water Supply and Telephone Services

Electricity in Karonga District is supplied by Electricity Supply Corporation of Malawi (ESCOM) from the Wovwe Mini Hydro Power Generation Plant. However as a result of a high demand as compared to generation and inadequate maintenance of the electricity supply system, Karonga Boma and the surrounding project area experience intermittent supply of electricity. The district hospital has a backup electricity generator which is used when there is no electricity. However it is expensive to run as it uses 20 litres of diesel for about an hour.
Water is supplied by Northern Region Water Board (NRWB). The board also relies on ESCOM for power for the pumps; hence there is also intermittent water supply. Boreholes and shallow wells are also sources of water supply in the district. The hospital has neither a borehole nor any other alternative water source. The hospital’s water storage tank was damaged during the 2009 Karonga earthquake and it is currently not in use, pending completion of maintenance works currently being done.

Telecommunications services are supplied by the Malawi Telecommunication Limited (MTL) and mobile phone networks (AIRTEL, TNM and ACCESS). The phone companies also provide internet services.

4.2.5. Health Services

Like in other districts, the health-care services in Karonga District are provided at the three levels of: district hospital, health centre/dispensary and community levels. Of great importance in these levels of health-care service delivery are the referral and communication systems. There are also ambulances which take referral cases from health centres to the district hospital and from the district hospital to Mzuzu Central Hospital.

Major health problems in the district include Malaria, tuberculosis, pneumonia and Diarrhoea. Diarrhoea and more especially cholera, are usually common during the rainy season as a result of flooding and poor water and sanitation in some parts of the district.

4.3 KARONGA DISTRICT HOSPITAL SPECIAL CHARACTERISTICS

4.3.1 Existing Infrastructure and Services

Karonga District Hospital is a standard district hospital comprising of an administration block, an out patients (OPD) and registration department, a drug store, a laboratory, theatres, paediatric wards, gynaecology/antenatal maternity ward, male and female medical/surgical wards, male and female TB isolation wards, a kitchen, a laundry, a mortuary and a mourners shed. It has a bed capacity of 208 patients but it usually admits more than this number.

The hospital was opened in 1988 and some of the infrastructure has deteriorated. However, most of the infrastructure is in good condition due to regular maintenance. There are some new structures that are being built at the hospital including an Antiretroviral Therapy Centre and a Counselling Centre. There are also plans to build a new TB isolation ward. The hospital is enclosed in a brick fence.

4.3.2 Waste Management Services

4.3.2.1 Liquid Waste

Liquid waste management is through septic tanks and each hospital department has its own septic tank. These septic tanks are supposed to be emptied twice in a year, in order to
minimise contamination, as the water table is high in the hospital area. However sometimes emptying is not done due to inadequate funding.

4.3.2.2 Solid Waste

Solid waste is segregated into sharps, infectious wastes, non-infectious wastes and food wastes at the point of generation; and is collected in appropriately labelled receptacles or bins. When full, the receptacles are emptied in wheelie bins which are taken to the waste disposal area twice a day (in the morning and in the evening). Waste management is done by hospital support staff.

The waste disposal area has an old two door brick incinerator, an open pit and a placenta pit enclosed in a fence (see figure 4.8). Sharps and infectious wastes are incinerated and ash is disposed in the open pit.

![Incinerator and an open waste disposal pit](image)

The incinerator is rarely used as compared to the open pit, as evidenced by the burning of infectious wastes (e.g. gloves and body fluid tubes) in the open pit. Segregation of wastes is also inadequately done. Smoke from the open pit reaches the nearby guardian shelter and affects people outside the hospital fence. There is no permanent staff stationed at the incinerator and it was established that dogs sometimes enter the disposal area.
CHAPTER 5  IMPACTS OF THE PROJECT AND SIGNIFICANCE RATING

Impacts of the project are defined as changes on the environmental and social components, resulting from implementation of proposed project activities. These impacts are classified as negative and positive. Impacts for the project activities were identified as follows:

5.1 IDENTIFICATION OF IMPACTS

5.1.1. Literature review

The consultant reviewed a number of documents including the World Health Organisation (WHO) manual for the care and management of patients in Ebola Care Units. The list of documents reviewed is indicated in the references. The documents were reviewed to assess the conditions of the socioeconomic environment in which the project will be implemented and to describe the activities during the operational phase. WHO has guidelines for environmental management and infection control in Ebola Units and these were also reviewed and have been considered in the mitigation measures for the project impacts.

5.1.2. Site Investigations

Site investigations were carried out to complement the literature review. The consultant specifically conducted the assessments at the hospital, visited the project site and access areas, the waste disposal area, the nearby stream and the water supply system. The investigations focussed on identification of critical environmental and socio-economic elements likely to be affected during construction and operation of the project.

5.1.3. Stakeholder Consultations

Stakeholder consultations were conducted on 11 February with key hospital staff including the District Health Officer, District Medical Officer, Environmental Health Officer and others. The list of people consulted is provided in annex 2, while main issues raised are presented in annex 3. During the consultations, the community was presented by the ward councillor for the area.

5.1.4. Study of satellite images

Satellite images were produced for assessment of fine details of the site. This was important as project area of influence is too small to be fully assessed on conventional maps.

5.2 DESCRIPTION OF POSITIVE IMPACTS

5.2.1. Positive impacts during planning phase

The main activities during this phase include:

i. Training and sensitizations;
ii. Designing of the EVD quarantine centre;

iii. Assessment of existing infrastructure;

iv. Identification of contractor;

v. Identification of the project site; and

vi. Moving of the power lines.

Most of the activities have already started and the following were identified as positive environmental and social impacts:

5.2.1. Increased knowledge and skills in infection control and prevention

The hospital staff that attended the training and sensitization in Ebola Virus Disease case management, infection control and waste management acquired knowledge and skills which can be applied to the management of other infectious diseases. These efforts will be further supported under the infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members that are a part of this Ebola response project.

The following measures can help enhance the impact:

i. Ensure that the trainings are continuous and that many more people are trained and sensitised;

ii. Conduct simulation exercise to firm up EVD response in case there is an outbreak.

iii. MoH must use set communication channel and procedures when selecting people to participate in trainings;

iv. Trained people must be encouraged and motivated to be available during an outbreak; and

v. Ensure that the Health Care Waste Management Plan completed for the Nutrition and HIV/AIDS Project is implemented and followed to address potential environmental and health impacts due to operational activities.

5.2.2. Positive impacts during construction phase

Main activities during the construction phase include:

i. Site clearing and digging of the foundation;

ii. Construction of a concrete slab;

iii. Installation of prefabricated walls;

iv. Roofing of the building;

v. Excavation for the septic tank; and

vi. Construction of the septic tank as well as installation of incinerators.

The following are the anticipated positive impacts:

5.2.2.1. Employment opportunities

The construction works will provide employment opportunities for the local people, although this will be short term and very few locals will be employed (about 10 people). During operation, the facility may also require skilled personnel (e.g. nurses and laboratory assistants); and unskilled workforce (e.g. guards and cleaners).
Enhancement Measures

i. The international contractor must observe local labour laws; and
ii. Workers must be paid fairly for the services rendered.

5.2.2.2. Acquisition of skills in construction of prefabricated buildings

The main contractor is from South Africa, but local labourers will be engaged. The local labourers are expected to acquire new skills from their counterparts through observation and on the job training. To enhance the impacts, the contractor must be encouraged to provide on job training to the labourers.

5.2.2.3. Income to material/ equipment suppliers

Construction of the treatment centre will require cement, sand and concrete. This will provide business opportunities for local materials suppliers; hence increased income opportunities. The impact can be enhanced by paying suppliers within the agreed times.

5.2.3. Positive Impacts during the Operation and Maintenance Phase

5.2.3.1. Increased rooms for medical services

The EVD Quarantine centre will be an additional infrastructure to the hospital and hence increase in the space for medical services. Since currently there is no EVD outbreak in Malawi, the EVD Centre structure can be used for other epidemics, thereby supplementing the use of tents for outbreaks and diseases including cholera. The new structure will also improve the appearance of the hospital.

Enhancement Measure

The impact can be enhanced through:

i. Taking proper care of the EVD Quarantine Centre; and
ii. Ensuring the Centre is not misused and is readily available when needed for EVD.

5.2.3.2. Improved medical services

It is anticipated that there will be improved medical services due to the following:

i. Training and sensitization in infectious diseases management;
ii. Medical supplies and equipment that will be made available in readiness of EVD;
iii. An ambulance and utility vehicle that may be provided to the hospital for EVD. In the event that there is no Ebola Virus Disease, the ambulance and utility vehicle can be used for other infectious diseases.

The impact can be enhanced by:

i. Periodic evaluation of the training and subsequent review of curricula;
ii. Ensuring that EVD preparedness equipment is used properly (i.e. staff and equipment for an EVD outbreak should be readily available when needed).
5.3 DESCRIPTION OF NEGATIVE IMPACTS

5.3.1. Impacts during the planning and design

There will be no significant impacts on the biophysical and socio-economic environment in the phase as the activities are limited to predominantly desk work.

5.3.2. Impacts during construction

5.3.2.1. Accidents to workers, staff and the public on the construction site

Accidents to staff, patients and the general public on the construction site may occur during construction. Sources of accidents may include electric shocks during welding, objects falling on people, workers falling from heights, nailing or hammering oneself and injuries from lifting and carrying building materials. The general public and animals may also be exposed to risks of falling into open trenches, especially outside the contractor’s working hours. Mitigation measures include to:

- Train workers on prevention and managing incidences;
- Restrict hospital staff and public from going to the construction site during and outside working hours by placing posters, reflecting tapes and erecting barriers;
- Workers must wear protective gear; and
- Provide first aid kit.

5.3.2.2. Utilizing unlicensed quarry sites

Construction of the treatment centre will require cement, sand and concrete. Indiscriminate mining activities can take place in sensitive areas and create depressions that often block surface drainage system and create pools of stagnant water. Such pools of stagnant water are breeding grounds for mosquitoes.

Mitigation measures include:

- Identify licensed quarries with the suitable materials for construction.
- Procure construction material only from permitted sites and licensed / authorized quarries

5.3.2.3. Use of lead-based paint products

Lead is commonly absorbed into the body by inhalation from use of and/or scrapping of lead-based products like paint. When workers breathe in lead as a dust, fume, or mist, their lungs and upper respiratory tract absorb it into the body. They can also absorb lead through the digestive system if it enters the mouth and is ingested.

Mitigation measures include:

- Ensuring that no paint containing lead or lead products are used.
• Provide facemasks to workers if a surface with lead paint is rubbed and scraped for removal.

5.3.2.4. Noise disturbances

Noise disturbances may result from metal fabrication activities and from other machinery. The noise will be a source of discomfort to the construction team and the users of the pharmacy, the cholera shelter and the nearby ward. The construction team may also make significant noise (through loud chatting) which can be a disturbance to others.

Mitigation measures include:
• The Hospital Administrator must sensitize the contractor to minimise noise;
• The contractor must use efficient machines that do not make loud noise;
• The contractor must provide appropriate PPE (e.g. ear muffs) to workers;
• The contractor must ensure that noisy activities, which cannot be avoided, are limited to normal working hours.

5.3.2.5. Risk of Spread of STIs and HIV/AIDS

Enhanced social interaction with the construction employees, most of whom are likely to come from other parts of the country, with the residents (considering the influence of money) is a potential avenue for transmission of HIV/AIDS and other social infections.

Mitigation measures include to:
• Awareness meetings shall be conducted as a part of all construction employee orientation programs; and
• Employees shall be provided with condoms for protection from STIs.

5.3.2.6. Increased costs of electricity and water

An increase in the cost of electricity and water may occur due to the contractor using the utilities from the hospital supply lines. This can be a source of conflicts, considering that the hospital is underfunded and therefore is likely to have problems to pay additional utility charges.

To avoid or mitigate the impact:

• A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration; and
• The contractor should provide a separate diesel generator to be used during construction of the EVD centre.

5.3.2.7. Waste generation

Solid waste will be generated at the site during construction. The waste may consist of metal cuttings, excavated materials during digging of foundation, paper/cement bags, empty paint and solvent containers and broken glass among others. Some of the wastes may be hazardous to the environment e.g. paints and cement while others like plastic are not biodegradable.
To avoid or mitigate the impact:

- Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers;
- Incinerate/burn segregated infectious wastes; and
- Designate appropriate disposal sites in the contract and cost unit disposal rates accordingly.

5.3.2.8. Water pollution

Water pollution is likely to result from cement, paints, lubricants and fuels where these fall or spill onto the ground.

The impact can be mitigated by:

- Lining surfaces where cement, paints and oils will be stored to catch spillage;
- Lining or covering the floor during painting and use of lubricants;
- Sensitizing the workers to appropriately manage construction materials and wastes; and
- Proper supervision of the workforce.

5.3.2.9. Removal of vegetation

Construction of the slab resulted in the removal of vegetation including grass, ornamental shrubs and one *Senna siamea* trees. About 2 more trees (*Adansonia digitata* and *Senna siamea*) and a shrub, shown in figure 5.1, are expected to be removed during the site clearing and landscaping activities for a car park and the general construction area.

*Figure 0.1: Two trees and a shrub that will be removed*

*Adansonia digitata* trees are indigenous trees but common in the area, while the *Senna siamea* and the shrubs were planted by the hospital and can be easily replanted; hence the impact is less severe. To mitigate the impact, the following should be done:

- Transplant trees and ornamental shrubs in the same or other nearby areas;
• Replace felled trees on a two for one basis (two replacement trees for each removed) and ensure that indigenous trees are selected; and
• Ensure landscaping design considers where hospital expansion activities are likely to occur in the near future.

5.3.3. Impacts during Operation and Maintenance

Activities during operation and maintenance phase include:

i. Site clearing and landscaping
ii. Receiving and isolation of suspected EVD cases and provision of health-care to EVD suspected or confirmed cases or to persons infected by other infectious diseases
iii. Specimen handling (collection and transportation) for the referral centre in Mzuzu; and
iv. Waste management (collection, transportation, treatment and disposal).

significant negative impacts anticipated during this phase include:

5.3.3.1. Fear of being infected

EVD is a highly infectious disease that causes fear of being infected among the workers and the general public. When suspected or confirmed cases are reported, there is likely to be anxiety and fear among the hospital staff, patients and the community. During the stakeholder consultations, it was established that communities wanted the EVD quarantine centre to be at a site with no settlements for fear of infection. Without proper sensitization, the people may continue to be afraid.

To avoid or mitigate the impact the following measures must be taken:

• Conduct adequate sensitization and awareness meetings with staff and the surrounding community on how the EVD may be contracted and transmitted; and on infection control and health-care practices for patients;
• Train staff on Occupational Safety and Health and Infection Control; and
• Frequently update the public on the activities in the EVD Quarantine Centre.

5.3.3.2. Air pollution and operational risk from incineration of wastes

Currently the hospital has an incinerator which has been operational since opening of the hospital. However, the incinerator is old, inefficient and is a source of air pollution.

During operation, the EVD Quarantine Centres will be generating healthcare wastes, which will be burnt in the incinerator, contributing to increased air pollution. The project development plans have included an incinerator, which produces low smoke and emissions (carbon dioxide (CO₂), sulphur dioxide (SO₂) and nitrogen oxides (NOₓ)). These emissions, together with those from other sources, accumulate in the air over a long period of time. The smoke will also be a nuisance to the community surrounding the EVD Quarantine Centre.
During the consultations it was also established that there is shortage of fuel for the incinerator and this results in increased smoke and emissions from incomplete combustions. Inadequate sorting of waste also means that some incombustible waste ends up in the incinerator and contributes to production of smoke.

To mitigate the impact, the following measures should be implemented:

- Install a high temperature, mechanical incinerator as specified for the EVD Centre;
- Ensure that good international industry practices related to hazardous waste incineration are followed in accordance with the World Bank Group’s environmental, health, and safety technical (EHS) guidelines for health care facilities.5
- Adequately budget for fuel for the incinerators;
- Sort the waste to ensure that only the right type of wastes go into the incinerators;
- Train staff on how to operate the incinerators;
- Regularly maintain the incinerators to ensure they are working properly;
- Orient laboratory and healthcare staff to the infection control and waste management practices; and
- Plant trees around the incinerator to absorb carbon dioxide from the incinerator.

5.3.3.3. Water pollution

Spillages of wastewater and chemicals from the EVD Quarantine Centre, onto ground surfaces and eventually into groundwater may occur. Moreover the area has a high water table increasing chances of ground water pollution.

The EVD Quarantine Centre will use a septic tank and a soak-pit, which can also be a source of surface and ground water pollution. Overflows and/or outflows through either the manholes or broken pipes; and through leaks may also occur.

To mitigate the impact:

- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank;
- Only licensed waste collectors shall be employed for this disposal;
- Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;
- Construct the septic tank according to the design specifications;

5 The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry- specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group’s EHS Guidelines for Health Care Facilities can be found at: http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169 and the General Environmental Health and Safety Guideline can be found at http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2B Ambient%2BAir%2BQuality.pdf?MOD=AJPERES
• Properly site the soak-pit ensuring that there are no chances of ground water contamination from effluent;
• Sensitize people to properly use the wastewater system to avoid blockages; and
• The septic tank should be regularly monitored to ensure early detection of overflow incidences.

5.3.3.4. Creation of stagnant pools of water

The roof of the EVD Quarantine Centre will act as a water collector, thereby increasing amount of rainwater on some areas around the centre. This is mainly because the area is flat and the soils have a high water retaining characteristic.

To mitigate or avoid the impact:
• Carefully design the drainage for the EVD quarantine centre and site; and
• Keep all drains clear of silt and debris.
• Installation of rain gutters to harvest rain water and reuse the water.
• Use comprehensive soft and hard landscaping of the project site after construction works.

5.3.3.5. Increased work load/ pressure on health workers

The District Health Office is understaffed and the workload for health workers is high. During operation, there will be an additional work load for the existing staff to manage operations of the EVD Centre hence the staff will be more stretched.

The impact can be mitigated by:
• Recruiting additional staff for the treatment centre; and
• Ensuring equal distribution of work through shifts.

5.3.3.6. Occupation safety and health impacts

The main occupational safety and health issues will relate to the following:

i) Working in a confined space under highly infectious conditions;
ii) Improper use of personal protective equipment e.g. the Ebola suit;
iii) Shortage of medical supplies;
iv) Exposure to highly infectious waste, especially by the waste handlers; and
v) Intermittent supply of utilities (electricity and water).

This is a high risk impact as the health care workers are likely to contract the Ebola Virus Disease. However the impact can be avoided or mitigated as follows:

• Karonga District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;
• The MoH and Karonga District Hospital must continue to regularly train and sensitize its staff in infection control and best practices for managing infectious wastes in
accordance with the World Health Organization’s *Safe Management of Wastes from Health-care Activities*\(^6\) handbook and its *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings*\(^7\). Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;

- Regularly monitor performance of equipment and carrying out preventive maintenance;
- Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors at distance but allowing them to see through;
- Ensuring there is enough supply of medicines and chemicals including PPEs;
- Regularly training staff on how to use PPE; and
- Ensure the EVD Quarantine centre is connected to the hospital electricity generator and the water reservoir.
- Ensure that the project’s Health Care Waste Management Plan and the infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members are implemented.

### 5.3.4. Impacts during Decommissioning

Decommissioning entails closure of the facilities and services. Consideration of impacts of decommissioning is important so that on closure of these facilities, due consideration is given to mitigate impacts from abandoned structures and equipment. Consideration should also be given to staff that may be made redundant.

#### 5.3.4.1. Air, land and water contamination

Air, land and water contamination from waste would result from cleaning of premises and equipment and from transportation and disposal of wastes. The impact can be mitigated through the following measures:

- Disposing wastewater in appropriate and approved drainage systems; and
- Incinerating contaminated solid waste and disposing ash in approved landfill sites

#### 5.3.4.2. Risk of infection from contaminated equipment

The decontamination team and other people are likely to be at risk of infection of handling equipment that has not been fully decontaminated. Mitigation measures would include to:

- Provide appropriate PPE for staff for destroying equipment used in the centre; and
- Destroy all equipment used in the EVD Quarantine Centres.

### 5.4. SIGNIFICANCE RATING OF NEGATIVE IMPACTS

\(^6\) [http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1)

\(^7\) [http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1)
The significance of the identified potential negative environmental and social impacts has been determined by assessing and rating the impacts as (-1), (-2) or (-3), using the available information, professional judgement and experience from similar development projects. The ratings are based on:

1. Likelihood of occurrence (L) – a measure of the likelihood of the impact to occur;
2. Spatial Distribution (SD) - size of the area to be impacted; and
3. Time (duration) of impact Distribution (TD) - the period of time over which the impact may occur.

The significance of the impact has been determined by the product of L, SD and TD. Table 5.1 provides the significance rating of the impacts of the construction and operation of the EVD Quarantine Centre at Karonga District Hospital before mitigation. After implementation of the mitigation measures, the impacts are assessed as low to nil.
<table>
<thead>
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<th>SN</th>
<th>Impact</th>
<th>Likelihood of occurrence (L)</th>
<th>Spatial Distribution (SD)</th>
<th>Time (duration) of impact Distribution (TD)</th>
<th>Severity of Impact (LxSDxTD)</th>
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<td></td>
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<td>1.1.</td>
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<td>3.1.</td>
<td>Air, land and water contamination</td>
<td>-2</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>3.2.</td>
<td>Risk of infection from contaminated equipment</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-4</td>
</tr>
</tbody>
</table>
CHAPTER 6  ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

6.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This Environmental and Social Management Plan (ESMP) has been prepared to facilitate the integration of environmental and social management measures in the construction and operation of the EVD Treatment Centre. The ESMP contains:

- Anticipated negative impacts of the proposed project and mitigation measures identified in Chapter 5 of this report;
- Responsible institutions to implement the mitigation measures; and
- Time frame for implementation of the mitigation measures.

Implementation of the ESMP will be done by the Contractor. Hence, the contractor has to include the costs for the impact mitigation measures in the project bid price.

The aim of the ESMP is to ensure that the Ministry of Health (MoH) will prevent, reduce, mitigate and compensate for the impacts of the proposed project on the biophysical and socio-economic environment. Key elements of the ESMP are summarised in table 6.1. As part of the environmental management, the Department of Planning and Policy Development (DPPD) in the MoH must ensure that the ESMP is included as part of the contractor’s contract documents. The MoH and Karonga District Hospital must also ensure that funds are available for implementation of the ESMP.

Several issues with the existing infrastructure and operational sustainability at the hospital have been identified through the development of this ESMP, including the incinerator in poor condition. While these issues are not directly linked to this project, it is recommended that Karonga District Hospital take a phased approach, given current budgetary constraints, to correct systemic challenges affecting human health, the natural environment and the general level of hospital performance. Other systemic issues, like those associated with inadequate water and electrical supplies, need to be mitigated as they can directly result in potentially serious environmental health issues during operation of the EVD treatment centres.
Table 0.1: Environmental and Social Management Plan

<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Construction Phase</td>
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</tbody>
</table>
| 1.1 | Accidents to workers, staff and the public on the construction sites | • Train workers on prevention and managing incidences;  
• Restrict hospital staff and public from going to the construction site during and outside working hours by placing posters, reflecting tapes and erecting barriers;  
• Workers must wear protective gear; and  
• Provide first aid kit. | Contractor | Before and throughout the construction phase | Include in the project bid for the Contractor |
| 1.2 | Utilizing unlicensed quarry sites         | • The Contractor will identify materials from existing licensed quarries with the suitable materials for construction; and  
• Procurement of construction material only from permitted sites and licensed / authorized quarries. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.3 | Use of lead-based paint products.        | • The Contractor shall ensure that no paint containing lead or lead products is used. He shall provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scraped. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.4 | Noise disturbances                        | • The Hospital Administrator must sensitize the contractor to minimise noise;  
• The contractor must use efficient machines that do not make loud noise;  
• The contractor must provide appropriate PPE (e.g. ear muffs) to workers; and  
• The contractor must ensure that noisy activities which cannot be avoided are limited to normal working hours. | Contractor, Karonga District Hospital | Throughout the construction phase | Include in the project bid for the Contractor |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or Social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>Spread of HIV AIDS</td>
<td>- Awareness meetings shall be conducted as a part of all construction employee orientation programs.; and&lt;br&gt;- Employees shall be provided with condoms for protection from STIs.</td>
<td>Contractor</td>
<td>Throughout the construction Phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.6</td>
<td>Increased costs of electricity and water</td>
<td>- A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration.&lt;br&gt;- The contractor should provide a diesel generator to be used during construction of the EVD Centre.</td>
<td>Karonga District Hospital, Contractor</td>
<td>Throughout the construction phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.7</td>
<td>Waste generation</td>
<td>- Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers;&lt;br&gt;- Incinerate/burn segregated infectious wastes;&lt;br&gt;- Use some of the excavated materials e.g. stones for backfilling and rehabilitating eroded areas;&lt;br&gt;- Designate disposal sites in the contract and cost unit disposal rates accordingly; and&lt;br&gt;- All wastes must be taken to the approved disposal area.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.8</td>
<td>Water pollution</td>
<td>- Line surfaces where cement, paints and oils will be stored to catch spillage;&lt;br&gt;- Line or cover the floor during painting and use of lubricants;&lt;br&gt;- Sensitize the workers to appropriately manage construction materials and wastes; and&lt;br&gt;- Properly supervise the workforce.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.9</td>
<td>Removal of vegetation</td>
<td>- Transplant trees and ornamental shrubs in the same or other nearby areas;&lt;br&gt;- Replace felled trees on a two for one basis (two replacement trees for each removed) and ensure that indigenous trees are selected; and&lt;br&gt;- Ensure landscaping design considers where hospital expansion activities are likely to occur in the near future.</td>
<td>Karonga District Hospital</td>
<td>Once before opening the facility</td>
<td>Include in the project bid for the Contractor</td>
</tr>
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<td>No.</td>
<td>Potential Environmental or Social Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Institutional Responsibility</td>
<td>Time for Implementation</td>
<td>Source of Funds</td>
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<tr>
<td>2.</td>
<td>Operation and Maintenance phase</td>
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</table>
| 2.1 | Fear of being infected                 | • Conduct adequate sensitization and awareness meetings with staff and the surrounding community on how the EVD may be contracted and transmitted; and on infection control and health-care practices for patients;  
• Train staff on Occupational Safety and Health and Infection Control; and  
• Frequently update the public on the activities in the EVD Quarantine Centre. | Karonga District Hospital, District Council | Once every month | Include in the project budget |
| 2.2 | Air pollution and operational risk from incineration of wastes | • Install a high temperature, mechanical incinerator as specified for the EVD Centre and in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities;  
• Plant trees around the incinerator to absorb carbon dioxide from the incinerator. | Karonga District Hospital and Contractor | Once during installation of the incinerator | Include in the project budget |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or Social Impact</th>
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</tr>
</thead>
</table>
|     | - Ensure that international industry best practices related to hazardous waste incineration are followed in accordance with the World Bank’s environmental, health, and safety technical (EHS) guidelines for health care facilities;  
- Adequately budget for fuel for the incinerators;  
- Sensitize and train staff to adequately segregate the waste from the point of generation, to ensure only combustible waste goes into incinerators;  
- Orient laboratory and health-care staff to the infection control and waste management practices; and  
- Regularly maintain the incinerators to ensure they are working properly; and  
- Train staff on how to operate the incinerators. | Karonga District Hospital | Once every month | Include in the hospital’s recurrent budget |
| 2.3 | Water pollution | - Construct the septic tank according to the design specifications; and  
- Properly site the soak-pit, ensuring that there are no chances of water contamination from the effluent. | Contractor | Once during construction of the septic tank | Include in the project bid for the Contractor |

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8 The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group’s EHS Guidelines for Health Care Facilities can be found at: [http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&ID=1323161961169](http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&ID=1323161961169) and the General Environmental Health and Safety Guideline can be found at: [http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d8f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2B Ambient%2BAir%2BQuality.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d8f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES)
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<th>Institutional Responsibility</th>
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<th>Source of Funds</th>
</tr>
</thead>
</table>
| 2.4 | Creation of stagnant water pools and or Increased runoff | • Keep all drains clear of silt and debris.  
• Maintain landscaping of the project site after construction works. | Karonga District Hospital | Throughout the operation phase | Include in the hospital’s recurrent budget |

- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank;
- Only licensed waste collectors shall be employed for this disposal;
- Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;
- Sensitize people to properly use the wastewater system to avoid blockages; and
- The septic tank should be regularly monitored to ensure early detection of overflow incidences.
- Keep all drains clear of silt and debris.
- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank; and
- Only licensed waste collectors shall be employed for this disposal;
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<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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</thead>
</table>
| 2.5 | Occupation safety and health risks       | • Mchinji District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
• The MoH and Karonga District Hospital must continue to regularly train and sensitize its staff in infection control and best practices for managing infectious wastes in accordance with the World Health Organization’s *Safe Management of Wastes from Healthcare Activities* \(^9\) handbook and its *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings* \(^10\). Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;  
• Regularly monitor performance of equipment and carrying out preventive maintenance;  
• Ensuring there is enough supply of medicines and chemicals including PPEs;  
• Regularly training staff on how to use PPE;  
• Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors out  
• Ensure that the Project’s Health Care Waste Management Plan and infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members are implemented; and  
• Ensure the EVD Quarantine centre is connected to the hospital electricity generator and the water reservoir. | Karonga District Hospital and MoH | Once every month | Include in the hospital’s recurrent budget |

\(^9\) [http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1)  
\(^10\) [http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1)
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<tbody>
<tr>
<td>3.</td>
<td><strong>Decommissioning Phases</strong></td>
<td></td>
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</tr>
</tbody>
</table>
| 3.1 | Air, land and water contamination      | • Dispose wastewater in appropriate and approved drainage systems; and  
|     |                                        | • Incinerate contaminated solid waste and dispose ash in approved landfill sites | Karonga District Hospital | Throughout the decommissioning phase | Include in the hospital’s recurrent budget |
| 3.2 | Risk of infection from contaminated equipment | • Provide appropriate PPE for staff for destroying equipment used in the centre; and  
|     |                                        | • Destroy all equipment used in the EVD Quarantine Centre. | Karonga District Hospital | Throughout the decommissioning phase | Include in the hospital’s recurrent budget |
6.2 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Environmental and social monitoring has to be carried out during construction, operation and maintenance and decommissioning of the Ebola Virus Disease Treatment Centre. Table 6.2 provides the proposed monitoring institutions, monitoring indicators, monitoring frequency and the estimated costs for monitoring the Environmental and Social Management Plan implementation. The contractor (Project Engineer) will also perform monitoring activities as stipulated in the contract.
### Table 0.2: Environmental and Social Monitoring Plan

<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Construction Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1.1 | Accidents to workers, staff and public on construction sites | • Train workers in prevention and managing incidences  
• Restrict hospital staff and public from going to the construction site during and outside working hours by placing posters, reflecting tapes and erecting barriers  
• Workers must wear protective gear  
• Providing first aid kit | • Number of workers trained  
• Number of posters and barriers elected  
• Number of workers wearing protective gear  
• Types and number of supplies in the first aid kit | Contractor, DHO, DPPD | Monthly | 3000 USD (for transport and allowances for officials from Department Planning and Policy Development) |
| 1.2 | Utilizing unlicensed quarry sites | • The Contractor will identify materials from existing licensed quarries with the suitable materials for construction.  
• Procurement of construction material only from permitted sites and licensed / authorized quarries. | • Evidence provided upon request demonstrating source of construction materials | Contractor, DHO, DPPD | As appropriate during the construction phase | Included in 1.1 |
| 1.3 | Use of lead-based paint products | • The Contractor shall ensure that no paint containing lead or lead products is used. He shall provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scraped. | • Evidence of using non-lead-based paint. | Contractor, DHO, DPPD | As appropriate during the construction phase | Included in 1.1 |
| 1.4 | Noise disturbances | • The Hospital Administrator must sensitize the contractor to minimise noise;  
• The contractor must use efficient machines that do not make loud noise;  
• The contractor must provide appropriate PPE (e.g. ear muffs) to workers; and  
• The contractor must ensure that noisy activities which cannot be avoided are limited to normal working hours. | • Complaints/reports on loud chatting  
• Efficiency ratings of machines  
• Number of workers using ear muffs and other appropriate PPEs  
• Time of the day when noise making activities are carried | Contractor, DHO, DPPD | Throughout construction phase | Included in 1.1 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>Spread of HIV/AIDS</td>
<td>• Awareness meetings shall be conducted as a part of all construction employee orientation programs; and · Employees shall be provided with condoms for protection from STIs.</td>
<td>• Number of meetings conducted  · Number of condoms distributed</td>
<td>Contractor, District Health Office, Local Assembly, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>1.6</td>
<td>Increased costs of electricity and water</td>
<td>• A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration. · The contractor should provide a diesel generator to be used during construction of the EVD Centre.</td>
<td>• A signed agreement on payment of utility bills  · Use of a separate water reservoir and generator</td>
<td>Contractor, District Health Office, MoH (DPPD)</td>
<td>Once before civil works begin again</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>1.7</td>
<td>Waste generation</td>
<td>• Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers; · Incinerate/burn segregated infectious wastes; · Use some of the excavated materials e.g. stones for backfilling and rehabilitating eroded areas; · Designate disposal sites in the contract and cost unit disposal rates accordingly; and · All wastes must be taken to the approved disposal area.</td>
<td>• Volume of wastes that is segregated  · Area that is rehabilitated using material from excavations  · Volume of hazardous material that is incinerated  · Size and area for a waste disposal pit</td>
<td>Contractor, District Health Office, Local Assembly, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
<td>Institution/perso n to monitor</td>
<td>Monitoring frequency</td>
<td>cost</td>
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</tbody>
</table>
| 1.8 | Water pollution  | • Line surfaces where cement, paints and oils will be stored to catch spillage;  
• Line or cover the floor during painting and use of lubricants;  
• Sensitize the workers to appropriately manage construction materials and wastes; and  
• Properly supervise the workforce.  
|  |                  | Area lined during application of cement and paints  
• Area lined for storage of paints etc.  
• Records of sensitizations  
• Number of hours the supervisor is available on site  
| Contractor, DHO, District Council, DPPD  
| Monthly  
| Included in 1.1  
| 1.9 | Removal of vegetation | • Transplant trees and ornamental shrubs in the same or other nearby areas;  
• Replace felled trees on a two for one basis (two replacement trees for each removed) and ensure that indigenous trees are selected; and  
• Ensure landscaping design considers where hospital expansion activities are likely to occur in the near future.  
|  |                  | Number of trees planted  
• Area grass is planted  
• Use of cut trees  
• Number of trees removed  
| DHO  
| During the clearing and landscaping period  
| Included in 1.1  
<p>| 2. | Operational and Maintenance phase | | | | | |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
</table>
| 2.1. | Fear of being infected | • Conduct adequate sensitization and awareness meetings with staff and the surrounding community on how EVD may be contracted and transmitted; and on infection control and health-care practices for patients;  
• Train staff on Occupational Safety and Health and Infection Control; and  
• Frequently update the public on the activities in the EVD Quarantine Centre. | • Number of times meetings are conducted  
• Number of staff and community members people sensitized  
• Number of staff trained in occupation safety and health and infection control  
• Number of reports on activities at the EVD Quarantine Centre | DHO, Local NGO’s, MoH’s Ebola Coordination Unit | Monthly | 4,500 USD (for transport and allowances for officials from Department Planning and Policy Development) and 20,000 USD for infectious disease management training and surveillance programs |
| 2.2. | Air pollution and operational risks from incineration of wastes | • Plant trees around the incinerator to absorb carbon dioxide from the incinerator.  
• Install a high temperature, mechanical incinerator as specified for the EVD Centre and in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities; | • Number of trees planted  
• Completed incinerator | Contractor, DHO, Local Council, MoH’s Ebola Coordination Unit | At the end of construction phase | Included in 2.1 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
</table>
|     |                 | Implement international industry best practices related to hazardous waste incineration that are provided in the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities.  
Train staff on Occupational Safety and Health and Infection Control; and  
Frequently update the public on the activities in the EVD Quarantine Centre  
Adequately budget for fuel for the incinerators;  
Sort the waste to ensure that only the right type of waste goes into the incinerators; and  
Regularly maintain the incinerators to ensure they are working properly. | Number of staff trained and surrounding community trained in EVD transmission and infection control;  
Number of staff trained on occupation safety and health infection control  
Number of times the public is updated on the activities in the EVD Quarantine Centre  
Litres of fuel available every month  
Volume of waste sorted appropriately  
Records of maintenance of incinerators | DHO, Local Council, MoH’s Ebola Coordination Unit | Monthly | Included in 2.1 |

2.3. Water pollution

|     | Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;  
Construct the septic tank according to the design specifications;  
Properly site the soak-pit ensuring that there are no chances of ground water contamination from effluent;  
Sensitize people to properly use the toilet system to avoid blockages; and  
The septic tank should be regularly monitored to ensure early detection of overflow incidences. | Number of times preventive maintenance is carried out  
Specification of the septic tank and soak pit  
Number of times the sewage system is monitored, emptied and maintained | DHO, Local Council, MoH’s Ebola Coordination Unit, DPPD | Monthly | Included in 2.1 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4.</td>
<td>Creation of stagnant water pools and or Increased runoff</td>
<td>• Keep all drains clear of silt and debris.</td>
<td>• A well designed and constructed drainage system</td>
<td>DHO, MoH (Ebola Coordination Unit)</td>
<td>Monthly during the rainy season</td>
<td>Included in 2.1</td>
</tr>
<tr>
<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
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</tbody>
</table>
| 2.5. | Occupation safety and health risks | • Karonga District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
• The MoH and Karonga District Hospital must continue to train and sensitize its staff in infection control and best practices for managing infectious wastes in accordance with the World Health Organization’s *Safe Management of Wastes from Health-care Activities*\(^{11}\) handbook and its *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings*\(^{12}\). Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;  
• Regularly monitor performance of equipment and carrying out preventive maintenance;  
• Ensuring there is enough supply of medicines and chemicals including PPEs;  
• Regularly training staff on how to use PPE;  
• Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors at distance but allowing them to see through;  
• Ensure that the Project’s Health Care Waste Management Plan and infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members are implemented;  
• Ensure the EVD Quarantine centre is connected to the hospital electricity generator and the water reservoir. | • Number of times health workers are screened  
• Number of staff trained in occupational safety, infection control and waste management  
• Compliance with recommended equipment maintenance schedule  
• Number of PPE in stock  
• Availability of separate water reservoir and electricity generator | DHO, MoH’s Ebola Coordination Unit | Monthly | Included in 2.1 |

\(^{11}\) [http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1)  
\(^{12}\) [http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1)
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Decommissioning Phases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Air, land and water contamination</td>
<td>• Dispose wastewater in appropriate and approved drainage systems; and • Incinerate contaminated solid waste and dispose ash in approved landfill sites</td>
<td>• Area for disposal of wastewater • Volume of solid waste incinerated</td>
<td>DHO, MoH’s Ebola Coordination Unit</td>
<td>Twice</td>
<td>750 USD for transport and allowances for officials from the Ebola Coordination Unit and Department Planning and Policy Development</td>
</tr>
<tr>
<td>3.2</td>
<td>Risk of infection from contaminated equipment</td>
<td>• Provide appropriate PPE for staff for destroying equipment used in the centre; and • Destroy all equipment used in the EVD Quarantine</td>
<td>• Reports of use of PPE during cleaning • Number of equipment destroyed</td>
<td>DHO, MoH’s Ebola Coordination Unit</td>
<td>Twice</td>
<td></td>
</tr>
</tbody>
</table>

Note: N/A means the costs are included in the preceding provision.
6.3 INSTITUTIONAL RESPONSIBILITY FOR IMPLEMENTATION OF THE ESMP

For effective implementation of the Environmental and Social Management and Monitoring Plan, there is need for clear roles, responsibility and reporting procedure:

The **Ministry of Health**, through the **Department of Planning and Policy Development (DPPD)** and the **Ebola Coordination Unit** will have the responsibility to ensure that the ESMP and the monitoring plan are implemented. They must ensure that all stakeholders are familiar with the contents of the ESMP and their roles; resources are available and key staff for implementing the activities are adequately trained. As part of the environmental management, the DPPD must also ensure that ESMP is part and parcel of the contract documents. Specific guidelines which the contractor must observe to minimise or mitigate impacts on the biophysical and social economic environment are provided in annex 5.

Since the impacts are mainly localised and moderate, the actual implementation of the ESMP and monitoring will be done by the stakeholders at district level as follows:

1. **Karonga District Health Office**, is responsible for delivering health services including environmental health in the area. The Environmental Health Officer (EHO) will lead in the implementation of the ESMP. The EHO will familiarise himself with the contents of the ESMP, mobilise resources and stakeholders and ensure that the mitigation measures are implemented. The EHO will however need training in management of wastes from an Ebola Treatment Centre. He will be reporting to the District Environmental Health Officer (DEHO) and the Hospital Administrator.

   The **Maintenance Supervisor**, under the District Health Office, will work with the contractor during the construction phase, to acquire the necessary operation and maintenance skills, particularly for the waste management systems. He will also maintain a daily record of the progress being made by the contractor in adhering to the requirements of the ESMP. He will report the progress to the Hospital Administrator, through the DEHO.

2. **The Contractor** will be responsible for ensuring that the construction activities are carried out sustainably through compliance to the contract with ESMP included. He will also adhere to the regulations and environmental standards for Malawi as well as the World Bank.

3. The hospital’s Healthcare Advisory Committee (HAC) will also work with the District Hospital in the monitoring of the ESMP implementation.

4. **The District Council** is the Local Authority for the district. The Council has a District Environmental Sub-Committee (DESC) which has the responsibility for appraising projects, environmental management plans and monitoring. Therefore all reports from the DEHO, Contractor and HAC will be reviewed by the DESC. The **District Council’s Environmental District Officer (EDO)** and the Engineer will work with Karonga District Health Office in monitoring the implementation of the ESMP.
The DESC reports to the District Executive Committee (DEC). Where the ESMP is found to be inadequate or there is non-compliance to the ESMP, the DESC will recommend the revision of the ESMP for its effective implementation.

The Environmental Affairs Department (EAD) in the Ministry of Natural Resources, Energy and Mining will provide an advisory role to the District Council. The EAD also has inspectors who will inspect the project for compliance to Environmental Standards in accordance with the Environmental Management Act (1996) and the World Bank policies.

6.4 COSTS FOR ENVIRONMENTAL MANAGEMENT

Costs for managing the impacts on the biophysical and socio-economic environment are, in general, included in the project budget. Costs for monitoring the ESMP have also been estimated in dollars at the exchange rate of 1 USD = MK 700.00 and they are as in Table 6.3.

Table 0.3: Summary of the costs for Managing the Environment

<table>
<thead>
<tr>
<th>Item/Activity</th>
<th>During construction phase</th>
<th>During operation phase (5 Years)</th>
<th>During decommissioning phase</th>
<th>Total Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport and allowance for monitoring staff from the Ebola Coordination Unit and Planning Department of Ministry of Health</td>
<td>3,000</td>
<td>22,500</td>
<td>750</td>
<td>26,250</td>
</tr>
<tr>
<td>Infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members</td>
<td></td>
<td>20,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3,000</td>
<td>42,000</td>
<td>750</td>
<td>46,250</td>
</tr>
</tbody>
</table>
CHAPTER 7 CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSIONS

The construction and operation of the Ebola Virus Diseases Quarantine Centre at Karonga District Hospital will have both positive and negative impacts. The negative impacts, on overall, are assessed as moderately severe and can be mitigated to low. Hence, this Environmental and Social Management Plan (ESMP) has been prepared to manage the impacts and to reduce their severity to low. Integration of environmental considerations presented in the ESMP will improve the sustainability and the performance of the EVD Quarantine Centre. The ESMP has also proposed a monitoring plan for effective implementation of the mitigation measures.

7.2 REQUIREMENTS

The following summary of requirements are applicable to the project:

- Karonga District Hospital is responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;
- The MoH and Karonga District Hospital will continue to train and enforce infection control practices for managing wastes in accordance with standards set by the World Health Organization, including those outlined in the Safe Management of Wastes from Health-care Activities handbook in addition to the Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings.
- During construction, operation and maintenance phases, the MoH and the Karonga District Hospital should implement all relevant good international industry practices provided in the World Bank Group’s environmental, health, and safety technical (EHS) guidelines for health care facilities.
- The ESMP is adopted and effectively applied;
- The Ministry of Health (MoH) will ensure that funds are available for implementation of the ESMP;
- The District Health Office, the District Council and the other responsible institutions will ensure that technical expertise is available for monitoring implementation of the ESMP;
- MoH will include the ESMP in the construction contract;
- The District Health Office will provide adequate sensitization to the local people about the project and the Ebola Virus Disease to allay Ebola fears and secure commitment for the project in the event that there is an Ebola outbreak;
- The contractor will comply with all relevant legal provisions outlined in this report and the associated contract; and
The District Health Office and the District Council will provide regular updates to the communities on the EVD preparedness activities.
REFERENCES

19. UNDP (2014). Assessing the socio-economic impacts of Ebola Virus Disease in Guinea, Liberia and Sierra Leone - The Road to Recovery


ANNEXES

ANNEX 1: TERMS OF REFERENCE

Environmental and Social Management Plans for 6 Ebola Sites

Introduction:
Any civil works/constructions being funded under World Bank projects require an Environmental and social due diligence to be undertaken during project conceptualization/preparation and prior to start of works. Such due diligence requires actions to be taken, and the process is documented, consulted and disclosed before project implementation starts. This step was missed out when the AF phase was approved; however, this is a requirement which the Bank has mandated which cannot be bypassed. Recognizing that the project is in active implementation, the Bank would help in any way possible to ensure requirements are adhered to and compliance is met, while also not significantly delaying project implementation. Therefore as a start, site-specific Environmental and Social management plans (ESMPs) must be prepared.

Scope of the ESMP:
1. Include a description of the geographical locale of each site and its environs and the associated social aspects during construction and operation of the Ebola Virus Diseases Quarantine/treatment centres;
2. Where the EVD quarantine/treatment is being constructed at a hospital include a detailed description of the existing waste management systems including incinerators and conditions of sewage systems;
3. Provide the mode of treatment of infectious waste water, a description what is to be undertaken in the event that a connection has been made to the municipal sewer lines. Likewise the system to be put in place for infectious sharps and waste;
4. Assess impacts of installation of incinerators, wastewater discharges and solid waste management will not have any negative impacts
5. Define any measures required to prevent any longer-term impacts on the environment and the neighbouring community and could also build in such enhancements into the design/infrastructural plan of the units.
6. Propose an EMP in tabular form by which all of the mitigation measures prescribed will be carried out. An environmental monitoring plan should also be prepared.
7. The ESMPs will need to be consulted with the local community and disclosed prior to continuation of works.

Report format:
Considering the project has been stopped prepare a summarised report of 6 – 10 pages.

Assignment Duration: 13 days

ToRs based on communications with World Bank and meetings between NAC and the Consultant. No official ToRs were provided
## ANNEX 2: LIST OF PEOPLE CONSULTED

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Contact</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settie Kanyenda</td>
<td>Epidemiologist</td>
<td>079960330972</td>
<td></td>
</tr>
<tr>
<td>Mohumbi Kapinga</td>
<td>ARMO</td>
<td>0884691575</td>
<td></td>
</tr>
<tr>
<td>Macama Kambula</td>
<td>Sims</td>
<td>0888539446</td>
<td></td>
</tr>
<tr>
<td>Joseph Mwachande</td>
<td>AHS A</td>
<td>0888747698</td>
<td></td>
</tr>
<tr>
<td>Lewis Tukula</td>
<td>DEHO</td>
<td>0999206298</td>
<td></td>
</tr>
<tr>
<td>Harry Misingumebe</td>
<td>Counsellor</td>
<td>0999783722</td>
<td></td>
</tr>
<tr>
<td>Maloni Nyirenda</td>
<td>DNO</td>
<td>083520656</td>
<td></td>
</tr>
<tr>
<td>Aggrey M. Mlyembe</td>
<td>FSS Admin</td>
<td>0882811482</td>
<td></td>
</tr>
<tr>
<td>Edward Chinde</td>
<td>EHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charles Sungani</td>
<td>DHO</td>
<td>088784745</td>
<td></td>
</tr>
<tr>
<td>Bwenda Mloti</td>
<td>NAC LC</td>
<td>0993092865</td>
<td></td>
</tr>
<tr>
<td>Arthur Chifuki</td>
<td>MPP Planning</td>
<td>0911937175</td>
<td></td>
</tr>
</tbody>
</table>

Some of the people consulted at Karonga District Hospital
### ANNEX 3: MAIN ISSUES RAISED BY STAKEHOLDERS

#### Issues raised during consultations with hospital administrators

<table>
<thead>
<tr>
<th>Site Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The project site is inside the hospital fence.</td>
</tr>
<tr>
<td>2. There is an alternative site at the border (at Iponga). During selection of this site there was community involvement. The site was selected during the recent Ebola outbreak in East Africa and it has no settlements as the Chiefs did not want Ebola cases to be near their villages. Some people would like to have the EVD shelter developed at the old site and not inside the hospital.</td>
</tr>
<tr>
<td>3. Site selection was done at Hospital Level. The district council was not consulted. TA Kyungu, the Traditional Leader in the area is aware and approves of the new site.</td>
</tr>
<tr>
<td>4. The present site has been selected because it is easily accessible by hospital staff, secure and isolated from other wards.</td>
</tr>
<tr>
<td>5. The District Health Office may still develop an EVD isolation room at the border, especially during an outbreak</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental and social setting of the area</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. There are houses outside the hospital fence – the houses were constructed after the hospital.</td>
</tr>
<tr>
<td>7. The site is near a kitchen and the antiretroviral treatment centre.</td>
</tr>
<tr>
<td>8. There are septic tanks nearby.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ebola Preparation Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Training in EVD case management and infection control has already started.</td>
</tr>
<tr>
<td>10. People that have been trained include the immigration and the Malawi Revenue Authority officers, nurses/clinicians, Environmental Health Officers. Patients attendant have however not been trained. The hospital administration would like to have the Patient Attendants to be trained as well.</td>
</tr>
<tr>
<td>11. The hospital has received a vehicle and supplies including PPE.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. The contractor has built a slab.</td>
</tr>
<tr>
<td>13. There is a small team employed for the construction and there have not been any problems between the construction team and the hospital or patients.</td>
</tr>
<tr>
<td>14. The Maintenance Supervisor has been monitoring the construction activities.</td>
</tr>
<tr>
<td>15. The contractor did not erect a workers camp inside the hospital fence.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Electricity is supplied by ESCOM.</td>
</tr>
<tr>
<td>17. The hospital experiences intermittent electricity supply. Power goes off for an hour, comes back for some hours and goes off for an hour again.</td>
</tr>
<tr>
<td>18. The hospital has a heavy duty generator. However it uses a lot of fuel. In an hour it uses about 20 litres of diesel.</td>
</tr>
<tr>
<td>19. Water is supplied by the Northern Region Water Board. Water is also unreliable as the pumps for the Water Board rely on the ESCOM power.</td>
</tr>
<tr>
<td>20. The hospital has 2 water reservoirs. One reservoir is not being used as its tower is falling on one side. It was affected by the Karonga 2009 earth quake.</td>
</tr>
<tr>
<td>21. The hospital is failing to fix the tower due to lack of funds.</td>
</tr>
<tr>
<td>22. The EVD may require a borehole. However this will be a problem as the water may be contaminated as there are a lot of septic tanks around the hospital.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ebola fears</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Shortage of PPE may be a problem during the outbreak.</td>
</tr>
<tr>
<td>24. Sample transportation may lead to infection – the hospital does not have appropriate containers for sample transportation.</td>
</tr>
</tbody>
</table>
25. Tracing may be a problem during an outbreak.

### Project Impacts

#### Negative

26. Staffing (shortage of specialists) may be a problem during the operation phase. The total number of staff that will be required to run the EVDC is 10 i.e. 6 healthcare workers, 2 security personnel and 2 support staff.

27. Inadequate funding would affect operations of the facility – the hospital may have problems to pay utility bills. The funding ceilings which are given to the hospital are unrealistic.

28. During the construction phase the hospital has been debating on who has to pay the utility bills for the contractor. They have been a problem on the hospital.

#### Positive impacts:

29. The utility vehicle which the hospital received has eased transportation problems.

30. The structure will be useful to the hospital e.g. can be used for cholera.

31. Staff have gained knowledge and skills through the trainings.

### Waste Management

32. The hospital has a waste management plan which was adapted from the Ministry of Health.

33. New staff are oriented to the waste management plan and there are also workshops which are conducted.

34. Waste is collected in small waste bins. When full the waste is put in a big wheeled bin. The wheeled bin is taken to the incinerator by hospital support staff.

35. The hospital has a brick incinerator and a waste disposal pit in a fence.

36. Liquid waste is treated in septic tanks. However the septic tanks are full and require emptying.

### General

37. The infection prevention system cannot work during an EVD outbreak, the system needs to be revised.
ANNEX 4: ARCHITECTURAL DESIGN OF ASH PIT FOR THE EVD CENTRES

NOTES

1. DO NOT SCALE OFF FROM THE DRAWING. ALL CONTRACTORS MUST CHECK ON SITE. ALL DIMENSIONS AND INFORMATION PROVIDED. ANY QUERIES OR DISCREPANCIES MUST BE REFERRED TO THE PROJECT ARCHITECT BEFORE MATERIALS ARE ORDERED OR WORK PUT IN HAND.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE STRUCTURAL STABILITY AND EFFICIENT PERFORMANCE OF HEATER WORK.

REVISIONS

PROJECT NAME
CONSTRUCTION OF AN INCINERATOR

CLIENT
SECRETARY FOR HEALTH
P.O. BOX 30377
LILONGWE

ELEVATIONS

DRAWN
DATE
SCALE

CHECKED
DATE

PROJECT ARCHITECT

FILE No

REVISION No
**ANNEX 5: ENVIRONMENTAL GUIDELINES FOR CONTRACTORS**

1. **General Provisions and Precautions**

The contractor shall take all necessary measure and precautions to ensure that all the works and associated operations on or off the work sites are carried out in accordance with statutory and regulatory environmental and social requirements of the Malawi. The contractor shall take all measures necessary to implement the requirements of the ESMP and protection measures relevant to the works.

The contractor shall avoid and prevent any nuisance or disturbance associated with execution of work under this project. In the event of any soil, debris or silt from the work sites being deposited on any adjacent land, the contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state, to the satisfaction of the responsible authorities. Any temporarily acquired land for construction purposes should be restored to its prior condition, to the satisfaction of the client or client’s representative.

The contractor shall include environmental management costs in the bid and shall commit to implementing the environmental management activities as agreed in the contract conditions. The contractor shall be liable to a fine as determined by the Environmental Affairs Department (or Minister of Natural Resources, Energy and Mining) in accordance with the EMA 1996, where his actions contravene environmental compliance.

2. **Protection of Water and other Public Services**

The Contractor shall ensure that no public services are disrupted as a result of execution of the construction works. In particular, the Contractor shall:

- Not interfere with supply or abstraction of water for public or private use; and shall not pollute any water resources (including groundwater);
- Not disrupt power supply or telephone connections or any other public or private services including footpaths and walkways;
- Not discharge or deposit any waste or any material into any waters or any grounds except with the permission of the appropriate regulatory authorities.
- At all times ensure that all streams, drains and trenches within and adjacent to the work sites are kept safe and free from any debris and any material arising from the works;
- Protect all water courses (including ditches, canals, drains and lakes) from pollution, siltation, flooding or erosion as a result of the execution of the works.
- Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the site.
- Assume responsibility for any damage and/or interference caused by him or his agents, directly or indirectly, arising from actions taken or a failure to take action to protect public or private utilities.
- Be responsible for full restoration of any damage caused and for restoration of services. Restoration shall be to the satisfaction of the client/client’s representative. The client/client’s representative will ensure that any affected
third party is content before confirming they are content with the restoration enacted by the contractor.

- Ensure that water and waste products shall be collected, removed and disposed of at a site approved by the District Council in a manner that will not cause pollution or nuisance.
- Not dispose of any surplus material on private land unless authorized in writing by the owner(s), authenticated before a notary public, and with previous authorization of the District/City Council.

3. **Control of Air Pollution**
   - Open fires and burning of construction waste shall not be permitted;
   - Dust-generating operations shall not be permitted to affect any residential areas, pedestrians or any public or private property. Where dust generation is inevitable, appropriate measures such as use of water sprays and fencing shields or appropriate covering material shall be employed. All workers shall be protected from dust emissions by providing them with appropriate protective wear.
   - All construction machinery, plant and equipment including all vehicles shall be regularly maintained to ensure that no smoke or obnoxious gas is discharged to pollute the air and affect the public or property.

4. **Acquisition of Construction Material**
   - Only licensed quarrying, sand mining and brick-making operations and sites shall be used as sources of construction materials.

5. **Prevention of Soil Erosion.**
   - The Contractor shall fence off construction sites, provide appropriate drainage and ram or compact soils where necessary to stabilize the soils and reduce erosion.
   - All construction sites shall be backfilled, levelled and re-planted with trees, vegetation and grass to restore them to the original state and to prevent soil erosion to the satisfaction of the client or client’s representative
   - As far as possible the contractor shall avoid or reduce construction activities and mining of construction material during the peak of rainy seasons.

6. **Control of Social Impacts**
   - The Contractor shall coordinate with all the neighbouring land users and respect their rights to a clean and safe environment. Written agreements with local landowners for temporary use of their sites or property shall be made and sites must be restored to original condition or conditions acceptable to the owner within an agreed time. Camp sites shall be maintained and cleaned up at all times and on completion of the works.
   - Health and safety of workers shall be protected by providing basic emergency health and first aid facilities and awareness meetings aimed at the prevention of sexually transmitted diseases. Awareness meetings shall be conducted as a part of all construction employee orientation programs. Employees shall be provided with condoms for protection from STIs.
• The Contractor shall obtain all necessary written traffic control permissions including for use of flagmen, traffic cones or other devices such as barricades and/or lights which he must use to control traffic for safety of pedestrians, cyclists and all road users, particularly school children.

• The Contractor shall neither stockpile nor store any construction materials; nor park construction plants or vehicles in walk ways, pedestal routes or driveways. Stockpiles of material shall be covered with tarpaulins or sprayed with water where these materials pose risks of dust to the public or people’s property.

7. **Noise Control and Regulation**
   • The Contractor shall take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the site shall not cause any unnecessary or excessive noise to the public. In addition, the Contractor shall operate noisy equipment within government working times unless with prior arrangement and permission from the employer.
   • Vehicle, plant and equipment exhaust systems shall be maintained in good working order, as recommended by the manufacturers, to ensure that no noise is unnecessarily generated to inconvenience the public.
   • Construction works and operations shall be scheduled to coincide with periods when people would least be affected by noise, having due regard for avoiding any noise disturbances to local residents, hospitals, schools or any other public and private places in the work site neighbourhood.
   • The contractor shall notify public (likely to be affected by the works) of impending construction operations and specify methods to receive and handle all public complaints.

8. **Environmental Monitoring**
   • The Contractor shall be responsible for monitoring all his activities and ensuring that all environmental requirements and the above conditions are met at all times.
   • Contractor shall also facilitate regular environmental, social and health; and safety monitoring by the Client, the Client’s representative or an independent monitor appointed by the Client, or any other national agency with a remit to inspect and monitor construction, environmental, social and health and safety performance.
   • The contractor will immediately agree and implement a rectification plan to bring the contractor back into compliance where inspections, audits and monitoring identify issues that are not in compliance with the ESMP as included in the contract.