THE WORLD BANK

SOLOMON ISLANDS GOVERNMENT

MINISTRY OF HEALTH AND MEDICAL SERVICES

COVID-19 EMERGERNCY RESPONSE PROJECT

Environmental and Social Impact Assessment

KILUFI HOSPITAL INCINERATOR

Project Management Unit (MHMS)

July 2024

Document Control

Date	Version	Description	Name
22/03/2024	1	Draft	John P. Labere – ESHS&CE Officer
02/04/2024	2	Draft review	Greg Andrews E&S Consultant
13/05/2024	3	Revisions	John P. Labere – ESHS&CE Officer
16/05/2024	4	Revisions	Greg Andrews E&S Consultant
18/05/2024	5	Revisions from WB review	Greg Andrews E&S Consultant

Contents

Abbreviations

CAUSE	Community Access to Urban Services Enhancement project
CoESP	Code of Environmental and Social Practice
COVID-19	Coronavirus disease
ECD	Environment Conservation Division
EIS	Environmental Impact Statement
ERP	Emergency Response Project
E&S	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health and Safety
ESHS&CE	Environmental, Social and Health and Safety and Community Engagement
ESIA	Environmental and Social Impact Assessment
ESIRT	Environmental and Social Incident Response Toolkit
ESS	Environmental and Social Standards
GBV	Gender Based Violence
HGH	Helena Goldie Hospital
IPCG	Infection Prevention and Control Guidelines
IPPF	Indigenous Peoples Planning Framework
LMP	Labor Management Procedure
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MHMS	Ministry of Health and Medical Services
MPHS	Malaita Provincial Health Services
MPG	Malaita Provincial Government
NRH	National Referral Hospital
PER	Public Environment Report
PMU	Subproject Management Unit
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SIG	Solomon Islands Government
SPC	South Pacific Commission
SPREP	Secretariat of the Pacific Regional Environment Programme
SPRP	Strategic Preparedness and Response Program
VAC	Violence Against Children
WB	World Bank
WHO	World Health Organization

Executive summary

This document is the Environmental and Social Impact Assessment (ESIA) for the installation of a Medical Waste Incinerator unit (hereafter referred to as the Subproject) at Kilufi Hospital in compliance with the environmental and social (E&S) impact assessment requirements of the World Bank and the Solomon's Islands Government (SIG). The Subproject involves installation of an energy efficient medical waste incinerator and provision of waste management training for Kilufi Hospital staffs. This ESIA documents the potential impacts and risks associated with the Subproject and strategies to mitigate impacts and risks. It will be guided by World Bank E&S requirements, international best practice mitigation strategies and national environmental frameworks, policies and regulations.

Whilst the Subproject is expected to have a positive impact on waste management capacity and infection control, potential short-term impacts and risk during construction on the surrounding biophysical and social environment are identified, these include: removal of vegetation and edible plants, soil erosion, noise and vibration, odor, fumes/smoke, dust, workplace occupational health and safety, inadequate design, sub-standard/inappropriate materials, and community grievances. The primary tool for managing the potential impacts and risks identified in this ESIA during subproject implementation will be a Code of Environmental and Social Practice (CoESP), collectively prepared by the contractor(s) with assistance from the Project Management Unit (PMU).

The Ministry of Health and Medical Services (MHMS) has established a PMU to implement and supervise the Subproject. The World Bank through its Fast Track Covid-19 Response Program is funding the Subproject.

1 Introduction

The Solomon Islands Government (SIG) has received a total of US$13 million in funding from the World Bank through IDA credits (US$2.5 million), grants (US$7.5 million), and the Health Emergency Preparedness Response Trust Fund (HEPRTF-US$3 million) under the Fast Track Covid-19 Response Program (FTCF). The funding covers the emergency response under the COVID-19 Strategic Preparedness and Response Program (SPRP). The COVID-19 Emergency Response Project (hereafter referred to as the ERP or the Project) is the Solomon Islands Government (SIG) component of this Program. The Project aims to prevent, detect and respond to the threat posed by COVID-19 and to strengthen national systems for public health preparedness in the Solomon Islands (SI). The Project coverage will be national in scale.

The installation of the medical waste incinerator forms part of the Emergency Response Project (ERP) and for the purpose of this ESIA, this undertaking is referred to as the Subproject. The Subproject falls under the ERP component 2 (b) enhancing health care waste management. The Subproject aims to improve health care waste management through financing an energy efficient medical waste incinerator including training in health care waste management and enhancing infection control for Kilufi Hospital.

In early discussions with the WB on the process for identifying impacts and risks for the installation of incinerators it was decided, following the Environmental and Social Screening of the Good Samaritan Hospital (GSH), that ESIA's would be required for all the incinerator installations. This removed the requirement for each incinerator to be screened using the screening form detailed in the Environmental and Social Framework (ESMF). Appendix 1 provides the WB approved screening undertaken for the GSH Incinerator that triggered the ESIA requirement for all incinerators.

Additional to the above arrangement for the screening process it was agreed that a Code of Environmental and Social Practice (CoESP) would be the instrument to manage the impacts and risks in the ESIA. This is the same as a Contractors Environmental and Social Management Plan (CESMP) or an Environmental and Social Code of Practice (ESCoP). The layout for the CoESP is detailed in Appendix 2.

This ESIA requires WB approval and details potential E&S impacts and risks, including removal of vegetation and wild food crops, soil erosion, noise and vibration, odor/smoke/fume, dust, occupational accidents and/or injuries, inadequate design and

materials, Subproject failing to implement the Code of Environmental and Social Practice (CoESP) and, possible community grievances.

Kilufi Hospital is categorized as a provincial hospital and second level medical store that is overseen by the Malaita Provincial Health Services (MPHS) under the MHMS. The Hospital has direct links with Area Health Centres (AHC) around Malaita and serves as a referral hospital and distributor of medical supplies. Kilufi hospital is the largest health facility in Malaita province and receives referrals from majority of area health centres and clinics around the island including Atoifi Hospital in the eastern region of the island. Apart from referral services, it offers ongoing general health services to its catchment area that covers Auki town and nearby villages. Kilufi hospital also accommodates the national psychiatric hospital and care centre in Solomon Islands.

In addition to identifying the potential E&S impacts, risks and mitigation strategies, this document also provides the Subproject description, baseline information, regulatory frameworks and a Code of Environmental and Social Practice (CoESP) template to guide contractors.

2 Subproject Location

The proposed incinerator is to be built at the Kilufi Hospital in Malaita Province. Kilufi is situated at the outskirts of Auki Township, the provincial capital of Malaita province. The hospital is 2.5km away from the main Auki township and is connected by a sealed road. The actual selected spot bears the coordinate of: latitude 8°44'32.23"S and longitude 160°41'26.02"E. Figure 1 shows the location of the Hospital within the Solomon Islands archipelago.

The incinerator site is located more than 70m away from the Hospital buildings. The hospital is situated inland approximately 2.1km away from the coast and 2.8km away from the Fiu River. A small area of wetland is located 220m from the incinerator site below the adjacent ridge. The incinerator site is on an elevated spot at the upper edge of a downward slope. The site is within the hospital's waste disposal zone which has accumulated solid wastes over time.

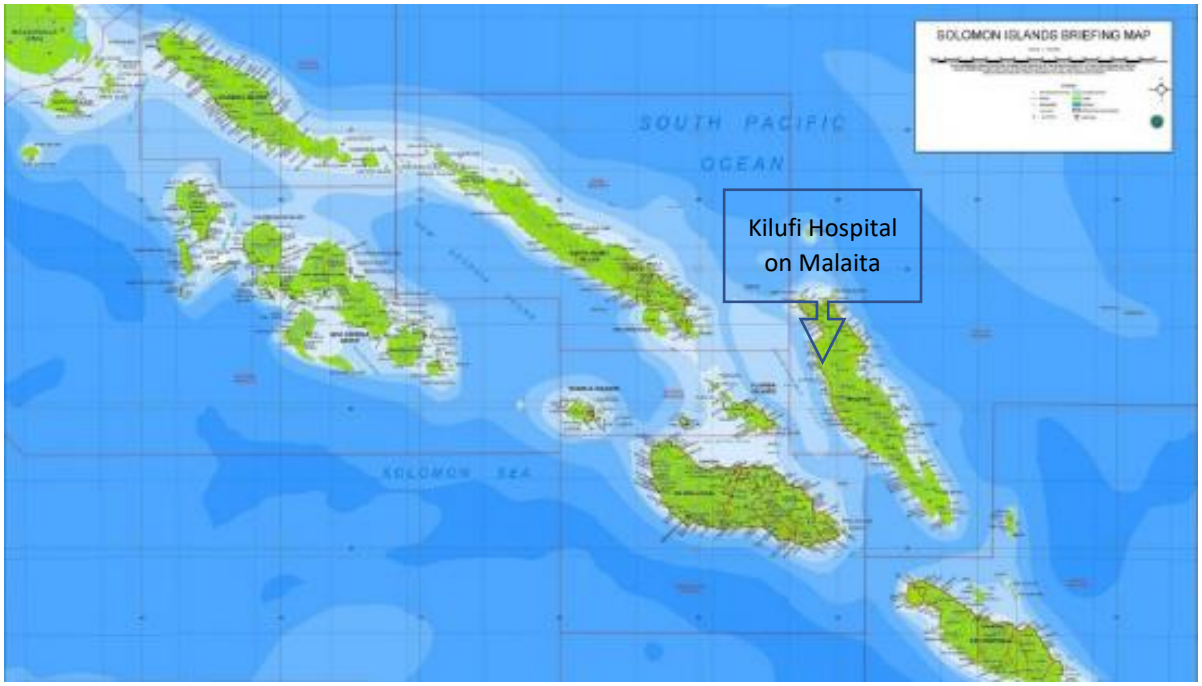


Figure 2.1 *Solomon Islands Map indicating location of Kilufi Hospital on Malaita*

The closest residences to the proposed incinerator site are to the south and within a distance of 70m. They consist mainly of staff residences of the hospital, and the cluster is demarcated with a yellow perimeter boundary in the aerial image in **Figure 2.2** below. The closest building to the incinerator is the chapel and next to it is a fresh-water storage tank (**Figure 2.2 & 2.3**) that supplies water to the hospital which is elevated at 20m above ground.

2.1 Site selection and alternative options

The site was selected on the premise that it is within the hospital's waste disposal zone and is conveniently located within the boundary of government owned land and accessibility is easy for staff to operate the facility. Currently there is a locally built incinerator by hospital staff located few meters next to the proposed spot and it is currently being used, and a non-functional and deteriorated unit few meters on the opposite side, from a failed project. Alternative spots were indicated by the hospital management within the vicinity and upon assessment of the physical characteristics of the site and discussions, the spot selected and mutually agreed on was that which is indicated in **Figure 2.3** below, which is between the current operational incinerator and an old decommissioned incinerator.

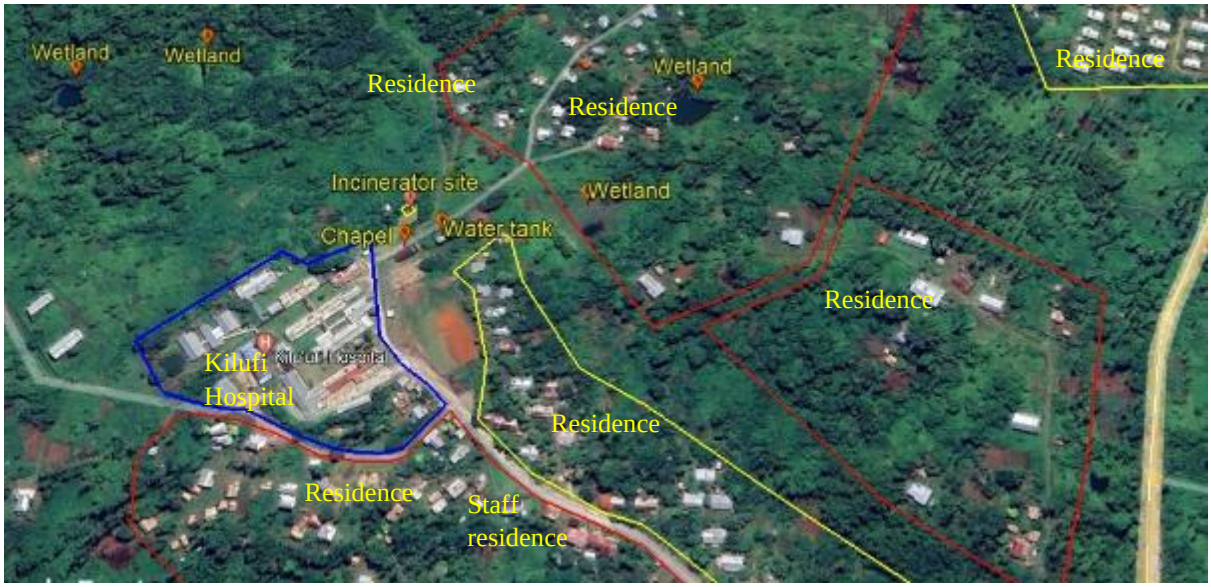


Figure 2.2 *Kilufi hospital incinerator site and surrounding area*

Figure 2.3 *Proximity of incinerator site to nearby infrastructure.*

Additional deliberation for selecting the spot was based on the following considerations:

- It should be located just within the Hospital area rather than on adjacent customary land to avoid potential dispute or tedious land acquisition processes.
- It should be distance away from the hospital and residences but easily accessible from the hospital.
- It should be on a vacant land and not in the way of future expansion plans of the Hospital.
- It should be at least established on an elevated location to give maximum possible height for the stack for free flow of emission without directly affecting residences and by passers (road users).

Furthermore, there are no alternative locations found as the choice for the site is based on availability of suitable and accessible land for the Hospital. The Project could have considered opting for other sites but might involve a lengthy identification and acquisition process which potentially could still not guarantee success. Which would also implicate the project's implementation timeframe.

The current site location for the ash-pit is close to the incinerator for convenience of transfer of ash from the incinerator. Its size will be 10.4m³ and is designed to cater for 10 years of ash waste which by then a new ash-pit should be built beside it. The baseline rate for anticipated ash quantity that would be produced per year was obtained from NRH hospital's calculations of ash production measured per weekly burning cycle which stands at 20kg. In a year of 52 weeks, ash produced should be around 1,040kg which is equivalent to 1.04m³. Given the baseline rate is from a large-scale hospital and a double size incinerator, it is anticipated that a Hospital of the size of Kilufi would definitely produce less ash than that and should take more than 10 years for the ash pit to be filled. The ash pit is designed to have a sealable lid that can be opened to transfer ash after every burning cycle and closed afterwards. The opening of the pit is slightly raised from ground level to avoid inundation or be filled by run-offs during rainy weather. The proposed technology to be used is standard for hospital level facilities and is considered to cater for future growth and expansion of the Hospital and also to mitigate growing demands as waste production increases.

With regards to sensitive receptors, **Figures 2.3**, displays the proposed incinerator site located 70m from the nearest residence. Private residences are also scattered around the

Hospital but at further distance. The closest building is the Chapel which is only used less frequently and most often remains empty.

There are no water bodies close to the selected site, however several wetland patches are evident further down the valley which were probably caused by trapped run-off from elevated regions of the land. The patches are indicated in **Figure 2.2** above. There is a road that passes nearby to the incinerator site that leads toward clusters of residential buildings and is always commuted by health workers and communities (residences).

2.2 Consultation

There were consultations carried out on the 13th and 14th of the September 2023 with the hospital management and community representatives to agree on the actual spot for the proposed incinerator. It was agreed that since the identified site is a waste disposal zone and discretion is given to the PMU engineers to assess whichever spot they prefer and deem practically reasonable in terms of site preparation costs and that would also have minimal environmental and social impact. Hence the spot was identified. The management expressed that the dysfunctional unit should be removed from the site after having the new unit installed, but cost for carrying it would be an issue. They have options to look at to settle the issue through consultations with other partners including the government. The old incinerator which is currently running would be improved and maintained for standby to the new unit lest it breaks down or the hospital faces financial issues in maintaining its operation. The dysfunctional incinerator unit is sitting in the waste management zone of the hospital and could easily be dumped by excavating a landfill pit beside it. An excavator would be required for the job. The hospital management will continue to work on plans to improve waste management in the hospital. The current project does not cater for additional works other than the proposed incinerator.

3 Environmental and Social Baseline

Kilufi Hospital provides direct medical services to Auki township and nearby villages and receives referrals from more than 60% of clinics and healthcare facilities around Malaita Province including Atoifi Hospital the furthest east. According to 2009 census report[1], Auki town alone has a total population of 5,105. This data excludes population of nearby

[1] Solomon islands National Census report,2009, Census population by Wards.

catchment villages, which would show a huge increase. The Hospital is administered by the Malaita Provincial Health Services in Auki (the provincial capital). Kilufi Hospital is also a second level medical storage facility that functions as a distributor of essential drugs and medications to clinics and healthcare facilities around Malaita province.

3.1 Environmental baseline

The proposed site for the incinerator is selected on the premise that it is a vacant land situated within the registered land boundary of the Hospital and is a site dedicated by the hospital management for waste management. The site is situated on the top edge of a downward slope that would require preliminary stabilization works. There are few wild food plants identified at the site including bananas, cassava and local cabbage. It was reported by hospital staff that the area had once been used for gardening by staff in the past and the local crops remain on the abandoned garden site. Crops present within the area are considered common property accessible by hospital staff.

The closest residential house to the incinerator site is the hospital staff residences which is around 70m. The closest facility is the hospital chapel and water storage tank at 30m.

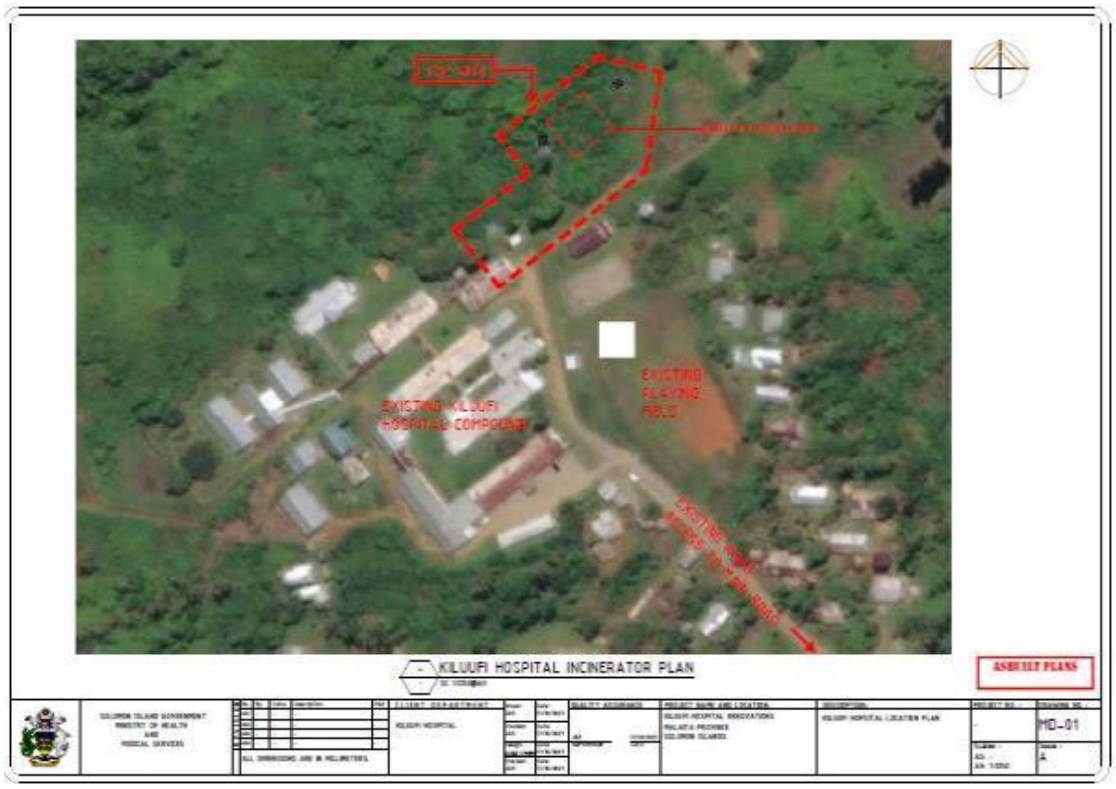


Figure 3.1 *Land area to be surveyed for the incinerator marked in dashed red line.*

Figure 3.1 above also shows road access that passes by in close proximity to the incinerator site. The elevation of the site is 18m above sea-level. The slope at the northern section

gradually subsides from 16m to 12m over a 100m distance perpendicular to the incinerator site.

3.1.1 Waste management

The hospital currently operates a basic waste management system utilising a simple collection protocol and disposal methods. A waste disposal zone has been established at the north-western perimeter of the hospital, next to the proposed incinerator site. The site is characterised by depressions, ditches and a general downward slope shown in **Figures 3.2 and 3.3** below. This area receives dumped general waste from the offices and hospital. The dumping process takes the form of filling up a particular spot first before moving to the next spot. Each spot is around 9m² in size, and are usually burnt to reduce the build-up of waste before adding more as shown in **Figure 3.4** below. Organic kitchen wastes especially of food scraps and grass cuttings from grounds work are dumped and composted next to the kitchen site in a rotational manner using blocks, the old and decomposed blocks are planted with vegetables while newer ones are being filled.

The hospital currently uses a locally made incinerator and is quite basic as shown in F**igure 5** below. The ashes it produces are piled up in mounts just next to it since there isn't an ash pit.

Figure 3.2 *View of general waste at disposal site*

Figure 3.3 *General waste disposal site*

Efforts were made in the past to improve waste disposal in that a modern incinerator was established as a project but failed to operate and was never sorted and was abandoned since then. Only a few sections of it remains from being vandalised.

Figure 3.4 *Existing incinerator*

3.1.2 Waste audit for Kilufi Hospital

A waste audit was conducted on Kilufi Hospital and involves inspection of bin contents, discussions with staffs on waste generation in terms of quantity and type, disposal

methods, handling practices and overall management. Results of the waste audit are displayed in **Table 3.1** below

Table 3.1 *Results of waste audit undertaken on the 14th Sept 2023 at Kilufi Hospital*

Waste receptacles	Description
 Clinical waste bin (Maternity ward)	Bin size: 15L bucket bin Fullness: 5% full Contents: 80% plastics (wrappings) 10% paper 10% wool & bandage Estimated weekly volumes: • 45L per week ✓ 36L plastics (wrappings) ✓ 4.5L paper ✓ 4.5L wool & bandage
 Clinical waste bin (general ward)	Bin size: 15L bucket bin Fullness: 80% Content: 60% plastics (wrappings & bottle) 30% paper 5% glass 5% metal sharps Estimated weekly volumes: • 45L per week: ✓ 27L plastics (wrappings & bottles) ✓ 13.5L paper ✓ 2.25L glass ✓ 2.25L metal sharps
 Pharmaceutical wastes (Pharmacy)	Bin size: 20L Cardboard box bin Fullness: 90% full Contents: 70% pharmaceuticals (expired) 20% general waste (plastic package) 10% paper cardboard Estimated weekly volumes: • 10L per week ✓ 7L pharmaceuticals (expired) ✓ 2L general waste (plastic packaging) ✓ 1L paper/cardboard

Waste receptacles	Description
  Sharps bins in general ward	Bin size: 2 x 5L bin = 10L (sharps bin) – 3 days old. Fullness: 1 x sharps bin is 100% full, 1 x sharps bin is 90% full. Contents: 40% sharps 50% plastics 10% paper cardboard Estimated weekly volumes: • 20L per week ✓ 8L sharps ✓ 10L plastics ✓ 2L paper cardboard
  General waste bin	Bin size: 120L Fullness: 5% Contents: 70% plastic 15% Organic Waste 10% paper 5% metals Estimated weekly volumes: • 240L per week ✓ 168L plastics ✓ 36L paper/cardboard ✓ 24L organic waste ✓ 12L metals
  Office waste bin	Bin size: 30L bin Fullness: 80% Contents: 50% general waste (soft plastics) 15% paper cardboard 25% Organic Waste 10% metal waste Estimated weekly volumes: • 15L per week 7.5L general waste (mostly soft plastics) 2.25L paper/cardboard 3.75L organic waste 1.51L metal waste

Waste receptacles	Description
 Clinical waste bin	Bin size: 30L bin Fullness: Empty Contents (generally): 20% paper cardboard 20% rubber (glove) 50% wool & bandage 10% plastics Estimated weekly volumes: • 60L/ week ✓ 12L paper cardboard ✓ 12L rubber (glove) ✓ 36L wool & bandage ✓ 6L plastics
 Clinical waste bin (female ward)	Bin size: 30L bin Fullness: Empty Contents (generally): 20% paper cardboard 20% rubber (glove) 50% wool & bandage 10% plastics Estimated weekly volumes: • 60L/ week ✓ 12L paper cardboard ✓ 12L rubber (glove) ✓ 36L wool & bandage ✓ 6L plastics
 Clinical waste bin	Bin size: 30L bin Fullness: Empty Contents (generally): 20% paper cardboard 20% rubber (glove) 50% wool & bandage 10% plastics Estimated weekly volumes: • 60L/ week ✓ 12L paper cardboard ✓ 12L rubber (glove) ✓ 36L wool & bandage ✓ 6L plastics

Waste receptacles	Description
 Clinical waste bin	Bin size: 30L bin Fullness: Empty Contents (generally): 20% paper cardboard 20% rubber (glove) 50% wool & bandage 10% plastics Estimated weekly volumes: • 60L/ week ✓ 12L paper cardboard ✓ 12L rubber (glove) ✓ 36L wool & bandage ✓ 6L plastics
 Clinical waste bin	Bin size: 30L bin Fullness: Empty Contents (generally): 20% paper cardboard 20% rubber (glove) 50% wool & bandage 10% plastics Estimated weekly volumes: • 60L/ week ✓ 12L paper cardboard ✓ 12L rubber (glove) ✓ 36L wool & bandage ✓ 6L plastics
  Clinical waste bin	Bin size: 30L bin Fullness: 5% Contents: 40% paper cardboard 40% rubber (glove) 10% wool 10% plastic Estimated weekly volumes: • 90L/ week ✓ 36L paper cardboard ✓ 36L rubber ✓ 9L wool ✓ 9L plastic

Waste receptacles	Description
  General waste bin (outside of hospital)	Bin size: 120L Fullness: 90% Contents: 70% plastic 15% Organic Waste 10% paper 5% metals Estimated weekly volumes: • 240L per week ✓ 168L plastics ✓ 36L paper/cardboard ✓ 24L organic waste ✓ 12L metals
 General waste	Bin size: 30L Fullness: 100% Contents: 70% plastics 20% Organic Waste 5% paper 5% metals Estimated weekly volumes: • 90L per week ✓ 63L plastics ✓ 18L organic waste ✓ 4.5L paper ✓ 4.5L metals

Table 3.2 *Calculated waste volume*

Waste type	Weekly total
Hospital waste (potentially infectious Hospital waste)	193.5L
General Waste (mostly soft plastics)	520.5L
Metals	30.01L
Food organics	69.75L
Paper/Cardboard	195.75L
Human blood and tissues	20L
Sharps	4.25L
Total Waste/week	**1,003.76L**

3.1.3 Waste audit summary for Kilufi Hospital

The following summarizes the current waste management practices at Kilufi Hospital:

- The hospital has ten (10) clinical units from which wastes are generated. Bins are unevenly distributed among them in that some share bins and are stationed at a centrally accessible location.

- Waste bins are emptied at the end of each shift. A shift lasts 6 to 8 hrs and bins are emptied every 3pm and 8am.
- Clinical waste bins containing infectious wastes comes in sizes of 30 ltrs, 20ltrs and 15ltrs and are emptied at every 8 hours shift.
- General waste bins come in 120ltrs wheelie bins that are half filled per day, takes 2 days to be filled.
- Kitchen wastes fills up 30ltrs bin in a day.
- Office waste fills up 15ltrs and 20ltrs bin per week.
- General wastes are dumped at designated spot as shown in **Figure 6** and **7** and are openly burnt.
- Clinical wastes are dealt with by nurses and are incinerated as shown in **Figure 5** and ashes are piled openly beside the incinerator facility.
- The incinerator is also used by Auki clinic to incinerate clinical wastes.
- The hospital also practices a general cleanup routine every Friday and all departments get to clean up their units as well as the hospital compound.
- The hospital has 2 grounds-men who perform regular grounds clean-up and handling of general wastes.
- More than 80% of nurses are trained in IPC and regularly undergo refresher trainings from time to time by the IPC unit of the hospital.
- The current incinerator is locally self- invented and less efficient and does not completely burn out wastes. Its fueled by diesel and firewood and produces huge amount of smoke that raises complains from daily commuters who uses the nearby road.
- The incinerator facility is fenced and secluded to avoid entry by scavenging dogs and general public. Only authorized persons and operators of the incinerator can access the facility.
- The hospital has no bin storage space, instead wastes are directly disposed whenever bins are full.

3.1.4 Air quality

Burning of general waste often produces large amounts of smoke. The current incinerator also produces a lot of smoke.

While air quality is an important factor to monitor for the sake of the incinerator's efficiency, accessibility to appropriate equipment remains a challenge. The environmental Health Unit in Honiara has not fixed or procured replacement for its out of service air quality monitoring devices. It is assumed that with a carefully designed incinerator such as the proposed CA03 will be a considerable improvement on the current practice of inefficient open pit burning.

The monitoring of noise, odor and dust during construction is not considered feasible based on equipment availability, budget and capacity of contractors and the level of risk. However, contractors' conditions prescribed in the CoESP that seeks for a considerate and sensible approach by potential contractors is the best way possible for the project to ensure risks are minimal.

3.2 Social baseline

The sensitive receptors of the proposed incinerator facility are the staff residences within the vicinity, the hospital, the chapel building and by passers who commute along the road daily. The closest residential building to the proposed incinerator is around 40m and the hospital and chapel is around 30m away. The amount of smoke produced by the existing incinerator is often excessive and have resulted in growing complaints by the general public.

The plot of land on which the incinerator facility will be installed is within the boundary of the hospital compound which is owned by the national government. The Commissioner of lands holds the Perpetual Estate (PE) title. Registered land such as this has minimal chances of attracting dispute.

4 Subproject Description

This section describes the Subproject purpose, planning and design, construction, operations and decommissioning.

4.1 Purpose, planning and design

The purpose of the Subproject is to enhance waste management service and improve infection control in Kilufi Hospital in Malaita through the establishment of a medical waste incinerator at Kilufi Hospital. Although Kilufi already has the service of an incinerator, it operates less inefficiently and produces a lot of thick smoke that has resulted in growing public concern. Hence a proper and more efficient model that operates at

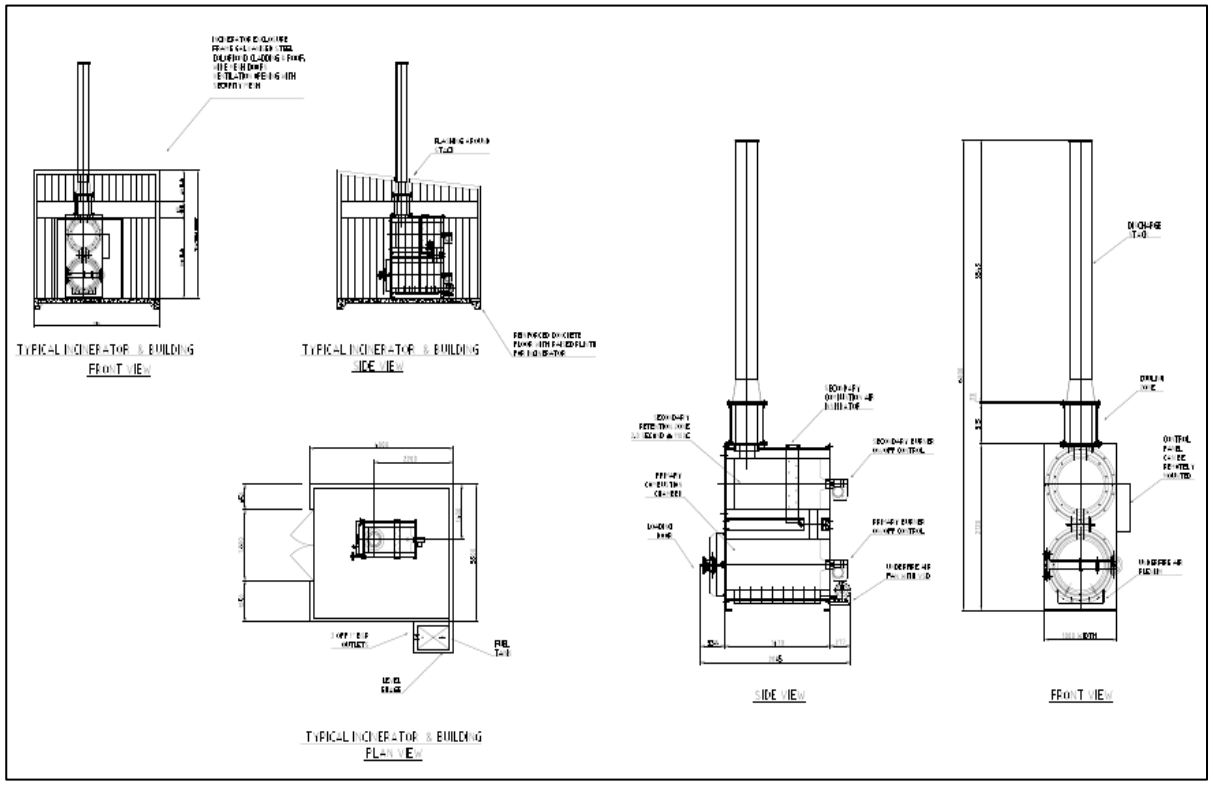
extremely high temperature for complete burn-out of wastes and generates less smoke is required.

The MHMS recognizes the need to improve waste management and infection control in provincial health facilities and consultations were held by the PMU with WB, MHMS, and Kilufi Hospital administration on the appropriate activities to make up the Subproject.

The proposed design for Subproject equipment/facilities will ensure that the Subproject complies with the provisions of the WB ESF and Environmental and Social Commitment Plan (ESCP) for the overarching funding, and with international, regional and national E&S conventions, laws, regulations and good practices.

The incinerator has been procured from Australia for the purpose of the Subproject and is the CA03 model of medical waste incinerator. The supplier was identified through a tender process. The incinerator is a newly built model by the supplier which is specifically designed to withstand the harsh environmental conditions in Solomon Islands. **Table 4.1** shows general specifications of the incinerator provided by the supplier. It is not equipped with a wet-type scrubber thus does not generate any liquid or sludge waste. It will incinerate up to 20kgs of waste per hour. The design layout of the incinerator is displayed in **Figure 4.1**.

Table 4.1 *General specifications of the incinerator*



Component	Specification
Primary Combustion Chamber	• 6mm ceramic fiber high temperature insulating blanket • 115 mm thick 42 % Alumina firebrick
Secondary Combustion Chamber	• 6 mm ceramic fibre high temperature insulating blanket • 115 mm thick 42 % Alumina firebrick
Secondary Combustion Chamber Stack Cooling Zone	• 115 mm thick 42 % Alumina firebrick
Exhaust stack	• 316 stainless steel
Combustion fan	• Primary chamber under-fire air fan
Length of time required for installation	• can readily be installed by two men in approximately one to two days

Figure 4.1 *CA03 incinerator design layout*

4.2 Construction

Construction activities for the incinerator comprises preparation of the site shown in **Figure 4.2** and **4.3**, civil works on the access road and stabilization of slope, construction of incinerator basement and power plant sheds, construction of ash pit, installation of incinerator and power generator. The layout of actual construction site is featured in **Figure 4.4, 4.5 & 4.6** below**.** Site preparation consists clearance/removal of grasses, shrubs and softwood trees, soil excavation works, cutting of slope, leveling of ground and setting out site profile and establishing a hardstand to store raw materials like sand gravel, blocks, metals, timber and associated construction material at the site. Additionally, a new access road will be cleared and created to access the site as shown in **Figure 4.4** and **4.5**.

Construction works involves excavation of foundation, preparing an elevated concrete slab on which to fix the incinerator and cleaning area, a shed to house the incinerator, a power plant shed, basic landscaping works for the drive-way and entrance gate pavement and installation of a lockable gate. A sealed ash pit and soak-away pit will also be constructed at the back of the incinerator shed with an elevated concrete slab and walls. A cross-section of the facility is featured in **Figure 4.6** below.

Figure 4.2 *Identification of site for the incinerator by Kilufi Hospital management and PMU team*

Figure 1.3 *Proposed incinerator site photo partially cleared by hospital staff as part of regular hospital compound cleaning.*

Fresh water for cleaning bins and tools after use will be sourced from the existing Hospital water system connection by Solomon Water. A small water tank for rain catchment will

also be installed beside the incinerator shed to supplement the piped water connection. A secured fencing will be constructed around the facility to restrict public access and feral dogs.

The incinerator arrived in Honiara in October 2023 and currently awaits transfer to Auki by the contractor.

The contract for civil works, transportation and installation of the incinerator has been awarded to a local contractor named; RSF Construction Company Limited. The same company is awarded works for three other incinerators namely; Noro, Good Samaritan and Tulagi. Currently the contractor is working on the Tulagi incinerator after completing Good Samaritan. Installation of cables, fittings and actual testing will be performed by the supplier. The supplier will also provide hands-on training on the incinerator's operation, upkeep and maintenance. The facility will be operated, and maintained by staff at the hospital and also the bio-medical team of the NRH for ongoing monitoring and operations.

The contractor will transport materials for civil works and the incinerator to the site on a heavy-duty crane Truck after it is landed on Auki Wharf by sea vessel. The contractor will provide the workforce for the Subproject. The workforce will consist of contracted permanent and casual workers. Options for workers temporary residence will be arranged through start-up meeting with key stakeholders at the site. Arrangement for workers mobility will be a sole responsibility of the contractor and will be clearly stipulated in the contract.

4.3 Operation

Operation of the incinerator is expected to commence immediately after completion of construction, training and official handover of the facility to Kilufi Hospital management. The incinerator will provide incineration services for clinical waste from the Hospital. Only trained waste handlers will operate the incinerator. IPC training and incinerator operations training will be provided for relevant Kilufi Hospital staff to better handle waste management and incineration.

For normal operation, waste handlers will schedule regular incineration days and time, except under exceptional circumstances when there is large amount of waste and extended incineration times required. Furthermore, in the event of a natural hazard such as prolonged heavy rain down-pours and associated inundation and excessive storm water

run-off, the incinerator will not be operated unless suitable. The Kilufi Hospital management with the help of the PMU-MHMS will develop operational instructions and schedules for use of the incinerator.

A health clinic in Auki will also use the incinerator through an MOU with Kilufi hospital management. Operational arrangement on fuel and other costs are to be factored into the MOU. Auki clinic waste will be transported to the incinerator via vehicle.

Waste from Kilufi Hospital could easily be transported to the incinerator using wheelie bins or wheelbarrow along the driveway or by vehicle when it is bulky. After incineration, all vehicles, bins, wheel-barrow and any material/equipment used for transporting and handling of waste will be washed/disinfected on site using the installed water facilities. Residents and the public will be advised on incinerator site and operation through signs and notices. The supplier has not recommended any monitoring for air quality, noise or odor since it is an improved version of previous units they have on the market.

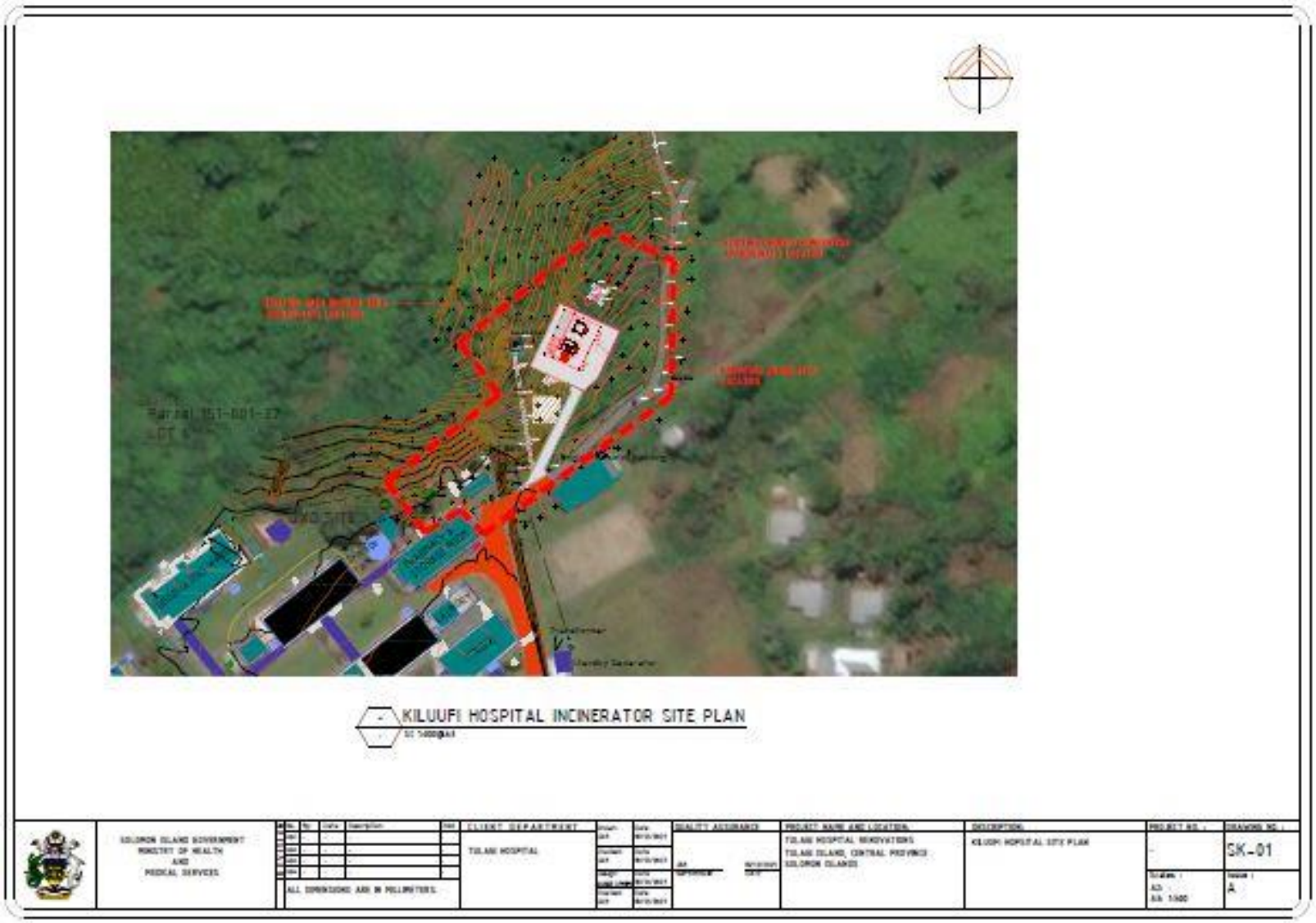


Figure 4.4 *Site plan and surrounding infrastructure*

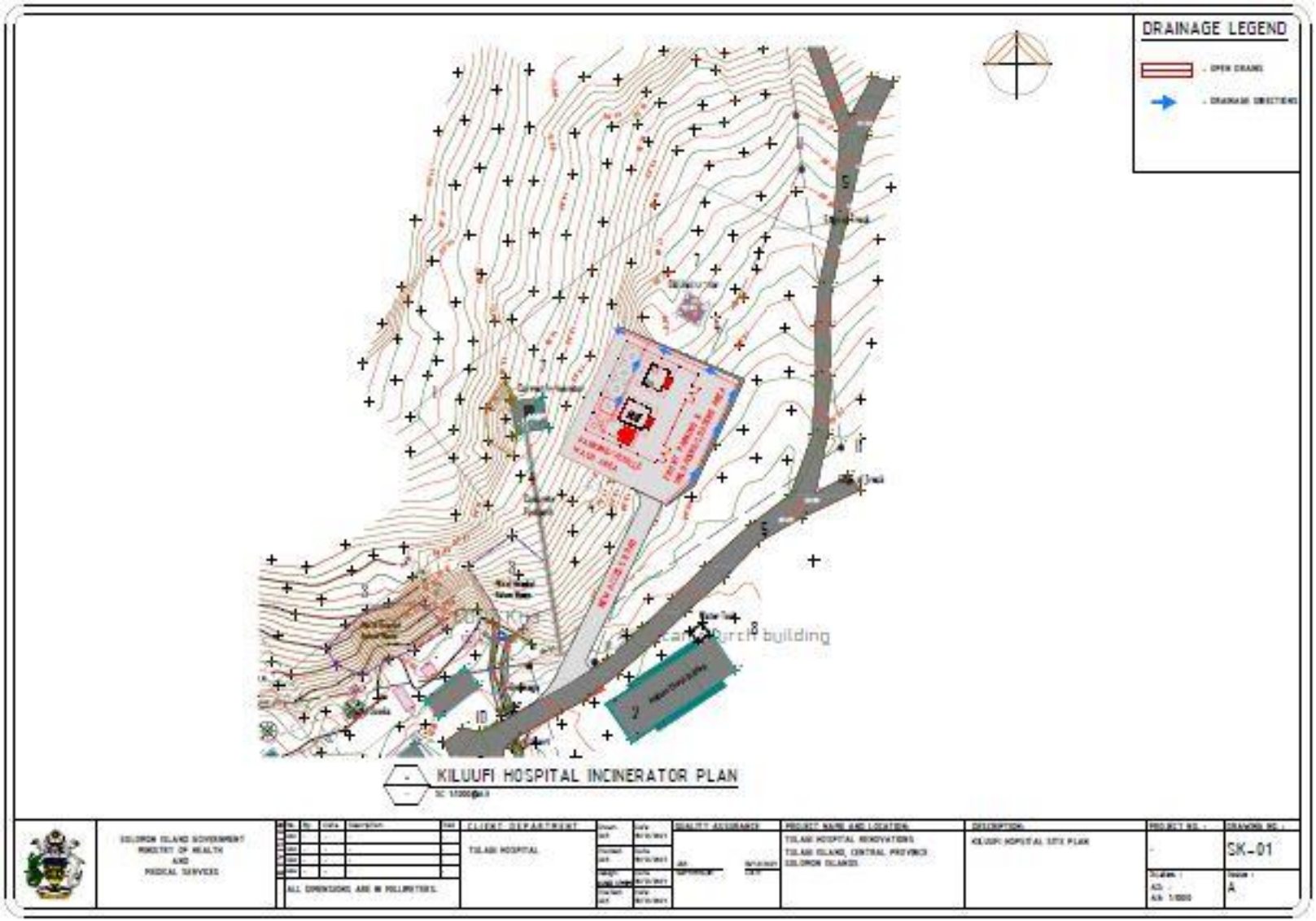


Figure 4.5 *Site plan incinerator facility layout*

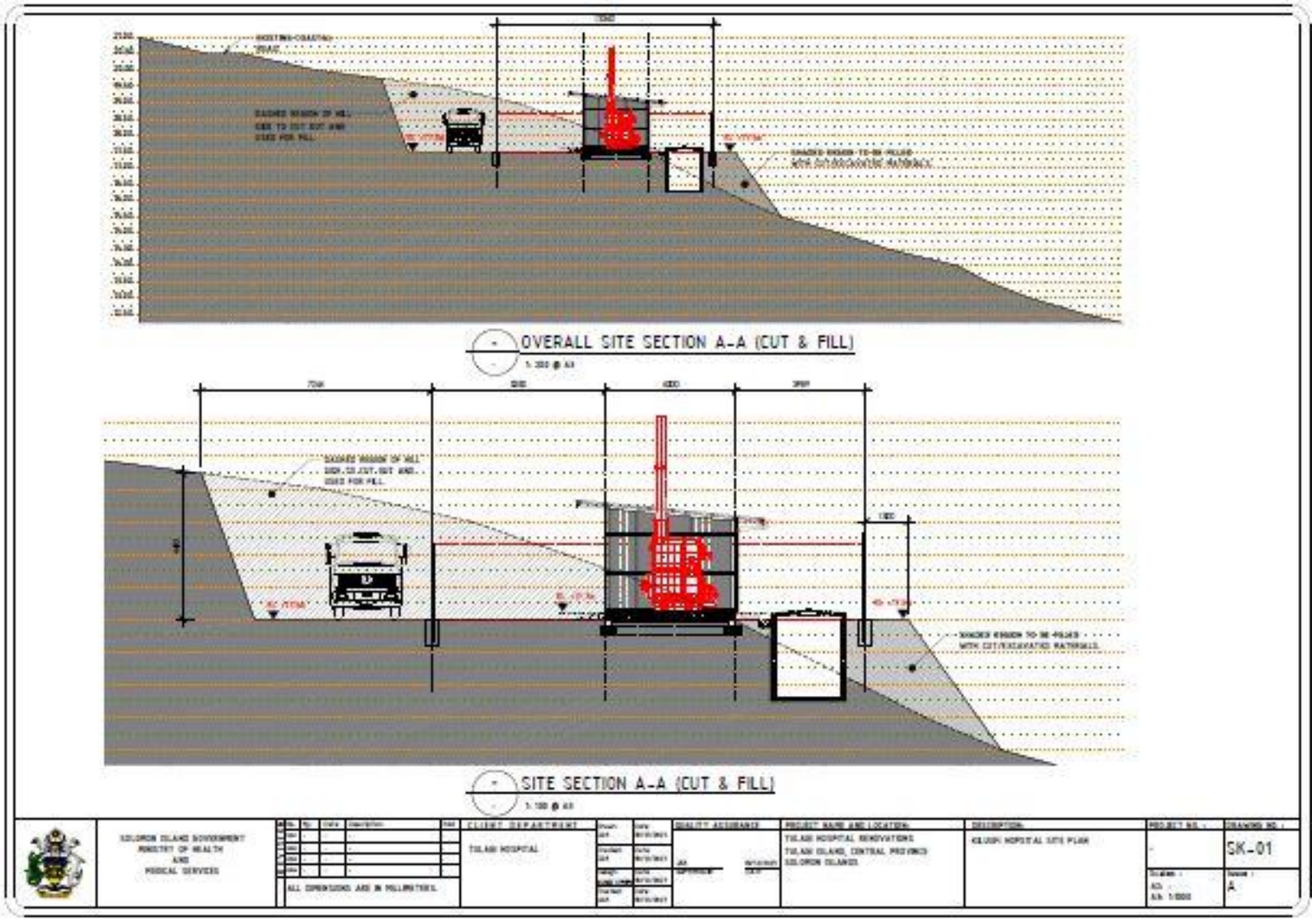


Figure 4.6 *Site cross section showing ash pit and soak-away pit.*

The incinerator will require power supply to operate and backups are included in the design. There will be a connection to the main Solomon Power electricity grid accessed by the Hospital. A stand-alone generator will also be installed beside the incinerator as backup for possible power outage. Furthermore, a solar system will be installed to provide energy backup. A shed will be constructed to shelter the solar batteries and the generator and its roof to accommodate the solar panels.

4.4 Decommissioning

After the life of the incinerator, solid waste components of it would be disposed in an excavated landfill and buried. All hazardous wastes such as electronic parts will be dumped in the ash pit and sealed. The decommissioning process also applies to the old incinerator. However, in the meantime, the old incinerator will be maintained to complement the new unit to avoid potential disruptions in the event of fault or shortage of fuel.

5 Policy and Regulatory Framework

This section documents the applicability of SIG regulatory framework and relevant WB policies for the assessment and permit for the construction and operation of the incinerator.

5.1 Country context

The SIG has an established regulatory framework that provides measures to protect and preserve the environment. The Environment Act 1998 and Environment Regulations 2008 make provision for the conservation and protection of the environment. This Act laid the foundation of Solomon Islands' environmental impacts assessment (EIA) system, which is implemented by the Environment and Conservation Division (ECD) of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM). **Table 5.1** summarizes the relevance of the Acts to the Subproject.

5.1.1 Environmental Act 1998

The Environment Act 1998 (the Act) provides for the protection and conservation of the environment. The core objectives of the Act are to provide for and establish integrated systems of development control, EIA, and pollution control, including:

- Prevention, control and monitor pollution;
- Reducing risks to human health and prevent degradation of the environment by all practical means, including the following;

- Regulating the discharge of pollution to the air, water and land;
- Regulating the transport, collection, treatment, storage and disposal of waste;
- Promoting recycling, re-use and recovery of materials in an economically viable manner; and
- To comply with and give effect to regional and international conventions and obligations relating to the environment.

The Act is divided into four sections. Part I provide the Act with considerable power and states that in the event of conflict between the Act and other legislation, the Environment Act shall prevail. Part II establishes and defines the powers and role of the ECD. Part III establishes the requirements for environmental assessment, review and monitoring. This provides for an environmental assessment to consist of either a public environment report or if the development is shown to be of such a nature as to cause more serious impacts then the developer is required to prepare and submit an environmental impact statement EIS. Part IV details requirements for pollution control and emissions (noise, odor and electromagnetic radiation) and requirements to permits for the discharge of waste. Noise (restrictions on emitting unreasonable noise) is covered in Article 51(1).

Part III Article 17 requires any developer who proposes to carry out any prescribed development to make an application to the Director of ECD. Article 19 specifies that a developer shall not commence or continue to carry out any prescribed development unless the developer has been issued with a development consent (defined in the Act as a consent to carry out any development under Part III). Activities that require assessment are described as 'prescribed developments' and are included in the Second Schedule of the Act. There are two levels of environmental assessment; public environment report (PER), as described in Article 20, or if the development is shown to be such a nature as to cause more serious impacts then the proponent is required to prepare and submit an Environmental Impact Statement (EIS), as described in Article 23.

5.1.2 Environmental Regulations (2008)

The Environment Regulations 2008 (the Regulations) establish the procedures for undertaking the environmental assessment of any Subprojects categorized as a prescribed development.

The developer is required to first submit a "development application" which is reviewed by the ECD to determine the likely significance of impact and required level of environmental assessment. The decision resulting from the review may include that:

- No further assessment is required, as such the development application is accepted, and development consent is issued;
- A PER is required; or
- Where major Subprojects are considered such as logging, large agricultural developments, mining and large-scale tourism developments and infrastructure Subprojects, an EIS is required which includes technical, economic, environmental and social investigations.

The Regulations establishes the procedures for undertaking the environmental assessment of 'prescribed developments' and the process of issuing development consent. The Regulations detail the process prescribed in the Act and set out the contents of PER and EIS.

Both the PER and EIS require public consultation. Following review and approval by the ECD, the development consent is issued either with or without conditions.

5.1.3 Environmental Impact assessment guidelines

The ECD developed the Environmental Impact Assessment Guidelines (2010) to provide basic advice and guidance to government officers, planners, developers, resource owners and those involved in processing development proposals, on the EIA process. The guidelines aim to clearly explain the procedures of EIA outlined in the Act and the Regulations. The guidelines describe the procedures needed to be undertaken (**Figure 5.1**), forms, and fees required before obtaining the development consent approval.

5.1.4 Regulatory relevance to the subproject activities

The 'prescribed developments' that may apply to Subproject activities are Activity 9 - Public Works Sector (b) infrastructure developments; and (h) waste management, drainage and disposal systems. The minor renovations and refurbishments will likely not meet the definition of 'infrastructure development', however, the demolition and reconstruction of small hospitals and health centers may be considered prescribed developments. The incinerators and construction of Isolation Unit will likely meet the definition of a 'waste management system and infrastructure development' under the Act.

5.1.5 Capacity of ECD

The ECD have overall accountability for environmental management in Solomon Islands. The ECD have some existing World Bank safeguard experience and capacity gained from working on previous World Bank funded Subprojects. However, ECD advise in their EIA Guidelines 2010 that the environment approval process can take several months (2-3 months at the minimum). Therefore, it is advisable that a proposal application to the ECD be lodged as early as possible to avoid delays. ECD also advise that prior to submission of the proposal application by the developer, it is advisable that the Developer should first seek written advice from the ECD.

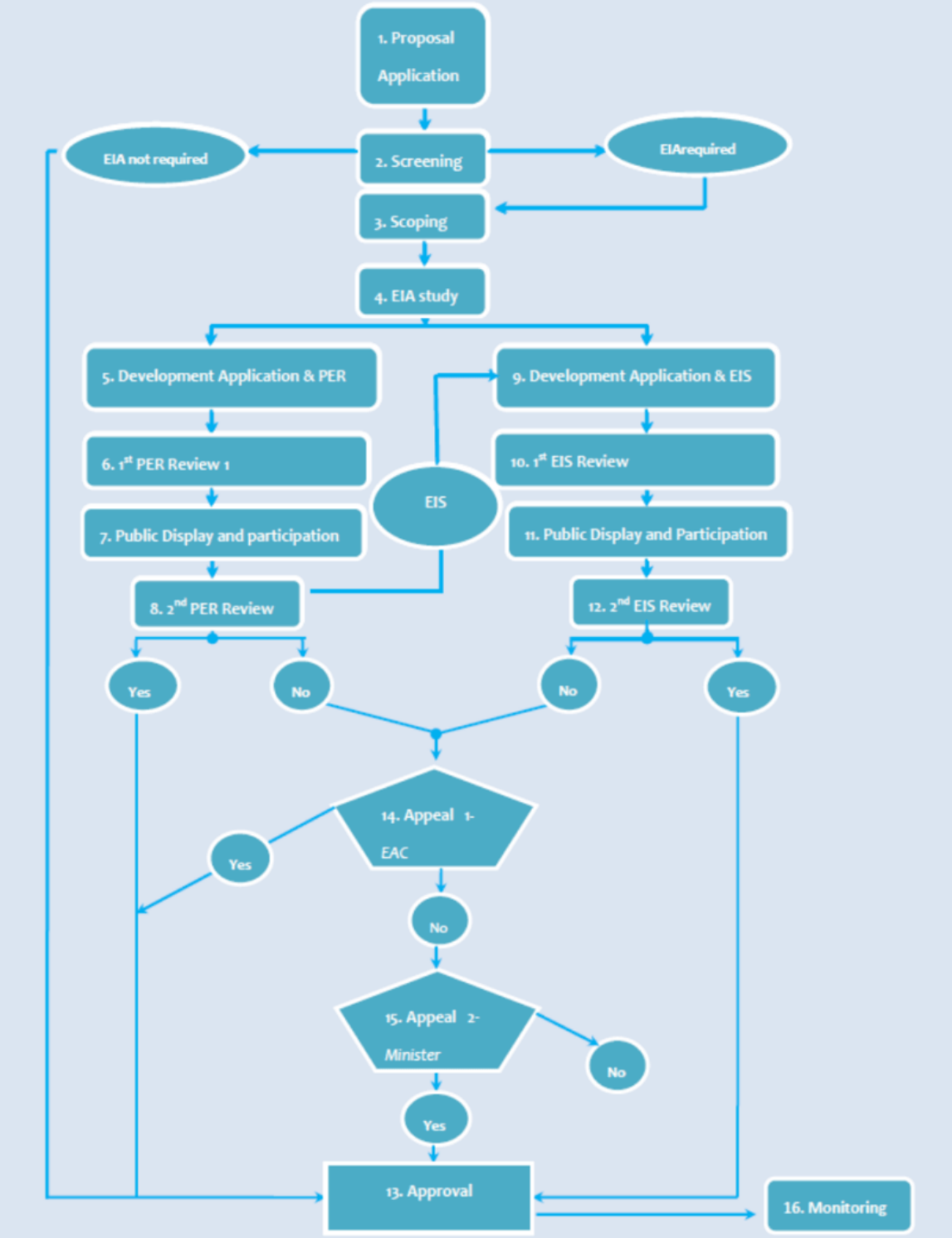


Figure 5.1 *EIA procedural steps*

5.1.6 Other relevant policies, plans and regulations

- Solomon Islands National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants. Submitted in fulfilment of Solomon Islands obligations as a party to the Stockholm POPs Convention.
- National Waste Management and Pollution Control Strategy 2017-2026. The Solomon Islands National Waste Management and Pollution Control Strategy 2017-2026 is the country's roadmap for managing waste and controlling pollution in the natural environment for 10 years with the vision for 'clean, healthy and green happy isles. The strategy addresses 5 main waste streams: Solid Waste, Liquid Waste, Hazardous and Chemical Waste, Healthcare Waste and Electronic Waste. The Strategy serves as a blueprint for waste management and pollution control that captures the national priorities and targets and identifies the relevant strategies to realize the priority targets in the next decade. It represents a major step forward for integration of waste issues and concerns into broader sustainable development policy. Objectives include to promote waste minimization in all aspects of development and to improve and upgrade existing management and disposal systems.
- Provincial Government Act 1997. This Act gives power to the provinces to make their own legislation and pass ordinances including for protection and conservation of environment, culture, wildlife and coastal and lagoon shipping.
- Town and Country Planning Act 1979. This Act applies to all urban areas (Honiara and provincial towns) and includes the management of land (all types of ownership) and management and planning functions for urban and rural areas including development.

5.1.7 Health-care regulatory and policy framework

The Health Services Act (1996) sets ups the Ministry of Health and Medical Services (MHMS) who are responsible for the provision of health and medical services in the Solomon Islands. The MHMS provides overall stewardship of the health sector and plays a regulatory role through strategic planning, standard setting and guidelines, for both government and non-state providers. The MHMS is responsible for providing public health services, including maternal and child health, family planning, school-based outreach, dental services, mental health, and vaccination and immunization. Section 10 (2) of the Health Services Act enables the Ministry to arrange with Provincial Assemblies

and the Honiara City Council (HCC) to undertake any of the above-mentioned public health services. Section 13 of the Act also empowers the Ministry to make arrangements with church or voluntary bodies for the provision of health services.

The Environmental Health Act 1980 sets up the administration and structure of community health in Solomon Islands. The Minister of Health is responsible for the administration of environmental health services. The Minister may delegate this administration to the Provincial Government and the HCC which are designated as Enforcement Authorities. The Environmental Health (Public Health Act) Regulations deal with public health issues and how to deal with them when they occur. The regulations empower the Minister and the Under Secretary of the MHMS to take specific measures to prevent the occurrence of a public health disease or where such disease had already occurred, to take measures to contain and prevent the spread of the disease.

To ensure quality of care, key legislative instruments implemented and upheld by the MHMS include:

- Health Workers Act 1989 – which regulates the functions and duties of various categories of health-workers and establishes a Health Workers Board "to prescribe registration, deal with matters pertaining to discipline and other connected matters";
- Medical and Dental Practitioners Act 1988 – "to regulate medical and dental practitioners";
- Nursing Council Act 1987 – which establishes a Nursing Council to register and regulate nurses, midwives and auxiliary nurses; and
- Quarantine Act 1978 – "for the inspection, exclusion, detention, observation, segregation, isolation, protection, treatment, sanitary regulation and disinfection of vessels, persons, goods and things" in order to prevent the introduction or spread of diseases.

5.1.8 Infection prevention control and healthcare waste management

Infection Prevention and Control Guidelines (IPCG) for Health Facilities were commissioned in 2020 by the World Health Organization (WHO) in collaboration with the MHMS (Annex VI) and published in September 2021. The overall purpose of these guidelines is to provide guidance on IPC standards and healthcare waste management for all levels of health service provision within the Solomon Islands. These guidelines are

based upon the WHO Core Components of Infection Prevention and Control, Sierra Leone National IPC Guidelines, the previous MHMS Solomon Islands IPC Guidelines, and the Secretariat of the Pacific Community (SPC) Infection Prevention and Control Guidelines.

The MHMS is responsible for the regulation of healthcare waste in the Solomon Islands. However, generally the management of healthcare waste lies with the individual hospitals with little intervention from the MHMS. MECDM is responsible for waste disposal and waste disposal facilities. The waste management sector relies largely on legislative and regulatory documents that contain general waste provisions. The legislations summarized in Table 5.1 should be used as the guidance for proper management of healthcare waste in the Solomon Islands. The MHMS IPCG also contains measures for managing health-care waste (Annex VI).

Table 5.1 *Legislation and Regulatory mechanism Impacting Healthcare Waste Governance – Solomon Islands*

Legislation	Type	Summary	Regulator/Agency
Environment Act 2008	Act	The Act makes provisions for the protection and conservation of the environment. With regards to waste control and management, section 3c of the Act specifies the following: 'to reduce risks to human health and prevent the degradation of the environment by all practical means. In section 3(c) (ii), objects of the Act include to regulate the transport, collection, treatment, storage and disposal of waste and to comply with and give effect to regional and international conventions and obligations relating to the environment. Waste is dealt with in Part IV Control of Pollution. Section 5 establishes an ECD consisting of a Director and Environmental Inspectors who enforce provisions of the Act.	MECDM/ECD
Environmental Regulations 2008	Regs.	Part 5 details the considerations the Director must take in approving a license application for waste discharge. Regulation 14(1)(d) states the Development may issue a Development Consent if satisfied that 'the proposed prescribed development will not contravene any relevant environmental obligation under any international treaty, convention or instrument to which Solomon Islands is a party'. Under r 18(1)(c), an appeal may be made against a decision of the Director under s 32 of the Act on the grounds the decision was 'inconsistent with any international treaty, convention or regional arrangement to which Solomon Islands is a party to'. Regulation 23(1)(c) states the Director may issue a license in Form 8 (a license to discharge waste) if 'the amendment will not contravene any environmental obligation under any international treaty, convention or arrangement to which Solomon Islands is a party'.	MECDM/ECD

Legislation	Type	Summary	Regulator/Agency
Environmental Health Act 1980	Act	This Act's objective is to ensure the maintaining of environmental health. Its regulation prohibits people from causing nuisances including the prohibiting of discharging of noxious matter or waste from premises. Section 94 prohibits depositing waste in water sources of urban sanitary districts. Sch 5 part I section 4 assigns refuse collection and street cleaning and refuse disposal to HCC.	MHMS

5.1.9 Labor Legislation

The legislation governing labor management in the Solomon Islands includes:

- **Labor Act** (revised edition 1996) provides an overarching framework for labor legislation, establishing standards in relation to:
    - Days and hours of work
    - Payment of wages
    - Written contracts of employment
    - Maternity leave
    - Child labor
    - Care of workers
    - Termination of employment
- **Trade Unions Act** (revised edition 1996), which regulates the registration, leadership and operation of trades unions in Solomon Islands
- **Workmen's compensation Act** (revised edition 1996) makes provision for compensation to workmen injured at work in Solomon Islands, it's also includes occupational diseases.
- **National Provident Fund Act** (revised edition 1993) requires employers to pay contributions for any employee under a contract of service or apprenticeship.
- **Unfair Dismissal Act** (revised edition in 1996) provides a remedy for employees who may be unfairly dismissed and establishes right of referral to the Trade Disputes Panel
- **Safety at Work Act** (1982) designed to establish safe systems of work to eliminate or minimize the risks to health, safety and welfare. Under the Safety at Work Act, employer has the duty to:
    - Ensure the health, safety and welfare of all employees including part-and full-time workers, temporary workers and work experience people.
    - Inform, instruct and supply relevant information to all employees

- Ensure that all plant, machinery and systems of work are safe and without risk to health and safety.
- Ensure that all premises are safe to use and that all hazardous processes are either eliminated or adequately controlled.
- Ensure that adequate training is supplied to staff where applicable
- Ensure freedom from discrimination, harassment, bullying or violence in the workplace.
- Ensure the health and safety of other who are not employed by the employer but may be affected by their undertaking, for example visits or contractors.

The COVID 19 ERP has prepared an overarching Labor Management Procedure (LMP) document which aligns with ESS2 Labor and Working Conditions of the WB ESF.

5.1.10 Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)

The primary policy and legislation dealing with GBV, SEA and SH are:

- **The Family Protection Act (FPA) 2014** - The passing of the Family Protection Act 2014 (FPA) marked the culmination of many years of lobbying by the government and civil society. This Act criminalises domestic violence and provides increased protection, and promotes the safety, health and well-being of victims of domestic violence. This includes physical, sexual, psychological and economic abuse. It also defines the types of relationships in which domestic violence can occur. The FPA is a mixture of criminal and civil law. While it criminalises behaviours relating to domestic violence, it also provides civil remedies to protect victims and ensures their safety.
- **National Policy to Eliminate Violence Against Women and Girls** – In the National Development Strategy 2016- 2035 the Solomon Islands government commits to "create a modern, united and vibrant Solomon Islands founded on mutual respect, trust and peaceful coexistence in a diverse yet secure and prosperous community where tolerance and gender equality are encouraged and natural resources are sustainably managed." The Strategy further identifies gender equality priorities through detailed reference to the National Gender Equality and Women's Development (GEWD) Policy, Disability Strategy, and Children's Policy. The National Gender Equality and Women's Development Policy 2010-

2020 provides the framework to implement Solomon Island's international and regional commitments to gender equality.

- **National Gender Equality and Women's Development Policy -** The Gender Equality and Women's Development (GEWD) Policy 2016 – 2020 is an overarching policy framework for achieving gender equality and women's human rights in Solomon Islands. As such, other national and international frameworks and commitments for gender equality and human rights which the Solomon Islands Government has adopted or to which it is already a party such as the Convention on the Elimination of All forms of Discrimination against Women (CEDAW) and the Sustainable Development Goals (SDGs) is fundamental to the purpose of this Policy.

5.2 World Bank Environmental and social framework (ESF)

Under WB classification the overall Subproject environmental and social risks rating is set at Substantial, particularly in relation to: (i) Occupational, Health and Safety (OHS) management of healthcare workforce; (ii) environmental pollution and community health and safety issues related to the handling, transportation and disposal of healthcare waste; (iii) Infection transmission and (iv) lack of capacity and experience of the implementation agency with regards to the WB's policy requirements for E&S management and (iv) the real or perceived inequities to the delivery of services.

The Subproject takes into consideration the potential negative impacts of installing the incinerator particularly given the proposed site is close to residential areas and within the Hospital area which construction and operation will have impacts on the patients and Health workers Mitigations measures will be developed to effectively avoid and/or minimize the impacts. Proper planning and consultation is important to develop mitigation measures, which is suitable for all stakeholders including the environment.

Six of the ten Environmental and Social Standards (ESSs) of the WB ESF have been screened as relevant. They are assessed in **Table 5.2** below. The other four are considered not relevant, namely: ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources, ESS8 on Cultural Heritage, and ESS9 on Financial Intermediaries. Detailed information on the Bank's ESF are available at:

https://www.worldbank.org/en/Subprojects-operations/environmental-and-social-framework

The ESS that apply to the Subproject and the required measures and actions that apply are listed in **Table 5.2**.

Table 5.2 *Relevant Environmental and Social Standard*

Environmental & Social Standard	Relevance to the Subproject
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	ESS1 is relevant to this Subproject as installation of the incinerator and construction of the new solation unit will potentially have E&S impacts on the surrounding environment and people, which requires effective mitigation.
ESS2 Labor and Working Conditions	ESS2 is relevant to this Subproject as it involves the use of human resources to execute the construction activities. It is important to consider the working condition and welfare of the workforce of the Subproject activities. A Labor Management Procedure (LMP) document has been prepared for the overarching Project in accordance with ESS2
ESS3 Resource Efficiency and Pollution Prevention and Management	ESS3 is relevant as this Subproject as it covers the disposal of medical waste and may generate solid waste.
ESS4 Community Health and Safety	ESS4 is relevant as the construction and operation of incinerator may potentially cause health and safety risks to the KILUFI HOSPITAL residents, patients, visitors and surrounding community members.
ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Indigenous people are expected to be the sole or the overwhelming majority of direct Subproject beneficiaries as the Subproject is expected to enhance health system to provide better service for the people. Accordingly, a separate Indigenous Peoples Planning Framework (IPPF) will not be prepared.
ESS8 Cultural Heritage	Although this standard is not considered relevant, in the unlikely event of construction or the movement of earth or items such as materials in connection with any Subproject activities that have not yet been identified the chance finds procedure (CFP) provided in the CoESP will apply.
ESS10 Stakeholder Engagement and Information Disclosure	ESS10 is relevant as the Subproject ensures to engage relevant stakeholders through the life cycle of the Subproject. A Stakeholder Engagement Plan (SEP) has been developed for the overarching Project in accordance with ESS10

5.3 World Bank group Environmental, Health and Safety guidelines (EHS Guidelines)

The following EHS guidelines are relevant to the Subproject will be used to guide the development of a Code of Environmental and Social Practice (CoESP – Appendix 2) and LMP:

- General EHS Guidelines: Environmental
- General EHS Guidelines: Occupational Health and Safety
- General EHS Guidelines: Community Health and Safety
- General EHS Guidelines: Construction and Decommissioning

- Environmental, Health, And Safety Guidelines Health Care Facilities.

5.4 World Bank operations to addess COVID-19

The World Bank Group (WBG) has developed the following guidance material to guide the preparation of WB operations to respond to the COVID-19 outbreak:

- Guideline for the preparation of a Contingency Plan for Subproject Sites.
- Technical Note: Public Consultations and Stakeholder Engagement to be applied to Subprojects under implementation and those under preparation.
- Technical Note: Use of Military Forces to Assist in COVID-19 Operations Suggestions on how to Mitigate Risks.
- Technical Note: SEA/H for HNP COVID-19 Response Operations.

For ESS1, the WB also identifies risks and mitigations measures for the transactions involving specific Subproject finance activities (i.e. works, goods and services, and technical assistance). The guidance has been considered during the preparation of this ES and supporting documents.

5.5 Relevant International and regional agreements

Solomon Islands is a party to the following regional and international agreements:

- London Convention and Protocol. The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, commonly called the "London Convention", is an agreement to control pollution of the sea by dumping. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of waste and other matter. In 1996, the "London Protocol" was agreed to further modernize the Convention and, eventually, replace it. Under the Protocol all dumping is prohibited, except for possibly acceptable waste on the so-called "reverse list". The Protocol entered into force on 24 March 2006 and there are currently 53 Parties to the Protocol, including the Solomon Islands.
- Natural Resources and Environment of the South Pacific Region (1986) (SPREP or Noumea Convention). This Convention is the major multilateral umbrella agreement in the Pacific Region for the protection of natural resources and the environment. This Convention was ratified by the Solomon Islands in 1989.
- Pacific Regional Solid Waste Management Strategy 2010-2015. Solomon Islands was one of several Pacific island countries to adopt the Pacific Regional Solid Waste Management Strategy, initiated by SPREP, and adopted by member

countries in 2009. This regional strategy covers medical waste from public institutions such as hospitals and health care Hospitals, and special and difficult waste such as asbestos.

- Stockholm Convention for Persistent Organic Pollutants. The Stockholm Convention on Persistent Organic Pollutants is an international environmental treaty, signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs). This convention was ratified and entered into force in Solomon Islands in May 2004.
- Waigani Convention on Hazardous Waste. The 1995 Waigani Convention is a treaty that bans the exporting of hazardous or radioactive waste to Pacific Islands Forum countries and prohibits Forum island countries from importing such waste. The convention has been ratified by Solomon Islands and entered into force in 2001.

5.6 Relevant good international industry practice (GIIP)

Relevant Good International Industry Practice (GIIP) such as WHO technical guidance have been developed for addressing COVID-19. These technical guidance documents are evolving, and they are being updated as new information becomes available and country conditions change. The guidance has been considered during the preparation of this ESIA and supporting documents.

WHO resources include technical guidance on: (i) laboratory biosafety, (ii) infection prevention and control, (iii) rights, roles and responsibilities of health workers, including key considerations for occupational safety and health, (iv) water, sanitation, hygiene and waste management, (v) quarantine of individuals, (vi) rational use of PPE, (vii) oxygen sources and distribution for COVID-19 treatment centers, (viii) Surveillance and case definitions, (ix) Risk communication and community engagement, (x) vaccine readiness assessment, (xi) surveillance of adverse events following immunization.

WHO Guidelines for COVID-19 are summarized in **Table 5.3**. Additional guidance is also listed in Annex VIII of the IPCP.

***Table 5.3**. WHO Guidelines for COVID-19*

WHO Guideline	Content
Covid-19 guidance environmental on cleaning for healthcare facilities 17 April 2020	Guidance on the cleaning and disinfection of rooms and wards or areas in healthcare facilities occupied with suspected and confirmed COVID-19 patients.
Covid19-stigma-guide	Methods to address risk of social stigma and discriminatory behaviors against people of certain ethnic backgrounds as well as anyone perceived to have been in contact with the virus.
Critical preparedness readiness and response actions COVID-10 2020-03-22_FINAL-eng	Update to the interim guidance document. This version provides updated links to WHO guidance materials and provides the full list of WHO technical guidance available for COVID-19 and provides updated recommendations in the table.
WHO-2019-nCoV-essential_health_services-2020.1-eng	Countries will need to make difficult decisions to balance the demands of responding directly to COVID-19, while simultaneously engaging in strategic planning and coordinated action to maintain essential health service delivery, mitigating the risk of system collapse. … Establishing effective patient flow (including screening, triage, and targeted referral of COVID-19 and non-COVID-19 cases) is essential at all levels.
WHO-2019-nCov-Hand_Hygiene_Stations-2020.1-eng	Hand hygiene is the most effective single measure to reduce the spread of infections through multimodal strategies.
WHO-2019-nCoV-HCF_operations-2020.1 – eng	To guide the care of COVID-19 patients as the response capacity of health systems is challenged; to ensure that COVID-19 patients can access life-saving treatment, without compromising public health objectives and safety of health workers.
WHO-2019-nCov-HCW_risk_assessment-2020.2-eng	This data collection form and risk assessment tool can be used to identify infection prevention and control breaches and define policies that will mitigate health care worker's exposure and nosocomial infection (infection originating in a hospital).
WHO-2019-nCov-HCWadvice-2020.2-eng	This document highlights the rights and responsibilities of health workers, including the specific measures needed to protect occupational safety and health.
WHO-2019-nCov-IPC_Masks-2020.3-eng	It is possible that people infected with COVID-19 could transmit the virus before symptoms develop. It is important to recognize that pre-symptomatic transmission still requires the virus to be spread via infectious droplets or through touching contaminated surfaces.
WHO-2019-nCoV- IPC_WASH-2020.2-eng	Frequent and proper hand hygiene is one of the most important measures that can be used to prevent infection with the COVID- 19 virus. WASH practitioners should work to enable more frequent and regular hand hygiene by improving facilities and using proven behavior-change techniques.
WHO-2019-nCoV-IPC-2020.3-eng	Guidance on infection prevention and control (IPC) strategies for use when COVID-19 is suspected.
WHO-2019-nCoV-IPCPPE_use-2020.2-eng	Summarizes WHO's recommendations for the rational use of personal protective equipment (PPE) in health care and community settings, as well as during the handling of cargo.
WHO-2019-nCoV-Leveraging_GISRS-2020.1–eng	Several countries have demonstrated that COVID-19 transmission from one person to another can be slowed or stopped. The key actions to stop transmission include active case finding, care and isolation, contact tracing, and quarantine.

WHO Guideline	Content
WHO-COVID-19-lab_testing-2020.1-eng	Laboratory testing guidance for COVID-19 in suspected human cases.
WHO-COVID-19-IPC_DBMgmt-2020.1-eng	Interim guidance for all those, including managers of health care facilities and mortuaries, religious and public health authorities, and families, who tend to the bodies of persons who have died of suspected or confirmed COVID-19.
WHO-WPE-GIH-2020.2-eng	The purpose of this document is to provide interim guidance on laboratory biosafety related to the testing of Hospital specimens of patients that meet the case definition of the novel pathogen identified in Wuhan, China, that is, coronavirus disease 2019 COVID-19.
WHO 2019 Overview of the Technologies for the Treatment of Infectious and Sharp Waste from Health Care Facilities?	The purpose of this document is to provide 1) criteria for selecting technologies to facilitate decision making for improved health care waste management in health care facilities and 2) an overview of specific health care waste technologies for the treatment of solid infectious and sharp waste for health care facility administrators and planners, WASH and infection prevention control staff, national planners, donors and partners.
WHO-2019-nCov-Immunization-Cold_Chain-2020.1-eng.pdf	The purpose of this document is to provide advice on cold-chain safety considerations.

6 Impact Assessment

6.1 Incinerator Unit

The CA03 Incinerator model procured by the PMU was not reviewed for E&S compliance requirements. The CA03 is a new unit and the supplier advised that emissions testing has not been completed and no data is currently available. Completion of modelling is not feasible for this Subproject based on lack of baseline data (and no working monitoring equipment in country), capacity, budget and time constraints. The incinerator will arrive in country in August. Storing the incinerators is considered a risk as units may deteriorate and there is a chance parts will go missing. Because emissions data is not available for the purchased CA03 model, data for a similar model has been adopted to give an indication of expected emissions. Refer to Table 6.1 technical specifications for the i8-M70 incinerator model compared to the CA03 model.

Table 6.1 *Technical Specifications of the i8-M70 Incinerator Model vs CA03 model*

	CA03	I8-M70
Chambers	2	2
Operation Temperature	> 1,100°C _ < 1,200°C (in Secondary Chamber)	>850°C (in secondary chamber)
Burn rate	Up to 20kg per hour	Up to 50kg per hour
Dimensions (l,w,h)	2.085m x 1m x 6m	1.61m x 1.19m x 4.68m

	CA03	I8-M70
Fuel Consumption	Full tank takes 4 weeks (5 days/wk use).	10-15 liters per hour
Fuel Type	Diesel	Light Oil, Diesel, Kerosene, Gas, LPG
Combustion Chamber Volume (m3)	0.3m³	0.75m3
Shipping Weight	4,200kg	2,450kg

Note: Actual burn rates and emissions will depend on a number of factors including waste type, volume of waste, moisture content, fuel used and local environmental conditions. *Source: iNCINER8, Advanced Combustion Engineering*

Use of the incinerator will result in emissions. Measured emissions (i.e., from the stack) were not able to be provided by the supplier. The results for the I8-M70 model have been utilized and compared to EU standards to give an indication of expected AQ outputs. These are provided in **Table 6.2**. Solomon Islands does not have air emissions standards, The WB EHS Guidelines for Health Care Facilities[2] provide emissions targets for small incinerators and these have been provided in **Table 6.2**. Most of the parameters provided in these guidelines differ slightly from the monitoring data provided by the vendor so direct comparison cannot be undertaken for most parameters. According to iNCER8, these figures are guidelines only and actual emissions depend on several factors including waste type, volume of waste, moisture content, fuel used and local environmental conditions.

Table 6.2 *Average emissions (on basic incinerator with secondary chamber without scrubbing system)*

Parameter	Measured*	European Union Standard**			EHS Guidelines for Health Care Facilities***
Averaging time	1/2 hour	Daily	Hourly	4 hours	Not specified
Unit	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
Total Dust	12	5	10	NS	-
Total Particulate Matter	NS	NS	NS	NS	10
Total organic carbon	5	5	10	NS	10
Chlorine compounds	NS	5	10	NS	NS
Hydrogen chlorine	NS	NS	NS	NS	10
Fluorine compounds	NS	1	2	NS	NS
Hydrogen fluoride	NS	NS	NS	NS	1
Sulphur dioxide	2.4	25	50	NS	50
Nitrogen dioxide	60	100	200	NS	-
NOx	NS	NS	NS	NS	400
Carbon monoxide	78.3	50	100	NS	50

[2] https://www.ifc.org/wps/wcm/connect/960ef524-1fa5-4696-8db3-82c60edf5367/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&CVID=nPtgRx5&id=1323161961169

Parameter	Measured*	European Union Standard**			EHS Guidelines for Health Care Facilities***
Mercury	NS	NS	NS	0.05	0.05
Cadmium and thallium	NS	NS	NS	0.05	0.05
Lead, chromium, copper, and Manganese	NS	NS	NS	0.5	0.5 (excluding tin)
Nickel and arsenic	NS	NS	NS	0.5	
Antimony, cobalt, vanadium and tin	NS	NS	NS	0.5	
Dioxins and furans	NS	NS	NS	0.1 ng/Nm3TEQ	0.1 ng/Nm3TEQ
Oxygen content	NS	At least 6%			At least 7%

** Source: iNCER8; ***Source: WBG EHS Guidelines for Health Care Facilities; NS = Not Specified*

While data is not available for the specific model purchased, based on the above it can be extrapolated that air quality impacts will be manageable and an improvement on the current situation where waste is burned on the ground. The supplier has advised that the units create minimal odor and are smoke free when operated as designed. As such, comprehensive training for operators will be the key mitigation measure, supported by working with the PMU to ensure that the appropriate budget and plans are in place to ensure that incinerator is maintained. The incinerator will provide an improvement from the current practice of open pit burning. The PMU will monitor the operation of the incinerator post-installation and adjust procedures if necessary, based on their observations and community feedback which will be collected via consultation and the Subproject Grievance Redress Mechanism (GRM).

The overall impact of the Subproject is expected to be largely positive by improving infection control and more efficient and safer disposal of medical waste for the Hospital and possibly Auki clinic. Construction for the installation of incinerator will introduce short-term impacts that will require management and mitigation strategies. The impacts and risks are discussed under this section and mitigation measures to manage these impacts and risks are described in Section 7 and **Table 7.1**. Operation of the incinerator will generate ongoing impacts as described in Section 6.1.3.

The work scopes and all identified impacts and risks will be further assessed during the development of the Code of Environmental and Social Practice (CoESP). The selected contractor is required to develop a CoESP, based on this ESIA, to confirm activities and to identify any additional impacts or risks not in this ESIA. The CoESP requires PMU

approval prior to any works proceeding and a template and guiding text is provided to assist the contractors as Appendix 2.

6.1 Potential site environmental and social impacts

6.1.1 Planning and design

The planning of the Subproject is a collective effort through discussions between the PMU, MHMS, WB, and Kilufi Hospital management and representatives of receptor communities (Section 10). The PMU ESHS&CE Officer has conducted formal and informal discussions and consultations with the stakeholders on the Subproject activities and impacts.

During planning, the ideal site selected for the incinerator was on unoccupied land further away from the Hospital but still within the Hospital compound. It is within the waste disposal zone demarcated by the Hospital management and beside a failed incinerator. The site is free from land dispute being within the Hospital compound. Selected materials and facilities are considered in the design to ensure durability, accessibility, sustainability and suitability for tropical climate. Stakeholders involved in the Subproject are the MHMS, residents, contractor, Hospital management and Malaita provincial government. The associated risks in planning of the Subproject include; engaging an unfit contractor to construct the incinerator, procuring inappropriate incinerator for the hospital, community grievances, and design failure due to natural hazards.

6.1.2 Construction

The construction and installation activities for the incinerator will not require land acquisition as it is already within Kilufi Hospital land. The residents' representatives who are mostly staff and hospital management have been consulted about the construction activities and the possibility of clearance of wild food plants (should there be any) that they might be using as their alternative food located within the incinerator site. A list of consultations and issues are presented in Appendix 3.

Grasses and shrubs will be removed and there will be minor earthworks to construct the foundation for the incinerator and power plant shed which may result in some sediment runoff. Digging of the ash pit next to the incinerator shed may also cause some sediment runoff during heavy rainfall where topsoil may be carried down the slope.

The minor earthworks involved may generate noise and vibration from machinery and vehicles used. This may cause nuisance to the Hospital patients and nearby residents.

Vehicles and machinery operating during construction and installation may generate dust and fumes with potential associated health risks to sick patients at the Hospital. The contractor will obtain construction materials from manufacturer/suppliers locally/internationally and provide the workforce for the Subproject, which could include casual labor from surrounding residents and villages. Construction materials such as gravel, sand, timber, cement and reinforcing steel for concrete will be obtained by the contractor from material suppliers in Honiara or within Auki town and transported to site on appropriate vehicles.

Material storage will require hardstands next to the site. Construction work will use water for concrete mixing and washing of tools after each days' work. This has the potential to affect the surrounding area including the road by creating pooled water and muddy conditions. Also, workers will need access to a toilet and clean water for food preparation and general use.

There may be a risk of limited or substandard materials, equipment, and engaging inappropriate workers, which could not deliver expected quality of work. The construction of the incinerator is within the Hospital area and may pose a risk of accidents and injuries to health workers, staff and patients at the Hospital. Construction workers will choose where to be accommodated within Kilufi or Auki Township, casual workers could live in their homes around Auki and travel to work site every morning. Accommodating some workers within Hospital compound is advisable in order to provide security for tools, materials and equipment on site. The possible risk of Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH) and Violence Against Children (VAC) will need management onsite during working times and if workers are accommodated locally or onsite.

Vehicle access to the incinerator site is through a drive way that will be constructed by the contractor. This will be the only access and can also be used for foot access as shown in **Figure 4.5**. The vehicle access road will be used during construction to bring in materials, machines, equipment and workers to the site. That same road is also daily commuted by residents living nearby and along that road are residential buildings.

Increased traffic poses the risk to community health and safety to the residents in terms of possible accidents, dust, odor and noise as machines and vehicles will frequent the road

near residential buildings during construction. Construction will also generate waste which may pose risk of pollution to the environment.

6.1.3 Operations

During operation, the Subproject activities require water and will be connected to the existing water system of the Hospital. This is unlikely to create a shortage of water to the Hospital as the water would only be used for cleaning bins, tools, equipment and vehicles. The incinerator may also produce noise during usage, which may impact nearby residents. Additionally, odor and dust during transportation of waste to incinerator site may cause nuisance to nearby residents and reduce air quality in the vicinity. The residents and patients may experience fumes, smoke/odor from the incinerator.

The incinerator consists of durable materials and the structure is permanent which may add to solid waste at the end of the facility's life-span. Appropriate disposal methods will be considered for end of life waste. In extreme natural hazards such as flooding by intensive and prolonged down-pours of rain, water may wash dust or ash into nearby vegetation, the road and residential areas.

The potential for fire will be managed through keeping surrounding vegetation maintained and the provision of adequate firefighting equipment. Incorrect operation of incinerator may cause damage to the equipment and aggravated risks and a professional level of operations needs to be maintained to avoid workplace risks.

6.1.4 Decommission

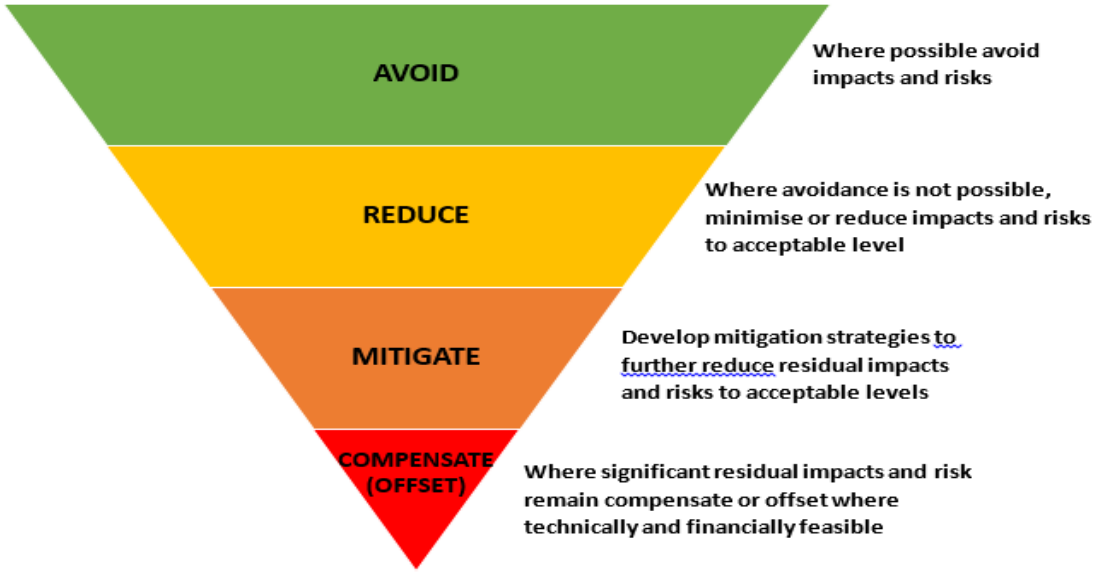
At the end of the incinerators life-span, infrastructure such as the incinerator and generator shed are repairable and for this case will be renovated and/or expanded to maintain the operations. Any decommissioned waste from the incinerator unit will be transferred to Auki township landfill site for disposal. All the ash will be buried and sealed in the ash pit. There is a minor risk that improper disposal of the equipment and waste may result in pollution. There is the expectation that the Auki damp site will be refurbished and reorganized through external assistance given the Townships potential for growth and expansion. This would enable proper management of solid and hazardous wastes generated by any decommissioning exercise.

7 Environmental and Social Management Plan (ESMP)

To address the potential adverse impacts and risks of the Subproject, mitigation measures have been developed to avoid and/or minimize the impacts and risks on the biophysical and social environment surrounding the Subproject site utilizing the mitigation hierarchy detailed in **Figure 7.1.** These mitigation strategies will be in the form of management actions and the responsible entity to implement those strategies. The mitigation strategies will be transferred and further developed for any site specific requirements through the development of a CoESP which forms the primary instrument for implementation of the ESMP.

Negative impacts and risks during the various phases of the Subproject are considered and strategies to avoid and/or minimize the impacts, in the best way possible, will be implemented. **Table 7.4** details the impacts, risks and mitigation strategies to avoid or mitigate impacts and risks of the Subproject.

Figure 7.1 *Mitigation Hierarchy*



7.1 Planning and design

During planning, the PMU has conducted consultation with relevant stakeholders to inform and gather feedback on the Subproject. In addition, the PMU with the MHMS shall conduct a proper procurement process to ensure a qualified and reputable contractor is selected based on capacity and capability to carry out the construction and installation work and implement the required E&S management measures to mitigate impacts and risks. The MHMS and PMU will ensure materials; equipment and building designs suit

the tropical climate condition and requirements for incinerator. The site for the incinerator has been selected during consultation as the area designated for waste management and the incinerator will be installed at the furthest corner of the site.

7.2 Construction

The contractor and the PMU ESHS&CE Officer will closely monitor the implementation of the CoESP to mitigate the adverse impacts and risks of the Subproject. Any soil erosion from earthworks for incinerator and generator shed footing will be minimized by securing excavated top soil or gravel that are likely to be washed off, during rain, in a proper place and limit removal of vegetation. Vegetation will be maintained and only trees and vegetation that hinder the construction site would be removed. This means only grasses and plants that are on the incinerator site should be removed and the rest of the areas should remain as it is.

The contractor must dispose all non-recyclable construction waste in a secure and appropriate landfill. Dust from construction activities should be controlled by the contractor utilizing appropriate methodologies. Waste water from site must be properly managed or soaked into proper pits. The Subproject shall ensure the contractor provides full PPE for the workforce and any visitor to the site. Noise and vibration during construction is to be reduced by switching off machines and equipment when not in use and contractor to provide noise protection gear to workers.

Traffic management to reduce any hazards from construction vehicles will be undertaken by the contractor to minimize risks to the community, Hospital staff and patients. Generators and similar machinery are to be placed in locations to minimise noise to the Hospital and residents. Construction barricades should be installed to avoid public access to the sites and to avoid injuries. Proper water channels and drainage, if required, should be constructed to control storm water and flooding during construction and operation of the incinerator. During unloading of materials, construction workers will control traffic to avoid any inconvenience or hazards and all the Hospital patients and surrounding residents will be advised to avoid the working area.

The PMU will ensure that contractors are fully aware of GBV, SEA, SH and VAC requirements outlined in the ESMP for the workforce. The MHMs has a national GBV Officer working under the social welfare department. There is an established national referral system called Safenet for the country, which the Subproject and PMU will utilize.

Details of the system can be found on the link[3] in the footnote. In addition, training will be provided to the contractor to improve their capacity to comply with the requirements of the CoESP.

7.3 Operations

Water connection will be made to the Hospital water system for the use of the incinerator operation especially for washing of bins, tools, equipment and vehicles before returning. Waste water from the operation of the facility must be properly handled through the use of drainage and a soak-pit.

The CA03 Incinerator model procured by the PMU (**Figure 4.1 and Table 4.1**) has not been independently reviewed for World Bank E&S compliance requirements. The CA03 is a new unit and the supplier advised that emissions testing has not been completed and no data is currently available. Based on this, air emissions data for a similar unit has been adopted and used as an indication of likely air quality emissions. Completion of modelling is not feasible based on lack of baseline data (and no working monitoring equipment in country), capacity and budget and time constraints. The incinerators arrive in country in early August. Storing the incinerators is considered a risk as units may deteriorate and there is the chance parts will go missing.

The supplier has advised that the units create minimal odor and are smoke free when operated as designed. As such, comprehensive training for operators will be the key mitigation measure, supported by working with the PMU, NTC and Hospital to ensure that the appropriate budget and plans are in place to ensure that incinerator is maintained. The new unit will provide an improvement from the current open burning practice which generates a lot of pollution. The PMU will monitor the operation of the incinerator post-installation and adjust procedures if necessary, based on their observations and community feedback which will be collected via the GRM.

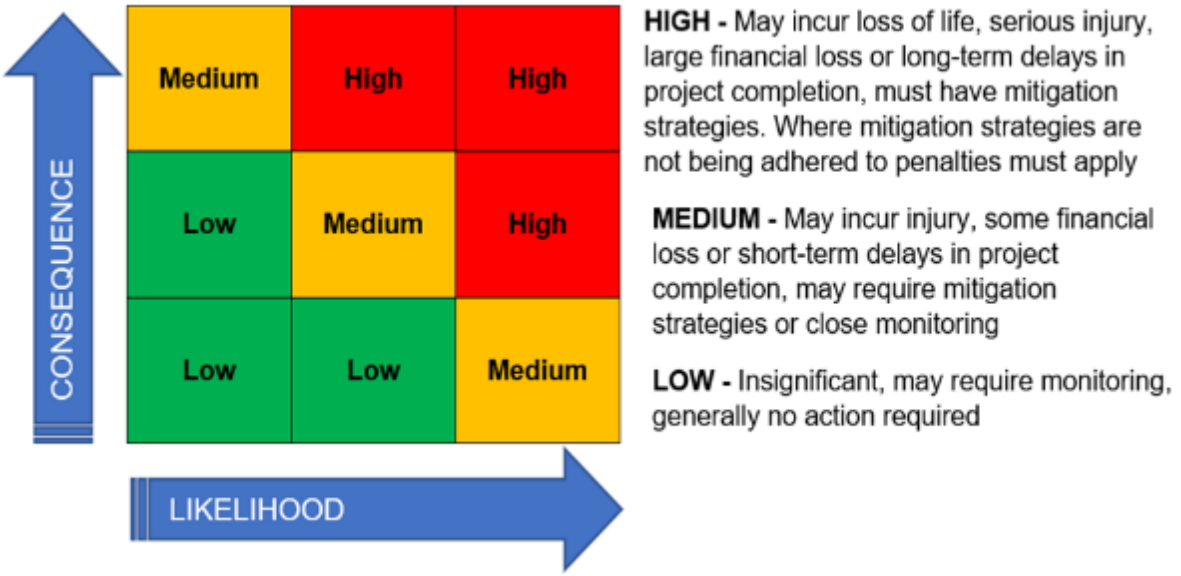
7.4 Impact risk rating

For the purpose of this ESIA an impact is the expected outcome of an action and risk is the chance that the impact will occur, calculated as potential consequences of harm by the likelihood of the event occurring. Risk analysis for this ESIA was undertaken using the

[3] https://www.facebook.com/SAFENETSolomonIslands/about

likelihood- consequence matrix detailed in **Figure 7.2.** The risk of the Subproject is considered medium as the implementation of the Subproject may cause erosion, noise and waste pollution, injuries and grievance which mitigation measures are developed.

***Figure 7.2** Risk Matrix*



7.5 Residual Risks

To determine the residual risks for each potential impact post implementation of mitigation strategies, a similar risk assessment approach has been undertaken. The likelihood of an impact occurring following the implementation of management and mitigation measures is assessed using the categories provided in **Table 7.1.**

***Table 7.1** Likelihood categories*

Likelihood	Description
Certain	Expected to happen routinely during the Subproject life
Likely	Could easily happen and has occurred on a previous similar Subproject
Unlikely	Possible, but not anticipated

The consequence of the impact occurring following the implementation of management and mitigation measure is assessed using the categories provided in **Table 7.2**.

***Table 7.2** Consequence categories*

Consequence	Description
Minor	Minor effects on biological, social, economic or physical environment, both built and natural. Minor short to medium term damage to small area of limited significance, easily rectified.
Moderate	Moderate effects on biological, social, economic or physical environment, both built and natural. Moderate short to medium term widespread impacts. More difficult to rectify

Major	Serious effects on biological, social, economic or environment, either built or natural. Relatively widespread medium to long term impacts. Rectification difficult or impossible.

Based on the assessment of the likelihood and consequence of a given risk with the proposed management and mitigation measures in place, a residual risk rating is derived from the risk matrix as presented in **Table 7.3.**

Table 7.3 *Residual Risk Matrix*

Likelihood	Consequence		
	Minor	**Moderate**	**Major**
Certain	Medium	High	High
Likely	Low	Medium	High
Unlikely	Low	Low	Medium

If an identified residual risk is not lowered or remains high, consideration of additional management and mitigation measures will be identified and implemented, or justification provided for the risk.

Table 7.4 details the assessed impacts and risks, the mitigation strategy to be applied to reduce each impact and risks, the persons/agency responsible for implementing the mitigation strategy and the residual risk after mitigation strategies are applied.

Table 7.4 *Impacts, risks, mitigation, responsibility and residual risk*

Potential Impacts	Potential Risks	Risk	Mitigation	Responsibility	Residual Risk
Design					
Subproject Failure	Inadequate design		Undertake sufficient research utilizing suitable technical specialists to identify appropriate sustainable technology	MHMS/PMU	
	Community does not accept Subproject		Facilitate good community consultation to ensure community understanding and acceptance of the Subproject prior to implementation. Maintain a record of all consultations and provide regular feedback to communities on the status of the Subproject	PMU	
	Permits not in place		Ensure all the legally required permits are obtained prior to undertaking the construction and this ESIA is acceptable for the SIG environmental approval process	PMU	
	E&S risks not mitigated		The contractor bidding documents should contain clauses on E&S	PMU	

Potential Impacts	Potential Risks	Risk	Mitigation	Responsibility	Residual Risk
			requirements to guide the contractor on the key requirements. Table 8.1 provides guidance for the bidding documents		
Construction					
Degradation of flora and fauna	Loss of critical flora and fauna		The contractor should ensure that there is minimal disturbance to the Subproject site area The contractor shall as much as possible complete the works in such a manner that natural aesthetics shall be retained at the location No unnecessary removal of plants, bushes, shrubs, trees and palms at the site. Guidance included in the CoESP	Contractor	
Water quality	Erosion and sediment runoff		The contractor will ensure proper demarcation of the Subproject area to be affected by the works Works to limit vegetation removal at the Subproject site; Any excavation activities should not interfere with local drainage or introduce physical changes that are not in harmony with the physical setting of the Subproject area Retention of grass, herbaceous plants, shrubs and trees, to the extent possible on the Subproject site Drainage system to divert storm water around the facility as per design (Figure 4..3, 4.4 & 4.5) Guidance included in the CoESP	Contractor	
	Pollution		Ensure proper handling, storage and disposal of waste oil, lubricants, oil filters and fuel from generator Guidance included in the CoESP		
Noise and vibration	Community grievances		Undertake works at suitably agreed times that do not impact the community adversely Observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines when not in use Provision of appropriate PPE (hearing protection ear muffs) to the workers and any other person	Contractor	

Potential Impacts	Potential Risks	Risk	Mitigation	Responsibility	Residual Risk
			visiting the site Guidance included in the CoESP		
Road damage, dust and traffic	Community grievances, loss of access		Undertake works that do not coincide the wet season to avoid damage to the road and heavy vehicles getting stuck Reduce speed close to sensitive receptors to reduce dust and traffic accidents	Contractor	
Solid waste	Community grievances		Ensure all solid waste is deposed to approved landfill sites or in a manner that is acceptable to the community Guidance included in the CoESP	Contractor	
Loss of crops	Community oppose Subproject due to loss of livelihood		Document any food crops onsite and if required facilitate written agreements through consultation if they are impacted by site works	Contractor	
Local employment	Community grievances		Where possible use locals and local businesses Guidance included in the CoESP	Contractor	
Social disruption	Community grievances		Non local workers to treat locally community with respect and follow the code of conduct (COC) as outlined in the CoESP	Contractor	
Occupational health and safety	Injury or death		Contractor to conform to all OHS laws and regulations All construction workers should be inducted on the health and safety requirements while at Subproject site Workers should be provided with adequate and appropriate PPE (safety helmets, shoes, gloves, mask,) and enforce on use of the PPE Provision of clean and accessible sanitary facilities and water to workers Install safety signage at the work site should be done by a trained certified, experienced personnel and include contacts for nearest emergency services Contractor to report immediately to the PMU any OHS incidents Guidance included in the CoESP	Contractor	
Operations					
Waste Management	All		Develop a Waste Management Plan (WMP – Appendix 4) that incorporates operational procedures, operational OHS, ash	MHMS – IPC team.	

Potential Impacts	Potential Risks	Risk	Mitigation	Responsibility	Residual Risk
			pit use and maintenance, air and water pollution prevention, fire risks and emergency response, training and maintenance.		
Injury or death to operators	Occupational, health and safety		OHS risks related to medical waste management including; thermal injuries while operating incinerators, sharps-inflicted injuries & disease infections are expected, the waste handlers and incinerator operators will be provided with adequate and appropriate personal protective equipment, provision of sanitary facilities (wash areas), provision of fire-suppression equipment guidance on operation and maintenance of the equipment, training and capacity building on OHS measures, infection prevention and control and medical waste management to healthcare workers, waste handlers and incinerator operators	Kilufi Hospital/ MHMS	
Ash Pit	Community grievances and disturbance by feral animals		In selecting the appropriate site for the ash pit, to be considered is that it should be as close to the incinerator as possible. Considerations for the local soil type should also be in mind when designing the ash pit. Ash pit will be a sealed unit	MHMS	
Pollution of local water	Heath risks to community		It should be checked that the ash pit will not affect the groundwater, or be affected by it. Ash pits are not recommended in sites where the water table is near the surface or in areas prone to flooding. At least 1.5m from the bottom of the pit to the groundwater level is recommended. The contractor should dig a test pit and insert a narrow metal pipe or bar into the soil to a depth of 1.5 m. If the end of the bar is wet or soil removed from the pipe is wet, the pit may be too close to the ground water. If the groundwater is too close to the bottom of the test pit, considerations for other options such as changing the design of the pit to make it wider but shallower; creating more,	MHMS	

Potential Impacts	Potential Risks	Risk	Mitigation	Responsibility	Residual Risk
			shallower pits or creating a pit that is partially made of bricks above ground. Soak pit to be constructed for wash up waste water runoff. Fuel to be stored in the power shed and handled to avoid any spillage		
Air pollution from incinerator	Community grievances		Develop a set of operating guidelines in the WMP that include: Introduction of waste into the incinerator only after the optimum temperature is reached in the combustion chamber Prevention of waste additions if the operating temperature falls below the required limits. Implementation of a maintenance and other procedures to minimize planned and unplanned shut-downs Avoiding operating conditions in excess of those that are required for efficient destruction of the waste Avoiding operating the incinerator on days where weather conditions will lead to air discharges impacting local communities	MHMS	
Emergencies	Damage to property, injury or death		Emergency responses to be included in the WMP as described in Section 7.6. Keep the area surrounding the incinerator clean and well mowed to remove possible fuel for a fire Have fire extinguishing capacity close to the incinerator when operating Emergency contacts to be displayed in the power storage shed	MHMS	
Decommissioning					
Community expectations	Community grievances		Ensure the obsolete incinerator is disposed of in an acceptable manner in approved landfill (Honiara Land-fill)	MHMS	
Solid waste	Community grievances		Ensure all solid waste is buried in the ash pit or disposed of at an approved landfill site in Honiara.	MHMS	

7.6 Outages and Emergency management

The incinerator may at times encounter problems either itself or issues with the peripheral equipment attached to it such as the local power supply, the generator and/or solar system, which would potentially disrupt its operation. In such situations the Hospital will revert to utilizing the pit burn and bury methodology for general waste and use the existing old incinerator for time being.

There is no flood risk onsite and drainage around the facility will facilitate drainage during heavy rains (**Figure 4.8**). The ash pit would need proper management by the waste management team in order to avoid it being filled prior to another pit being prepared. This practice should be part of the ongoing commitment of the Kilufi Hospital management and will be emphasized during waste management training and instructions included in the WMP.

Management of fuel supplies is important as it has direct relation to the operation of the incinerator. Immediate fuel required for a period of operation will be kept at the site. Fuel transportation to the incinerator will be made on a regular basis considering the fact that the incinerator fuel tank can only store up to a week's worth of burning. Whenever there is no fuel to operate the incinerator, waste will be burnt and buried onsite as per the pre incinerator method.

The responsible waste management staff bares the responsibility to always manage the facility. A barricade fencing, which has been part of the design, will be erected around the facility to avoid intrusion by animals or humans even if the area is unattended for a longer period. It will have a lockable entrance and managed by the waste management staffs of Kilufi Hospital.

For the purpose of back-up and/ or continuity of proper waste management practices, training will include other health workers or part-timers on how to handle and collect medical wastes. This is to complement the IPC nurses, the waste truck driver and handy persons of the Hospital who are currently responsible for waste management.

8 Requirements for Constructions Bidding Documents and E&S Mitigation Cost Estimates

To implement the management of the E&S mitigation strategies the contractor will be required, with the support of the PMU to develop a CoESP (Appendix 2). Development

of the CoESP will be undertaken at the contractor's expense and must be included in all bids for the bids to be valid.

Table 8.1 *E&S requirements and estimated costs for bidding documents*

Potential Impacts	Potential Risks	Mitigation	Contractors Requirements	Estimated Cost
All	**All**	**Develop and implement the CoESP**	**Develop in collaboration with the PMU a CoESP, implement and train staff on CoESP including OH&S**	**USD5,000**
Degradation of flora and fauna	Loss of critical flora and fauna	The contractor should ensure that there is minimal disturbance to the Subproject site area The contractor shall as much as possible complete the works in such a manner that natural aesthetics shall be retained at the location Guidance included in the COESP	The contractor to have a basic understanding of the site parameters and requirements for any earth works or other site disturbances during works	Contractor to include costs, if any, when bidding
Water quality	Erosion and sediment runoff	The contractor will ensure proper demarcation of the Subproject area to be affected by the works. Works to limit vegetation removal at the Subproject site; Any excavation activities should not interfere with local drainage or introduce physical changes that are not in harmony with the physical setting of the Subproject area. Retention of grass, herbaceous plants, shrubs and trees, to the extent possible on the Subproject site Guidance included in the COESP	The contractor to have a basic understanding of the site parameters and requirements for any earth works or other site disturbances during works	Contractor to include costs, if any, when bidding
	Pollution	Ensure proper handling, storage and disposal of waste oil, lubricants, oil filters and fuel from vehicles Guidance included in the COESP	Best practice to be undertaken by the contractor and detailed in COESP	Contractor to include costs, if any, when bidding
Noise and vibration	Community grievances	Undertake works at suitably agreed times that do not	Standard best practice to be undertaken by the	Contractor to include costs, if any,

Potential Impacts	Potential Risks	Mitigation	Contractors Requirements	Estimated Cost
		impact the community adversely Observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines when not in use Provision of appropriate PPE (hearing protection ear muffs) to the workers and any other person visiting the site Guidance included in the COESP	contractor and detailed in COESP	when bidding
Solid waste	Community grievances	Ensure all solid waste is deposed to approved landfill sites or in a manner that is acceptable to the community Guidance included in the COESP	Best practice to be undertaken by the contractor and detailed in COESP	Contractor to include costs, if any, when bidding
Local employment	Community grievances	Where possible use locals and local businesses Guidance included in the COESP	Contractors to priorities local employment and businesses	No cost
Occupational health and safety	Injury or death	Contractor to conform to all OHS laws and regulations All construction workers should be inducted on the health and safety requirements while at Subproject site Workers should be provided with adequate and appropriate PPE (safety helmets, shoes, gloves, masks,) and enforced on use of the PPE Provision of clean and accessible sanitary facilities and water to workers Install safety signage at the work site should be done by a trained certified, experienced personnel Contractor to report immediately to the PMU any OHS incidents Guidance included in the COESP	Best practice to be undertaken by the contractor and detailed in COESP	Contractor to include costs, if any, when bidding

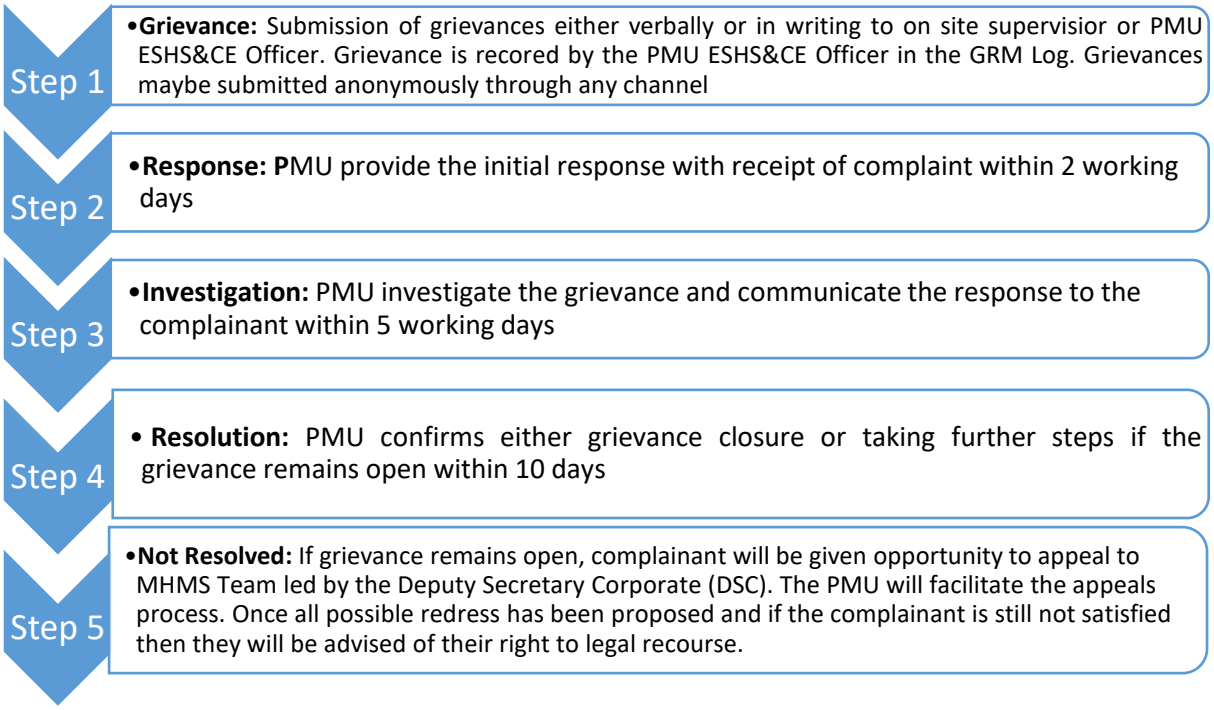
Potential Impacts	Potential Risks	Mitigation	Contractors Requirements	Estimated Cost
Social disruption	Community grievances	Non local workers to treat locally community with respect and follow the code of conduct (COC) as outlined in the COESP)	Detailed in COESP	No cost
COVID - 19	Community infections	All the current at time of construction COVID-19 prevention measures should be observed and may include the following: • Wearing prescribed and appropriate PPE (masks) on site at all times. • Regularly washing hands, sanitizing and observing social distancing at all times • Seeking healthcare services immediately one experiences any of the following symptoms (while at home or work): cough, fever and shortness of breath.	Contractor to comply with COVID 19 mandates at time of construction	Contractor to include costs, if any, when bidding

9 Complaints and Grievances

A Grievance Redress Mechanism (GRM) has been established by the PMU to record and resolve any complaint based on the Subproject activities. Any complaints and grievance during the life cycle of the Subproject will be acknowledged and recorded by the PMU ESHS&CE Officer. If the complaints or grievance is minor, the PMU ESHS&CE Officer and/or contractor/site supervisor may resolve it on site. For complaints and grievance that are not resolved onsite, the PMU ESHS&CE Officer will forward to the PMU Program manager (PM). The PMU PM will liaise with the PMU ESHS&CE Officer to negotiate and implement resolution. However, for complaints and grievance that are not resolve at this level, the PMU PM will forward to the Permanent Secretary (PS) MHMH and its executive for resolution. The PMU ESHS&CE Officer will liaise with all the stakeholders of the Subproject. The CoESP (Appendix 2) will provide guidance to the contractor for managing complaints and grievance on site. The GRM provides the steps

for recording and resolving of any complaint and grievance of the Subproject. Below are the steps for GRM that the Subproject will be using to invite and resolve grievances.

Figure 9.1 *GRM process and timeframes*



10 Stakeholder Engagement

Different stakeholders are involved in the Subproject lifespan. Consultation was carried out as detailed in **Table 10.1**. The key stakeholders include Kilufi Hospital, representatives of provincial government, MHMS and nearby residents and the public. A Stakeholder Engagement Plan (SEP) has been prepared for the overarching Project to assist the stakeholder engagement process. The PMU ESHS&CE Officer conducted several consultations with the Kilufi Hospital management and staff on the Subproject activities. Following this, nearby residents, community representatives were consulted to provide them with information on the Subproject and likely impacts and risks.

Discussions between the PMU ESHS&CE Officer and the community members based on the direct impacts of incinerator included; how it will improve waste management for the hospital and the types of potential impacts and risks such as erosion, noise, dust, and OH&S. Starting dates for construction activities were discussed along with mitigation strategies to control noise, dust, accidents and community interaction with workers

(including GBV, SEA &SH & VAC). Risks are identified and possible mitigation are discussed with the Hospital staffs on site.

Table 10.1 *List of dates and activities carried out for stakeholder engagements for the Kilufi Hospital*

Date	Location	Activity Description	Stakeholders consulted
14th Sept 2023	Kilufi Hospital	• Site visits to Kilufi Hospital and incinerator site. • Consultation for incinerator installation.	- Kilufi Hospital management. - Community representatives. - Provincial government representatives.

11 Capacity Development and Training

Capacity development and training is essential for the sustainability of the Subproject. The supplier of the incinerator shall provide training on incinerator handling and safety. This was assured to be done practically upon installation of the first incinerator which is at Good Samaritan Hospital. However, it can also be done virtually to incinerator handlers and staff of the Kilufi Hospital. The PMU will provide training for the waste handlers through the MHMS IPC group to improve their capacity on waste management. The Subproject shall encourage capacity building and refresher trainings in the long run to improve the Hospital's staff capacity. The Subproject will ensure OHS training for the construction workers are conducted. The MHMS has an Environmental Health Division, which is responsible for provision of OHS training for national Subprojects. In overall, the MHMS being the government, has an ongoing capacity building training program.

12 Incident Management and Emergency response

Any accident or incident to construction workers, Kilufi Hospital staff or the public that occur during the Subproject activities and/or on Subproject site will be reported to the PMU ESHS&CE Officer within 24 hours. The PMU and ESHS&CE Officer's contact details will be placed among other basic information of the works on a printed sign board at the construction site. In an accident, the affected individual (s) will be first treated at the Kilufi Hospital, being the closest health facility to the Subproject site. Then possible referrals can be made to National Referral Hospital (NRH) in Honiara upon Kilufi Doctors' recommendation if/ when the issue is beyond their handling capacity. If the issue is manageable for Kilufi Hospital, it should be resolved there. Additionally, medical safety and first aid kits will be provided on site by the contractor as an OHS obligatory requirements expected to be fulfilled. Also, the construction works is within the Kilufi

Hospital compound hence warrants quick response by medical experts for life threatening incidents.

Incident investigations will be completed as required by MHMS PMU in accordance with the World Bank Environmental and Social Incident Response Toolkit (ESIRT). With regards to fire incidents, the contractor is will include in CoESP a designated emergency assembly area for workers and any additional measures pertaining to fire safety plans and procedures. It is also understood that Kilufi Hospital also has no fire safety equipment nor response plan in place. The Subproject would ensure such plans are in place and are activated and integrated with a fire response plan and procedure of the Subproject managed by the contractor. As part of the ESHS&CE officer's obligation on safety, a stakeholder engagement undertaking will be activated that would further involve the nearest police station (Auki Township Police station) being consulted and alerted for possible response on reported incidents as they arise from the Subproject site relating to fire, GBV and/ or social disorders relating to the Subproject. Furthermore, the ESHS&CE officer will ensure OHS training is conducted with the contractor prior to commencement of work. It will cover important areas on safe work practices, emergency procedures for fire, evacuation, natural disasters, GBV, SEA, SH and VAC. This should put the contractor in a much better position to manage incidents at Subproject site.

13 Implementation

The PMU will facilitate the implementation of the Subproject. The PMU ESHS&CE Officer shall ensure that the contractor abides by the WB's environmental and social standards (ESS) and the national E&S frameworks and regulations. The PMU (particularly the ESHS&CE Officer and infrastructure officer) will monitor the overall progress of the Subproject by conducting regular site visits and requesting progress reports from the contractor. The contractor shall provide a Subproject construction schedule to the PMU infrastructure officer. The ESHS&CE Officer shall ensure there is proper coordination between the MHMS, PMU and the contactor.

14 Monitoring

The PMU and specifically the PMU ESHS&CE Officer will be responsible for monitoring the implementation of the CoESP on site. The contractor will appoint an onsite E&S focal point who will be responsible for ensuring the implementation of the CoESP's E&S

provisions. The focal person will liaise with the PMU ESHS&CE Officer and reporting incidents to the PMU.

The PMU will attend the induction training to monitor the implementation of the training and the signing of the company and individual code of conduct (COC) as detailed in the CoESP. The ESHS&CE Officer (or a designated local MHMS officer) will visit the site once construction is underway to monitor the implementation of the E&S impact and risk mitigation strategies. These visits should be recorded and reported on in the regular PMU Subproject reporting.

The ESHS&CE Officer will establish incident and reporting log to record the monitoring and incidents. Identification of non-compliance by the contractor on any of the provisions within the CoESP will require notification in writing to the contractor within 24 hours of the ESHS&CE Officer identifying the issue. Depending on the severity of the issue the letter should outline the timeframe for rectification and the actions required.

The PMU will also monitor the operation of the incinerator post-installation and adjust procedures if necessary, based on observations and community feedback which will be collected via the GRM. The monitoring will mainly be focussed on the handling and operation of the incinerator according to procedures provided by the supplier (to be provided in training by supplier) to ensure optimum usage for efficiency and low emissions level. Monitoring will also track general community perception and tolerance of residual impacts especially on odour and smoke of incinerator and the handling of wastes by health workers in relation to community safety. The ESHS&CE officer of the project will carry out the monitoring on a monthly basis by site visits for observations and getting feed-back from receptor communities, Hospital staff and stakeholders. However, this should be carried out within the remaining time between completion of construction and end of project.

References

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Solomon Islands Government, 2020. SIG Portal. [Online] Available at: https://solomons.gov.sb/key-success-of-nfd-and-soltuna-is-in-their-integration/ [Accessed 13 06 2023]

Appendix 1. GSH Incinerator E&S screening that triggered the requirement for ESIA's for all Project incinerators

Activity Name	Installation of Medical Waste Incinerator at the Good Samaritan Hospital
Activity Location	Good Samaritan Hospital, Tetere, Guadalcanal Province
Activity Proponent	MHMS, PMU
Estimated Investment	0.5 Million SBD
Start/Completion Date	July 2022

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	no		
Does the activity involve civil works including new construction, expansion, upgrading or rehabilitation of health-care facilities and/or waste management facilities? Could climate change or extreme weather adversely impact the project?	✓ ✓		ESS1	Activity ESIA/ESMP. (new construction), CoESP (minor civil works), Construction/Renovation H&S and WMP, Project LMP, SEP & GM
Does the activity involve land acquisition and/or restrictions on land use?		✓	ESS5	If yes, this activity is ineligible for project financing
Does the activity involve acquisition of assets for quarantine, isolation or medical treatment purposes?		✓	ESS5	If yes, this activity is ineligible for project financing
Is the activity associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant for health-care waste disposal?	✓		ESS3	Activity ESMP, MHMS IPCG, Project SEP, GM & LMP
Is there a sound regulatory framework and institutional capacity in place for health-care facility infection control and health-care waste management?	✓		ESS1	Activity ESMP, MHMS IPCG, Project SEP &GM
Does the activity have an adequate system in place (capacity, processes and management) to address waste?		✓		MHMS IPCG and/or activity WMP, Project SEP & GM
Does the activity involve recruitment of workers including direct, contracted, primary supply, and/or community workers?	✓		ESS2	Project LMP, SEP & GM

Does the activity have appropriate OHS procedures in place, and an adequate supply of PPE (where necessary)?		✓		Activity H&S Plan. Project LMP
Does the activity have a GM in place, to which all workers have access, designed to respond quickly and effectively?	✓			Project GM
Does the activity involve transboundary transportation (including Potentially infected specimens may be transported from health-care facilities to testing laboratories, and transboundary) of specimen, samples, infectious and hazardous materials?		✓	ESS3	Activity IPC&WMP, Project SEP & GM. Transport should be performed in accordance with WHO interim guidelines on specimen collection and shipment
Does the activity involve use of security or military personnel during construction and/or operation of health-care facilities and related activities?	✓		ESS4	Follow WB Technical Note: Use of Military Forces to Assist in Covid-19 Operations Suggestions on how to Mitigate Risks. Project SEP & GM
Is the activity located within or in the vicinity of any ecologically sensitive areas?		✓	ESS6	If yes, this activity is ineligible for project financing
Are there any indigenous groups (meeting specified ESS7 criteria) present in the activity area and are they likely to be affected by the proposed activity negatively or positively?	✓		ESS7	SEP incorporating provisions for IPs
Is the activity located within or in the vicinity of any known cultural heritage sites?		✓	ESS8	If yes, this activity is ineligible for project financing
Does the activity area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?	✓		ESS1	Project LMP, SEP & GM
Does the subproject carry risk that disadvantaged and vulnerable groups may have inequitable access to project benefits?		✓	ESS1	Activity ESIA/ESMP, Project SEP & GM

Is there any territorial dispute between two or more countries in the activity and its ancillary aspects and related activities?		✓	*OP7.60 Projects in Disputed Areas*	If yes, this activity is ineligible for project financing
Will the activity and any related activities involve the use or potential pollution of, or be located in international waterways[4]?		✓	*OP7.50 Projects on International Waterways*	If yes, this activity is ineligible for project financing
Will the activity be classified as "High" risk pursuant to the World Bank's Environment and Social Standard 1 (ESS1) of the Environment and Social Framework (ESF) and based on this screening process?		✓	ESS1	If yes, this activity is ineligible for project financing

Conclusions:

1. **Proposed Environmental and Social Risk Ratings (High, Substantial, Moderate or Low). Provide Justifications.**

   Substantial – Installation of incinerator may pose health risks to nearly residents/hospital patients during operation of project.

2. **E&S Management Plans/ Instruments to follow.**
   - ESIA required
   - Review SEP, LMP, GRM to ensure instruments adequately cover risks of activity
   - Update SEP and GRM
   - Implement MHMS IPCG

Remarks.……
….……

Sign by: Activities owner: ……
Position: ……Date …….

Sign by: ……

Position: ……Date……

[4] International waterways include any river, canal, lake or similar body of water that forms a boundary between, or any river or surface water that flows through two or more states.

Appendix 2 Code of Environmental and Social Practice template

SOLOMON ISLANDS GOVERNMENT

MINISTRY OF HEALTH AND MEDICAL SERVICES

P. O. BOX 349, HONIARA, SOLOMON ISLANDS

CODE OF ENVIRONMENTAL & SOCIAL PRACTICE (CoESP) TEMPLATE

Prepared by PMU – March 2024

Document history

Revision history			
Version #	**Date**	**Description**	**Name**
1	22/03/2024	Template	John P.Labere (ESHS&CE officer) PMU

Abbreviations and Acronyms

COC	Code of Conduct
CoESP	Code of Environmental and Social Practice
CSS	Contractor's Site Supervisor
E&S	Environmental and Social
EHS	Environmental Health and Safety
ESF	Environmental and Social Framework (World Bank)
ESH	Environmental, Social and Health
ESS	Environmental and Social Standard
GBV	Gender based violence
GRM	Grievance Redress Mechanism
GRS	Grievance Redress System
HCC	Honiara City Council
LUA	Land Use Agreement
MHMS	Ministry of Health and Medical Services
MLHS	Ministry of Lands, Housing and Survey
KH	Kilufi Hospital
OHS	Occupation Health and Safety
PMU	Subproject Management Unit
POA	Plan of Action
PPE	Personal protective equipment
PS	Permanent Secretary
SIG	Solomon Islands Government
SWD	Social Welfare Department
VAC	Violence Against Children
WB	World Bank

1. Introduction

Generally, construction of small works poses limited environmental and social (E&S) impacts and risks, however it is still very important to take into consideration and implement the principles of best practice environmental and social risk management to facilitate outcomes that are harmonized with World Bank (WB) Environmental and Social Frameworks (ESF) Environmental and Social Standards (ESS) and to avoid any negative E&S impacts on local staff, workers and local communities. An Environmental and Social Assessment (ESIA) has been undertaken as a part of the Subproject approval. The ESIA should guide and be referred to in the completion of this CoESP.

2. Purpose of the Code of Environmental & Social Practice

The Code of Environmental and Social Practice (CoESP) is developed purposely to manage and guide the contractor in their management of environmental and social risks and impacts and the construction of WB projects. The contractor is obliged by the provisions of the contract to undertake the actions detailed in this CoESP which has been approved by the PMU. Should the contractor fail to comply with the provisions of this CoESP, the PMU shall withhold payment of invoices until the contractor resolves the issue(s).

3. Objectives

Key objectives of the CoESP are:

- To guide compliance with relevant Solomon Islands legislation and the CoESP conditions
- To describe the conditions and mitigation measures the contractor will undertake to manage the environmental and social impacts and risks including health and safety of workers.
- To clearly define key personnel roles and responsibilities for the management, implementation, monitoring and reporting of the provisions within the CoESP.
- To detail the contractor's responsibility for any training and internal communications, which ensures their workers, understand the risks and impacts associated with the Subproject.

4. Scope of Works

The scope of construction works to be carried out for the incinerator facility broadly involves the following:

- Clearance of vegetation and topsoil for construction and handstand area.
- Cutting and stabilising the slope section of a hill.
- Excavation of trenches for foundation works.
- Steel rebar deformation works and positioning in trenches.
- Infilling of earth works and soil compaction.

- Mixing and pouring of concrete into foundation moulds to create a concrete slab.
- Installation of incinerator's major component and assembling minor parts.
- Installation of plumbing works and electrical wiring.
- Construction of incinerator shed and generator shed.
- Construction of concrete ash-pit.

Other associated tasks to be carried out for the initial mobilisation include:

- Procurement of materials (hardware and raw).
- Transportation of materials to site.
- Mobilisation of machines, tools and labour to construction site.
- Storage of materials at site (hardware and raw materials like sand, gravel and timber).

As such, E&S risks and impacts that may arise (including those that may affect the health and safety of humans and the environment) could include those pertaining to occupational health and safety, community health and safety, employment and labour rights, cultural heritage, water quality and quantity, soil protection, air quality, noise and vibration, waste, and potential interruption to basic services.

5. Contractor Obligations

The following information details the minimum actions the contractor must take to mitigate the E&S impacts and risks identified in the ESIA and any additional impacts and risks identified on site.

5.1 Impact and risk mitigation

Table 5.1 identifies the mitigation actions identified in the ESIA. The contractor with the PMU during site takeover will identify any additional impacts and risks and include them in **Table 5.1.** The contractor will implement the E&S mitigation strategies detailed in **Table 5.1.**

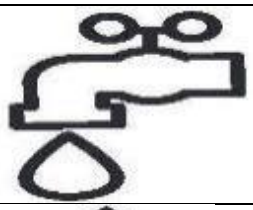
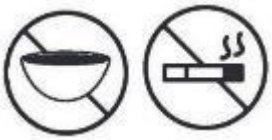
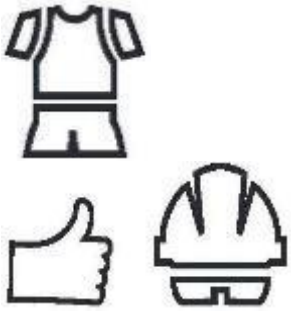
Table 5.1 *Potential Impacts and Risk, ESIA mitigation strategies and additional contractor requirement*

Potential Impacts & Risks	Mitigation as outlined in the ESIA	Site specific actions (contractor to add)
Degradation of flora and fauna	The contractor should ensure that there is minimal disturbance to the Subproject site area The contractor shall as much as possible complete the works in such a manner that natural aesthetics shall be retained at the location No unnecessary removal of plants, bushes, shrubs, trees and palms at the site.	**Contractor to add any additional actions after site assessment**
Water quality, erosion and sediment runoff	The contractor will ensure proper demarcation of the Subproject area to be affected by the works	**Contractor to add any additional actions after site assessment**

Potential Impacts & Risks	Mitigation as outlined in the ESIA	Site specific actions (contractor to add)
	Works to limit vegetation removal at the Subproject site; Any excavation activities should not interfere with local drainage or introduce physical changes that are not in harmony with the physical setting of the Subproject area Retention of grass, herbaceous plants, shrubs and trees, to the extent possible on the Subproject site Drainage system to divert storm water around the facility as per design (ESIA Figure 4..3, 4.4 & 4.5)	
Pollution	Ensure proper handling, storage and disposal of waste oil, lubricants, oil filters and fuel from vehicles	**Contractor to add any additional actions after site assessment**
Noise and vibration	Undertake works at suitably agreed times that do not impact the community adversely Observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines when not in use Provision of appropriate PPE (hearing protection ear muffs) to the workers and any other person visiting the site Provision of appropriate PPE (hearing protection ear muffs) to the workers and any other person visiting the site	**Contractor to add any additional actions after site assessment**
Road damage, dust and traffic	Undertake works that do not coincide with the wet season to avoid damage to the road and heavy vehicles getting stuck Reduce speed close to sensitive receptors to reduce dust and traffic accidents	**Contractor to add any additional actions after site assessment**
Solid waste	Ensure all solid waste is deposed to approved landfill sites or in a manner that is acceptable to the community	**Contractor to add any additional actions after site assessment**
Loss of crops	Document any food crops onsite and if required facilitate written agreements through consultation if they are impacted by site works	**Contractor to add any additional actions after site assessment**
Local employment	Where possible use locals and local businesses	**Contractor to add any additional actions after site assessment**
Social disruption	Non local workers to treat locally community with respect and follow the code of conduct (COC) to be signed by all employees	**Contractor to add any additional actions after site assessment**
Occupational health and safety	Contractor to conform to all OHS laws and regulations. **Table 5.2** best describes on-site OHS ways to manage the risks of injury or death during construction activities All construction workers should be inducted on the health and safety requirements while at Subproject site	**Contractor to add any additional actions after site assessment** **Local emergency response agencies (Police, hospital ambulance, fire) to be included with emergency numbers**

Potential Impacts & Risks	Mitigation as outlined in the ESIA	Site specific actions (contractor to add)
	Workers should be provided with adequate and appropriate PPE (safety helmets, shoes, gloves, mask,) and enforce on use of the PPE's Provision of clean and accessible sanitary facilities and water to workers Install safety signage at the work site should be done by a trained certified, experienced personnel Contractor to report immediately to the PMU any OHS incidents	

Table 5.2. *Minimum OHS provisions to be applied*

	Sufficient and clean drinking water to be on site at all times for workers		Toilets on or near the site to be available for all workers
	Suitable protection from rain and sun during rest breaks or weather stoppages to be made available		Workers are not forced to work in extreme weather (heavy rain, strong winds, etc.) or other weather that is dangerous or impactful.
	Site Supervisors should be trained in basic first aid to be able to provide care		The Site Supervisor should know where the nearest hospital/Hospital is and where an ambulance or quick transport can be found/accessed
	A first aid kit is to be kept up to date, and on site at all times in a visible, accessible location		No alcoholic drinks or drugs to be taken before starting or during work (kwaso, bettlenut, kava, beer, marijuana). Workers should be not be affected by drugs or alcohol while on site at any time
	Machinery operators must be properly trained to use the machine		Protective clothing to be worn at all times: Safety boots. Reflectorized yellow or orange-colored safety vests or harnesses. Hats where there is strong sun. Goggles/masks when working in dusty condition Gloves when working in

			bush clearing and removal of obstructions, or mixing concrete/handling other toxic materials. Hard hats/helmets when working on sites where there is a danger of falling objects, e.g., in deep drains, digging pit latrines, work in quarries, etc.

5.2 Community Engagement

The PMU will develop some basic community information disclosure to make aware the recipient community, groups and individuals of the Subproject activities and responsibilities of the contractor. It is very important that the contractor is required to have the name and contact of a community leader/representative and work closely with the community leader/representative on activities regarding any noise, dust or inconvenience that may be caused to the local community during construction. The contractor must erect a construction sign with contact details for making a complaint or seeking further information as detailed in the grievance redress mechanism (GRM) **Annex 1**.

5.3 Worksite Induction

A site induction prior to start of work is very important and it must be undertaken for all site workers to ensure employees are aware of:

- The importance and purpose of the CoESP
- OHS onsite
- Any significant environmental hazards, actual or potential, that may be caused as a result of their activities or the Subproject
- Roles and responsibilities in relation to this CoESP
- Any spill response and or emergency procedure
- Accident and incident reporting and methods of prevention
- Codes of Conduct including responsibilities around Gender based Violence (GBV), Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH) and Violence against Children (VAC).

The PMU ESHS&CE Officer must be present at the initial site induction;

5.4 Roles and Responsibilities

The contractor has the responsibility to apply this CoESP during construction and to:

- Nominate an onsite supervisor:
  - To be the focal point for the PMU
  - To manage any public interaction
  - To be responsible for reporting any issues to the PMU
  - To ensure all individuals understand this CoESP and their obligations.

The PMU will be responsible for ensuring that the contractor complies with this CoESP with regular site visits and discussions with the nominated onsite manager.

6. Company Acknowledgment of CoESP and Code of Conduct (COC)

The Contractor is committed to ensuring that the Subproject is implemented in a way which minimizes any negative impacts on the local environment, communities, businesses, NMS staff and its workers. This will be done by respecting the environmental and social issues detailed in this CoESP, reporting and if appropriate, responding to issues that are unforeseen and ensuring appropriate OHS standards on-site. The company is also committed to creating and maintaining an environment in which they will not tolerate any breaches of the provisions within the CoESP by any employee, sub-contractor, supplier, associate, or representative of the company.

To ensure that all those engaged in the Subproject are aware of their obligations, the contractor commits to the following core principles and minimum standards of behavior that will apply to all company employees, associates, and representatives, including sub-contractors and suppliers, without exception:

- The company and all employees, associates, representatives, sub-contractors and suppliers commits to complying with all relevant national laws, rules and regulations.
- The company commits to fully implementing this CoESP.
- The company commits to treating women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
- The company shall ensure that interactions with local community members are done with respect and non-discrimination.
- Demeaning, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behavior are prohibited among all company employees, associates, and its representatives, including sub-contractors and suppliers.
- The company will follow all reasonable work instructions from the PMU (including those pertaining to environmental and social safeguards).
- The company will protect and ensure proper use of property (for example, to prohibit theft, carelessness or waste).
- The company will ensure that the Subproject's OHS standards are effectively implemented by company staff, as well as sub-contractors and suppliers.
- The company will ensure that all people on-site wear prescribed and appropriate personal protective equipment (PPE), preventing avoidable accidents and reporting conditions or practices that pose a safety hazard or threaten the environment.

To ensure that the above principles are implemented effectively the company will:

a) Prohibit the use of alcohol during or before work activities.

b) Prohibit the use of narcotics or other substances which can impair faculties at all times.
c) Provide adequate sanitation facilities on site and at any worker accommodation provided for those working on the Subproject.
a) Have all personnel on site sign the Code of Conduct (6.1) confirming their agreement to comply with the CoESP and OHS standards
b) Provide copies of the Company and Codes of Conduct are translated into the appropriate language of use in the work site areas.
c) Have employees attend an induction prior to commencing work on site to ensure they are familiar with the company's commitments within the CoESP and the OHS standards.

I do hereby acknowledge that I have read the abovementioned Code of Practice and Company Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to support the CoESP and OH&S standards. I understand that any action inconsistent with this CoESP or failure to act mandated by this CoESP may result in disciplinary action.

Company name: Insert company name

Signature: _____

Printed Name: _____

Title: _____

Date: _____

6.1 Code of Conduct (COC)

The following Code of Conduct (COC) must be read and understood by all workers on site including any subcontractors (if required):

I, individual's name, acknowledge that adhering to the provisions as detailed in this COC and following any of the Subproject's Environmental, Social and Health (ESH) or Occupational Health and Safety (OHS) provisions is important.

The Client considers that failure to follow the COC, ESH or OHS standards, be it in an office, on a work site, office and work site surroundings, at workers' camps, in worker's homes, or the surrounding communities constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment.

I agree that while working on the Subproject I will:

1. Attend and actively participate in any induction or training required for OHS, GBV/SEA/SH and VAC as requested by my employer.
2. Will wear my personal protective equipment (PPE) at all times when required.

3. Implement any OHS requirements
4. Comply with all laws of the Solomon Islands, regulations and other requirements, including protecting the health, safety and well-being of other Contractor's worker and any other persons.
5. Not drink alcohol or use narcotics or other substances which can impair faculties and potentially cause incidents, before or during work activities.
6. Consent to a Police background check if required.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
8. Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not engage in sexual harassment—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior (e.g., looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody's sex life; etc.).
10. Not engage in sexual favors—for instance, making promises or favorable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.
11. Not participate in sexual contact or activity with children (persons under the age of 18) including grooming, or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
12. Unless there is the full consent by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non- monetary) to community members in exchange for sex, such sexual activity is considered "non-consensual" within the scope of this COC.
13. Report to my manager any suspected or actual GBV/SEA/SH or VAC by a fellow worker, whether employed by my company or not, or any breaches of this COC.

With regard to children under the age of 18:

14. Wherever possible, ensure that another adult is present when in the proximity of children.
15. Not invite unaccompanied children unrelated to my family into my home, or the works site unless they are at immediate risk of injury or in physical danger.
16. Not use any computers, mobile phones, video and digital cameras or any other medium to exploit or harass children or to access child pornography.
17. Refrain from physical punishment or discipline of children.

18. Refrain from hiring children for domestic or other labor below the minimum age of 14 unless national law specifies a higher age, or which places them at significant risk of injury.
19. Comply with all relevant local legislation, including labor laws in relation to child labor and World Bank's safeguard policies on child labor and minimum age.

Sanctions

I understand that if I breach this COC, my employer will take disciplinary action which could include:

a) Informal warning.
b) Formal warning.
c) Additional Training.
d) Loss of up to one week's salary.
e) Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
f) Termination of employment.
g) Report to the Police if warranted.

I do hereby acknowledge that I have read the foregoing Code of Conduct, have attended the induction training, I understand my role and responsibilities to support the Subproject's CoESP, OHS, GBV/SEA/SH, VAC and any other E&S conditions determined by the Subproject or the World Bank. I understand that any action inconsistent with this COC may result in disciplinary action and may affect my ongoing employment.

- **I have read and understand the contents and of the COC and my responsibilities**
- **I have attended the induction training and understand my responsibilities with regards to OHS, GBV/SEA/SH and VAC**

Signature:

Printed Name:

Date:

Annex 1. Grievance Redress Mechanism (GRM)

The purpose of the GRM is to address and record any complaints that may arise during the implementation of the contract. The GRM works within existing legal and cultural frameworks.

The key objectives of the GRM are:

- Settle the grievances through consultation including informing stakeholders of solutions.
- Forward any unresolved cases to the relevant authority.
- Record, categorize and prioritize the grievances.

Potential construction grievances, which are minor and site-specific, could be easily resolved on-site by the Contractor's Site Supervisor (CSS) or the PMU ESHS&CE Officer. They usually revolve around nuisances generated during construction such as traffic, obstruction of access, noise, dust, vibration, workers' dispute's etc. On-site grievances that are easily resolved still need to be communicated to the PMU ESHS&CE Officer for recording, including how the dispute came about and how it was resolved. However, some complaints are likely to be unresolved on site. The CSS shall inform the PMU ESHS&CE Officer and formal GRM will be activated.

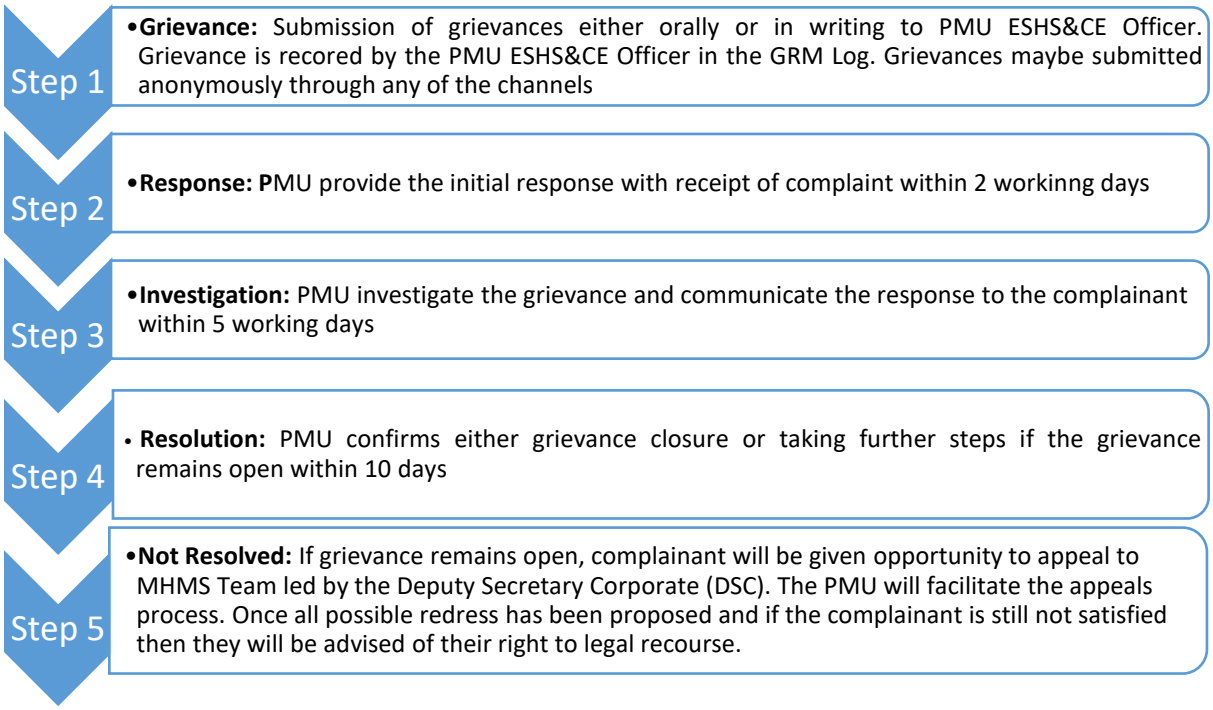
The CSS or PMU ESHS&CE Officer will request the complainant to fill out the grievance form or give details to the PMU ESHS&CE Officer in person, by phone or email. The PMU ESHS&CE Officer will note the date, time, name and contact details of the complainant, and the nature of the complaint in the Complaints Register. The PMU ESHS&CE Officer will inform the complainant of the formal receipt of the complaint utilizing a standard response letter and a timeframe for a response.

The PMU ESHS&CE Officer will endeavour to address the issue with direct dialog with the complainant in the first stage of the GRM. If the PMU ESHS&CE Officer is not able to resolve the complaint to the satisfaction of the affected person(s), it will then be forwarded to the PMU Project Manager (PM). The PMU PM and ESHS&CE Officer will develop a Plan of Action (POA) to resolve the issue and communicate this back to the complainant. At all stages, the complainant must be kept informed about the course of action being taken within a period of five days from the date that the complaint was received. If it is a land related issue, the PMU PM will inform the MHMS to communicate with MLHS to provide relevant documents to develop best resolution.

If the complaint is not resolved by the PMU PM to the satisfaction of the complainant, it will then be referred to the Permanent Secretary (PS) MHMS. The PS MHMS will be supported by the PMU to inform and advice. The PS MHMS is required to address the concern within 10 days. The PMU ESHS&CE Officer will draft a revised POA to resolve the issue based on the PSs' determination and take this POA to the complainant for resolution. In circumstances where measures outlined in the POA fail to satisfy the complainant, the aggrieved party is free to take his/her grievance to the Ombudsman's Office for mediation and a decision by the Ombudsman. If the complainant does not accept any resolution at this stage, the GRM will not obstruct complainants' access to the legal system. At any time, the complainant may take the matter to the appropriate legal or judicial authority as per the laws of Solomon Islands. Complainants can also access the WB Grievance Redress System (GRS www.worldbank.org/grs).

Signs must be erected at the sites of all works providing the public with updated information and summarizing the GRM process, including contact details of the PMU ESHS&CE Officer. Anyone will be able to lodge a complaint through a number of methods (including the complaints form, in person, by telephone in either English or Solomon Islands Pidgin). The PMU must provide a GRM that makes every effort not to inhibit the lodgement of a complaint. The PMU ESHS&CE Officer, who will log the details and maintain the Complaints Register. This information will be included in PMU progress reports to the WB.

GRM process and timeframes



Gender Based Violence (GBV), Sexual Exploitation and Abuse, (SEA) Sexual Harassment (SH) and Violence against Children (VAC) Process

This process includes serious and minor incidents of Gender Based Violence (GBV)/SEA/SH and VAC and Sexual Exploitation and Abuse (SEA). Issues of minor sexual harassment on project construction sites such as lewd remarks, wolf whistling or bad language should use the normal GRM.

For incidents that are more serious the complainant must be made aware they can make a complaint directly to the MHMS Social Welfare Department (SWD) and PMU ESHS&CE Officer. The MHMS SWD may report the incident to the Police at the discretion of the complainant. If any such grievances are reported to the PMU, it will ensure that all SEA/SH related grievances will be handled by qualified trained professional who can ensure adherence to anonymity and sensitivity requirements associated with such grievances. Since the PMU doesn't have the required capacity/ personal certified to handle these types of grievances, they will refer such matter to GBV service providers for further processing/action such as the MHMS Social Welfare Department (SWD) or the Family Support Centre (FSC).

GBV/SEA/SH and VAC incidents related to a World Bank project will include the following:

- Incidents of GBV/SEA/SH and VAC perpetrated by, or upon, a person directly contracted by a World Bank project. This includes PMU staff and any direct workers and contracted workers as determined by the LMP

- Incidents of GBV/SEA/SH and VAC that have been perpetrated at a designated construction or project site funded by the World Bank
- Incidents of GBV/SEA/SH and VAC that are perpetrated by local civil works contractors and subcontractors and their staff as detailed in the LMP.

Appendix 3: Stakeholder engagement

Consultation meetings for the proposed incinerator project for Kilufi hospital were conducted on the 13th and 14th of September 2023 in Auki and Kilufi respectively.

Initial stages of the consultation involves the PMU undertaking a stakeholder review of Kilufi Hospital to ascertain relevant persons and entities responsible for the hospital to consult. This was done by retrieving information within the MHMS – policy planning division, about names and details of relevant health workers at the management level. Next, an appointment was scheduled as a preliminary step, for a brief visit which basically aims at getting relevant background information about the hospital and its environment and also to obtain a wider range of stakeholder information and contact details within the existing social network of the hospital. Then a visit was arranged by PMU with the hospital management through email correspondence and phone calls. The hospital management was advised to notify the rest of the staffs of the hospital and the surrounding residences about the proposed meeting. By doing this approach, the PMU believes to avoid short circuiting the existing social hierarchical orders and flow of formal information and engagements between the hospital and its stakeholders. Hence the hospital management is given the mandate for this matter by the PMU to spearhead who and where to meet but also maintains the principle of ensuring wider audience for the project's intention. Where it is made possible by the hospital management, direct phone calls and SMS messaging were also used to notify parties about the meeting. The key stakeholders were met on varied occasions since equal availability of all the stakeholders is practically impossible. The entire process is informal (deliberately meant to allow free flow of information) in that some of the discussions were made outdoor in the Subproject site vicinity and should there be a round table meeting, usually the level of discussion is pretty much informal.

The Community engagement utilized in the process basically involves obtaining community views through consultation, on site observations and incorporating them into planning of risk and impact management. A feedback mechanism was activated in that PMU's contact details were handed out to stakeholders for feed-back by means of distributing Subproject fact-sheet. The engagement is an ongoing process and would yet to reach fulfilment which is at the Subproject's peak of implementation.

The table below shows the record of some of the key feed backs obtained from stakeholders through the consultation process.

Date	Stakeholder	Stakeholder feedback
13th Sept 2023	Kilufi Hospital Management and Residential representatives	• So pleased to be a recipient of a cutting edge medical waste incinerator which would definitely improve waste management in the hospital. • Hope it won't be another failed project as previously experienced for the non-functional unit sitting next to the proposed site. • Hope the cost of operating the new incinerator would be within the hospital's means, given that fuel price is constantly rising in the country. • Staff residents who commute the nearby road to the existing incinerator have raised concerns about smoke and odor for the current burning practice and hopeful that the proposed new unit would be better than the current unit. • In terms of support services the contractor might need during the ,course of construction, the hospital management is open to dialogue on possible arrangements with the contractor and would ensure the hospital provides

		a conducive environment that encourages flawless construction works to avoid failure. We do not want to repeat the experience of getting a failed project. • The hospital can allow connection from its water system for use in construction given that it is used appropriately and efficiently, minimizing wastage by possible means. • Appropriate measures and care must be taken by the contractor in handling waste water to avoid water-logging and muddy patches around the hospital. • Noise, dust and air pollutions must be minimized at all levels during construction to safeguard the health of patients at the hospital during construction works. • Food crops of abandoned garden site within the vicinity are common properties of the hospital. No individual staff owns them, hence could be cleared by contractor for handstand space.
14th Sep 2024	Malaita Provincial Government representatives	• Glad to have support from the government boost health service in terms of assisting our hospital with a proper incinerator. We are pleased because we are direct beneficiaries. • The provincial government is always the agent of the National government in delivering services to our help hence supports this undertaking. • The land is government owned and should not pose an issue.

Appendix 4 Operational Waste Management, Health and Safety Manual for Health Care Facilities.

Operational Waste Management, Health and Safety Manual for Health Care Facilities.
(For operation period of the health care facilities)

Solomon Islands COVID-19 Emergency Response Project (P173933)

April 12, 2024

Table of Contents

Introduction

According to WHO[5], health workers working at health care facilities and laboratories are exposed to a complex variety of health and safety hazards every day, including:

- biological hazards, such as TB, Hepatitis, HIV/AIDS, SARS;
- chemical hazards, such as glutaraldehyde, ethylene oxide;
- physical hazards, such as noise, radiation, slips trips and falls;
- ergonomic hazards, such as heavy lifting;
- psychosocial hazards, such as shift work, violence, and stress;
- fire and explosion hazards, such as using oxygen, alcohol sanitizing gels; and
- electrical hazards, such as frayed electrical cords.

Due to these, health workers need protection from these workplace hazards when they enter their workplace. Unsafe working conditions contribute to health worker attrition in many countries due to work-related illness and injury and the resulting fear of health workers of occupational infection, including from HIV and Tuberculosis. Infections caused by accidental blood exposure are generally preventable if health workers use appropriate protective wear such as gloves and eye protection, spills of body fluids are cleaned up promptly, and biomedical waste is disposed of correctly. Protecting the occupational health of health workers is critical to having an adequate workforce of trained and healthy health personnel.

Health and safety issues of the community, including patients and visitors related to the health care facilities and laboratories, are similar to those issues exposed to the health care workers. Thus, it is important to recognize shared health and safety risks between health care staff and patients and identify opportunities to integrate patient and worker safety activities across departments and programs.

Without basic health and safety guidelines and the ability to implement them, health workers, patients, and visitors to health care facilities and laboratories are vulnerable to accidents and exposure to infectious diseases.

This Operational Manual is developed as the guidance for the healthcare workers of the Nila isolation unit under Solomon Islands COVID-19 Emergency Response Project (P173933) on the Healthcare Waste Management, Occupational Health and Safety, and the Infection Prevention and Control during operation period. Most of the relevant sections are extracted from the National level Infection Prevention and Control Guidelines (IPCG) (2020), and the Environmental and Social Management Framework (ESMF) of the project.

National Infection Prevention and Control Guidelines (IPCG), 2020

The National level Infection Prevention and Control Guidelines (IPCG) was enacted by the Ministry of Health and Medical Services (MHMS) in 2020 with the assistance from the World Health Organization (WHO). The national guidelines cover the best practices on the infection prevention and control including the health care waste management practices, and occupational health and safety in line with the GIIP and World Bank's ESF requirements. The subprojects under the project will follow the practices under the IPCG.

Hazardous and clinical waste management

Health care waste (HCW) includes all wastes generated in the delivery of health care services. WHO (1999a) estimates that 75-90% of the waste produced by the health care facilities originates from non-risk or general sources (e.g., janitorial, kitchens, administration) and is comparable to domestic waste.

[5] https://www.who.int/occupational_health/topics/hcworkers/en/

The remaining 10-25% of HCW are classified as hazardous and poses a variety of potential health risks. Categories of health care waste, as defined in WHO (1999a) are summarized in Table 1.

Exposure to hazardous healthcare waste can result in disease or injury. All individuals exposed to hazardous healthcare waste are potentially at risk, including those within healthcare establishments and those outside these sources. The main groups at risk are health staff (doctors, nurses, technicians, auxiliary and maintenance staff, janitors); patients, their relatives and visitors; workers at waste disposal sites including scavengers; and nearby communities.

Pathogens in infectious waste may enter the human body by a number of routes: through a puncture, abrasion, or cut in the skin; through the mucous membranes; by inhalation; or by ingestion. Sharps may not only cause cuts and punctures but also infect wounds if they are contaminated with pathogens. Sharp injuries are the most popular accidents in health facilities. Sharp injury is the main transmission way of several dangerous infectious diseases. Unless healthcare wastes are managed strictly, they easily cause pollution of the environment and health impacts.

Table 1: Health care waste characteristics and hazards profile

Classification	**Characteristics/Associated Hazards**
Infectious	Comprises waste that is suspected of containing pathogens including laboratory cultures, surgery and autopsy waste from patients with infectious diseases, bodily wastes from patients in infectious disease wards, and miscellaneous waste such as disposable gloves, tubing, and towels generated during the treatment of infectious patients). Pathogens from infectious waste may enter the human body through puncture of skin cuts, mucous membranes, inhalation or ingestion.
Pathological	Consists of tissue, organs, body parts, blood and body fluids. Pathological wastes are considered a sub-category of infectious wastes and pose the same hazards.
Sharps	Describes items that could cause cuts or puncture wounds, including hypodermic needles, scalpel, and broken glass. Because sharps can not only cause cuts and punctures but also infect these wounds if they are contaminated with pathogens, this sub-category of infectious wastes is considered very hazardous.
Chemical	Consists of discarded solid, liquid and gaseous chemicals with toxic, corrosive, flammable, reactive, and genotoxic properties. Chemicals most commonly used in HCF include formaldehyde, photographic chemicals, heavy metals such as mercury from broken clinical equipment, solvents, organic and inorganic chemicals, and expired, used or spilt pharmaceuticals. Hazards from chemical and pharmaceutical waste include intoxication as a result of acute or chronic exposure from dermal contact, inhalation or ingestion and contact burns from corrosive or reactive chemicals.
Radioactive	Includes solid, liquid and gaseous materials contaminated with radio nuclides; produced as a result of procedures such as *in-vitro* analysis of body tissue and fluid, *in-vivo* organ imaging and various investigative and therapeutic practices. Because radioactive waste is genotoxic, health workers in handling active sources and contaminated surfaces must take extreme care.

To address clinical and hazardous waste issues, national level guidelines such as Infection Prevention and Control Guidelines (IPCG) (July 2020) have been prepared and practiced by the Ministry of Health and Medical Services (MHMS). This guidelines is intended to ensure consistency with best practice, available evidence and international standards.

However, it has been observed that weak management at the on ground health facility level hinders the implementation of the guidelines for health care waste management, including proper waste segregation and storage and maintenance of incinerators.

Recognizing that sanitary or engineered landfills are unlikely to be available in remote locations, another option is the safe burial of health care waste on health care facility premises. On-site disposal represents an acceptable disposal option only if certain requirements are met as follows:

- Restricted access to disposal site by authorized personnel only
- The lining of burial site with a material of low permeability such as clay to prevent groundwater pollution
- Limit use to hazardous materials that cannot safely be incinerated to maximize the lifetime of a landfill.

Notwithstanding the availability of health care waste management guidelines, it is apparent that there is considerable scope for adopting more rigorous health care waste management practices in health centers and training centers.

Health Care Waste Management Plan (HWMP)

Nila isolation unit will follow a healthcare waste management process, including sorting, handling, storage, and final disposal of solid HCW outlined in good international practices and Infection Prevention and Control Guidelines (IPCG) etc. The following section briefly describes guidance for health care wastes segregation, handling, storage, and final disposal indicated in the MHMS guidelines and good international practices.

Waste Segregation

Segregation of health care waste is intended to ensure that wastes are properly identified and separated and that different waste streams are handled and disposed of correctly. It typically involves sorting different wastes into color-coded plastic bags or containers at the source. Recommended handling and disposal practices for different categories of health care waste will vary according to the resources available to health care facilities. Examples of WHO (1999a) recommended health care waste handling practices appropriate for health care facilities that apply minimal waste management programs are:

- General health care waste (in colored coded bags or containers) should join the domestic refuse stream for disposal.
- Sharps should be collected together into puncture-proof yellow safety boxes and held for high-temperature incineration. Encapsulation and disposal to a secure landfill is a suitable alternative for sharps.

Clinical waste treatment and disposal

Highly infectious waste should be sterilized by autoclaving where possible. For other infectious waste, disinfection is sufficient to reduce microbial content. Treated infectious waste should then be deposited in yellow bags and containers marked with the international infectious substance symbol. Incineration is the preferred method for disposal of infectious waste, although landfilling is also appropriate. Blood should be disinfected before discharge to the sewer system or wastewater treatment plant, if available, or maybe incinerated.

Since the existing health care facility of the proposed subproject does not have autoclaving and incineration facilities, the following protocols and practices that are outlined in the Infection Prevention and Control Guidelines (IPCG) will be practiced.

Table 2 Waste Segregation and recommended disposal methods outlined in the Infection Prevention and Control Guidelines (IPCG)

	Waste type	**Waste bag colour**	**Disposal**
General waste	Kitchen refuse, paper waste, boxes, bottles, plastic containers	black	Incinerate/Burn in the designated facility

Sharps	Needles, broken or disposal syringes, razors, lancets, scalpel blades	sharps container yellow or red	Incinerate/Burn in the designated facility , then bury
Solid infectious and/or clinical waste	Dressings, gauze, or other items contaminated with blood, pus, faeces or other body fluids; human tissue; body parts; paper specimen collection cups	yellow or red	Incinerate/Burn in the designated facility
Liquid and clinical waste	Blood, urine, faeces, pus, sputum, spinal and peritoneal fluids, pathology specimens	no bags	Drain fluids into toilet or utility sink; or place in contaminated waste bin, and Incinerate/burn in the designated facility
Laboratory waste	Used culture plates, specimen containers, specimens	yellow or red	Sterilise, place in contaminated waste binds, and Incinerate/burn in the designated facility
Cytotoxic waste	Cancer treatment drugs and used consumables	Purple	Incinerate/Burn in the designated facility
Pharmaceutical waste	Tablets, mixtures and injectables	Yellow	Incinerate/Burn in the designated facility

Building and using a simple stove for burning wastes

Since the existing facility has no incineration equipment available, burning will be done in a simple, large stove as illustrated in the figure 1 below. Open burning is dangerous; therefore, all waste will be burned or incinerated in special stoves located in enclosed (properly fenced) areas. The subproject will construct/install a special stove(s) as per the illustrations (figure 1 below). This special stove will be located near the designed waste pit area, and both waste pit and stove will be well fenced to prevent from unauthorized person accessing the area.
Below are basic guidelines for building and using a simple stove for burning waste, and the waste pit. The subproject will:

1. Select a site downwind from the healthcare facility
2. Build a simple stove using local materials (mud or stone), or a used oil drum
3. Place the stove on hardened earth or a concrete base
4. Make sure the stove has:
   - Sufficient air inlets underneath to burn well,
   - Loosely placed metal bars to hold wastes and allow ashes to fall below,
   - Enough space to add waste at the top and to remove ashes from below,
   - Long enough chimney to allow for good draught and removal of smoke.

5. Burn all burnable waste, such as paper and cardboard, as well as dressings and other contaminated wastes
6. If the waste is wet, add kerosene so that a hot fire burns all the waste. Store waste for incineration in covered rubbish bins
7. Ash from the stove or incinerator can be treated as non-contaminated waste. Note, however, that sharps, even after incineration, may be dangerous and should be buried in the designated waste pit.

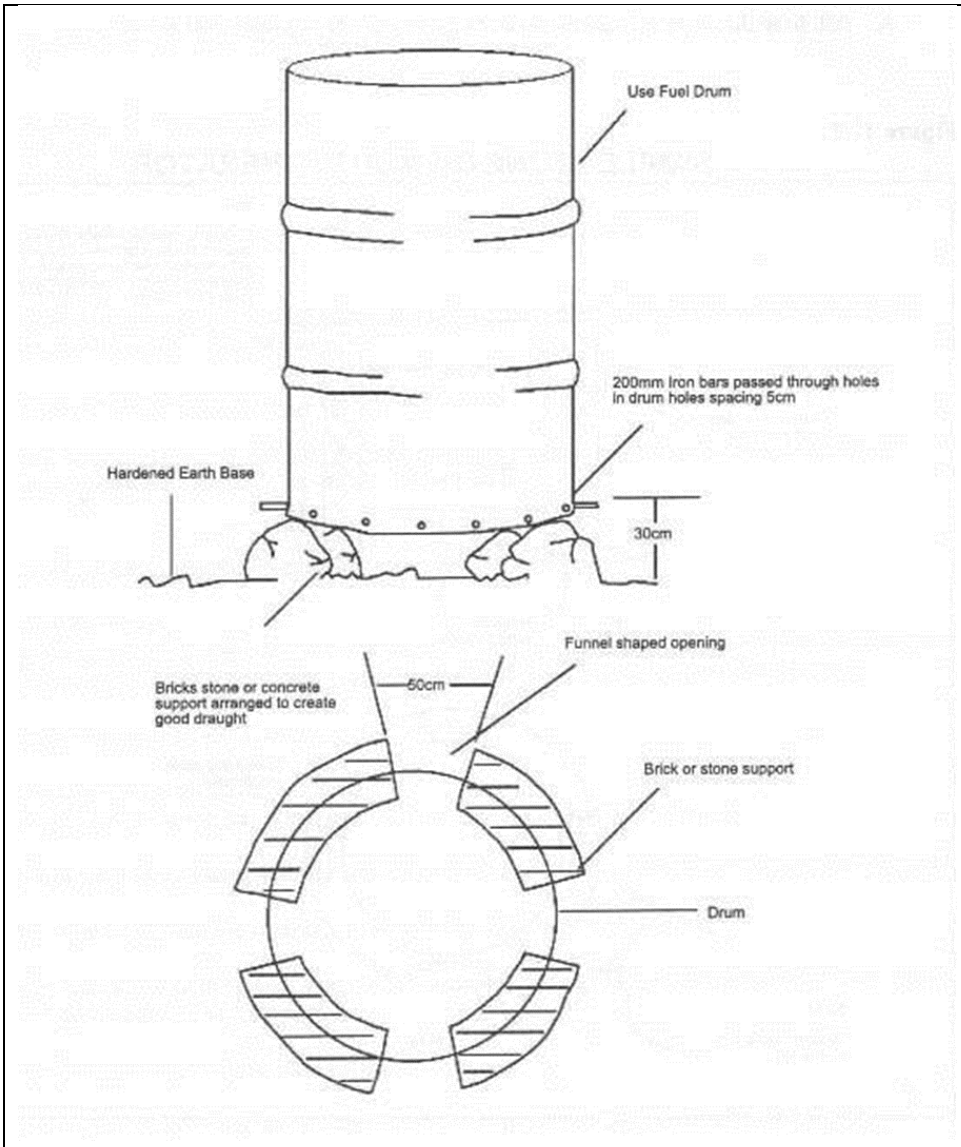


Figure 1 Simple oil drum incinerator Source: Infection Prevention and Control Guidelines (IPCG)

Waste disposal by burying

When clinical and non-clinical wastes cannot be burned or incinerated, waste must be buried. When wastes are buried, certain requirements must be met so that children and animals cannot dig up the waste. **Note**: Sharp objects may not be destroyed by burning and may later spread tetanus infection. Dispose of all sharp objects by putting them underground, even after burning.
The following procedures for making and using an underground waste disposal site will be followed:

1. Select a site that:

- is at least 50 meters (150 feet) away from any water source, to prevent contamination of the water supply.
- has proper drainage, is located downhill from any wells, and is free of standing water.
- is not in an area that floods.

2. Dig a pit 1 meter (3 feet) wide and 2 meters (6 feet) deep. The bottom of the pit should be 2 meters above the water table.
3. Fence in the site to keep animals and children away.
4. Wear heavy gloves when handling waste buckets.
5. Empty buckets of non-burnable waste into the pit every day.
6. Cover the waste with a thin layer of earth each day. The final cover should be 10 centimetres deep.

Note: General waste is the only waste that can be disposed of in a municipal garbage facility (i.e. landfill). It is illegal and dangerous to dispose of other wastes with municipal garbage.

General waste handling

Garbage storage and disposal protocols

Garbage should be removed at least twice daily and no garbage should be left in clinic/hospital facility areas overnight. Not only are many common pests capable of transmitting infection, but the sight of insects and pests within the hospital environment can be very disturbing to patients, staff, and visitors alike. It is, therefore, a basic requirement of the hospital cleaning program that adequate attention be paid to preventive and protective measures designed to minimize this potential form of cross infection.

In general, six elements are essential in any effective program for the control of pests in a clinic/hospital facility.

- Thorough, constant cleaning of all potential areas of infestation
- Regular, careful inspections for evidence of pests
- Storage of waste and garbage in water-tight containers
- Thorough cleaning of all garbage containers after use
- Daily removal of all stray garbage not placed in correct receptacles
- Proper storage of all goods and supplies likely to attract pests

It is important to train all healthcare workers at all level, including physicians and nurses to keep contaminated and non-contaminated waste separate. Only a small percentage of the waste generated by a healthcare facility is clinical and hazardous waste that must be specially handled to reduce the risk of infections or injury. Segregation of the waste at the point where it is generated can conserve resources by greatly reducing the amount of waste that needs special handling. Poor separation of waste at the point where it is generated leads to large amounts of waste that must be handled especially – which can overwhelm the disposal system, lead to improper disposal of clinical and hazardous waste, and put everyone at risk.

Waste Handling

Staff and students should handle medical and hazardous waste as little as possible before storage and disposal. The more waste is handled, the greater the chance for accidents. Special care must be taken when handling used needles and other sharps, which pose the greatest risk of accidental injury and infection.

- ***Emptying waste containers:*** Waste containers that are too full also present greater opportunities for accidents. Waste should be removed before the containers become completely full. Dispose of sharps containers when they are 3/4 full. (When sharps-disposal containers become too full, people may push sharps into the container, causing injury.)
- Staff should wear utility gloves, heavy-duty apron, and boots when collecting waste.

- Do not collect clinical and hazardous waste from the storage areas by emptying it into open carts or wheelbarrows, as this may lead to spills and contamination of the surroundings, may encourage scavenging of waste, and may increase the risk of injury to staff, patients, and visitors.
- Handle clinical and hazardous waste as little as possible.

Interim storage of waste

If possible, the final disposal of waste should take place immediately, but it is often more practical to store waste briefly in the facility before final disposal. Interim storage should be short-term.
If it is necessary to store clinical and hazardous waste on-site before final disposal:

- Place waste in a closed area that is minimally accessible to staff, patients, visitors and animals. As few people as possible should come into contact with stored clinical and hazardous waste.
- All containers should have lids to prevent accidental contamination, spillage, and access by insects, rodents, and other animals.
- Contaminated clinical and hazardous waste poses serious health threats to the community. Never store clinical and hazardous waste in open containers & never throw waste into an open pile.

Occupational Health and Safety

All the healthcare workers under the subprojects will strictly follow the protocols and procedures stated in the chapter 6 Occupational Health and Safety of the National level Infection Prevention and Control Guidelines (IPCG) (2020). The IPCG is attached as the annex (Annex I) of this document. The hospital in charge will supervise and monitor the application of the stated occupational health and safety by all healthcare workers at all levels.
The PMU and the Environmental Health Division within the MHMS will conduct the training on occupational health and safety practices to all healthcare workers prior to the operation of the respective subprojects.

Infection Prevention and Control Protocols

The National level Infection Prevention and Control Guidelines (IPCG) (2020) (Annex I) has detail and comprehensive protocols and guidance for the infection prevention and control at the health care facilities. All the healthcare workers under the subproject will strictly follow the protocols and procedures stated in the National guidelines.

Implementation and monitoring arrangement for the Operational manual at subproject level

According to the National IPC guideline, all health facilities are required to have a management committee each that deals with IPC. This is an integral aspect prescribed by the IPCG for establishing an improved governance structure that fosters better waste management practices at the Facility level but also control mechanism at the national level. The management committee at the healthcare facility level would link with the national IPC committee to ensure that objectives of the IPCG and related policies from which it is transcribed, are achieved to a minimum level by the health facility. The management committee would also oversee the daily implementation of waste management practices at the health facility level and ensures that health workers receive relevant training needs by liaising with the Public Health Emergency and Surveillance Unit (PHESU) of the Ministry of Health and Medical Services (MHMS).
For small-scale health facilities such as clinics that have less than 10 workers which is sparsely captured by the IPCG, a focal team will be formed and assigned to spearhead the on the ground practices of implementing the operational manual in respective health clinics. The focal team will include but not limited to (i) the manager/supervisor of health care facility, (ii) health care specialist(s)/worker(s), and

(iii) an admin assistant. Below table indicates the institutional arrangement of implementing and monitoring of this HCWM and HSE plan.

Name	Position	Assigned Role for HCWM implementation
Moscs m Lamana	Supervisor (RN)	Supervisor of Health facility. Give instructions and coordinate wor shifts.
Jonica Gregary	RN/Midwife	Waste management
Ruth Iele	Registered Nurse Aid (RN)	Waste management
SR Chris Konasa	Church Employee	Waste Disposal site overseer
Marlin Pae	Pharmacist	Waste management
Emelina Georgine	Pharmacy Aid	Waste management
James Faye	Microscopist	Waste management
Tony Iele	Clinic Driver	Waste Management

The team will be in charge to ensure that the above-mentioned protocols and practices set in this document are set on ground, the required staff are assigned with designated tasks and being trained properly. As needed, the lead person of the team will liaise with the management committee for the set-up of proper waste disposal facilities such as an incinerator, ash pit and a landfill pit. The team will ensure that all the set procedures are implemented, monitored and reported regularly.

Training plan for waste management and occupational health and safety

Training subject	Target participants	Trainer(s)	Training Frequency
Healthcare waste management	All healthcare workers of the proposed clinic/hospital	PMU	One time prior to the subproject operation. A refresher course could be conducted during operation period by the Public Health Emergency and Surveillance Unit (PHESU) of the Ministry of Health and Medical Services (MHMS).
Occupational Health and Safety and IPC	All healthcare workers of the proposed clinic/hospital	PMU and the Public Health Emergency and Surveillance Unit (PHESU) of the Ministry of Health and Medical Services (MHMS).	One time prior to the subproject operation. A refresher course could be conducted during operation period by the Public Health Emergency and Surveillance Unit (PHESU) of the Ministry of Health and Medical Services (MHMS).

Budget allocation

Activity	Est. Amount (SBD)	Implementation Responsibility
Training (mentioned in sec 7)	$60,000.	PMU - MHMS
Construction/ installation of incinerator/ burning facility (for those clinics which does not have existing burning facility)	Minimum $5,000.00	PMU
Operation and maintenance cost		Clinic
Regular refresher trainings		Clinic