REPUBLIC OF SIERRA LEONE

HEALTHCARE WASTE MANAGEMENT PLAN

ADDITIONAL FINANCING COVID-19 EMERGENCY PREPAREDNESS AND RESPONSE PROJECT
(PARENT PROJECT, ADDITIONAL FINANCING 1 & 2)

UNDER THE
COVID-19 STRATEGIC PREPAREDNESS AND RESPONSE PROGRAM (SPRP)

December 2022

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List of Abbreviations

AF	Additional Financing
AIDS	Acquired Immune Deficiency Syndrome
BPHS	Basic Package Health Services
BSL	Biosafety Level
CDC	Community Development Committee
CERC	Contingent Emergency Response Component
CHC	Community Health Centre
CHO	Community Health Officer
CMO	Chief Medical Officer
CoC	Certificate of Compliance
COVAX	COVID-19 Vaccines Global Access Facility
COVID-19	Coronavirus Disease 2019
DEHS	Directorate of Environmental Health and Sanitation
DHMTs	District Health Management Teams
EHS	Environmental Health and Safety
EHSG	Environmental Health and Safety Guidelines
EPA	Environmental Protection Agency
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
FCC	Freetown City Council
GBV	Gender Base Violence
GIIP	Good International Industry Practice
GoSL	Government of Sierra Leone
HAIs	Healthcare-associated Infectious
HCF	Health Care Facility
HCU	Healthcare Unit
HCW	Health Care Waste
HCWM	Health Care Waste Management
HCWMP	Health Care Waste Management Plan
HEPA	High Efficiency Particulate Air Filter
HSDSSP	Health Service Delivery and System Support Project
HVAC	Heating, Ventilation and Air Conditioning
ICC	Interagency Coordination Committee
ICU	Intensive Care Unit
ICWMP	Infection Control and Waste Management Plan
IHPAU	Integrated Health Project Administrative Unit
IOM	International Organization for Migration

IPC	Infection Prevention and Control
IPCP	Infection Prevention and Control Protocol
LMP	Labor Management Plan
MoHS	Ministry of Health and Sanitation
NaCOVERC	National COVID-19 Emergency Response Center
NEPA	National Environmental Protection Agency
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OHS	Occupational Health and Safety
OPD	Outpatient Department
PDOs	Project Development Objective
PPEs	Personal Protection Equipment
PSEA	Protection from sexual exploitation and abuse
REDISSE	Regional Disease Surveillance Systems Enhancement Project
RPF	Resettlement Policy Framework
SEP	Stakeholder Engagement Plan
SL	Sierra Leone
SOPs	Standard Operating Procedures
UNFPA	United Nation Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nation Children's Fund
WASH	Water, Sanitation and Hygiene
WBG	World Bank Group
WFP	World Food Program
WHO	World Health Organization

1.0 Introduction

The World Bank is providing support to the Government of Sierra Leone for preparedness planning to provide optimal medical care, maintain essential health services and to minimize risks for patients and health personnel (including training health facilities staff and front-line workers on risk mitigation measures and providing them with the appropriate protective equipment and hygiene materials/ equipment). As COVID-19 places a substantial burden on inpatient and outpatient health care services, support will be provided for a number of different activities, all aimed at strengthening national health care systems, including systems for the deployment of a safe and effective vaccine. The Project's Development Objective (PDO) of the Project is, "to prevent, detect and respond to the threat posed by COVID-19 and strengthen systems for public health preparedness in Sierra Leone.''

A Health Care Waste Management Plan (HCWMP) has been prepared for the entire health sector of Sierra Leone in 2015 & 2016 with support from the World Health Organization under the REDISSE Project funded by the World Bank. The Health Care Waste Management Plan for the COVID-19 Emergency Response and Health System Preparedness Project draws on this national plan, updating it for the COVID-19 Project. It is prepared in line with the relevant World Bank Environmental and Social Standards (ESSs), the Project Environmental and Social Management Framework (ESMF), relevant World Bank Group's Environmental, Health and Safety Guidelines (EHSGs), World Health Organization (WHO) and Ministry of Health & Sanitation (MoHS) COVID-19 guidelines and other Good International Practices.

This Health Care Waste Management Plan (HCWMP) includes templates for the Infection Control and Waste Management Plan (ICWMP) as Annex A, climate-related Infection Prevention, and Control Protocol (IPCP) as Annex B. The ICWMP template focuses on infection control and health care waste management practices during the operation of health care facilities. The HCWMP together with ESMP will set out appropriate measures for infection control and waste management during operation of the relevant Health Care facilities, laboratories and vaccination and vaccination storage centers.

1.1 Purpose of the Healthcare Waste Management Plan

The COVID-19 Emergency Response and Health Systems Preparedness Project including the Additional Financing for the supply and rolling out of the priority vaccination exercise in Sierra Leone will be a nationwide project. The purpose of this HCWMP is to guide the Ministry of Health and Sanitation and its implementing partners under this project to mitigate the adverse impacts/risks associated with the generation of health care waste as part of project implementation.

1.2 The Objective of the Healthcare Waste Management Plan

The main objective of this document is to provide an environmentally sound, technically feasible and viable health care waste management plan for Sierra Leone to improve health care waste management systems and practices under the COVID-19 Emergency Response and Health Systems

Preparedness Project. It will be applicable to all health care facilities, laboratories, vaccine storage and vaccination centers and related facilities under the project.

2.0 Project Description

The Project activities involve the construction of an Infectious Disease Hospital Center in Lungi as well as the procurement of goods such as PPE, chemical/biological reagents, vaccines and non-vaccine equipment for laboratories, health care and ancillary workers involved in frontline activities as part of the fight against the COVID-19 pandemic.

The Project will also not involve trans-boundary movement of specimen, samples, or any hazardous materials. Vaccination centers will be set up within existing health care facilities and mobile vaccination teams will be stationed at these facilities.

The existing waste management systems will be used. Sharp boxes and biohazard bags would be required for the collection of used needles, syringes, empty vials and swabs. Both centralized and on-site waste treatment methods are employed. Where incinerators are non-functioning, open burning pits (2 to 3-meter-deep and 1.5 meters above groundwater level) are the common methods. Ash pits should be dug at each incineration points for the final disposal of ash after incineration. Training will be conducted for the National Supervisors, District Supervisors, Waste Handlers and Incinerator Operators on the safe management of vaccination campaign wastes across the country.

2.1 Project Components- Parent Project

The components are as follows:

Component 1: Supporting National and Subnational Public Health Institutions for Prevention and Preparedness

The objective of this component is to enable Sierra Leone to adequately prepare and prevent COVID-19 or limiting local transmission through containment strategies. Activities to be supported are:

I. Case Detection, Case Confirmation, Contact Tracing, Case Recording, and Case Reporting: comprising of supporting the development and/or enhancement of an early warning system, epidemiological studies, surveillance programs and diagnostic capacity;
II. Community Engagement and Risk Communication: covering developing and testing messages and materials to be used in the event of a pandemic or emerging infectious disease outbreak and establishing a Grievance Redress Mechanisms (GRM) and activities to ensure information flow and reporting of COVID-19 at all levels. This sub-component also supports citizen's perceptions surveys on government's preparedness and response and uses feedback to enhance project delivery.

Component 2: Strengthening Multi-Sector National Institutions and Platforms for Policy Development and Coordination of Prevention and Preparedness using One Health approach.

This component supports implementation of activities to strengthen the core capacities as described in the National Action Plan for Health Security (NAPHS) 2018-2022 and improves collaboration among all the relevant sectors, including health, agriculture, and environment as part of strengthening the national one health platform. Under Component 2, support will also be provided to the National EOC to effectively coordinate and promptly respond to public health

threats as well as the Freetown City Council (FCC) and other local councils to implement COVID-19 preparedness and response activities.

Component 3: Emergency COVID-19 Response

This component has the following sub-components:

I. Case Management, including IPC which supports the training of health facilities staff and front-line workers on risk mitigation measures, provision of appropriate PPEs and IPC materials together with establishing and implementing treatment and hospital infection control guidelines and strategies to increase hospital bed availability, including deferring elective procedures, more stringent triage for admission, and early discharge;

II. Health Systems Strengthening, which supports the establishment of a sample referral system to care for COVID-19 patients. This sub-component will also promote local production of Alcohol Base Hand Rub (ABHR) sanitizers and liquid soap and locally-made masks. This component is building the capacity of health personnel (clinical and non-clinical staff) working in the designated health facilities and laboratories and mobilize additional health personnel, support training of health personnel, and other health worker operational expenses. The component also supports the District Health Management Teams (DHMTs) to monitor COVID-19 response and preparedness activities at the district and community levels.

III. Safe and Dignified Burial to prevent the occurrence of lack of burial space resulting from the possibility of high mortality from an escalation of the COVID 19 disease, the project supports the FCC in acquiring and developing safe and dignified burial grounds.

Component 4: Implementation Management and Monitoring and Evaluation

Component Four consists of:

I. Project Management for strengthening the capacity of the National Task Force on COVID-19 that has been set up by the GoSL for overall coordination of the SL COVID-19 Emergency Preparedness and Response Project; and

II. Project M&E of prevention and preparedness, building capacity for clinical and public health research, including veterinary, and joint learning across and within Sierra Leone and countries in the West Africa sub-region. This sub-component also supports training in participatory Monitoring and Evaluation M&E at all administrative levels, evaluation workshops, and development of an action plan for M&E, replication of successful models, monitoring and reporting of Environmental and Social Commitment Plan (ESCP) implementation.

2.2 Activities under Additional Financing 1

The changes proposed for the AF entail expanding the scope of activities in the parent project: Sierra Leone COVID-19 Emergency Preparedness and Response, adjusting its overall design. In summary, the proposed AF will include the following changes:

(a) Revision of the total project cost from US$7.5 million to US$16.0 million to account for commitments of US$8.5 million, US$5.0 million of which is from IDA grant and US$3.5 million is from the HEPRTF grant;

(b) Scaling up of risk communication and community engagement for COVID-19 vaccination under sub-component 1.2;
(c) Expansion of support for national and district coordination for COVID-19 vaccination under Component 2;
(d) Replace the sub-component 3.3, which activities for social and financial support to households were dropped at the first restructuring, with a sub-component for the operationalization of the COVID-19 vaccine deployment (See details below);
(e) Addition of sub-component 3.5 to scale up COVID-19 vaccines acquisition beyond 20 percent of the total population;
(f) Revision of the results framework to include new indicators for the COVID-19 vaccine deployment under the proposed AF and modify indicators in response to the evolving pandemic situations; and
(g) Extension of the closing date of the project from March 31, 2022, to June 30, 2023.

The additional activities will be incorporated into the existing components of the parent project as described below based on information obtained from the Project Paper.

Component 1: Supporting national and sub-national public health institutions for prevention and preparedness

Sub-component 1.2: Community Engagement and Risk Communication

The parent project's activities that support risk communication and community engagement will continue and expand to include communication and social mobilization on COVID-19 vaccination. With the lessons learned from the first 10 days of COVID-19 vaccination in the country, the GoSL needs to intensify risk communication and community engagement to improve COVID-19 vaccine literacy and acceptance, which include building confidence and trust, and reducing stigma around the vaccine. The current uptake of COVID-19 vaccination is slower than expected, especially in the Western Urban and Rural Areas where high densities of populations, particularly in informal settlements, are observed and record the highest number of COVID-19 cases (see details in Annex 3). This activity is critical for the COVID-19 vaccination, building on the ongoing efforts for strengthening community-based disease surveillance and the 117 Toll-Free Emergency Call Center under the REDISSE, the active Community Health Worker (CHW) Program under the HSDSSP, and community engagement with Councilors, the Tribal Heads, religious leaders, Mammy Queens, youth leaders, WDC members and volunteers under the parent project. The AF will actively facilitate the MoHS for the engagement of CSOs and community-based organizations (CBOs) to monitor the vaccine deployment processes and to ensure no forced vaccination and their feedback to be incorporated into the improved COVID-19 vaccination. Communication activities will also have a focus on climate-related diseases to ensure greater awareness of the risks among key population groups.

Component 2: Strengthening multi-sector, national institutions and platforms for policy development and coordination of prevention and preparedness using One Health approach

The scope of the parent project's support for national and district coordination will be expanded to include the National and District COVID-19 Vaccine Technical Working Groups and the NITAG.

These coordination mechanisms operate under the umbrella of the ICC and the EOC. Strengthening the existing coordination mechanism by disbursing directly from the IHPAU to the DHMTs is expected to solve the current constraints in delayed fund disbursement for social mobilization and COVID-19 vaccination at the designated vaccine centers in the district headquarters.

Component 3: Emergency COVID-19 Response

Sub-component 3.3: COVID-19 vaccines service delivery

New activities will be added to support the enhancement of preparation and operationalization of COVID-19 vaccines deployment in the country. The project will support service delivery at the national and sub-national levels, including: (i) the development of necessary COVID-19 deployment micro plans based on the COVID-19 vaccine readiness assessment results; (ii) support the MoHS and the PBSL for monitoring and supervision of the safety of COVID-19 vaccines and deployment in the country;(iii) procurement of essential consumables and equipment for the COVID-19 vaccination nationwide, including syringes, graves and face masks to ensure the safety of vaccinators and vaccines; (iv) training of vaccinators and volunteers for scale-up of the COVID-19 vaccination, including the integrated training for CHWs in their routine refresher training; (v) strengthening M&E system, especially stock management of COVID-19 vaccines, using the existing SMT, and the vaccine coverage as per the set target population groups. The support includes training of district vaccination teams in data entries to effectively utilize the developed vaccine surveillance system, which is linked to the DHIS2; (vi) enhancing logistics to scale up COVID-19 vaccination, including medical waste management; and (vii) strengthening vaccine safety surveillance to effectively monitor and promptly respond to and investigate AEFI, which could contribute to health systems strengthening in the context of Sierra Leone. The above is an indicative list of activities and technical assistance for prioritization will be provided, whenever needed, to ensure that the prioritized activities are financed. It is also expected to scale up mobile vaccination teams to further reach the population, especially health workers, outside of the district headquarters.

The proposed AF will pay special attention to: (i) the enforcement of policies related to ensuring that there is no forced vaccination and that any mandatory vaccination program (such as for entry to schools) is well designed, following due process for those who choose to opt out; (ii) acceptable approved policy for prioritized intra-country vaccine allocation; (iii) regulatory standards at the national level, including pharmacovigilance; and (iv) appropriate minimum standards for vaccine management. The policies for prioritizing intra-country vaccine allocations follow principles established in the WHO Allocation Framework, including targeting an initial coverage of 20 percent of the country's population by focusing first on health workers and frontline officers and then focusing on the elderly and those with underlying conditions that places them at higher risk.

Sub-component 3.5: COVID-19 Vaccines Acquisition

The support for vaccines, which was anticipated in the initial Global COVID-19 MPA, will be added as part of the containment and mitigation measures to prevent the spread of COVID-19 and deaths under Component 3: Emergency COVID-19 Response of the parent project. Up to US$4.00 million out of the US$5.00 million from IDA grant will be used to expand the coverage of additional COVID-

19 vaccines to the COVAX Facility by 3.5 percent to make it a total of 24.98 percent of the population vaccinated. Sierra Leone will use the COVAX Facility, the AVATT or bilateral agreements for vaccine purchase either individually or jointly with neighboring countries. The compliance with the World Bank's VAC is required for all Project COVID-19 Vaccines. However, the VAC does not constitute an approval, validation, or endorsement by the World Bank of the Project COVID-19 Vaccines' safety or efficacy. The relevant regulatory authority or the PBSL is solely responsible for the assessment of the Project COVID-19 Vaccines' safety and efficacy, and for the authorization and deployment of these vaccines in the country. This will be done through the existing framework for vaccine registration, safety and regulation.

a. Changes in the Parent Project during AF1: Establishment of an Infectious Disease Center

The GoSL has indicated its decision to abandon the planned rehabilitation works on existing isolation and quarantine centers and treatment units, proposed under Components 1 and 2 of the Parent Project and in its place the GoSL has proposed the establishment of an Infectious Disease Center at Freetown International Airport at Lungi.

2.3 Components under Additional Financing 2

Sub-component 1.2: Community Engagement and Risk Communication

This sub-component is proposed to be scaled up. The parent project's activities that support risk communication and community engagement (RCCE) will continue and expand the community outreach with tailored risk communication and community engagement in alignment with the scaling up of COVID-19 vaccination nationwide, including hard-to-reach communities and remote areas. With the lessons learned from the Ebola response in 2014-2015 and the initial phases of COVID-19 vaccination in the country, and the low-risk perceptions of COVID-19 infection among the population with the low prevalence of COVID-19 cases in the country, the GoSL is in a dire need to reach out to the population, instead of promoting their COVID-19 vaccination at static vaccination centers, unlike the routine immunization for children.

The AF2 will further support the intensified RCCE with tailored messages, proactive community outreach, face-to-face communication through influencers and social mobilizers to increase for improved equitable vaccination coverage among the vulnerable population, including women and persons with disabilities. The Communication and Social Mobilization Pillar has effectively engaged key influencers, including the religious and traditional leaders, politicians, the female and male Fighting against COVID-19 Ambassadors (*"Corona Fet Ambassador"*), Mammy Queens, youth leaders, Ward Development Committee (WDC) members and volunteers. The District COVID-19 Emergency Response Center (DICOVERC) coordinators had dialogue with the Paramount Chiefs to join force to promote COVID-19 vaccination. In the Western Rural and Urban districts, where the majority of the country's population reside, the Communication and Social Mobilization Pillar collaborates with Imams to make use of Fridays prayers to promote COVID-19 vaccination, and also engages 121 Village Heads to compete the number of people vaccinated.

The AF2 will support duplicating such collaborative efforts in other districts and rural settings, as well as further engaging key influencers such as traditional healers. Following the consultation

meeting with associations with persons with disabilities on October 19, 2021, the MoHS and the World Bank teams are planning to include a representative of persons with disabilities at the weekly leadership meeting of the NACOVERC, thus providing a platform for regular feedback and ensuring their needs are addressed in the government's COVID-19 response and vaccination. The tailored social mobilization and risk communication for persons with disabilities are expected to increase its reach to the intended audience with support from the AF2. The MoHS also pay a special attention to expand outreach to women, whose vaccination rate is currently lower than men by reducing physical and socio-cultural barriers. In close coordination with mobile vaccination teams to bring COVID-19 vaccines into their communities, the COVID-19 Vaccine TWG jointly plan and conduct COVID-19 vaccination at marketplaces to increase women's self-efficacy and reduce travel time to get vaccinated.

Component 3: Emergency COVID-19 Response

Sub-component 3.3: COVID-19 vaccines service delivery (total US$4.87 million from the Health Emergency Preparedness and Response Trust Fund (HEPRTF), of which AF2 US$1.37 million equivalent from IDA grant)

This sub-component is proposed to be scaled up. The AF2 will support the preparation and operationalization of scaling up of COVID-19 vaccines deployment in the country. The AF2 will extensively support service delivery at the sub-national level to expand community outreach through mobile vaccination teams, including: (i) the development of necessary COVID-19 deployment micro plans, based on the COVID-19 vaccine readiness assessment results presented in Table 1 above; (ii) support the MoHS, the PBSL and DHMTs for review meetings, monitoring and supervision of the safety of COVID-19 vaccines and effective deployment in the country; (iii) procurement of essential consumables and equipment for the COVID-19 vaccination nationwide, including the printing of vaccination cards, cold-chain equipment, gloves, face masks to ensure the safety of vaccinators and vaccinees; (iv) training of vaccinators and volunteers for scale-up of the COVID-19 vaccination, especially mobile vaccination teams; (v) strengthening M&E system, especially the deployment of additional data clerks at the DHMTs. The support includes training of district vaccination teams in data entries to effectively utilize the developed vaccine surveillance system, which is linked to the DHIS2, which could contribute to health systems strengthening in the context of Sierra Leone. As described above, the Vaccine TWG and the Communication and Social Mobilization Pillar will continue to work closely and plan to have one integrated team to outreach communities (three mobile vaccination team and one social mobilier). The above is an indicative list of activities and technical assistance for prioritization will be provided, whenever needed, to ensure that the prioritized activities are financed. The AF2 will continuously pay special attention to: (i) the enforcement of policies related to ensuring that there is **no forced vaccination** and that any mandatory vaccination program (such as for entry to schools) is well designed, following due process for those who choose to opt out; (ii) acceptable approved policy for prioritized intra-country vaccine allocation; (iii) regulatory standards at the national level, including pharmacovigilance; and, (iv) appropriate minimum standards for vaccine management.

Sub-component 3.5: COVID-19 vaccines acquisition

This sub-component is proposed to be scaled up. The support for vaccines acquisition under the AF2 is part of the containment and mitigation measures to prevent the spread of COVID-19 and deaths under Component 3: Emergency COVID-19 Response. Sierra Leone will continue to use the option for vaccine purchase and financing mechanisms through the AVAT. The AF2 estimates that the financial envelop would enable Sierra Leone to acquire an additional 1,920,357 Janssen vaccine (for 23.1 percent of the total population) and would contribute to increasing the cumulative vaccination coverage up to 51.6 percent, which would meet the national target of vaccinating all the people aged 18 and above. The GoSL will continue to ensure prioritizing the COVID-19 vaccination for the elderly and those who have not received the second dose, while reaching out people aged 18+ who have not been vaccinated to break the chains of the transmission. Re-vaccination will not be financed under the AF2.

In addition, vaccine storage in all the 16 districts is in adequate for routine Vaccines. Ultra-Cold Chain will be needed to store COVID vaccine 70^{o} C for the 3% of the target population. Activities for additional financing 2 also include:

a) Procurement of 2 Ultra-Cold Chain equipment (UCC)
b) Rehabilitation of non-functional UCCs and maintenance of Cold Chain Equipment (CCEs) at the national and district levels;
c) Procurement of Positive Temperature Monitoring Devices and Negative Temperature Monitoring Devices

3.0 Policy and Legal Framework

3.1 World Bank Environmental and Social Framework

The World Bank ESF, which seeks to support borrowers develop and implement environmentally and socially sustainable projects as well as build capacity in the assessment and management of environmental and social impacts and risks associated with the implementation and operation of projects. The ESF contains Environmental and Social Standards (ESSs) that borrowers must apply to all projects in order for the projects to be sustainable, non-discriminatory, transparent, participatory, environmentally and socially accountable as well as conform to good international practices. The ten (10) Environmental and Social Standards are:

i. Environmental and Social Standard 1 (ESS1): Assessment and Management of Environmental and Impacts
ii. Environmental and Social Standard 2 (ESS2): Labor and Working Conditions
iii. Environmental and Social Standard 3 (ESS3): Resource Efficiency and Pollution Prevention and Management
iv. Environmental and Social Standard 4 (ESS4): Community Health and Safety
v. Environmental and Social Standard 5 (ESS5): Land Acquisition, Restrictions on Land use and Involuntary Resettlement
vi. Environmental and Social Standard 6 (ESS6): Biodiversity Conservation and Sustainable Management of Living Natural Resources
vii. Environmental and Social Standard 7 (ESS7): Indigenous Persons/Sub Saharan African Historically Underserved Traditional Underserved Traditional Local Communities
viii. Environmental and Social Standard 8 (ESS8): Cultural Heritage
ix. Environmental and Social Standard 9 (ESS9): Financial Intermediaries; and
x. Environmental and Social Standard 10 (ESS10): Stakeholder Engagement and Information Disclosure

Out of these, ESS1 (Assessment and Management of Environmental and Social Risk and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency and Pollution Prevention and Management), ESS4 (Community Health and Safety) and ESS10 (Stakeholders Management and Information disclosure) are relevant for the Sierra Leone COVID-19 Emergency Response and Health Systems Preparedness Project (see Table 3.1 below).

Table 3.1: Relevant World Bank Environmental and Social Standards for the HCWMP

ESS	Relevance	Activities & Actions Required
ESS1- Assessment and Management of Environmental and Social Risks and Impacts	Relevant	ESS1 discusses the borrower's responsibilities in identifying and managing the E&S risks/impacts of the project. The project will provide health services in response to the COVID-19 pandemic. Given the nature of how the disease spreads together with the medical requirement and resources needed to address the issue, health workers, community members and the environment are likely to be exposed to health risks

ESS	Relevance	Activities & Actions Required
		from health care waste generated from the health facilities as well as the vaccination exercise (if not properly treated and managed). Other forms of risk associated with the COVID-19 Project are exposure of health and other frontline workers to the COVID-19 virus and other pathogens and their interaction among public which may spread the virus. This ESS prescribes the various E&S instruments such as ESMF, and ESMPs that has been prepared to address the E&S risks/impacts associated with this project. An ESCP, ESMF and SEP have been prepared and disclosed with high-level commitment of the Government to managing the adverse E&S risks and impacts that will emerge from the implementation of the project. This HCWMP also provides additional guidance for the preparation of facility specific ICWMPs and IPCPs based on the templates from the ESMF attached as Annexes A and B.
ESS2- Labor and Working Conditions	Relevant	This ESS deals with labor related issues. The project will include health workers and sanitation service providers, janitors, cleaners, conservancy laborer, vaccinators who can be exposed to infections, toxic waste and injuries as results of waste collection, storage, transportation or treatment/disposal. This HCWMP has guidance for infection prevention and control as well as measures to minimize workers' exposure to hazardous and toxic materials.
ESS3- Resource Efficiency and Pollution Prevention and Management	Relevant	The project is likely to generate a considerable amount of health care waste during the constructional and operational phase of the project. Under this AF, used needles, syringes, empty vials, and expired vaccines will be major waste streams that will be generated and needs to be properly disposed of. Air pollution and emission of greenhouse gases will also be associated with the incineration of combustible health care waste. In line with the guidance of ESS 3, an Infection Control and Waste Management Plan (ICWMP) and Infection Prevention and Control Protocol (including health care, solid and liquid waste management) will be prepared, per templates in Annexes A and B to manage health care waste from project activities. These plans will be prepared in line with ESS 3 and related to ESHGs, GIIPs, WHO COVID-19 guidelines and national laws and additional guidance from this HCWMP

ESS	Relevance	Activities & Actions Required
ESS4- Community Health and Safety	Relevant	ESS 4 discusses the need and requirement for community health and safety issues in World Bank financed projects (investments). Activities under this project may give rise to a number of community health and safety risks and impacts. The project will generate both infectious, non-infectious and hazardous waste during the upgrading/rehabilitation and operation of the selected isolation centers and laboratories. Under the AF, used needles, syringes and empty vials will be the major waste streams to be properly disposed of so that they do not hurt/harm members of the community. The facility specific Infection Control and Waste Management Plan (ICWMP) and Infection Prevention and Control Protocols (IPCPs) will present measures to address minimizing community exposure to infectious and hazardous health care waste based on the Project ESMF and guidance from this HCWMP. Accidents and spillage may also occur during the collection, storage and transportation of health care waste putting communities at risk in terms of exposure to infections and toxic materials
ESS10- Stakeholder Engagement and Information Disclosure	Relevant	The HCWMP will be shared with stakeholders including vaccinators, health care workers and sanitation service providers for their review and inputs. The final HCWMP, IPCPs and ICWMPs should be disclosed to staff of HCFs, laboratories and vaccinators and other stakeholders such as NEPA (Annex E presents a report on the consultative meeting).

3.2. Relevant Technical Guidelines for COVID-19 Virus

The World Health Organization, since the outbreak, has issued a number of guidelines to prevent and contain the spread of infections among the population as well as frontline workers. These guidelines, according to WHO, will be updated as more information about the virus emerges. Relevant guidelines that relate to the project are discussed below.

3.2.1 Water, Sanitation, Hygiene, and Waste Management for the COVID-19 Virus

WHO has updated its technical brief for water and sanitation practitioners amidst the outbreak of the COVID-19 pandemic. The guidelines cover water, sanitation and health care waste management. It presents strategies in WASH in the health care setting as well as the home/community environment. Thematic areas discussed under WASH in the health care setting include practices for hand hygiene, sanitation and plumbing, emptying latrines and holding tanks,

transporting excreta off-site, handling feces, cleaning practices and safe disposing of greywater or water from washing PPEs, surfaces and floors. Health care waste management guidelines in this document are prepared based on this WHO technical guidelines.

3.2.2 Rationale on the Use of PPEs

This WHO technical reference document is relevant for both site workers and health personnel alike. The guidelines acknowledge disruption in the PPE supply chain because of the outbreak and spread of COVID-19 and outlines measures to minimise the over dependence on PPE amidst the global shortage. This notwithstanding, the guideline underscores the importance of the proper use of PPE as a measure against the spread of the disease. It also outlines activities and personnel requiring PPE, the type of PPE required and settings within which the PPEs will be required. It also emphasises the need for hand and respiratory hygiene as complementary measures to the use of PPE. https://apps.who.int/iris/handle/10665/331498

3.2.3 WHO Guideline "Getting Your Workplace Ready for COVID-19

The document presents simple measures to be implemented within the workplace to prevent the spread of COVID-19. These measures include activities to ensure the workplace is clean and hygienic, things to consider during traveling and when you return from travel and getting your business ready in case COVID-19 arrives in your community.

3.2.4 Center for Disease Control Coronavirus Lab Biosafety Guidelines

The guidelines discuss procedures/requirements for laboratory biosafety, routine laboratory procedures, viral isolation, working with animals suspected to be infected with the Coronavirus, referral of specimen to laboratories and packaging/shipping. The key recommendations in the guidelines include basing laboratory procedures on the results of risk assessments of the laboratory and ensuring that only personnel demonstrating capability to undertake procedures in strict conformity to laid protocols are utilized in laboratories. Other recommendations are using disinfectants with proven activity against enveloped viruses in laboratories for cleaning and disinfection as well as the fact that Biosafety Level (BSL 2) equivalent procedures must be used in propagative work in laboratories.

3.3 Relevant World Bank Group Guidelines

3.3.1 World Bank Group EHSG, 2007

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in ESS3. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and that are generally considered achievable in new facilities at reasonable costs by existing technology. For World Bank funded projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC/World Bank, become project- or

site-specific requirements. The World Bank Group EHS Guidelines for Water and Sanitation, guidelines for Health Facilities and the General Guidelines are relevant for this project.

3.3.2 ESF/Safeguards Interim Note: COVID-19 Considerations in Construction/Civil Works

This interim note emphasizes the importance of careful scenario planning, clear procedures and protocols, management systems, effective communication and coordination and the need for high levels of responsiveness in a changing environment. It recommends assessing current situation of projects, putting in place mitigation measures to avoid or minimize the chance of infection (Corona virus) and planning what to do if either project workers become infected or the work force including workers from proximate communities is affected by COVID-19. The recommendation covers cleaning and waste disposal, medical services and general hygiene for the workforce together with management of site entry and exit points, work practices and medical supplies for site workers. There are also recommendations to ensure continuity in supply of materials and project activities amidst disruption supply chains as a result of COVID-19. The interim note is useful for SCO staff, Project Consultants and Contractors.

3.3.3 Infection Prevention and Control during Health care when COVID-19 is Suspected or Confirmed

This WHO guideline is intended for health care workers, health care managers, and infection prevention teams at the facility level but it is also relevant for national, regional and district levels teams. It recommends triage, early recognition and source control measures including isolating suspected COVID-19 patients in the health facility setting to contain the spread of COVID-19. Other recommendations mentioned in the document are applying standard precautions for all patients such as hand washing after contact with respiratory secretions and offering medical masks to patients suspected to have contracted COVID-19 while in waiting/public areas or in consulting rooms. The guidelines also propose the implementation of additional empiric precautions (droplet, contact and airborne precautions) for patients suspected to have contracted COVID-19. Such measures include designating a team of health care workers to care exclusively for suspected or confirmed cases to reduce the risk of transmission, whenever possible. These measures, together with implementing administrative, environmental and engineering controls, some of which are training of health care workers in COVID-19 precautionary measures, provision of laundry services (for infected garments and beddings), ensuring that rooms are well ventilated (60L/s) and 1 meter spacing between patients, are proposed in the guidelines. Finally, they outline procedures for collecting and handling laboratory specimens from suspected patients. Notably among these measures are hand delivering all specimens, whenever possible and avoiding the use pneumatic-tube systems in the transportation of specimens (see https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-2020.4 for details).

3.3.4 Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings

The guidelines acknowledge that national and local laws may impose social distancing, restriction on movement and large gatherings as measures to minimize the spread of COVID-19 together with

the fact the public may be averse to large gathering as they protect themselves from COVID-19. They further acknowledge that these realities can adversely affect the extent to which Borrowers can meet the requirements of ESS10. The guidelines go ahead to proffer strategies on how to manage stakeholder engagement and consultation amidst these challenges. These include identifying and reviewing planned activities as well as assessing the COVID-19 status of the country/project settings, risk of transmission through consultation and ICT penetration rate of the Borrower. The guidelines stipulate that public gatherings such as workshops should be avoided but small group meetings like focus group meetings can be carried out, if permitted by national and local laws. The use of social media platforms for both consultations and information dissemination is preferred, while traditional forms are recommended for information dissemination.

Additional guidance is listed in Annex F-Resource List: COVID-19 Guidance.

3.3.5 Getting Your Workplace Ready for COVID-19

The document presents simple measures to be implemented within the workplace to prevent the spread of COVID-19. These measures include activities to ensure that the workplace is clean and hygienic, things to be considered during traveling and when workers return from travel and getting your business ready in case COVID-19 arrives in the community (see https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf?ua=1 for details).

3.3.6 Framework for Allocation and Prioritization of COVID-19 Vaccination

The WHO document offers broad guidance on the allocation of COVID-19 vaccines between countries as well as the prioritization of groups for vaccination within countries while supply is limited based on the values framework. The overarching goal is for COVID-19 vaccines to contribute significantly to the equitable protection and promotion of human well-being among all people of the world.

Key principles outline to guide the globally and national distribution of COVID-19 vaccines in the document are human well-being, equal respect (equal opportunity for all groups and individuals based on an acceptable criteria), global equity (support countries to meet vaccines needs of the populations), national equity, reciprocity (protect those who are significantly at risk in order to protect others) and legitimacy.

In the guidelines, criteria for prioritizing vulnerable populations in-country for vaccination based on the twelve (12) objectives of the Values Framework are outlined. Vulnerable groups in relation to COVID-19 as presented in the document include health workers, the aged as defined by national law, groups living in dense urban residential areas as well as persons with comorbidity.

3.3.7 Interim Note: Protection from Sexual Exploitation and Abuse (PSEA) During Covid-19 Response (WHO, UNFPA, UNICEF, UNHCR, WFP, IOM, OCHA, CHS Alliance, Inter Action, UN Victims' Rights Advocate)

The Interim note underscores the potential for SEA/SH cases to be on rise during the COVID-19 pandemic and the fact that health/frontline workers can be survivors or perpetuators of SEA/SH. It also recommends risk reduction and preventive measures such as building safeguards into the recruitment process for volunteer frontline workers and focal persons. Other measures focus on providing safe and accessible channels for reporting SEA/SH and GBV cases, promoting a culture of speaking up together with measures that provide protection and support for SEA/SH/GBV survivors and co-ordination with in-country initiatives (see https://reliefweb.int/report/world/interim-technical-note-protection-sexual-exploitation-and-abuse-psea-during-covid-19 for details).

3.3.8 WHO Code of Ethics and Professional Conduct

The Code of Ethics and Professional Conduct outlines measures to ensure an effectiveness, efficiency, transparency, and accountability by promoting and upholding the highest organizational standards, ethical principles and conduct for staff. It sets out the principles of ethical behavior and standards of conduct that should guide staff decisions and actions within and outside the work environment. The Code of Ethics and Professional Conduct covers fair and respective workplace, prevention of sexual exploitation, personal conduct, relations with government and political activity and reporting wrongdoing as well as protection for whistle blowers (see https://www.who.int/docs/default-source/documents/ethics/code-of-ethics-pamphlet-en.pdf?sfvrsn=20dd5e7e_2 for details).

3.3.9 CDC Coronavirus Lab Biosafety Guidelines

The guidelines discuss procedures/requirements for laboratory biosafety, routine laboratory procedures, viral isolation, working with animals suspected to be infected with the Coronavirus, referral of specimen to laboratories and packaging/shipping. The key recommendations in the guidelines include basing laboratory procedures on the results of risk assessments of the laboratory, ensuring that only personnel demonstrating capability to undertake procedures in strict conformity with laid protocols are utilised in laboratories, using disinfectants with proven activity against enveloped viruses in laboratories and the fact that BSL 2 equivalent procedures must be in propagative work in the laboratories (see https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html for details).

3.4 National Laws and Policies

The management of healthcare waste is in accordance with the Government of Sierra Leone legislation such as the Environmental Protection Act of 2008 (amended in 2010), Local Government Act of 2004 and Public Health Act of 1960. These legislations are discussed briefly in Table 3.2.

Table 3.2: Relevant In-Country Laws

Legislation	Relevant Sections	Comments/Gaps	Gap Filling Measures
Environmental Protection Agency Act, 2008	The EPA Act is the legislation governing the protection of the environment and the EIA/ESIA process. This Act establishes the role and function of the Environment Protection Agency (EPA) for monitoring implementation and evaluation of national environmental policies of Sierra Leone as well as the obligations of the proponent (environmental licenses' holders) and the Board of Directors of SL-EPA in the event that an environmental license is granted. Under the EPA-SL Act of 2008 section 24 (g), a license is required for the waste management and disposal (e.g. sewerage systems and treatment plants, landfills, treatment plants for household and hazardous waste).	Although most of the provisions under the Act relate to ESS1, the SL-EPA classification/categorization scheme (Category A, B and C) does not align with the World Bank's categorization (High, Substantial, Moderate and Low risk) under ESS1.	MoHS will have to apply for environmental licenses of all sub projects/procurements with safeguards concerns from SL-EPA by formally applying to the Agency. Upon screening the projects appropriate instruments, as may be directed by the SL-EPA, will be prepared and approved by SL-EPA, after which an Environmental License will be issued to cover that particular sub project, prior to the commencement of works, intervention and/or procurement.
The Public Health Ordinance, 1960	This Act remains the principal piece of public health-related legislation in Sierra Leone. The Act places sanitation management, premises inspection, environmental hygiene, food safety, prevention of water pollution and designation of sanitary of sites under the remit of the Ministry of Health and Sanitation and by extension the Health Authorities at the local level.	The Ordinance has some good provisions to minimize community exposure to health issues as required by ESS4.	No gap-filling measures required
Public Health Amendment Act, 2014	This amendment to the Public Health Act, 1960 added Ebola and other communicable diseases to Section 2 of the Public Health Ordinance, 1960.	Consistent with the community exposure to health issues requirement under ESS4	No gap-filling measures required

National Medical Supplies Agency Act, 2017	The Act establishes the National Medical Supply Agency. Its functions include procuring and selling medical supplies as per the Pharmacy Act, 2001, maintaining strict security protocols for the storage of drugs and medical supplies in its storage facilities and other storage facilities as well as procuring, distributing and donating medical supplies to all government health facilities and public bodies as requested by the Ministry of Health and Sanitation. The Agency is also expected to collect data on stocks levels among others.	Consistent with ESS4 requirement under management and safety of hazardous materials in ESS4	No gap-filling measures required
The National Fire Service Act, 1980	The Act establishes and lay out the constituents of the Sierra Leone Fire Service as well as the National Fire Force. It also empowers the Minister to establish Fire Authorities in designated areas. The Act also grants right of entry to fire and police officers for the purposes of fire prevention and control.	The Act does not prescribe standards for fire installations for buildings and infrastructure. It does not also enjoin developers to acquire fire permits, certificates or approval from the National Fire Force or Service prior to the construction of buildings. This makes the law inconsistent with the infrastructure and equipment design under ESS4	The Fire Service/Force will be furnished with the design drawings of new constructions for their input. British Standards (BS) will be the applicable standards for all electrical cables and fittings under the project.
The Hospital Boards Act 2003	The Act establishes governing boards specialized and district government hospitals. The Act also assigns the functions to the Boards, which include provision of	Consistent with ESS4 requirements for Community Exposure to Health Issues and	No gap-filling measures required

(amended in 2007)	accommodation and equipment necessary for the listed hospitals to work, construction, operation, maintenance of the hospital facilities such as laboratories, outpatients' wards, departments, facilities for waste treatment and disposal as well as appointment and training of staff of the respective hospitals. The Board, under this Act, may recommend hospital fees for the consideration of the Minister of Health and Sanitation. The 2007 Amendment to this Act sought to streamline the fee collection structure by stipulating that fees collected from the hospitals involved are paid into the Consolidated Fund.	Infrastructure and Equipment Design and Safety for health care waste management and other health delivery operations	

a. Infection Control and National Health Care Waste Management Plan, 2015

The plan provides the blueprint for health care waste collection, storage and treatment/disposal in Sierra Leone. Some of the strategies discussed in the plan include specifying colour codes for waste receptacles and end treatment for various categories of health care waste and the use of sodium hypochlorite as a disinfecting agent for infectious sharps and infectious waste. The plan also recommends training in occupational exposure-response systems, monitoring and supervision of all activities in the health care waste value chain.

The Infection Control and National Health Care Waste Management Plan, 2015 also provides guidelines for the management of Ebola-related health care waste, which includes wearing of appropriate PPEs by workers involved in the handling and disposal of infectious waste. It also has proposals for demarcation of sites for pit burning/incineration, security of burning sites and training of staff who carry out waste collection and disposal. These proposals are useful for the current COVID-19 Emergency Preparedness and Response Project.

b. The Integrated Waste Management Policy, 2012

Based on the national policy, a national strategy to achieve the policy objectives should:

- Reflect priorities within HCFs for treatment and disposal of healthcare waste;
- Set goals for and means of monitoring infection control and environmental protection;
- Provide an optimal selection of technologies for packaging, transportation, treatment, and disposal of waste;

- Identify appropriate options for centralized and decentralized waste treatment options and disposal systems;
- Reflect distribution of responsibility in the sector among national, regional, and local authorities;
- Propose guidelines for healthcare waste management training programs at healthcare facilities, municipal, regional, and country levels;
- Provide guidelines for the setup of a monitoring and documentation system on healthcare waste management;
- Propose an action plan for the implementation of improved healthcare waste management;
- Provide an investment plan and annual operation and maintenance plan of the implementation of the strategy;
- Establish waste management committees, plans and waste audits;
- Include waste minimization, avoidance, segregation, recycling;
- Include waste container labelling and waste containment;
- Include proper healthcare waste handling, storage and transport;
- Include correct healthcare waste treatment and disposal;
- Increase knowledge of segregating and recycling health care waste.

The purpose of this is to:

- Protect public health and safety;
- Provide a safer working environment;
- Minimize waste generation and environmental impacts of healthcare waste and disposal;
- Ensure compliance with legislative requirements.

c. Sierra Leone COVID-19 Waste Management Standard Operating Procedures (SOP)

The main objective of the SOP is to outline, in a concise manner, directive to personnel charged with the responsibility of collecting, storage, transportation and disposal of health care waste to prevent the transmission of COVID -19 emanating from these wastes. They cover the entire waste management process under two scenarios:

- Scenario 1: Management of COVID-19 Waste at the quarantine homes, Isolation, laboratory and treatment centres in phases one and two of the outbreak and;
- Scenario 2: Management of COVID-19 health care waste in the event of community spread of the disease. It draws on the lesions from the Ebola Virus Disease and guidance from relevant WHO COVID-19 Guidelines (see Annex C for details).

4.0 Existing Conditions

4.1 Location and Population

The Republic of Sierra Leone is a country on the southwest coast of West Africa. It is bordered by Liberia to the southeast and Guinea to the northwest and northeast. Sierra Leone has a total land area of 71,740 km2 (27,699 sq. mi). As of 2019, the population of Sierra Leone was estimated to be 7, 176,260 with an annual growth rate of 2.13%. It is estimated 3,507,584(48.9%) are males, while 3,668,676(51.1%) are females. The country is divided into four (4) regions and 16 districts.

4.2 Types of Health Care Waste Generated in Sierra Leone

All waste produced in a health-care unit is defined as Health-Care Waste but practically 75-90% of HCW is general waste which is non-infectious and similar in nature to Municipal Solid Waste (MSW). The remaining 10-25% of the HCW comprising of infectious waste (Sharp Waste, Contaminated dressings, anatomical and body parts), chemical or pharmaceutical waste and small amounts of radioactive, cytotoxic or Mercury-based waste, represents an elevated risk as a source of potential infection, injury or other health impact. A miniscule fraction (generally less than 1%) may pose a serious chemical, radiological or physical hazard. The lack of waste minimization measures may inflate the amount of HCW produced at facility.

Infectious waste, if not managed properly, can endanger the health of patients, health-care workers, waste-pickers and the people at large and can lead to people dying or getting injured or sick. Sharps waste poses the highest risk among the entire range of Infectious HCW. The WHO estimates that the unsafe injection practices may cause 1.3 million people[1] premature death a year. Improper occupational practices and waste handling of infectious waste pose a high risk to health care workers, environment-service staff, waste handlers and the public.

Waste generated from specific programs/projects is also classified as HCW. The improper usage of insecticides, pesticides etc. such as rodenticides for control of rats and mice, antimicrobial pesticides, bleach etc. can result in increased contamination of soil and water if precautionary measures are not taken.

During maintenance, a lot of electrical and construction wastes are generated within healthcare facilities. These wastes also contribute to the growing waste generated and need to be treated as a special waste.

Infectious, pharmaceutical, chemical and general waste will be generated during the implementation of the Sierra Leone COVID-19 Emergency Preparedness and Response Project Parent Project/AF1/AF2).

4.3 Management System for Health Care Waste in Sierra Leone

Health care waste management is the process of collecting, storing, transporting, treating and disposal or re-use of health care waste. The COVID-19 vaccination activities are generating large amounts of sharps and infectious waste which adds to the existing healthcare waste, notably, liquid

[1] Bulletin of the WHO,1999,77(10)

and solid waste, infectious, pathological, genotoxic, pharmaceutical and chemical waste from healthcare facilities. Other types of health care waste include sharps and equipment containing heavy metals. Proper infection control measures, sound treatment and disposal methods of health care waste are lacking in Sierra Leone. In most health facilities, color-coding is inadequate. Bins lack lining and paddles. In some facilities, on-site transportation is done manually by hand. In addition, many health care facilities do not have adequate Personal Protective Equipment (PPEs) and appropriate tools/equipment for handling health care waste.

Healthcare waste treatment and disposal is a problem across Healthcare Facilities in Sierra Leone. Healthcare facilities, particularly clinics and peripheral health units, do not have appropriate waste management systems to treat and dispose of healthcare waste. As a result, waste is accumulated around healthcare facilities and clinics or is burnt in open pits without supervision, creating risk to patients, the community and the environment. Most of the primary health care facilities have broken down single chambered incinerators. In the secondary and tertiary facilities, substandard poorly maintained stand-a-lone double chamber incinerators and open burn pits that do not provide adequate destruction of waste and cause environmental pollution, are in use. Only few facilities have modern technologies, notably autoclaves and shredders and harmer-mill donated by donors. Their use is constrained by limited ability to operate them or maintain them due to lack of finance to power these facilities at the individual health facility level. Disposal is largely done at facility ash pits within the waste zone building and the general, electrical and construction wastes are mostly transported off site for final disposal to the un engineered but approved dumpsites such as the Kingtom dumpsite, making the case of a centralized system that does not require further treatment of residues prior to final disposal.

Black water from health care facilities are channeled into septic tanks while grey water is channeled into soak away pits. Cesspool empties collect the black water from the facilities and transport them to the feacal sludge pond at the Kingtom dumpsite.

In spite of these challenges, the Ministry of Health and Sanitation (MoHS), with support from the World Bank, implemented interventions to improve healthcare waste management systems notably training of Waste Handlers and Operators, procurement of PPEs and Sanitary Tools. Under the REDISSE, for example, 120 bins have been procured while two refrigerators waste collection trucks are being procured to serve health care facilities in the Western Area (rural and urban). The COVID-19 Emergency Response and Preparedness Project has provided tools and personnel protective equipment for waste handlers. Training of healthcare waste handlers and health personnel in healthcare waste management and infection prevention/control best practices is on-going nation-wide including the Western Area alongside procurement processes for an additional 180 34-litre color-coded bins and bin liners to be distributed in Western Area. The procurement of color-coded bins is at an advanced stage.

Table 4.3 presents a description of health care waste management practices in selected health facilities in Western Area Rural and Urban districts to give a sense of existing health care waste

management practices in the Sierra Leone (see Annex D for list of health care facilities sampled for the assessment).

Table 4.3: Summary of Existing Healthcare Waste Management Practices in the Selected Facilities

Operation	Existing practice in Health Care Facilities
Waste Collection	• Waste collected from the operation theatres, General Wards, OPDs, and Laboratories etc. • Apart from the sharps and placentas, most of the other waste is collected.
Waste Segregation	• General waste, anatomical and other Infectious wastes are normally collected separately at the point of generation • Sharps (used syringes) are collected separately in yellow boxes but end up being mixed during transportation. • Patients/Visitors in the wards sometimes dump the general waste in the bins near the Nursing Stations
Waste Transportation	• Waste is normally transported in bags or carried manually in trolleys by the Hospital Sanitation Workers • Secondary transportation is non-existent as the disposal takes place inside the Health Care Unit (HCU) primarily.
Color Coding	• Color-coding exists only as far as usage of yellow boxes for used AD syringes and black bins for other wastes • No Color-Coding for bags & the trolleys in which wastes are transported • The color-coding for different types of health care waste (HCW) is not consistent and is used more as an exception than as a rule • Lack of consistency in color-coding often results in different types of HCW getting mixed together
Waste Treatment/Disposal	• The Integrated National Waste Management Policy & Strategies of 2015 are to be used to guide HCW treatment and disposal, but the practice is poor across the healthcare facilities. • HCW is either burnt in ovens/single chamber incinerators or is buried inside the compound. No disinfection equipment such as Microwave/

	Autoclaves/Shredders have been installed, except in a few hospitals • Placentas are placed in placenta pits • Waste effluent generated from health care facilities join the drainage without treatment
Scavenging & Recycling	• During the field visits to the hospitals, no major scavenging or rag pickers operations were observed. This is probably due to the fact that the recycling industry based on the waste generated in the health care facilities in Sierra Leone is not organized. however, a few recycling operations are going on. • There is evidence of scavenging operations, but that is mostly for municipal waste.
Disposal Site Analyses	• A visit to the Kingtom dump site revealed that presently the HCW mixed with the MSW is being disposed off at the site. Aerobic composting of the organic fraction of the MSW is undertaken.
Technology	• No Comparative evaluation of various technologies for HCW treatment has been or is being done. • A low level of technology is in use for HCWM e.g. Single Chamber Incinerators ovens, Drums, Cemented Kilns etc.
Equipment	• The equipment for HCW waste collection, transportation, treatment & disposal is of poor quality with no clear set of guidelines • Non-standardized equipment is being used mostly. Many of the incinerators are low technology based, with only a single chamber, low chimney height (3-4m), no temperature Indicators • Incinerators have been installed at many hospitals. However, many of this equipment are not operational owing to a number of factors such as the following: ○ Lack of trained technicians required to operate the Incinerators ○ Maintenance issues ○ Lack of funds for the fuel & other operational heads required for their smooth running ○ Age of the Incinerators

Personal Protective Equipment PPE	• The PPE such as gloves, goggles, mask boots etc. is used partially in some of the hospitals but the situation has improved since the COVID-19 Emergency Response and Health System Preparedness Project. • The guidelines provided in the IP Policy are also not followed in general. • No mechanism to monitor the extend of usage of PPE.
Personal Hygiène & Pollution Abattement	• No major focus on Personal Hygiene such as washing of hands, PPE, etc. • Water Quality at HCU level & Ambient Air Quality (where Incinerators used) are not monitored
Monitoring & Evaluation	• No M&E mechanism for HCWM is in place at healthcare facility level
Action Plan	• No road map for implementing HCWM Plan in Place at the Central, Provincial or the HCU levels
Finance	• No separate budget for financing mechanism for HCWM provided • At the HCW level there is also no budget for HCWM provided, not even for operational costs such as fuel for the installed incinerator

4.4 COVID-19 Waste Management

The COVID-19 Waste Management is the process of collection, treatment and disposal of the healthcare waste produced through vaccination, quarantine, treatment, isolation and testing. Management of waste related to COVID-19 requires special attention. Due to the infectious nature of the virus and usage of PPE, large volumes of immunization waste (including; open vaccine, vials, needles, syringes and PPE) as well as well as from testing and treatment of waste generated will be generated. Safe collection and final disposal of health care waste will eliminate the potential risk to health workers, the public and protect the environment. The health care waste management system in existing HCFs and laboratories are described in Table 4.3. However, the five (5) main health care waste that will be generated under the project are:

i. Vials - All COVID-19 vaccines have limited shelf life. Any vial that goes beyond that date is to be disposed of as biomedical waste, empty vials will also be generated;
ii. Syringes – A used syringe (full, partially empty, or empty);
iii. Needles – used, broken or contaminated;
iv. Personnel Protective Equipment – nose masks, gowns, gloves, overalls and other apparel;
v. Packaging – Any packaging for COVID-19 vaccines (containers or plastic sleeves for vials, trays and syringes).

5.0 Health Care Waste: Risks, Prevention and Mitigation Measures

5.1 Risks Associated with Exposure to Healthcare Waste under the Project

Under the Parent Project and Additional Financing 1 & 2, the following activities are expected to generate health care waste:

a. The operation of a number of laboratories as well as isolation, quarantine and intensive care centers to support treatment and containment of the corona virus disease; and
b. Procurement of vaccines and deployment of vaccines to the target population at vaccination centers (points of service) and through mobile teams; and
c. Testing suspected cases and travelers.

Poor identification, classification, collection, storage, transportation treatment/disposal of health care waste are associated with public health concerns, especially, the outbreak of communicable and non-communicable diseases together with environmental pollution, injuries and more importantly mortality. In Table 5.1 health care waste is classified and the associated risks/hazards they can pose to human health and the environment are presented together with the likelihood of the waste being generated under the Sierra Leone COVID-19 Emergency Preparedness and Response Project. As all health care waste has the potential to cause mortality. They are rated severe in terms of magnitude by default. Their likelihood of being generated as part of the project is used to establish their significance and hence the need to propose preventive and mitigation measures as well as guidance. The likelihood of a particular type of health care waste being generated during the implementation of the project is estimated based on probabilities as indicated below:

- Certain: Project activities have 70% and above chance of generating a particular type of health care waste;
- Likely: Project activities have between 50-70% chance of generating a particular type of health care waste;
- Possibly: Project activities have between 20-50% chance of generating a particular type of health care waste;
- Unlikely: Project activities have between 10-20% chance of generating a particular type of health care waste;
- Very Unlikely: Project activities have less than 10% chance of generating the type of health care waste

Guidelines, preventive and mitigation measures will be proffered for waste streams with at least a 10% chance of being generated.

Table 1.1: Potential Risks Associated with Health Care Waste

Type of Health care Waste	Composition	Risk description	Source	Likelihood of Generation during Project Implementation
Infectious	includes garments, laundry, specimen, contaminated with bacteria, viruses and other pathogens e.g., SARS COV 2 virus	Can cause or spread various infections including COVID 19 and HIV-AIDS with consequences including long term or permanent morbidity and mortality	Isolation, vaccine centers, quarantine and intensive care centers as well as laboratories	Certain
Anatomical	Body parts, organs, blood and other body fluids (urine, saliva, other secretions), fetuses	Can cause and spread infections with consequences as indicated above	Isolation, quarantine and intensive care centers as well as laboratories	Certain
Sharps	Discarded syringes, hypodermic, intravenous or other needles, blades, knives, lancets, scalpels, broken glasses etc.	Can cause injuries, puncture wounds, cuts or lacerations which help pathogenic organisms to enter the body to cause infections with consequences as infectious waste e.g., tetanus	Vaccination and intensive care centers	Certain
Pharmaceutical	All kinds of outdated/expired medications and medication no longer required including vials	Toxic substances with the potential to cause long term or permanent morbidity or mortality e.g., organ failure and	Vaccine and medical storage centers	Possibly

		environmental pollution		
Chemical	Solvents, disinfectants, laboratory reagents, mercury from thermometers and chemical from batteries.	Can cause poisoning, burns, injuries to eye and other organs as well as environmental pollution	Laboratories as well as isolation, quarantine and intensive care centers	Certain
Radioactive	Waste including vials, gloves contaminated with or containing radioactive substances from radiotherapy or laboratory research e.g., Clothing and utensils of patients administered high doses of radioisotopes like I-131	Carcinogenic and mutagenic materials	ICU, Radiography	likely
Pressurized Containers	Aerosol sprays, asthma inhalers, gas containers, "Doom"	Explosion when burned	Isolation, quarantine and intensive care centers	Likely
Cytotoxic	Waste containing substances with genotoxic properties such as drugs as well as equipment vials, gloves etc. used in cancer treatment	Capable of impairing, injuring or killing cells and causing toxic or allergic reactions	-	Very Unlikely
General Waste	Same as domestic waste (e.g., packaging, paper, plastic, food residue)	Non-infectious but could be contaminated to become infectious, if not well managed	Vaccination, vaccine storage isolation, quarantine and intensive care centers	Certain

			as well as laboratories	
Wastewater	Grey and black water from kitchens, bathrooms and washroom	Infectious and toxic can cause infections leading to morbidity and mortality	Vaccination, vaccine storage isolation, quarantine and intensive care centers as well as laboratories	Certain

5.2 Health Care Waste Management under the Project

5.2.1 Health Care Waste Management Processes

There are a number of basic operations involved in Health Care waste management i.e., segregation/collection, storage, transportation and treatment and disposal. The objective of compilation of different guidelines is to provide a ready reference for the implementing agency/authority during implementation of HCWM Plan.

Steps in Healthcare Waste Management: The basic steps in healthcare waste management are segregation, collection, storage, transportation and treatment and disposal. Table 5.2 shows the linkages in the health care waste management system.

Table 5.2: Steps in Health Care Waste Management -COVID-19 Project

step	location	healthcare waste stream	key points
0		*waste minimization*	*purchasing policy; stock management; recycling of certain types of waste…*
1	in medical unit	**generation**	
2		**segregation at source**	*one of the most important steps to reduce risks and amount of hazardous waste*
3	in health facility	**collection + on-site transport**	*protective equipment; sealed containers; specific easy to wash trolleys*
4		**on-site storage**	*lockable easy to clean storage room; limited storage time of 24-48 hours*
5		**on-site treatment / disposal**	*adequate storage room; limited time of max 48 hours*
6	outside of health facility	**off-site transport**	*appropriate vehicle and consignement note; HCF is informed about final destination*
7		**off-site treatment / disposal**	*appropriate vehicle and consignement note to ensure…*

Waste Segregation Systems

Segregation is the process of separating different types of waste and keeping them isolated from each other. This process should be done correctly at the point of generation (ie. at a minimum, a three-bin system: General healthcare waste, sharps and infectious non-sharps waste). Correct segregation of waste is the responsibility of the person who produces each waste item. The HCF management is responsible for making sure there is a suitable segregation. Segregation should:

- Always take place at the source, that is at the COVID-19 facilities, ward bedside, Operation Theatre, Medical Analysis Laboratory, or any other room or ward in the hospital where the waste is generated;
- Be simple to implement for the medical and allege health workers /auxiliary staff and applied uniformly across the country;
- Be safe and guaranty the absence of infectious Healthcare waste in the domestic waste flow;
- Be well understood and well known by the medical, ancillary staff, patient and visitors of the healthcare facilities; and
- Be regularly monitored to ensure that the procedures are respected.

Waste segregation should be practiced at all collection points. Color-coding should be maintained across the service chain. Separate waste containers are required for each waste fraction to facilitate safe handling and disposal. Separate containers are required for infectious waste (non-sharps), sharps waste, pathological waste and general waste.

Container Color and Labels

Use color-coded plastic bags or waste containers with clearly labelled containers to alert staff, patients and the public on the contents of the containers; Clearly visible charts showing the color-coding system; If a container and a plastic bag are used, then both must be of the same color. – see Table 5.2. The MoHS Integrated National Waste Management Policy 2012 adopts the WHO guidelines and color-coding or waste segregation. Color-coding of containers and waste streams makes it easier for healthcare workers to:

- Put waste items into the correct containers;
- Maintain segregation of the wastes during transport, storage, treatment & disposal;
- Visually recognize the potential risk posed by the waste in that container;
- Correctly treat and dispose of the waste stream;
- Correctly manage their waste irrespective of the HCF they may be working in.

Table 5.2: Recommended Segregation Scheme

Waste type	Container Color and Markings	Symbol	Type of container
Infectious Clinical Waste	Yellow with biohazard symbol		Strong, leak-proof plastic bag. Held inside rigid, clearly marked lidded bin **(with pedal).** Bag preferably 70 µm thick (ISO 7765 2004)
Sharp	Yellow, labeled "sharps", with Bio-hazard symbol		Rigid, puncture-resistant container.
Pathological Auto calve and Laboratory waste	Red, label "Pathological for Burning"		Rigid, leak-proof container **(with pedal)** and with sealable lid
Chemical & Pharmaceutical	Brown, label with relevant symbol and "Do not autoclave"	See Table 2 -4.7	Unspecified. Bag/box/bin must adequately contain substance (no leakage)
Radiological	Not specified, Label with Radioactive symbol, and "Do not burn"		Lead-lined box (for on-site storage until activity level falls below proscribed limit)
General	Black	None required	Plastic bag

5.2.1 Handling Waste

After waste is segregated, it is collected by a designated staff and transported for storage, treatment and disposal. All hazardous wastes must be handled in small quantities. This reduces the risk of accidents, self-contamination and contamination of others and the environment:

- Special care must be taken when handling used needles and other sharps as they pose the greatest risk of accidental injury and infection;
- Place waste containers convenient to the point of waste generation to allow for minimal handling;
- All staff must wear appropriate personal protective equipment (PPE) when handling hazardous wastes. Types of PPE differ depending on the risks for specific waste but should include at least heavy-duty gloves, heavy-duty apron, boots or closed toed shoes with cover, eye protection and/or face mask (if indicated); and
- After handling waste, remove PPE and perform hand hygiene.

<u>Capacity and design of Waste Containers</u>

Attention must be given in the waste management plan to the size and design of waste containers. They must be sufficiently large to hold the type of wastes discarded in them yet not be too large that their weight poses a lifting hazard for the stature of staff handling the bins or pose an ergonomic hazard in the room. They must also be ergonomic design to allow easy closure, lifting, carriage and transport. Whether a reusable bin is used alone, or in combination with a bag, is up to the waste management team. However, even with liners, the bins get soiled over time, and this may pose an odor and infection issue. Thus, the containers must be regularly inspected and cleaned, if soiled.

Using an unlined bin is more economical (saves on buying plastic bags, and less impactful on the environment) but the bins need replacing with an empty one immediately on removal for emptying (thus many bins may be needed in larger HCFs), and every bin will need washing before reuse.

If unlined bins are used, they must not be emptied in patient care areas as this may lead to spills and contamination of the surroundings, thus posing increase of injury and infectious to staff, patients and visitors.

Waste Collection

It involves primary or on-site collection (within the establishment) and secondary collection (off-site collection to CWTFs). Primary collection starts at the point of waste production including wards, isolation centers and vaccination centers.

Waste containers must be collected on a regular basis to reduce overfilling and odour risk. It is recommended bins be emptied on a daily basis or whenever they are 3/4th full. Bins more than 3/4th full pose significant risks to staff. Sharps bins never be filled more than 2/3rd full and the lid must close fully. Overfilled bins/sharps boxes are hazardous via sharps injuries, attempts at compressing the waste into the bin, or removing waste to put into a new bin.

(a) How to Handle Overfilled Bags

- Do not attempt to transfer portions of the waste to another bag or container;
- Two workers with proper PPE are needed;
- With one worker holding open a larger secondary container (e.g., a larger plastic bag of the same color code), another worker should carefully place the overfilled bag or container into the secondary container putting the overflowing waste in first;
- Affix a special label on the outside container if it is not color-coded; follow clean-up procedures if there is a spill;
- Report the overfilled bag to your supervisor.

(b) How to Handle an Overfilled Sharps Container

- Do not attempt to transfer portions of the waste to another container;
- Using long heavy-duty gloves that protect the arms, carefully place the overfilled container into a larger secondary container that is puncture-resistant (e.g., a thick hard cardboard box or plastic box);
- Affix a special label on the outside container if it is not labeled and follow clean-up procedures if there is a spill;

- Report the overfilled container to your supervisor.

(c) Key to Waste Handling and Collection

- Use of Proper Containers
- Location of the Containers
- Posters, Signs, Communication
- Color-Coding
- Labeling of Containers/Bags

Transportation of Waste

The transportation of waste is the movement of waste over a specific area by trains, tankers, vehicles to the designated or appropriate landfill. Health-care waste should be transported within the hospital or the heath care facility by means of wheeled trolleys, containers, or carts that are not used for any other purpose. Waste transportation could be on or off site.

(a) On-site Transportation of Healthcare Waste

In Peripheral Health Units (PHUs), wastes will commonly be carried by hand to their final disposal or treatment area.

- All bins and bags must be closed/lidded when carried, and carried such that they do not touch the body of the carrier.
- Bags must always be carried by their top. Never use a hand to support their bottom or sides (a sharp may have wrongly been discarded into the bag).

In hospitals, wastes will commonly be transported by internal cart or trolley.

- Bins must not be emptied in patient-care areas.
- Unlined bins must be closed, transported upright, and safely emptied directly into the pit, burn pit, incinerator, or other treatment systems appropriate for the category of waste.
- The transport route is unimportant from an infection risk point of view provided necessary safeguards are in place, but account should be taken of public aesthetics, patient and public traffic, ease of transport and route efficiency.
- When emptying bins, only the sides or handle(s) should be grasped, not the upper rim.
- All bins must be washed clean prior to reuse.
- Carts/trolleys for collection of wastes from the bins, must be regularly decontaminated.

(b) Off-site transport of Healthcare Waste

In the teaching, regional, district and secondary hospitals, currently in Sierra Leone, it is unlikely that wastes generated by healthcare facilities will be transported offsite. If this is necessary, they will need to be transported in accordance with Sierra Leone Integrated National Waste Management Policy of 2012 & 2015 and other statutes and international codes to which Sierra Leone may be signatory (e.g., UN Model Regulations for Transport of Dangerous Goods).

In the case of COVID-19 mobile vaccination team, they should have tree (3) biohazard bags and sharp containers per team per day. Sharp boxes should be placed in biohazard bags/ liners and safely transported by a designated staff.

In summary, Key to transporting of healthcare waste:

- Avoid transport by hand;
- Use a covered trolley, wheeled bin, or closed cart to transport waste;
- If none of them exists, a wheelbarrow or cart may be used;
- Wash with soap and warm water after each use, then wipe handles and inner and outer surfaces of the trolley, bin or cart with 0.5% chlorine solution.

Storage of Waste

Waste storage involves the interim containment of waste, in an approved manner, after it is generated and prior to disposal. A storage location for health-care waste should be designated inside the health-care facility.

If possible, wastes, once collected, should be disposed of immediately. In larger healthcare facilities, it may be necessary to store wastes onsite while awaiting treatment. If storage is necessary:

- Store for the minimum time possible, preferably only a few hours (not more than 2 days);
- Store the waste at a reduced temperature or minimize waste in warm climates to avoid the production of odour;
- Ensure that carts/trolleys can be wheeled inside the storage area;
- Consider bonding or another form of catch-containment if liquids are stored;
- Waste must be stored:
  – Preferably in a ventilated area or at low temperature;
  – In a secure area not accessible to patients, the public, or animals;
  – So as not to attract or be accessible to vermin;
  – In a covered area so that it remains dry;
- Waste must be labelled with the relevant hazard symbols;
- A spill container kit and fire extinguishers should be available inside the storage area for any stored liquids or inflammables;
- Radioactive waste must be stored separately behind lead shielding until the radioactivity has decayed to legislatively acceptable levels; After which, it may be discarded as general waste unless a higher risk category is present (e.g., sharps).

Treatment of waste

Waste treatment involves the processing and recycling or deposition of waste materials. Healthcare waste should be treated prior to disposal to ensure protection from potential hazards posed by the waste. To be effective, treatment must reduce or eliminate the risk present in the waste so that it no longer poses a hazard to persons who may be exposed to it.

Several methods for medical waste treatment may exist for a variety of Health Care facilities, depending on the size of the facility as well as its location. Primary methods of medical waste treatment include autoclaving, chemical disinfection, incineration and microwaving.
The Treatment approach in healthcare waste management includes:

(a) **On-site**: Healthcare facility treats its own waste;
(b) **Cluster treatment**: Hospitals treat waste from other health facilities in a small area;
(c) **Central treatment**: dedicated treatment plant collects and treats waste from many facilities in an urban center or region.

Each class of healthcare waste requires specific treatment. However, in order to be pragmatic, it is advisable to distinguish three major classes polarizing around 90 % of the biomedical waste production. These major categories could be:

- Waste sharps;
- Infectious and cytotoxic wastes;
- Organic wastes (blood and body fluid wastes, human anatomical waste).

Hazardous /infectious Healthcare waste can be treated to reach a level of hazard / infectiousness that is considered acceptable. Thus, after treatment, they follow the non-risk HCW stream and are disposed of with the general solid waste. They can also be directly disposed of by incineration or in sanitary landfills.

Hazardous / infectious HCW can be treated on-site (i.e. in the HCF itself) or off-site (i.e. in another HCF or in a dedicated treatment plant).

<u>On-site Treatment</u>
This option is often the only one possible in the rural HCFs of the primary sector, but on-site treatment can be also carried out for HCW generated in major HCFs. On-site treatment facilities are particularly appropriate in areas where hospitals are situated far from each other, and the road system is poor.

The advantages of providing each health-care establishment with an on-site treatment facility includes convenience and minimization of risks to public health and the environment by confinement of hazardous / infectious HCW to the health-care premises. However, the treatment costs may be high if there are many hospitals: extra technical staff may be required to operate and maintain the facilities and it may be difficult for the relevant authorities to monitor the performance of many small facilities. This may result in poor compliance with operating standards, depending on the type of facilities, and increased environmental pollution.

Off-site Treatment

The HCW generated in a HCF can be treated off-site when centralized regional facilities exist. Although off-site treatment increases dependency of the HCF on an external actor and requires a fine- tuned transportation system, it provides the following advantages:

- Hospitals will not have to devote time and personnel to manage their own installations;
- Efficient operation can be more easily ensured in one centralized facility than in several plants where skilled workers may not be readily available;
- Greater cost-effectiveness for larger units, through economies of scale;
- Future modifications or expansions (relating to flue-gas cleaning systems of incinerators, for example) are likely to be less expensive;
- Where privatization of facilities is seen as a desirable option, this can be achieved more easily on a regional basis than for numerous small units;
- It will be easier for the relevant government agencies to supervise and monitor the facilities;
- Air pollution may be more easily kept to a minimum at a centralized plant (costs of monitoring and surveillance as well as flue-gas cleaning, for example, will be reduced);

Disposal of Waste

The common methods of waste disposal: municipal disposal sites, sanitary landfills, protected ash pits, placenta pits, anatomical pits, recycling, return to supplier/manufacturer, and approved sewer/drainage systems. Untreated waste discharged into an uncontrolled, non-engineered, open dump does not protect the local environment and should not be undertaken.

5.2.2 Mitigation Measures and Guidelines for Healthcare Waste Management under the Project

Health care waste management activities will be guided by the waste management hierarchy principle namely;

- Waste minimization to reduce the quantity of waste generated;
- Re-use materials, wherever possible;
- Recycle material streams, where practicable;
- Recover as much materials as possible; and
- Responsible disposal following appropriate treatment.

From the foregone, Tables 5.3, 5.4 and 5.5 present guidance for the various stages of the health care waste management process. These guidelines complement existing national guidelines and Standard Operating Procedures.

Table 5.3: Measures and Guidelines of Healthcare Waste Collection and Storage

Process	Measures/Guidelines	Overall Responsible Party	Supporting Parties
Collection	• Sharps waste from the vaccination exercise should be collected in safety boxes • Infectious waste from intensive care units and laboratories including anatomical waste and cultures will be placed in red bins and collected in plastic leak proof bags marked 'INFECTIOUS'. If the red bags or bins are not available, use any of the available color bags and mark them with the Biohazard stickers - Universal biohazard waste symbol. • Yellow rigid, impermeable, puncture-proof container should be used to collect sharp waste from wards and intensive care units. • Yellow plastic bags will be used for non-infectious wet waste, black containers should be used for non-infectious dry waste. • Leak-proof brown plastic bags or containers should be used for chemical or pharmaceutical waste. • All plastic bags for waste collection should be tightly sealed with a tape or plastic tie when 3/4th full to reduce the risk of spilling or breaking. • Highly infectious waste, whenever possible, must be sterilized or disinfected immediately after collection. • Bags should not be closed by stapling. • Hazardous/infectious waste should be collected with separate trolleys.	• Service Providers and MOHS HCF/Laboratory Managers	• Heads of isolation, quarantine and intensive care units in Mohs HCF and Service Provider HCFs and laboratories • Janitors, waste collectors and cleaners at Service Providers and MoHS HCFs/Laboratories Managers • Vaccinators • Waste Collectors

Process	Measures/Guidelines	Overall Responsible Party	Supporting Parties
	• No bags should be removed unless they are labeled with their point of production (ward, unit or department) contents and weighed. • Collection times should be fixed and appropriate to the quantity of waste produced in each area of the health care facility. • General waste should not be collected at the same time or in the same trolley as infectious or other hazardous wastes. • All persons involved in waste collection should be trained on the relevant WHO COVID-19 Guidelines, Emergency Response, Procedures Infection Prevention and Control Protocols and the Government of Sierra Leone COVID-19 Guidelines as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls and goggles should be provided for all persons involved in waste collection. • Bins should be fitted with liners and paddles.		
Storage	• Separate storage areas should be considered for different HCW and chemical waste. • Storage areas should be located within the premises of the HCF and must have the following features: - An impermeable, hard-standing floor with good drainage, and adequate water supply to clean and easy to disinfect;	• Service Providers and Mohs HCF/Laboratory Managers	• Managers of waste storage areas within HCFs/Laboratories • Janitors at Service Providers and MoHS HCFs/Laboratories Managers

Process	Measures/Guidelines	Overall Responsible Party	Supporting Parties
	- Good lighting and at least passive ventilation and protection from the sun; - The facility will keep general waste separated from infectious and other hazardous waste; - Easy access for staff in charge of handling the waste; - Be lockable to prevent access by unauthorized persons; - Easy access for waste-collection vehicles; - Be inaccessible to animals, insects and birds; - Not situated proximate to fresh food stores or food preparation areas; - Supply of cleaning equipment, protective clothing and waste bags or containers should be located conveniently close to the storage area; - A washing basin with running tap water and soap that is readily available for the staff; - Spillage containment equipment. Storage times for Health Care waste (i.e., the delay between production and treatment), unless a refrigerated storage room is available, should not exceed 48 hours in winter and 24 hours in summer for temperate climate. • Storage of infectious waste related to COVID-19 should not exceed 24 hours. • Storage areas should be cleaned at least once a week. • Storage areas should have emergency response/spillage and contingency plans.		

Process	Measures/Guidelines	Overall Responsible Party	Supporting Parties
	• All persons involved in handling waste at waste storage areas should be trained on the relevant WHO COVID-19 Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID 19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons working at the storage collection.		

Table 5.4: Guidelines and Measures for Transportation of Health Care Waste

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties
On Site Transportation	- HCW should be transported within the HCF and laboratory setting by means of wheeled trolleys, containers or carts that are dedicated solely for the purpose. - Wheeled trolleys, carts and containers used in the transportation of HCW should be marked with the corresponding color and/or labelled to indicate the type of waste they are supposed to carry. - Spare trolleys will be available in case of breakdowns and maintenance of operational trolleys.	Service Providers and MoHS HCFs/Laboratory Managers	• Service Providers • MoHS HCFs/Laboratories Managers

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties

	- Trolleys and other vehicles should be cleaned and disinfected daily.
	- The selection of on-site vehicles should be based on the following specifications:
	  o Easy to load and unload;
	  o No sharp edges that could damage waste bags or containers during loading and unloading;
	  o Easy to clean;
	  o Easy to push and pull;
	  o Not too high (to avoid restricting the view of staff transporting waste);
	  o Be secured with a lock (for hazardous waste);
	  o Be appropriately sized according to the volumes of waste generated at a health-care facility;
	- No bags should be moved or removed unless they are weighed and labeled with their point of production (hospital ward or department) and contents;
	- All waste bag seals should be in place and intact at the end of transportation;
	- A routing plan for the HCW should be prepared based on:
	  - Waste volume and number of waste bags or containers;		

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties
	○ Waste types; ○ Capacity of the waste storage area(s); ○ Capacity of the transportation trolleys; ○ Transportation routes, distances and journey times between the collection points and final treatment/disposal sites etc. - All persons involved in waste transportation should be trained on the relevant WHO COVID Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID 19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements; • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons involved in waste transportation.		
Off Site Transportation	• All vehicles transporting health care waste should be authorized by the MoHS and the Ministry of Transport and Aviation. • Haulage trucks must have the following features: - The body of the vehicle should be of a suitable size commensurate with the design of the vehicle, with an internal body height of 2.2 meters;	• Service Providers and MoHS HCF/Laboratory Managers • Managers of Third Private Waste Transport Companies/Entities	• Drivers of Waste Collection Trucks

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties
	- There should be a bulkhead between the driver's cabin and the vehicle body, which is designed to retain the load if the vehicle is involved in a collision; - There should be a suitable system for securing the load during transport; - Empty plastic bags, suitable protective clothing, cleaning equipment, tools, and disinfectant, together with special kits for dealing with liquid spills, should be carried in a separate compartment in the vehicle; - The internal finish of the vehicle should allow it to be steam cleaned, and the internal angles should be rounded; - The vehicle should be marked with the name and address of the waste carrier; - Empty plastic bags, suitable protective clothing, cleaning equipment, tools, and disinfectant, together with special kits for dealing with liquid spills should be carried always and in a separate compartment; - potable fire extinguishers; • The vehicle should be cleaned at the end of each working day and in the event of any spillage.		

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties
	• The vehicle should be marked with the name and address of the waste carrier. • The international hazard sign and emergency telephone number should be displayed on the vehicle or container. • Empty plastic bags, suitable protective clothing, cleaning equipment, tools, and disinfectant, together with special kits for dealing with liquid spills should be carried on the haulage trucks always and in a separate compartment. • The international hazard signs should be displayed on the vehicle or container as well as an emergency telephone number. • No bags should be moved or removed unless they are weighed and labeled with their point of production (hospital ward or department) and contents. • Empty plastic bags, suitable protective clothing, cleaning equipment, tools, and disinfectant, together with special kits for dealing with liquid spills should be carried always and in a separate compartment of the vehicle. • HCW must be transported by the quickest possible route. • HCW transported to a treatment and disposal facility should be accompanied by a consignment note or manifest.		

Type of Health Waste Transportation	Measures/Guidelines	Responsible Party	Supporting Parties
	• The waste should be transported off-site only by the authorized or accredited transporter or carrier by MoHS or MoHS Certified Service Provider. • All persons involved in waste transportation should be trained on the relevant WHO COVID Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID 19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons involved in waste transportation.		

Table 5.5: Measures and Guidelines of Treatment and Disposal of Health Care Waste

Type of Treatment	Measures/Guidelines	Responsible Party	Supporting Parties
Treatment (In situ)	• All sharps and laboratory samples containing body fluids and tissues must always be pre-treated at source by autoclaving or disinfected in a concentrated 2% solution of sodium hypochlorite and then placed in red bags.	• Heads of quarantine and intensive care unit in MoHS HCF and Service Provider HCFs and laboratories	• Selected staff assigned by management at the Facility for disinfection and sterilization
Treatment at Central Waste	• Sharp waste from isolation, quarantine and intensive care units as well as laboratories should be collected in	• Managers of Treatment Facilities	NA

Type of Treatment	Measures/Guidelines	Responsible Party	Supporting Parties
Treatment Facilities (CWFT)	safety boxes, autoclaved/microwaved that HCF and shredded to reduce their quantity treated at common treatment facility. • Discarded medicines should be incinerated at common treatment facilities. • General waste should be sent to an approved land fill site. • All persons involved in waste treatment should be trained on the relevant WHO COVID Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID 19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons involved in waste treatment.		
Treatment when No CWTF is available	• Sharp waste from the vaccination exercise and other activities collected in safety boxes, autoclaved/microwaved should be disposed off by means of encapsulation, in burial pit on the premises of the HCF or they can also be destroyed on the spot using a needle destroyer. • Solid, semi-liquid, or liquid pharmaceutical waste as well as pressurized containers could be placed in plastic	• Service Providers' and MoHS HCF/Laboratory Managers • Managers of the Off-Site Treatment Facilities	• Selected staff assigned by management undertake disinfection and sterilization • Focal Person responsible Health Care Waste Management at the HFC/Laboratories

Type of Treatment	Measures/Guidelines	Responsible Party	Supporting Parties
	drums to three-quarters of their capacity and encapsulated in burial pits within the premises of HCFs. • Garments and beddings should be disinfected with 1% Hypochlorite solution for 30 minutes and washed at a laundry. • Large quantities of chemicals and pharmaceutical waste should be returned to the supplier or encapsulated. • Intact glass tubes, petri dishes, empty glass bottles should be disinfected with 5% Hypochlorite for 30 minutes, autoclaved or micro-waved and sent for recycling or reuse, where possible. • All persons involved in waste treatment should be trained on the relevant WHO COVID-19 Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID-19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons involved in waste treatment.		
Disposal	• Ash from incinerators should be disposed off at the approved landfill. • Autoclaved waste may be disposed off by off-site incineration or in approved landfill sites.	Managers of the Final Disposal Sites	NA

Type of Treatment	Measures/Guidelines	Responsible Party	Supporting Parties
	• General health care should be disposed off at an approved landfill site or recycled, where possible in the case of waste such as glass, plastic, polythene and paper. • All persons involved in waste disposal should be trained on the relevant WHO COVID Guidelines, Infection Prevention and Control Protocols and the Government of Sierra Leone COVID 19 Guidelines, Emergency Response procedures as well as other GIIPs including the use of PPEs and reporting requirements. • Appropriate PPEs including hand gloves, nose mask, wellington boots, overalls goggles should be provided for all persons involved in waste disposal. • Liquid waste should be collected in septic tanks and dislodged at the final disposal site.		

5.3 Guidance for Using Autoclaves

Adhering to the following guidance can minimize the hazards inherent in operating Autoclaves:

i. Responsibility for operation and routine care should be assigned to trained individuals;
ii. A preventive maintenance program including regular inspection of the chamber, door seals and all gauges and controls by qualified personnel should be implemented;
iii. The steam should be saturated and free from chemicals (e.g., corrosion inhibitors) that could contaminate the items being sterilized;
iv. A minimum recommended exposure temperature-time criterion should be 121°C for 30 minutes. This corresponds to a pressure of 205 kPa or 2.05 bar (15 psig or 30 psia);
v. All materials to be autoclaved should be in containers that allow ready removal of air and permit good heat penetration;
vi. The chamber should be loosely packed so that steam will reach the load evenly;
vii. For autoclaves without an interlocking safety device that prevents the door from being opened when the chamber is pressurized, the main steam valve should be closed and the temperature allowed to fall below 80 °C before the door is opened.
viii. Slow exhaust settings should be used when autoclaving liquids, as they may boil over when removed due to superheating;
ix. Operators should wear suitable gloves and visors for protection when opening the autoclave, even when the temperature has fallen below 80 °C;
x. In any routine monitoring of autoclave performance, biological indicators or thermocouples should be placed at the center of each load;
xi. Regular monitoring with thermocouples and recording devices in a “worst case” load is highly desirable to determine proper operating cycles;
xii. The drain screen filter of the chamber (if available) should be removed and cleaned daily;
xiii. Care should be taken to ensure that the relief valves of pressure cooker autoclaves do not become blocked by paper, etc. in the load;
xiv. Volatile and semi-volatile organic compounds, chemotherapeutic waste, mercury, other hazardous chemical waste, and radiological waste should not be treated in an autoclave or retort;
xv. Huge and bulky bedding material, large animal carcasses, sealed heat-resistant containers, and other waste loads that impede the transfer of heat should be avoided;
xvi. Maintain records of indicator tests, time-temperature profiles, maintenance activities (such as replacing filters and gaskets), and periodic inspections;
xvii. SOPs, manufacturers specifications, manuals and quick guides for operation and maintenance should be made available in the autoclave operation areas for referencing;
xviii. Safety notices should be pasted at advantage points within HCFs and at the locations where the autoclave will be located.

5.4 Guidance for Constructing Burial Pits

In case the health care facilities do not have autoclaves or incinerators, burial pits may be constructed and used as the treatment/disposal method for small quantities of infectious waste and sharps especially in the rural areas. The pit should have proper drainage and should not be located in or near an area that floods. The bottom of the pit should be at least 1.5 meters higher

than the water table. The pit should also be downhill from any nearby wells and about 50 meters away from any water sources such as streams (see Annex D-Plate for a diagram of a Burial Pit).

The construction method for burial pits should involve:

i. Digging a pit 1 to 2 meters wide and 2 to 5 meters deep;
ii. Lining the bottom of the pit with clay or a low-permeable material e.g., geotextile membranes, if available;
iii. Constructing an earth mound around the mouth of the hole to prevent surface water from entering the pit;
iv. Constructing a fence or barrier around the area to keep animals, scavengers, and children away;
v. Periodically placing batches of waste inside the pit and covering each batch with a 10-cm layer of soil; Or, as an alternative, a mixture of lime and soil can be used as a covering layer;
vi. When the pit is about 50 cm of the ground surface, cover the waste with soil and permanently seal it with cement. While the preferred method of sealing is to use cement, another alternative is to embed a sheet of wire mesh within a final 50-cm layer of soil cover; and
vii. The area should be appropriately marked with warning signs.

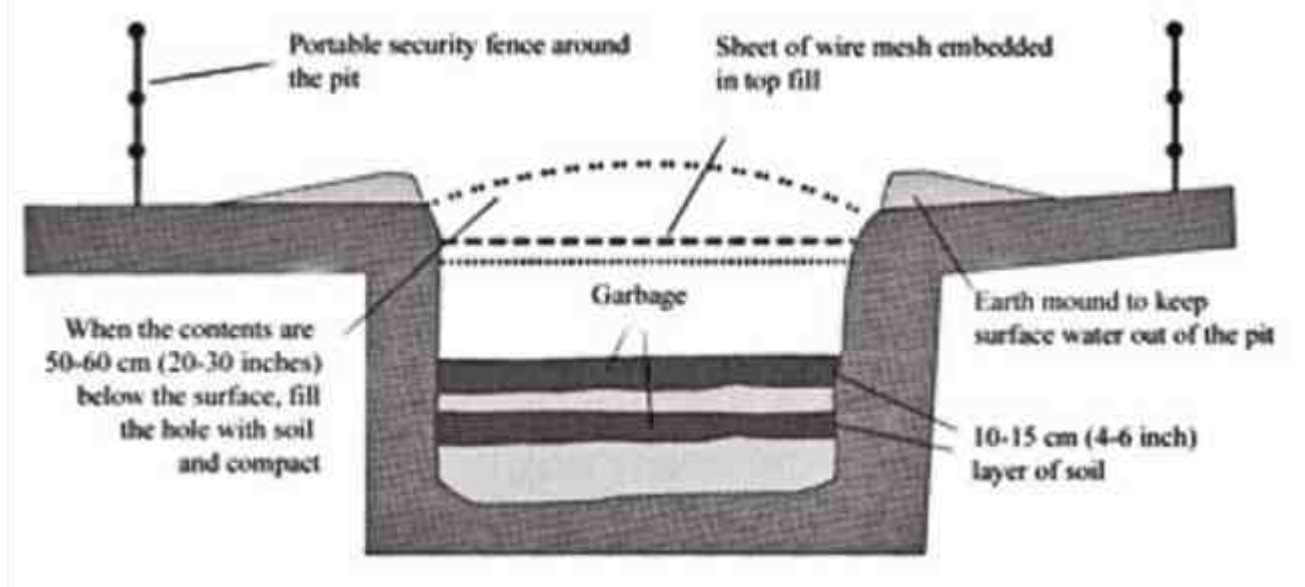

Fig. 1: Plan of a burn pit and its construction

5.5 Guidelines for Incinerators

Additional guidelines for the operation of incinerations are as follows:

i. Imported and European Union certified incinerators should be considered under the project instead of locally manufactured systems;
ii. Single-chamber, drum and brick incinerators should not be accepted for use in HCF/Laboratories and Common Bio-Medical Waste Treatment Facilities (see a picture of containerized incinerator in Annex D-Plate 2);

iii. Chlorinated waste such as polyvinyl chloride plastics should be minimized or eliminated from the waste to be incinerated;
iv. The temperature in the primary chamber should be at least 800 °C and that in the secondary chamber should be at least 1000 °C;
v. Introduction of the waste in the combustion chamber only at temperatures of 850°C; (The plant should have an automatic system to prevent waste feed before the above-mentioned temperature is reached);
vi. Installation of auxiliary burners (for start-up and shut-down operations);
vii. Avoidance of starts and stops of the incineration process);
viii. The chambers should not operate at temperatures below 850°C and there should be no cold regions;
ix. Control of oxygen input depending on the heating value and consistency of feed material to provide sufficient oxygen content at an average of 6% Oxygen by volume;
x. Minimum residence time of 2 seconds at between 1300°C to 1500ºC in the secondary chamber;
xi. High turbulence of exhaust gases and reduction of air excess should be achieved by injection of secondary air or re-circulated flue gas, pre-heating of the air-streams and regulated air inflow;
xii. Incinerators must meet emissions standards in the World Bank Group EHSG for health facilities namely:

a) Total Particulate matter (PM)	*-10 mg/Nm^3*
b) Total organic carbon (TOC)	*- 10 mg/Nm^3*
c) Hydrogen Chloride (HCl)	*- 10mg/Nm^3*
d) Hydrogen Fluoride (HF)	*- 1 mg/Nm^3*
e) Sulfur dioxide (SO_2)	*- 50 mg/Nm^3*
f) Carbon Monoxide (CO)	*- 50 mg/Nm^3*
g) NO_X	*- 200-400$^{(a)}$ mg/Nm^3*
h) Mercury (Hg)	*- 0.05mg/Nm^3*
i) Cadmium + Thallium (Cd + Tl)	*- 0.05mg/Nm^3*
j) Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V	*- 0.05 mg/Nm^3*
k) Polychlorinated dibenzodioxin and dibenzofuran (PCDD/F)	*- 0.1mg/Nm^3TEQ*

Notes: a. 200 mg/m^3 for new plants or for existing incinerators with a nominal capacity exceeding 6 tons per hour; 400 mg/m3 for existing incinerators with a nominal capacity of 6 tons per hour or less b. Oxygen level for incinerators is 7 percent.

The choice of a particular type of treatment technology will depend on the volume and types of waste stream anticipated from the HCF and laboratories in consultation with the Ministry of Health and Sanitation.

5.6 Guidelines for operation of an Incinerator

- A good incinerator generally consists of:
  - Primary combustion chamber (waste burning chamber);

- Secondary chamber* (exhaust gas burning chamber);

- Many incinerators must be pre-heated before wastes are added;
- Mix of dry and wetter material must be added during waste burning to ensure good temperature is maintained;
- Rate of loading should be controlled, and overloading should be avoided;
- Sufficient time must be provided for the carbon in the waste ash to combust and for cool down

  ~1 hr plus 20 min for each hour of operation or usually 2 to 3 hr total.

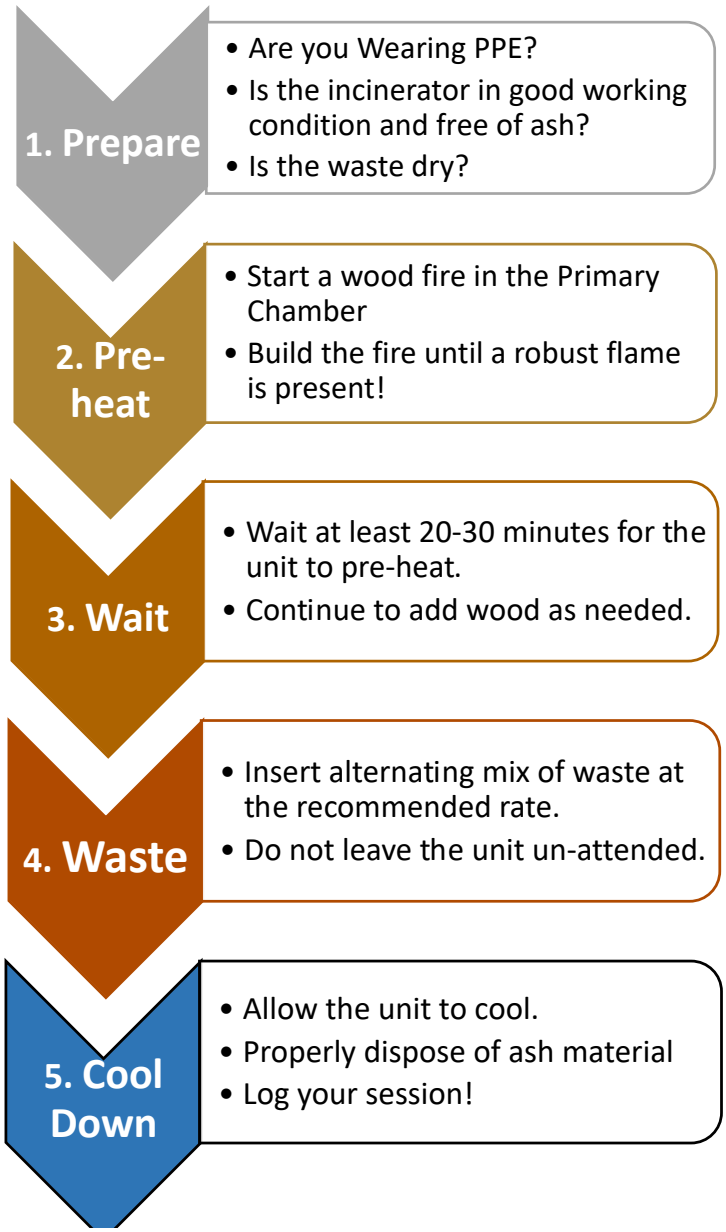

Fig. 3. Incinerator Operation Principles

5.7 Guidelines for Pathological Waste (limbs, organs, placentae, etc.) Management

In management of pathological waste, the following should be observed:

- Body parts must be disposed of safely and with respect to local culture;
- Remember – body parts are infectious waste;

- Body parts must not be placed in burn-pit, but they should be buried in a separate 2m deep (non-burn) pit away from the public;
- Access areas, patient-care areas, vegetable gardens, water-table and water courses;
- Seal body-part container (bag or bin) with tape;
- Transport and lower carefully and with respect into burial pit;
- Cover with 10cm soil after each deposition into pit;
- When a pit is 3/4th filled with soil, dig a new one.

5.8 Guidelines for Infection Prevention and Control

Preventing nosocomial infections requires a hygienic and sanitized environment, maintenance of good practices and use of protective gear. Routine cleaning of the health facility is essential, as that will keep the environment free from dust and dirt. In addition to preparing facility infection prevention and control protocol, as set out in Annex B at the facility level, infection prevention and control measures should include hygiene, immunization and measures to prevent and/or minimize exposure to sharps waste.

5.8.1 Hygiene

Running water, soaps or antiseptic and facilities for drying without contamination are required for Health Care workers to always maintain cleanliness. As a general practice of maintaining good hygiene, the floors of the Health Care Facility should be first swabbed with a wet cloth, then swept to remove grits to avoid dust carrying pathogens from rising into the air and, finally, swabbed with a disinfectant solution. The swab cloth should be washed with detergent after every use. Infected linen in the health care facility should be carefully packed in plastic bags and taken to the washing area. It must be soaked in bleach solution and then washed with a detergent.

Washing and maintenance of equipment used to contain and transport waste should be done immediately after use and hand-washing facilities (with warm running water and soap) must be provided for employees who undertake these activities.

5.8.2 Immunization

Health workers, laboratory personnel, waste transporters, vaccinators and others in the health care waste value chain are those at risk of picking up infections in the line of duty. They should be:

i. Vaccinated against COVID-19, Tetanus etc.;
ii. Each HCF is required conduct immunization for all newly employed staff; and
iii. The HCF should also keep records of staff who have been vaccinated.

5.8.3 Precautions for Sharps and Body Substance Exposures

Precautionary measures must be implemented to protect against exposure to infectious sharps, blood and body fluids during the vaccination exercise and working in the intensive care and isolation units. These measures should include:

i. Providing a purposely designed sharps container as close as practicable to the point of generation of sharps waste e.g., vaccination centers and intensive care wards;
ii. Providing appropriate PPEs for potential air, blood and body substance exposures;
iii. Conducting compliance checks to confirm that people use the PPEs;
iv. Investigating all incidents to identify causes of exposures;
v. Taking remedial action to eliminate risks;
vi. Setting up infection Control Committees or an appropriate forum to review incident reports and confirm appropriate action taken;
vii. Training staff in first aid and injury management procedures for sharps injury and body substance exposure;
viii. Reinforcing the need for staff to report all incidents and injuries; and
ix. Analyzing statistics to identify any risk and exposure trends for necessary interventions.

5.8.4 Safety Measures for Workers

Waste handlers, health and allied workers working in the various isolation, quarantine and intensive care centers as well as laboratories together with vaccinators are particularly at risk from health care waste and infections. At all stages, they require:

a. PPEs including gloves, nose masks, googles and wellington boots;
b. Hold waste containers at the handle or at the top of liner bag;
c. Avoid any waste falling on the floor during collection and transportation;
d. Non-complying waste (in terms of segregation) should not be sorted by hand;
f. Cloak rooms for changing and showering should be provided in the facility;
g. Waste handlers should have access to treatment/prophylaxis for infectious diseases and,
h. Training of waste handlers and health care workers on occupational health and safety relating to health care waste handling and management.

5.9 Guidelines for the Transportations of Specimen, Reagents and Chemicals

In order to prevent spillage and contamination of specimen, reagents and chemicals, the following should be undertaken:

i. Cross border transportation of medicines, samples/specimen, reagents etc., should be guided by United Nations Model Regulations on the Transport of Dangerous Goods (40) and Infectious Substances Shipping Guidelines;
ii. Packaging for shipment and internal transportation should follow the triple packing approach i.e., packaging will consist of watertight, leak proof receptacle(s) for the specimen/regnant/equipment/ medicine etc., a second watertight, leak-proof packaging to

enclose and protect the primary receptacle(s) and a third layer to protect the secondary packaging from physical damage;

iii. Packages will be appropriately labelled to include content, sender etc.; and
iv. Samples and specimen to laboratories should be 'hand delivered.'

5.10 Guidelines for the Transportation of Infectious Healthcare Waste

5.10.1 Logistic staff

Drivers of vehicles carrying infectious healthcare waste should have appropriate training about risks and handling of hazardous waste. Training on the following issues should be included:

- Relevant legal regulations;
- Waste classifications and risks;
- Safe handling of hazardous waste;
- Labelling and documentation;
- Emergency and spillage procedures; and
- In addition, drivers should be declared medically fit to drive vehicles.

In case of accident, contact numbers or details of the emergency services and other essential departments should be carried in the driver's cab. For safety reasons, vaccination against tetanus and hepatitis A and B, COVID-19 is recommended, and vaccination and training details of staff should be recorded.

5.10.2 Vehicle Requirements

A fundamental requirement is for the vehicle transporting hazardous waste to be roadworthy and labelled to indicate its load, and its payload to be secured to minimize the risk of accidents and spillages. Any vehicle used to transport health-care waste should fulfil several design criteria:

- Must be able to maintain a low temperature (functioning refrigerator truck is required to transport infectious wastes);
- The body of the vehicle should be of a suitable size commensurate with the design of the vehicle;
- There should be a bulkhead between the driver's cabin and the vehicle body, which is designed to retain the load if the vehicle is involved in a collision;
- There should be a suitable system for securing the load during transport;
- Empty plastic bags, suitable protective clothing, cleaning equipment, tools and disinfectant, together with special kits for dealing with liquid spills, should be carried in a separate compartment in the vehicle;
- The internal finish of the vehicle should allow it to be steam-cleaned and internal angles should be rounded to eliminate sharp edges to permit more thorough cleaning and prevent damage to waste containers;
- The vehicle should be marked with the name and address of the waste carrier;

- An international hazard sign should be displayed on the vehicle and containers as well as an emergency telephone number
- The driver should be provided with details of the waste being carried.

Vehicles or containers used for transporting health-care waste should not be used for transporting any other material. Vehicles should be kept always locked, except when loading and unloading, and kept properly maintained. Articulated or demountable trailers (temperature-controlled if required) are particularly suitable because they can easily be left at the site of waste production. Other systems may be used, such as specially designed large, closed containers or skips. Open-topped skips or containers are unsuitable because they fail to isolate waste from the general public during transportation and should not be used for health-care waste transport. Where the use of a dedicated vehicle cannot be justified, a bulk container that can be lifted onto a vehicle chassis may be considered. The container may be used for storage at the health-care facility and replaced with an empty one when collected. Refrigerated containers could be used if the storage time exceeds the recommended limits described previously, or if transportation times are long. The same safety measures should apply to the collection of hazardous health-care waste from scattered small sources, such as clinics and general practice surgeries.

5.10.3 Labelling of the Transport Vehicles

The transport vehicle should be labelled according to the type of waste that is being transported. The label that is displayed will depend on the United Nations classification of the waste.

5.10.4 Cleaning of Waste Container and Vehicles

Vehicles and transporting containers used for the transportation of health care waste should be cleaned and disinfected daily after use. Mechanical cleaning, combined with soaps and detergents, which act as solubility promoting agents, can be used. Cleaning and disinfection have to be carried out in a standardized manner or by automated means that will guarantee an adequate level of cleanliness. In addition, a schedule for preventive maintenance should be set up for all equipment and vehicles used in the transportation process.

5.10.5 Transport Documentation

Before sending hazardous health-care wastes offsite, transport documentation (commonly called a “consignment note” or “waste tracking note”) should be prepared and carried by the driver. A consignment note should be designed to take into account the control system for waste transportation in operation within a country. If a waste regulatory authority is sufficiently well established, it may be possible to pre-notify the agency about a planned offsite transport and disposal of hazardous health-care waste and to obtain the agency’s approval. Anyone involved in the production, handling or disposal of health-care waste should recognize that they have a general “duty of care” – that is, an obligation to ensure that waste handling, treatment and disposal and the associated documentation comply with the national regulations.

The consignment note for a vehicle carrying a hazardous health-care waste load should include the following information in case of accidents or official inspection:

- Waste class;
- Waste sources;
- Pick-up date;
- Destination;
- Driver name;
- Number of containers or volume; and
- Receipt of load received from responsible person at pick-up areas.

This information allows quick and effective countermeasures to be taken in the event of an accident or incident. Weight of waste is useful for commercial treatment and disposal operators who bill health-care facilities for their waste services. On completion of a journey, the transporter should complete a consignment note and return it to the waste producer.

Segregated waste should be kept separated until final disposal. General waste should follow a municipal waste disposal route, if available. Sharps and non-sharps wastes should be treated and disposed of using the best available practices based on the minimum options.

6.0 Emergency Response Procedures

Spills and accidents have the potential to cause and spread infections, while fire may destroy lives and property within the HCVFs and laboratories. This chapter discusses emergency response procedures for spills, fire and accidents.

6.1 Chemical/Pharmaceutical/Infectious Waste Spills

The steps should be followed as part of emergency response in the event of spillage of chemical/pharmaceutical products including vaccines, drugs, laboratory specimens and health care waste in-transit from intensive care, isolation and quarantine and vaccination centers as well as temporary storage areas and vaccination centers:

i. Vacate and secure the area to prevent further exposure and exposure of other individuals;
ii. Provide first aid and medical care to injured individuals;
iii. Inform the designated person (e.g., waste management focal), who should coordinate the necessary actions;
iv. Determine the nature of the spill;
v. Limit the spread of the spill;
vi. Vacate all people not involved in the cleaning, if the spillage involves particularly hazardous substance;
vii. Neutralize or disinfect the spilled or contaminated material;
viii. Collect all spilled and contaminated material (sharps should never be picked up by hand);
ix. Spilled material and disposable contaminated items for cleaning should be placed in the appropriate waste bags or containers;
x. Decontaminate or disinfect the area (using 5% bleach solution) wiping up with absorbent material, cloth or paper towel, working from the least to the most contaminated part, with a change of cloth at each stage. Dry cloth should be used in the case of liquid spillage; for spillage of solids, cloth impregnated with water (acidic, basic, or neutral as appropriate) should be used;
xi. Dispose of contaminated materials into a leak proof, puncture-resistant waste disposal container;
xii. Decontaminate or disinfect any tools that were used;
xiii. Remove any contaminated clothing and disinfect them;
xiv. Clean and disinfect the area of the spillage (if necessary, repeat the steps until spill is cleaned;
xv. After successful disinfection, inform the competent authority that the site has now been decontaminated;
xvi. Seek medical attention if exposure to hazardous material occurs during the operation.

6.2 Injuries and Accidents Linked to Healthcare Waste Management

In the event of any accident or injury during health care waste collection, transportation treatment and disposal the procedures to follow include:

i. If it is a minor accident/injury and the victim can move, a person, who is trained in administering first aid will administer first aid, assess the injury, and refer the victim to

the nearest health facility after which he/she will record the incident in an incident record book on the site or in the HWC transportation vehicle;

ii. If the victim requires further treatment, the victim(s) should be sent to the nearest health facility immediately in an appropriate vehicle;
iii. If the accident/injury is such that the victim cannot move by him/herself but can be moved, the workers present should assist him/her to the nearest point where first aid can be administered and arrange for the victim to be sent to the nearest health facility immediately; After that, he/she will record the incident in an incident record book; site/ward/unit/department/facility/center or in the HWC transportation vehicle;
iv. If the accident/injury is such that the victim cannot be moved, the workers present should put him in a stable condition and immediately arrange for medical staff from the nearest health facility to be brought to the scene to attend to the victim and assist evacuation to nearest health facility; and
v. All accidents and injuries will be recorded in the Incident Report Book and reported to the Waste Management or Infection Control Focal Person for investigation and on ward information of the Head of Department and/or Facility Manager.

In case of skin and eye contact with hazardous substances, there should be immediate decontamination, generally, with copious amounts of water. The exposed person should be removed from the area of the incident for decontamination. Special attention should be paid to the eyes and any open wounds. In case of eye contact with corrosive chemicals, the eyes should be irrigated continuously with clean water for 10-30 minutes. The entire face should be washed in a basin, with the eyes being continuously opened and closed.

7.0 Monitoring the Health Care Waste Management Plan

7.1 Tracking and Recording Health Care Waste from Health Care Facilities and Laboratories

The following steps will be followed to track and record waste from the various sections of health care facilities, laboratories and vaccination centers under the project:

- Waste will be segregated at the department/ward/unit level by color-codes and the type of receptacle stipulated in this Health Care Waste Management Plan;
- Waste receptacles will be stationed at vantage points to enable 100% collection;
- The weight of the empty receptacles will be obtained from the manufacturers specifications or by weighing and recording the weight of a replica that has not been used;
- At the point of collection, each receptacle with its content will be weighed and its weight will be recorded by the nurse in charge in a Consignment Note together with the sources, destination and type of waste, date and time of weighing. Particulars of the janitor will also be recorded on the Consignment Note;
- For waste that would be stored and transported, it will be sent to the temporary storage/holding area, where it will be reweighed and documented as done previously on the Consignment Note and kept;
- Prior to it being transported, it will be weighed again and documented on the Consignment Note by the person in charge of the storage/holding area. Same details will be recorded on the Consignment Note and handed over to the transporter and a copy should be kept at the facility.
- At the off-site disposal facility, the transporter will hand over the Consignment Note to the Manager of the Treatment Facility who will also weigh the waste and complete the Consignment Note. The Completed Consignment Note will be returned to the health care facility by the transporter;
- Waste that will be disposed of in-situ, will be weighed prior to final disposal and same data would be entered on the Consignment Note by the Treatment/Disposal Facility Manager; and
- Daily reports will be prepared from the Consignment Notes by the officers in charge of holding areas and treatment/disposal sites covering source, type and quantity of waste for the Waste Management/Infection Prevention and Control Focal Persons who will compile monthly reports for the Facility for review and submission by the Facility Manager.

The operator of the waste autoclave shall also maintain records of the usage of the autoclave and submit the records to Waste Management/Infection Prevention and Control Focal Persons for consolidation. A register shall be maintained by the operator, in which the following records shall be maintained: daily record of boiler operation, treatment cycle details, usage of autoclave bags, and number of bags containing infectious plastic waste.

7.2 Monitoring at the National Level

Monitoring ensures that the hazards and risks associated with health care waste management have been accurately predicted and guidelines for prevention and mitigation measures being

implemented are effective. Monitoring of the HCW management and infection prevention procedures at the national level will be undertaken by the Integrated Health Project Admiration Unit (IHPAU) Safeguard staff in collaboration with the Directorate of Environmental Health & Sanitation. This will include field monitoring and validating monthly monitoring reports submitted by the various HCFs, laboratories, DHMTs and the preparation of consolidated quarterly reports based on facility and site inspections to validate submitted reports from health care facilities/laboratories/DHMTs. These quarterly reports will be submitted to the World Bank and other stakeholders for the review and recommendations. EPA-SL will be responsible for ad-hoc monitoring.

7.3 Monitoring at the Facility Level

At the HCFs/Laboratories, vaccine storage and vaccination centres, Infection Prevention and Control Focal Persons/Committee Members will be responsible for the monitoring of IPC and HCW management processes and procedures and reporting on the performance of same monthly. If the hazards and risks discovered during the monitoring are different from those predicted or mitigation/guidance measures are found to be inadequate, the Waste Management/Infection Prevention/Control Committee will evaluate the situation and propose alternative measures to the Facility Manager for implementation. Monitoring indicators at the facility level are presented in **Table 7.1** below.

Table 7.1: Monitoring Indicators/Parameters at the Facility Level

Stage	Location	Monitoring Parameter/Indicator	Mode of Verification	Frequency	Responsibility for Monitoring at the Facility Level
Collection	• Various units/ departments of isolation, quarantine and intensive care Centers • Laboratories • Vaccine Storage Areas • Vaccination Centers	• Presence of colored coded receptacle fabricated with the appropriate material and clearly labelled appropriately • Waste placed in appropriate receptacles • Number of times waste is collected • Presence of overflowing receptacles • Type and quantity of waste • Odor • Presence of sharp/safety boxes at vaccination centers and other relevant departments/unit of HCF/laboratories • Presence of spill clean-up equipment/materials or otherwise • Availability and use of PPEs • Presence of waste collection procedures pasted at relevant sections of the HCF/laboratory or otherwise • Number of waste collectors/staff trained in waste collection SOPs and GIIPs* e.g., waste segregation and color codes*	Inspection	Daily	HCW/ IPC Focal Person/Committee

		• Number of training programs undertaken* • Number of spills and incidents* • Presence of flies and otherwise			
Storage	• Designated temporary HCW storage/holding areas	• Presence of flies and another pest or otherwise • Number of spills and incidence/accidents • Type and quantity of waste • Odor • Availability and use of PPEs • Presence of collection procedures pasted at relevant sections of the HCF/laboratory or otherwise • Number of staff at temporary waste storage areas trained in relevant SOPs and GIIPs* • Number of training programs undertaken*	Inspection	Daily	• HCW/ IPC Focal Person/Committee
Transportation	• HCF • Treatment facilities	• Type of vehicles used for HCW • Type and quantity of waste transported • Presence of dedicated haulage routes or otherwise • Presence of Consignment Note/Manifest on haulage trucks	Inspection	Daily	• HCW/ IPC Focal Person/Committee

		• Frequency of HCF transportation • Number of spills and accidents • Presence of spill clean-up equipment/material on vehicles • Availability and use of PPEs • Presence of collection procedures pasted at relevant sections of the HCF/laboratory or otherwise • Number of waste transporters trained in relevant SOPs and GIIPs* • Number of training programs undertaken*			
Treatment	•	• Type and quantity of waste treated at the treatment facility • Stack tests to measure emissions at incinerators*** • biological indicators or thermocouples placed at the center of each load of autoclaves**** • Presence of signage at burial pits • Odor at burial pits • Presence of fencing or otherwise* • Availability and use of PPEs at treatment sites		Daily	• HCW/ IPC Focal Person/Committee

Infection Prevention and Control	•	• Number of staff (e.g., waste collectors, vaccinators, nurses at isolation centers etc.) immunized against COVID 19, tetanus etc. • Presence of handwashing stations (clean flowing water, soap, tissue and waste bin) at unit/departments of HCF and laboratories as well as vaccination centers • Availability and use of PPEs for vaccinators, health workers and ancillary workers e.g., orderlies, cleaners etc. • Number of staff and ancillary workers trained in the Facility IPCP and ICHWMP relevant SOPs and GIIPs* • Number of training programs undertaken*	Inspections	Daily	• HCW/ IPC Focal Person/Committee
Emergency Response	• Various units/ departments of isolation, quarantine and intensive care Centers • Laboratories	• Presence of fire installation e.g., fire extinguishers, smoke detectors etc. at HCF, laboratories, vaccination centers and waste trucks • Presence of spill kits in waste trucks, wheeled carts, waste storage and treatment areas etc.	Inspections	Daily	• HCW/ IPC Focal Person/Committee

	• Vaccine Storage Areas • Vaccination Centers • Waste Treatment sites	• Number of staff and ancillary workers trained in relevant Emergency Response Procedures * • Number of training programs undertaken* • Number of fire drills undertaken** • Number and Type of accidents/incidents			

*Frequency of monitoring this indicator will be quarterly

** Frequency of monitoring this indicator will be annually or as may be required

*** Frequency of monitoring this indicator will be once every quarter

**** In each load

7.4 Monitoring and Reporting Requirements

In charges of the various facilities will be responsible for the preparation and implementation of Infection Prevention Control Protocols and Infection Control and Waste Management Plans in their respective Facilities based on the templates provided in Annex A and B.

Two types of monitoring reports will be required under the project:

a. Monthly Monitoring Reports

The IPS/HCW Focal person/Committee in facilities and service areas (vaccination centers and storage areas) where an aspect of the project is being implemented will submit Monthly Monitoring Reports to the DHMT for onwards submission to MoHS and IHPAU. The report will present the outcome of monitoring activities in the month under review covering the indicators in Table 7.1, additions that will be captured in the facility specific ICWMPs and IPCPs as well as compliance and non-compliance issues. Other information to be presented in the monitoring report include the type and quantity of waste generated at each stage of the health care waste management process in the facility together with proposed corrective/mitigation measures with timelines for implementing the measures to deal with the identified non-compliance issues and challenges, responsible party or parties for implementing the proposed corrective/mitigation measures as well as cost implications, if any.

b. Quarterly Reports

The IHPAU Safeguard Unit will compile a summary of the issues in the monthly reports in a quarter and submit it to the World Bank in the form of a Quarterly Report. The report will detail out challenges as well as the performance of the facilities in implementing the various guidelines and preventive and mitigation measures in this document as well as the Facility Specific Infection Prevention Control Protocols and Infection Control and Waste Management Plans. Other aspects of the report will include compliance and non-compliance issues and recommendations among others. It will also present a summary of types and quantity of waste generated by various types of facilities under the Project.

c. Third Party Reports

Third party specialists will also prepare annual monitoring reports and a Project Completion Report on the overall implementation of the HCWMP.

7.5 Disclosure

This HCWMP upon review and acceptance by the World Bank and other stakeholders will be subsequently disclosed on the relevant websites including that of the MoHS. Copies will be disseminated to all the participating HCFs and laboratories to guide the preparation of their own facility specific ICWMP and IPCPs based on Annex A and B. The World Bank will also disclose the HCWMP on its external website.

8. Institutional Arrangement, Responsibilities and Capacity Building

8.1 Institutional Arrangement and Responsibilities

Project management arrangements used under the COVID-19 parent project, which are the same as those under the on-going World Bank-supported COVID-19 Additional Finance Project, are being adopted under AF 1&2. The Director of Policy, Planning and Information (DPPI) in the MoHS will serve as the Project Coordinator with support of the IHPAU of the MoHS which will coordinate project activities with all stakeholders.

8.1.1 World Health Organization (WHO)

The World Health Organization will play a role in supporting MoHS in training of conversancy laborers, vaccinators, Facility Managers and medical staff, cleaners and other related staff on relevant WHO Guidelines and other GIIPs that relate to infection prevention and control as well as health care waste management under the project.

8.1.2 Directorate of Environmental Health and Sanitation

Responsible for national sanitation and hygiene (including waste management) policy and strategy formulation through its Integrated National Waste Management Program. In terms of health care waste management, the Directorate of Environmental Health and Sanitation (DEHS) will collaborate with the Environmental and Social Safeguard Unit at IHPAU for Healthcare Waste Management Plan implementation and monitoring. MoHS through the Environmental and Social Safeguard Unit of IHPAU and DEHS will also run training programs for relevant project staff. MoHs will be responsible of the provision of equipment (e.g., PPEs, bins, waste haulage trucks and wheeled carts under the project). Environmental and Social Safeguard Unit of IHPAU supported by DEHS will carry out monitoring at the national level.

8.1.3 Environmental and Social Safeguards Unit at IHPAU

The Safeguards specialists, the Waste Management Specialist at IHPAU, will collaborate with the DEHS and other related Directorates and Programs in coordinating, monitoring and reporting healthcare waste management activities of the project. Technical Assistance will be provided by the Environmental and Social Safeguards Technical Advisor at IHPAU.

8.1.4 District Health Management Teams (DHMTs)

At the district level, DHMTs focal person(s) for Healthcare Waste Management, in collaboration with the district(s) IPC Committees, will be responsible for coordinating, monitoring and reporting healthcare waste management activities of the project at district level. Their responsibilities will also cover review and validation of monthly monitoring reports from the various facilities.

8.1.5 MoHS Facility Managers/ In-charge of the Hospital, CHC, MCHP & CHP

Implementation of the HCWMP will largely be within the health facilities, laboratories, vaccine centers and vaccine storage areas. At this level, the responsibility of leading the implementation of the HCWMP will fall on the MoHS Facility Managers/ In-charge /Laboratory Managers. They will be responsible for setting up Waste Management/Infection Control and Prevention Committees and appointing Waste Management/Infection Prevention and Control Focal Persons for their respective facilities as well as a dedicated person(s) for operating the autoclave and incinerators (where available). They will review training needs and co-ordinate training programs for health care workers and those in healthcare waste management within their respective facilities. Facility Heads will also receive monthly monitoring reports from their IPC/HCW Focal Persons/Committees and forward them to the District Healthcare Waste Management Focal persons at the DHMT for onward submission to the DEHS and IHPAU Safeguard Unit.

Facility Managers/In-charges will also appoint ICP/HCW Focal Persons for their respective facilities, who will be part of the Waste Management/Infection Control and Prevention Committee. They will also review, sign off, disclose and lead the implementation of the facility level ICWMPs and the IPCPs which will be based on the templates attached as Annex A and B and guidance provided in this HCWMP. Facility managers will also be responsible for organizing transport to cart HCW such as sharps in safety boxes to on and offsite treatment and disposal sites.

8.1.6 Health care Waste Management/Infection Prevention and Control Focal Persons

The Waste Management/Infection Prevention and Control Focal Persons, who will be management level staff of participating health facilities/laboratories, will be responsible for:

i. The day-to-day supervision and co-ordination of healthcare givers, waste transporters, cleaners, medical waste incinerator operators and other staff irresponsible for collection, storage and transportation and treatment of health care waste generated from the facility;
ii. Determine training needs of works at the facility and co-ordinate training programs together with heads of department;
iii. Provision of continuing education/awareness creation in infection prevention protocols and GIIP in Health Care waste management;
iv. Ensuring proper waste management processes and infection prevention and control measures laid out in the ICWMPs, IPCPs and the HCWMP are adhered to in the Facility;
v. Collecting and collating data on health care waste e.g., type and quantity of waste generated at each stage of the waste management process at the facility level,
vi. Record and investigate accidents/incidents and make recommendations,
vii. Track the waste generated from the facility;

viii. Occupational Health and Safety (ensuring there are PPEs and workers actually use them in the correct manner)
ix. Co-ordinate maintenance, repairing and replacement of equipment/facilities and vehicles; and
x. Institution of a system to deal with emergencies.

8.1.7 Facility Based Waste Management/Infection Control and Prevention Committees

The Waste Management/Infection Control and Prevention Committee for each HCF, Laboratory or vaccination center shall be composed of the various heads of departments within the health care facility, Vaccine Storage Center, Vaccination Center or laboratory, Waste Management/Infection Prevention and Control Focal Person, the Provincial Environmental Health Officer and a medical practioner (in the case of a laboratory). The Committee shall be responsible for the preparation of the Facility Specific Infection Control and Waste Management Plan and the Infection Prevention Control Protocols for their respective HCFs (including vaccine storage and vaccination centers and laboratories) using the templates provided in Annex A and B. These documents will be based on the Project Health Care Waste Management Plan, ESMF as well as the relevant World Bank ESHG and WHO COVID-19 guidelines, Government of the Republic of Sierra Leone COVID-19 guidelines and other GIIPs. The Committee will also be responsible for monitoring the implementation of these facility plans/protocols and periodic review of same, when necessary. The Waste Management/Infection Control and Prevention Committee and the focal persons at the facility level will report to their respective Facility Managers.

8.1.8 Health care and Ancillary Workers

Health care and ancillary workers within the HCFs and laboratories will also be involved in the implementation of various aspects of this HCWMP. Healthcare providers, conservancy laborers, cleaners and other staff members are expected to avail themselves of training programs that will be rolled out as part of the project. This included the implement the guidelines and mitigation measures outlined in the HCWMP as well as those in Facility Specific ICWMPs and IPCPs together with any innovations gained from the training programs in which they will participate. Vaccinators, nurses at the isolation centers and intensive cares wards, operators of incinerators and health care waste transporters will be required to weigh and record the various types of waste they collect, transport or receive daily at each stage of the process.

8.2 Capacity Building

Under Component 2 of the Project, elaborate training programs will be designed and implemented for technical staff within the health sector such as laboratory technicians, data analysts and epidemiologists to enhance their capacity to respond to the COVID-19 pandemic. The training programs will be complemented with the provision of equipment and PPEs.

Therefore, capacity building as presented in this plan is limited to health care waste management and infection prevention and control concerns as presented in Table 8.1.

Table 8.1: Capacity Needs for HCWMP Implementation

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
Training on ICWMP and GIIPs in the area of Infection Control and Waste Management in time of COVID 19	• Sub Project ICWMPs • Source Separation • Use of PPES etc. • Operation and Maintenance of incinerators	Sanitation Service Providers, Sanitation and Laundry worker's /service providers All workers at the Isolation and Quarantine Centers, ICUs and Laboratories as well as Ancillary workers including • Incinerator Operators	Twice/ to be repeated twice a year	Health Facility Managers/ Staff	20,000.00
Training in IPCP ICWMP and GIIPs in the area of Health Care Waste Management in time of COVID 19 using WHO COVID 19 guidelines, CDC guidelines, MoHS	•	• Sanitation Service Providers • All workers at the HCF and Laboratories • Ancillary workers • Vaccination teams • Waste Transporters	Before the vaccination exercise.	MoHS WHO	35,000.00

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
guidelines, HCWMP guidelines and other relevant guidelines		• Facility Managers • Infection Prevention and Control/Waste Management Committee Members • National Safeguards staff • National Environmental Health Officers • District Environmental Health Focal Persons • Facility Managers • Facility Infection Prevention and Control/Waste Management Focal Persons			

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
Training in Waste Collection and Segregation	• Hazards of Health-care Waste • Infection Control Measures • Health Care Waste • MoHS COVID -19 Guideline • Cleaning Spills • Principle of Waste Minimization and Segregation • Alternatives to hazardous chemicals • Occupational Safety Issues • Handling health care waste	• Sanitation Service Providers • All workers at the HCF and Laboratories • Ancillary workers at HCF and laboratories • Vaccination teams • Waste Transporters • Facility Managers • Infection Prevention and Control/Waste Management Committee Members • National Focal Person • Provincial Environmental Health Officers Facility Managers • Facility Infection Prevention	Twice a year (Starting before the commencement of project activities)	MoHS WHO	20,000.00

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
		and Control/Waste Management Focal Persons			
Waste Storage	• MoHS COVID -19 Guideline • Cleaning Spills • Principle of Waste Minimization and Segregation • Alternatives to hazardous chemicals • Occupational Safety Issues • Handling health care waste • Infection Prevention and Control Protocols	• Vaccination Storage Staff • Staff involved in temporary waste storage • Staff involved loading and off loading • National Focal Person • Provincial Environmental Health Officers Facility Managers • Facility Infection Prevention and Control/Waste Management Focal Persons	Twice a Year	MoHS	20,000.00
Training in Waste Treatment	• Managing Incinerators	• Workers at Incinerations	Twice a year (Starting before the	MoHS/ Manufacturers	30,000.00

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
	• Managing and Operating Autoclaves and/or Incinerators • Filling Consignment Note • Use of PPEs • Disinfection and Sterilization	• Designated workers who operate autoclaves • Infection Prevention and Control/Waste Management Committee Members • National Focal Person • Provincial Environmental Health Officers Facility Managers • Facility Infection Prevention and Control/Waste Management Focal Persons	commencement of project activities)	of Incinerators and Autoclaves	
Training in Emergency Response	• Fire Drills • Operating Fire Extinguishers • Spill clean up	• Sanitation Service Providers • All workers at the HCF and Laboratories	Once a year (During project Implementation)	Fire Force MoHS	20,000.00

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
		• Ancillary workers • Vaccination teams • Waste Transporters • Facility Managers Facility Infection Prevention and Control/Waste Management Focal Persons • Infection Prevention and Control/Waste Management Committee Members • National Focal Person • Provincial Environmental Health Officers Facility Managers			

Type of Training	Training Contents	Participants	Timeframe	Responsible Actor	Estimated Cost (in USD)
Training for Transporters (Drivers of Cold Trucks and Waste Haulage Vehicles	• Road Traffic Rules • Spill Containment and Clean up • Incidents/Accident Reporting • Filling the Consignment Note Handling and loading and unloading of waste bags and containers	• Drivers • Persons involved in Loading and Off- loading of health care waste	Before the arrival of the First Consignment of Vaccines	WHO MoHS	10,000.00

8.3 Estimated Budget for the Healthcare Waste Management Plan

It is estimated that a total amount of Four Hundred and Two Thousand United State Dollars **(USD 402,000.00)** will be required to implement activities identified under the Healthcare Waste Management Plan. The details are summarized in Table 8.2.

Table 8.2: Estimated Budget for HCWMP Implementation

No.	Activities	Unit Cost (USD)	Total Cost (USD)
1	Training Cost for Training Programs (in Table 8.1)	-	155,000
2	Waste Management Supervision (National Level) for 5 national officers @ USD 400.00 per person per quarter for 1 year	500	10,000.00
3	Waste Management Supervision (District	100	19,200.00

No.	Activities	Unit Cost (USD)	Total Cost (USD)
	Level) for 16 Supervisors @USD 100.00 per supervisor per month per supervisor including transportation		
	Fuel for transportation of medical waste in 16 districts for 12 months @ USD 200.00 per district per month per	200	38,400.00
4	Fuel for waste 20 incinerations for 1 year @ USD 50 per incinerator per day for 180 days per year	100	180,000.00
	Total		**402,000.00**

*Incinerators will operate 15 days a month

ANNEX A: Infection Control and Waste Management Plan (ICWMP) Template for HCFs

1. Introduction

1.1 Describe the project context and components

1.2 Describe the targeted Health Care facility (HCF):

- Type: E.g., general hospital, clinics, inpatient/outpatient facility, medical laboratory
- Special type of HCF in response to COVID-19: E.g., existing assets may be acquired to hold yet-to-confirm cases for medical observation or isolation
- Functions and requirement for the level infection control, e.g., biosafety levels
- Location and associated facilities, including access, water supply, power supply
- capacity: beds

1.3 Describe the design requirements of the HCF, which may include specifications for general design and safety, separation of wards, heating, ventilation and air conditioning (HVAC), autoclave, and waste management facilities.

2. Infection Control and Waste Management

2.1 Overview of infection control and waste management in the HCF

- Type, source and volume of Health Care waste (HCW) generated in the HCF, including solid, liquid and air emissions (if significant);
- Classify and quantify the HCW (infectious waste, pathological waste, sharps, liquid and non-hazardous) following WGB EHS Guidelines for Health Care Facilities and pertaining GIIP.
- Given the infectious nature of the novel coronavirus, some wastes that are traditionally classified as non-hazardous may be considered hazardous. It is likely the volume of waste will increase considerably given the number of admitted patients during COVID-19 outbreak. Special attention should be given to the identification, classification and quantification of the Health Care wastes.
- Describe the Health Care waste management system in the HCF, including material delivery, waste generation, handling, disinfection and sterilization, collection, storage, transport, and disposal and treatment works
- Provide a flow chart of waste streams in the HCF if available
- Describe applicable performance levels and/or standards
- Describe institutional arrangement, roles and responsibilities in the HCF for infection control and waste management.

2.2 Management Measures

- Waste minimization, reuse, and recycling: HCF should consider practices and procedures to minimize waste generation, without sacrificing patient hygiene and safety consideration.
- Delivery and storage of specimens, samples, reagents, pharmaceuticals, and medical supplies: HCF should adopt practice and procedures to minimize risks associated with delivering, receiving and storage of hazardous medical goods.
- Waste segregation, packaging, color coding and labeling: HCF should strictly conduct waste segregation at the point of generation. Internationally adopted methods for packaging, color coding and labeling of waste should be followed.
- Onsite collection and transport: HCF should adopt practices and procedures to timely remove properly packaged and labelled waste using designated trolleys/carts and routes. Disinfection of pertaining tools and spaces should be routinely conducted. Hygiene and safety of involved supporting medical workers such as cleaners should be ensured.
- Waste storage: A HCF should have multiple waste storage areas designed for different types of wastes. Their functions and sizes are determined at the design stage. Proper maintenance and disinfection of the storage areas should be carried out. Existing reports suggest that during the COVID-19 outbreak, infectious wastes should be removed from HCF's storage area for disposal within 24 hours.
- Onsite waste treatment and disposal (e.g. an incinerator): Many HCFs have their own waste incineration facilities installed onsite. Due diligence of an existing incinerator should be conducted to examine its technical adequacy, process capacity, performance record, and operator's capacity. In case any gaps are discovered, corrective measures should be recommended. For new HCF financed by the project, waste disposal facilities should be integrated into the overall design and ESIA developed. Good design, operational practices and internationally adopted emission standards for Health Care waste incinerator can be found in pertaining EHS Guidelines and GIIP.
- Transportation and final disposal at offsite waste management facilities: Not all HCF has adequate or well-performed incinerator onsite. Not all Health Care wastes are suitable for incineration. An onsite incinerator produces residuals after incineration. Hence offsite waste disposal facilities provided by local government or private sector are probably needed. Therefore, the waste will be collected, decontaminated, transported and disposed of by licensed and trained staff or better by relevant private contractors as was the case last year. These offsite waste management facilities may include incinerators, hazardous wastes landfill. In the same vein, due diligence of such external waste management facilities should be conducted to examine its technical adequacy, process capacity, performance record, and operator's capacity. In case any

gaps are discovered, corrective measures should be recommended and agreed with the government or the private sector operators.

- Wastewater treatment: HCF wastewater is related to hazardous waste management practices. Proper waste segregation and handling as discussed above should be conducted to minimize entry of solid waste into the wastewater stream. In case wastewater is discharged into municipal sewer sewerage system, the HCF should ensure that wastewater effluent comply with all applicable permits and standards, and the municipal wastewater treatment plant (WWTP) can handle the type of effluent discharged. In cases where the municipal sewage system is not in place, HCF should build and operate properly onsite primary and secondary wastewater treatment works, including disinfection. Residuals of the onsite wastewater treatment works, such as sludge, should be properly disposed of as well. There are also cases where HCF wastewater is transported by trucks to a municipal wastewater treatment plant for treatment. Requirements on safe transportation, due diligence of WWTP in terms of its capacity and performance should be conducted.

3. Emergency Preparedness and Response

Emergency incidents occurred in an HCF may include spillage, occupational exposure to infectious materials or radiation, accidental releases of infectious or hazardous substances to the environment, medical equipment failure, failure of solid waste and wastewater treatment facilities, and fire. These emergency events are likely to seriously affect medical workers, community, HCF's operation and the environment.

Thus, an Emergency Response Plan (ERP) that is commensurate with the risk levels is recommended to be developed by the Project E&S Focal Officer in consultation with the relevant Public and Environmental Health authorities of the Ministry and to be cleared by the World Bank. The key elements of an ERP are defined in ESS 4 Community Health and Safety (para. 21).

4. Institutional Arrangement and Capacity Building

A clearly defined institutional arrangement, roles and responsibilities should be included. A training plan with recurring training programs should be developed. The following aspects are recommended:

- Define roles and responsibilities along each link of the chain along the cradle-to-crave infection control and waste management process;
- Ensure adequate and qualified staff are in place, including those in charge of infection control and biosafety and waste management facility operation;
- Stress the chief of an HCF takes overall responsibility for infection control and waste management;

- Involve all relevant departments in a Health Care facility, and build an intra-departmental team to manage, coordinate and regularly review the issues and performance;
- Establish an information management system to track and record the waste streams in HCF; and
- Capacity building and training should involve medical workers, waste management workers and cleaners. Third-party waste management service providers should be provided with relevant training as well.

5. Monitoring and Reporting

Many HCFs in developing countries face the challenge of inadequate monitoring and records of Health Care waste streams. HCF should establish an information management system to track and record the waste streams from the point of generation, segregation, packaging, temporary storage, transport carts/vehicles, to treatment facilities. HCF is encouraged to develop an IT based information management system should their technical and financial capacity allow.

As discussed above, the HCF chief takes overall responsibility, leads an intra-departmental team and regularly reviews issues and performance of the infection control and waste management practices in the HCF. Internal reporting and filing system should be in place.

Externally, reporting should be conducted per government and World Bank requirements.

Activities	Potential E&S Issues and Risks	Proposed Mitigation Measures	Responsi-bilities	Timeline	Budget
General HCF operation – Environment	- General wastes, wastewater and air emissions				
General HCF operation – OHS issues	- Physical hazards - Electrical and explosive hazards - Fire - Chemical use - Ergonomic hazard - Radioactive hazard				
HCF operation - Infection control and waste	-				

Activities	Potential E&S Issues and Risks	Proposed Mitigation Measures	Responsi-bilities	Timeline	Budget
management plan					
Waste minimization, reuse and recycling	-				
Delivery and storage of specimen, samples, reagents, pharmaceuticals and medical supplies	-				
Storage and handling of specimens, samples, reagents, and infectious materials	-	-			
Waste segregation, packaging, color coding and labeling	-				
Onsite collection and transport	-				
Waste storage	-				
Onsite waste treatment and disposal	-				
Waste transportation to and disposal in offsite treatment and	-				

Activities	Potential E&S Issues and Risks	Proposed Mitigation Measures	Responsi-bilities	Timeline	Budget
disposal facilities					
HCF operation – transboundary movement of specimen, samples, reagents, medical equipment, and infection materials	-				
Emergency events	- Spillage, - Occupational exposure to infectious - Exposure to radiation, accidental releases of infectious or hazardous substances to the environment - Medical equipment failure - Failure of solid waste and wastewater treatment facilities - fire - Other emergent events	Emergency response plan			
Operation of acquired assets for holding					

Activities	Potential E&S Issues and Risks	Proposed Mitigation Measures	Responsi-bilities	Timeline	Budget
potential COVID-19 patients					
To be expanded					

ANNEX B: Infection and Prevention Control Protocol

(Adapted from the Center for Disease Control *Interim Infection Prevention and Control Recommendations for patients with confirmed COVID-19 or persons under investigation for COVID-19 in Health Care Settings*)

HEALTH CARE SETTINGS

1. **Minimize Chance of Exposure (to staff, other patients, and visitors)**
   - Upon arrival, make sure patients with symptoms of any respiratory infection to a separate, isolated and well-ventilated section of the health care facility to wait, and issue a facemask.
   - During the visit, make sure all patients adhere to respiratory hygiene, cough etiquette, hand hygiene and isolation procedures. Provide oral instructions on registration and ongoing reminders with the use of simple signs with images in local languages.
   - Provide alcohol-based hand sanitizer (60-95% alcohol), tissues and facemasks in waiting rooms and patient rooms.
   - Isolate patients as much as possible. If separate rooms are not available, separate all patients by curtains. Only place together in the same room patients who are all definitively infected with COVID-19. No other patients can be placed in the same room.
2. **Adhere to Standard Precautions**
   - Train all staff and volunteers to undertake standard precautions - assume everyone is potentially infected and behave accordingly.
   - Minimize contact between patients and other persons in the facility: health care professionals should be the only persons having contact with patients and this should be restricted to essential personnel only.
   - A decision to stop isolation precautions should be made on a case-by-case basis, in conjunction with local health authorities.
3. **Training of Personnel**
   - Train all staff and volunteers in the symptoms of COVID-19, how it is spread and how to protect themselves. Train on correct use and disposal of personal protective equipment (PPE), including gloves, gowns, facemasks, eye protection and respirators (if available) and check that they understand.
   - Train cleaning staff on most effective process for cleaning the facility: use a high-alcohol based cleaner to wipe down all surfaces; wash instruments with soap and water and then wipe down with high-alcohol based cleaner; dispose of rubbish by burning etc.
4. **Manage Visitor Access and Movement**
   - Establish procedures for managing, monitoring, and training visitors.
   - All visitors must follow respiratory hygiene precautions while in the common areas of the facility. Otherwise, they should be removed.

- Restrict visitors from entering rooms of known or suspected cases of COVID-19 patients. Alternative communications should be encouraged, for example by use of mobile phones. Exceptions only for end-of-life situations and children requiring emotional care. For these cases, PPE should be used by visitors.
- All visitors should be scheduled and controlled, and once inside the facility, instructed to limit their movements.
- Visitors should be asked to watch out for symptoms and report signs of acute illness for at least 14 days.

CONSTRUCTION SETTINGS IN AREAS OF CONFIRMED CASES OF COVID-19

1. Minimize Chance of Exposure

- Any worker showing symptoms of respiratory illness (fever + cold or cough) and has potentially been exposed to COVID-19 should be immediately removed from the site and tested for the virus at the nearest local hospital.
- Close co-workers and those sharing accommodations with such a worker should also be removed from the site and tested.
- Project management must identify the closest hospital that has testing facilities in place, refer workers, and pay for the test if it is not free.
- Persons under investigation for COVID-19 should not return to work at the project site until they are cleared by test results. During this time, they should continue to be paid daily wages.
- If a worker is found to have COVID-19, wages should continue to be paid during the worker's convalescence (whether at home or in a hospital).
- If project workers live at home, any worker with a family member who has a confirmed or suspected case of COVID-19 should be quarantined from the project site for 14 days and continued to be paid daily wages, even if he has no symptoms.

2. Training of Staff and Precautions

- Train all staff in the signs and symptoms of COVID-19, how it is spread, how to protect themselves and the need to be tested if they have symptoms.
- Allow Q&A and dispel any myths.
- Use existing grievance procedures to encourage reporting of co-workers if they show outward symptoms such as ongoing and severe coughing with fever, and do not voluntarily submit to testing.
- Supply face masks and other relevant PPE to all project workers at the entrance to the project site. Any persons with signs of respiratory illness that is not accompanied by fever should be mandated to wear a face mask.

- Provide hand wash facilities, hand soap, alcohol-based hand sanitizer and mandate their use on entry and exit of the project site and during breaks, via the use of simple signs with images in local languages.
- Train all workers in respiratory hygiene, cough etiquette and hand hygiene using demonstrations and participatory methods.
- Train cleaning staff in effective cleaning procedures and disposal of rubbish.

3. Managing Access and Spread

- Should a case of COVID-19 be confirmed in a worker on the project site, visitors should be restricted from the site and worker groups should be isolated from each other as much as possible.
- Extensive cleaning procedures with high-alcohol content cleaners should be undertaken in the area of the site where the worker was present prior to any further work being undertaken in that area.

ANNEX C: Standard Operating Procedures for Health Care Waste Management-COVID -19

Introduction

COVID -19 spreads through direct contact and droplets to an infected person. One way of preventing the spread of the virus is by practicing proper waste management especially from respiratory excreta of the infected person.

There is no evidence that direct, unprotected human contact during the handling of health care waste has resulted in the transmission of the COVID-19 virus. However, all health care waste produced during the care of COVID 19 patients should be collected safely in designated containers and bags, treated, and then safely disposed of or treated, or both, preferably on-site.

The safe handling of waste generated through the care of patients with COVID- 19 is based on three main principles:

1) Segregation, safe containment and packaging of waste should be performed as close as possible to the point of generation.

2) Limit the number of personnel handling generated waste before and after primary containment.

3) Always use appropriate personal protective equipment (PPE) and procedures for handling waste until final treatment and disposal.

Objective of the SoP

The main objective of this SoP is to outline in a concise manner directives to personnel, charged with the responsibility of collecting, storage, transportation and disposal of health care waste to prevent the transmission of COVID -19 emanating from these wastes.

SCENARIOS:

SCENARIO 1. Management of COVID-19 WASTE at the quarantine homes, isolation, laboratory and treatment centers in phases one and two of the outbreak.

SCENARIO 2. Management of COVID-19 health care waste in the event of community spread of the disease.

SCENARIO 1.

A. What Needs Treatment and Disposal

- Respiratory secretion, used masks, paper tissues, gauze and any other materials used during cough and sneezing;
- Disposable needles and syringes and disposable or non-reusable protective clothing;
- Treatment materials and dressings;
- Non-reusable gloves;
- Laboratory supplies and biological samples;

•Used disinfectants;

SCENARIO 1.

B. At Collection Points

• Waste should be segregated at the point of generation to enable appropriate and safe handling.
• Waste should not be stored more than 24 hours before being treated.
• Sharps (e.g. needles, syringes, glass articles) should be placed inside safety boxes. These should be located as close as practical to the patient care area where the items are used, similarly in laboratories.
• All waste from infectious zone (Red zone) should be stored in red bins, food remains can be kept in yellow bin.
• Waste in green zone should be stored in black/blue bins.
• Waste material from red zone should not be taken to the green zone.
• Waste material will only be moved out through the rear door to the waste management area and laundry.

SCENARIO 1.

C. At Collection Points

• Place non-sharps solid waste in the biohazard bag. Bags should not be filled beyond two thirds full to allow safe closure.
• Carefully place sharps waste in appropriate disposable sharps container and close the container. Containers should not be filled beyond three thirds full to allow safe closure.
• Prepare filled bags and sharps containers for onsite inactivation
• Place closed sharps containers in a biohazard bag.
• Close the bag with a method that will not tear or puncture the bag (e.g., tying the neck of bag with a goose-neck knot) and will ensure no leaks.
• Apply disinfectant (wipe or spray) to the outside surface of the closed bag.
• Place the wiped/sprayed closed bag into a second biohazard bag.
• Close the bag with a method that will not tear or puncture the outer bag and will ensure no leaks (e.g., tying the neck of bag with a knot).
• Apply disinfectant (wipe or spray) to the outside surface of the secondary bag.
• Store the disinfected closed bags in a designated area to await removal.
• Follow recommended procedures for disinfecting visibly soiled PPE and taking off PPE.
• The healthcare workers wearing PPE should spray or wipe the outside surfaces of double-bagged waste with disinfectant immediately before removing waste from the room.
• Upon removing the double-bagged waste from the patient's room, the healthcare worker should place the double-bagged waste in a designated transport cart (for onsite inactivation or a rigid outer receptacle)

• The designated container should be located at the periphery of the area for taking off PPE so that removal from the area is efficient and does not create a risk of recontamination of the outer container.
• Environmental cleaning personnel removing the waste from the care area should only handle the outer container/transport cart and should never open the container or handle the double-bagged waste.
• For onsite treatment, disinfection personnel wearing appropriate PPE should
Safely transfer waste in a transport cart to dedicated waste autoclave room or secured storage location or incineration area.

SCENARIO 1.
D. At Disposal Points
Select Site for disposal of COVID- 19 Contaminated solid Waste

- Select a disposal point (incinerator/burning pit) on the health facility grounds.
- Disposal point should be fenced.
- It should be located away from the normal traffic flow, should be fenced and should have a lockable door. The site should not be in public view or in an area where it will attract a crowd /scavengers.

SCENARIO 1.
E. Procedures for Handling Liquid Waste (Body Fluids Including Blood, Urine, Vomit, Faeces)
• Primary handling of liquid waste should occur in the patient's room and be performed by the primary healthcare workers wearing recommended PPE as designated in the guidance for Isolation, Treatment and Quarantine Facilities.
• Pour waste, avoiding splashing by pouring from a low level, into the toilet.
• Close the lid first, and then flush toilet.
• Clean and disinfect flush handles, toilet seat, and lid surfaces with chlorine.
• Discard cleaning cloths in biohazard bags.
• Discard emesis and portable toileting containers as solid waste.
• Follow recommended procedures for disinfecting visibly soiled PPE and removal of PPE.

SCENARIO 1.
F. On-Site Transportation
1) Wear an appropriate set of PPE and heavy duty/rubber gloves and goggles when handling infectious waste.
2) Infectious solid waste should not be transported by hand due to the risk of accident or injury from infectious material or incorrectly disposed sharps.
3) Use a covered trolley or a wheeled bin with a lid to reduce the potential for exposure.
4) Collect wastes including sharp containers (puncture resistant safety boxes) from all generating points at least twice a day or when containers are ¾ full or whenever necessary.

5) For infectious waste generated in laboratories (e.g. specimens and specimen's containers, pipettes, etc.), pre-treat by autoclaving or chemical disinfection prior to transporting it for final treatment/disposal.
6) Start with non- infectious waste followed by infectious waste.
7) After each use, all surfaces of the trolleys or bins should be disinfected with 0.5 % chlorine solution.
8) Wash hands properly after removing PPE.

SCENARIO 1.

G. Treatment of COVID-19 Contaminated Waste

- Wear appropriate PPE.
- Recommended Disposal Methods: Disinfect liquid waste (including patient reparatory excreta) with 2% chlorine solution and then dispose it of in an isolated latrine or toilet set aside for COVID 19 cases. (NB: Avoid splashing when disposing of liquid infectious waste).
- Burning is the recommended method for disposal of other COVID 19-contaminated waste. Using an incinerator or a pit for burning can make a safe and inexpensive disposal system.
- There should be well trained staff to manage waste generated at Isolation, Treatment and Quarantine Facilities.
- Decontaminate the area in case of spillage around the incinerator/burning pit with 0.5% chlorine solution.
- Conduct regular cleanliness, decontamination, maintenance and repairs of the incinerator.
- Decontaminate any used receptacles.
- Remove ashes from the incinerator and put in the ash pit.
- Put a layer of soil on top of ashes.
- Wash hands after removal of PPE.

SCENARIO 2.

Management of COVID-19 waste at community level

• If the number of positive COVID-19 cases increases and there is evidence of community spread and where there is widespread use of face masks and proper disposal is observed within communities, all households and citizenry should be encouraged to segregate waste at all point of generation.
• Risk communication
• Training and Selection of Youth Groups and waste collectors should be conducted across the country.
• Locally made incinerators should be utilised at the designated dump sites for incineration of used masks and PPEs.

Annex D: List of Healthcare Facilities Assessed

SN	Facility Name	Location	Category of facility
1	Bo Gov. Hospital	Bo	Southern Regional Hospital
2	Makeni Government Hospital	Makama	Northern Regional Hospital
3	Bonthe Government Hospital	Bonthe Town	Secondary Hospital
4	Kailahun Government Hospital	Kailahun Government Hospital	Secondary Hospital
5	Kambia Government Hospital	Kambia Town	Secondary Hospital
6	Kenema Government Hospital	Kenema	Eastern Regional Hospital
7	Kabala Government Hospital	Kabala	Secondary Hospital
8	Kono Government Hospital	Koidu	Secondary Hospital
9	Moyamba Government Hospital	Shaka Steven Street	Secondary Hospital
10	Port Loko Government Hospital	Port Loko	Secondary Hospital
11	Pujehun Government Hospital	Pujehun Gov Hospital	Secondary Hospital
12	Magburaku Government Hospital	Magburaka	Secondary Hospital
13	Lakka Hospital	Ogoo Farm	Secondary Hospital
14	Connaught Hospital	Percival Street Freetown	Teaching Hospital
15	PCMH Hospital	Fourah Bay Road, Freetown	Teaching Hospital
16	Lungi Government Hospital	Lungi	Secondary Hospital
17	34 Military Hospital (EPI)	Wilberforce Barracks	Secondary Hospital
18	Tissana CHC	Tissana Village	CHC
19	Madina CHC	Madina Town	CHC
20	Dodo CHC	Dodo	CHC

Annex E: Summary Report for the Consultative Meetings for the Development of Healthcare Waste Management Plan and Training for COVID-19 Waste Handlers

GOVERNMENT OF SIERRA LEONE

MINISTRY OF HEALTH AND SANITATION

Summary Report on the consultative meeting for the development of a healthcare waste management plan for COVID-19

Background:

A Health Care Waste Management Plan (HCWMP) has been prepared for the entire health sector of Sierra Leone in 2015 & 2016 with support from the World Health Organization under the REDISSE Project funded by the World Bank. The Health Care Waste Management Plan for the COVID-19 Emergency Response and Health System Preparedness Project draws on this national plan, updating it for the COVID-19 Project. It is prepared in line with the relevant World Bank Environmental and Social Standards (ESSs), the Project Environmental and Social Management Framework (ESMF), relevant World Bank Group's Environmental, Health and Safety Guidelines (EHSGs), World Health Organization (WHO) and Ministry of Health & Sanitation (MoHS) COVID-19 guidelines and other Good International Practices.

This consultative meeting on the development of the Health Care Waste Management Plan (HCWMP) for COVID-19 was conducted during the Training of 160 waste handlers and 16 supervisors from the 16 DHMT.

During the consultative meeting stakeholders had the opportunity to explain existing infrastructure and equipment, management systems and practices at their facility for the treatment of COVID-19.

3.0 Objectives: The objective of the consultative meeting was to identify existing in fractures, equipment, management systems and practices on the treatment of COVID-19 wastes across the 16 districts.

3.0 Methodology:

These consultative meeting was conducted along the training sessions and during COVID-19 vaccine rollout assessment across the 16 districts.

Stakeholders (including COVID-19 vaccine waste handlers, supervisors, etc.) had the opportunity to know about the best practices and systems in the management of COVID-19 vaccine waste management.

Duration for the consultative meeting: 40 minutes per stakeholder.

4.0 Deliverables:

4.1 **Expected Output**

- Key stakeholders (including COVID-19 vaccine waste handlers, supervisors, etc.) from the 16 districts explained about the existing infrastructure, equipment and management systems and practices in COVID-19 Vaccine Waste Management.
- Key stakeholders informed on COVID-19 vaccine waste management draft plan.

4.2 Expected Outcome

- Stakeholders have adequate knowledge on the COVID-19 Vaccine waste management and draft plan.

4.3 Categories of participants:

Environmental Health Officer
Incinerator Operators
Waste Collectors
Nurses

The consultative meeting was facilitated by the IHPAU Safeguards Team comprising of the Senior Social Safeguards Specialist, Environmental Safeguards Specialist and Environmental and Social Technical Advisor.

Dated: 13th to 18th June, 2021.

5.0 ISSUES DISCUSSED

5.1 Availability of Standard Operating Procedure at COVID-19 vaccination center

The purpose of the SOP for COVID-19 waste management is to clarify and guide health workers, patients and community on how to safely dispose COVID-19 waste. All of the participants stated that postal and standard operating procedures are visible and displayed at strategic location across all the COVID-19 vaccine centers.

After the approval of the COVID-19 Vaccine waste management plan, the plan will be printed and shared to all healthcare facilities across the 16 districts in Sierra Leone.

5.2 Availability of COVID-19 waste collection bin, personal protective equipment, etc.

Since Waste collection bins and PPEs are produced in various sizes and capacities and can be positioned and used at all service delivery points. All the participants present complained about the in-availability of PPE and biohazard bags/ bin liners at vaccine centers. But all the participants agreed that the COVID-19 centers have sharp boxes.

The in availability of PPEs and bin liners across the COVID-19 centers exposes healthcare workers, patients, visitors and community to risks of healthcare associated infections (HAIs).

This COVID-19 waste management plan, when approved and implemented, can be used to advocate for the procurement of bins and personal protective equipment.

5.3 Availability of COVID-19 vaccine waste treatment facility

All healthcare wastes should be treated prior to disposal to ensure protection from potential hazards posed by the waste. To be effective, treatment must reduce or eliminate the risk present in the waste so that it no longer poses a hazard to persons who may be exposed to it.

The availability of healthcare waste treatment technologies is critical in the fight against COVID-19. During the consultative meetings, all participants of the Teaching Hospitals stated that they have incinerators but four (4) stated that they have non-functioning incinerators. The secondary hospitals and Community Health Center do not have functioning incinerators, but all healthcare generated wastes are burnt in open burning pits.

5.4 Quantification of healthcare waste

Health-care waste (HCW) quantification is the first step in the continuing improvement of COVID-19 waste management. The results could be used for planning, budgeting, cost controlling, and optimizing waste-management systems. It also provides an opportunity to compare with other healthcare facilities.

During the consultative meeting 90% of the stakeholders reported they are not quantifying waste and only 10% reported that they do quantify healthcare wastes.

5.5 Recommendations

The recommendations were developed based on the discussions during the consultative meetings sessions with the waste handlers, incinerators operators, environmental health officers, district environmental health superintendent, district, nurses, etc. Some of the major recommendations include:

- The IHPAU Safeguard Staff should conduct Environmental and Social Committed Plan (ESCP) Monitoring across the 16 districts to determine the level of Environmental and Social safeguard due diligence implementation.
- The COVID-19 Healthcare Waste Management Plan as well as the Sierra Leone- COVID-19 Waste Management SOP should be printed and available at all facilities.
- All healthcare facilities in the urban populated communities without functioning incinerators or non-incinerator machines should collect and transport their waste to the nearest facilities with functioning incinerators for proper treatment of healthcare wastes.
- All healthcare facilities in the unpopulated communities in the rural area without functioning incinerator or non-incinerator for treatment of healthcare waste should construct a standard burning pit for treatment/burning of healthcare wastes.
- All healthcare facilities should be encouraged to quantify their wastes to aid planning, procurement and effective treatment of healthcare wastes.
- All waste collectors, incinerators operators must be encouraged to use PPEs during operation.

Appendix 3. Attendance List

GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

ATTENDANCE REGISTER

LOCATION: KENEMA   Date: 9th & 10th Nov 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (9th Nov)	SIGNATURE DAY 2 (10th Nov)
1	Anso D. Kallon	Dis. public H/Supt	Kono	076696247	[illegible]	[illegible]
2	Tommy Ciessimu	EHA	Kenema	076881012	[illegible]	[illegible]
3	Mohamed S. Foroma	Facilitator	Freetown	07423595	[illegible]	[illegible]
4	Bockarie Aruna	public H/supt	Kono	07858787	[illegible]	[illegible]
5	Moriea Adama Sellu	PH. Supt	Kenema	076 77 3239	[illegible]	[illegible]
6	Tamba V. Sam	PAI	Kono	077668312	[illegible]	[illegible]
7	Haja M. mondeh	PH.I	Kono	030141497	[illegible]	[illegible]
8	Gome Koroma	Driver	Freetown	076687917	[illegible]	[illegible]
9	BRIMA TURAY	PHI	KENEMA	07630323	[illegible]	[illegible]
10	Frances S. Kabba Sei	PH.I	Kono	099697405	[illegible]	[illegible]
11	John Coomber	SECHN	Kailahun	076906515	[illegible]	[illegible]
12	Olin Bull	Porter	Kenema	0128339090	[illegible]	[illegible]
13	Sahr Theophilus Nyama	PH.I	Kono	076414548	[illegible]	[illegible]
14	Hayia Bockarie	Nurse	Kailahun	079193621	[illegible]	[illegible]

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (9th Nov 21)	SIGNATURE DAY 2 (10th Nov 21)
15	Mariama Brima	Porter	Kenema			
16	Peter Komba Jimmy	Lab Tech	Kono	076319650	[illegible]	[illegible]
17	Bockarie Fallindu	SECHN	Kailahun	076957949	[illegible]	[illegible]
18	Saffiatu B. Sowah	W/M	Kenema	07638097	[illegible]	[illegible]
19	Abdul Nabieu	EHO	Kono	079547228	[illegible]	[illegible]
20	Kamatulai Jalloh	SECHN	Kailahun	079490690	[illegible]	[illegible]
21	BRIMA LAHAI	W/M	Kenema	078398085	[illegible]	[illegible]
22	Ibrahim Kangaju	Porter waste	Kono	099673168	[illegible]	[illegible]
23	Abdul Sangura	Cleaner	Kailahun	—	[illegible]	[illegible]
24	Jansana Mansaray	W/M	Kenema	075440512	[illegible]	[illegible]
25	Aiah Sandi	Porter coordinator	Kono	088503486	[illegible]	[illegible]
26	Camrah J. Sandi	SECHN	Kailahun	076907864	[illegible]	[illegible]
27	Musa Kanis	W/M	Kenema	076560842	[illegible]	[illegible]
28	Sheku Kamara	SECHN	Kailahun	088-887060	[illegible]	[illegible]
29	Alhaji Bundu	Driver	Freetown	079498881	[illegible]	[illegible]
30	Eric M.A. Moosa	Prin. P.H. Supt	Kenema	077891130	[illegible]	[illegible]
31	Sando Kamara	matron	Kailahun	076-691116	[illegible]	[illegible]
32	Francis A. Koroma	Facilitator	Freetown	076298898	[illegible]	[illegible]
33	Mariama A. Kaimu	S.E.CH.N	Kenema	078878888	[illegible]	[illegible]
34	Malcome B. Kamara	P.HI	Kailahun	076523353	[illegible]	[illegible]

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE	
					DAY 1	DAY 2
35	Saidu Kamara	PHS	Kailahun	077761272	[signature]	[signature]
36	Alossa D. Brima	Nat. Facilitator	Freetown	078-87-17-88	[signature]	[signature]
37	Mustapha Sankoh	Driver	F-T	099314031	[signature]	[signature]
38	Samuel Williams	driver	W-A	030913341	[signature]	[signature]
39	Ibrahim Mbundo	Co-facilitator	F/T	076131810	[signature]	[signature]
40	Comfort Williams	Nat. facilitator	F/Town	078A8226	[signature]	[signature]
41	Mumin Kallon	Co-facilitator	Freetown	076-61611	[signature]	[signature]
42	Juliana Kamanda	Sr. Safeguard Specialist	Freetown	076267248	[signature]	[signature]
43	Fayinkeh Kamara	Finance KSM	Freetown	078851275	[signature]	[signature]

GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

ATTENDANCE REGISTER

LOCATION: MAKENI Date: 15th & 16th Nov. 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (15th Nov)	SIGNATURE DAY 2 (16th Nov)
1	Idrissa Tarawalie	WASH Cordit	Bombali	078219157	[signature]	[signature]
2	Fusu Miyer	SPHS	Falaba	076190005	[signature]	[signature]
3	Lansana Marah	Waste Collector	Koinadugu	079411189	[signature]	[signature]
4	Marie Kargbo	labourer	Bombali	088354566	[signature]	[signature]
5	Mohamed S. Koroma	Facilitator	Freetown	034294831	[signature]	[signature]
6	Augustine Madiyei	PHS	Falaba	076107681	[signature]	[signature]
7	Mustapha Sesay	District Health Supt.	Bombali	077846000	[signature]	[signature]
8	Babah Bangura	DHEO/IPC2	Falaba	076239144	[signature]	[signature]
9	Andrew Papayo Koroma	PHI	Koinadugu	078225888	[signature]	[signature]
10	Senesie F. Kalokoh	IPC Focal	Bombali	078602920	[signature]	[signature]
11	Braima J. Dassams	PPH Supt	Tonkolili	076910482	[signature]	[signature]
12	Tidankay F. Kamara	SECHN	Falaba	076343129	[signature]	[signature]
13	Agnes F. Sandy	MCH Aide	Bombali	079523888	[signature]	[signature]
14	Alah M. Blamkoe	SPH/Supt	Tonkolili	078327013	[signature]	[signature]
15	Alimamy P. S. Bum	PHS	Falaba	076239184	[signature]	[signature]
16	Theresa B. Sesay	MCH Aide	Bombali	099990597	[signature]	[signature]
17	Zainab A. Bangura	nurse	Tonkolili	088640159	[signature]	[signature]
18	Fatmata T. Jalloh	PHI	Falaba	076153010	[signature]	[signature]
19	Mamusu Kargbo	labourer	Bombali	080046532	[signature]	[signature]
20	Alhaji Sheku Koroma	SPHS/IPC Lead	Tonkolili	076813222	[signature]	[signature]
21	Mortai Sesay	PH Supt	Falaba	0761?8686	[signature]	[signature]
22	Amara Kamara	waste handler	Bombali	099703635	[signature]	[signature]
23	Benjamin S. Bangura	PPH Supt	Koinadugu	079985308	[signature]	[signature]
24	Adama D. Sesay	midwife	Falaba	076-850-246	[signature]	[signature]
25	Mohamed Lakor	waste handler	Bombali	080083548	[signature]	[signature]
26	Mariatu Balu Kalokoh	SECHN	Koinadugu	078558457	[signature]	[signature]
27	Dura Kamara	Waste Collector	Koinadugu	088770972	[signature]	[signature]
28	Alpha Kamara	Ince operator	Bombali	080990265	[signature]	[signature]
29	Isatu M. Kamara	nurse	Tonkolili	077989709	[signature]	[signature]
30	Sorie Turay	PHS	Falaba	070134757	[signature]	[signature]
31	Abdulrahman Conteh	supervisor	Tonkolili	099886664	[signature]	[signature]
32	Elsie Mansaray	midwife	Falaba	079932024	[signature]	[signature]
33	Ibrahim Turay	waste zone	Tonkolili	099060036	[signature]	[signature]
34	Kelia M. Conteh	P.H.I	Koinadugu	074-880-559	[signature]	[signature]

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (18th Nov)	SIGNATURE DAY 2 (19th Nov)
35	Sia Gandi					
36	Mohamed Samurah	IPC Focal	Koinadugu	079819232	[signature]	[signature]
37	Yusif .Y. Kamara	Waste Collector	Koinadugu	078047677	[signature]	[signature]
38	Borboh Conteh	Incinerator Operator	Tonkolili	07503911	[signature]	[signature]
39	Mamunatu Barrie	Waste Mage	Koinadugu	050308657	[signature]	[signature]
40	David Quee	IPC Asst.	Koinadugu	078077206	[signature]	[signature]
41	Solomon .R. Sankoh	Co-facilitator	F/Town	077550231	[signature]	[signature]
42	Comfort Williams	Vaccinator	Tonkolili	077613830	[signature]	[signature]
43	Janisa O. Bama	Nat. Facilitator	Freetown	078278820	[signature]	[signature]
44	Victoria S. Kamara	" Facilitator	Freetown	078-577708	[signature]	[signature]
45	John S. Kanguna	M.CH Aide	Tonkolili	080421192	[signature]	[signature]
46	Samuel Turay	P.H.S	Freetown	0768859 B	[signature]	[signature]
47	Mohamed Sow	Driver	F.T	099413918	[signature]	[signature]
48	Juliana Kamanda	driver	F-town	077781444	M. Sow	M. Sow
49	Minkailu Smith	Sn Safeguard Specialist	Freetown	096267868	[signature]	[signature]
50	Sorie Koroma	Driver	F-town	079534417	[signature]	[signature]
51	Fayinka Koroma	Driver	Freetown	07668717	[signature]	[signature]
52		Finance Asst	FT	078551275	[signature]	[signature]

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GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

LOCATION: PORT LOKO **ATTENDANCE REGISTER** Date: 18th & 19th Nov. 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (18th Nov. 21)	SIGNATURE DAY 2 (19th Nov. 21)
1	Ama Koyo	P/H Supt	Port loko	078697917	Koto	Koto
2	Beatrice Reserve	SECHN	Kamalolie	076821171	[signature]	[signature]
3	Amara Rabba Kamara	Cleaner	Kambia	07734232	[signature]	[signature]
4	Rosaline B. Conteh	MCH Aide	Portloko	078372914	[signature]	[signature]
5	Sorie Koroma	Driver	Freetown	076687917	[signature]	[signature]
6	Mohamed Sesay	incinerator opp.	Kambia	078939380	MS	MS
7	David Bernard	P/H Supt	Port loko	078460212	[signature]	[signature]
8	Aminata A. Kamara	MCHA	Mabonkaelie	088961692	[signature]	[signature]
9	Lamin S. Conteh	Porter	Kambia	078490961	[signature]	[signature]
10	Mohamed Lamin Turay	SECHN	Port Loko	099601692	[signature]	[signature]
11	Steven Ansumana	EHO	Freetown	07811811	[signature]	[signature]
12	Hassan Swarray	HCW Manager	Kambia	076355770	[signature]	[signature]
13	Sheku Kamara	Incinerator Operator	P.L G'H	075948464	[signature]	[signature]
14	Yeamah Fenah	MCH Aide	Komakwe	076929677	[signature]	[signature]

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1	SIGNATURE DAY 2
15	Samuel Williams	Driver	Freetown	078601911	Sue	Sue
16	Sulaiman Kamara	Potter	PL GH	079953160	[illegible]	[illegible]
17	Mohamed Falloh	Inc. Operator	Kambia	074880668	Mfalloh	Mfalloh
18	Alusine Bah	Ass. Manager/EHO	Karene	077107419	[illegible]	[illegible]
19	Admire Sia Phillie	MCH Aide	Portloko	076936410	[illegible]	[illegible]
20	Musa Kamara	Incinerator Operator	Kambia	079567185	MK	MK
21	Mohamed S. Koroma	Klet facilitator	Freetown	034-296831	Msko	Msko
22	Adamsay S. Conteh	Nurse	Portloko	076557600	[illegible]	[illegible]
23	Aminata Bai Bundu	Vaccinator	Kambia	079687187	[illegible]	[illegible]
24	Jonathan K. Blie	D. AH/ supt	DHMT - Karene	076780070	Blie	Blie
25	Salieu Sesay	Nurse	Portloko	075887978	[illegible]	[illegible]
26	Mabinty Sesay	SECHN	Kambia	078346076	[illegible]	[illegible]
27	Ibrahim Turay	Driver	Freetown	099304920	ITuray	ITuray
28	Abbas J. Koroma	P. P. H Supt.	Portloko	076656091	Koroma	Koroma
29	Yarie M. Tommy	SRN	Kambia	078889305	[illegible]	[illegible]
30	Maletch Kaw	M.C.H Aide	Bottom ...	030809119	[illegible]	[illegible]
31	Foday S Kamara	PH. Supt	Kambia	076198080	[illegible]	[illegible]
32	Bockarie Kamanda	Driver	Freetown	076888662	[illegible]	[illegible]
33	Mary Turay	SECHN	Gbanki CHC	078797868	[illegible]	[illegible]
34	Juliana Kawakanda	Sn. Safeguard specialist	Freetown	076757718	[illegible]	[illegible]

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1	SIGNATURE DAY 2
35	Zainab K. Kamara	SECHN	Foredugu CHC	088216944	[illegible]	[illegible]
36	Comfort Williams	Facilitator	Freetown	078278220	CWilliams	CWilliams
37	Josephus Kelly	W.D	Freetown		Kelly	Kelly
38	Tity Kamara	SECHN	Mamamah CHC	079024441	T. Kamara	T. Kamara
39	Anissa ? Bima	Facilitator	Freetown	078-871768	[illegible]	[illegible]
40	Francis A. Kamara	Facilitator	F/Town	078938884	[illegible]	[illegible]
41	Alex Sesay	P.H.A	DHMT	079932862	[illegible]	[illegible]
42	Tayibu Kabia	Finance Asst	Freetown	078851745	[illegible]	[illegible]

GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

LOCATION: BO

ATTENDANCE REGISTER

Date: 12th & 13th Nov. 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (12th Nov)	SIGNATURE DAY 2 (13th Nov)
1	Albert Dove	Dist. Health Supt	Bonthe	076958857		
2	Augustine T. Fotoma	EHO	BO	076820862		
3	James J. Turay	Waste handler	Moyamba	079176891		
4	Esther T. Bangalie	Nurse	Bo	076361116		
5	Mariama B. Swaray	C H O	Pujehun	076366228		
6	Adama Fomara	S.E.C.H.N	Moyamba	078 111 589		
7	Elizabeth T. Samuma	midwife	Bonthe	078 49444		
8	Mohamed M.G.T. Pessima	P. H. I	Pujehun	078383718		
9	Ibrahim Morfureh	Etto	Bonthe	079-070588		
10	Cecelia Coker	SECHN	BO	078629898		
11	Joepe J. Roges	Dept H. Supt	Pujehun	076819845		
12	Cassimu J. Massaquoi	Incinerator Operator	Bonthe	078040998		
13	Manama Villa	SECHN	BO	076828219		
14	Tima Senesie	MCH Nurse	Moyamba	076907730		
15	Rachel Joe-Harding	MCH Nurse	Moyamba	079-460700		
16	Jebbeh Aruna	MCH Aide	Pujehun	079224602		
17	Janet B.D. Kamara	waste Handler	Pujehun	088827344		
18	Adama Tarawally	MCH Aide	Moyamba	07656583		
19	Princess Y. Fomba	Etto	Freetown	077908411		
20	Sylvester Allie	SECHN	Moyamba	078208370		
21	Dauda K. Koroma	P.H.O	Pujehun	078772626		
22	Sonia Amara	MCH Aide	Pujehun	079758281		
23	Mohamed Nalla	waste Handler	Pujehun	079856862		
24	Margaret Smith	SECHN	Bo	078765563		
25	Beatrice T. Amadu	MCH Aide	Pujehun	078353831		
26	Jusu Kpaka	waste Handler	Pujehun	0326773679		
27	Fadietu Bangura	SECHN	Moyamba	079927406		
28	Manama E. Barnie	SECHN	Pujehun	078915139		
29	Ellie K. Sallu	Waste Handler	Bonthe	079627907		
30	Augustine G. Moncauley	D.H. Supt	Moyamba	076783934		
31	Aminata Saffa	MCH Nurse	Moyamba	088945355		
32	IBRAHIM SAM	WASTE HANDLER	BONTHE	074611074		
33	Zainab Monsor	P.H.S.	BO	079399144		
34	Abdulai Bangura	P.H.A	Bonthe	078038227		

NO.	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (12th Nov)	SIGNATURE DAY 2 (13th Nov.21)
35	Mohamed Massaquoi	Waste Handler	Bonthe	079627907	[signature]	[signature]
36	Senesie Mambu	P.P.H.S	BO	076726375	[signature]	[signature]
37	Samuel S. Soko	EHO	Bonthe	078123333	[signature]	[signature]
38	Michael Moiyu	P.H.S	Moyamba	078299389	[signature]	[signature]
39	Alusine D Brima	Facilitator	Freetown			
40	Anthony Paul Lahai	P.H.S.	BO	078276638	[signature]	[signature]
41	Comfort Williams	Facilitator	Freetown	076278226	[signature]	[signature]
42	Amir B.S. Koroma	Dist H. Supt	Bo	076795315	[signature]	[signature]
43	Osman B. Gbabai	Co-Facilitator	F-T	076884524	[signature]	[signature]
44	Joseph Bellu	Driver	Freetown	077883019	[signature]	[signature]
45	Mustapha Yansaneh	driver	F-Town	079481920	[signature]	[signature]
46	Sorie Koroma	Driver	F-T	076687917	[signature]	[signature]
47	Juliana Kamanda	SR Safeguard Specialist	Freetown	078267148	[signature]	[signature]
48	Samuel Williams	driver	WA	099309411	[signature]	[signature]
49	Mohamed S Koroma	Facilitator	Freetown	074235595	[signature]	[signature]
50	Fatmata Jebeh Kpaka	SECHN	Bo	076149862	[signature]	[signature]
51	Zainab Jbangura	SECHN	BO	078761147	[signature]	[signature]
52	Francis A. Koroma	Facilitator	F/Town	078938884	[signature]	[signature]

GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

LOCATION: BO

ATTENDANCE REGISTER

Date: 12th & 13th Nov. 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (12th Nov)	SIGNATURE DAY 2 (13th Nov)
1	Albert Dove	Dist. Health Supt	Bonthe	076958857		
2	Augustine T. Fofoma	EHO	BO	076820862		
3	James J. Turay	Waste handler	Moyamba	079176891		
4	Esther T. Bangalie	Nurse	Bo	076361116		
5	Mariama B. Swaray	C.H.O	Pujehun	076366228		
6	Adama Kamara	S.E.C.H.N	Moyamba	078111569		
7	Elizabeth T. Samura	midwife	Bonthe	078494444		
8	Mohamed M.G.T. Pessima	P.H.I	Pujehun	078583768		
9	Ibrahim Morfureh	EHO	Bonthe	079-07-0588		
10	Cecelia Coker	SECHN	Bo	078629898		
11	Joepe J. Roges	Dist. H. Supt	Pujehun	076819845		
12	Sassimu J. Massaquoi	incinerator operator	Bonthe	078040998		
13	Manama Villa	SECHN	BO	076828219		
14	Tima Senesie	MCH Nurse	Moyamba	076907730		

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE DAY 1 (12th Nov)	SIGNATURE DAY 2 (13th Nov 21)
15.	Rachel Joe Harding	MCH Nurse	Moyamba	079-680700		
16	Jebbeh Aruna	MCH Aide	Pujehun	079224602		
17	Janet B.D. Kamara	waste Handler	Pujehun	088827844		
18	Adama Tarawally	MCH Aide	Moyamba	076?6583		
19	Princess Y. Fomba	Etto	Freetown	077908411		
20	Sylvester Allie	SECHN	Moyamba	078208370		
21.	Dauda K. Koroma	P.H.O	Pujehun	078772626		
22.	Sonia Amara	MCH Aide	Pujehun	079738281		
23.	Mohamed Nalla	waste Handler	Pujehun	079856862		
24	Margaret Smith	SECHN	Bo	078768563		
25	Beatrice I. Amadu	MCH Aide	Pujehun	078353831		
26	Jusu Kpaka	waste Handler	Pujehun	076773477		
27	Kadiatu Bangura	SECHN	Moyamba	079927406		
28	Manama E. Barnie	SECHN	Pujehun	078915135		
29	Ellie K. Sallu	Waste Handler	Bonthe	079627907		
30	Augustine G. Moncauley	D.H. Supt	Moyamba	076783934		
31	Aminata Saffa	MCH Nurse	Moyamba	088945355		
32	IBRAHIM SAM	WASTE HANDLER	BONTHE	074600?0		
33	Zainab Monsor	P.H.S.	BO	079399944		
34	Abdulai Bangura	P.H.A	Bonthe	078038252		

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE 12th Nov DAY 1	13th Nov.21 DAY 2
35	Mohamed Massaquoi	Waste Handler	Bonthe	079627907	[signature]	[signature]
36	Senesie Mambu	P.P.H.S	BO	076724375	[signature]	[signature]
37	Samuel S. Soko	E Ho	Bonthe	078123333	[signature]	[signature]
38	Michael Moiju	P.H.S	Moyamba	078299381	[signature]	[signature]
39	Idrissa O Brima	Facilitator	Freetown			
40	Anthony Paul Lahai	P.H.S.	BO	078274688	[signature]	[signature]
41	Comfort Williams	Facilitator	Freetown	078278226	CWilliams	CWilliams
42	Amir R.S. Koroma	Dist H. Supt	Bo	076795315	[signature]	[signature]
43	Osman B. Gbabai	Co-Facilitator	F-T	076834524	[signature]	[signature]
44	Joseph Bellu	Driver	Freetown	077883019	JBellu	JBellu
45	Mustapha Yansaneh	driver	F-Town	079481920	[signature]	[signature]
46	Sorie Koroma	Driver	F-T	076687917	[signature]	[signature]
47	Julliana Kamanda	on safeguard specialist	Freetown	076257148	[signature]	[signature]
48	Samuel Williams	driver	WA	099304441	[signature]	[signature]
49	Mohamed S. Koroma	Facilitator	Freetown	074235595	[signature]	[signature]
50	Fatmata Jebeh Kpaka	SECHN	Bo	076147862	[signature]	[signature]
51	Zainab Jbangura	SECHN	BO	078911741	[signature]	[signature]
52	Francis A. Kamara	Facilitator	F/Town	078938884	[signature]	[signature]

GOVERNMENT OF SIERRA LEONE
INTEGRATED HEALTH PROJECTS ADMINISTRATION UNIT
MINISTRY OF HEALTH AND SANITATION

ACTIVITY: Training of Waste Handlers on Covid-19 Vaccine Waste Management

LOCATION: FREETOWN

ATTENDANCE REGISTER

Date: 22nd & 23rd Nov. 2021

NO	NAME	DESIGNATION	LOCATION	PHONE NO.	SIGNATURE 22nd Nov.21 DAY 1	23rd Nov. 21 DAY 2
1	Patrick Lansana	Porter	L GH	088694218	Lansana	Lansana
2	Comfort Williams	Nat Facilitator	F/town	078278226	CWilliams	CWilliams
3	Idrissa O. Brima	Facilitator	Freetown	078-871768	[signature]	[signature]
4	Ibrahim Kargbo	porter	L G H	033909404	[signature]	[signature]
5	Sorie Fessebeh Kargbo	EHO	Connaught	076783013	Kargbo	Kargbo
6	Ramond Sesay	Incinerator	P.C.M.H	030091768	[signature]	[signature]
7	Rugiatu Bangura	Student	P.C.M.H	099718427	Bangura	Bangura
8	Henry Fofanah	P.H.I	P.C.M.H	078324852	[signature]	[signature]
9	Jerry Smith	incinerator	Connaught	076687717	[signature]	[signature]
10	Christiana Sandy	SECHN	L G H	095944255	CSandy	CSandy
11	Mohamed S. Koroma	Nat. Facilitator	Freetown	034294831	[signature]	[signature]
12	Samuel Tamba Kamara	P.H.S	WAR	077215325	[signature]	[signature]
13	Annie Amara	SECHN	L G H	099594505	[signature]	[signature]
14	Daniel Wongo	PHI	F/town	088634080	[signature]	[signature]

ANNEX F: Resource List - COVID-19 Guidance

WHO Guidance

Advice for the public

- WHO advice for the public, including on social distancing, respiratory hygiene, self-quarantine, and seeking medical advice, can be consulted on this WHO website: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public

Technical guidance

- Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected, issued on March 19, 2020
- Recommendations to Member States to Improve Hygiene Practices, issued on April 1, 2020
- Severe Acute Respiratory Infections Treatment Center, issued on March 28, 2020
- Infection prevention and control at health care facilities (with a focus on settings with limited resources), issued in 2018
- Laboratory biosafety guidance related to coronavirus disease 2019 (COVID-19), issued on March 18, 2020
- Laboratory Biosafety Manual, 3rd edition, issued in 2014
- Laboratory testing for COVID-19, including specimen collection and shipment, issued on March 19, 2020
- Prioritized Laboratory Testing Strategy According to 4Cs Transmission Scenarios, issued on March 21, 2020
- Infection Prevention and Control for the safe management of a dead body in the context of COVID-19, issued on March 24, 2020
- Key considerations for repatriation and quarantine of travelers in relation to the outbreak COVID-19, issued on February 11, 2020
- Preparedness, prevention and control of COVID-19 for refugees and migrants in non-camp settings, issued on April 17, 2020
- Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health, issued on March 18, 2020
- Oxygen sources and distribution for COVID-19 treatment centers, issued on April 4, 2020
- Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response, issued on March 16, 2020
- Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19), issued on March 19, 2020
- Operational considerations for case management of COVID-19 in health facility and community, issued on March 19, 2020
- Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19), issued on February 27, 2020
- Getting your workplace ready for COVID-19, issued on March 19, 2020
- Water, sanitation, hygiene and waste management for COVID-19, issued on March 19, 2020

- Safe management of wastes from health-care activities, issued in 2014
- Advice on the use of masks in the community, during home care and in Health Care settings in the context of the novel coronavirus (COVID-19) outbreak, issued on March 19, 2020
- Disability Considerations during the COVID-19 outbreak, issued on March 26, 2020
- Global manual on Surveillance of adverse events following immunization, issued 2016
- How to monitor temperature in the vaccine supply chain, issued July 2015

WORLD BANK GROUP GUIDANCE

- Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings, issued on March 20, 2020
- Technical Note: Use of Military Forces to Assist in COVID-19 Operations, issued on March 25, 2020
- ESF/E&S Interim Note: COVID-19 Considerations in Construction/Civil Works Projects, issued on April 7, 2020
- Technical Note on SEA/H for HNP COVID Response Operations, issued in March 2020
- Interim Advice for IFC Clients on Preventing and Managing Health Risks of COVID-19 in the Workplace, issued on April 6, 2020
- Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19, issued on April 6, 2020
- IFC Tip Sheet for Company Leadership on Crisis Response: Facing the COVID-19 Pandemic, issued on April 6, 2020
- WBG EHS Guidelines for Health Care Facilities, issued on April 30, 2007

MFI GUIDANCE

- EBRD COVID-19 resources (includes list of websites providing information on Covid-1(and guidance materials and resources provided by IFIs)
- ADB Managing Infectious Medical Waste during the COVID-19 Pandemic
- IDB Invest Guidance for Infrastructure Projects on COVID-19: A Rapid Risk Profile and Decision Framework
- KfW DEG COVID-19 Guidance for employers, issued on March 31, 2020
- Center for Disease Control Group COVID-19 Guidance for Employers, issued on March 23, 2020
- Center for Disease Control Vaccine Storage and Handling Toolkit, issued 2020

Reference

1. https://chinasewagetreatment.en.made-in-china.com/product/XbLnwTHPCRDO/China-High-Temperature-Hospital-Clinic-Medical-Waste-Incinerators-Machine.html
2. http://ecosteryl.com/products/ecosteryl-125/
3. Agunwamba J C1*, Emenike P C1 and Tenebe I T1 (2013), Comparative Analysis of Hospital Waste Management in Calabar Metropolis and Developed Countries.
4. Hatice Eser Ökten, Adnan Corum, Hacer Handan Demir (2015), A Comparative Economic Analysis for Medical Waste Treatment Options.
5. WHO (2004) on safe management of wastes from health-care facilities.Jang *et al*., 2006 https://www.remediationearth.com/pdf/REIs-OZONATOR-NG-1000-Information-Package-za.pdf
6. https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/rwa-sl-roadmap-strategy-draft_3-20140824-submitted.pdf
7. https://www.resilientinstitutionsafrica.org/sites/default/files/2018-08/%5BSierra%20Leone%5D%20National%20Policy%20Roadmap%20on%20Integrated%20Waste%20Management%20%282015%29.pdf
8. https://www.afro.who.int/sites/default/files/2017-05/ipcguide.pdf
9. https://www.afro.who.int/sites/default/files/2017-05/ipcpolicy.pdf