

ENVIRONMENTAL & SOCIAL MANAGEMENT FRAMEWORK (ESMF)

for the

Saint Lucia Health System Strengthening Project (P166783)

DRAFT FOR PUBLIC DISCLOSURE - June, 2018

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BMP	Best Management Practice
CEHI	Caribbean Environmental Health Institute
CITES	Convention on Trade in Endangered Species of Wild Flora and Fauna
CUBiC	Caribbean Uniform Building Code
CWIQ	St. Lucia Core Welfare Indicators Questionnaire
CZMAC	Coastal Zone Management Advisory Committee
DCA	Development Control Authority
EHD	Environmental Health Department
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
EOC	Emergency Operations Centre
GOSL	Government of Saint Lucia
HIV	Human immunodeficiency virus
ILO	International Labor Organization
MCH	Maternal and Child Health
MOPD	Ministry of Physical Development, Environment and Housing
MOHW	Ministry of Health and Wellness
MCWTPU	Ministry of Communications, Works Transport and Public Utilities
NEAP	National Environmental Action Plan
NEC	National Environmental Commission
NEMAC	National Emergency Management Advisory Committee
NEMO	National Emergency Management Organisation
NEOC	National Emergency Operations Centre
NEP	National environment Policy
NEMS	National Emergency Medical Services
NGO	Non-governmental Organisation
NIC	National Insurance Corporation
OAS	Organisation of American States
OECS	Organisation of Eastern Caribbean States
OP	Operational Policy
PCU	Project Coordination Unit
PPU	Physical Planning Unit
PPDB	Physical Planning and Development Board
PAHO	Pan American Health Organisation
PIU	Project Implementation Unit

PPP	Public Private Partnership
SDED	Sustainable Development and Environment Division
SLNS	Saint Lucia National Standard
SLNT	Saint Lucia National Trust
SWMA	St. Lucia Solid Waste Management Authority
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WASCO	Water and Sewerage Company
WBG	World Bank Group
WRMA	Water Resources Management Agency

EXECUTIVE SUMMARY

The Government of Saint Lucia (GoSL) is collaborating with the World Bank Group (WBG) to develop a Health System Strengthening Project with the objectives to improve the accessibility, efficiency, and responsiveness of health service delivery through the Ministry of Health and Wellness (MOHW). Component 2 of the Project would include improvements and refurbishments of up to 33 selected primary health facilities including equipment inventory, procedures provided, and infrastructure, based on a survey to be conducted during implementation. The precise changes and activities are not yet known in detail, so an Environmental and Social Management Framework (ESMF) is being created to plan for, prevent, minimize and mitigate any potential negative impacts from planned project activities. In addition, national health care waste management plans will be updated for activities that include minor refurbishments and the proper disposal of medical equipment. Activities will also include the strengthening of surveillance and information systems, laboratory capacity, and preparedness for public health emergencies.

The potential negative impacts can be grouped into two categories: those associated with typical small civil works during refurbishment, and those associated with medical waste management during operation. The former are addressed within the ESMF by the provision of a generic Environmental and Social Management Plan (ESMP) with Best Management Practices (BMPs) and standard contract clauses for small civil works, and a pre-design screening to identify any special conditions requiring additional mitigation measures. The latter are addressed by provision of Terms of Reference (TOR) to develop a Health Care Waste Management System (HWMS) during the early stages of implementation.

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1.0 INTRODUCTION

1.1 Project Description

The Government of Saint Lucia (GoSL) with the assistance of the WBG is developing the Health System Strengthening Project to further assist with the reform activities currently underway within the health sector through its Ministry of Health and Wellness (MOHW). The development objective is to improve the accessibility, efficiency, and responsiveness of health service delivery.

The proposed Project will have three components as described below.

Component 1. Improving Service Delivery through a Sustainable Benefits Package. This Component would include the review and implementation of the benefits package for health insurance, including administration, purchasing and contracting arrangements, regulations surrounding the scheme, and potential sources of additional revenue for expanding health service coverage.

Component 2. Strengthening Responsiveness of Public Health Systems to Noncommunicable Diseases and Public Health Emergencies. This component would involve strengthening the integration of primary care systems to enhance the role of primary care facilities and encourage their use as the first point of contact for health services, particularly NCDs. The care pathway across the health system will be reviewed to potentiate the use of the less costly primary health care services as the entry point into the system of care. A survey of primary health facilities including equipment inventory, procedures provided, and infrastructure would be conducted. Subsequently, improvements (such as refurbishment or provision of equipment) to health facilities will be made based on survey outcomes. The type of refurbishments envisioned could include minimal infrastructure adjustments such as establishing partitions in existing structures, improving lighting, and painting. It is possible that small additions, annexes or other upgrades to existing facilities may be proposed in some cases. The magnitude of such refurbishments is minor as potential adverse environmental impacts due to these interventions potentially involving dry-wall installation, installation of new lighting fixtures, and properly disposing of unused paint or improving waste management. Under the project, the national health care waste management plans will be updated for activities that include the minor refurbishments and the proper disposal of medical equipment. Other possible activities under this component include the roll-out of mobile clinics, Geographic Information Systems, and radio systems for communication with health facilities. Tracer conditions, such as diabetes, asthma/chronic obstructive pulmonary disease and cardiovascular disease may be used to assess the progress of this component.

As a separate activity under Component 2, there will be strengthening of surveillance and information systems, laboratory capacity, and preparedness for public health emergencies, to include the development of protocols and the provision of equipment to primary health care facilities to enable them to serve as the first point of detection for selected infectious diseases, investments in laboratory facilities (such as equipment), data management, transportation and storage, and the development of health emergency preparedness and response plans, establishment of emergency operation centers¹ and rapid response teams for public health emergencies, and outbreak communications. Where relevant, investments will also be made in IT systems, e.g. strengthening communication between HIS and MOHW for notification of selected diseases. For example, this subcomponent will support the development of a maternal and child registry following the impact of Zika on microcephaly. Under the project, the national health care waste management plans will be updated to include measures for how to manage equipment distribution and installation in the case of a disease outbreak.

Component 3: Institutional Capacity Building, Project Management and Coordination.

This Component supports project implementation efforts, including project management, fiduciary tasks and monitoring and evaluation (M&E). This component would involve monitoring and evaluation and project management costs associated with supervision of the Project. This Project will be managed by a stand-alone PIU housed within the MOHW.

1.2 Purpose and Scope of ESMF

Although the Project will create many positive environmental and social benefits, there are also possible negative impacts that can occur as a result of the Project. To avoid, minimize, or mitigate any negative outcomes, this ESMF document was developed to identify potential risks, analyze mitigation strategies, and provide guidance during project implementation. In this way, good environmental and social management can be furthered over the course of the Project. The ESMF also serves as a public document to inform stakeholders and improve the Project by getting their feedback on relevant concerns or issues.

¹ Selected facilities will be designated as emergency operations centers which would allow them to serve as a point of coordination during a public health emergency.

2.0 LEGAL AND REGULATORY FRAMEWORK

2.1 National Regulatory Framework

Saint Lucia has in place several pieces of legislation and institutions to protect the environment, some of which were originally enacted in the 1940's and amended in recent times. There is no comprehensive Environmental Management Act in force at present, however a Draft was completed in 2008, to provide for the allocation of administrative responsibilities for environment management, the undertaking and coordination of environmental management and related activities. Current legislation of most relevance to the present project are summarised below.

2.1.1 Land Conservation and Improvement Act

The Land Conservation and Improvement Act (Cap 5.10) provides for the establishment of the Land Conservation Board to advise the Minister for Agriculture and Lands on the general supervision of land and water resources, stimulate public interest in conservation, and coordinate efforts of other conservation bodies. The Act also provides for making protection orders for conservation and improvement of land and water.

2.1.2 Saint Lucia National Trust Act

The Saint Lucia National Trust Act (Cap. 6.02) establishes the SLNT with responsibility to promote and preserve submarine and subterranean areas of beauty or natural or historic interest to preserve the natural aspect, features, animal and plant life. Police officers and Trust officers have powers of arrest against persons in breach of the bye-laws.

2.1.3 Physical Planning and Development Act

The Physical Planning and Development Act (Cap. 5.12) repeals the Town and Country Planning Ordinance (Cap. 175), and the Land Development (Interim Control) Act of 1971, and makes provision for the development of land, the assessment of environmental impacts of development, the grant of permission to develop land, and for other powers to regulate the use of land. The Act (save for Part I) took effect on July 1, 2003. The Development Control Authority (DCA) has not been dissolved, and reference to the Head of the Physical Planning and Development Division is to be construed as reference to the DCA. The Act seeks to ensure that appropriate and sustainable use is made of all publicly and privately owned land, to maintain and improve the physical environment, provide for the orderly sub-division of land and the provision of infrastructure and services, maintain and improve building construction standards to secure human health and safety, and protect the natural and cultural heritage of Saint Lucia. The Act imposes a duty to prepare physical plans on the Head of the Division in consultation with

stakeholders, such plans are to be reviewed as least every five years. Once plans are approved by the House of Assembly, the prescriptions of the plan must be given principal consideration in determination of applications, and the government shall be guided by the prescriptions of the plan in the preparation of public sector projects or programmes.

The Physical Planning and Development Act (No. 29, 2001) is the act that guides the Development Control Authority (DCA) and the Physical Planning Section. Environmental Impact Assessments are requested under Section 22 of the Act and the list of undertakings that require an Environmental Impact Assessment (EIA) as part of the consideration for approval are listed in Schedule 4 of the Act, as follows:

1. Hotels of more than the number of rooms specified in the Regulations;
2. Sub-divisions of more than the number of plots specified in the Regulations;
3. Residential development of more than the number of units specified in the Regulations;
4. Any industrial plant which in the opinion of the Head of the Physical Planning and Development Division is likely to cause significant adverse impact on the environment;
5. Quarrying and other mining activities;
6. Marinas;
7. Land reclamation, dredging and filling of ponds;
8. Ports;
9. Dams and reservoirs;
10. Hydro-electric projects and power plants;
11. Desalination plants;
12. Water purification plants;
13. Sanitary land fill operations, solid waste disposal sites, toxic waste disposal sites and other similar sited;
14. Gas pipeline installations;
15. Any development projects generating or potentially generating emissions, aqueous effluent, solid waste, noise, vibration or radioactive discharges;
16. Any development involving the storage and use of hazardous materials;
17. Coastal zone developments;
18. Development in wetlands, marine parks, national parks, conservation areas, environmental protection areas or other sensitive environmental areas.

The Physical Planning Section of the Ministry is guided by this legislation and after soliciting an EIA based on the type of development, will circulate the report to a number of referral agencies which are made up of some of the other agencies and statutory bodies with some responsibility for environmental management and safeguard and who would have assisted in contributing to the Terms of Reference for the study. The study will be reviewed for its adequacy and the agencies may make additional recommendations if necessary. The final decision on any proposed

development application or an EIA is made by the Board of the Development Control Authority (DCA) who may approve the EIA with its recommendations and measures, along with the recommendations and measures of the referral agencies. The Development Control Authority (DCA) is empowered under the Physical Planning and Development Act No 29 of 2001 to consider and grant approval for all development within the state (Interview DPPS-MPDH, Executive Secretary- DCA). The DCA is made up of a government appointed Board of various professional interest and main technical government offices which also includes the Chief Engineer of the Ministry of Infrastructure or his representative.

2.1.4 Solid Waste Management Authority Act

The Saint Lucia Solid Waste Management Authority Act (Cap. 6.10) provides for the management of waste. It establishes the Saint Lucia Solid Waste Management Authority (SWMA), provides for waste management planning, licensing of facilities including waste haulers, regulation of operations, and for powers of authorized officers. In 2008 the Waste Management (Biomedical Waste, Transportation, Treatment and Disposal) Regulations were established.²

2.1.5 Public Health Act

The Public Health Act (Cap. 11.01) makes the Minister of Health responsible for the prevention, treatment, limitation and suppression of disease; abatement of nuisances and removal or correction of any condition injurious to public health; prevention, treatment, limitation and suppression of disease; control of food and drugs in the interest of the public health; publishing reports, information and advice concerning public health; and public education on public health issues. The Minister has power to make regulations for the proper carrying out of the provisions of the Act. Regulations under this Act include Nuisances, Communicable and Notifiable Diseases and its amendment of 1991, Water Quality Control, Sewage and Disposal of Sewage and Liquid Industrial Waste Works, Transportation of Human Remains, Disposal of Offensive Matter, Sewage and Disposal of Sewage etc, Foods Regulations, Clothes Washing in Streams, Disposal of Corpses, and Mosquito Control. The Public Health (Water Quality Control) Regulations set standards for the purity of the water supply.

2.1.6 Public Hospitals Act

The Public Hospitals (Management) Act provides for the management and administration of public hospitals. It provides for establishment of a Hospitals Board for the general management and administration of any hospital (except Victoria Hospital), conferring on the Board the power to do all things necessary for the proper discharge of its functions, including preparation of

² <http://sluswma.org/wp-content/uploads/2013/09/biomedical%20waste%20legislation.pdf>

annual estimates and collection of fees. The Act assigns responsibility for medical administration of hospitals to the Chief Medical Officer and provides for the appointment of a Medical Director, Medical Superintendent, specialists, consultants, medical officers, nursing and other personnel.

2.1.7 Disaster Preparedness and Response Act

The Act provides for a more effective organization of the mitigation of, preparedness for, response to and recovery from emergencies and disasters.

2.1.8 OECS Building Code and Guidelines

The draft OECS Building Code and Building Guidelines (Draft) acknowledges the natural hazards to which OECS countries are subjected. The Code seeks through introduction of building standards, to prevent or mitigate damage of extreme natural events. Codes are based on the Caribbean Uniform Building Code (CUBiC) and other regional codes. The code advocates development of an adequately staffed building inspectorate to ensure compliance, and to assist developers.

2.1.9 Labour Act

The 2006 Labour Act (or Labour Code, as amended in 2011) provides for the rights of workers for minimum wages, contracts and termination, leave and benefits, prohibition of child labour, protection against discrimination, rights to association, and occupational health and safety. In May 2017 this was strengthened by introduction of an Occupational Safety and Health Policy that was developed in conjunction with the International Labour Organization (ILO).

2.2 Environmental Management Capacities

Ministry of Health and Wellness

The MOHW, through its Environmental Health Department (EHD), it has the responsibility for reviewing plans, monitoring and enforcing public health and sanitation regulations and practices, and promoting public awareness on matters relating to public health and the environment. These include practices that affect health such as food preparation, sanitation, solid waste management, liquid and solid waste disposal, dust and air pollution, water quality, some occupational health and safety matters.

The EHD bears the major responsibility for the organization of resources and services for health of the nation. The Ministry is organized into sub-divisions, which are responsible for various health programs including preventive services, health education and promotion, environmental

health, hospital and curative services. Private sector health services in Saint Lucia comprise medical, dental, pharmacy and laboratory. Private sector services are concentrated in the capital city of Castries and its suburbs in the north. Health services in Saint Lucia are provided from 33 health centres, 2 district hospitals, 1 polyclinic, 2 general hospitals, 1 mental hospital, 1 drug rehabilitation facility, 1 private hospital, approximately 70 private offices, approximately 15 private pharmacies, three private laboratories, and two private radiology facilities.

Primary curative and preventive care in the public sector is provided by a network of thirty-two health centres, two district hospitals and a polyclinic. These facilities are widely dispersed throughout the island in nine defined health regions. Geographic access to services is good. In addition to routine medical clinics, the health centres and district hospitals offer special services in obstetrics/gynaecology, paediatrics, surgery, sexually transmitted diseases, dermatology, pharmacy, nutrition counselling, environmental and health education services and mental health. Special clinics and services are also offered for diabetes, hypertension, family planning and maternal and child health (MCH) and a focus on men's health. Casualty and emergency episodes are mostly handled within the accident and emergency departments within the general hospitals.

The EHD within the MOHW is responsible for monitoring and regulating environmental health conditions, including programme areas of vector control, food safety, water and wastewater, industrial hygiene and air pollution. The Environmental Health Unit carries out inspection of food handling premises as part of the public health programme. This Unit also facilitates the issuance of health permits to food handlers and deals with public complaints as it relates to waste, water and other environmental health aspects. The MOW is represented on the Solid Waste Management Authority Board, the Development Control Authority and the National Emergency Management Advisory Committee (NEMAC), and collaborates with the DOF in some coastal water quality monitoring. The Epidemiology Department collects statistics and maintains a database on the incidence of various diseases.

The Corporate Planning Unit of the MOHW manages capital projects and plant (structure and equipment) maintenance. The Unit is charged with the responsibility of analysing and utilising data to inform project and programme conceptualisation, health policy development and implementation, and other health related interventions for the health sector.

The Department has on staff an Engineer who reviews plans, inspects work locations, and ensures that all projects are implemented in accordance with the building code and other health related spatial standards which may exist. The Department has also recruited a Quality Assurance Manager within the last two years to standardise service delivery through standard/guideline development and licensure. The Department also has a Biomedical Engineer on staff whose main duties include procurement of appropriate technologies and standardisation of medical equipment and devices within the sector.

Ministry of Physical Development, Housing, and Urban Renewal

This Ministry has responsibility through the functions of its various departments/ sections which impact directly on the management of the country's natural resources. The Physical Planning section is the technical arm of the Development Control Authority (DCA). The Ministry is also responsible for the implementation of the Saint Lucia Building Codes and guidelines which are supposed to provide guides for best construction practices.

Caribbean Public Health Agency

The Caribbean Public Health Agency (CARPHA) is a regional CARICOM institution and the lead agency in matters related to public health including water quality and water pollution prevention and management. It has been involved in testing for and quantifying various inputs into the coastal waters of the island and establishing monitoring and controls especially as part of water quality monitoring programmes. It collaborates with the Department of Health performing testing and analysis for that Department as well as other ministries, agencies, and the private sector who may wish to employ its technical services. This organization is has a well equipped laboratory to assist its functions. The Department of Health relies on the Caribbean Public Health Agency (CARPHA) to perform many of its analytical functions. CARPHA also provides technical assistance and support to water resource management initiatives.

Saint Lucia National Trust

This statutory body has responsibility for the conservation and management of buildings and objects of historical and architectural value as well as areas of natural and scientific importance. The Trust is responsible for protecting and promoting the patrimony of the country. It manages the Pigeon Island National Landmark, the Praslin Protected Landscape, and the Maria Island and Frigate Island Nature reserves.

A related entity is the Archaeological and Historical Society, which is an NGO founded in 1954. It is custodian of many of Saint Lucia's archaeological and historical collections and is supposed to serve as a "Preserver of Records". The area of preservation of historical buildings and sites has remained a grey one between the Society and the Trust, and this has caused some conflict at times. The Society also promotes itself as the custodian of underwater archaeological sites as well.

Saint Lucia Solid Waste Management Authority

This statutory authority has the responsibility for providing a coordinated and integrated systematic approach to collection, treatment, disposal, and recycling of wastes including

hazardous wastes. The Authority is also responsible for the management of two sanitary disposal sites, one in the north at Deglos, and the other in the south in Vieux Fort. The agency has also developed guidelines for medical waste management.³

Ministry of Public Service, Sustainable Development, Energy, Science and Technology

The Ministry of Public Service, Sustainable Development, Energy, Science and Technology is the government body responsible for the following-up of the international commitments signed by Saint Lucia related with environmental issues, including the Climate Change Convention (UNFCCC). The Sustainable Development, Energy, Science and Technology Section oversees all matters relating to sustainable development within the country and ensure that the various protocols are adhered to. It is the lead environmental agency in the country and spearheads the National Environmental Policy (NEP), National Environmental Management Strategy (NEMS), the National Climate Change Committee (NCCC), and other initiatives related to biodiversity, marine and terrestrial pollution, energy efficiency, sustainable development and environment.

National Emergency Management Office (NEMO)

The role of the National Emergency Management Organisation [NEMO] is to develop, test and implement adequate measures to protect the population of Saint Lucia from the physical, social, environmental and economic effects of both natural and man-made disasters such as hurricanes, landslides, oil spills, and fires. Its responsibility is to ensure the efficient functioning of preparedness, prevention, mitigation and response actions. NEMO is responsible for preparing and managing the National Emergency Management Plan. NEMO is the chair of the National emergency Management Advisory Committee which convenes whenever there is a national emergency.

Labour Relations Department

This Department of the Ministry of Education, Innovation, Gender Relations and Sustainable Development is responsible for standards of occupational health and safety in places of employment and largely focuses on workers safety in the work place and employer/employee relations, grievances, and other aspects of the Labour Act.

2.3 World Bank Safeguard Policies

The World Bank projects and activities are governed by Operational Policies (OP) which are designed to ensure that the projects are economically, financially, socially and environmentally

³ <http://sluswma.org/how-to-manage-medical-waste/>

sound.⁴ The World Bank's policy on Environmental Assessment (OP 4.01) is used to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. This policy is considered to be the umbrella policy for the Bank's "environmental safeguard policies" which among others include: Natural Habitats (OP 4.04), Forests (OP 4.36), Pest Management (OP 4.09), Physical Cultural Resources (OP 4.11), and Safety of Dams (OP 4.37). The Bank's "social safeguard policies" include Involuntary Resettlement (OP4.12) and Indigenous Peoples (OP4.10).

Under OP 4.01 the Bank will undertake environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment required. Proposed projects are classified into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. The categories of potential environmental impacts are classified as A, B, C and FI, as described in Table 2 below:

Table 2: World Bank project categories

Category	Description
Category A	Category A project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. The EA for Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" scenario), and recommends any measures needed to prevent, minimise, mitigate, or compensate for adverse impacts and improve environmental performance. For Category A project, a borrower is responsible for preparing an Environmental Impact Assessment (or a suitably comprehensive regional or sectorial EA).
Category B	Category B project has potential adverse environmental impacts on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats - which are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.
Category C	Category C project is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required.
Category FI	Category F or FI project involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

⁴Source: <http://www.worldbank.org/opmanual>

The Saint Lucia Health System Strengthening Project is classified as Category B, meaning that environmental impacts for the type of work anticipated under the project are expected to be moderate to minimal in nature and can be readily managed through the application of appropriate and well established engineering and management measures.

The World Bank Safeguard Policy OP 4.01 requires that an Environmental and Social Management Framework (ESMF) be prepared along with an Environmental and Social Management Plan (ESMP) to guide the project's screening of project risks and its implementation of recommendations to reduce those risks. This program-level ESMF includes guidance during project execution for screening possible sub-projects (i.e., individual civil works or other project-related activities) and identify complex projects which would require additional studies to comply with safeguards policies. All future subprojects which are as yet not identified in detail are included within this single ESMF document, and will be incorporated into the Project Operations Manual to serve as a guide for environmental management of future subprojects or activities once they are defined in sufficient detail for execution. The ESMF as a public document, serves to inform stakeholders and guide environmental management of activities to be implemented.

The other World Bank Safeguard Policies dealing with natural habitats, physical cultural resources, pest management, and forests will not be applicable to the Saint Lucia Health System Strengthening Project. Therefore, screening of proposed activities or sub-projects should be done during project implementation to ensure that they do not affect natural habitat or forests, physical cultural resources, or involve pesticide use, in which case they should be excluded and rejected as ineligible. The policies are described briefly below to guide MOHW assessment of sites during pre-design screening.

- **Natural Habitats (OP/BP 4.04)** strictly limits the circumstances under which any Bank-supported project can affect or alter natural habitats (land and water areas where most of the native plant and animal species are still present) as well as parks, natural areas, or other declared protected areas. Projects must avoid, minimize, restore, or offset any activities that cause degradation of natural habitat. Projects that would cause significant conversion or degradation of critical natural habitat (legally protected areas, or those with high conservation value) are not eligible for funding.
- **Physical Cultural Resources (OP/BP 4.11)** seeks to avoid, or mitigate, adverse impacts on cultural resources (movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance) from development projects that the World Bank finances. If a project may affect physical

cultural resources, it should be excluded during the screening project. In addition, as a standard practice, a chance-find procedure is required for all projects with earth-moving activities (excavation, trenching, grading, or plowing) to stop work and notify authorities to prevent damage or destruction of these resources if encountered.

- **Pest Management (OP 4.09)** is meant to ensure that harmful pesticides are not used, the policy requires that any pesticide it finances be manufactured, packaged, labelled, handled, stored, disposed of, and applied according to standards acceptable to the World Bank, and excludes certain formulated products, as well as requiring training, equipment, and facilities to handle, store, and apply these products properly. The use of minor amounts of pesticides, such as termite treatment for building foundations, is acceptable provided that it is done through licensed registered professional contractors; however, the use or purchase of significant amounts of pesticides (e.g. for vector control) must be excluded in the screening process as ineligible.
- **Involuntary Resettlement (OP 4.12)** requires fair and transparent process for acquisition of lands, physical relocation of persons (even if not the property owner), and removal of crops or access to livelihood. Thus the project will not finance investments that result in direct economic and social impacts through the: (i) involuntary taking of land resulting in relocation or loss of shelter, loss of assets or access to assets, or loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or (ii) involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons. It is necessary to avoid triggering the Policy by the removal of persons or their assets such as crops or structures, or by requiring access or occupation without recourse or recompense. Therefore, any works or activities to be financed as part of this project or at a later stage will be on government lands, unoccupied and unencumbered by informal settlers or their assets. Privately owned land or land purchased through willing-seller and willing-buyer is acceptable, provided that the land acquisition must occur by mutual agreement in exchange for a notarized purchase contract based on the market price at the date of acquisition. Any temporary access agreements should be equitable, voluntary, and documented in writing.

The PIU must screen, exclude and reject any works or activities which would inadvertently trigger the above policies (see section 5.1 of this ESMF). Most of the activities to be undertaken are expected to be fairly simple in nature, with only minor improvements or physical upgrades to existing clinics, so it is expected that very few or none of the anticipated activities would be excluded at the end of the day.

Saint Lucia is almost entirely volcanic with the oldest rocks, largely of rhyolite, andesite and various basalts, dating from the early Early Tertiary period. The rock formations have been grouped into three wide island classes – northern series (early Tertiary [Eocene]), central series (middle Tertiary [Miocene/Pliocene]), and southwestern series (Holocene [mid to late Pleistocene]) series⁶.

3.3 Topography and Drainage

Saint Lucia is mountainous (refer to Figure 1) with a south central mountain range rising to Mount Gimie at 3,117 ft (950m) above sea level and extending to the northeast and southwest in an irregular but pronounced axial ridge of approximately 15 miles (24 km) long with many pronounced gulleys and valleys.⁷ The land descends to the coast on both the western and eastern side of the central ridge within deep canyons, to expansive valley areas with perennial streams and rivers, flat alluvial plains, then the sea. The northern, central and eastern parts of the island tend to display a softened, rounded topographic quality reflecting old geologic age, erosion and weathering. Expansive valley areas include such examples as Marquis, Choc, Cul de Sac, Roseau, Mabouya, Fond d'or and Troumassee Valleys, and are also generally where large agricultural production is undertaken. In the upper reaches the average range elevation is approximately 900 feet (274m) above sea level but this is also dominated by peaks such as La Sorciere (2221 ft, 677m) and Piton Flore (1850 ft, 564m).

The west and southwestern edges of the country are geologically newer with more rugged and steeper mountainous terrain and dramatic drops. The Pitons of Soufriere (over 2000 ft (750m)) are located in this area and form part of a massive caldera that contains the town of Soufriere and then drops off into Soufriere Bay. The southwestern area stretching from Gros Piton inland to Mount Grand Magazon and down to Vieux Fort and the sea has an extensive flat southern area extending to the sea. This area has deeply cut, narrow, steep-sided gorges as evidence of older geologic activity and time. The town of Vieux Fort lies within the flat sandy plain mentioned above.

3.4 Climate

Annual rainfall in Saint Lucia ranges from 250 inches in the wet central mountainous interior to 60 inches in the dry coastal locations. This is largely due to the orographic effect as a result of the general topography of the island with a high central mountain range and lower coastal areas.

⁶ Organization of American States, Saint Lucia Development Atlas. Department of Regional Development, OAS General Secretariat, Washington D.C. USA. 1987

⁷ The Caribbean Conservation Association. Saint Lucia Country Environmental Profile. St. Michael, Barbados. 1991

Saint Lucia has two seasons; a dry season which starts from December and usually ends in May, and a wet season which is from June to November. It is during the wet season that Saint Lucia is very vulnerable to hurricanes and other tropical storm occurrences as this is known as the hurricane season. The rainy season, during which the island receives ~70% of total annual rainfall, coincides with the period of highest tropical storm activity in the region.

There is also considerable inter-annual variability in the rainfall record. 1997 was among the driest years on recent record (~160 cm), but was followed by one of the wettest years, 1998, (~295 cm). There is evidence that some of the variability is driven by global climatic fluctuations such as the El Niño-Southern Oscillation (ENSO) or by large scale gradients in tropical Atlantic and Pacific sea surface temperatures.

Mean temperatures vary by 2° C throughout the year and peak between May and October. Maximum temperatures can reach a high of 31° C during these months, and minimum temperatures a low of around 23° C in February. Highest temperatures on record were seen in 1998, which is consistent with global estimates. Both the maximum and minimum temperature records show a warming trend over the past 22 years. The warming is consistent with the rest of the Caribbean (Peterson et al. 2002) and the rest of the world (Alexander et al. 2006). Also, like the global averages, maximum temperatures for Saint Lucia are increasing at a slightly faster rate (0.2°C/decade) than minimum temperatures (0.15°C/decade).

Relative humidity across the country tends to be generally high year round (above 70%) and predictably highest during the main rainfall period. Winds are generally E to ESE, and wind speed is strongest (>9 metres per second) through the dry period to the beginning of the rainy period (December-June). During this period the north Atlantic high is a persistent and dominant influence on the region. Notwithstanding, strong wind gusts are also common from June to November during the passage of tropical waves, depressions, storms or hurricanes. Saint Lucia is on the hurricane track of the eastern Caribbean (Figure 2).

which predisposes the residents to water borne diseases such as diarrhea which affect especially children. Given the nature of tenure and lack of resources, residents have little or no vested interest in managing the lands and lack the capacity to make any investments that may reduce risk exposure.

The island nation has been able to attract foreign business and investment, especially in its offshore banking and tourism industries. Tourism is Saint Lucia's main source of jobs and income - accounting for 65% of GDP - and the island's main source of foreign exchange earnings. The manufacturing sector is the most diverse in the Eastern Caribbean area. Crops such as bananas, mangos, and avocados continue to be grown for export, but Saint Lucia's once solid banana industry has been devastated by strong competition.

3.6 Biological Resources

Saint Lucia's rugged terrain has resulted in a variety of vegetative types. The range of natural life zones occurring in Saint Lucia displays heterogeneity and a rich diversity of ecosystems, which are typical of the tropics. Saint Lucia possesses a high degree of diversity not only in the ecosystems and habitats found on the island, but also in the variety of biological resources present, some of which are endemic to the country. In a 2009 survey, Saint Lucia registered 9 endemic 'higher plants', 6 endemic birds (11 sub-species); 7 endemic reptiles (5 sub-species); 1 endemic amphibian; 1 endemic mammal (1 sub-species) and more than 200 endemic beetles.

For purposes of this ESMF, four main ecosystem types can be considered: Forest and Terrestrial Wildlands, Coastal and Marine, Inland Fresh Waters, and Agro- Ecosystems.

- An estimated 15% of the island's landmass is under forest cover. Between 1990 and 2000 it is estimated that the island lost 36% of its forest cover as a result of clearing of natural vegetation for agriculture, construction and other development purposes. The forest reserves are regarded as exceptionally preserved in the country with mainly rainforest ecosystems. Five main types of forest ecosystems have been described: Rainforest: dominant vegetation of the mountain slopes; Lower montane rain forest: in higher elevations, plant composition and structure of the forest change, with lower canopy; Elfin woodland; or cloud forest occurs on highest peaks; xerophytic forest - natural dry forest, typically in the coastal region; primarily secondary woodland consisting of regenerating forest interspersed with cultivation; Dry scrub woodland; driest portions of the island.
- The coastal and marine areas also contain a diversity of ecosystems including mangroves, coral reefs, sea grass beds and beaches. St Lucia's coastal zone is characterised by mangroves, seagrass beds, coral reefs and beaches, which not only play an increasingly important role in tourism but also are an integral component in natural coastal defense

and ecology of the island. Among the mangrove species found on the coast are the red mangrove (*Rhizophora mangle*), white mangrove (*Laguncularia racemosa*), black mangrove (*Avicennia germinans*), and buttonwood (*Conocarpus erecta*). The Department of Fisheries (DOF) has declared most of the mangroves marine reserves. The seagrass beds offshore include turtle grass (*Thalassia testudinum*) and manatee grass (*Syringodium filiforme*). In general, larger and denser seagrass beds are found off the East Coast compared to the infrequent and sparsely covered seagrass patches along the West Coast.

- Thirty-seven watersheds have been delineated in Saint Lucia, all radiating from the central mountain ranges of the interior towards the coast, with the upper reaches of many of these drainage basins located within high rainfall zones. Fresh water ecosystems provide habitats for many species including fishes, molluscs, amphibians, reptiles, insects, plants and mammals. Species richness in relation to area of habitat is extremely high in many freshwater groups. Studies indicate the occurrence of 14 fresh water fish species, nine (9) of which are native to Saint Lucia. The freshwater and mangrove wetlands of Saint Lucia are relatively small but are representative of most wetland ecosystems.
- A wide variety of vegetables, fruit trees and other crops are grown on the island. Banana cultivation is still considered the largest agricultural production activity. There are approximately 24 varieties of *Musa* species, most now held in germplasm. Other germplasm conservation at the 4 agricultural stations on the island is largely focused on horticultural and fruit crops such as guava, wax apple, mango, citrus varieties, sugar apple, orchids, cocoa, cashew, coconut, musseanda, ixora, palms, cherry, ginger lilies, pawpaw (resistant to *Erwinia*). Agro-ecosystems also comprise a number of useful species, including herbs and medicinal plants.

The biological resources of Saint Lucia provide the foundation for tourism activities, as well as the ecosystem services such as clean water, runoff control, and protection from storm surges and river flooding.

3.7 Geo-hazards

Saint Lucia is vulnerable to a number of natural hazards such as hurricanes, earthquakes, volcanic activity, drought, tsunamis, flooding, and landslides. The effects of these phenomena can be exacerbated by the activities of population such as deforestation, indiscriminate garbage disposal, poor building practices, and unplanned settlements in environmentally sensitive areas.

With the increased frequency of more intense weather events as a result of climate change, the possibility for disasters to occur increases placing increased strain on the limited national

technical and financial resources and the country's ability to respond. Hurricane Tomas was a clear example of this. The island has also experienced two periods of drought, in 2002, and again between 2009 and 2010, placing tremendous strain on the limited national water supply.

As an example of the vulnerability of Saint Lucia to natural disasters, Hurricane Tomas which impacted Saint Lucia in October 2010 was a major disaster affecting areas around the country resulting in landslides, infrastructural damage, loss of property, and life. Several major landslides and debris flows occurred along major roadways and settlements, with several others occurring in many forested areas affecting critical water supply infrastructure. The December 2013 trough resulted in more than 250 mm (10 inches) of rain falling on Saint Lucia, causing massive infrastructural damage as a result of the freak storm. Several parts of the island were ravaged by landslides and flash floods caused by unseasonal heavy rains and overflowing rivers that burst their banks. There was widespread flooding in Central Castries and the villages of Anse-La-Raye and Canaries along the west coast, as well as in Bexon, Dennery and Micoud on the east coast, and further south in the towns of Vieux Fort and Soufriere.

The volcanic hazard of Saint Lucia has been studied by many researchers. The University of West Indies (UWI, 2011) has produced updated maps showing seismic hazard (earth shaking) that can be used for planning purposes in the Eastern Caribbean. These seismic hazards result from tectonic activity (the subduction of the Atlantic Plate beneath the Caribbean Plate). In Saint Lucia the peak ground acceleration (expressed as a percentage (%) of g , the acceleration of gravity), is up to 15% g every 100 years, 25% g every 500 years, and 40% g every 1,000 years.

Costal zones are also vulnerable to storm surge during hurricanes, and erosion from wave energy. Storm surge from hurricanes is pronounced on the southwest coast, where up to 5 meters of sea level rise during hurricanes could occur. Elsewhere, up to 2 meters would be expected during hurricanes. The eastern side of Saint Lucia is exposed to long-fetch waves across thousands of miles of open Atlantic Ocean, and consequently has a number of erosion hot spots (Fig. 10) vulnerable to wave energy. Tsunamis also pose a hazard in the Eastern Caribbean and can be caused by earthquakes, and by eruptions of volcanoes particularly those lying on the seafloor such as Kick-em Jenny near Grenada, which could result in a 2-meter tsunami arriving at Saint Lucia within 15 minutes of eruption (Gibbs, 2001).

3.8 Physical Cultural Resources

The rich culture and history of Saint Lucia has created physical cultural resources, which are features or objects of interest and value to nation's people because of their archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. These may include artefacts, objects, sites, structures, groups of structures, and natural features and landscapes, and may be located in urban or rural settings, above or below ground, or under

water. Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices.

Recognition of physical cultural resources may be at the local, national level, or within the international community. Examples may include Saint Lucia's natural treasures such the Botanic Gardens, masonry works, historical buildings, or other features of community importance or international renown. Prehistoric rock art at Balenbouche, structures of cultural interest such as the Vigie Lighthouse, and historic building facades in Castries are all examples of physical cultural resources in Saint Lucia.

4.0 POTENTIAL IMPACTS

The Project is expected to bring numerous positive benefits, but there is also a risk of negative impacts in the social and environmental areas if activities are not appropriately managed.

As described earlier in this ESMF, Component 2 of the Project would include improvements and refurbishments to selected primary health facilities including equipment inventory, procedures provided, and infrastructure, based on a survey to be conducted during implementation. The precise changes and activities are not yet known in detail. Under the project, the national health care waste management plans will be updated for activities that include the minor refurbishments and the proper disposal of medical equipment. Under Component 2, there will also be strengthening of surveillance and information systems, laboratory capacity, and preparedness for public health emergencies, to include the development of protocols and the provision of equipment to primary health care centers to enable them to serve as the first point of detection for selected infectious diseases, investments in laboratory facilities (such as equipment), data management, transportation and storage, and the development of health emergency preparedness and response plans. This ESMF seeks to plan for, prevent, minimize and mitigate any potential negative impacts from these activities.

4.1 Positive Impacts

There are several potential positive impacts of the project and associated works. These will only be highlighted here, as the focus of the ESMF is on the potential for negative environmental and social impacts and defining the best mitigation measures.

The most obvious positive impact is the improvement of access to health services, and the reduction of the nation's vulnerability to disease. Other positive benefits include the creation of employment and income generation during the operations phase.

4.2 Negative Impacts

Negative environmental and social impacts could result from several of the project activities, as summarized below.

- Refurbishments at selected health facilities presents risks typical for small civil works, such as occupational health and safety, heavy equipment and increased traffic, dust and noise, stormwater runoff from disturbed areas or concrete mixing areas, inadequate debris disposal, poor sanitary facilities, and others.

- Unexpected risks from small civil works include destruction of historical artefacts during earth-moving activities, damage to historical buildings or facades, or other impacts to physical cultural resources.
- If new lands must be acquired or informal settlers removed from government (Crown) lands, then social impacts could include loss of crops or livelihood, or involuntary physical displacement of persons.
- Upgrading of facilities should also include adequate treatment of wastewater. Diesel generators may also be used for emergency power back-up, requiring adequate ventilation, fuel storage, and safety measures. During operations, these systems must be maintained adequately to minimize potential releases to the environment.
- Refurbishments at selected health facilities could create sources of medical waste, equipment or supplies needing proper management and disposal. Asbestos, mercury, chemicals or other hazardous materials may also be discovered during demolition, repairs, or refurbishment.
- During operation of the health care facilities, there may be increased use and scope of services, resulting in additional sources of medical waste needing proper treatment and disposal. This is also the case for work during emergency response or epidemics.
- The health and safety of health care workers could be affected by waste management practices as well as by hygiene conditions, isolation and storage procedures for bioinfectious, radiologic or genotoxic waste. Such risks may also affect the nearby communities.

The potential negative impacts can be grouped into two categories: those associated with typical small civil works, and those associated with medical waste management. Each is discussed in more detail in the following sections.

4.2.1 Negative Impacts associated with Small Civil Works

There is the possibility of the occurrence of typical works-related negative impacts associated with the small civil works (refurbishment of selected health facilities) for the Project. Each of the impacts is described in more detail below. Measures to avoid, minimize, and mitigate the negative effects, are described later in this report.

- **Increased Traffic and Potential for Traffic Conflict.** There is always the possibility of increased traffic for civil works of certain sizes especially when the works are occurring

adjacent to a main highway. The potential for vehicular/vehicular and pedestrian/vehicular conflict increases as the scale of works increases if proper traffic management procedures are not implemented. This can lead to very tempered negative response from the nearby residents or the community affected. The matter of safety also becomes a great concern in relation to the speed of the vehicles as well as the alertness of the drivers as they traverse the highways and through communities especially if there are children within the vicinity who may be accustomed to playing on the roads or sidewalk areas. The breakdown of a large project vehicle causing the blockage of a well travelled route can escalate tensions within a community especially if it contributes to loss of travel time to work, school, or returning home. This may be the case at many of the health facilities selected for refurbishment.

- **Increased Noise levels.** Increased noise and vibration levels resulting from activities such as the movement of heavy supply trucks into and out of the site, the use of various forms of heavy equipment such as demolition equipment, can have negative impacts on both the terrestrial and marine environments especially along the coast as well as in the forested areas. In secluded or forested areas, fauna habitats can be disturbed causing such creatures to flee their homes and nesting areas. Similarly, increased noise levels from activities adjacent to or within communities and residential areas, can be deemed as an unnecessary and unwanted nuisance affecting local business and day to day activities. Care must be taken in the judicious usage of any form of heavy noise and vibration equipment. Associated vibrations from the use of heavy equipment such as rollers can negatively impact surrounding communities, causing nuisances by shaking household items and possibly affecting the stability of nearby structures.
- **Poor Solid and Liquid Waste Management.** The improper management and disposal of both solid and liquid wastes can be detrimental to both the terrestrial and to the nearby marine environment. The mishandling of chemicals, detergents, greases, oils, building materials, can lead to the poisoning of the terrestrial environment. The entry into the marine environment of any waste or chemical, either through runoff, in drains, or are blown by the wind can also poison the marine environment or damage the fragile marine ecosystem. The management of human wastes on site is very critical to ensuring a healthy working environment and reduce the risk of faecal contamination. The management of food wastes is also critical to reducing the incidence of vector entry into an area causing infestation. Managing excavated soil is also important especially when there is potential for stormwater runoff into drains, rivers, and coastlines. In addition care is needed when soil is being transported to another site for use or storage. Care must be taken to ensure the appropriateness of the transport and the protocols for transporting and storing the soil, using BMPs for erosion control and safe transport.
- **Hazardous Materials.** At times hazardous materials may be discovered, especially

when older buildings are being refurbished. Such materials may include asbestos in ceiling tiles or roof panels, medical waste in storage areas or debris piles, paints or solvents in maintenance areas, or fuels such as diesel tanks or contaminated soils. Improper handling or disposal of these materials can lead to impacts to health of workers or the community, or pollution of watercourses and nearby lands.

- **Deforestation and Removal of Natural Habitat.** The practice of land clearing and especially mass and sometimes indiscriminate land clearing, excavation practices, as well as poor site drainage can lead to land slippage and eventually siltation leading to the loss of life, coastal marine pollution and destruction. This is especially so on steep slopes. In forested areas, such deforestation to accommodate the creation of new road segments can lead to loss of habitat for forest and endemic flora and fauna as well as a loss of biodiversity. Particular care must be exercised in these cases, as may occur near some health centers selected for refurbishment.
- **Air Pollution.** Air pollution can come from a number of sources. The vehicles and machinery being utilized can both produce noxious fumes such as carbon monoxide, diesel fumes, as well as burnt oil fumes. There is the increased potential for air pollution to come from older or improperly service vehicles and machinery as well. Dust also arises from cleared land that has been exposed to the sun, is dried, and the wind carries this material to nearby residences or communities. Similarly, uncovered fines such as sands or even cement can be light enough to be blown by the wind. This is a nuisance to nearby facilities or communities. The mishandling of particularly noxious chemicals such as solvents or chemical washes, greases, as well as the burning of solid wastes on the work site, especially chemical containers, can lead to air pollution resulting in negative health impacts.
- **Terrestrial and Marine Pollution.** The potential for terrestrial and marine pollution can occur with indiscriminate disposal of both solid and liquid wastes. The mishandling of chemicals and especially waste oils can poison the landscape. During rainfall events chemicals can mix with or be carried by runoff and create liquid wastes that impact both terrestrial and marine environments. Improper disposal of human wastes can lead to similar effects. This also applies to pesticides used in termite treatment of new or existing buildings. With the occurrence of civil works projects along or adjacent, or within the coastal waters, there is the possibility of impact on the marine ecosystem which must be evaluated as project details become more clear.
- **Soil Erosion and Land Slippage.** The practice of land clearing and especially mass and sometimes indiscriminate land clearing, excavation practices, as well as poor site drainage can lead to exposed soil. This, the nature of the exposed soil, in combination with the precipitation and/or poor drainage, can lead to land slippage especially on steep

slopes. This can result in loss of life and property. Eventually this material can wash down into rivers and then to the sea causing siltation and sedimentation. The resulting effect within the coastal marine environment can be pollution leading to ecosystem death and loss of livelihoods. In Saint Lucia there is a special vulnerability with regards to landslides, and other mass earth movements, due to the loose unconsolidated geologic materials which form the island, the heavy rains to which they are exposed, and the steep slopes upon which they lay. Opening of roadways, trenching for installation of water lines, grading or clearing, may all destabilize the soil surface and eventually be the cause for landslides at a later time. Accordingly, careful planning is required to ensure that soil erosion is minimized and that landslide potential is not exacerbated. Best Management Practices (BMPs) for slope stabilization should be used to develop mitigation measures as needed in case slopes must be cut.

- **Occupational Health and Safety Issues.** The International Labour Organization (ILO) defines decent work as safe and having appropriate compensation. Worker safety is critical to any operation, therefore, mishandling of equipment, the improper storage and usage of various chemicals and materials on site, poor and unsafe working conditions, high levels of continuous noise and fumes, as well as inadequate safety equipment can cause serious injury and down time to the workers and project and should therefore be avoided. Best management practices should always be implemented as labour laws hold the employer responsible for the workers safety. Proper facilities will need to be provided for workers in the interest of the workers and the environment.
- **Loss of or Damage to Physical Cultural Resources.** During any type of earth works that may occur in the course of refurbishment activities, there is the possibility of coming across or “chance finding” what may appear to be an historical or cultural artifact which may need to be studied and preserved by the relevant authorities. One example is the facades of pre-1950’s buildings in downtown Castries which are now the subject of historical preservation and reconstruction. In cases like this, the resource could be lost due to careless activities prior to the relevant authorities determining whether or not it is worthy of preservation. It is therefore recommended to consult with local stakeholders as to the final design of facility, and the disposition of any potential physical and cultural resources, because the valuation of such items is ultimately subjective and they are of most value to local stakeholders.
- **Loss of Land, Access or Livelihood.** Informal settlements often utilize or encroach upon public lands. In many cases it is necessary to remove crops when clearing or preparing crown or government lands, or relocate businesses or structures if they happen to occupy lands needed for a sub-project or activity. If the compensation is not adequate, or if the process is not transparent or done according to prevailing law and World Bank Policy OP 4.12, then justice is not served and social conflict may occur. The same is true

for temporary access to work sites, rights-of-way, or other project-related actions that can affect landowners, tenants, or persons informally occupying public lands.

4.2.2 Negative Impacts associated with Medical Waste

According to the WHO⁹, waste and by-products from the health sector cover a diverse range of materials, as the following list illustrates:

- Infectious waste: waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g. swabs, bandages and disposable medical devices);
- Pathological waste: human tissues, organs or fluids, body parts and contaminated animal carcasses;
- Sharps waste: syringes, needles, disposable scalpels and blades, etc.;
- Chemical waste: for example solvents and reagents used for laboratory preparations, disinfectants, sterilants and heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries;
- Pharmaceutical waste: expired, unused and contaminated drugs and vaccines;
- Cytotoxic waste: waste containing substances with genotoxic properties (i.e. highly hazardous substances that are, mutagenic, teratogenic or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites;
- Radioactive waste: such as products contaminated by radionuclides including radioactive diagnostic material or radiotherapeutic materials; and
- Non-hazardous or general waste: waste that does not pose any particular biological, chemical, radioactive or physical hazard.

Health-care waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Other potential hazards may include drug-resistant microorganisms which spread from health facilities into the environment. Adverse health outcomes associated with health care waste and by-products also include:

- sharps-inflicted injuries;
- toxic exposure to pharmaceutical products, in particular, antibiotics and cytotoxic drugs released into the surrounding environment, and to substances such as mercury or dioxins, during the handling or incineration of health care wastes;
- chemical burns arising in the context of disinfection, sterilization or waste treatment activities;

⁹ <http://www.who.int/mediacentre/factsheets/fs253/en/>

- air pollution arising as a result of the release of particulate matter during medical waste incineration;
- thermal injuries occurring in conjunction with open burning and the operation of medical waste incinerators; and
- radiation burns.

These concerns are applicable to the operation of the health care facilities in Saint Lucia. The Project may create an increase in use and scope of services, resulting in additional sources of medical waste needing proper treatment and disposal. This is also the case for work during emergency response or epidemics. The health and safety of health care workers could be affected by waste management practices as well as by hygiene conditions, isolation and storage procedures for bioinfectious, radiologic or genotoxic waste. Such risks may also affect the nearby communities.

5.0 MITIGATION MEASURES

Mitigation measures address the potential impacts of the projects to reduce or avoid any negative impact on the environment. As indicated in the section on impacts, there is the potential for negative impacts typically associated with small civil works, and there are potential impacts associated with management of medical waste.

The careful implementation of mitigation measures will allow for the reduction or avoidance of any adverse effects. Prevention is the key to avoid potential environmental impacts. These efforts start in the pre-design phase with the screening of possible sub-projects for consideration, and include efforts during the design, implementation, and operation phases.

5.1 Pre-Design Phase

It is understood that all the health care facilities to be refurbished will be located on lands already owned by the GoSL and in areas that are clear, fenced, safe, and unoccupied. However, it is possible that conditions have changed, that new parcels or locations might be better suited for improvements, or that needs may evolve over the course of the project. In addition, the specific details of the health care facilities where improvements and refurbishments will be done are not yet known, and will not be known until a survey is performed during the early stages of project implementation. Therefore, it will be necessary to conduct a screening process and verify that the expected works are in line with those envisioned in the ESMF, and that there are no new, unexpected, or unacceptable environmental and social risks that have not been taken into account in the ESMF.

During the pre-design phase, the PIU officer uses his/her training and experience to make a determination bases on the degree of impact likely to be caused by the project due to its size, proximity to a coastal area, marine or terrestrial reserve and the existing topography that may be disturbed. Other environmental and social risks or potential impacts should be kept in mind during the pre-design screening process, such as infringement on lands (whether legally occupied or not), presence of vulnerable persons, existence of hazardous materials or conditions, etc. In the pre-design phase the questions in the following Table should be reviewed, addressed, and recorded:

Table 1. Pre-Design (Screening) Questions for Health Facility Refurbishments

Characteristic of Sub-project or Activity:	Yes/No	Observations
1. Does the facility have good access, a functional entry, and a road that does not need major repairs or extensions?		
2. Is the work site flat, clear, and level, and not require cutting of slopes or major earth movement, except small amounts?		
3. Is the work site outside a flood zone, wetland, river or coastal flood plain, an area with high water table, or a poor drainage zone?		
4. Does the project involve hazardous materials management and disposal (e.g. asbestos, medical or infectious waste, solvents or gasoline) excepting small amounts?		
5. Could the project activities affect any natural or protected areas, Parks, natural areas, or Forest Reserves within 1 km of the Project?		
6. Could the works adversely affect cultural property, including archeological sites or historic buildings, artwork, visual aesthetics, or other physical cultural resources?		
7. Does the activity or project involve the use of pesticides, herbicides, or other agents to destroy pests or control vectors?*		
8. Will the work activities require temporary or permanent land acquisition (other than willing buyer-seller at market price), reduce other people's access to economic resources (land, water, pasture, crops) upon which they rely, require taking of crops or temporary occupation of lands, or evict squatters?		
9. Might the work activities adversely affect vulnerable people and underserved groups (e.g., elderly poor pensioners, physically challenged, women, particularly head of households or widows, etc.) living in the area?		

* Note that activities or projects involving the purchase or use of significant amounts of pesticides are not eligible (however, incidental amounts by licensed and registered professional contractors are acceptable).

As previously stated, it is expected that the sites to be refurbished will pass the screening criteria with no problem, and will be found suitable for improvements and any small civil works required. In such cases the standard mitigation measures would be all that is needed to minimize any risk of negative environmental and social impact. The generic Environmental and Social Management Plan (ESMP) in chapter 6 of this ESMF would apply in these cases.

On the other hand, if any of the screening questions identify situations where less than optimum conditions occur (i.e. negative responses to questions 1, 2, 3, 7 and 8, or positive responses to questions 4, 5 and 6), then the site may not be suitable for refurbishment. In such cases it would

be necessary to reject improvements and refurbishments if doing so would provoke negative environmental impacts that could not be avoided or mitigated. In particular, if the project works meet the provisions of WBG Policies as regards alteration of natural habitat, change of use in forested land, damage or destruction of physical cultural resources, significant pest management issues, or involuntary resettlement, then the activity must be rejected and excluded because it would cause the triggering of the policy in question.

Alternatively, if works at the site are deemed critical to success of the Project, then the site should be considered “complex or sensitive” and in need of additional assessment, such as an Environmental Impact Assessment (EIA). In such cases the WBG would be notified and requested to provide a no-objection to the particular works in question, based on a review of the safeguards applicable. The additional mitigation measures resulting from the EIA studies would then be added to the generic ESMP to create a more comprehensive, customized ESMP for that particular works. However, in no case should a project be proposed or allowed if it would cause the triggering of the aforementioned WBG policies. This exclusion would apply to works or actions that would trigger the policies and thereby render them ineligible.

5.2 Design Phase

It is expected that the projects would receive adequate technical review by qualified technical professionals to ensure their technical and environmental soundness. Engineering review for all plan details and designs would be integral in this process.

The design should include adequate wastewater treatment and disposal systems, such as package treatment plants and chlorination, where appropriate for the size, capacity, and services offered at the particular health facilities. The design should also include adequate facilities for management of solid waste and medical waste, where appropriate for the size, capacity, and services offered at the particular health facilities.

If local permits are required from the Physical Planning Department or other agencies, then these should be processed according to Saint Lucia regulations. Development projects including commercial buildings, industrial building, roads, drains, retaining walls, may be required to submit their plans to the PPU/PPDB for approval before works can commence. Any conditions or stipulations resulting from such permits must also be added to the ESMP for the works and becomes an additional compliance requirement.

Land acquisition is not anticipated because the health care facility refurbishments will typically occupy the same physical footprint; in addition, the facilities are already located on government (Crown) property. However, adjustments to plans, titling issues, temporary access during rehabilitation or renovation, or other needs may occur that require parcels to be occupied

temporarily, purchased, or accessed. In such cases it is necessary to avoid triggering the Involuntary Resettlement Policy (OP/BP 4.12) by the removal of persons or their assets such as crops or structures, or by requiring access or occupation without recourse or recompense. Therefore, any works or activities to be financed as part of this project or at a later stage will be on government lands, unoccupied and unencumbered by informal settlers or their assets. Privately owned land or land purchased through willing-seller and willing-buyer is acceptable, provided that the land acquisition must occur by mutual agreement in exchange for a notarized purchase contract based on the market price at the date of acquisition. Any temporary access agreements should be equitable, voluntary, and documented in writing.

5.3 Implementation Phase

A number of general impacts typical of small civil works have been identified in Section 4.2.1 of this ESMF. Appendix 1 provides the standard mitigation measures in the form of contract clauses so they can be incorporated into the requirements for the contractor who will undertake the civil works. Additional mitigation measures would be derived from any conditions imposed by any statutory agency who reviewed the sub-projects and provided recommendations or conditionalities. These should also be converted to contract clauses as necessary.

Community engagement during the implementation of works is required in order to minimize social risk and ensure orderly and transparent execution of project activities. Communities also serve an important monitoring function and provide valuable feedback on contractor performance, design, and operation. The MOHW will be required to provide information to communities on a regular basis throughout the works.

Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

In addition, MOHW will develop a Grievance Redress Mechanism to register, track, address and resolve any complaints or related issues associated with the project. All complaints or related issues can be sent to the designated email account for the project and by telephone, as posted on the work site, to the attention of the Project Coordinator. Reported issues should include a name, date and contact information with a detail description of the case. All reported cases will be logged by the PIU and directed to the Project Coordinator's attention who will be responsible to assign or escalate the case to the appropriate personnel. There will be a normal response time of 7 days for each case, however high level cases may require up to 14 or more days for a response. The Project Coordinator for high level cases will direct the matter to the attention of the Director to which the PIU will report and further to the WBG representatives where necessary. The PIU will maintain a Data Base to log all complaints and to track each from date received to date resolved and highlight how each case was resolved.

5.4 Operations Phase

The chief environmental risk during the operation of the health facilities relates to the management of medical waste. During operation of the health care facilities, including times of emergency response or epidemics, medical waste will require proper treatment and disposal, as there may be potential negative effects on health care workers and to the public. To minimize these risks, the project will support the development of the national health care waste management plan.

At the present time, there is no formalized plan for health care waste management in Saint Lucia, but practices are in place. Specialised 240-liter containers are provided by SWMA to biomedical waste generators including the major hospitals, polyclinics, and health centres.¹⁰ Biomedical waste containers are collected from generators once weekly, in a specialised vehicle (with the capacity to hold 20 containers) operated by a private contractor with two specialized vehicles which are stainless steel lined and sealed, with equipment to properly secure bins. About 20 bins per week of medical waste are collected from hospitals, health centres and other biomedical waste generators around the island. This service is provided at no charge to government institutions, while private facilities pay. The waste is transported to an autoclave facility located at Deglos, where biomedical waste is stored in a 70-L refrigerated storage container and treated twice weekly with an autoclave. Since it entered into operation several years ago, the autoclave has failed once due to a faulty valve, and this was repaired within a week. In the event of autoclave failure, the refrigerated storage facility at the same site has more than 3 weeks storage capacity at current generation rates. In the event of prolonged system failure, the SWMA could revert to deep burial of biomedical waste at the 2 waste disposal sites (Vieux Fort and Deglos) in Saint Lucia.

¹⁰ Environmental Impact Statement for Construction of a New Polyclinic at Bois Jolie, Dennery, Saint Lucia. Consultants Report by Alison King-Joseph et al., December 2011.

Currently, health care workers in Saint Lucia are required to follow guidelines for occupational safety and for best practice in medical waste management. Waste generators are required to properly segregate their waste, so that unnecessary treatment is avoided. Continuous training is required as staff become complacent and supervision is often inadequate.

To improve the management of medical waste and minimize risk to health care workers and the public, during project implementation the national health care waste management plan will be further developed and formalized in the form of a Health Care Waste Management System (HWMS). The Terms of Reference in Appendix 2 of this ESMF lay out the scope, activities and deliverables for development of the HWMS, which will be consistent with WBG Environmental Health and Safety Guidelines for Health Care Facilities.¹¹ The HWMS will be adequate to the scale and type of activities and identified hazards for Saint Lucia, and will be implemented and operated by MOHW.

¹¹ http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

6.0 INSTITUTIONAL ARRANGEMENTS

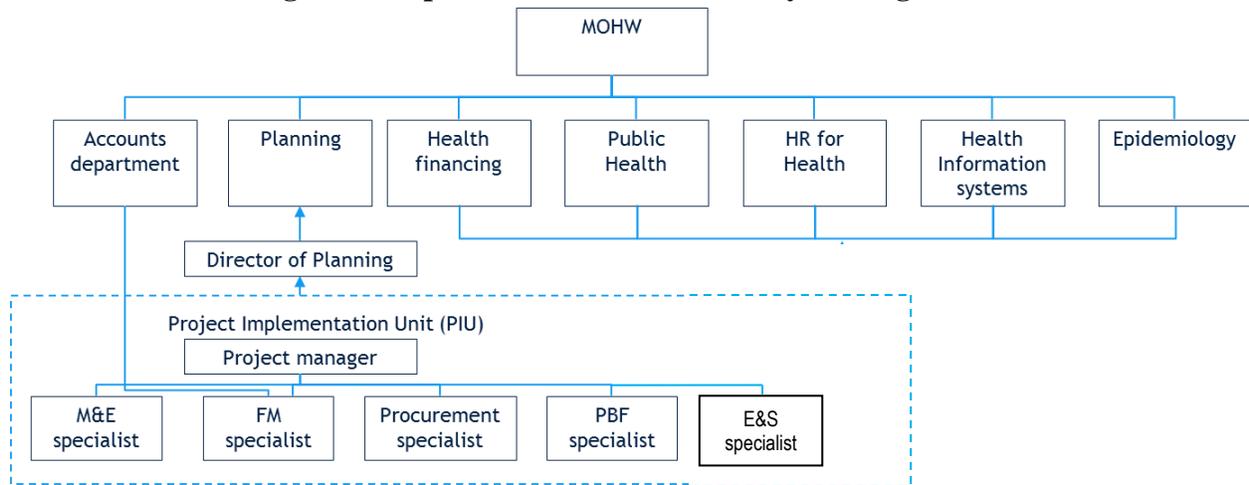
This section of the report describes the link between the predicted environmental impacts, the needed mitigation measures identified during the screening and assessment process, provisions for budgeting the costs of such measures, and the roles of those responsible for ensuring that the mitigation measures are carried out.

6.1 Project Implementation Unit (PIU)

The Saint Lucia MOHW will have the overall responsibility for project implementation. The Project Implementation Unit (PIU) will be physically located within the MOHW. A Project Manager will lead the day-to-day implementation of the project and will report to the MOHW Permanent Secretary through the Chief Health Planner on project interventions in MOHW priority and strategic areas, on the coordination of efforts with other partners, and for technical coordination of activities financed under the project. The PIU team will include the following roles: a Monitoring and Evaluation Specialist, a project Financial Management Specialist, a Procurement Specialist, and a PBF Project Coordinator, who all report to the Project Manager, who in turn reports to the MOHW-Chief Health Planner. Furthermore, the PIU team will be supported by technical staff of the MOHW for specific areas of the project, such as health financing, public health, human resources for health, health information systems, epidemiology, among others. Figure 3 below provides a visual overview of the MOHW structure that will support and implement the project.

The institutional arrangements for this specific project differ from the institutional arrangements followed by other World Bank-financed projects in Saint Lucia. This is due to this project's highly technical nature which requires a closely coordinated process across technical and fiduciary requirements. In addition, the current national-level Project Coordination Unit (PCU) is already stretched thin from the demanding project management and fiduciary needs of the disaster risk project together with the other existing projects in the portfolio. While the recruitment of these fiduciary positions will be ongoing in the context of project preparation, the proposed PPF may seek to utilize the support of the existing PCU, which is currently supporting other Bank operations. Interim arrangements under consideration include the temporary assistance provided by fiduciary staff of the current national-level PCU. Adequately staffing the new PIU will be a condition of effectiveness of the project.

Figure 3. Implementation and Fiduciary Arrangements



6.2 Environmental Performance Clauses for Works Contracts

Standard environmental related clauses were developed and are to be appended to or incorporated into the contracts as necessary depending on the type of works to be conducted or the findings of the checklist by the appraising project officer. These form part of the environmental management plan and the mitigation measure presented there. These clauses are general and may be modified to conform to applicable laws and contract procedures of Saint Lucia and shall remain in force throughout the contract period.

Generic contract clauses are provided in Appendix 1 for the following general conditions for small civil works, roads, buildings, and other works expected to have minor impacts:

- Permits and Approvals
- Site Security
- Discovery of Antiquities
- Worker Occupational Health and Safety
- Noise Control
- Use and Management of Hazardous Materials, fuels, solvents and petroleum products
- Use and Management of Pesticides
- Use of Preservatives and Paint Substances
- Site Stabilization and Erosion Control
- Traffic Management
- Management of Standing Water
- Management of Solid Wastes - trash and debris
- Management of Liquid Wastes

Additional clauses for the following special conditions are also within Appendix 1:

- Management of Medical Wastes
- Management of Asbestos

It is expected that these generic clauses will be incorporated into all contracts, as applicable. In addition, specific project-related recommendations may also be forthcoming from statutory bodies that are part of the permitting agencies such as the PPDB and that these can be reformatted in to contract clauses as well. Finally, if an EIA has been conducted for a particular sub-project due to its environmentally sensitive or complex nature (see section 5.1), then the specific recommendations for mitigation measures in that EIA should also be included as contract clauses.

For purposes of cost estimation and budgeting, the contractors should be aware of the existence of the environmental mitigation measures and associated ESMP requirements, and include cost items for such purposes in their proposals.

6.3 Supervision, Monitoring, and Reporting

A unified and integrated approach must be adopted in reviewing the ESMP, monitoring the projects from pre to post positions, and responding to any issue that may arise. The purpose of the ESMP and its conditions reflected in the works contracts are to ensure accepted good practices are employed and maintained in order to mitigate any adverse environmental impacts.

The person or entity responsible for on-ground implementation and abiding by the contract clauses, recommendations, and mitigation measures will be the contractor. The contractor will be required to provide reports to the PIU on at least a monthly basis, that include adherence to the contract clauses.

For complex or larger projects, or for bulk procurements where several projects may be undertaken as a group, a separate supervision consultant may be engaged. In this case the supervision consultant will collect the contractor's reports, verify performance in the field, and report to the PIU on a monthly basis.

The overall agency with the responsibility to supervise and monitor the various works, activities, and sub-projects is the PIU. The PIU will designate a field representative who shall conduct periodic inspections to assure environmental compliance and adherence to the ESMF. In addition to WBG requirements, the PIU will also be responsible for ensuring the proper application of any national or local environmental requirements.

Reporting to WBG on the ESMF will be included in quarterly reports under a separate section on Safeguards.

6.4 Health Care Waste Management System (HWMS)

The PIU will be responsible for implementing the HWMS. The Quality Control Officer at DOHW may incorporate the HWMS into an ISO-consistent scheme and integrate the management of medical waste into DOHW administrative processes.

Appendix 1. Contract Clauses for small Civil Works

The following are standard environmental and social related clauses that should be appended to or incorporated into the contracts for the small civil works. These mitigation measures are the core of a generic, standardized ESMP (Environmental and Social Management Plan) for these types of small works and the typical associated minor impacts which can be routinely addressed with Best Management Practice (BMPs). These clauses are general and may be modified to conform to applicable Saint Lucian laws, regulations and contract procedures for such works. These are the mitigation measures which are expected of all professional contractors who are performing civil works, and represent the minimum standard of execution for environmental protection during the execution of such works. (Additional, specific requirements or recommendations may also be forthcoming from statutory permitting agencies such as the PPDB or the Ministry of Health, and these can be included as contract clauses as well; and, if an EIA has been conducted for a particular sub-project due to its environmentally sensitive or complex nature, then the specific recommendations for mitigation measures in that EIA should also be included as contractual requirements.)

1. Permits and Approvals

The contractor shall be responsible for ensuring that he or she has all relevant legal approvals and permits required to commence works.

2. Site Security

The contractor shall be responsible for maintaining security over the work site including the protection of stored materials and equipment. In the event of severe weather, the contractor shall secure the work site and associated equipment in such a manner as to protect the site and adjacent areas from consequential damages. This includes the management of stored materials, sanitary wastes, additional strengthening of erosion control and soil stabilization systems and other conditions resulting from contractor activities which may increase the potential for damages.

3. Discovery of Antiquities

If, during the execution of the activities contained in this contract, any material is discovered onsite which may be considered of historical or cultural interest, such as evidence of prior settlements, native or historical activities, evidence of any existence on a site which may be of cultural significance, all work shall stop and the supervising contracting officer shall be notified immediately. The area in which the material was discovered shall be secured, cordoned off, marked, and the evidence preserved for examination by the local archaeological or cultural

authority (Saint Lucia National Trust). No item believed to be an artifact must be removed or disturbed by any of the workers. Work may resume, without penalty of prejudice to the contractor upon permission from the contracting officer with any restrictions offered to protect the site.

4. Worker Occupational Health and Safety

The contractor shall ensure that all workers operate within a safe environment. Sanitation facilities shall be provided for all site workers. All sanitary wastes generated as a result of project activities shall be managed in a manner approved by the contracting officer and the local authority responsible for public health. The contractor shall ensure that there are basic medical facilities on site and that there are staff trained in basic first aid. Workers must be provided with the necessary protective gear as per their specific tasks such as hard hats, overalls, gloves, goggles, boots, etc. The contractor shall provide the contracting officer with an occupational health and safety plan for approval by the local health authority prior to the commencement of site activities.

The contractor must ensure that all workers operate within a safe environment. All relevant Labour and Occupational Health and Safety regulations must be adhered to ensure worker safety. Sanitary facilities must be provided for all workers on site. Appropriate posting of information within the site must be done to inform workers of key rules and regulations to follow.

5. Noise Control

The contractor shall control noise emissions generated as a result of contracting activities to the extent possible. In the case of site locations where noise disturbance will be a concern, the contractor shall ensure that the equipment is in good working order with manufacturer supplied noise suppression (mufflers etc.) systems functioning and in good repair. Where noise management is a concern, the contractor shall make reasonable efforts to schedule activities during normal working hours (between 8 am and 5 pm). Where noise is likely to pose a risk to the surrounding community either by normal works or working outside of normal working hours or on weekends, the contractor shall inform the contracting officer and shall develop a public notification and noise management plan for approval by the contracting officer.

Specific elements of the noise control activities by the contractor shall include: work activities will occur within specified daylight hours e.g. 8:00 am to 4:00pm; community / public to be informed in advance of any work activities to occur outside of normal working hours or on weekends; sites should be hoarded wherever possible; during operations, the engine covers of generators, air compressors and other powered mechanical equipment shall be closed, and equipment placed as far away from residential areas as possible; there will be no excessive idling

of vehicles at sites; noise suppression equipment or systems supplied by manufacture will be utilized; ensure all vehicles and equipment are properly serviced; the contractor must develop and implement a public notification and noise management plan.

6. Use and Management of Hazardous Materials, fuels, solvents and petroleum products

The use of any hazardous materials including pesticides, oils, fuels and petroleum products shall conform to the proper use recommendations of the product. Waste hazardous materials and their containers shall be disposed of in a manner approved by the contracting officer. A site management plan will be developed by the contractor if the operation involves the use of these materials to include estimated quantities to be consumed in the process, storage plans, spill control plans, and waste disposal practices to be followed. This plan and the manner of management are subject to the approval of local authority responsible for safety, and waste management, and the contracting officer.

Elements of the hazardous materials management shall include: contractor must provide temporary storage on site of all hazardous or toxic substances in safe containers labeled with details of composition, properties and handling information; the containers of hazardous substances shall be placed in an leak-proof container to prevent spillage and leaching; the wastes shall be transported by specially licensed carriers and disposed in a licensed facility; paints with toxic ingredients or solvents or lead-based paints will not be used; banned chemicals will not be used on any project.

7. Use and Management of Pesticides

The project will not fund activities that involve the purchase or use of significant quantities of pesticides. For incidental, minor use of pesticides, the use of pesticides shall be approved by the contracting officer and shall conform to the manufacturers' recommendations for use and application. Any person using pesticides shall demonstrate that they have read and understood these requirements and are capable of complying with the usage recommendations to the satisfaction of the contracting officer. All pesticides to be used shall conform to the list of acceptable pesticides that are not banned by the relevant local authority.

If termite treatment is to be utilized, ensure appropriate chemical management measures are implemented to prevent contamination of surrounding areas, and use only licensed and registered pest control professionals with training and knowledge of proper application methods and techniques.

8. Use of Preservatives and Paint Substances

All paints and preservatives shall only be used with the approval of the contracting officer. Information shall be provided to the contracting officer who describes the essential components of the materials to be used so that an informed determination can be made as to the potential for environmental effects and suitability can be made. Storage, use, and disposal of excess paints and preservatives shall be managed in conformance with the manufacturers' recommendations and as approved by the contracting officer. The contractor shall provide the contracting officer with a list of materials and estimated quantities to be used, storage, spill control and waste disposal plans to be observed during the execution of the contract. This plan is subject to the approval of the contracting officer.

9. Site Stabilization and Erosion Control

The Contractor shall implement measures at the site of operations to manage soil erosion through minimization of excavated area and time of exposure of excavated areas, preservation of existing ground cover to the extent possible, provision of approved ground cover. Where excavations are made, contractor shall implement appropriate stabilizing techniques to prevent cave-in or landslide. Measures shall be approved by the contracting officer.

The contractor must ensure that appropriate erosion control measures such as silt fences are installed. Proper site drainage must be implemented. Any drain clogged by material or sediment must be unclogged as soon as possible to prevent overflow and flooding. The use of retaining structures and planting with deep rooted grasses to retain soil during and after works must be considered. The use of bio-engineering methods must be considered as a measure to reduce erosion and land slippage. Keep angle of slopes within limits of soil type. Balance cut and fill to limit steepness of slopes. All slopes and excavated areas must be monitored for movement.

All materials, including chemicals, must be properly stored. The contractor will establish appropriate erosion and sediment control measures such as hay bales, sedimentation basins, and / or silt fences and traps to prevent sediment from moving off site and causing excessive turbidity in nearby streams, rivers, wetlands, and coastal waters.

An erosion management plan will be required where the potential exists for significant sediment quantities to accumulate in wetlands, lakes, rivers and nearshore marine systems. This plan shall include a description of the potential threat, mitigation measures to be applied, and consideration for the effects of severe weather and an emergency response plan.

If works are along coastal marine areas or near major streams and river, water quality monitoring must be done before works begin, and at regular intervals to determine turbidity levels and other quality parameters. Vehicles and machinery will be washed only in designated areas where runoff will not pollute natural surface water bodies.

10. Air Quality

The following conditions apply to work sites for the control of air quality including dust control:

- Materials such as sand, cement, or other fines should be kept properly covered.
- Cement should be kept stored within a shed or container.
- The sand and fines can be moistened with sprays of water.
- Unpaved, dusty roads should be compacted and then wet periodically.
- During interior demolition debris-chutes shall be used above the first floor.
- Demolition debris shall be kept in controlled area and sprayed with water mist to reduce debris dust.
- During pneumatic drilling/wall destruction dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site
- The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust.
- There will be no open burning of debris / waste material at the site.
- There will be no excessive idling of vehicles at work sites.
- The bins of all haulage vehicles transporting aggregate or building materials must be covered on all public roads.

11. Traffic Management

In the event that refurbishment activities should result in the disruption of area transportation services, including temporary loss of roadways, blockages due to deliveries and site related activities, the contractor shall provide the contracting officer with a traffic management plan including a description of the anticipated service disruptions, community information plan, and traffic control strategy to be implemented so as to minimize the impact to the surrounding community. This plan shall consider time of day for planned disruptions, and shall include consideration for alternative access routes, access to essential services such as medical, disaster evacuation, and other critical services. The plan shall be approved by relevant local authority and the contracting officer.

Elements of the traffic management plan to be developed and implemented by contractor shall include: alternative routes to be identified in the instance of extended road works or road blockages; the public to be notified of all disturbance to their normal routes; signposting,

warning signs, barriers and traffic diversions must be clearly visible and the public warned of all potential hazards; provision must be made for the safe passages and crossings for all pedestrians where work-related traffic interferes with their normal route; there must be active traffic management by trained and visible staff at the site or along roadways as required to ensure safe and convenient passage for the vehicular and pedestrian public; Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement .

12. Management of Standing Water

Under no circumstances shall the contractor permit the collection of standing water as a consequence of contractor activities without the approval of the contracting officer and consultation with the relevant local environmental health authority. Recommendations from that local authority on how to manage and treat the standing water must be implemented. The condition of the standing water must be monitored by the contractor to ensure that it does not present itself as a breeding ground for any pests such as mosquitoes.

13. Management of Solid Wastes -trash and debris

The contractor shall provide the contracting officer with a solid waste management plan as part of a site waste management plan that conforms to the solid waste management policies and regulations of the relevant Saint Lucia authority. Under no circumstances shall the contractor allow wastes to accumulate so as to cause a nuisance or health risk due to the propagation of pests and disease vectors. The site waste management plan shall include a description of how wastes will be stored, collected and disposed of in accordance with current law. Additionally the contractor shall provide for the regular removal and disposal of all site wastes and provide the contracting officer with a schedule for such removal.

14. Management of Liquid Wastes

The contractor shall provide the contracting officer with a liquid waste management plan as part of a site waste management plan that conforms to the waste management policies and regulations of the relevant Saint Lucia authority. Under no circumstances shall the contractor allow liquid wastes to accumulate on or off the site, or to flow over or from the site in an uncontrolled manner or to cause a nuisance or health risk due to its content. The site waste management plan shall include a description of how these wastes will be stored, collected and disposed of in accordance with current law. Additionally the contractor shall provide for the regular removal and disposal of all site wastes and provide the contracting officer with a schedule for such removal.

Specific elements of the contractor's liquid waste management plan shall include: contractor to abide by all pertinent waste management and public health laws; waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and refurbishment activities; debris and demolition wastes will be stored in appropriate bins; liquid and chemical wastes will be stored in appropriate containers separated from the general refuse; all waste will be collected and disposed of properly in approved landfills by licensed collectors; the records of waste disposal will be maintained as proof for proper management as designed; whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos); liquid wastes must not be allowed to accumulate on or off the site, or to flow over or from the site in an uncontrolled manner or to cause a nuisance or health risk due to its contents.

15. Special Condition - Management of Medical Wastes during refurbishment works

In the event that the contractor discovers medical wastes, the contractor shall provide the contracting officer with a medical waste management plan as part of a site waste management plan that conforms to the waste management policies and regulations of the relevant Saint Lucia authorities. The plan shall include a description of how these wastes will be stored, collected and disposed of in accordance with current law. The contractor must ensure that all persons handling medical wastes are provided with proper protective clothing. All medical wastes must be secured in specially labelled and sealed containers, and disposed of according to relevant local legislation at specified disposal sites. Medical wastes must be kept separate from the other waste streams on site.

The waste management plan provided by the contractor must ensure that all persons handling medical wastes are provided with proper protective clothing. All medical wastes must be treated as hazardous. All medical wastes must be secured in specially labeled and sealed containers separate from other wastes streams. All medical wastes must be disposed of according to relevant local legislation at specified disposal sites.

16. Special Condition - Management of Asbestos during refurbishment works

In the event that during the course of work activities the contractor discovers asbestos as part of the existing site that requires stabilization and removal, the contractor shall contact the relevant local authorities and the contracting officer immediately. If work has already commenced, all work in the area must stop immediately. An asbestos management plan must be prepared by the contractor and approved by the relevant local health and waste management authorities and the contracting officer describing how this material will be stored, collected and disposed of in accordance with current law, and identifying the approved experienced professional who will undertake this work. The plan must include:

- Description of the issue and extent of contamination
- Site safety measures
- Stabilization techniques to be employed
- Storage and transport plan
- Approved disposal procedure
- Worker awareness and training

In preparing the plan, the contractor should liaise with the relevant local health and waste management agencies to ensure that the adequacy of the measurements being proposed.

Site management shall consist of enclosing relevant sections of the site with appropriate material by the contractor. Where possible the asbestos and its location must be appropriately contained and sealed to minimize exposure, and any asbestos shall be marked clearly as a hazardous material. Stabilizing friable asbestos will be done prior to removal (if removal is necessary) and it will be treated with a wetting agent to minimize asbestos dust. Asbestos will be handled and disposed by skilled & experienced professionals using appropriate PPE (personal protective equipment) such as respirators and tyvec suites which will be provisioned to workers to protect them and prevent contamination with asbestos fibres. Respiratory protection together with measures to prevent the contamination of clothing and inadvertent transport of asbestos fiber off-site shall be provided to all exposed workers. If asbestos material is to be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately. Security measures must be implemented against unauthorized removal of asbestos from the site. No removed asbestos will be reused.

Appendix 2. TOR for Consulting Services to develop a Health Care Waste Management System (HWMS)

1. Program Background

The Government of Saint Lucia (GoSL) with the assistance of the WBG is developing the Health System Strengthening Project to further assist with the reform activities currently underway within the health sector through its Ministry of Health and Wellness (MOHW). The development objective is to improve the accessibility, efficiency, and responsiveness of health service delivery.

The project will include improvements and refurbishments of up to 33 selected primary health facilities including equipment inventory, procedures provided, and infrastructure, based on a survey to be conducted during implementation. Under the project, the national health care waste management plans will be updated for activities that include the minor refurbishments and the proper disposal of medical equipment. The development of the HWMS will also include capacity-building for health care workers through occupational health and safety training, including exposure to diseases, medical waste and the use of certain equipment with radiation. Accordingly, the Project Implementation Unit (PIU) under the MOHW is requesting the services of a qualified consultant (individual or firm) to research and develop a Health Care Waste Management System (HWMS).

2. Technical Background

According to the WHO¹², waste and by-products from the health sector cover a diverse range of materials, as the following list illustrates:

- Infectious waste: waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g. swabs, bandages and disposable medical devices);
- Pathological waste: human tissues, organs or fluids, body parts and contaminated animal carcasses;
- Sharps waste: syringes, needles, disposable scalpels and blades, etc.;
- Chemical waste: for example solvents and reagents used for laboratory preparations, disinfectants, sterilants and heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries;
- Pharmaceutical waste: expired, unused and contaminated drugs and vaccines;
- Cytotoxic waste: waste containing substances with genotoxic properties (i.e. highly hazardous substances that are, mutagenic, teratogenic or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites;
- Radioactive waste: such as products contaminated by radionuclides including radioactive diagnostic material or radiotherapeutic materials; and

¹² <http://www.who.int/mediacentre/factsheets/fs253/en/>

- Non-hazardous or general waste: waste that does not pose any particular biological, chemical, radioactive or physical hazard.

Health-care waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Other potential hazards may include drug-resistant microorganisms which spread from health facilities into the environment. Adverse health outcomes associated with health care waste and by-products also include:

- sharps-inflicted injuries;
- toxic exposure to pharmaceutical products, in particular, antibiotics and cytotoxic drugs released into the surrounding environment, and to substances such as mercury or dioxins, during the handling or incineration of health care wastes;
- chemical burns arising in the context of disinfection, sterilization or waste treatment activities;
- air pollution arising as a result of the release of particulate matter during medical waste incineration;
- thermal injuries occurring in conjunction with open burning and the operation of medical waste incinerators; and
- radiation burns.

These concerns are applicable to the operation of the health care facilities in Saint Lucia. The Project may create an increase in use and scope of services, resulting in additional sources of medical waste needing proper treatment and disposal. This is also the case for work during emergency response or epidemics. The health and safety of health care workers could be affected by waste management practices as well as by hygiene conditions, isolation and storage procedures for bioinfectious, radiologic or genotoxic waste. Such risks may also affect the nearby communities.

At the present time, there is no formalized plan for health care waste management in Saint Lucia, but practices are in place. Specialised 240-liter containers are provided by SWMA to biomedical waste generators including the major hospitals, polyclinics, and health centers.¹³ Biomedical waste containers are collected from generators once weekly, in a specialised vehicle (with the capacity to hold 20 containers) operated by a private contractor with two specialized vehicles which are stainless steel lined and sealed, with equipment to properly secure bins. About 20 bins per week of medical waste are collected from hospitals, health centres and other biomedical waste generators around the island. This service is provided at no charge to government institutions, while private facilities pay. The waste is transported to an autoclave facility located at Deglos, where biomedical waste is stored in a 70-L refrigerated storage container and treated twice weekly with an autoclave. Since it entered into operation several years ago, the autoclave has failed once due to a faulty valve, and this was repaired within a week. In the event of autoclave failure, the refrigerated storage facility at the same site has more than 3 weeks storage capacity at current generation rates. In the event of prolonged system failure, the SWMA could

¹³ Environmental Impact Statement for Construction of a New Polyclinic at Bois Jolie, Dennery, Saint Lucia. Consultants Report by Alison King-Joseph et al., December 2011.

revert to deep burial of biomedical waste at the 2 waste disposal sites (Vieux Fort and Deglos) in Saint Lucia.

Currently, health care workers in Saint Lucia are required to follow guidelines for occupational safety and for best practice in medical waste management. Waste generators are required to properly segregate their waste, so that unnecessary treatment is avoided. It is reported that continuous training is required as staff become complacent and supervision is often inadequate.

3. Objective of the Consultancy

To improve the management of medical waste and minimize risk to health care workers and the public, during project implementation the national health care waste management plan will be further developed and formalized in the form of a Health Care Waste Management System (HWMS). These Terms of Reference lay out the scope, activities and deliverables for development of the HWMS, which will be consistent with WBG Environmental Health and Safety Guidelines for Health Care Facilities.¹⁴ The HWMS will be adequate to the scale and type of activities and identified hazards for Saint Lucia, and will be implemented and operated by MOHW.

4. Scope of Work

The scope of work includes conducting a preliminary evaluation and verification of current health care waste management, identifying infrastructure and capacity needs, developing written protocols and procedures for health care waste management, and providing training and outreach.

Task 1 – Evaluate current health care waste management

The first task is to establish baseline information on the current status of health care waste management in Saint Lucia. Data on the number and type of generators, volumes and types of wastes for various facilities, number and registration of transporters, status of landfill operations, functioning of bioclave, etc. will be generated by the consultant based on interviews and field visits. Any emissions to air, water or soil must be considered, as well as compliance with national law and best practice.

With regards to health care worker protection and community health and safety, the Consultant will assess current practice for occupational health and safety, including training, use of protective equipment, isolation and segregation of wastes, and other factors that could affect exposure to infections or diseases, exposure to wastes or hazardous materials, radiation, and fire safety.

Task 2 – Identify infrastructure and capacity needs

¹⁴ http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

The Consultant will review the inventory to be prepared by the MOHW of the capacity, condition, and needs of the primary health care facilities in Saint Lucia. Combining this with the Task 1 results, the Consultant will evaluate the adequacy of the existing physical infrastructure available in primary health care facilities and associated facilities in terms of location and size of areas where wastes are stored, temperature and condition of wastes, segregation and isolation of wastes. In addition evaluate liquid waste disposal practices such as type of disposal system (septic tank, leach field, cesspool, sewer system, package treatment plant), types of wastes expected, whether chlorination is needed, and level of treatment. The consultant will also evaluate level of training and capacity of health care workers, landfill workers, and waste transporters. Based on the evaluation, the consultant will provide recommendations for physical and capacity improvements.

Task 3 – Develop Protocols and Procedures

The consultant will prepare a formal set of protocols and procedures that will constitute the HWMS to be implemented by the MOHW. The HWMS will integrate the following:

- WBG EHS Guidelines for Health Care Facilities³
- The 2008 Waste Management (Biomedical Waste, Transportation, Treatment and Disposal) Regulations¹⁵
- WHO guidelines for management of solid health care waste at Primary Health Care Facilities¹⁶

The HWMS procedures must address waste minimization, reuse and recycling; waste segregation; on-site handling, collection, transport and storage; transport to external facilities; and, treatment and disposal. The HWMS shall be prepared in collaboration with MOHW and subject to their review and approval.

The roles, responsibilities and duties of MOHW and health care facility operators will be included, and an assessment made of capacity gaps to implement the program, with corresponding recommendations for training and capacity building.

Task 4. Provide training and outreach

The Consultant will prepare a presentation on the results of Tasks 1-3 and deliver it to MOHW as part of a one-day workshop/seminar, which will include training and instruction on the HWMS. All training materials will be provided to MOHW for subsequent delivery to each of the 33 primary health care facilities in the country.

5. Reporting Requirements and Deliverables

The consultant will report to the MOHW designated contact person. Shortly after the Consultant has mobilized his/her resources and after having met the staff of the MOHW and visited key

¹⁵ <http://sluswma.org/wp-content/uploads/2013/09/biomedical%20waste%20legislation.pdf>

¹⁶ http://www.who.int/water_sanitation_health/publications/manhccwm.pdf

project sites, the consultant will present a brief inception report and work plan to ensure that both parties (the Consultant and MOHW) are in agreement that the assignment will be carried out as planned and as stipulated in the contract. The inception report will incorporate a work plan for the development of the different activities and deliverables.

Each of Tasks 1-4 will also have a specific deliverable, as follows:

- Task 1 Report - Findings of the assessment of current practice
- Task 2 Report – Recommendations for infrastructure and capacity
- Task 3 Report – HWMS
- Task 4 – Presentations and Training Materials

Each of the deliverables shall be provided in Draft form, to which MOHW will revert comments within 2 weeks. The Final versions of each deliverable will then be provided taking into account and addressing the comments provided.

6. Logistics and Timing

The assignment is anticipated to last for a period of 14 weeks, or three to four months, as per the following tentative schedule:

Task	Duration (weeks)
Inception Report	2
1	4
2	2
3	4
4	2

The Consultant shall ensure that he/she is adequately supported and equipped in terms of personal technical equipment (transportation, laptop, software and field tools),

The MOHW will arrange and coordinate access, arrange requested interviews, provide reports and respond promptly to data requests to facilitate the assignment. The MOHW will provide comments to Draft deliverables within two weeks of receipt.

7. Qualifications

The Consultant or Firm must have at least 5 years of experience in the field of environmental assessment, environmental management, or environmental supervision, with direct and relevant project experience in medical waste planning and/or management. Experience in Saint Lucia, and in the Caribbean, is a benefit. Facility in the English language is required.

Appendix 3. Public Disclosure & Consultation

This draft ESMF has been disclosed on the MOHW website along with an invitation to provide input and feedback via the email address or telephone numbers provided. In addition, emails and links to the draft document were provided to key stakeholders to solicit input.

The ESMF will be updated in June 2018 to include the comments from the public consultation, and the final version will be posted on the websites of the MOHW and WBG.