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SOLOMON ISLANDS AGRICULTURE AND RURAL TRANSFORMATION PROJECT  
(P173043)

**SITE-SPECIFIC**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

For

***The Refurbishment of the former Taiwanese Technical Mission (TTM) Slaughter Facility, Pig Breeding Facility and Research Office Headquarter, East Honiara, Guadalcanal.***

**Version 4**

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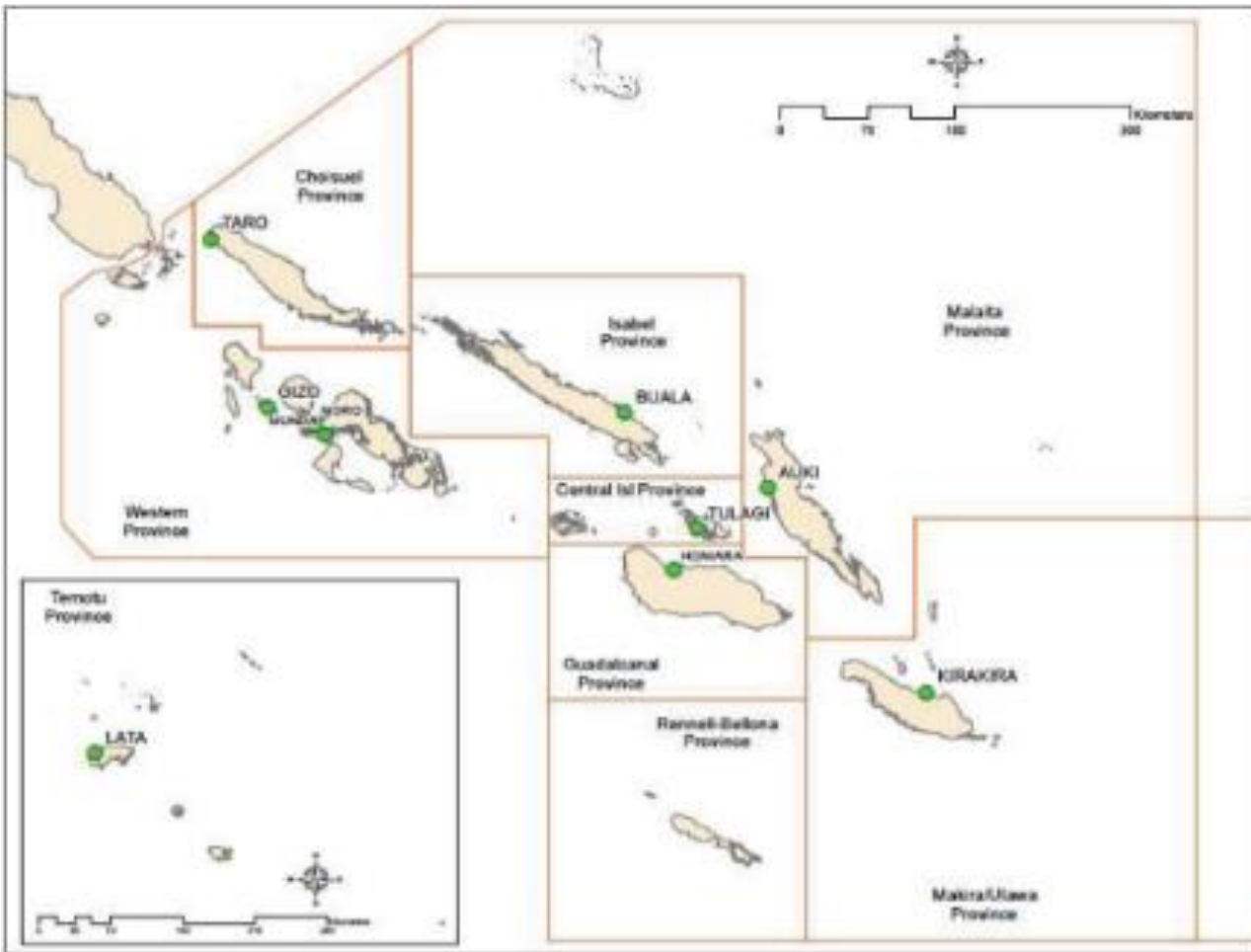


## 1.0. INTRODUCTION

### 1.1. Background

1. The proposed renovation works are in line with the following sub-components;
  - a. subcomponent 1.2: for productive infrastructure under SI ART purposely to enhance economic activity and generate spill-over benefits through targeted investments which among others also include the small repairs to the National Research Headquarters.
  - b. Sub-component 2.2: Small-stock Sector Renewal. This sub-component will support the MAL Division Department of Livestock in enhancing its pig breed improvement program by increasing multiplier farms and upgrading poultry production in project provinces. This is expected to improve production, reduce mortality, increase animal protein consumption, and boost domestic sales of pig and chicken meat. Activities include establishing pig and poultry slaughter facilities, offering private sector incentives, and promoting best practice hygiene.
2. The subproject aims at targeting foundation for economic and production activity and generate positive spill-over benefits for farmers and operators of the slaughter and pig breeding facilities. The slaughter facility will be operated by a private entrepreneur through a public-private partnership and will focus only on pig slaughtering. MAL also has a tentative plan to consider expanding the slaughter facility in the future to cater for slaughtering cattle but not in the immediate future. For the pig breeding facility, it will still be operated by MAL but in the long-term the public-private partnership will be ensured, highly likely, with the business partner that operates the slaughter facility. Both the slaughter facility and the pig breeding facility are in deteriorating condition that need some renovation and improvement works. Literally, they are existing facilities established by the then Taiwanese Technical Mission (TTM) to Solomon Islands, in their effort to improve agriculture and livestock development in the country by way of ensuring the quality and safety of meat from perspective of animal pathology and disease and to provide quality pig breeds.
3. This Site-Specific Environmental and Social Management Plan (SS-ESMP) is prepared in order to manage environmental and social risks and impacts that may arise as a result of the renovation and improvement works on the pig slaughter facility, pig breeding facility and Research Headquarter office that are located in King George (KGV) area, Burns creek, West Honiara, Guadalcanal Island (Figure 1-1). For the pig breeding facility and the research headquarters office, they are still in the discussion stage and will not be immediately renovated. Although they are mentioned in this report, their immediate need for renovation are not yet reached. Therefore, this report will mainly focus on the renovation and improvement works on the slaughter facility.
4. The environmental and social risks and impacts are described stage-wise, from preconstruction and through to construction and decommissioning phases. The projects will be funded by the Solomon Islands Government (SIG) through the Ministry of Agriculture and Livestock (MAL), with financial support from the World Bank (WB).

Figure 1-1: Map of Solomon Islands showing the island of Guadalcanal where the sub-project is located.



5. Since the withdrawal of the TTM in Solomon Islands, these facilities have been left idle and deteriorated, though the pig breeding facility still hold few sows and boars that continuously produce piglets that MAL still supply to piggery farmers. Recently, MAL has seen the importance of reviving the operation of the slaughter facility and sees the pig breeding facility as an important component of this for improved pig breeds. As for the research headquarter office, the building is just as old as both slaughter and pig breeding facilities as they are being built at the same time almost over 40 years ago by the TTM to Solomon Islands.
6. These investments are aligned with the SIG policy of investing heavily on economic infrastructures and facilities<sup>1</sup> to contribute to the social and economic development of the country.

### 1.2. Environmental and Social Management Plan Objectives and Scope

7. The objective of this SS-ESMP include but not limited to the followings:
  - ✓ to provide a set of stipulations for managing the renovation and improvement works on the slaughter facility, pig breeding facility and the research office headquarter and their operations in a manner that incorporates the principles of environment sustainability according to the SIG legislation and World Bank

<sup>1</sup> Solomon Islands Agriculture Sector Growth and Investment Plan (2021 – 2030).

Environmental and Social Standards (ESSs) according to the WB ESF, and,

- ✓ to minimise potential adverse effects on the surrounding community and the environment.
8. To achieve this objective the SS-ESMP outlines the mitigation measures required for avoiding or minimising the potential impacts throughout the renovation/improvement works and operational phases of the two facilities and the research office headquarter and provides a monitoring program to confirm effectiveness of the required mitigation measures.

## 2.0. DESCRIPTION OF THE SUB-PROJECT

### 2.1. Screening of the Sub-Project Site

9. The impact screening was carried out for the pig breeding facility, slaughter facility and research office headquarter on 27<sup>th</sup> May 2024 (refer to appendix 1). The sub-project will involve refurbishment and improvement works, and the overall Environmental and Social Risk Classification (ESRC) is classed as 'moderate' with environmental risk as 'moderate' and social risk as 'low' without mitigation measures. By the nature of the renovation works, the majority of the environmental and social impacts are expected to be site specific and temporary only during the course of the actual renovation stage. With the application of the readily available and attainable mitigation measures, the resulting environmental and social impacts are expected to be low.
10. The screening activity confirmed that there are no Cultural Heritage Sites and Protected Area and/or buffer zone of a Protected Area. The site is a built environment. Mangroves and estuarine are not at reach given the nature of locality of the sub-project site. The site is located within Honiara town boundary with significant development footprint and habitat is highly degraded due to years of anthropogenic interventions. It is expected that the main environmental and social risks that need proper management during the renovation works is noise emanating from construction machines/equipment. During the operation stage, waste in the likes of slaughterhouse waste (solid and liquid wastes) are anticipated and needs proper management. Likelihood of other environmental risks occurring is likely but even if they occur, the impacts would be low with applications of tangible mitigation measures.

### 2.2. Location

11. The sub-project including three distinct buildings situated on a single parcel of land located at what was previously known as the Taiwanese Technical Mission (TTM) farm at KGVI area, Burnscreek, West Honiara, at geographical location of Latitude: 9°25'22.50"S, Longitude: 160° 1'14.11"E for both slaughter and pig breeding facility that situated close to each other. While specific location of the research office headquarter is at Latitude: 9°25'23.48"S, Longitude: 160° 1'17.07"E. The land title was held by the Commissioner of Lands (CoL) with parcel number: 192-007-0183 Lot 1039. Each renovation and improvement work focus on modernizing and enhancing the functionality of these buildings while preserving their architectural integrity.
12. The boundary map of the land parcel is shown in Figure 2-1. The location of the sub-project site with reference to Honiara city on imagery in Figure 2-2 and the site-specific location in Honiara city at KGVI – Burnscreek area is shown in figure 2-3.

Figure 2-1: Land boundary map of the sub-project site<sup>2</sup>.



Figure 2-2: Location of the sub-project site with reference to Honiara City – local context



<sup>2</sup> Ministry of Lands, Housing and Survey

Figure 2-3: Site-specific location of the sub-project site with reference to KGVI – Burnscreek area.



### 2.3. Site description

13. The site is located on a flat land with good existing drainage that properly controls flood risk. There are existing structures at the site which are constructed back in the year 1981 when the TTM establish bilateral relation with the government of Solomon Islands. When the TTM withdrew, the slaughter facility (Figure 2-4) ceased operation while the pig breeding facility (Figure 2-5) and the Research HQ office (Figure 2-6) remain operational (more photos of the project site in annex 11). The pig breeding facility has in fact has less than twenty sows, boars and piglets altogether with materials have since deteriorated. The slaughter facility has been dormant since the TTM withdrawal in 2019 and has been deteriorating since then. The research headquarters' office also deteriorated and in dire need of renovation. Literally, all these facilities only need minor renovation works.
14. The habitat is a degraded one, being a built environment. This means there is total lack of primary or pristine areas of native vegetation, no known rare or endangered species or any species of significant conservation values at the sub-project site or within 300 meters safety radius identified for the site. The site does not have a defined vegetation as it is a built-environment. There is no waterway or sink-holes at the site and nearby areas (within the range of 300 meters safety radius from the site of interest). The Burnscreek stream is approximately 40 meters away while the Lunga river at a distance of 700 meters. The shoreline is approximately 1km away. The ownership of the land is held by the Commissioner of Land, hence, there is no need of land acquisition as the land is owned by the government and resettlement is not required.

*Figure 2-4: overview of the existing structure of the slaughter facility*



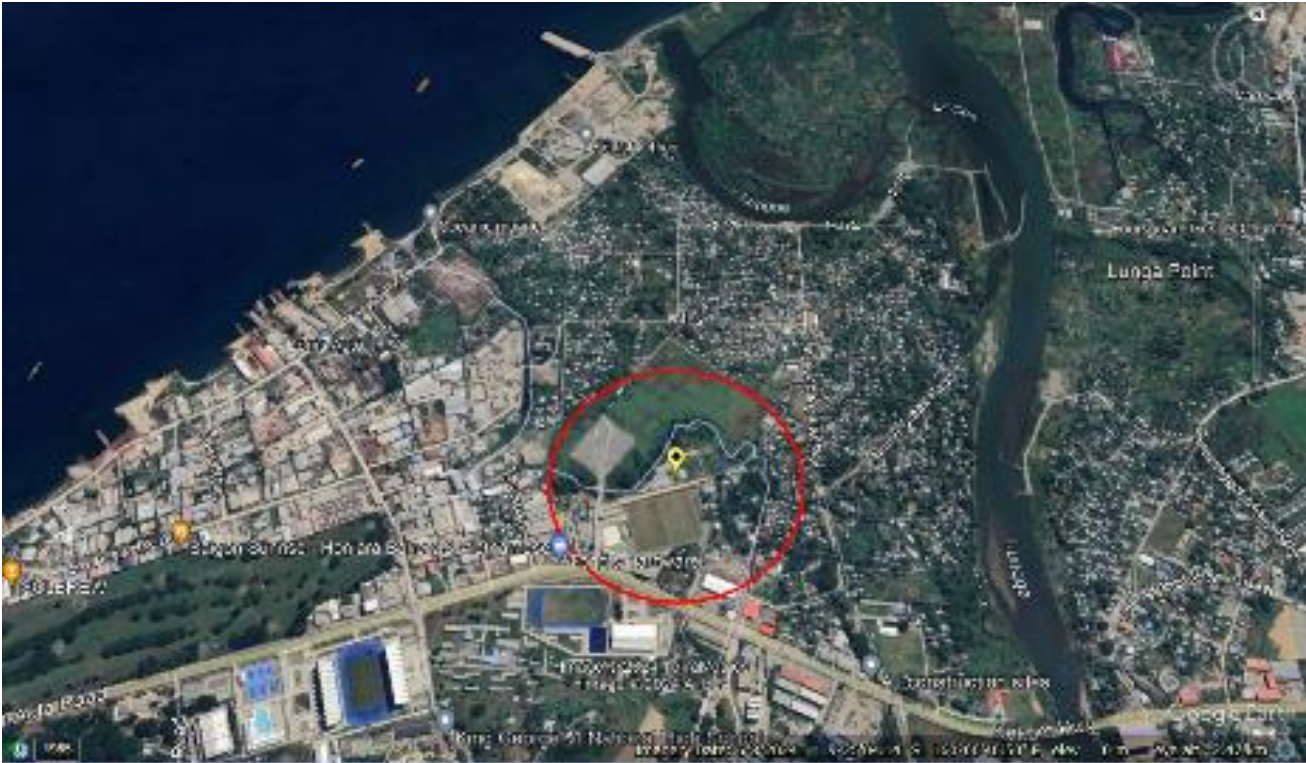
*Figure 2-5: Part of the pig breeding facility*



*Figure 2-6: Overview of the front exterior view of the Research HQ office*



Figure 2-7: 300 meters safety radius



15. The sensitive receptors that are within the 300 meters safety radius (Figure 2-7) are mainly residential buildings in the custom garden area who are mostly squatters and the newly built Solomon Islands Football Federation Academy including a playing ground and the Tongs hardware. There is a school (Perch Kindergarten) that is situated adjacent to Tongs Hardware. The assessment of the sub-project area signifies the importance of consultation before and during the renovation works especially with Perch Kindergarten School beside Tongs. The PMU through its Social Safeguards Officer (SSO) will carry out these consultations before renovation works started to inform them about the proposed development and to ensure safety of staff and students from moving machines or vehicles transporting material to the site. During the renovation stage, the SSO in collaboration with the Contractor’s Environmental Health and Safety Officer (EHSO) will need to continue with the consultation process as part of compliance to WB and SIG safeguards policies. Before the actual renovation begins, the contractor will need to prepare their Contractor’s Environmental and Social Management Plan (CESMP) which will outline the relevant specific activity to be carried out by the contractor in order to manage the environmental and social risks and impacts of the project, and that it needs to be approved by the PMU and the WB.

## 2.4. Key Activities for the Proposed Works

### 2.4.1. Slaughter Facility

16. Renovating a slaughterhouse involves several key activities to ensure it meets modern standards for hygiene, efficiency, and environmental sustainability. Here is a step-by-step breakdown of the main activities that need that will be undertaken for the slaughter facility upgrade and improvement works:

- ✓ Assessment and Planning:

- Site Assessment: Evaluate the current state of the facility, including structural integrity, equipment condition, and compliance with health and safety regulations.
  - Needs Analysis: Identify areas that need improvement or expansion based on capacity requirements, technological advancements, and regulatory changes.
  - Regulatory Compliance: Review relevant local, national, and international regulations, including sanitary standards, environmental laws, and animal welfare guidelines.
  - Budget and Timeline: Establish a realistic budget and timeline for the renovation project.
- ✓ Design and Layout Optimization:
- Facility Layout: Optimize workflow, minimize cross-contamination, and improve operational efficiency. Consider the separation of clean and dirty zones.
  - Expansion: The Plan had considered additional space within the same sub-project footprint if needed in the future, such as more holding pens, processing area, or storage.
  - Accessibility: Ensure easy access for animals, staff, and transportation vehicles.
- ✓ Infrastructure Upgrades:
- Structural Improvements: Repair or upgrade the building's structure, including walls, floors, and roofs, to meet hygiene standards. Use materials that are easy to clean and resistant to moisture and bacteria.
  - Plumbing and Drainage: Upgrade plumbing and drainage systems to ensure efficient waste management and prevent contamination.
  - Ventilation and Climate Control: Install or upgrade ventilation systems to control odours, humidity, and temperature, providing a comfortable environment for both animals and workers.
- ✓ Equipment Modernization:
- Refrigeration Systems: A chiller will be provided to ensure proper storage of meat products and compliance with food safety standards. Owners of the carcasses will have 24 hours to collect their meat products.
  - Waste Management Systems: The small slaughter facility at KGVI, designed specifically for pig slaughtering, is expected to produce minimal solid waste due to its limited operational scale. The controlled volume of animals processed, combined with efficient waste management practices, ensures that the waste generated—primarily inedible parts such as offal, bones, and minimal packaging materials—remains at a significantly lower level compared to larger industrial slaughterhouses. Additionally, the facility will implement strict sorting and disposal procedures, further minimizing the overall environmental impact of the solid waste produced. Solid waste will mainly be hooves, hairs and bones. Intestines or offal and other solid parts will be taken away by farmers for pig meal. Bones will be cut with the meat so expect no bone waste. Solid waste will be segregated at the source for collection by farmers or a rendering machine will be employed to crush solid waste to produce pig meal components. Wastewater is washed through a drain leading from the slaughter to aseptic tank (3 m x 7 m) and soak-away pit (3 m x 6 m). Blood is collected separately. Per pig slaughtered produces about 3 Litre of blood, hence 20 pigs slaughtered per day will produce approximately 60 litres of blood. These bloods will be given out to farmers as their incentives and can be used for food and pig meal. Waste Management is discussed in section 2.6.2 and 2.6.3.

- ✓ Hygiene and Sanitation Enhancements
  - Cleaning Systems: There are existing water pipes in the facility that will be repaired for use in cleaning surfaces and ensure proper drainage to facilitate regular and thorough cleaning of all areas.
  - Sanitization Stations: Set up sanitization stations for workers to maintain hygiene before entering processing areas.
  - Pest Control: Implement the SIART Pest Management Plan for effective pest control measures to prevent contamination.
  
- ✓ Animal Welfare Improvements
  - Handling Facilities: Improve animal handling facilities to reduce stress and injury, including proper lairage (holding) areas, ramps, and chutes.
  - Humane Slaughter Practices: Improvement on the stunning, scalding and dehairing area to ensure slaughter practices meet humane standards.
  
- ✓ Environmental Sustainability Measures
  - Energy Efficiency: Upgrade to energy-efficient systems and equipment to reduce the facility's carbon footprint.
  - Water Conservation: Improvement on water pipes. There is an existing water storage facility at the site with water source from a borehole. It utilizes pressure pump and is working properly and in good condition.
  
- ✓ Staff Training and Safety
  - Training Programs: Develop and implement training programs for staff on new equipment, hygiene practices, animal welfare, and safety procedures.
  - Safety Measures: Ensure the facility complies with occupational health and safety regulations, providing protective gear and safe working conditions.
  
- ✓ Documentation and Compliance
  - Record-Keeping: Maintain detailed records of renovation activities, compliance with regulations, and standard operating procedures.
  - Audits and Inspections: Conduct regular audits and inspections to ensure ongoing compliance with all standards and regulations.
  
- ✓ Community and Stakeholder Engagement
  - Stakeholder Communication: Engage with local communities, regulatory bodies, and other stakeholders to address concerns and ensure transparency throughout the renovation process.
  - Feedback Mechanisms: Implement feedback mechanisms to continuously improve operations based on stakeholder input.
  - Grievance Redress Mechanism: The SIART Project has a comprehensive GRM for its contractors that provides a structured process for addressing and resolving complaints from affected persons,

communities and stakeholders, ensuring transparency, accountability, and the protection of their rights when the project is implemented (detail GRM can be found in Section 6.5).

#### 2.4.2. Pig Breeding Facility

17. Renovating a pig breeding facility involves several key activities aimed at improving efficiency, animal welfare, and environmental sustainability. Here are the main renovation activities:

- ✓ Structural Upgrades:
  - Building Repairs: Fixing any structural damages in barns, farrowing houses, and other facilities.
  - Roof and Insulation: Replacing or repairing roofs and improving insulation to maintain optimal temperature.
  - Flooring: Installing durable, non-slip flooring to enhance cleanliness and reduce injury risks for pigs.
- ✓ Environmental Control Systems:
  - Ventilation: Upgrading ventilation systems to ensure proper air quality and temperature control.
  - Lighting: Implementing energy-efficient lighting systems to support pig health and productivity.
- ✓ Feeding and Watering Systems:
  - Improved Feeding: Installing improved feeding systems to ensure consistent and efficient feed delivery.
  - Water Supply: Upgrading water systems to provide clean and easily accessible water.
- ✓ Waste Management:
  - Manure Handling: Enhancing manure handling systems by improving slurry storage facility at the site.
  - Composting: Improve/rehabilitate the current composting house at the site for manure to reduce waste and create a usable product (organic fertilizer).
- ✓ Biosecurity Measures:
  - Isolation Areas: Creating or improving quarantine and isolation areas for sick or new pigs.
  - Sanitation Stations: Installing sanitation stations at entry points to reduce the risk of disease spread.
  - Pest Control: Implementing effective pest control measures as per the SIART Project Pest Management Plan (PMP) during operation of the facility to minimize the presence of rodents and insects.
- ✓ Animal Welfare Improvements:
  - Housing: improve housing to provide more space and comfort for pigs, including group housing for sows.
  - Health Monitoring: Implementing systems for regular health checks and monitoring of pigs.
- ✓ Regulatory Compliance:
  - Environmental Standards: Ensuring the facility meets all local and international environmental standards.

- Animal Welfare Regulations: Complying with animal welfare regulations to improve living conditions for pigs.
  - Safety Standards: Upgrading facilities to meet safety standards for workers and animals.
- ✓ Staff Training:
    - Training Programs: Implementing training programs for staff on new systems and best practices in pig husbandry.
    - Health and Safety: Ensuring all staff are trained in health and safety protocols.
  - ✓ Community and Stakeholder Engagement:
    - Transparency: Keeping local communities and stakeholders informed about renovation plans and progress.
    - Feedback Mechanisms: Establishing channels for feedback from the community and other stakeholders and implementing the GRM as detailed in Section 6.5.

### 2.4.3. Research Headquarter (Office) Renovation

18. Renovating the office building involves several key activities, each critical to ensuring the project meets its objectives. Here is a step-by-step breakdown of these activities:

- ✓ Planning and Assessment:
  - Needs Assessment: Identify the goals of the renovation, such as increasing space efficiency, updating technology, improving energy efficiency, or enhancing aesthetics.
  - Building Inspection: Conduct a thorough inspection of the current state of the building, including structural integrity, electrical systems, plumbing, AC, and compliance with current building codes.
  - Budgeting and Financing: Develop a detailed budget covering all aspects of the renovation. Financing of the renovation to be supported by SIART.
- ✓ Design and Approval:
  - Architectural Design: The SIART Engineer to create design plans that meet the identified needs and comply with local building codes<sup>3</sup> and regulations.
  - Interior Design: Plan the interior layout, including workspaces, communal areas, lighting, and finishes. Consider ergonomics and employee well-being.
  - Permits and Approvals: This is an existing building for minor renovations only and does not require any permit or approvals.
- ✓ Pre-Construction Activities:
  - Hiring Contractors: Select a reputable contractor through a bidding process. Ensure they have experience with office renovations.
  - Scheduling: The SIART engineer will develop project timeline.
- ✓ Demolition and Site Preparation:
  - Demolition: Safely remove any structures, fixtures, or materials that need to be replaced or reconfigured. This will include walls, flooring, ceilings, and outdated infrastructure.
  - Site Preparation: Prepare the site for construction, including waste removal, leveling, and setting up temporary facilities if necessary.

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<sup>3</sup> National Building Code, 2022

- ✓ Construction Activities:
  - System Upgrades: Update or install some new electrical, plumbing, and AC systems to meet modern standards and improve efficiency.
- ✓ Interior Finishing:
  - Walls and Ceilings: Paint, install new drywall, or apply other finishes as designed.
  - Specialized Areas: Refurbish specialized areas such as conference room, restrooms, and reception area.
- ✓ Final Inspections and Adjustments:
  - Quality Control: Conduct thorough inspections to ensure all work meets the required standards and specifications. Address any deficiencies or issues identified.
  - Compliance Checks: Ensure the renovation complies with all building codes, safety regulations, and environmental standards.
  - Client Walkthrough: Conduct a final walkthrough with the client to ensure their satisfaction with the renovation.
- ✓ Post-Renovation Activities:
  - Cleanup: Perform a comprehensive cleanup of the site, removing all construction debris and making the space ready for occupancy.
  - Final Documentation: Provide all necessary completion documentation
  - Move-In Coordination: Assist with moving furniture, equipment, and staff back into the renovated space, ensuring minimal disruption to operations.
  - Post-Occupancy Evaluation: Conduct a post-occupancy evaluation to gather feedback from occupants and address any lingering issues.
- ✓ Sustainability and Maintenance:
  - Sustainability Measures: Implement sustainability measures such as energy-efficient lighting, water-saving fixtures, and environmentally friendly materials.
  - Maintenance Plan: Develop a maintenance plan to ensure the longevity and efficiency of the renovated office space.

19. It is a requirement that this SS-ESMP will be included in the bidding documents. Based on this SS-ESMP, the contractor will prepare a more specific Contractor's ESMP (CESMP) which will detail the practical implementation of the mitigation measures identified in this SS-ESMP. Should there be any changes on the design or scope of work, the SS-ESMP will be updated to reflect such variation.

## 2.5. Specific Scope of Works for the Slaughter Facility

20. The renovation works that will happen immediately soon after the identification of a contractor would be on the slaughter facility. The renovation of this facility has been widely discussed by the MAL executive, therefore, SIART Project has mobilized its resources to specifically assess its viability and have also prepared a specific design and specific scope of work for the facility.
21. The following activities outline the specific scope of work for the execution of the refurbishment works on the KGV I Slaughter Facility;
- ✓ Removal of timber flooring of approach from loading/off-loading area and reconstruct timber flooring,

- ✓ Removal of Ceiling Fan and all lighting. Thoroughly check wiring, cables, all switches, power point and replace with new ones where necessary,
- ✓ Removal of Ceiling cover, cleaning inside ceiling and replace ceiling cover with new materials,
- ✓ Reconstructing new doors, lock, screen and re-install/reassemble louvers and louver frames inclusive,
- ✓ Wash with water blaster all areas within the facility and thoroughly clean/wash floor slab in both holding pens and slaughter house,
- ✓ Remove and replace floor and wall tiles including half partition wall in the slaughter house,
- ✓ Check plumbing system and taps to ensure water system within the vicinity is functioning. Replace missing plumbing, pipe lines and water fitting and taps with new materials where necessary,
- ✓ Replace bulb lighting and switches and power point and ensure electrical work is done properly and is functioning before reconnecting power to facility,
- ✓ Disconnect Power and Water Supply during course of renovation,
- ✓ Demolish shed roofing and truss of stun cleaning area and reconstruct with new materials,
- ✓ Disconnect and remove old taps and fountains and replace with new ones
- ✓ Repaint Fascia board with 2 (two) coat,
- ✓ Contractor must meet SIEA fees and SIWA fees for re-connection of services should there be need to do so, and, Painting in and around slaughter house including other buildings where necessary and general clean up.
- ✓ Rehabilitating the existing drain with further improvement works.
- ✓ Desludging existing septic tank and further improvement works and constructing a soakaway pit. The sludges (organic waste) from the septic tank will be treated using composting method described in section 2.6.2.1 and detail Annex 9.
- ✓ Rehabilitating the existing anaerobic digester and treatment of organic waste using composting method described in section 2.6.2.1 and detail in Annex 9.

## 2.6. Main Components of the Slaughter Facility in detail

22. MAL through SIART will be improving the slaughter facility to a modern state that meets international abattoir standards for the operation of the facility. It is designed to cater of 20 carcasses per day. The main components of the slaughter facility also known as an abattoir as outlined below, are designed to ensure the humane treatment of animals, the safety of workers, and the sanitary processing of meat. Here are the key components that will be improved during this renovation work:

- ✓ Receiving Area:
  - Holding Pens: For holding animals before slaughter.
  - Inspection Area: For health and welfare checks of animals.
- ✓ Stunning and Bleeding Area:
  - Stunning Box or Restraint System: For humane stunning of animals.
  - Bleeding Rail: For suspending animals to allow proper bleeding.

- ✓ Evisceration and Dressing Area:
  - Scalding and Dehairing/Defeathering Equipment: For removing hair or feathers.
  - Evisceration Line: For removing internal organs.
  - Inspection Station: For veterinary inspection of carcasses and organs.
  - Carcass Splitting and Washing: For cleaning and splitting carcasses.
- ✓ Chilling and Storage:
  - Chill Rooms/Coolers: For rapid cooling of carcasses to prevent bacterial growth.
  - Freezer Storage: For storing meat at sub-zero temperatures.
- ✓ Cutting and Processing Area:
  - Cutting Room: For cutting carcasses into smaller parts.
  - Processing Area: For further processing like deboning, grinding, or packaging.
- ✓ Packaging Area:
  - Packaging Lines: For wrapping and packaging meat products.
  - Labelling and Weighing Stations: For proper labelling and weight measurement.
- ✓ Rendering and By-products Area:
- ✓ Rendering equipment: For processing inedible parts into by-products like bone meal and fat.
- ✓ Waste Management and Treatment:
  - Effluent Treatment: Effluents from the slaughter facility are mainly organic matter, blood, fat and proteins. Blood is collected/harvested separately at the stun/killing area for various uses e.g., food, pig meal etc, while some blood remains in the body that goes to slaughter. Chemicals used will be liquid hand soap for cleaning hands and diluted Quat (Quaternary ammonium) for cleaning surfaces and equipment. These cleaning agents pose very low (if not negligible) risk to the environment. It is important to note that in the past, effluents from pig breeding facilities only are treated by way of septic tank and excess water (manure water) are piped for irrigation in the adjacent crop farm. Whereas, waste water from the slaughter facility is discharged directly to the nearby pond and subsequently onto the Burns creek stream that runs just north of the facility. Nevertheless, according to the proposed renovation design, the effluents will be treated by way of septic tank and soakaway. The septic tank and soakaway are designed to sufficiently handle all the effluents Sludge or slurry from the septic tank will be routinely cleared and re-use as organic fertilizer by interested farmers.
  - Solid Waste Management: For handling solid waste like bones, offal and skins. There will be no bone waste as bones will be cut along with the meat. Should there be some bone waste remain, they will be separated at the source with other solid waste like hooves/offal/skin which makes it easier to manage and recycle them effectively with the use of a rendering machine to produce pig feed/bone meal. More detail in Section 2.6.2.
- ✓ Support Facilities:
  -

- Administrative Offices: For management and administrative staff.
  - MAL Livestock laboratory (drug store) at town-ground: The MAL Livestock laboratory (drugstore) will be utilized for storage of concentrates of liquid hand soap and quat (quaternary ammonium). This is where these concentrates will be diluted before transporting to the slaughter facility for use.
- ✓ Safety and Sanitation Measures:
- Sanitation Stations: For workers to sanitize equipment and hands.
  - Pest Control Measures: Implement the SIART Pest Management Plan (PMP) to prevent contamination from pests.
23. These components work together to ensure that the slaughtering process is efficient, humane, and meets health and safety standards.

### 2.6.1. Slaughtering Process

24. During the TTM<sup>4</sup> operation days, several simple but critical processes were undertaken to ensure the meat's safety, quality, and suitability for storage. The meats were stored in the chiller and the farmers have 24 to 48 hours to collect them. The meat is prepared and stored in a manner that maximizes its shelf life and ensures it is safe for consumption.
25. As MAL planned to revive this slaughtering business, the same process employed by the TTM described below will be revived and utilized.

#### **Stunning and Slaughter:**

- Animals are humanely stunned and slaughtered to minimize stress and ensure compliance with animal welfare standards.

#### **Bleeding (Exsanguination):**

- The carcass is bled by severing major blood vessels to remove as much blood as possible. This step is crucial for meat quality and safety.

#### **Scalding and Dehairing (for pigs):**

- The carcass is submerged in hot water (scalding) to loosen the hair, followed by manual dehairing.

#### **Evisceration:**

- The internal organs (offal) are removed from the carcass. Edible organs are separated from inedible parts and kept for owners to take home for pig meal or are sold (some cultures use them for food).

#### **Carcass Splitting and Trimming:**

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<sup>4</sup> Taiwanese Technical Mission to Solomon Islands.

- The carcass may be split into halves or quarters, and excess fat, bones, or other unwanted parts are trimmed.

#### **Washing and Sanitizing:**

- The carcass is thoroughly washed to remove any blood, hair, dirt, or other contaminants. Sanitizing may be done to reduce bacterial load.

#### **Inspection and Grading:**

- Meat inspectors check the carcass for signs of disease, contamination, or defects. The meat is then graded based on quality standards.

#### **Pre-Chilling:**

- The carcass is often pre-chilled in a chiller to remove residual body heat quickly. This step helps prevent bacterial growth and reduces the cooling load on the main chiller.

#### **Cutting and Portioning:**

- The carcass is cut into specific portions (e.g., cuts of pork) before chilling. This step is also done after chilling.

#### **Weighing and Labelling:**

- Portions may be weighed and labelled with relevant information, such as the date of slaughter, weight, and type of meat, before chilling.

#### **Loading into the Chiller:**

- The carcasses or meat portions are carefully loaded into the chiller. Proper spacing is maintained to allow cold air circulation and even cooling.

#### **Chilling:**

- The meat is rapidly cooled to a safe storage temperature (typically between 0°C and 4°C) to slow down bacterial growth and preserve freshness.

#### **Monitoring:**

- Temperature and humidity levels in the chiller are continuously monitored to ensure that meat is stored under optimal conditions.

### 2.6.2. Solid Waste Management Process

26. In the past operation, the slaughter facility is only used for pig slaughtering and solid wastes were separated at the source where splitting and trimming occurred. Bones were not wasted as they were cut together with meat, minimizing or mitigating bone waste. Offal and blood were collected as incentive for farmers as they were edible for some cultures in Solomon Islands, and were also used as pig meal for farmers. In situation where farmers did not prefer taking with them offal and blood, they were transported with other inedible parts such as skins/hides/hoofs to Mamara, West of Honiara, where they were properly dumped. In some occasions when some parts of bones were produced as waste, they were crushed using a rendering machine along with other solid waste parts to produce proteins that form

important component for pig feed/meal and fertilizers. For the proposed operation, bones will be cut along with meat and in occasions where farmers decide to remove bones, they shall be crushed using a rendering machine along with the other solid wastes including skin/hides/hoofs.

27. Usually, a farmer had one or two pigs for slaughtering at one time, therefore, there were not much solid waste generated per pig slaughtered. Some farmers request to collect bones and skull to be re-used for crafts or buried them properly along with skins/hides/hoofs. Offal and blood are edible; thus, farmers can consume or sell them for income or feed them to their pets and/or use them as ingredient for pig meals. Discussed below is how solid wastes from the slaughter facility and the pig breeding facility are treated during the past operation. This same process will be utilized for this proposed operation.

#### **Waste Segregation**

- **Sort Waste:** Solid waste is separated into different categories at the source, such as offal, skin, hooves, and blood. This segregation facilitates the effective management and recycling of each type of waste. Bone waste is minimal since bones are typically cut along with the meat during processing.

#### **Use as Animal Feed**

- **Feeding:** In exceptional circumstances, bones and other solid waste may be produced as by-products. These can be processed into valuable products such as bone meal or proteins, which can be used as pig feed or as components of organic fertilizer. Some offal and other by-products, such as blood, were provided as incentives to farmers who owned the carcasses, allowing them to safely use these by-products as animal feed, such as for pets or pigs. In some cultures, within the Solomon Islands, these by-products are also consumed as food. This approach has proven to be an effective way to encourage the re-use of solid waste from the slaughter facility.

#### **Anaerobic Digestion**

- **Biogas Production:** A small-scale anaerobic digester was installed on-site as a demonstration for generating biogas energy for cooking. Organic waste, primarily manure from one of the piggery houses, was processed in the digester, producing both biogas for energy and nutrient-rich slurry that was used as fertilizer on the former TTM farm. This method proved to be an effective approach to solid waste management during the piggery's previous operations. However, after TTM left the country, the slaughter facility, pig breeding facility, and the anaerobic digester were inoperative. As part of MAL's proposal to revive the slaughter and pig breeding facilities, the defunct anaerobic digester at the KGVl facility site will be rehabilitated to sustainably process piggery waste, reduce environmental impacts, and harness biogas for renewable energy, supporting both waste management and operational efficiency. This comes with several risks to the environment and health and safety of workers (see Environmental and Social, and Health and Safety Audit for the Anaerobic Digester in Annex 7). In the event of an emergency situation (e.g., fire, spill etc) during decommissioning or rehabilitation of the existing Anaerobic digester, the emergency procedures outlined in Annex 8 will be activated and adhered to.

28. These strategies were proved to be effective, efficient and environmentally friendly in the past operation. Therefore, MAL is planning that such a small slaughtering facility and pig breeding facility revive this waste management approach so that it can manage its solid waste responsibly, minimizing environmental

impact and turning waste into valuable resources where possible.

#### *2.6.2.1. Solid Waste Treatment Method*

29. To treat the solid waste from the KGVl pig breeding and slaughter facility and convert it into organic fertilizer, the process would involve two stages: anaerobic digestion and composting. Each stage plays a role in stabilizing the waste, reducing harmful pathogens, and enriching the waste with nutrients that can be beneficial for soil. Here is how the process works:

##### **Step 1. Anaerobic Digestion Stage**

30. Anaerobic digestion is a biological process in which microorganisms break down organic matter (such as pig waste) in the absence of oxygen, producing biogas (methane and carbon dioxide) and a nutrient-rich solid/liquid material known as digestate.

##### **Process:**

- **Collection of Solid Waste:** Solid waste from the KGVl facility (such as pig manure, bedding material, and other biodegradable slaughter by-products) is collected.
- **Slurry Preparation:** If needed, water is added to the waste to create a slurry, which helps to improve the flow of waste into the digester and promotes more efficient microbial digestion.
- **Anaerobic Digestion:** The slurry is fed into a sealed anaerobic digester where it is broken down by bacteria in the absence of oxygen. This process will occur in a closed tank for a period of 15-30 days.
  - **Biogas Production:** During digestion, methane and carbon dioxide are produced. The methane can be captured and used as a renewable energy source (for heating or electricity generation).
  - **Digestate:** The remaining material, called digestate, contains nutrients such as nitrogen, phosphorus, and potassium and is a valuable fertilizer. However, it may still need further processing to improve its stability and nutrient content for safe agricultural use.

##### **Benefits of Anaerobic Digestion:**

- **Biogas production:** This renewable energy can be used on-site to reduce energy costs or sold if feasible.
- **Pathogen reduction:** The digestion process reduces harmful pathogens and stabilizes the waste.
- **Odor control:** Anaerobic digestion significantly reduces odours associated with raw manure or slaughter waste.

##### **Step 2: Composting Stage**

31. The digestate from the anaerobic digester, while nutrient-rich, will be further processed via composting to produce high-quality organic fertilizer. Composting helps to improve the texture of the material, reduce any remaining pathogens, and make nutrients more accessible for plants.

##### **Process:**

- **Solid-Liquid Separation:** First, the digestate is separated into solid and liquid fractions. The solid portion is the primary material used for composting, while the liquid fraction will be used for irrigation on the nearby MAL research farm just next to the KGVI facility.
- **Mixing with Carbon-Rich Materials:** To achieve optimal decomposition, the digestate (which is nitrogen-rich) is mixed with carbon-rich materials such as straw, sawdust, wood chips, or dried leaves. This balances the carbon-to-nitrogen (C) ratio, which should ideally be around 30:1 for composting.
- **Composting Process:** The mixture is then placed in windrows (long composting piles) or **composting bins** where it undergoes aerobic decomposition.
  - **Aeration:** The compost pile must be turned regularly (every few weeks) to introduce oxygen and maintain the right conditions for the bacteria to break down the material.
  - **Moisture Control:** Moisture levels are maintained between 40-60% to ensure microbial activity and proper decomposition. If too dry, water is added; if too wet, more dry carbon materials are added.
  - **Temperature Monitoring:** During composting, the pile heats up to between 55-65°C. This temperature range is crucial because it kills off remaining pathogens and weed seeds, making the final compost safe for use.
- **Curing:** After several weeks to a few months (depending on the conditions), the compost enters a curing phase, where the temperature decreases, and the material stabilizes. During this time, the compost is left to mature for a further 1-2 months to ensure it is fully decomposed and ready for use. See Annex 9 for detail.

#### **Final Product – Organic Fertilizer:**

32. The resulting compost is dark, crumbly, and has an earthy smell. It contains essential plant nutrients like nitrogen, phosphorus, and potassium in forms that are more readily available to plants. The compost will then be packed in bags and sold or supplied to farmers to be used as an organic fertilizer to improve soil structure, water retention, and overall soil fertility for agricultural crops or gardens.

#### 2.6.3. Waste Water Management Process

33. As discussed above, during the past operation of the KGVI facility wastewater from the slaughter facility are discharged directly into the fish pond situated adjacent to the facility, while wastewater from the pig breeding facility were treated by way of septic tank. This septic tank is currently in obsolete condition and will be rehabilitated under this project. For this small-scale pig breeding and slaughter facility new set-up in the KGVI compound, all waste water will be discharged into the septic tank and soakaway pit system which is adapted to manage the specific wastewater generated from animal waste, slaughter by-products, and facility cleaning. Discussed below is how the system works:

#### **Septic Tank (3 m x 7 m):**

- **Purpose and Design:** The septic tank will serve as the primary treatment unit, collecting wastewater from the piggery (e.g., manure washdown, cleaning of pig pens) and slaughter facility (e.g., blood, water used for cleaning). At 3 meters by 7 meters, this tank is designed to handle the wastewater volume from both operations.
- **Wastewater Collection and Separation:**

- Wastewater from the pig pens, slaughterhouse floor drains, and washing areas flows into the septic tank.
- Inside the tank, the wastewater separates into three layers:
  - Top Scum Layer: Light materials, such as fats, grease, and any floating solids.
  - Middle Effluent Layer: Liquid wastewater, which contains dissolved waste, is relatively free of solids and ready for further treatment.
  - Bottom Sludge Layer: Heavier solids, such as manure particles and solid waste from slaughter by-products, settle at the bottom as sludge.
- **Anaerobic Digestion:** In the septic tank, anaerobic bacteria break down the organic material in the manure and other waste, reducing the solid waste volume and allowing effluent to flow out more easily.
- **Effluent Discharge:** After digestion, the liquid effluent from the middle layer flows out of the septic tank into the soakaway pit for further treatment.

#### **Soakaway Pit (3 m x 6 m):**

- **Effluent Distribution and Treatment:**
  - The liquid effluent from the septic tank enters the soakaway pit, which is 3 meters by 6 meters in size. The pit consists of perforated pipes or a porous structure that evenly distributes the effluent into the surrounding soil.
  - As the effluent percolates (seeps) through the gravel and soil in the soakaway pit, it undergoes natural filtration, where solids and contaminants are trapped, and microorganisms in the soil further break down harmful substances.
- **Final Disposal:** The treated effluent is absorbed into the surrounding soil, safely recharging the groundwater and ensuring no harmful environmental impacts. The gravel and soil act as a biological filter, removing pathogens and pollutants before the water reaches the groundwater table. Water quality test has been carried out in the Burnscreek stream and the result indicates a polluted or disturbed waterway due to human interference. Result of water quality baseline is discussed in section 4.

#### **System Efficiency for the Facility:**

- **Solid Waste Management:** The septic tank is critical in separating and treating solid waste from both pig breeding and slaughter activities. Regular maintenance, such as pumping out accumulated sludge, will ensure the system continues to function effectively without overflowing or causing contamination.
- **Slaughter By-Product Considerations:** Blood and small amounts of solid waste from the slaughter process will enter the septic system, but larger solid by-products (e.g., bones, meat scraps) will be managed separately to avoid overwhelming the system. Proper separation of these materials will enhance the efficiency of the septic tank and prevent clogging or excessive sludge build-up.



plumbing and electrical system. According to the design, the KGVI facility will be using a septic tank and soak hole (or soakaway pit) to dispose of waste-water as discussed above.

#### 2.7.1. Resilience features

37. The primary renovations to the slaughter facility will focus on improving its standard in terms of hygiene and environmental compliance. This will involve installing simple modern equipment, upgrading waste management systems (including septic and soakaway pits), and enhancing the facility's layout to optimize operations and reduce contamination risks. These upgrades are designed to meet current health and environmental standards, ensuring more efficient and safe processing of pigs.
38. The resilient features outlined below focus on both environmental and structural improvements. An integrated drainage system will serve both the slaughter facility and pig breeding facility, directing all wastewater to a single septic tank and a soak away pit (see Figure 2-9), addressing the previous issue where wastewater from the slaughter facility was discharged into a nearby swamp. Additionally, the resilience features—primarily targeting the slaughterhouse—are designed to strengthen the building's resistance to natural hazards such as heavy rainfall, floods, and storms. This includes upgrades to the roofing and structural elements to ensure the facility's durability, safeguarding its long-term operational efficiency and environmental compliance.

##### 2.7.1.1. Drainage

39. The KGVI facility has a well-constructed network of drains that ensures an efficient and reliable drainage system throughout the compound, including both the slaughterhouse and pig breeding facility. This proper drainage helps prevent waterlogging, minimizes the risk of flooding, and effectively channels wastewater to a designated septic system, avoiding environmental contamination. As a resilient feature, this drainage network enhances the facility's ability to withstand heavy rainfall and other natural hazards by quickly removing excess water, thus protecting the structural integrity of the buildings and ensuring uninterrupted operations. This design reduces long-term maintenance costs and supports the facility's environmental sustainability goals.

##### 2.7.1.2. Roofing

40. Adjustment on the roofing height is a prime priority as to attain resilient features of the structure. Since the ceiling of the existing slaughter facility is really low which may not allow space to install roller pulley, there is need to remove the roof structure and adjust height before re-installing roofing structure. The roof covering is of cyclone proof corrugated sheets.

##### 2.7.1.3. Other Resilient Features

41. All existing structures within the vicinity are all earthquake and climate resilient in the sense that they were securely built to have cyclone proof roofing with tie down anchors that holds roof structure to the building frames and reinforced concrete footing foundation.
42. The materials used were accessible locally (domestic) as timber were sourced from preferred suppliers within Honiara and hardware materials including steel, were supplied by hardware shops in Honiara.
43. The renovation plan for the slaughter facility ensures any design flaws identified must be rectified and all defects to be refurbished accordingly. The resilient features of the facility include the followings:

- **Concrete** – The footing foundation of the existing structure is made of reinforced concrete and block wall of 1m height all around the building wall parameter (Figure 2-10) to ensure the building withstand high magnitude earthquake.
- **Windows** – All windows are securely assembled to have Steel Hollow Square (SHS) welded together forming mesh and bolted to concrete surrounding the window opening. Other window features include louver frames with louvers and screen mesh. The window frame is really secured and only need minor repairs.

Figure 2-9: Plan layout of stormwater and waste water management at the site (not to scale)

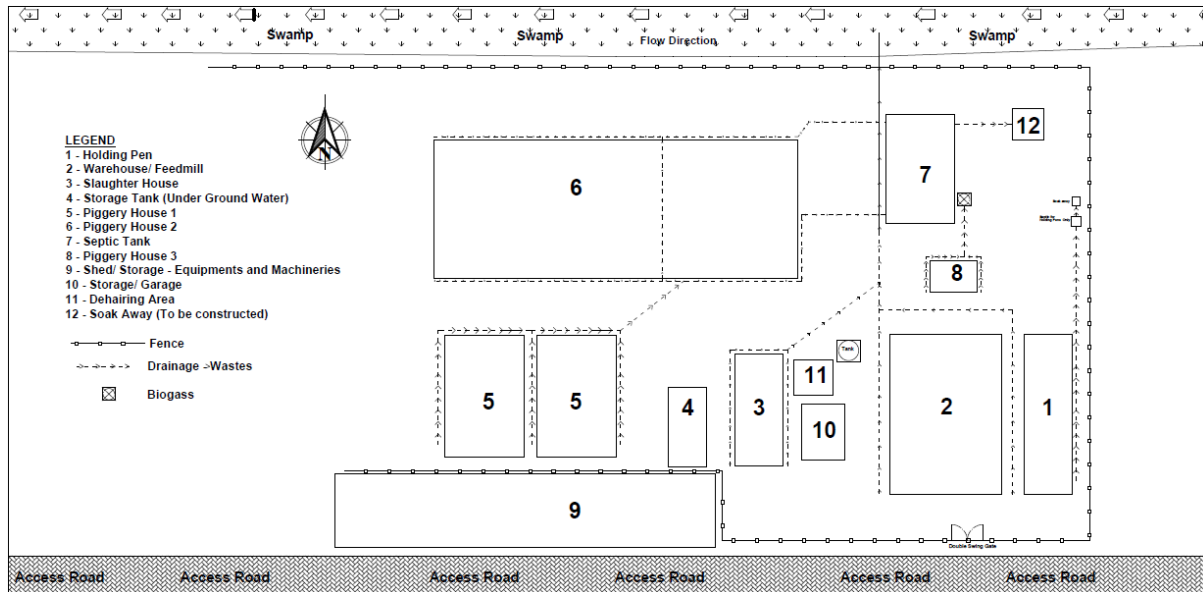
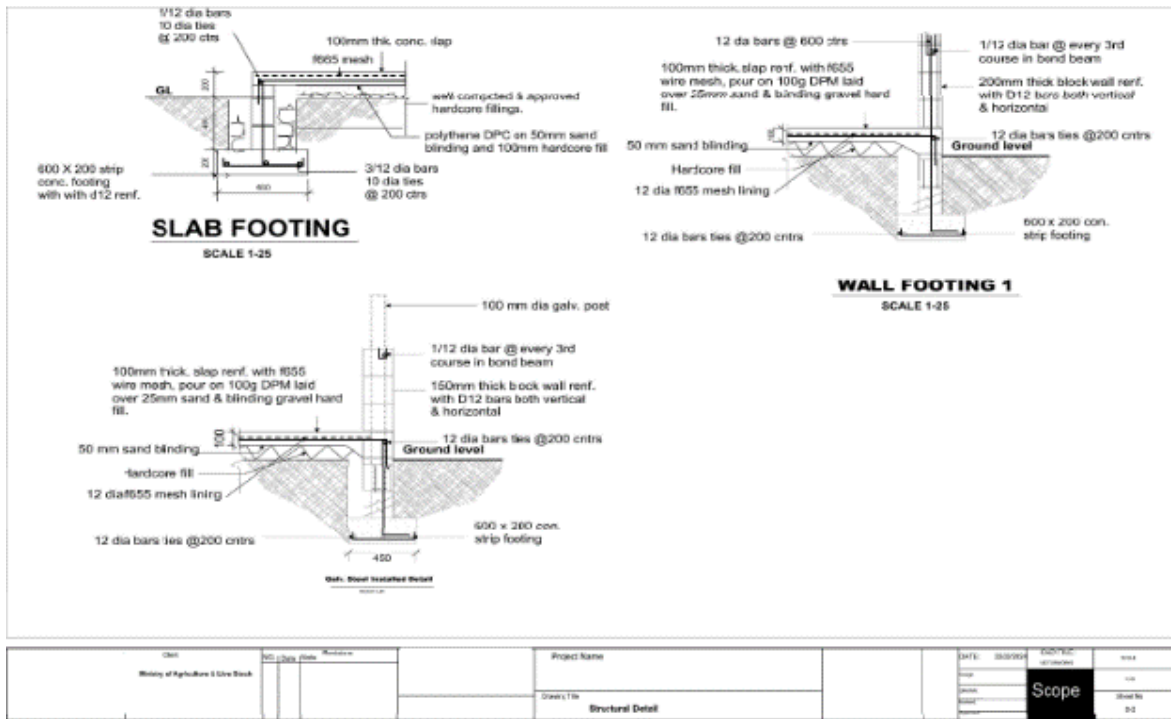


Figure 2-10: Drawing of the reinforced and block wall footing foundation.



### 2.7.2. Proposed Major Improvement Works

44. The primary renovations to the slaughter facility will focus on improving its standard in terms of hygiene and environmental compliance. This will involve installing simple modern equipment and upgrading waste management systems. The major improvement works will be undertaken for the holding pens (Figure 2-11), the laneway (Figure 2-12), the stun cleaning area (Figure 2-13) and the slaughter house itself with Plan layout and designs shown in Figure 2-14, Figure 2-15, Figure 2-16, and Figure 2-17.
45. The renovation works will focus on upgrading key areas of the facility to meet proper standards for efficiency, hygiene, and animal welfare. This includes the holding pens, which will be improved to provide better conditions for the animals, ensuring sufficient space and proper drainage. The laneway connecting the holding pens to the slaughter area will be renovated for smoother and safer movement of animals, minimizing stress and ensuring efficient workflow. The stun cleaning area will be upgraded to ensure thorough cleaning and sanitation during operations, reducing the risk of contamination. Finally, the slaughterhouse itself will undergo significant refurbishment to align with modern standards for hygiene, safety, and environmental compliance. These upgrades aim to enhance the overall functionality and sustainability of the facility.
46. The drainage network for stormwater and waste water within the KGVI facility will all link up to a single septic tank (Figure 2-8). That includes the pig breeding facility, holding pen at the offloading area as well as the slaughter facility. The current drainage system and pipe network are still functioning effectively. However, the septic tank has ceased to operate due to silt infiltration that occurred over the years following the farm's abandonment by the Taiwanese Technical Mission Team. To restore the system to full operational capacity, both the drainage system and septic tank require rehabilitation. Additionally, a new soakaway pit will be constructed in accordance with section 2.6.3.
47. The planned works will also involve desilting the existing drains and ensuring a proper layout for efficient

water flow. Refurbishment of the septic tank will be carried out, along with the construction of a new soakaway pit. Additionally, vent pipes will be installed on the septic tank's top cover to enhance microbial activity, improving the tank's performance.

48. The construction of the soakaway will begin with setting out lean concrete at the bottom floor, followed by the construction of sidewalls using blocks with mortar infill. All concrete work will be reinforced with steel bars, ensuring durability, and appropriate concrete cover will be applied to protect the structure. Daily inspections will be conducted to monitor the progress, and the contractor must obtain a completion certificate before the system is commissioned and brought into use.

*Figure 2-11: Current holding pens*



Figure 2-12: The laneway



Figure 2-13: Stun cleaning area just next to the abattoir



Figure 2-14: Plan lay out of the Slaughter Facility (not to scale)

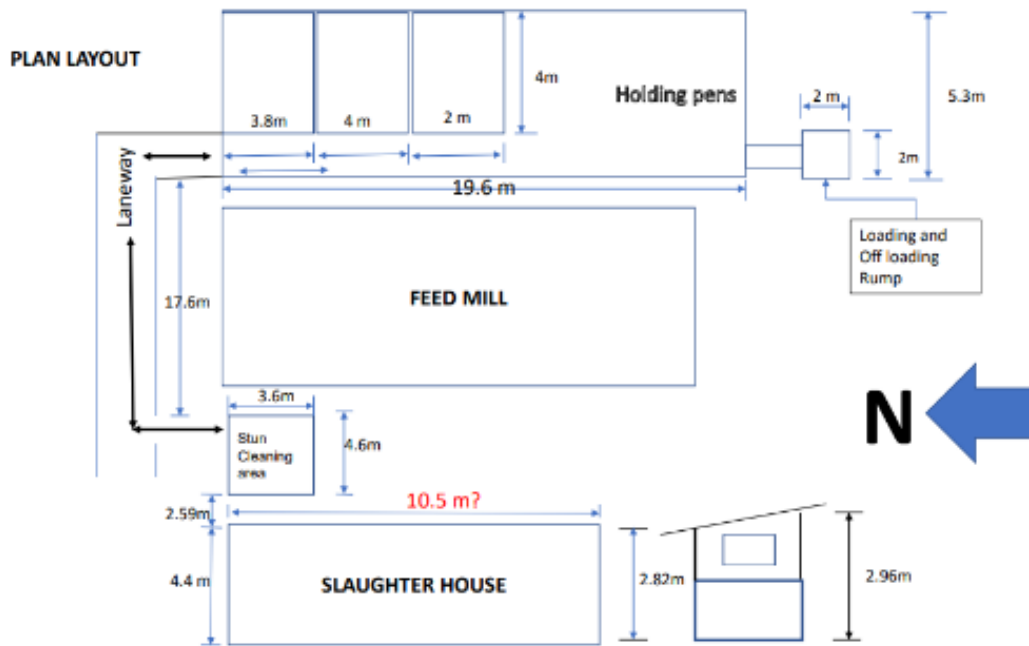


Figure 2-15: Floor Plan of the slaughter facility.

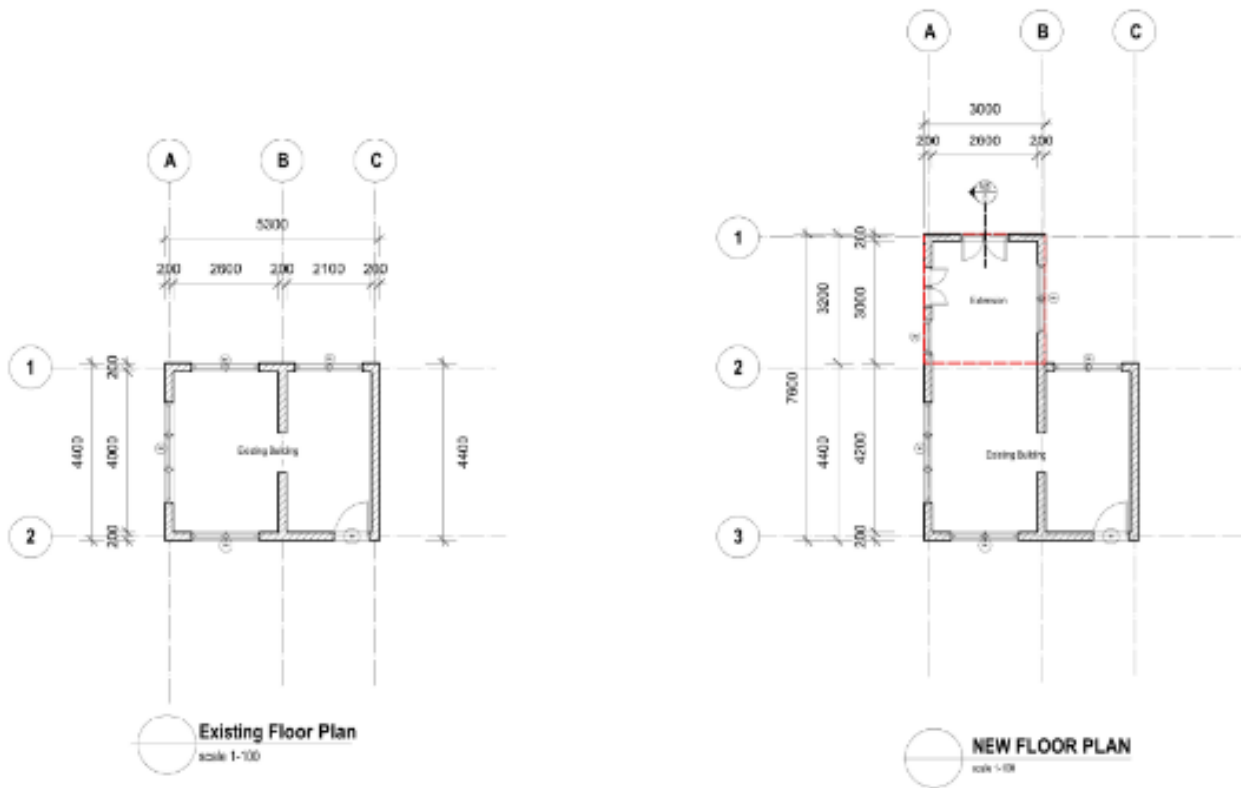


Figure 2-16: Elevations of the slaughter facility

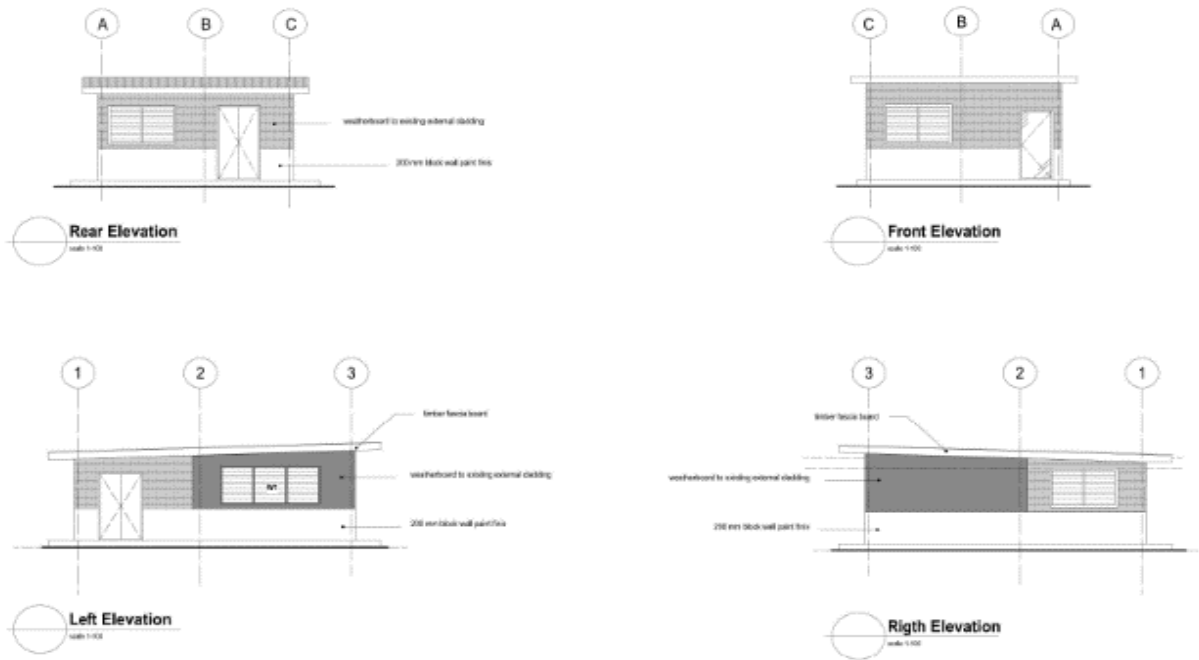
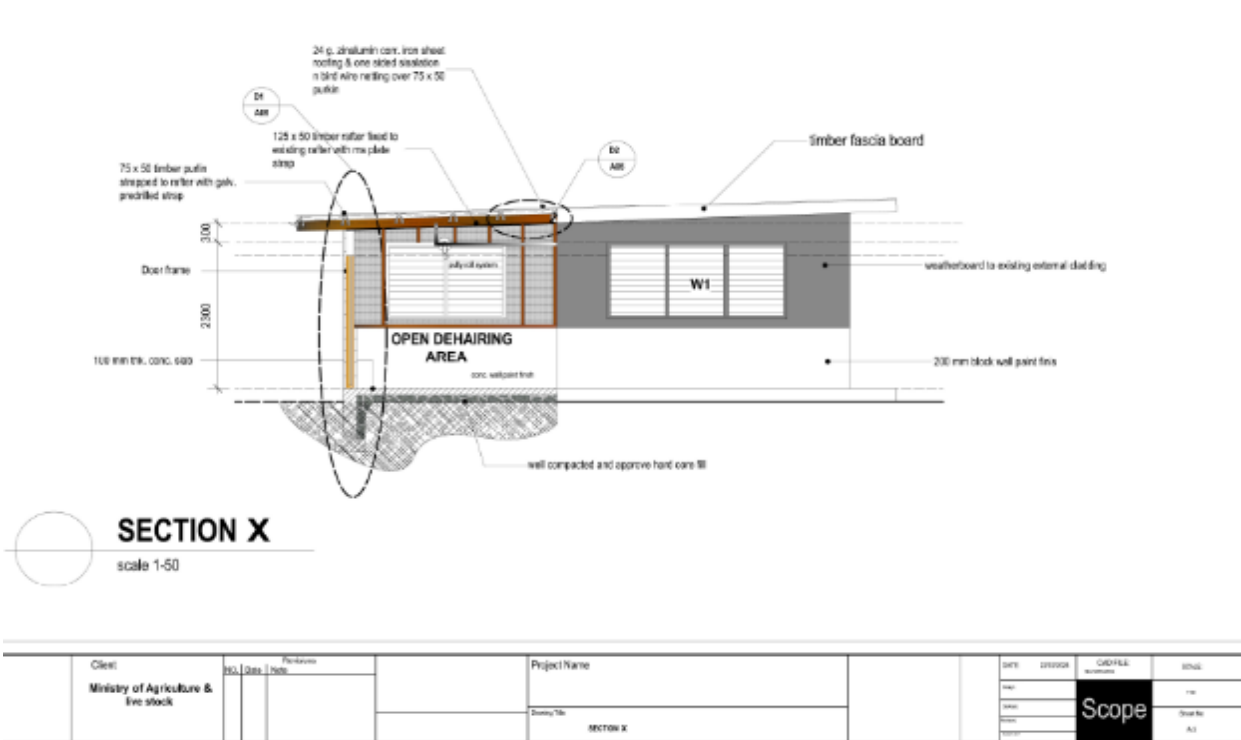


Figure 2-17: Cross-section overview of the slaughter facility



## 2.8. Construction Force, Equipment, Activity and Schedule

49. The project will be tendered and awarded as a procurement of works as per the WB Procurement Policy. It requires construction workforces such as construction supervisor, qualified builders, electricians, plumbers and other skilled and non-skilled labours. It is estimated that there will be about 10 workers including skilled and unskilled labours for this project. It requires construction equipment and machineries as well as power tools as per the scope of works. The works will be carried out as per the scope of works outlined in Section 2.5 and specifications prepared by the Engineer. The table below provides a summary of the proposed works.

*Table 1: Summary of works*

1.1	Copy Right	: All documents remain the copy right of Ministry of Agriculture and Livestock
1.2	Allow for	: Temporary Works – profiling, Shuttering, lockable, storage shed on Site.
1.3	DEMOLITION	: All demolishing work shall be performed in compliance to SI Building Code or Similar standards. All debris and demolished materials shall be properly disposed off by contractor at an approved site. Contractor to seek approval from Honiara City Council and responsible authority prior to demolishing work.
1.4	Builder	: To inform the Relevant Honiara City Council Authority and the Architect for Specific approvals before commencement/continuance
1.5	Subcontractor	: Subcontractor shall not be permitted without prior written consent of the PMU Project Manager
1.6	Notices	: Builder shall post notice of dangerous works and obtain all necessary licenses and permits for his building operations. Contractor to procure, purchase and supply materials for the Project Notice Board and ensuring the dimensions are as per specified.
1.7	Protect	: Open trenches, holes etc. Properly flagged and fenced to avoid injury. contractor to isolate all hazard and risk at project site and ensuring safety practices is observed at all times
1.8	Adjoining owners	: The surrounding neighbouring owners shall be informed of the construction works of noisy or dirty works, beware of demolishing of existing facility.
1.9	Site	: Shall only be used for the specific works outlined in the scope of work; partially demolishing of existing slaughter facility, refurbish and site cleaning
1.10	Site Condition	: Keep site dry with open drains, clear away rubbish at the end of each day
1.11	Site Access	: Allow at all reasonable times for the architect/ Engineer and other relevant party
1.12	Holidays etc	: Allow for time lost to public holidays and normal rain.
1.13	Normal working hours	: Between: 8:00am and 5:00pm Monday to Friday, 7:00am and 1:00pm Saturday. There shall be NO work on Sunday
1.14	All materials	: Shall be new and in perfect condition and left so in completion. Demolished materials shall not be re-used for the refurbishment works.
1.15	Acceptance	: Contractor shall reject materials delivered to site that are not in perfect condition
1.16	Materials on site	: Contractor shall protect from rain/direct sunlight, damage and use in order of delivery
1.17	Local Supply	: Contractor to obtain material such as timber from approved sources in Honiara, Solomon Islands
1.18	Standard	: The term 'Standard' shall mean of a type commonly available
1.19	Customs and duty	: Unless otherwise scheduled, all costs shall be duty paid in Solomon Islands

1.20	Tools	: Use of handy tools such as mitres, squares, levels and proper electrical tools are a condition of contract
1.21	Work	: Provide everything reasonably required to bring construction to full function
1.22	Subcontract	: Agree times of access, joint use of scaffolding and services with main contractor
1.23	Dimensions	: Take all dimensions from actual work confirm with architect or Engineer at site if in doubt
1.24	Actual Work	: Unless otherwise scheduled and with the permission of the Architect/Engineer/Project Manager
1.25	Make good	: Means restore work to a standard equal to that immediately surrounding
1.26	Cart Away	: cart away salvaged materials and stock at an approved location or removed from site.
1.27	Clean Up	: Polish glass, mirrors, with non-abrasive cleaner, oil movable hardware, clean labels of all fittings, tag all key : Cart away builders' debris, temporary works, leave site clean and tidy
1.28	Hand-Over	: handover certificate shall be issued upon completion and handing over
1.29	Guarantees	: Pass on all guarantees for materials and fittings to Owner
1.30	Certifications	: Pass on certificate of occupation to Owner
1.31	As Built	: Provide as built drawings to Owner where work significantly varies from contract
1.32	Replace	: Replace damaged boundary markers (if any) to approval of the Survey Authority.
1.33	Restore	: Ensure restoring damaged roads, kerbing, footpath etc. damaged during course of construction if any

50. Table 2 provides a summary of the project schedule. It is anticipated to be tendered by mid-December 2024 and the contract awarded in January 2025. This shall be a Request for Quotation (RFQ) as per the procurement process. Construction should begin in early February 2025 and over a period of three months. Construction will be over a period of three months and is expected to complete by April 2025.

Table 2: Project schedule

Activity	Qtr 4- 2024			Qtr 1- 2025			Qtr 2- 2025		
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
submission to World Bank , comments, NOL									
Bidding									
NOL, Negotiation and sign contract									
Advance Payment (10%)				A					
Contract implementation/Construction Supervision									

## 2.9. Construction Materials

51. Hardware materials, woods or timbers, and gravels/aggregates for concrete works will all be sourced from hardware and licensed suppliers in Honiara. For the supply of gravels and aggregates, it is crucial that the supplier possesses a valid Building Material Permit (BMP) as per regulatory requirements.
52. The Building Materials Permit (BMP) is issued to aggregate and gravel suppliers in the Solomon Islands who meet strict regulatory requirements. To qualify, suppliers must undergo a rigorous development consent process under the Environment Act 1998, which mandates the preparation of a Public Environment Report (PER). The PER, similar in scope to the World Bank's Environmental and Social Management Plan (ESMP), involves an in-depth assessment of potential environmental and social impacts. This includes considerations of child and forced labour, safety risks to workers and nearby communities, and environmental impacts of aggregate/gravel extraction. The PER is comprehensively reviewed by the Environment and Conservation Division (ECD) within the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) to ensure compliance with all relevant standards and regulations.
53. Only after meeting these stringent requirements are suppliers granted Development Consent, a mandatory precondition for obtaining a BMP. The BMP itself is issued by the Mines and Minerals Board within the Ministry of Mines, Energy and Rural Electrification (MMERE), ensuring that all social and environmental concerns identified during the assessment process are addressed as part of the decision-making process. These regulatory steps provide assurance that licensed suppliers operate responsibly and adhere to both environmental and social safeguards.
54. For the KGVI facility refurbishment subproject, the contractor will source gravel for concrete works exclusively from permitted or licensed suppliers holding valid a BMP issued by the Ministry of Mines and Energy. This ensures that the materials used in the project are obtained from suppliers who comply with national laws and safeguard requirements, thus aligning with environmental and social best practices.

## 3.0. LEGAL AND INSTITUTIONAL FRAMEWORK

55. The World Bank's policies on environmental and social protection, applied to all its projects, promote sustainable development and safeguard communities and ecosystems. By aligning with the Environmental and Social Framework (ESF), Occupational Health and Safety (OHS) policies, Environmental, Health, and Safety (EHS) guidelines, and Solomon Islands' safeguards systems, including environmental legislation and regulations, the KGVI refurbishment ensures worker safety, community protection, and minimal environmental impact. The contractor's compliance with these standards guarantees adherence to international best practices while supporting the long-term sustainability of the facilities.

### 3.1. World Bank ESF

56. Under the World Bank's Environmental and Social Framework (ESF), projects are required to assess and manage environmental and social risks, ensuring that development initiatives promote sustainable and inclusive growth. Key policies applicable to the renovation works at KGVI include the Environmental and Social Standard 1 (ESS1) for assessment and management of environmental and social risks, ESS3 on resource efficiency and pollution prevention, and ESS4 on community health and safety. These standards ensure that the renovation minimizes environmental impacts and promotes worker and community safety.

57. The ESF ensures that the project adheres to the best environmental protection and social responsibility practices, requiring the development of a site-specific contractor's environmental and social management plan (CESMP) and the associated sub-plans. These site-specific plans will address potential environmental, social and safety risks and impacts and promote positive outcomes for surrounding community and the environment. Through the ESF, the World Bank ensures that the project meets international standards and contributes to the long-term sustainability and resilience of the facilities.

### 3.2. WB Occupational Health and Safety (OHS) Policies

58. The World Bank's OHS policies, outlined under ESS2 and further detailed in the General and Industry Sector Environmental, Health, and Safety (EHS) Guidelines at <http://www.ifc.org/ehsguidelines>, emphasize worker protection during project implementation, and Good International Industry Practices (GIIPs). They require hazard identification, provision of personal protective equipment (PPE), safe handling of tools, and adequate training for workers. For the KGVI refurbishment, the construction contractor must adhere to these OHS guidelines to ensure a safe working environment, particularly during the use of power tools and other small-scale machinery.

### 3.3. WB Environmental, Health, and Safety (EHS) Policies

59. The EHS Guidelines provide practical measures for minimizing risks related to environmental impacts, community health, and worker safety during construction and operational phases. These guidelines, also accessible at <http://www.ifc.org/ehsguidelines>, include waste management practices, pollution prevention, and noise and dust control measures, and Good International Industry Practices (GIIPs). For the KGVI refurbishment, the contractor must adhere to these guidelines and GIIPs, ensuring compliance with industry standards and the implementation of effective environmental safeguards. Sector-specific standards for agricultural and livestock activities are particularly relevant, supporting the development of improved and sustainable facilities.

### 3.4. Solomon Islands Policy

60. At the national level, the Solomon Islands' Environment Act 1998 and its Environment Regulations 2008

guide environmental management for construction and infrastructure projects. Any development, including renovations like those at KGVI, requires an environmental assessment to ensure compliance with these regulations. Additionally, the Solomon Islands Building Code sets the standard for construction works, while the Ministry of Lands, Housing, and Survey and Ministry of Environment, Climate Change, Disaster Management, and Meteorology (MECDM) play key roles in overseeing land use and environmental compliance. The Labour Act and Public Health Ordinance also provide relevant frameworks for labour safety, health standards, and waste management in the renovation activities.

## 4.0. BASELINE DATA

### 4.1. Description of the Project Area

61. The assessment of the KGVI site was conducted through a combination of utilizing available geospatial data<sup>5</sup> and conducting an actual site inspection. Geospatial data provided valuable insights into the land use patterns, topography, and environmental features of the site, allowing for a comprehensive understanding of the area prior to the field visit. This was complemented by an on-site assessment, which enabled direct observation of the current conditions, including the presence of flora, fauna, and existing infrastructure. Together, these methods ensured a thorough and accurate evaluation of the site, forming a strong basis for the planned renovation works.

#### 4.1.1. Location

62. The project area is situated within the Honiara town boundary, specifically in the greater Ranadi industrial area on the Island of Guadalcanal, Solomon Islands. This industrial zone is a significant hub for various commercial activities and serves as a central location for the renovation project.

#### 4.1.2. Habitat

63. The habitat of the project area is predominantly a built environment. This indicates that the land use in the vicinity is largely industrial and urban, with infrastructure and facilities characteristic of an industrial zone. There are no sensitive environmental areas within the immediate vicinity, suggesting minimal ecological impact from industrial activities.

#### 4.1.3. Biodiversity

64. The KGVI site does not support significant flora or fauna, as it is primarily a built environment. There are no species of notable conservation concern in the area. The IBAT analysis indicated that there are no Key Biodiversity Area (KBAs) and Protected Areas (PA) within a buffer distance of 2 km (map on Figure 4-1). Furthermore, the IBAT analysis highlighted that there is no presence of threatened species listed under the IUCN Red list, however, it was indicated that they may potentially be found within 50km of the area of interest (Figure 4-2). Since the departure of the Taiwan Technical Mission (TTM), the site has become overrun with common grasses, primarily *Imperata cylindrica* (cogon grass), and creepers such as *Merremia peltata*. These species typically thrive in disturbed environments due to their aggressive growth and reproductive strategies. Additionally, the presence of the invasive *Broussonetia papyrifera* (pepper mulberry) has been noted, contributing to the altered ecological balance of the site. The area is largely devoid of significant fauna, although during the assessment, parrots were observed in a nearby *Terminalia* species tree located outside the KGVI facility compound, the area of concern.

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<sup>5</sup> Toolkit- ESF Report (Report 'Slaughter Facility' requested by [kwynn@worldbank.org](mailto:kwynn@worldbank.org)) & Integrated Biodiversity Assessment Tool generated by Khine Thwe Wynn

Figure 4-1: IBAT Analysis MAP with buffer distance of 2 km



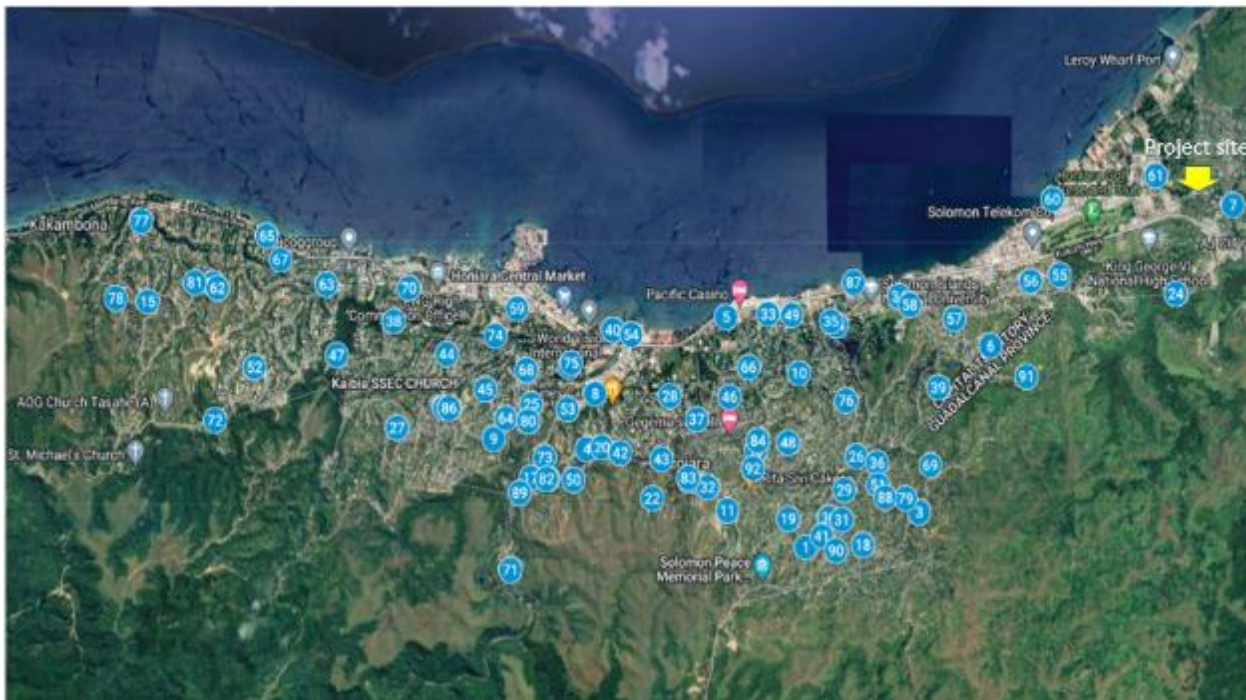
Figure 4-2: IBAT Analysis showing Protected Areas potentially 50 km away.

<b>Protected Areas</b>	1 km: 0	10 km: 0	50 km: 8	8
World Heritage (WH)	1 km: 0	10 km: 0	50 km: 0	0
<b>Key Biodiversity Areas</b>	1 km: 0	10 km: 1	50 km: 2	3
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 1	50 km: 0	1
<b>IUCN Red List</b>				<b>47</b>

#### 4.1.4. Surrounding Environment

65. The east to north-eastern periphery as well as western periphery of the project site is bordered by informal settlements or communities (Figure 4-3). These settlements typically consist of makeshift, semi-permanent and permanent housing and are inhabited by residents who may rely on nearby industrial activities happening around the greater Ranadi area for employment or resources. The presence of these communities highlights the need for careful consideration of social impacts and community engagement during the project.

Figure 4-3: Informal settlements or squatters within Honiara City boundary (source: Regina Souter, International Water Centre at Griffith University (modified from World Bank and Honiara City Council: Community Access and Urban Services Enhancement Project).



#### 4.1.5. Key Characteristics

66. The key characteristics of the project area include;

- **Industrial Zone:** The Ranadi area is primarily industrial, with various commercial enterprises operating in the vicinity.
- **Lack of Sensitive Environments:** There are no environmentally sensitive areas within the project boundary, reducing the likelihood of direct environmental harm from the renovation activities.
- **Adjacent Informal Settlements:** The presence of informal settlements or squatters on the eastern and north-eastern borders necessitates strategies for mitigating any negative social impacts, ensuring community safety, and possibly improving local conditions through the project.

#### 4.1.6. Considerations

67. Some considerations for the renovation work project include;

- **Environmental Management:** Even though the area is not environmentally sensitive, standard environmental management practices must be adhered to, ensuring that pollution and waste are minimized during renovation.
- **Social Management:** Engagement with key stakeholders including the squatter communities is crucial. This involves understanding their needs, mitigating adverse impacts, and possibly involving people from the informal settlements or squatters in project-related employment opportunities.
- **Regulatory Compliance:** Adherence to local and international environmental and social standards

is essential to maintain compliance and promote sustainable practices.

#### 4.2. Topography, Geology and soil

68. The terrain of the site is mostly flat. The average elevation of the proposed project site is approximately 3 meters above mean sea level. The distance of the site to the shoreline is about 1.14 km, the elevation gain/loss is 5.05 m, -7.95 m and the average slope is 0.9%, -1.2% (Figure 4-4). The medium level elevation and distance of the project site to coastline and waterways presents no risks from sea level rise, storm surge and flash floods. According to Hansel and Wall (1970), the geology of the Lungga area where the project site is located comprise of Quaternary, Calcareous sediments overlying sandstone and conglomerates of late tertiary. The soils are brownish loams and clays (the “Chiri Land System” of Hansell and Wall, 1970). The whole of Burnscreek is characterized by coralgall biolithite and derived debris, the *Honiara Limestones*, Qpr, and extensive alluvial valley occur along the Plain of Lunga River. A detailed study by Hackman (1979) also found the area to have a sequence of calcareous volcanic arenite and rudites.

Figure 4-4: Elevation profile of the project area.



#### 4.3. Weather, Climate and Natural Hazards

69. The KGV facility in Honiara, Guadalcanal, is situated within a tropical climate zone characterized by warm temperatures and high humidity throughout the year. The area experiences a wet season from November to April, with rainfall intensifying due to the northwest monsoon winds and periodic cyclones. Honiara’s annual rainfall averages around 2,000-3,000 mm, making rainwater management essential for any facility operations. The dry season, lasting from May to October, is influenced by the southeast trade winds, offering a period with lower rainfall and slightly cooler temperatures, though humidity remains relatively high.

70. Natural hazards in Guadalcanal include cyclones, earthquakes, and the associated risk of tsunamis due to the island’s position within the Pacific Ring of Fire, a region of high seismic activity. Cyclone frequency increases in the wet season, posing risks such as flooding and storm surges, which can impact facilities and infrastructure. Additionally, heavy rainfall during the cyclone season raises the likelihood of landslides and flash floods, which are common in the region’s hilly terrain. Earthquakes are also a significant hazard, with the potential to disrupt structures and utilities. Preparedness measures (including good structural design) for these natural hazards are essential to minimize risks to both the facility and personnel.

#### 4.4. Water Resources

71. The Lungga river is located within 1 kilometer of buffer distance from the KGVI facility, but project activities will not have any impact on the river due to the sufficient buffer distance. Additionally, the Burnscreek stream runs closer to the project site – approximately 40 meters, but the renovation works are not expected to affect the stream either. During the operation of the facility, wastewater from the septic-soakaway system may percolate into the ground and potentially enter the stream through groundwater movement. However, the impact of this is anticipated to be low to negligible, as the wastewater from the facility is non-hazardous and is managed through a properly designed septic and soakaway system that minimizes the risk of contamination.

##### 4.4.1. Water Quality

72. A baseline water quality assessment of Burns creek stream was conducted on 27/08/2024. Samples were collected from two sites (Figure 4-5) and analysed independently for five different water quality parameters. The following parameters were tested; Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Phosphorus (PO<sub>4</sub>-P), Ammonia (NH<sub>3</sub>-N) and Total Suspended Solids (TSS).

Figure 4-5: Sampling locations.



73. All results fell within the World Bank and World Health Organization water quality guidelines except for Biochemical Oxygen Demand (BOD) with concentration exceeding by almost twice that of the limits

provided by WB guideline. The analytical results from BOD, COD and Ammonia levels indicate that Site 1 (upstream) is more polluted from organic sources such as sewage discharges. While TSS readings revealed that Site 2 (downstream) has a higher amount of suspended solid particles possibly due to increased human induced interferences downstream (results are shown in the Table below).

Table 3: Water Quality Results for Sites 1 & 2

	<b>Biochemical Oxygen Demand, BOD (mg/L)</b>	<b>Chemical Oxygen Demand, COD (mg/L)</b>	<b>Phosphorus, PO<sub>4</sub>-P (mg/L)</b>	<b>Ammonia, NH<sub>3</sub>-N (mg/L)</b>	<b>Total Suspended Solids, TSS (mg/L)</b>
<b>Site 1</b>	<b>54</b>	7.6	<1.6	0.382	0.7
<b>Site 2</b>	<b>52</b>	6.4	<1.6	0.103	8.7
Method of Analysis	Respirometric Method 10099	TNT Method 821	TNT Method 846	TNT Method 830	APHA 2540-D TSS
Limit of Detection	0-700 mg/L	3-150 mg/L	1.6- 30 mg/L	0.015 - 2.00 mg/L	0.01-2000 mg/L
WB/IFC EHS Guideline for Wastewater and Ambient Water Quality	<b>30</b>	<b>125</b>	<b>2</b>	<b>1.5<sup>a</sup></b>	<b>50</b>

<sup>a</sup> World Health Organization Guideline for drinking-water quality. (2022). 4<sup>th</sup> edn, pp 241.

74. A frequent water quality monitoring program is recommended to assess any changes in biochemical pollutants during redevelopment of the slaughterhouse facility and pig breeding facility (see water quality report in annex 3).

#### 4.5. Socio-economic Environment

##### 4.5.1. Population Growth and Urban Expansion- Honiara City

75. The population of Honiara City in 2010 is 70,002 and as at 1<sup>st</sup> July 2020 the city’s population rises spontaneously to 90,441. This is an increase of 29.19%. As can be noted in Figure 4-6, the population growth for Honiara City is increasing steadily. This is a worrying trend and that the Solomon Islands Government must be proactive in ensuring social infrastructure are readily available for the benefit of the city populace. There is a significant young age group, with those below 15 years of age accounting for 32%. Those belonging to the 15-24 years age bracket accounted for about 24%<sup>6</sup>. Women, on the other hand, represented about 47%. The growth of this urban population is expected to show increasing trends and is projected to reach 235,000 by 2035<sup>7</sup>.

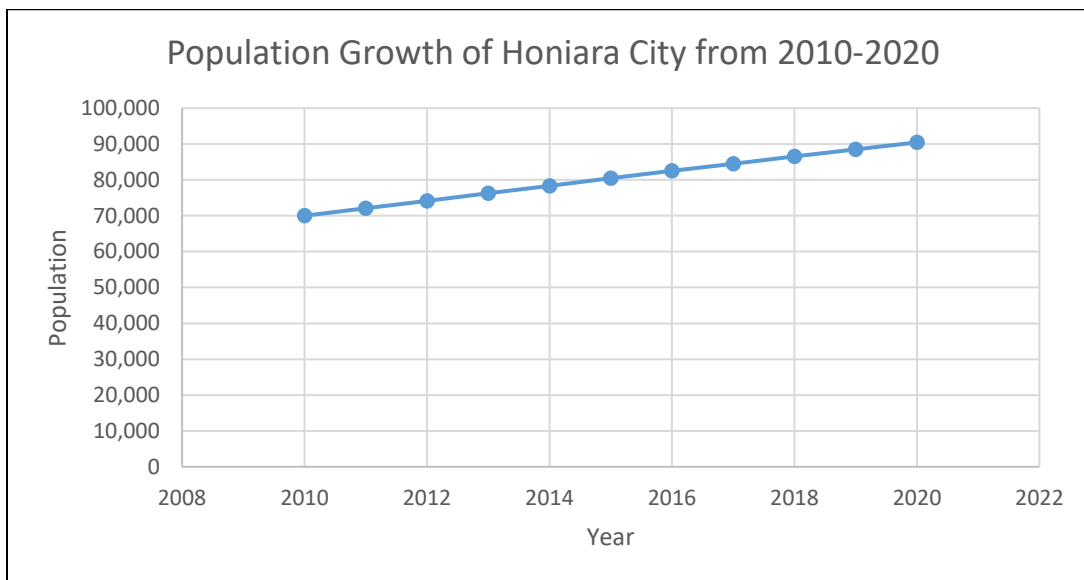
76. The development pattern of commercial areas in Honiara generally follows an east-west direction following the alignment of Kukum Highway which is the primary spine route that runs along the coast. This highway extends from the Honiara city centre (near the Mataniko River) eastwards to Henderson International Airport, with Henderson considered to be part of Guadalcanal Province (GP). The westward extension of this road, in the form of Mendana Avenue, runs from the city centre to White River, the western HCC boundary.

<sup>6</sup> SIG Statistic Office, 2020.

<sup>7</sup> *ibid*

77. There are three main commercial centres along Kukum Highway. One is on Mendana Avenue from Point Cruz port to the mouth of the Mataniko River, which includes the Central Market. A second is the Chinatown area, with a third found further eastwards around the Pacific Casino Hotel, not far from the Mataniko River.
78. Further east of the Pacific Casino Hotel is King George VI School, Solomon Islands National University (SINU) and Capital Park. Informal settlement expansion has encroached into boundary of the GP from the Tasahe/White River settlements to the west and the Mount Austin settlement including others to the south. Many of these informal settlements are without tenure and security of tenure. They are located in environmentally sensitive locations such as on steeply sloping land and riverbanks.

Figure 4-6: Honiara City Population Growth (source: National Statistics Office)



#### 4.5.2. Land and Land Use

79. The majority of lands within the Honiara City Boundaries are either crown land (government owned) or registered estates and land outside of Honiara City Boundaries are either customary or privately owned. Land in Honiara is about 22.73km<sup>2</sup> and of which about 65% of it is being developed, 1.5 % is yet to be developed. Another 13.5% of the land is occupied by informal settlements<sup>8</sup>.
80. Honiara City occupies a large part of the north-west coastal side of the island of Guadalcanal. Guadalcanal Provincial office and Honiara City’s Government and Administrative Headquarters are situated in Honiara, and Henderson International Airport is located east of Honiara, outside the HCC boundaries. The project site is within the easternmost HCC’s boundary. The largest open-air food market is in Honiara CBD, two smaller markets exist on the eastern side of the town, Fishing village Market and Henderson Market and at White River on the western side of the town. Beyond Aligator bridge is the Corona Market. There are also numerous smaller and often illegal markets that operate in Honiara associated with schools and health clinics, as well as along the Main Road and other feeder routes.
81. There are around 90 informal settlements located within the City boundary in Honiara<sup>9</sup> (as shown in visual

<sup>8</sup> Greater Honiara Urban Development Strategy and Action Plan, vol 1, July 2018.

<sup>9</sup> Ibid

representation on Figure 4-3 above). Many people lived in the unplanned informal settlements. These settlements lack adequate services such as water and electricity supply. The closest settlements to the project site include Ranadi, KG and Burns Creek.

82. The use of land for small scale farming and gardening particularly for root crops and vegetables is common in areas around Burns Creek and at the outskirts of Honiara city. The land-use at the project area is mainly industrial, residential (mainly informal settlements), sports facility and MAL's research farm land.

#### 4.5.3. Economic Activities

83. In Solomon Islands the working age population were engaged in paid work and others had been undertaking unpaid work. The non-labour force is those being full time students, those engaged in home duties, the retired, the disabled, and all those who did not work and were not unemployed (did not look for and were not available for work) for various reasons. Simultaneously, some of the labour force is employed in the agriculture, forestry and logging, as well as fishing and aquaculture.
84. According to the 2009 Census, the number of people in Honiara of working age, i.e. 12 years and older has accounted for 52.7% male and 43.1% female. Most of the people are engaged in economic activities particularly in the services sector that is provision of services by human resources. This involves wholesaling, retailing, banking, restaurants or fast-food bars and hotel related business but the rise of the common effects of increase population that is, unemployment, poverty and high cost of living. People that lived in the project influenced area especially those residing in informal settlements are engaged in a variety of economic activities.
85. Since the majority of the people living in Honiara depend on money for living, most of the settlers (squatters) along the project influenced area are involved in sale of market produce by buying agricultural produces from indigenous Guadalcanal people and reselling the products at the Honiara Central Market, Henderson Market and Fishing Village Market. Accordingly, the most common economic activity practiced by most people living along the project influenced area include the selling of cooked food during the night and betel nut vending all throughout the day. These are street markets of which one main betel nut market outlet is situated at the Kukum area and Panatina (Maromaro) and a market for garden produces at the Henderson Market and Fishing Village. A betel nut market area is situated King George Sixth area where it operates seven days a week during day and night time.

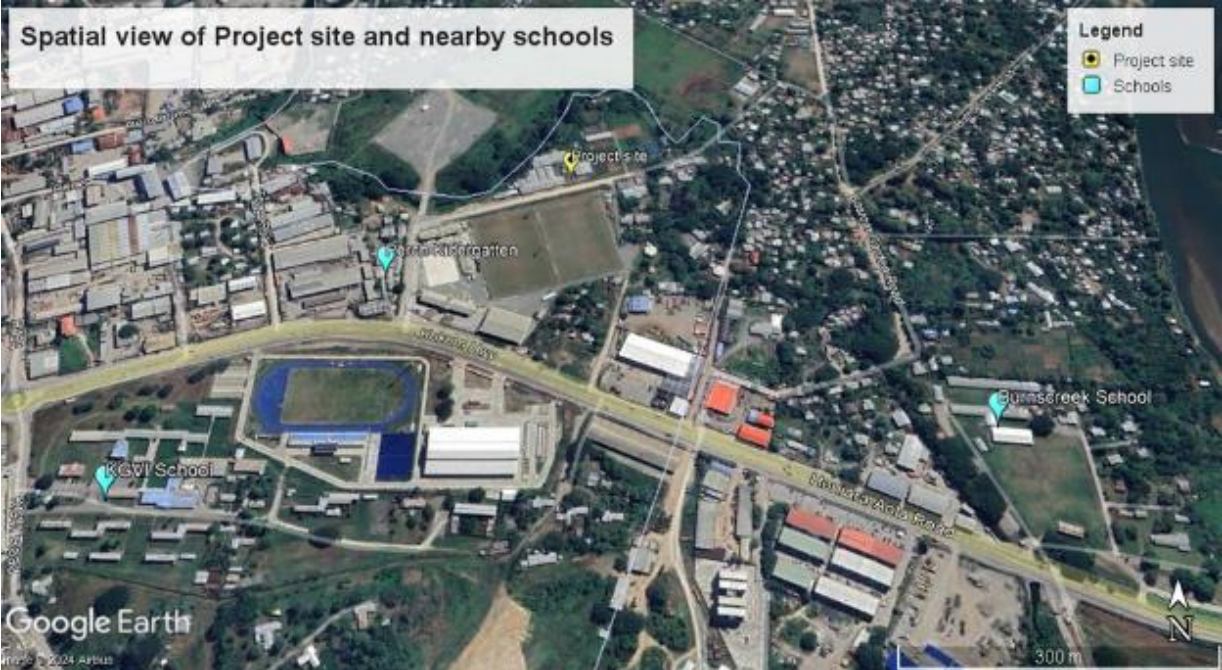
#### 4.5.4. Social Services and Facilities

86. Honiara as the main educational and administration center constitute of Schools (primary and secondary) that are privately owned, owned by the Government and the Honiara City Council. The National Referral Hospital and about nine (9) clinics are found in Honiara including private clinics. Residences are delivered a range of basic urban services including, water, electricity, roads and garbage collection. The Kukum Highway which runs East – West of Honiara is the main road for road users to access schools, Offices, Hospital and Health Centers and other public facilities. Burns creek School including Primary and Secondary, Perch Kindergarten and KGV National Secondary school are the nearby education institutions to the Project site (Figure 4-7).
87. Along the Kukum Highway is the Solomon Islands National University (SINU)- Kukum Campus. This campus accommodates School of Natural Resources and applied Sciences, Business and Management, School of Nursing & Allied Health Sciences and School of Technology and Maritime Studies. Ranadi Campus hosts institutes of Maritime and Fisheries Studies whilst the School of Education and Humanities is located at Panatina Campus.
88. Accessibility to health services is not an issue as people living along the project influenced area can access their nearest health center within minutes is an Area Health Center which is located at Burns creek and

accessing the Central Hospital can be within one hour or less using the prevailing mode of transport. There are several Private Medical Clinics and Dispensary which people accessed. Emergency cases are transferred to the National Referral Hospital.

- 89. Solomon Islands and Honiara as a whole is predominantly Christian having Church headquarters to expedite religious activities. In the vicinity of the project area, there are six (6) church Head Quarters and churches namely; South Seas Evangelical Church (SSEC); United (Methodist) Church; Roman Catholic Church (Lungga); Jehovahs Witness Kingdom Hall, and the Seventh Day Adventist Church (SDA) at the Burns Creek and an Anglican Church Parish at Lungga.
- 90. Basic urban services such as water and electricity supply and garbage collection vary between residential areas, formal and informal residential area resulting in tapping of water and electricity supply by most settlers.

Figure 4-7: Map showing the location of the project site and nearby schools.



- 91. The populace has access to the internet services and communication facilities and connected to the electricity grid with electrical power lines column and lighting along the main road. Water pipes run underground for water supply to most parts of Honiara, and the main port facility is located west of the project area, at Point Crus, located central of Honiara city.
- 92. Other facilities and services that can be easily accessed to and from the project site include, Capital Park, Panatina Plaza, AJ City Mall, Honiara International Airport, Henderson Court, the KG and Panatina Campus Sports Ground, including apartments/Accommodations, 3 Fuel Depot (Didao Refilling Station, Solo Gas and GTL), Chinese shops and Hot Bread Bakery Shop.
- 93. Transport services along the highway includes heavy to light vehicles, privately owned vehicles, public transport include buses and taxis, and Government vehicles. Along the highway there are designated bus bays or bus stops for public access whilst there is no provision for taxi stands hence taxis just parked anywhere along the road.
- 94. Public transportation services are provided by buses, taxis and flatbed trucks. Flatbed trucks are

commonly used by people travelling out of Honiara and hired for various purposes such as transportation of agricultural products to the market.

#### 4.6. Legal Ownership of the Land

95. The slaughter facility, pig breeding facility and the research HQ office are located on a land owned by the Commissioner of Lands (CoL). The research office headquarter and the pig breeding facility are still operational while slaughter facility has been dormant. It is important to note that all government Ministries in Solomon Islands do not hold land titles, rather all Ministries use land owned by the Commissioner of Lands. As such, there is no need to subdivide the land to create a new parcel because the new parcel and the remainder parcel will be identical in terms of ownership (by CoL).

## 5.0. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS IDENTIFICATION AND MITIGATION MEASURES

96. The environmental impacts identified at this stage are preliminary in nature and will need to be reviewed and further elaborated specifically during renovation works and potential for occurrence has to be ascertained during implementation. According to the screening, the anticipated environmental impacts during construction phase will be hazardous from the operation of power (electrical) equipment and dust from specific demolitions and perhaps the use of an excavator for drainage works. Social impacts include occupational health and safety of workers. Overall, the contractor for the renovation and upgrade works will be implementing a general environmental code of practice (Appendix 6) which is one of the fundamental safeguard instruments for the management of potential impacts.
97. This section details the potential environmental and social impacts of the sub-project funded by WB through SIART project which is implemented under MAL. Mitigation measures are provided for all identified impacts.

### 5.1. Design/Preconstruction Phase Impacts and Mitigation Measures

#### 5.1.1 Development, Review and Clearance of the CESMP

98. Before the actual renovation or construction, the contractor will need to prepare a CESMP using this ESMP as guidance. As soon as the contract is awarded, the contractor will need to identify and appoint a dedicated Environment, Health & Safety Officer (EHSO) whose role is to prepare the CESMP and ensure its subsequent implementation. The CESMP will have to be reviewed and approved by the SIART PMU and the WB before actual construction can begin.

#### 5.1.2. UXO

99. This is just a renovation work on an existing development site, thus, does not require UXO clearance. However, in case of any discovery of UXO during the renovation phase, the contractor will immediately cordon off the area and arrange the evacuation of nearby residences and inform the Royal Solomon Islands Police Force (RSIPF) of the find. Works may continue only when all is cleared by the RSIPF. Project's Chance Find Procedure is attached as appendix 2 of this document.

#### 5.1.3. Climate Change and Design Adaptations

100. Climate change impacts have had the potential to negatively impact the project. The majority of risks to the proposed development as a result of climate change revolve around the ongoing operation and maintenance of the asset. The main climate change risks were considered to relate to occurrences of extreme rainfall events and tropical cyclones. Extreme rainfall events have the potential to cause flooding, and enhance surface run-off and erosion and tropical cyclones associated with strong winds.
101. Guadalcanal is located on a high seismicity zone<sup>10</sup>, a resilient septic tank and soakaway pit system is essential. According to the design the system incorporates reinforced concrete with steel bars to strengthen the structure against ground movements caused by earthquakes. Flexible joints will be used in the pipe connections to absorb seismic shocks and prevent cracking. Additionally, the soakaway pit will have a well-compacted base with lean concrete at the bottom and reinforced block walls to ensure stability. Regular inspections and maintenance will be ensured to address any potential damage following seismic events, ensuring the system remains functional and safe.
102. According to assessment carried out for the site, there is no waterway at or nearby the vicinity of

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<sup>10</sup> Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) <<https://www.pacificdisaster.net>>

the subproject site. The only risk posed by extreme rainfall events is associated with enhanced surface runoff/stormwater. This superimposed with poor drainage may result to local inundation. There is a drainage system at the site but was full of silts and debris since there was no maintenance since the Taiwanese Technical Mission left. An improved climate resilient option with a stormwater and waste water drainage system has been proposed. This will include the desilting and cleaning of the current drain and improve it to handle waste-water, surface runoff and stormwater and direct it away into the septic tank. There will be roof gutters, downspouts, and a concreted drain that carry the water to the main drain.

#### 5.1.4. Potential risks on water table depletion and excessive energy consumption

103. Risk of Water Table Depletion
- Description: Excessive water extraction from the borehole may lower the water table, potentially leading to scarcity for nearby communities and affecting groundwater-dependent ecosystems.
104. Mitigation Measures:
- Install Water Meters: Monitor and regulate water usage to avoid over-extraction.
  - Rainwater Harvesting: Installing gutters on roofs and installing rain water tanks to harvest rainwater in order to supplement groundwater use, reducing reliance on the borehole.
105. Risk of Excessive Energy Consumption
- Description: High energy usage from water pump and other operations may lead to increased operational costs and environmental impacts due to higher greenhouse gas emissions.
106. Mitigation Measures:
- Use Energy-Efficient Equipment: Install energy-efficient pump and treatment technologies such as septic tank and anaerobic digester to minimize consumption.
  - Renewable Energy Integration: Incorporate solar panels or other renewable energy sources to power facility operations.
  - Optimize Operational Schedules: Operate high-energy equipment during off-peak hours to reduce strain on the power grid and improve efficiency.
107. These mitigation measures ensure the KGVF facility operates sustainably while minimizing environmental and community impacts.

## 5.2. Demolition Impacts and Mitigation Measures

### 5.2.1. Dust Generation

108. This is a small renovation works, and demolition activities will not cause any significant impact. However, several environmental impacts are discussed below but on a very low scale. Below are anticipated impacts along with corresponding mitigation measures:
- **Impact:** Demolition activities can generate dust, affecting air quality and health and safety of workers and community, and health of the livestock in the nearby pig breeding facility.
  - **Mitigation Measures:**
    - ✓ **Dust Suppression:** Use water sprays or misting systems to suppress dust during demolition.

- ✓ **Barriers and Screens:** Erect an appropriate physical safety barrier as in accordance with the engineer’s approval or dust screens around the demolition site to contain dust.
- ✓ **Regular Cleaning:** Clean surrounding areas regularly to prevent dust accumulation.
- ✓ **Personal Protective Equipment (PPE):** Provide workers with appropriate PPE such as masks when the need arises.
- ✓ Implementation of Health and Safety, and Biosecurity Risk Plan in Annex 5 to mitigate contamination risk to the pigs.

#### 5.2.2. Noise Pollution

109. Noise pollution is not anticipated to increase and is not significant. The renovation works will involve the use of power tools and perhaps an excavator that will be used for drainage improvement works. Below are anticipated impacts along with corresponding mitigation measures:

- **Impact:** Demolition activities can produce high localised noise levels, disturbing nearby residents.
- **Mitigation Measures:**
  - ✓ **Work Hours:** Schedule noisy activities during less sensitive times of the day – 8 am to 5pm.
  - ✓ **Equipment Maintenance:** Ensure machinery is well-maintained and fitted with noise reduction features.
  - ✓ **Communication:** Inform nearby residents about the demolition schedule and expected noise levels.

#### 5.2.3. Solid Waste Generation

110. During demolition, solid waste is expected to be generated (see annex 4 for solid/liquid waste management plan). The renovation works at the KGVI facility will generate various solid wastes, including old timbers, window frames, glass panes, oscillation paper, and organic sludge from the septic tank and digester. If not managed properly, these wastes could lead to environmental impacts such as pollution, safety hazards, and inefficient resource use. To mitigate these impacts, recyclable materials like timbers, window frames, and glass panes will be repurposed or sent to recycling facilities, while organic sludge will be safely composted on-site for agricultural use. Proper segregation, storage, and disposal practices will be enforced to minimize risks and support sustainable waste management.

111. Below (Table 4) is an analysis of the recyclable potential of the waste produced during the demolition and renovation works at the KGVI facility:

*Table 4: Recyclable potential of solid waste produced during demolition and renovation works*

Waste Type	Recycling Potential	Notes
<b>Old Timbers</b>	Can be repurposed for construction, furniture making, or firewood.	Ensure timbers are free from pests and structural damage before reuse.
<b>Window Frames (Metal)</b>	Can be melted down and recycled into new metal products.	Clean and separate from other materials before sending to a recycling facility.

<b>Glass (Window Panes)</b>	Can be recycled into new glass products or reused in other construction projects.	Ensure no cracks or contamination before recycling; consult with local recycling programs.
<b>Oscillation Paper</b>	Can be used in composting or recycled into pulp for making new paper products.	Must be clean and free of contaminants for recycling.
<b>Organic Sludge (from Septic Tank and Digester)</b>	Can be processed into compost for agricultural use.	Ensure proper composting techniques to eliminate pathogens before applying to soil.

112. By segregating these materials at the source and coordinating with local recycling programs, much of the demolition waste can be reused or recycled, contributing to sustainability efforts during the renovation.

#### 5.2.4. Safety Hazards

113. Safety of workers and the public is crucial in any renovation works. According to screening, there are some residents who are living within the 300 meters safety radius. Below are anticipated impacts along with corresponding mitigation measures:

- **Impact:** Demolition activities pose safety risks to workers and the public.
- **Mitigation Measures:**
  - ✓ **Safety Training:** Provide comprehensive safety training to all workers.
  - ✓ **Site Security:** Secure the site to prevent unauthorized access.
  - ✓ **PPE:** Ensure all workers use appropriate PPE.

#### 5.2.5. Traffic Safety During Demolition Phase

114. During the demolition stage, there is a risk of accident due to presence of vehicles and machines at the site. Traffic poses a very low risk in this project. Below shows the potential traffic impact and the relevant mitigation measure.

- **Traffic Safety Issue:** One traffic safety issue during the demolition process is the potential for vehicle collisions or accidents due to the presence of construction vehicles, such as dump trucks, in the vicinity of the site. These vehicles may obstruct visibility and create hazards for both workers and pedestrians.
- **Mitigation Measure:** To mitigate this risk, clear signage and barriers will be established at the worksite to redirect traffic and inform pedestrians of potential hazards. If required and with the advice of the engineer, a flagger will control the flow of vehicles and ensure safe passage during the transportation of demolition waste.

#### 5.2.6. Septic Tank desludging and Drains desilting

115. Cleaning of the existing septic tank and drains will take place at the demolition phase. Below is an outline of potential impacts and mitigation measures of the cleaning works. The mitigation measures will help address the unique conditions at the KGVI facility focusing on the management of solidified sludge in the septic tank and silt/sediment on drains, and maintaining environmental and worker safety during the renovation activities.

### Potential Impacts:

1. **Air Quality and Odor:** Although the facility is inactive, the solidified sludges and silts in the septic tank and drains may still release odors during the desludging process, potentially affecting air quality in the surrounding area temporarily.
2. **Soil and Water Contamination:** Since the facility is not operational, the risk of leaks or spills is minimized. However, care must be taken to ensure that the solid slurries are properly managed to prevent contamination of surrounding soil or nearby water body during the desludging process of the septic tanks, and demolition and replacement of the old drainage pipeline.
3. **Health and Safety Hazards:** Workers may still be exposed to pathogens or harmful gases released from the solidified sludge during cleaning. This poses a potential health risk despite the facility's inactivity.
4. **Disturbance During Drainage Pipeline Replacement:** The demolition and replacement of the drainage pipeline could cause temporary disturbances in the surrounding environment, including potential dislodgment of solid materials if not managed properly.

### Mitigation Measures:

1. **Odor Management:** To minimize odor release during desludging, solidified sludges should be promptly removed and sealed in covered containers. Implementing temporary ventilation systems may also help reduce airborne odors.
2. **Proper Disposal of Solid Slurries:** The solidified sludges should be handled with care and properly treated for re-use as organic fertilizers. They are in fact nutrient-rich organic material needing stabilization through composting (see Section 2.6.2.1 for composting process of treating organic sludge and detail of the process in Annex 9).
3. **Health and Safety Protocols:** Workers will utilize appropriate personal protective equipment (PPE), including masks and gloves, to protect against any potential exposure to pathogens. The cleaning process will be conducted under the close supervision of the engineer to ensure compliance with safety standards and operational protocols. This oversight will guarantee that all procedures are executed effectively and that the safety of personnel is prioritized throughout the project works.
4. **Careful Management of Pipeline Replacement:** The replacement of the drainage pipeline will be conducted under close supervision of the engineer to ensure that solid materials remain contained and that no disruption occurs in the surrounding area. To manage any residual materials during the drainage pipeline replacement process, containment strategies such as using leak-proof containers or bags to temporarily hold any displaced solids will be utilized. Additionally, the contractor will be implementing a thorough clean-up protocol immediately following the pipeline work. This will help ensure that any residual materials are safely collected and disposed of accordingly. The clean-up protocol can be found in Annex 9, but the contractor will actually provide further detail to this protocol in their CESMP.

### 5.2.7. Anaerobic Digester risks

116. Based on an environmental, social, health and safety audit undertaken for the defunct anaerobic digester (see Annex 7), the table below summarizes the environmental, social, health, and safety risks and impacts, along with proposed mitigation measures for the anaerobic digester at the KGVI pig breeding facility that has been non-operational for several years:

Table 5: Potential risks, impacts and mitigation measures of the anaerobic digester at KGVI facility

Risk/Impact Area	Potential Risks and Impacts	Mitigation Measures
<b>Environmental</b>	<p><b>Leachate &amp; Soil Contamination:</b> Non-operational digesters may leak leachate, contaminating soil and groundwater.</p> <p><b>Odor Emissions:</b> Decomposing organic matter may produce foul odors impacting air quality.</p>	<ul style="list-style-type: none"> <li>- Regularly inspect and repair leaks.</li> <li>- Introduce a containment barrier or liner around the digester.</li> <li>- Conduct soil and water quality testing around the digester site.</li> <li>- Apply organic cover materials like compost to mitigate odors.</li> </ul>
<b>Social</b>	<p><b>Community Complaints:</b> Unpleasant odors and potential environmental hazards may affect neighboring communities.</p>	<ul style="list-style-type: none"> <li>- Inform the community about the facility's status and ongoing remediation efforts.</li> <li>- Establish a complaint mechanism to address community concerns promptly.</li> <li>- Limit access to the site to avoid potential unauthorized usage.</li> </ul>
<b>Health</b>	<p><b>Pathogen Exposure:</b> Stagnant organic matter may harbor pathogens, posing health risks to workers and nearby residents.</p>	<ul style="list-style-type: none"> <li>- Require PPE for all personnel handling the digester.</li> <li>- Set up handwashing and sanitation stations near the site.</li> <li>- Regularly monitor air quality, focusing on methane and hydrogen sulfide levels.</li> </ul>
<b>Safety</b>	<p><b>Structural Hazards:</b> Potential structural degradation may increase the risk of collapse.</p> <p><b>Gas Emissions:</b> Accumulated gases (e.g., methane) may pose a fire or explosion hazard.</p>	<ul style="list-style-type: none"> <li>- Conduct structural assessments before any maintenance or remediation.</li> <li>- Install gas monitoring and ventilation systems to mitigate gas buildup.</li> <li>- Train personnel on fire and gas safety measures and emergency response procedures.</li> </ul>

117. These mitigation measures can reduce the risks associated with the anaerobic digester, particularly given its prolonged non-operational state.

### 5.3. Renovation/Construction Phase Impacts and Mitigation Measures

#### 5.3.1. Environmental Impacts and Mitigation Measures

118. During the actual renovation phase, there are potential environmental impacts that are anticipated. Below are anticipated impacts along with corresponding mitigation measures:

a) Air Quality-

- **Impacts:** Dust and emissions from construction equipment and operations can degrade air quality.
- **Mitigation:**
  - ✓ Use dust control measures such as water spraying.
  - ✓ Ensure construction equipment is well-maintained and uses low-emission technologies.
  - ✓ Implement a construction activity schedule to minimize simultaneous high-emission activities.

b) Water Quality

- **Impacts:** Potential contamination from construction runoff, waste, and chemicals.
- **Mitigation:**
  - ✓ Install silt fences and sedimentation basins to control runoff.
  - ✓ Properly store and handle hazardous materials to prevent spills.
  - ✓ Treat wastewater before discharge.

c) Noise Pollution

- **Impacts:** Construction activities can generate significant noise, affecting workers and nearby residents.
- **Mitigation:**
  - ✓ Use noise barriers and mufflers on equipment.
  - ✓ Limit construction activities to daytime hours.
  - ✓ Provide hearing protection to workers.

d) Waste Management

- **Impacts:** Renovation generates construction waste, including hazardous materials.
- **Mitigation:**
  - ✓ A waste (solid/liquid waste) management plan is development prioritizing reuse and recycling (see annex 4).
  - ✓ Properly dispose of hazardous materials following regulations.
  - ✓ Minimize waste generation through efficient use of materials.

e) Energy Use

- **Impacts:** Increased energy consumption from construction and operation.
- **Mitigation:**
  - ✓ Use energy-efficient equipment and lighting.
  - ✓ Implement energy-saving practices and technologies in the renovated facility.
  - ✓ Conduct energy audits to identify and reduce inefficiencies.

f) Traffic safety

- **Impact:** During the renovation phase, the use of dump trucks to transport materials can lead to increased dust emissions due to access road being unsealed and noise pollution, which may

affect nearby residents or workers. This can cause discomfort and potentially adverse health impacts, such as respiratory irritation due to the dust generated.

- **Mitigation Measure:** To mitigate this, water will be sprayed on haul roads and material loads when required, to suppress dust emissions. Additionally, noise-reducing measures like scheduling truck movements during less disruptive hours and maintaining trucks to minimize engine noise will help reduce the impact on the surrounding area.

g) Contamination (Virus) Risk to pigs

- **Potential Impact:** During the renovation works at the pig breeding facility, there is a risk of viral contamination from construction workers to the pigs. The close proximity of the slaughter facility and the pig breeding facility increases the likelihood of pathogens being transferred through contaminated footwear, clothing, or equipment. This can pose significant health risks to the pigs, potentially leading to outbreaks of viral diseases, which can have devastating effects on the herd and the overall operation of the facility.
- **Mitigation Measures:** To mitigate the risk of contamination, the following measures will be implemented:
  - ✓ **Biosecurity Protocols:** Establish strict biosecurity measures, including requiring all construction workers to change into clean clothing and footwear before entering the pig breeding area. Workers must undergo a thorough hand sanitization process.
  - ✓ **Controlled Access:** Limit access to the pig breeding facility to essential personnel only. Signage will be displayed to inform workers and visitors of biosecurity protocols, emphasizing the importance of preventing contamination.
  - ✓ **Disinfection Stations:** Set up disinfection stations at entry points to the pig breeding facility, where workers can sanitize their hands and footwear before entering. Use effective disinfectants that are proven to eliminate viral pathogens.
  - ✓ **Training and Awareness:** Conduct training sessions for construction workers on biosecurity practices and the importance of preventing disease transmission to the pigs. Clear communication about the potential risks and protocols will enhance compliance and effectiveness.
  - ✓ **Regular Monitoring:** MAL will implement routine health checks on the pigs during the renovation phase to quickly identify any signs of illness and take prompt action if contamination is suspected.

### 5.3.2. Social Impacts and Mitigation Measures

119. Below is an anticipated social impact along with corresponding mitigation measures:

✓ Worker Safety

- **Impacts:** Increased risk of accidents and injuries during renovation.
- **Mitigation:**
  - **Safety Training and PPE:** All workers should receive proper safety training, particularly on the risks involved in the renovation process, and be provided with appropriate personal protective equipment (PPE), such as helmets, gloves, and boots.
  - **Strict Safety Protocols:** Implement and enforce strict safety protocols on-site, including the use of protective gear at all times, and ensure emergency response plans are in place and regularly communicated.
  - **Safety Equipment Maintenance:** Conduct regular inspections and maintenance of safety equipment to ensure functionality and availability in case of accidents.

120. Worker's Code of Conduct and Care: In line with the Labour Management Plan (LMP) and Solomon Islands' national labour laws, all workers including contractors and service providers working on SIART project must adhere to a strict Code of Conduct that emphasizes ethical behaviour, respect for co-workers, the surrounding community and safe working practices. Attached in Appendices 3,4 and 5 are Code of Conducts templated for companies that provide services to the project and also for individual workers respectively, adopted from the transport sector projects under the Ministry of Infrastructure Development which SIART wishes to adopt as means of good practice. The code of conduct ensures;

- Zero tolerance for harassment (including sexual exploitation and abuse and sexual harassment (SEA/SH), violence, or discriminatory behaviour.
- Provided clear guidelines on appropriate interactions with nearby Burns Creek/Ranadi communities that include business houses, offices, schools and settlements.
- Prohibition of alcohol and drug use on-site to prevent impaired judgment and accidents.
- Ensuring the implementation of good practises on OHS.

121. Additionally, Worker's Welfare should be prioritized by providing safe and adequate working conditions and rest breaks. Compliance with the Solomon Islands' Labour Act will ensure fair wages, working hours, and rights to workers during the project.

#### 5.4. Operation Phase Impacts and Mitigation Measures

122. Apart from operating the small pig breeding facility at the site, operating the small slaughter facility or abattoir at the same compound can have several operational impacts, which include environmental, social, and economic aspects. The potential operational impacts and their mitigation measures are discussed below.

##### 5.4.1. Environmental Impacts and Mitigation Measures

###### 5.4.1.1. Slaughterhouse Cleaners

123. Slaughterhouse cleaners should never be used as a substitute for hygienic slaughter practices. The types of cleaners are: soaps, Quaternary ammonium (quat) compounds, chemicals like chlorine, and degreasers. The Table below outlines their characteristics. Soaps are useful as hand cleaners, slaughter counters and table surfaces, but are poor degreasers and disinfectants. The quat group is the most used cleaner type for slaughter facilities. It can be used for all purpose, deodorant, disinfectant, and cleaning slaughter tools and instruments. Chlorine sanitizers are used only to disinfect floors but can kill microflora present in waste system digesters. Degreasers are toxic and must only be used to clean out grease traps and pipelines conducting slaughter grease. Degreasers are costly. Pressurized hot water is commonly used as a degreaser (by melting congealed grease) but is not available in the country to be used in the slaughter setup. Hot water from the scalding vat (60 degrees C) can be tried but may not be hot enough. Cleaner costs vary. Quats and soaps are reasonably priced and can be purchased as concentrates and diluted for use.

124. Recommendation: use liquid hand soap for personal cleaning and counter tops. Use a quat for cleaning slaughter tools, table tops and floors.

Table 6: Table of potential chemicals under consideration<sup>11</sup>

Name	All Purpose	Chemical Type	Deodorizer	Degreaser	Disinfectant	Est. Cost
Gojo industrial hand cleaner	no	soap	yes	modest	no	USD22/gallon
Clean Quick Quat	yes	Quarternary ammonium	yes	no	yes	USD30/gal concentrate
Clorine sanitizer	no	Chlorine	yes	no	yes	about USD14/gal
Goo-Gone; Cleaner/Degreaser; Zep; Degreaser to clean slaughter fat from floors and piping	Toxic	N-Propyl Bromide (nPB), Trichloroethylene TCE}	no	yes	no	USD15-50/gal

125. MAL has a livestock drug store that is located at the Livestock Headquarter in Honiara where concentrates of liquid soap and Quat can be stored. To mitigate any environmental, health and safety impact, the cleaning agents will be handled carefully and diluted as per the Material Safety Data Sheet (MSDS) before use. Ensure that appropriate safety measures, such as wearing personal protective equipment (PPE) before handling these cleaning agents to protect workers from potential hazards.

#### 5.4.1.2. Slaughter Facility Effluents

##### Environmental Impacts:

##### a) Water Pollution

- **Impacts:** Wastewater from slaughtering processes, including blood, fats, and cleaning agents, can contaminate local water bodies.
- **Mitigation:**
  - ✓ Blood are collected separately at the stun/killing stage.
  - ✓ Other organic wastes in the form of slurry and diluted soaps and quats used for cleaning are discharged into the septic tank as waste-water where they are treated (see annex 4).
  - ✓ Regular monitoring of water quality to ensure compliance with environmental standards (refer to appendix 8 for monitoring plan).

##### b) Solid Waste Management

- **Impacts:** Generation of solid waste such as bones, offal, and packaging materials.
- **Mitigation:**
  - ✓ Implement a comprehensive waste management plan that includes recycling and proper disposal of waste (refer to Annex 4 for solid/liquid waste management plan)
  - ✓ Composting organic waste at an existing composting house near the compound where such waste is re-used as organic fertilizer.

##### c) Odor Emissions

- ✓ **Impacts:** Decomposition of organic matter and animal waste can produce unpleasant odors.
- ✓ **Mitigation:**
  - ✓ Use biofilters or other odour control technologies.

<sup>11</sup> Information on this section including Table 5 is provided to us by Brian, World Bank Livestock Specialist.

- ✓ Maintain high standards of cleanliness and regular waste removal.

**d) Air Quality**

- ✓ **Impacts:** Emissions from slaughtering processes and transportation can affect air quality.
- ✓ **Mitigation:**
  - ✓ Ensure proper ventilation in the facility.
  - ✓ Use low-emission equipment and vehicles.

**Social Impacts:**

**a) Community Health and Safety**

- **Impacts:** Potential for the spread of diseases if hygiene standards are not maintained.
- **Mitigation:**
  - ✓ Implement strict hygiene and sanitation protocols.
  - ✓ Provide regular health checks for workers.
  - ✓ All workers must adhere to a strict Code of Conduct that emphasizes ethical behaviour, respect for co-workers, the surrounding community and safe working practices. This include:
    - (i) Zero tolerance for harassment (including SEA/SH), violence, or discriminatory behaviour.
    - (ii) Clear guidelines on appropriate interactions with nearby Burnsreek/Ranadi communities that include business houses, offices, schools and settlements.
    - (iii) Prohibition of alcohol and drug use on-site to prevent impaired judgment and accidents.

**b) Noise Pollution**

- **Impacts:** Noise from slaughtering activities and transportation can disturb nearby communities.
- **Mitigation:**
  - ✓ Install noise barriers or use soundproofing materials.
  - ✓ Schedule operations to minimize noise during sensitive times.

**c) Employment Opportunities**

- **Impacts:** Providing jobs for local communities can improve livelihoods.
- **Mitigation:**
  - ✓ Prioritize hiring from local communities.
  - ✓ Provide training and capacity-building programs for workers.

**Economic Impacts**

**a) Local Economic Development**

- **Impacts:** The facility can stimulate the local economy by creating jobs and supporting local suppliers.
- **Mitigation:**
  - ✓ Establish partnerships with local businesses and farmers.
  - ✓ Promote local sourcing of materials and services.

**b) Market Access**

- **Impacts:** Improving meat processing and safety standards can enhance market access and competitiveness.
- **Mitigation:**
  - ✓ Adhere to national and international food safety standards.
  - ✓ Invest in quality control and assurance systems.

126. Operating this small slaughter facility involves managing various environmental, social, and economic impacts. By implementing effective mitigation measures, the facility can operate sustainably, benefiting both the local community and the environment. The detail mitigation measures for this project are provided on Table 7.

*5.4.1.3. Antibiotic-resistant Bacteria*

127. The use of antibiotics in the small-scale KGVI pig breeding facility, may lead to antibiotic-resistant bacteria, posing risks to human health. Resistance arises from overuse or misuse of antibiotics, with bacteria spreading via waste, workers contact, or environmental contamination, potentially compromising antibiotic effectiveness in humans.

128. To mitigate risks, antibiotics should only be used under veterinary supervision for treatment. Proper waste management, regular livestock health monitoring, and hygiene practices can minimize antibiotic reliance (refer to Health and Biosecurity Plan for pigs in Annex 5). Training workers on responsible antibiotic use and resistance prevention is also essential to protect both human and animal health.

Table 7: Mitigation Measure Matrix

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
<b>DESIGN/PRECONSTRUCTION MOBILIZATION PHASE</b>					
Detail design impact	Final design has taken into consideration climate adaptation measures and other design resiliency features of the slaughter facility (Section 2.7.2) and septic tank-soak away system with details in Section 2.6.3.	Location related to works	Included in design cost	Contractor's Construction supervisor; SIART PMU-Project Engineer	SIART PMU- Project Engineer
<b>Renovation/Construction preparation stage-</b> Environmental management budget & Incorporate environmental management into contract documents	Confirm budgets for the implementation of environmental management measures and environmental supervisory responsibilities.	Renovation/Construction site and within the 300-meter safety radius, with special attention to areas close to sensitive receptors, especially residential, school and other areas deemed risky	Included in design cost	Contractor's Construction supervisor; SIART PMU-Project Engineer	SIART PMU- Project Engineer
	Contract documents: Preparation of the environment section in the Terms of Reference for bidders for construction contract, and environmental contract clauses for contractor, namely the special conditions for the protection of the water, soil and air environments (referencing the CEMP and monitoring plan).	Renovation/Construction site including the project impact area	Included in design cost	Contractor's Construction supervisor; SIART PMU-Project Engineer	SIART PMU- Project Engineer
UXO impact	Chance-Find Procedure (refer appendix 2)- the contractor to report the find to the RSIPF, condone off the area and arrange for eviction of nearby residents. Work will	Renovation/Construction site	Included in renovation cost	Contractor's Construction supervisor;	SIART PMU- Project Engineer

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
	continue only after clearance has been given by the RSIPF.			SIART PMU-Project Engineer	
<b>Construction support preparation-</b> Environmental Education awareness & Complaints procedures established	Environmental Protection Training: Environmental Safeguard Officer & Social Safeguard Officer to provide on-the-job (safeguards induction) training on implementation and supervision of environmental/social mitigation measures to contractor.	Renovation/Construction site including the project impact area	Included in design cost	PMU Environmental & Social Safeguards Officers	SIART PMU Environmental & Social Safeguards Officers
	The Project Grievance Redress Mechanism has been established (Section 5.5) that provides process to follow for raising complaints pertaining to the implementation of the project, and contact persons for the sub-project will be provided to affected persons and included on sign boards at renovation/construction site	Renovation/Construction site including the project impact area	Included in design cost	Contractor's EHSO	SIART PMU Environmental & Social Safeguards Officers
<b>DEMOLITION/SITE CLEARING PHASE</b>					
Demolition waste include concrete, bricks, tiles, and ceramics as well as wood, glass, and plastic (may be used as coating of other building material).	<ul style="list-style-type: none"> <li>• Waste Segregation: Segregate waste at the source for easier recycling and disposal.</li> <li>• Recycling: Recycle materials like metal, wood, and concrete whenever possible.</li> <li>• Proper Disposal: Ensure hazardous materials (e.g., lead paint) are handled and disposed of according to regulations (refer annex 1 for tentative outline of Hazardous Material Management Plan).</li> <li>• Waste Reduction: Plan demolition to minimize waste generation (refer annex</li> </ul>	Renovation/Construction site	Included in design cost	Contractor;  SIART PMU-Project Engineer	SIART PMU- Project Engineer

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
	2 for tentative outline of Waste Management Plan during demolition and construction stage).				
Contamination (virus) risk to pigs	<ul style="list-style-type: none"> <li>• Biosecurity Protocols: Implement strict measures requiring all workers to change into clean clothing and footwear before entering the pig breeding area, accompanied by thorough hand sanitization. Detail in Annex 5.</li> <li>• Controlled Access: Limit access to essential personnel only, and place clear signage to emphasize biosecurity protocols, reducing the risk of contamination.</li> <li>• Disinfection Stations: Install disinfection stations at facility entry points where workers sanitize hands and footwear using effective disinfectants to eliminate viral pathogens.</li> <li>• Training and Awareness: Conduct sessions to educate workers on biosecurity practices and the importance of preventing disease transmission to the pigs.</li> <li>• Regular Monitoring: Routine health checks will be performed on pigs during renovation to detect early signs of illness, allowing prompt intervention if contamination occurs.</li> </ul>	KGVF Facility (Pig breeding and slaughter facilities)	Included in design cost	Contractor; MAL; SIART PMU	SIART PMU- Project Engineer/ESO

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
Desludging the existing septic tank and desilting existing drains	<ul style="list-style-type: none"> <li>• Odor Management: Solidified sludges will be promptly removed in sealed containers to minimize odor. Temporary ventilation may help reduce airborne smells during desludging.</li> <li>• Slurry Disposal: Handle solid slurries with care to avoid contamination. MAL will treat the sludge through composting treatment process and subsequently reuse as organic fertilizers.</li> <li>• Health and Safety: Workers must wear PPE (masks, gloves) during cleaning, under the engineer's supervision, ensuring compliance with safety standards.</li> <li>• Pipeline Management: Drainage pipeline replacement will be closely monitored, using containment methods (leak-proof containers) and a clean-up protocol to handle residual materials safely. Detail in Annex 11 <b><u>Waste Removal Protocol</u></b></li> <li>• Safety and PPE: <ul style="list-style-type: none"> <li>• Equip workers with PPE, including gloves, masks, boots, and coveralls, due to the confined space and possible microbial hazards.</li> <li>• Conduct a safety briefing on confined space entry and handling of potentially pathogenic materials.</li> </ul> </li> </ul>	KGV Facility compound	Included in design	Contractor; MAL; SIART PMU	SIART PMU- Project Engineer/ESO

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
	<ul style="list-style-type: none"> <li>• Pump Out and Manual Removal:               <ul style="list-style-type: none"> <li>• Use a sludge pump to extract the sludge. If it has thickened, assist with manual removal using shovels and other hand tools.</li> <li>• Place the removed material into sealable containers for transport to the composting area.</li> </ul> </li> <li>• Confined Space Safety Measures:               <ul style="list-style-type: none"> <li>• Ensure proper ventilation in the tank and use a gas monitor to detect hazardous gases before and during entry.</li> <li>• Use a harness and safety line for personnel entering the tank, supervised by an external observer trained in confined space procedures.</li> </ul> </li> </ul>				
Vegetation clearance and excavation	<p>Only plants that impede the renovation/construction works will be removed. There are no plants that are of any significant conservation values.</p> <p>Excavation works will be restricted to the construction site with supervision of the Project Engineer.</p>	Renovation/Construction site	Included in design cost	Contractor	SIART PMU- Project Engineer;  Environmental Safeguards Officer.
Demolition activities can generate dust, affecting air quality and health of workers and the pigs in the nearby pig breeding facility.	<ul style="list-style-type: none"> <li>• Dust Suppression: Use water sprays or misting systems to suppress dust during demolition.</li> <li>• Barriers and Screens: Erect physical barriers or dust screens around the demolition site to contain dust.</li> </ul>	Renovation/Construction site	Included in demolition cost	Contractor	SIART PMU- Project Engineer;  Environmental Safeguards Officer.

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
	<ul style="list-style-type: none"> <li>Regular Cleaning: Clean surrounding areas regularly to prevent dust accumulation.</li> <li>Personal Protective Equipment (PPE): Provide workers with appropriate PPE such as masks when the need arises.</li> </ul>				
Demolition activities can produce high localised noise levels, disturbing nearby residents.	<ul style="list-style-type: none"> <li>Work Hours: Schedule noisy activities during less sensitive times of the day – 8 am to 5pm.</li> <li>Equipment Maintenance: Ensure machinery is well-maintained and fitted with noise reduction features.</li> <li>Communication: Inform nearby residents about the demolition schedule and expected noise levels</li> </ul>	Renovation/Construction site	Included in demolition cost	Contractor	SIART PMU- Project Engineer;  Environmental Safeguards Officer.
Demolition activities pose safety risks to workers and the public.	<ul style="list-style-type: none"> <li>Safety Training: Provide comprehensive safety training to all workers.</li> <li>Site Security: Secure the site to prevent unauthorized access.</li> <li>PPE: Ensure all workers use appropriate PPE.</li> </ul>	Renovation/Construction site	Included in demolition cost	Contractor	SIART PMU- Project Engineer;  Environmental Safeguards Officer.
<b>CONSTRUCTION PHASE</b>					

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
Air Quality- Dust and emissions from construction equipment and operations can degrade air quality.	<ul style="list-style-type: none"> <li>• Use dust control measures such as water spraying.</li> <li>• Ensure construction equipment is well-maintained and uses low-emission technologies.</li> <li>• Implement a construction activity schedule to minimize simultaneous high-emission activities.</li> </ul>	Renovation/Construction site	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project Engineer	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
Noise- Demolition activities can produce high localised noise levels, disturbing nearby residents.	<ul style="list-style-type: none"> <li>• Work Hours: Schedule noisy activities during less sensitive times of the day – 8 am to 5pm.</li> <li>• Equipment Maintenance: Ensure machinery is well-maintained and fitted with noise reduction features.</li> <li>• Communication: Inform nearby residents about the demolition schedule and expected noise levels.</li> </ul>	Location of works and sensitive areas including residential area, school, canteens/shops that are within the 300-meter safety radius.	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project Engineer	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
Contamination (virus) risk to pigs	<ul style="list-style-type: none"> <li>• Biosecurity Protocols: Implement strict measures requiring all workers to change into clean clothing and footwear before entering the pig breeding area, accompanied by thorough hand sanitization.</li> <li>• Controlled Access: Limit access to essential personnel only, and place clear signage to emphasize biosecurity protocols, reducing the risk of contamination.</li> <li>• Disinfection Stations: Install disinfection stations at facility entry points where workers sanitize hands and footwear</li> </ul>	KGVI Facility compound	Included in design cost	Contractor; MAL; SIART PMU	SIART PMU- Project Engineer/ESO.

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
	<p>using effective disinfectants to eliminate viral pathogens.</p> <ul style="list-style-type: none"> <li>• Training and Awareness: Conduct sessions to educate workers on biosecurity practices and the importance of preventing disease transmission to the pigs.</li> <li>• Regular Monitoring: Routine health checks will be performed on pigs during renovation to detect early signs of illness, allowing prompt intervention if contamination occurs. Detail in Annex 5.</li> </ul>				
<p>Anaerobic Digester rehabilitation:  <b>Leachate &amp; Soil Contamination:</b> Non-operational digesters may leak leachate, contaminating soil and groundwater.  <b>Odor Emissions:</b> Decomposing organic matter may produce foul odors impacting air quality.  <b>Community Complaints:</b> Unpleasant odors and potential environmental hazards may affect neighbouring communities.</p>	<ul style="list-style-type: none"> <li>• Regularly inspect and repair leaks.</li> <li>• Introduce a containment barrier or liner around the digester.</li> <li>• Conduct water quality testing in the nearby stream.</li> <li>• Apply organic cover materials like compost to mitigate odors</li> <li>• Inform the community about the facility's status and ongoing remediation efforts.</li> <li>• Establish a complaint mechanism to address community concerns promptly.</li> <li>• Limit access to the site to avoid potential unauthorized usage.</li> <li>• Require PPE for all personnel handling the digester.</li> <li>• Set up handwashing and sanitation stations near the site.</li> </ul>	<p>KGVI Facility anaerobic digester site</p>	<p>Included in design/construction cost</p>	<p>Contractor; MAL; SIART PMU</p>	<p>SIART PMU- Project Engineer/ESO.</p>

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
<p><b>Pathogen Exposure:</b> Stagnant organic matter may harbor pathogens, posing health risks to workers and nearby residents.</p> <p><b>Structural Hazards:</b> Potential structural degradation may increase the risk of collapse.</p> <p><b>Gas Emissions:</b> Accumulated gases (e.g., methane) may pose a fire or explosion hazard</p>	<ul style="list-style-type: none"> <li>Regularly monitor air quality, focusing on methane and hydrogen sulfide levels.</li> <li>Conduct structural assessments before any maintenance or remediation.</li> <li>Install gas monitoring and ventilation systems to mitigate gas buildup.</li> <li>Train personnel on fire and gas safety measures and emergency response procedures. Detail in Annex 9.</li> </ul>				
<p>Waste Management- Renovation generates construction waste, including hazardous materials.</p>	<ul style="list-style-type: none"> <li>An outline of a site-specific waste management plan is provided in annex 2 to this document for demolition and construction stage, prioritizing reuse and recycling.</li> <li>Properly dispose of hazardous materials following regulations.</li> <li>Minimize waste generation through efficient use of materials.</li> </ul>	Renovation/Construction site	Included in construction cost	Contractor's Construction supervisor.  SIART PMU-Project	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
<p>Water Quality- Potential contamination from construction runoff, waste, and chemicals.</p>	<ul style="list-style-type: none"> <li>Install silt fences and sedimentation basins to control runoff.</li> <li>Properly store and handle hazardous materials to prevent spills.</li> <li>Treat wastewater before discharge.</li> </ul>	Renovation/Construction site	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
Energy Use- Increased energy consumption from construction and operation.	<ul style="list-style-type: none"> <li>Use energy-efficient equipment and lighting.</li> <li>Implement energy-saving practices and technologies in the renovated facility.</li> <li>Conduct energy audits to identify and reduce inefficiencies.</li> </ul>	Renovation/Construction site	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
Worker Safety- Increased risk of accidents and injuries during renovation.	<ul style="list-style-type: none"> <li>Provide proper safety training and personal protective equipment (PPE).</li> <li>Implement strict safety protocols and emergency response plans.</li> <li>Regularly inspect and maintain safety equipment.</li> </ul>	Renovation/Construction site	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
<i>Gender-Based Violence (GBV)/SEA/SH-</i> Physical or verbal abuse of women or children	<ul style="list-style-type: none"> <li>Strict Code of Conduct for workers with no tolerance for physical or verbal abuse of women or children</li> <li>Training to workers on maintaining good community relations, Provision of information to local communities about the renovation works that is going on.</li> </ul>	Project Impact Areas	Included in construction cost	Contractor's Construction supervisor;  SIART PMU-Project Engineer	SIART PMU Environmental & Social Safeguards Officers;  SIART PMU- Project Engineer.
<b>OPERATIONAL PHASE</b>					
<i>Water Pollution-</i> Wastewater from slaughtering processes including blood, fats, and cleaning agents, can contaminate local water bodies.	<ul style="list-style-type: none"> <li>All waste water will be directed into a drain that leads to the septic tank and soakaway.</li> <li>Regular monitoring of water quality to ensure compliance with environmental standards.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Solid Waste Management-</i> Generation of solid waste	<ul style="list-style-type: none"> <li>Implement a comprehensive waste management plan (annex 4) that</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
such as bones, offal, and packaging materials.	<ul style="list-style-type: none"> <li>includes recycling and proper disposal of waste.</li> <li>Utilize the existing composting house near the KGVI Facility compound for composting organic waste to be re-used as organic fertilizer</li> </ul>				
<i>Odor Emissions-</i> Decomposition of organic matter and animal waste can produce unpleasant odors.	<ul style="list-style-type: none"> <li>Use biofilters or other odor control technologies.</li> <li>Maintain high standards of cleanliness and regular waste removal.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Air Quality-</i> Emissions from slaughtering processes and transportation can affect air quality.	<ul style="list-style-type: none"> <li>Ensure proper ventilation in the facility.</li> <li>Use low-emission equipment and vehicles</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
Antibiotic-resistant bacteria: -Antibiotic-resistant bacteria can cause infections in humans that are harder to treat, leading to longer illness durations, increased medical costs, and higher mortality rates. - Resistant bacteria can spread within communities and healthcare settings,	<ul style="list-style-type: none"> <li>Antibiotics should only be used under veterinary supervision for treatment</li> <li>Proper waste management, regular livestock health monitoring, and hygiene practices can minimize antibiotic reliance.</li> <li>Training workers on responsible antibiotic use and resistance prevention</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
leading to outbreaks of resistant infections.					
<i>Community Health and Safety-</i> Potential for the spread of diseases if hygiene standards are not maintained.	<ul style="list-style-type: none"> <li>Implement strict hygiene and sanitation protocols.</li> <li>Provide regular health checks and vaccinations for workers.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Noise Pollution-</i> Noise from slaughtering activities and transportation can disturb nearby communities.	<ul style="list-style-type: none"> <li>Install noise barriers or use soundproofing materials.</li> <li>Schedule operations to minimize noise during sensitive times.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Employment Opportunities-</i> Providing jobs for local communities can improve livelihoods.	<ul style="list-style-type: none"> <li>Prioritize hiring from local communities.</li> <li>Provide training and capacity-building programs for workers.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Local Economic Development-</i> The facility can stimulate the local economy by creating jobs and supporting local suppliers.	<ul style="list-style-type: none"> <li>Establish partnerships with local businesses and farmers.</li> <li>Promote local sourcing of materials and services.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
<i>Market Access-</i> Improving meat processing and safety standards can enhance market access and	<ul style="list-style-type: none"> <li>Adhere to national and international food safety standards.</li> <li>Invest in quality control and assurance systems.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL

ENVIRONMENTAL AND SOCIAL ISSUES / POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT	PROPOSED MITIGATION MEASURE OR ENHANCEMENT MEASURE	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	RESPONSIBLE PARTY	VERIFICATION REQUIRED TO DETERMINE EFFECTIVENESS OF MEASURES
competitiveness.					
Ongoing maintenance & Sustainability of the facility	<ul style="list-style-type: none"> <li>• It shall be the responsibility of MAL to ensure maintenance, repair, replacement, and refurbishment when the need arise;</li> <li>• MAL to ensure operational energy use and operational water use are taken care of.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
Safety of the facility	<ul style="list-style-type: none"> <li>• Ensure the facilities site is fenced and maintained, and one or two guards to be employed by MAL to secure the premises.</li> </ul>	Project site	Included in operation cost	Private company & MAL	MAL
Sustainability (Maintenance)	<ul style="list-style-type: none"> <li>• Ensure drains are cleared of sediment and detritus build up on a regular basis and after significant rain events;</li> <li>• Ensure that debris is cleared from drains;</li> <li>• Ensure the septic tank and soakaway pit are checked and desilted regularly.</li> </ul>	Project site	MAL operational cost	MAL	MAL

## 5.5. Monitoring of ESMP

129. The SIART PMU Environmental and Social Safeguards Officers and Engineer will monitor overall environmental performance during the actual renovation stage. They will have their own work plan to carry out monitoring and inspection of the contractor’s renovation works to ensure the contractor adhere to requirements of the WB and SIG safeguards policy (see monitoring checklist in Appendix 7).
130. The project will have a site-specific Contractor’s ESMP document (CESMP) in which the contractor will outline roles and responsibilities and how they will perform to ensure their activities are in harmony with the bio-physical and the socio-economic environment of the area. It will identify the internal procedure that the Contractor will follow when a non-compliance has been identified during the daily monitoring. Procedure will include notification responsibilities, rectification timeframe and reporting obligations. Procedure will also cover the process the Contractor will follow when non-compliances are reported by the project Engineer.
131. For each of the environmental components, the monitoring plan specifies the parameters to be monitored, locations for monitoring and duration of monitoring (refer to Table 8 below). The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. In addition to the critical locations selected during design/preconstruction stage, the environmental monitoring will also be done at any other site as determined relevant during the actual renovation stage. During operational stage, the monitoring plan in appendix 8 will be implemented.

*Table 8: Monitoring Matrix*

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
<b>DESIGN / PRE-CONSTRUCTION STAGE</b>					
Environmental budget	Bidding document & contract	The results of observations and complaints are made in the tabulation to compare with the previous month. One time only before the renovation works start (Review the bidding document and contract)	Enough budget in the BOQ	Every month	SIART PMU-Project Engineer
Design of septic tank-soak away system	KGVI Facility compound	Proper design standard to meet all necessary requirements	Enough budget in design cost	Throughout the project life	SIART PMU-Project Engineer (design & construction); MAL during operational phase
Contractor’s Environmental and Social Management Plan	1 <sup>st</sup> monthly report from the contractor	One time only before the renovation works start (Through review document which is submitted by contractors).	Approved CESMP	Every month	SIART PMU-Project Engineer

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
Site Planning	project site	Once before the contractor mobilize to the project site (through site planning document to be prepared by the PMU Engineer)	Site Plan prepared and approved	Every month	SIART PMU-Project Engineer
Consultation	Location of works	Check whether consultation is carried out for affected communities.	Consultation report.	Prior to commencing works	SIART PMU-Project Engineer / E&S Officers
<b>DEMOLITION/SITE CLEARING STAGE</b>					
Demolition waste i.e., bricks, tiles, roofing iron, plastics etc	Sub-project site (demolition site)	Daily checking against mitigation measures specified in this SS-ESMP.	Observation and report on demolition activity	Daily during demolition	SIART PMU-Project Engineer / E&S Officers  Contractor's ESO
Contamination (virus) risk to pigs	KGVF Facility compound	Biosecurity Protocol Compliance (detail in Annex 5): <ul style="list-style-type: none"> <li>What to monitor: Adherence to biosecurity measures, such as changing clothes and disinfecting hands and footwear before entering the pig area</li> </ul>	Record any non-compliance, address immediately, and retrain workers if necessary (annex 5)	Daily, during worker entry and exit	Biosecurity Officer/Contractor
		Health Status of Pigs: <ul style="list-style-type: none"> <li>What to monitor: Regular health checks to detect any signs of illness or viral symptoms in the pigs</li> </ul>	Immediate isolation of sick pigs, testing, and response protocols if illness is detected and follow the emergency procedure (annex 5 & 6).	Weekly health assessments	MAL Livestock officer- animal Health Officers
		Disinfection Practices: <ul style="list-style-type: none"> <li>What to monitor: Effectiveness and use of disinfection stations at facility entry points.</li> </ul>	Refill disinfectants and maintain stations to ensure they are always operational	Daily checks on station functionality and disinfectant supply levels	Site Manager/Biosecurity Officer
		Construction Worker Health Monitoring: <ul style="list-style-type: none"> <li>What to monitor: Health of workers</li> </ul>	Isolate any symptomatic workers and implement medical assessment	Weekly health reports	Contractor/Health and Safety Officer.

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
		in proximity to the pig breeding facility, checking for symptoms of any illness.	protocols (annex 5 & 6 & 7).	from workers.	
		Waste Management: <ul style="list-style-type: none"> <li>What to monitor: Proper handling and disposal of waste materials to prevent contamination.</li> </ul>	Correct any improper waste management practices and ensure compliance	Weekly inspections of waste disposal procedures	Contractor/ESO – SIART PMU
Desludging the existing septic tank and desilting existing drains	KGVF Facility compound	Preparation and Setup: <ul style="list-style-type: none"> <li>What to Monitor: Availability of necessary equipment (e.g., PPE, vacuum trucks, containment units, and sludge handling tools).</li> </ul>	Confirm readiness of equipment; delay work if required equipment or safety gear is missing.	Pre-operation inspection before desludging or desilting activities.	Site Supervisor/ESO -SIART PMU
		Septic Tank Desludging: <ul style="list-style-type: none"> <li>What to Monitor: Proper extraction and containment of sludge. Ensure no leakage occurs during transfer.</li> </ul>	Stop desludging immediately if leaks occur, ensure all sludge is handled in sealed containers for transport to the disposal site (annex 4 & 5)	Continuous monitoring during the desludging process	Site Supervisor/Contractor/SIART PMU Engineer & ESO.
		Drain Desilting: <ul style="list-style-type: none"> <li>The removal of silt from drains and safe containment during transport.</li> </ul>	Ensure silt is properly contained to avoid any spillages, and inspect the drains post-desilting to verify their functionality (annex 4 & 5)	Continuous during desilting activities	SIART PMU Engineer & ESO/Contractor
		Waste Disposal: <ul style="list-style-type: none"> <li>What to Monitor: Proper disposal of solid and liquid waste (sludge and silt) at designated sites.</li> </ul>	Verify that waste is transported to and disposed of at approved location; maintain disposal records for future audits (annex 4 & 5)	After each sludge or silt transport operation	SIART PMU Engineer & ESO/Contractor
		Environmental Monitoring <ul style="list-style-type: none"> <li>What to Monitor: Potential spills or contamination</li> </ul>	In case of spills, immediately implement containment and	During desludging of septic and	ESO- SIART PMU

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
		<p>near the work area or surrounding environment.</p> <ul style="list-style-type: none"> <li>Composting house (detail of treatment method in Annex 9):</li> </ul> <p>Temperature: levels necessary for pathogen kill-off</p> <p>Moisture Level:</p> <p>Aeration:</p> <p>Odor:</p> <p>pH Levels: The compost's pH can affect microbial activity.</p>	<p>clean-up protocols (annex 6 and 8).</p> <p>Typically, 55-70°C for thermophilic composting). Use a compost thermometer</p> <p>Composting works best with moisture levels between 40-60%.</p> <p>Adequate oxygen is essential for aerobic composting.</p> <p>Monitor for any foul smells, which can indicate issues with aeration or moisture balance.</p> <p>It should ideally be slightly acidic to neutral (pH 6-7.5).</p>	<p>desilting drains</p> <p>During composting</p>	<p>ESO- SIART PMU</p>
		<p>Health and Safety Monitoring:</p> <p>What to Monitor:</p> <p>Worker compliance with safety protocols, including the use of personal protective equipment (PPE) and following confined space entry procedures.</p>	<p>Ensure that workers are equipped with necessary PPE; halt operations if safety procedures are not followed (annex 5, 6 and 7).</p>	<p>During desludging septic and desilting drains</p>	<p>ESO- SIART PMU</p>
Anaerobic Digester rehabilitation:	KGVI facility site, nearby community	<p>Monitor nearby contamination of nearby waterbody, odour emission, leakage, spill, toxic gas (health/safety), community perception</p>	<p>Proper handling, based on contractor's cleaning protocol provided in the CESMP, workers equipped with full PPE, trained personnel, complaints.</p>	<p>During rehabilitation of the anaerobic digester</p>	<p>ESO- SIART PMU</p>
Vegetation clearing and excavation	project site	<p>Daily checking against mitigation measures specified in this SS-ESMP.</p>	<p>Observation and report on vegetation clearing and excavation works</p>	<p>Daily</p>	<p>SIART PMU- Project Engineer / E&amp;S Officers</p>

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
					Contractor's ESO
Dust- air quality	Project site	Daily checking against mitigation measures specified in this SS-ESMP.	Observation and report on demolition activity	Daily	SIART PMU-Project Engineer / E&S Officers  Contractor's ESO
Safety of workers and surrounding communities	Project site	Daily checking against mitigation measures specified in this SS-ESMP.	Observation and report on demolition activity.  Interview workers and members of communities within 300 m safety radius.	Daily	SIART PMU-Project Engineer / E&S Officers  Contractor's ESO
<b>RENOVATION/CONSTRUCTION STAGE</b>					
Noise level	Location of work (construction site) and within the 300-meter safety radius	Monthly checking against mitigation measures specified in this SS-ESMP	Noise level reported in quarterly report submitted to PMU.  Through interview with nearby residents, school administration, business houses, and observation.	Daily	Contractor's construction supervisor;  SIART PMU-Project Engineer / E&S Officers
Air quality and dust	Location of work (construction site)	Monthly checking against mitigation measures specified in this SS-ESMP.	Air quality and dust are reported in quarterly report submitted to PMU.  Through interview with nearby residents, school administration, and observation.	Daily	Contractor's construction supervisor;  SIART PMU-Project Engineer / E&S Officers
Solid Wastes	Implementation of construction workers management.	Monthly checking against mitigation measures specified in this SS-ESMP	Observation and report on quarterly report	Daily	Contractor's construction supervisor;  SIART PMU-Project Engineer / E&S Officers
Contamination (virus) risk to pigs	KGVI Facility compound	Biosecurity Protocol Compliance (detail in Annex 5): <ul style="list-style-type: none"> <li>What to monitor: Adherence to biosecurity measures, such as changing clothes</li> </ul>	Record any non-compliance, address immediately, and retrain workers if necessary (annex 5)	Daily, during worker entry and exit	Biosecurity Officer/Contractor

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
		and disinfecting hands and footwear before entering the pig area			
		Health Status of Pigs: <ul style="list-style-type: none"> <li>What to monitor: Regular health checks to detect any signs of illness or viral symptoms in the pigs</li> </ul>	Immediate isolation of sick pigs, testing, and response protocols if illness is detected (annex 5 & 6)	Weekly health assessments	MAL Livestock officer- animal Health Officer
		Disinfection Practices: <ul style="list-style-type: none"> <li>What to monitor: Effectiveness and use of disinfection stations at facility entry points.</li> </ul>	Refill disinfectants and maintain stations to ensure they are always operational (annex 5)	Daily checks on station functionality and disinfectant supply levels	Site Manager/Biosecurity Officer
		Construction Worker Health Monitoring: <ul style="list-style-type: none"> <li>What to monitor: Health of workers in proximity to the pig breeding facility, checking for symptoms of any illness.</li> </ul>	Isolate any symptomatic workers and implement medical assessment protocols (annex 5 & 6).	Weekly health reports from workers.	Contractor/Health and Safety Officer.
		Waste Management: <ul style="list-style-type: none"> <li>What to monitor: Proper handling and disposal of waste materials to prevent contamination.</li> </ul>	Correct any improper waste management practices and ensure compliance (annex 4 & 5)	Weekly inspections of waste disposal procedures	Contractor/ESO – SIART PMU
Flora and fauna	Subproject location and neighbouring community.	Monthly checking against mitigation measures specified in this SS-ESMP	Observation and reports/complaints	Daily	Contractor's construction supervisor;  SIART PMU- Project Engineer / E&S Officers
Human health and safety	Implementation of community and occupational Health and Safety and Emergency	Monthly checking against mitigation measures specified in this SS-ESMP)  Monthly checking of incidences or accidents	Visual observation;  Community complaints through channels proposed in the GRM;	Daily	Contractor's construction supervisor;  SIART PMU- Project Engineer / E&S Officers

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
	Response at the project site		Details of immediate actions taken to address the incident or accident and mitigation measure(s) taken by the contractor to prevent it from happening again.		
SEA/SH	Location of project	<p>Check whether information and training on SEA/SH based on the WB Good Practice Note and the national and international convention on elimination of violence against women and children are provided to appropriate stakeholders;</p> <p>Ensure implementation of the Codes of Conduct on SEA/SH, contractor's code of conduct and individual workers code of conduct (refer to Appendix 3, 4 and 5);</p>	Documents assessment field work	Weekly	<p>Contractor's EHSO;</p> <p>SIART PMU- Project Engineer / E&amp;S Officers</p>
Conflict between the workers and community	project location (KGV I and the nearby communities of Ranadi and Burns creek)	Monthly checking against mitigation measures specified in this SS-ESMP (Through observation, and interview with community members)	Complaints in the GRM register	Weekly	<p>Contractor's construction supervisor;</p> <p>SIART PMU- Project Engineer / E&amp;S Officers</p>
Consultations	project site and nearby communities.	<p>Community members aware about the project.</p> <p>Awareness on health and safety for community.</p>	<p>Complaints in the GRM register;</p> <p>Interviewing key informants.</p>	Weekly	SIART PMU- Project Engineer / E&S Officers
Contractor Training/ Inductions etc	project site	Check whether there have been trainings on CESMP, community	Number of training on CESMP; Community governance and	Monthly	SIART PMU- Project Engineer / E&S Officers

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
		governance/protocol, and induction training on health and safety	protocols; induction training on health and safety; HIV/AIDS/STI training/awareness for contractor and receiving community		
GRM	Location of project	<p>Check whether GRM are properly communicated with relevant stakeholders (e.g., Whether workers are informed about the relevant GRM upon their recruitment and their right to redress, confidentiality and protection against any reprisals from the employer, etc.);</p> <p>In the event project received a complaint, check whether it has been processed and filed accordance to its designated categories and it is correctly report through the GRM systems and referral paths if related to SEA/SH.</p>	<p>Number of complaints received and resolved;</p> <p>Updated GRM Register;</p>	Monthly	<p>Contractor's construction supervisor;</p> <p>SIART PMU-Project Engineer / E&amp;S Officers</p>
<b>OPERATIONAL STAGE (Recommended for consideration by MAL)</b>					
Operational phase impacts for risks to employee and public safety; health hazards due to maintenance issue.	Office building (external and internal parts of the building)	<p>Check for materials that may got rotted away due to unforeseen circumstances;</p> <p>Check for electrical equipment;</p> <p>Check for water connectivity;</p> <p>Check for sewer system (pipes, septic tanks, soak holes etc);</p> <p>Clearly identifying conditions that may</p>	Incidence of public health diseases i.e., diarrhoea, cholera etc.	Annually	MAL

PARAMETER TO MONITOR	LOCATION	MONITORING ACTIVITIES	MEANS OF VERIFICATION	FREQUENCY	MONITORING RESPONSIBILITY
		cause acute worker health and safety problems;			
BOD, COD, TSS, pH, Nitrates/Ammonia, Phosphates	Site 1 and Site 2 as per water quality assessment report	Collect samples and laboratory analysis (annex 5)	Check against WB and WHO Water Quality Standards	Monthly	MAL
Health of pigs	Pig breeding facility	Conduct regular health checks, observe behaviour, and inspect for signs of illness, injury, or malnutrition	Veterinary inspection records, observation logs, and health reports	Weekly or as needed, based on observed conditions	MAL
		Collect samples for disease screening (if applicable)	Laboratory test results and disease surveillance records	Monthly or in response to suspected illness outbreaks	MAL
		Monitor feed and water quality to ensure proper nutrition	Feed and water analysis reports	Quarterly or upon changes in supply	MAL
Complaints by the public about the slaughter facility/pig breeding operations	project location	Direct observation of office use and reviewing public complaints that generate from the facilities' renovation/construction works. The results of observations and complaints are made in the tabulation to compare with the previous month.	Complaints in the GRM Register to be administered by Livestock Department, MAL	Annually	MAL
Drainage system operational	Slaughter facility & Pig breeding facility site	Check for gutter, downspout, storm lateral pipe, sanitary lateral pipe, drain.  Check for main stormwater catchment drain and drain way to the septic tank and pipe to soakaway pit.	Inspection and desilting drain, septic tank and soakaway pit.	After significant rain events and 6-monthly to remove sediment.	MAL

## 6. ESMP IMPLEMENTATION

132. The environmental and social impact assessment has determined that the renovation works will have minor impacts on the local environment. The SS-ESMP includes: (i) implementation arrangement, mitigating measures to be implemented, and (iii) required monitoring associated with the mitigating measures. It also describes institutional roles and responsibilities in the various phases of the project.

### 6.1. Institutional Arrangement

133. The MOFT is the Project executing agency and MAL is the implementing agency, operating through the SIART PMU which consists of various experts. A summary of the environmental management responsibilities for the Project is presented in Table 9 below.

*Table 9: Summary of environmental management responsibilities in the Project*

<b>Project Implementation Agency</b>	<b>Roles and Responsibility</b>
Ministry of Finance and Treasury (executing agency)	<ul style="list-style-type: none"> <li>• Guide and monitor overall project execution Financial and procurement oversight.</li> <li>• Ensure flow of funds to the implementing agency and the timely availability of counterpart funding.</li> <li>• Review and coordinate bid evaluations (for bigger projects).</li> </ul>
Ministry of Agriculture and Livestock (MAL)	<ul style="list-style-type: none"> <li>• Responsible for overall project implementation and monitoring at the implementing agency level.</li> <li>• Ensure adequate funding available for the PMU.</li> <li>• Submit semi-annual and annual monitoring reports to WB.</li> <li>• Assist in resolving complaints brought through the GRM that have not been resolved at lower levels.</li> <li>• Responsible for operating the KGVF Facility (Slaughter and Pig Breeding facilities) and will be responsible for implementing and monitoring mitigation measures of this management plan during the operation period.</li> <li>• MAL to hire consultant to carry out Water Quality monitoring, environmental and health and safety audit each quarter during the operational stage (TOR for the consultant in annex 10)</li> </ul>
SIART Project Management Unit	<ul style="list-style-type: none"> <li>• Responsible for overall renovation supervision and monitoring E&amp;S compliance monitoring by the contractor.</li> <li>• Responsible for overall project management, implementation and monitoring.</li> <li>• Responsible for supervision of renovation work progress by the contractor.</li> <li>• Responsible for application for a Development Consent (DC) for prescribed developments.</li> <li>• Update the site specific ESMP based on the detailed design and submit to WB for clearance.</li> <li>• Ensure environmental safeguard concerns are incorporated in the detailed engineering design.</li> </ul>

Project Implementation Agency	Roles and Responsibility
	<ul style="list-style-type: none"> <li>• Ensure updated environmental assessments and site specific ESMP and development consent conditions (if any) are integrated into bid documents</li> <li>• Disclose safeguard documents, as appropriate</li> <li>• Conduct awareness and consultations as per the project’s SEP.</li> <li>• Submit semi-annual monitoring report to be embedded in the Project progress report submitted to WB.</li> <li>• Review and clear off contractor’s CESMP.</li> <li>• Evaluate the contractors' overall work schedules relative to the requirements of the approved CEMP.</li> <li>• PMU ESO to provide training for contractors’ environment health and safety officer to ensure they understand the SS-ESMP requirements.</li> <li>• Ensure contractor’s implementation of site specific ESMP/CESMP.</li> <li>• Ensure corrective action requests/instructions to contractor for non - conformances or breaches of the contract or CESMP are undertaken.</li> <li>• Compile project's environmental compliance performance upon completion of the construction activities monthly reports.</li> <li>• Implement the GRM and maintain records of complaints/grievances. Ensure the contractor observes the GRM requirements</li> <li>• Ensure contractor compliance with required resources for mitigation measures as reflected in the CESMP and prepare monitoring reports as required.</li> </ul>
Contractor	<ul style="list-style-type: none"> <li>• Prepare and submit prior to construction the CESMP for review by PMU’s ESO and clearance from WB.</li> <li>• Understand the site specific ESMP requirements and allocate necessary resources (budget and staff) for implementation.</li> <li>• Designate and maintain a full -time Environmental Health and Safety Officer (EHSO) to ensure compliance with all requirements concerning environmental, health and safety, and labour regulations during construction</li> <li>• EHSO also to provide capacity building and training for workers on site specific ESMP requirements as required.</li> <li>• Implement construction activities with the required mitigation measures</li> <li>• Conduct environmental monitoring as required by site specific ESMP and approved CESMP</li> <li>• Act promptly on complaints and grievances concerning the construction activities in accordance with the project’s</li> </ul>

Project Implementation Agency	Roles and Responsibility
	GRM and ensure that the contractor’s GRM register is kept up to date. <ul style="list-style-type: none"> <li>• Submit monthly progress reports on CESMP/site specific ESMP implementation to PMU.</li> </ul>

## 6.2. ESMP Reporting

134. Throughout the renovation period, the SIART PMU Engineer who shall act as the Supervision Engineer will include results of monthly SS-ESMP monitoring, along with the details of any incidents reported by the Contractor, in a monthly report for submission to the SIART Project Manager, MAL Executive and WB Project Support Team. The format of the monthly report shall be agreed with the relevant agencies but is recommended to include the following aspects:
- ✓ Description and results of the SS-ESMP monitoring activities undertaken during the month (this will include results of daily CESMP monitoring by the contractor);
  - ✓ Status of implementation of relevant environmental and social mitigation measures pertaining to the works;
  - ✓ Key environmental problems or social issues encountered and actions taken to rectify problems;
  - ✓ Summary of non-compliance notifications issued to the Contractor during the month, actions taken and non-compliances closed out;
  - ✓ Summary of complaints received, actions taken and complaints closed out;
  - ✓ Key environmental and social issues to be addressed in the coming month;
  - ✓ Training records along with gender and age disaggregated employment statistics;
  - ✓ Health and Safety Indicators;
  - ✓ Summary of consultation / stakeholder engagement undertaken;
  - ✓ Copies of SS-ESMP inspection reports (including LMP requirements);
  - ✓ Summary of reported incidents, actions taken and recommendations for follow up, and;
  - ✓ Before project implementation photos, during project implementation photos, and completion photos of works.
135. The contractor needs to keep a day-to-day record of all happenings in relation to the execution of works. This day-to-day record is to include any environmental events that may arise in the course of the day, including incidents and response, complaints and inspections completed.
136. There are monitoring requirements associated with this SS-ESMP that are applicable once SIART has concluded, and normal operations of the slaughter facility and the pig breeding facility have begun. At this operational stage, there is no safeguard monitoring by the SIART PMU and it is recommended that Safeguards Monitoring be incorporated into existing MAL operational processes and cost. This SS-ESMP should be updated as and when necessary to reflect the SIART environmental and social monitoring and reporting processes before the completion of the project.
137. The SIART PMU is responsible for quarterly progress reports to the WB. This quarterly progress report will include a section on safeguard compliance and issues. This section will cover (as a minimum):
- ✓ The overall compliance with implementation of the SS-ESMP;
  - ✓ Any environmental or social issues arising as a result of project works and how these issues will be remedied or mitigated, and;
  - ✓ OHS performance.

### 6.3. Estimated Budget for ESMP Implementation

138. The costs of implementing the environmental and social management and impact mitigation measures listed in the SS-ESMP matrix are included in the design costs, construction contracts and operational budgets. Final budget allocations for Environmental and Social Safeguards items in the SS-ESMP have been determined by the PMU Engineer in collaboration with the Environment and Social Safeguards Officers. The total cost for preparation and implementing environmental and social risks management during construction period is SBD\$60,000. This cost is added to contractor's BOQ to implement and establish the works such as induction training for contractor (environment, health & safety), preparation and implementation of CESMP, and Environmental monitoring costs during construction that include air quality monitoring, noise and vibrations monitoring to ensure compliance, Health (first aids kit) and safety (install: construction signboard, banner, etc. (provisional quantities), Safety for staffs (Protective Helmet, Safety Hand Gloves, Reflective Safety Vest Safe Strap, and Construction Boots. This is a small project and all workers are expected to live in Honiara and travel to the site for work. Safe drinking water and toilets to be provided by the contractor. The estimated cost for E&S risks management during operational period is SBD\$40,000 per quarter. Table 10 below shows the different activities at different phases and who is responsible to budget the cost.

Table 10: Budget Table for the implementation of the ESMP

Project Stage	Activity	Cost	Responsibility	Status
Design Stage	Desludging septic and desilting drains	Design cost	PMU	Complete
	Designing of new soakaway pit	Design cost	PMU	Complete
Pre-Construction Stage	Preparation of ESMP	Project operational cost	PMU	Complete
	ESMP disclosure	Project operational cost	PMU	Not yet
Construction Stage	Induction training for contractor (environment, health & safety)	Included in construction cost	PMU	Not yet
	Preparation and implementation of CESMP and environmental monitoring	CESMP preparation - <b>SBD\$20,000</b>	Contractor	Not yet
		CESMP Monitoring - <b>SBD\$20,000</b>	Contractor	Not yet
		CESMP Implementation (mitigation cost) - To be quoted by contractor as it is part of construction cost.	Contractor	Not yet
	Training & Capacity Building	Project Construction/Operational Cost ( <b>SBD\$20,000</b> )	Contractor & PMU	Not yet
	Rehabilitating/improvement works on current septic tank & new soakaway pit	Included in construction cost	Contractor/PMU	Not yet
Operational Stage	First Aid	Ministerial operational cost	MAL/Private Investor	Not yet
	Office sustainability (e.g., maintenance)	Ministerial operational cost	MAL/Private Investor	Not yet
	E&S risk management Monitoring and Reporting (Quarterly)	Ministerial operational cost for hiring E&S Consultant ( <b>SBD\$20,000 per quarter</b> )	MAL/Private Investor	Not yet

	Environmental, Health, and Safety Monitoring, Risk Management and Trainings (such as for water sampling and other E&S risk management costs and health and safety training)	Ministerial operational cost (SBD\$20,000 per quarter)	MAL/Private Investor	Not yet
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6.4. Stakeholder Engagement Plan

139. The SIART Stakeholder Engagement Plan (SEP) will be implemented for the renovation activity. Stakeholder engagement will be ongoing for the duration of the project. Throughout the implementation of these works, ongoing and meaningful stakeholder engagement will be critical to the review of detailed designs, the selection of mitigation options for identified social and environmental impacts and the prioritisation of investments for funding and implementation scheduling. It is important that the affected communities including women and vulnerable groups are made aware about the proposed development. It shall be the role of the Social Safeguards Officer (SSO) to liaise with contractor’s ESO to carry out such consultations. SIART PMU will be responsible for ensuring meaningful consultations be carried out throughout all stages of the project. The SEP implementation include the project GRM processes, ensures that information about the GRM is effectively shared including focal points, and grievance redress remains an ongoing process throughout the project lifecycle.

6.4.1. Key outcome of MAL-SIART Collaboration to Date

140. The initial site visit for the KGVI facility renovation by the MAL and SIART project teams was conducted on-site on August 10, 2023. During this visit, a team from the MAL Management and the Solomon Islands Agriculture and Rural Transformation (SIART) project reviewed the site and discussed the importance of reviving the slaughter facility. This initial consultation also involved initial screening for potential environmental and social risks associated with the project. Following this, on 5<sup>th</sup> April 2024, officers from the Project Management Unit (PMU) conducted a follow-up visit to further assess the site and its conditions.

141. A more recent visit occurred on 5<sup>th</sup> July 2024, when a team including World Bank Environmental and Social Safeguards Specialists visited the KGVI slaughterhouse, pig breeding site, and the research headquarters. Officers managing these facilities and staff from the research headquarters were engaged in discussions about the proposed works. They expressed strong support for the plan to revive the operation of the KGVI facility, emphasizing the importance of producing pork locally and highlighting the long-overdue need for the facility’s restoration. This series of consultations provided essential insights and reinforced the commitment to moving forward with the project.

6.4.2. Key outcomes of other Stakeholders Consulted

142. Several key stakeholders (Table 11) located in close proximity to the project site were consulted on 4<sup>th</sup> and 5<sup>th</sup> September 2024 regarding the proposed redevelopment of the KGVI slaughter and pig breeding facilities, given their proximity to the project site. During these consultations, positive and negative impacts of the project were discussed with the community. There was overwhelming support for the redevelopment, as many recognized the benefits of reviving the facility. However, concerns were raised regarding the safety of school children at the nearby Perch School, especially considering the location of the school adjacent to the project’s entrance. Additionally, concerns about potential dust and noise during the renovation works were highlighted.

143. In response to these concerns, stakeholders were informed that mitigation measures would be

implemented by the contractor. These measures would specifically address safety, ensuring minimal disruption to the school and the surrounding community, as well as reducing dust and noise during the construction phase. This engagement helped ensure that the project was aligned with the community's interests while addressing potential negative impacts. Detail consultation report in appendix 9.

Table 11: Consultation Stakeholders

Location	Name	Description	Contact	Remarks
1	Perch Christian School	Few meters away from the KGVI stream, very close to the main highway, situated between Tongs Company and SIFF Academy	School Principal Contact (phone): 24257/24889/7514394	Exposed to effects of past projects, eg; Construction of current SIFF Academy which generated dust, noise and posed safety issues to the school and especially little children
2	SIFF Academy	Adjacent to the venue for the slaughter house facility	Contact Admin Officer: Alison Ramo, phone: 44166	SIFF already aware of the proposed project for the slaughter facility through a meeting with MAL few months ago
3	Tongs Corporation	A big fenced area not far from the slaughter house location at KGVI farm,	Contact Admin Officer: Margie Galo Phone: 38159	Support the consultation process in informing them about the proposed project
4	Lee Kwo Kin downstream residential area	Situated by the stream, retain wall erected to protect the homes	Contact Resident Waga, phone: 7728366	The whole residential area is highly exposed to impacts of the facility, support the consultation process
5	KGVI market & farm (residential area)	Opposite the facility, separated by the SIFF academy soccer field	Contact Lorina Taebo Phone: 7135919	Support the reviving of the project
6	Small town farming area	Within Burns Creek community	Contact: Paul Damari Phone: 7479528	A farmer who strongly supports the project
7	Burns Creek Health Center (Clinic)	Within Burns Creek Community	Contact: Elizabeth Liame (7215084)	Keen to know more about the project
8	Mosquito community	Within Burns Creek Community	Contact: Allen Idu 7642546	A youth leader who also support the Slaughter House project on behalf of their piggery farmers

9	Revival Church Compound	Part of Burns Creek Community	Contact: Fanly Robsin 7774375	A farmer who also engages in piggery farming
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144. As a World Bank requirement, the SIART project’s PMU will ensure that public consultation and disclosure of information communication is carried out to ensure that the public are fully aware of the proposed works. Consultations include potential impacts and mitigation measures, and all other aspects of the project including the renovations works to aware the nearby residents and business houses of the proposed activity. Consultation included raising awareness of the project construction GRM, how to raise complain and how complaints are managed. In all instances, consultations are designed to ensure that all project stakeholders of the affected communities or affected persons/parties are fully informed of project activities with the aim to maintain the broad community support for the project. The Table below provides a generic consultation Plan for this project.

Table 12: Indicative Consultation Plan

No.	Consultation activity	Targeted audience	Responsibility
<b>Pre-construction Stage</b>			
1	Consultation on proposed project	MAL executive and relevant officers	PMU
2	Consultation on preparation of ESMP	Heads of Departments of the MAL MAL Research and Livestock officers working on-site.	Environmental and Social Safeguards officers
3	Initial awareness/consultation for surrounding communities, business houses, offices and school	communities, business houses, offices and schools	(ESO) and Social Safeguards Officer (SSO)
4	ESMP disclosure	Relevant line Ministries, nearby communities, Business houses	Environment Safeguards officer (ESO) and Social Safeguards Officer (SSO)
<b>Construction Stage</b>			
4	Community/public awareness-health and safety	Communities within 300 meters safety radius, businesses, Schools, SIFF offices	Social Safeguards officers
5	Induction training (CESMP, community health & safety, safety at work, community protocol and governance	Contractor workers	Environmental and Social Safeguards officers
6	HIV/AIDS/STI awareness, SEA/SH, CAE, GBV	Contractor workers and relevant communities within 300 meters safety radius	Social Safeguards officers
7	Grievance Redress Mechanism	Contractor workers, and	Social Safeguards officer

		community members.	
<b>Operation Stage</b>			
8	Sustainability awareness	MAL officers, MAL management	MAL Executive

145. It is a requirement that this SS-ESMP will be publicly disclosed by the Ministry of Agriculture and Livestock (MAL) as the agency responsible for project preparation, and on the SIART project page hosted at the Ministry of Agriculture and Livestock (MAL) website. Once this is done, copy of the link will be forwarded to the World Bank who will also publicize the document in the World Bank Website. The Environment and Conservation Division (ECD) of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) is the responsible authority to publicly disclose all environmental and social reports in the country. A copy of the ESMP will be submitted to the Director of Environment and Conservation Division.

146. A public flyer and/or radio advert will alert the public to the disclosure of the instrument. Likewise, the SIART PMU will ensure that several copies of all prepared safeguard instruments are available at the MAL Extension Department Office in Honiara and easily accessible to affected groups and local Non-Governmental Organisations (NGOs).

6.4.3. Disclosure of the ESMP

147. The Environmental and Social Management Plan (ESMP) was disclosed during a consultation meeting held on 19<sup>th</sup> December 2024. Key stakeholders, including community representatives, government officials, and project partners, were invited to participate in the meeting (Figure 6-1). The Environmental Safeguards Officer facilitated the session, delivering a comprehensive presentation that outlined all chapters of the ESMP. This ensured that all participants were well-informed about the project's environmental and social safeguards and the measures to address potential risks and impacts. The consultation was positively received, with attendees expressing appreciation for the revival of the slaughter facility, which had been dormant for several years. Participants acknowledged the facility's potential to generate significant economic benefits by improving revenue streams for farmers and contributing to the country's economy.

148. During the consultation, several key concerns were raised by stakeholders. A representative from Perch Integrated School highlighted the need for service and dump trucks transporting materials to the worksite to adhere to safety measures. Specific recommendations included reducing vehicle speeds near the school to minimize dust, noise, and risks to students, particularly those in primary classes. Another issue raised involved the importance of worker induction programs. Stakeholders emphasized the need for contractors and workers to undergo training on construction protocols, including adherence to safety measures and respect for local community norms. These measures were deemed essential to maintaining harmony with the community and ensuring the safety of residents and school children during project implementation.

149. The feedback and concerns shared during the consultation have been documented (refer to Appendix 10 for the Minutes of Meeting) and will be incorporated into the implementation and monitoring phases of the ESMP to ensure effective management of environmental and social impacts.



Figure 6-1: Participants during the disclosure consultation meeting

## 6.5. Grievance Redress Mechanism (GRM)

### 6.5.1. Purpose

The purpose of the Grievance Redress Mechanism (GRM) is to address and record any complaint that may arise during the implementation of the SI ART Project. GRM works within the existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the community and project level. This GRM is prepared in accordance to the Environmental and Social Framework (ESF). It shall be the role of the PMU Social Safeguards Officer to manage the GRM Register where all grievances are recorded (Flow chart in Figure 6-3). It is to be noted that a workers' grievance mechanism (GM) is required under the LMP for all project workers including the contractor. The workers GM is separate from the project GM which is outlined under this section.

### 6.5.2. Objectives

150. The key objectives of the GRM are:

- ✓ To address complaints and grievances through consultation with all stakeholders including inform stakeholders of the solutions.
- ✓ Ensure transparency and accountability throughout the implementation of project amongst relevant stakeholders including project beneficiaries.
- ✓ Record, categorize and prioritize the grievances.
- ✓ To promote relations between the project implementers, executors and beneficiaries.

### 6.5.3. Fundamental Principles

151. The design of the GRM employed the following fundamental principle:

- **Openness and transparency** – The Project will record all complaints submitted, including their

outcomes and details of time taken to consider and resolve the complaints. A regularly updated summary of this record will be posted on the project website. The project will take all complaints and view them as opportunities for project improvement.

- **Fairness** – All grievances will be accepted as submitted in good faith and will be assessed on their merits without regard to the complainant's identity or status. All complaints will be evaluated objectively in relation to relevant regulations and operational guidelines of the ART project. Where applicable, the standards of the World Bank's ESF will be applied to the resolution of grievances.
- **Accessibility** – The Project will make every effort to ensure that all project-affected persons and other stakeholders have access to the GRM. To this end, the GRM will accept grievances submitted verbally, in writing, by any suitable means of communication. Complaints may be made by or on behalf of an individual, an organization, or an institution such as media.
- **Responsiveness and effectiveness** – The Project will endeavor to process and respond to all grievances in a timely and effective manner. Receipts of all submissions will be acknowledged within 5 working days. Consideration of valid complaints by the GRM will occur within 30 working days, giving time for collecting and examining evidence if required. Additional time may be required for negotiation with aggrieved parties, but the resolution should not exceed 45 working days.
- **Anonymity and confidentiality** – Individuals or institutions submitting complaints may request anonymity, in which case their names will not be made public. Confidentiality will also be observed during the period when the GRM is considering a case (e.g., the source and any person, contractors, or entity accused of wrongdoing should be protected).

#### 6.5.4. Community

152. Local communities in the Solomon Islands have existing traditional and cultural ways of resolving issues. It is expected that some disputes at the community level will be resolved using these mechanisms, without the involvement of the contractor(s), and or Government representatives at local and national level.

#### 6.5.5. Awareness

153. The GRM will be publicized among stakeholder group such as affected communities, government agencies and civil society organizations. Signs must be erected at the sites of all works providing the public with updated project information and summarizing the GRM process, including contact details of the PMU Social Safeguards officer (who is the PMU GRM focal person). 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 inhibit the lodgement of a complaint. The PMU Social Safeguard officer who will log the details, will maintain the Complaints and Grievance Register. This information will be included in PMU progress reports to the World Bank.

#### 6.5.6. GBV/SEA/SH

154. The risk of Sexual Exploitation and Abuse/Sexual Harassment is considered low for the project as the scale of work is small and would only be requiring local contractor with a relatively small workforce to construct the infrastructure. The contractor however still needs to ensure that any SEA/SH related grievances are handled by qualified trained professionals who can ensure adherence to anonymity and sensitivity

requirements associated with such grievances. If the contractor doesn't have the required capacity/personal certified to handle these types of grievances, they will refer it to GBV/SEA/SH service providers in Honiara such as Seif Ples, Family Support Center and Christian Care Center for further processing/action and care.

#### 6.5.7. Step-by-Step Procedure for Managing Complaints During Construction

155. The following are the general step by step procedure for receiving and managing complaints during construction. This will be adjusted suitable to the context of the works and the location of the subproject site. Other layers of focal points can be added as necessary. The PMU will provide approval to the GRM processes that the contractor will be implementing.

##### **Step 1: Notification of Complaints Directly to the Contractor**

- **Contractor's on-site Engineer's Decision:** The contractor's on-site Engineer or site supervisor will receive, record and ensure the complaints are resolved as possible include limitation of noise, suppression of dust and other construction works related complaints.
- **Communication:** The actions carried out by the contractor to resolve the complaint will be communicated back to the complainant within seven days.

##### **Step 2: Forwarding to MAL Provincial Office:**

- **Complicated complaints:** For grievances that that are beyond the contractor's capacity to resolved, the contractor's on-site Engineer will escalate the unresolved complaint through the necessary MAL provincial office GRM focal points to be resolved at the provincial level by the Chief Field Officer (CFO).

##### **Step 3: PMU Environment and Social Safeguards officers:**

- Serious issues that cannot be resolved by CFO should be promptly referred to SIART PMU Environment and Social Safeguards officers who will within 10 working days to resolve the matter.
- General public can bring serious claims and issues relating to the project to PMU Social Safeguards officer (PMU GRM focal person). If the complainant still disagrees with the Environment and Social Safeguards Officers' effort to solve the grievance the PMU Environment and Social Safeguard officers will develop a brief report accompanied by relevant grievance documents of that matter to be forwarded to the PMU Project Manager.

##### **Step 4: PMU Project Manager:**

- The Project Manager will deliberate on the brief report and the accompanied grievance documents sent to him/her by the PMU Environment and Social Safeguards Officers and may opt to consult with them if deemed necessary. A resolution will then be reached and communicated back to the aggrieved person. The project manager has 10 working days to resolve the matter. If the issue cannot be resolved or resolution is not accepted by the complainant, the project manager with the support of the Environment and Social Safeguards Officers will develop and inform the PS on a Plan of Action (PoA) to be taken.

##### **Step 5: MAL Permanent Secretary:**

- The PS MAL is required to address the concern within 1 month. The PMU SS officer will draft a revised PoA to resolve the issue based on the PS MAL 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. The CFO will be advised to communicate and

update the complainant relating to the resolution of the grievance. If the resolution at this stage is not accepted by the complainant, the PS MAL will forward his decision together with a PoA to World Bank Office in Honiara for further deliberation.

**Step 6: Appeals Process**

- **Informing the AP:** If the complaint is dismissed, the AP is informed of their rights to escalate the issue to the relevant courts of the country.
- **Copy of Decision:** If it is a complaint in relation to environmental impacts, a copy of the decision is sent to the Environmental Compliance Unit of the Environment and Conservation Division (ECD) within the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM).

6.6. GRM During Operation

156. The complaint will be referred directly to the PS of MAL through writing or by email. The PS of MAL will assign relevant officer (s) to deal with such complaints. During operation, the same conditions apply; i.e., there would be no fees attached to the AP for making a complaint, the complainant is free to make the complaint which will be treated in a transparent manner and the AP will not be subject to retribution for making the complaint.

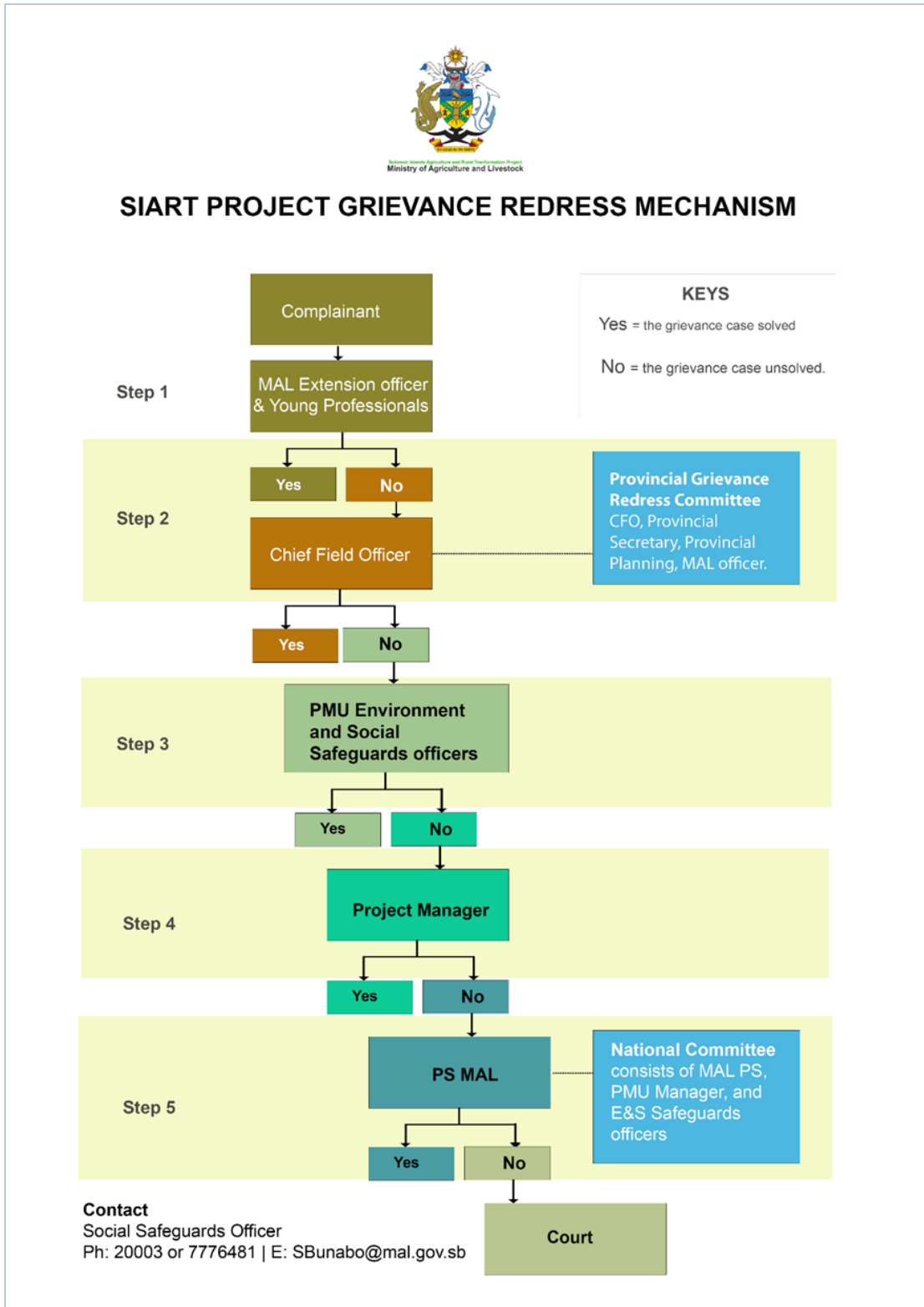
6.7. Record or Register of Feedback and Complaints

157. The contractor will maintain a GRM register at the site office. However, the main project GRM register is kept in Microsoft Excel in the SIART PMU and managed by the Social Safeguards Officer (SSO). See example of template below (Figure 6-2).

Figure 6-2: Example of the GRM Register kept at the SIART PMU

SIART PROJECT GRIEVANCE REDRESS MECHANISM (GRM) LOG REGISTRY [2022 - 2026]														
m		STEP 2 - DETAILS OF COMPLAINT					STEP 3 - ASSESSING & TAKING PROPOSED ACTIONS				STEP 4 - RESOLVING & CLOSURE OF COMPLAINT			
Complaint ntry	Date received	Mode of receipt (letter/walk-in/email/mobile/PMU landline phone/verbal/suggestion box/ Facebook	Name of complainant/ request anonymity (RA)	Type	Date complaint received by Provincial Project Team (PPT) - CFO/ECs/YPs & ABPOs/CRPs/CAC reps	Date complaint received by National Office - PMU/PM/PS/MAL	Details of complaint (name of ABPO/contractor/community/public/ description of issue (what, who, when, where, how)	Name of persons involved in trying to solve the problem (eg; a community leader)	Action planned taken to address the matter	Was the problem solved? (Yes/No)	If no, when was the problem referred to the next level? (Referral) What happened? Note: NA = Not Applicable	Date to discuss resolving the matter (who/where) & what actions were taken (eg; consultations, meetings etc)	the final outcome/how long it takes to resolve the particular issue	Date the complaint was closed

Figure 6-3: GRM Flow Chart



## 6.8. Workers Grievance Mechanism

158. As required by the Project's Labour Management Procedure, a worker's grievance mechanism (GM) is necessary for this subproject to cater for contractor workers and service providers such as surveyors' complaints. The procedure for handling the workers grievance is outlined under Table 4 of the LMP. During the development of the CESMP, the contractor will adopt this GM and develop clear processes including focal points before disclosure to ensure that the GM is accessible by all workers without the any fear of reprisal. This GM will be subjected to the approval of the PMU ES.

## 7.0. Analysis of Alternatives

159. This section outlines the alternatives considered for the location, technology, and operational approaches for the project, highlighting the rationale for selecting the proposed development.

### 7.1. Alternative Locations

160. The KGVI site was selected as the most suitable location for the proposed project for several compelling reasons:

- **Existing Infrastructure:** The site already houses a slaughter facility, piggery, and research office, which align with the project's objectives and reduce the need for new construction.
- **Land Ownership:** The land is owned by the Solomon Islands Government, eliminating potential issues related to land acquisition or tenure disputes.
- **Centralized Operations:** Consolidating activities in one location enhances efficiency and minimizes logistical challenges compared to establishing a new site.

161. An analysis of potential alternative sites revealed that no other location could provide the same level of infrastructure readiness, land security, and operational synergy as KGVI.

### 7.2. Alternative Technologies

162. This section evaluates alternative waste treatment technologies, including septic tank and anaerobic digester, proposed for this subproject. To assess these options effectively, advanced and more costly technologies are also reviewed to highlight trade-offs in efficiency, scalability, and environmental benefits, even if they exceed the budget. Below are the evaluated technologies:

#### 1. Anaerobic Digester (Existing System)

- **Advantages:**
  - Processes high-strength waste efficiently, reducing solid waste volume and producing biogas.
  - Can be upgraded to improve efficiency with minimal cost compared to installing new systems.
- **Disadvantages:**
  - Requires skilled maintenance and periodic sludge removal.

#### 2. Septic Tank

- **Advantages:**
  - Simple design, low installation cost, and easy maintenance.
  - Suitable for the small land area with additional treatment stage being a soakaway pit.
- **Disadvantages:**
  - Ineffective for treating high-strength waste from slaughter operations without additional treatment stages.

### 3. Membrane Bioreactors (MBR)

**Description:** MBRs combine biological treatment with membrane filtration, offering superior effluent quality by removing fine particles, pathogens, and organic matter.

**Advantages:**

- High-quality effluent suitable for reuse in agriculture or landscaping.
- Compact footprint compared to conventional treatment plants.
- High removal efficiency of BOD, TSS, and pathogens.

**Disadvantages:**

- High capital and operational costs.
- Requires skilled personnel for operation and maintenance.
- Sensitive to changes in influent characteristics.

**Cost:** Typically, 2-3 times more expensive than anaerobic digesters.

**Relevance:** MBRs are ideal for high-demand areas or facilities requiring stringent effluent standards, but their cost makes them challenging for small-scale projects.

### 4. Sequencing Batch Reactors (SBR)

**Description:** SBRs treat wastewater in a series of batch processes, including aeration, settling, and decanting, within the same tank.

**Advantages:**

- Efficient nitrogen and phosphorus removal.
- Flexible operation for varying waste volumes.
- Lower land requirements than traditional activated sludge systems.

**Disadvantages:**

- Higher energy consumption than anaerobic digesters or septic tanks.
- Relatively complex operation and maintenance.
- Requires trained operators for optimal performance.

**Cost:** Higher than septic tanks and digesters due to energy use and complexity.

**Relevance:** Suitable for large-scale applications, especially where nutrient removal is a priority.

### 5. Constructed Wetlands

**Description:** These engineered systems use natural processes involving vegetation, soil, and microbial activity to treat wastewater.

**Advantages:**

- Low energy and operational costs.
- Environmentally friendly and visually appealing.
- Long lifespan with proper maintenance.

**Disadvantages:**

- Requires a large area of land.
- Limited treatment efficiency for high-strength waste.
- Performance can vary with climate and season.

**Cost:** Higher initial setup costs due to land requirements but lower ongoing expenses.

**Relevance:** Best for rural areas with sufficient land availability, but less effective for small, urban-confined sites like KGVl.

163. Based on this analysis, the septic tank and anaerobic digester are the most suitable choices for the KGVl facility as they already exist on-site, significantly reducing capital investment. Rehabilitation and upgrading these systems would be far more cost-effective than constructing new, advanced waste treatment technologies, which would require higher upfront costs and specialized maintenance. This approach aligns with the budget constraints while meeting the facility's waste management needs effectively.

### 7.3. The "No-Project" Alternative

164. The "no-project" scenario would maintain the current status quo, leaving existing facilities in their deteriorated state without improvement. This alternative would:

- Deny farmers the opportunity to improve their livelihoods and standards of living.
- Limit the quality and quantity of meat production, affecting the potential for economic growth in the sector.
- Prevent the realization of benefits associated with the renovated facilities, such as enhanced productivity and improved operational efficiency.

165. Given the significant socioeconomic and operational advantages, the "no-project" alternative is not a viable option.

### 7.4. Rationale for Selecting the Proposed Project

The proposed project was selected due to its potential to:

- Upgrade and utilize existing facilities at KGVl effectively.
- Enhance local capacity through skills transfer and employment.
- Improve livelihoods, agricultural productivity, and meat quality for local farmers.
- Minimize environmental impacts through sustainable construction and maintenance practices.

166. The benefits of renovating and operating the facilities far outweigh the potential negative

impacts, ensuring the project's alignment with both community development and sustainability goals.

## 8.0. CONCLUSION

167. The establishment and operation of the slaughter and pig breeding facility is crucial for promoting food security, economic growth, and sustainable agriculture. These facilities will provide a reliable source of high-quality meat products, reducing reliance on imports and enhancing local food supply. By improving livestock breeding practices and ensuring humane and efficient slaughter processes, the facility supports animal welfare and biosecurity measures. Additionally, it creates employment opportunities, boosts local incomes, and contributes to the development of related industries, fostering overall economic resilience and growth in the country.
168. In addition, improvements on the research office headquarters is essential for enhancing agricultural productivity, ensuring food security, and promoting sustainable farming practices. This headquarters will serve as a central hub for developing innovative agricultural techniques, conducting vital research on local crops and livestock, and disseminating best practices to farmers. By supporting data-driven decision-making and policy formulation, the office will strengthen the agricultural sector, boost rural livelihoods, and contribute to the overall economic development and environmental sustainability of the Solomon Islands.
169. The environmental and social screening process has identified and addressed the minor nature of the environmental and social issues of the proposed project. There are no significant negative environmental and social impacts or risks that cannot be mitigated or managed. All the impacts are expected to be minor, site-specific and temporary and can be readily mitigated by practical mitigation measures identified in this SS-ESMP. The contractor will need to prepare a CESMP based on this SS-ESMP. Monitoring and reporting of the approved CESMP ensured that the project will be implemented in an environmentally acceptable manner. It shall be the role of the PMU's Social Safeguards Officer to undertake consultation prior to construction and will do so during the renovation period in collaboration with the contractor's construction supervisor or the contractor's Environmental, Health and Safety Officer.

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Solomon Islands Agriculture Sector Growth and Investment Plan (2021 – 2030).

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World Bank Environmental and Social Framework 2018. The World Bank Group.

APPENDICES

## APPENDIX 1 RISK ASSESSMENT CHECKLISTS

### A- IMPACT SCREENING FOR SLAUGHTER FACILITY

Date: 27<sup>th</sup> May 2024

Screened by: Steve Sae

#### IMPACTS SCREENING FORM

Prepared and Checked/Verified by the Environmental Safeguards Consultant: Steve Sae

**Sub-project name and a brief description:** King George PIG Slaughter Facility

- The site has an approximate area of 0.5 Ha and is located on an existing MAL land at King Geroge area, formerly known as Taiwanese farm. There is an existing infrastructure (former TTM Livestock Slaughter Facility) in the area that needs to be renovated and improved to meet the standard to support farmers during the PG23.
- There is no need of land acquisition and resettlement as the land is owned by MAL.
- There is no presence of species of significant conservation values in the area.
- The habitat is highly modified and degraded of its original state due to years of anthropogenic interference (developmental activities).
- There is no waterway and no sighting of sink-holes at the site and nearby.
- There is good drainage at the site which needs to be further improved.

**Location of Facility and Province:** King George, West Honiara, Guadalcanal Island.



**Fig 1: Location of the slaughter facility- former TTM farm.**



**Fig 2: Existing infrastructure of the Slaughter facility**



Fig 3: Interior part of the slaughterhouse.



Fig 4: Overview of the site.

Subject	Screening Questions	Yes	No	Note/Comment (column to be completed with additional information where the response to a screening question is yes)
<b>CONSTRUCTION PHASE</b>				
	<i>Will the subproject:</i>			<b>(guidance are given below)</b>
1. Vegetation cover, trees, insects, animal	Remove vegetation cover, cut down trees for timber or site clearance?		No	<i>There is no rare plant species or forest in the area, hence no trees for timber. The site has development footprint (existing infrastructure for livestock slaughtering which have since been dormant).</i>
	Affect cropland with waste and wastewater?		No	<i>There is no cropland in the area</i>
	Disturb wildlife, insects such as snakes?		No	<i>There is no crucial wildlife in the area. The area can be characterized as having a built-environment (modified habitat).</i>
2. natural resources	Be located near forest or least disturbed /nature reserve area?		No	<i>No forest area nearby and the site has a highly modified habitat.</i>
3. Landscape	Cause significant changes to, or negatively affect the landscape of the area?		No	<i>The site has existing infrastructure that only needs renovation. There will be no significant changes to landscape.</i>
4.Solid waste	Generate solid waste such as excavated soil, unused materials		No	<i>The sub-project will not generate solid waste such as excavated soil, unused material like overburdens. The renovation will not involve excavation works.</i>
5. Hazardous wastes	Generate hazardous waste such as batteries, unused paints, oil, lubricant	Yes		<i>Some hazardous materials will be used during renovation of</i>

	etc.			<i>the slaughter facility such as paints and lubricants. However, there will be a Hazardous Waste Material Management Plan that will be in place to provide procedure on how to properly manage and dispose off hazardous waste.</i>
6.Wastewater	Generate wastewater from the site?  e.g. lubricant etc.	Yes		<i>There is potential for wastewater emanating from the renovation work. However, this will be properly controlled with existing drainage which will also be further improved to trap the waste water and disposed-off correctly. A Waste Management Plan will be in place with practical measures to manage or mitigate potential impacts e.g., wastewater.</i>
7.Dust and smoke	Cause increased dust level at the site, or generate smoke		No	<i>The sub-project will not cause increased dust level.  No smoke is expected to be generated from this sub-project.</i>
8.Noise and vibration	Generate high noise and vibration		No	<i>Noise level for the proposed renovation work can be rated at low to medium. While vibration can be rated negligible to low.</i>
9. Erosion risks	Disturb slopes?		No	<i>There is no slope at the site. This is a flat area.</i>
10. Water quality	Cause water pollution by construction waste and materials loaded at the construction site		No	<i>There are no waterways at the site and no existence of sink holes.</i>

11. Local flooding	Increase localised flooding risk by temporary/permanent loading of construction materials/wastes		No	<i>The sub-project does not pose any flooding risk due to lack of presence of surface water at the site.</i>
12. Water quantity	a. Withdraw groundwater in a coastal area that may lead to the risk of salinity intrusion		No	<i>For the renovation work, it will not in any way involve withdrawing of groundwater.</i>
	b. Extract or use a large amount of water in local river/streams may cause shortage to water supply to other users in the locality?		No	<i>For this sub-project, it will not involve extracting or use any water from rivers or streams.</i>
13. Social disturbance	a. Disrupt local traffic/ transportation/ pedestrian traffic		No	<i>The subproject will not disrupt local traffic/transportation or pedestrian traffic.</i>
	b. Disrupt the operation of local water supply system		No	<i>The operation of local water supply system is controlled by the Solomon Water Authority and this sub-project will not in any way disrupt the operation of local water supply system.</i>
	c. Disrupt the operation of local irrigation system		No	<i>The subproject will only involve renovation works to existing infrastructure. There is no irrigation system in the area.</i>
	d. Disrupt the operation of local drainage system		No	<i>The facility has its own drainage system which is well defined and will only require some improvement works to become fully operational.</i>
	e. Disrupt local farming activities		No	<i>There is no existence of local farming activities within or nearby the sub-project site</i>
	f. Disrupt community meetings/social events		No	<i>The subproject will not disrupt community meetings or social events as the site is away from any meeting or social events halls such as the church halls etc.</i>

	g. Affect community security?		No	The subproject will not affect community security.
14. Safety to community	Cause safety risk to the community		No	<i>The construction work will not pose safety risk to the community as currently, the site fully fenced. During the renovation works MAL security officers will man the work site to ensure any person who wanders to the site will be deterred. There will be no unauthorized entry to the work site.</i>
15. Public health	Cause concerns on public health/ sanitation /hygiene in the local community		No	<i>The renovation of the facility will not cause any concern on public health in the vicinity of the construction site. A toilet shall be provided for conveniency of the workers.</i>
16. Worker's health & safety	Cause workers health and safety concerns		No	<i>All workers will be supplied with full PPE and will be provided with food and water for drinking.</i>
17. PCR	Impact cultural sites such as church, historical site, graveyard, etc.		No	<i>The site is devoid of any cultural sites such as church, tambu site or graveyard. It is a land owned by the government.</i>
18. Community support	Does the project enjoy broad community support?	Yes		<i>Consultation has been underway amongst stakeholders in order to see this sub-project implemented.</i>
19. Sustainability	Does the community have a plan for the management and maintenance of assets after implementation?	NA		<i>This is not a community project but a national project which is fully supported by the government. MAL is currently discussing with two potential business entities who will be interested in leasing the facility.</i>

20. Land acquisition	Does the subproject involve voluntary land acquisition		NO	<i>The land is owned by the government.</i>
Others:		NA		
<b>OPERATION PHASE</b>				
	<i>Will the subproject:</i>			
1. Water/soil pollution	Generate wastewater from the site? e.g. slaughterhouse wastewater, fertilizer runoff etc.	Yes		Wastewater will be generated during the operation phase especially from the slaughter house. The wastewater from the slaughterhouse usually contains various and high amounts of organic matter (e.g., proteins, blood, fat and lard). However, proper drainage will be in place to trap and treat wastewater before discharge.
2. Waste	Generate solid waste e.g. slaughterhouse waste	Yes		Wastes that will be produced from the slaughter facility include; organs, fat or lard, skin, feet, abdominal and intestinal contents, bone, blood and meat trimmings.  These slaughterhouse waste can be recycled.  Wastewater from the slaughter facility should be stored in a treatment pond and treated before discharged.
3. Nuisance noise, odour	Result in noise or odour impacts to nearby receivers (houses, schools, community facilities etc.)		No	Hygiene is number one priority of operating the slaughter facility. Noise and odour risks are low. Even if they occur, the impact will be low as well.
4. unhygienic conditions, public health risks			No	The slaughter facility will uphold international standards for slaughterhouse operation. It will follow the Australian Standard for the hygienic

				production and transportation of meat and meat products for human consumption, AS 4696:2007. Also, there is an international standard known as ISO 23781:2021 Operating procedures of pig slaughtering which is also valuable for the operation of the slaughter facility.
5. Worker's health & safety	Require training and health and safety management for workers to allow for safe operation	Yes		Workers need to be trained on managing simple but important risks such as slipping, tripping, falling, ergonomic risk, indoor air pollution, fire safety, workplace health and safety/OHS
6. visual impacts			No	The site is a former slaughter facility sight and only small renovation works will be required to ensure the facility is operational. Hence, no visual impacts.
7. Conflict with downstream water users?			No	No waterways in the area or nearby
8. Others				NA

Conclusion: Based on the above screening preparation of the below ESF documents/instruments is recommended:

- ECOP (in the ESMF) (Solomon Islands & WB)

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- ESIA/ESMP (Solomon Islands/WB)
- [Site Specific ESMP is recommended for this project](#)
- Full EIA incorporating ESMP (Solomon Islands)

- Waste or Wastewater Management Plan

[A site-specific Solid and Liquid Waste Management Plan will be required. This will be prepared by the facility operator with the support of MAL/PMU.](#)

- Land Commitment Letter (in the ESMF)

## B. IMPACT SCREENING FOR PIG BREEDING FACILITY

IMPACTS SCREENING FORM				
Filled in by MAL Officer: <b>Martin Jaiki</b>				
Checked and verified by the Environment Consultant: <b>Steve Sae</b>				
<b>project name and a brief description: Upgrade of Pig Breeding Facility</b>				
<b>Location and Province: KGVI, Burnscreek Area, Honiara.</b>				
Subject	Screening Questions	Yes	No	Note/Comment (column to be completed with additional information where the response to a screening question is yes)
CONSTRUCTION PHASE				
	<i>Will the subproject:</i>			<b>(guidance are given below)</b>
1. Vegetation cover, trees, insects, animal	Remove vegetation cover, cut down trees for timber or site clearance?		X	<i>Built environment</i>
	Affect cropland with waste and wastewater?		X	<i>Built environment</i>
	Disturb wildlife, insects such as snakes?		X	<i>Built environment</i>
2. natural resources	Be located near forest or least disturbed /nature reserve area?		X	<i>Built environment</i>

3. Landscape	Cause significant changes to, or negatively affect the landscape of the area?		X	<i>Built environment</i>
4. Solid waste	Generate solid waste such as excavated soil, unused materials	X		<i>There could be timber cut-offs or glasses remains etc</i>
5. Hazardous wastes	Generate hazardous waste such as batteries, unused paints, oil, lubricant etc.	X		<i>There could be unused paint at the site during renovation works</i>
6. Wastewater	Generate wastewater from the site?		X	
	e.g. lubricant etc.		X	
7. Dust and smoke	Cause increased dust level at the site, or generate smoke		X	
8. Noise and vibration	Generate high noise and vibration		X	
9. Erosion risks	Disturb slopes?		X	
10. Water quality	Cause water pollution by construction waste and materials loaded at the construction site		X	<i>There are no waterways or sink holes at the site</i>
11. Local flooding	Increase localised flooding risk by temporary/permanent loading of construction materials/wastes		X	
12. Water quantity	a. Withdraw groundwater in a coastal area that may lead to the risk of salinity intrusion		X	
	b. Extract or use a large amount of water in local river/streams may cause shortage to water supply to other users in the locality?		X	
	a. Disrupt local traffic/		X	

13. Social disturbance	transportation/ pedestrian traffic			
	b. Disrupt the operation of local water supply system		X	
	c. Disrupt the operation of local irrigation system		X	
	d. Disrupt the operation of local drainage system		X	
	e. Disrupt local farming activities		X	
	f. Disrupt community meetings/social events		X	
	g. Affect community security?		X	
14. Safety to community	Cause safety risk to the community		X	
15. Public health	Cause concerns on public health/ sanitation /hygiene in the local community		X	
16. Worker's health & safety	Cause workers health and safety concerns		X	
17. PCR	Impact cultural sites such as church, historical site, graveyard, etc.		X	
18. Community support	Does the project enjoy broad community support?		X	
19. Sustainability	Does the community have a plan for the management and maintenance of assets after implementation?		X	
20. Land acquisition	Does the subproject involve voluntary land acquisition		X	
Others:			X	
<b>OPERATION PHASE</b>				

	<i>Will the subproject:</i>			
1. Water/soil pollution	Generate wastewater from the site? e.g. slaughterhouse wastewater, fertilizer runoff etc.		X	
2. Waste	Generate solid waste e.g. slaughterhouse waste		X	
3. Nuisance noise, odour	Result in noise or odour impacts to nearby receivers (houses, schools, community facilities etc.)		X	
4. unhygienic conditions, public health risks			X	
5. Worker's health & safety	Require training and health and safety management for workers to allow for safe operation		X	
6. visual impacts		X		Positive impact especially on the face-lift of the office
7. Conflict with downstream water users?			X	
8. Others			X	

Conclusion: Based on the above screening preparation of the below ESF documents/instruments is recommended:

- ECOP (in the ESMF) (Solomon Islands & WB)  
An ESCOP is recommended due to very minor works to be carried out.
- ESIA/ESMP (Solomon Islands/WB)  
\_\_\_\_\_
- Full EIA incorporating ESMP (Solomon Islands)  
\_\_\_\_\_
- Waste or Wastewater Management Plan

- 
- Land Commitment Letter (in the ESMF)
- 

### C. IMPACT SCREENING FOR RESEARCH HQ OFFICE

IMPACTS SCREENING FORM				
Filled in by MAL Officer: <b>Martin Jaiki</b>				
Checked and verified by the Environment Consultant: <b>Steve Sae</b>				
<b>project name and a brief description: Renovation of the MAL Research office HQ</b>				
<b>Location and Province: KGVI, Burnscreek Area, Honiara.</b>				
Subject	Screening Questions	Yes	No	Note/Comment (column to be completed with additional information where the response to a screening question is yes)
<b>CONSTRUCTION PHASE</b>				
	<i>Will the subproject:</i>			<b>(guidance are given below)</b>
1. Vegetation cover, trees, insects, animal	Remove vegetation cover, cut down trees for timber or site clearance?		X	<i>Built environment</i>
	Affect cropland with waste and wastewater?		X	<i>Built environment</i>
	Disturb wildlife, insects such as snakes?		X	<i>Built environment</i>
2. natural resources	Be located near forest or least disturbed /nature reserve area?		X	<i>Built environment</i>

3. Landscape	Cause significant changes to, or negatively affect the landscape of the area?		X	<i>Built environment</i>
4. Solid waste	Generate solid waste such as excavated soil, unused materials	X		<i>There could be timber cut-offs or glasses remains etc</i>
5. Hazardous wastes	Generate hazardous waste such as batteries, unused paints, oil, lubricant etc.	X		<i>There could be unused paint at the site during renovation works</i>
6. Wastewater	Generate wastewater from the site?		X	
	e.g. lubricant etc.		X	
7. Dust and smoke	Cause increased dust level at the site, or generate smoke		X	
8. Noise and vibration	Generate high noise and vibration		X	
9. Erosion risks	Disturb slopes?		X	
10. Water quality	Cause water pollution by construction waste and materials loaded at the construction site		X	<i>There are no waterways or sink holes at the site</i>
11. Local flooding	Increase localised flooding risk by temporary/permanent loading of construction materials/wastes		X	
12. Water quantity	a. Withdraw groundwater in a coastal area that may lead to the risk of salinity intrusion		X	
	b. Extract or use a large amount of water in local river/streams may cause shortage to water supply to other users in the locality?		X	
	a. Disrupt local traffic/		X	

13. Social disturbance	transportation/ pedestrian traffic			
	b. Disrupt the operation of local water supply system		X	
	c. Disrupt the operation of local irrigation system		X	
	d. Disrupt the operation of local drainage system		X	
	e. Disrupt local farming activities		X	
	f. Disrupt community meetings/social events		X	
	g. Affect community security?		X	
14. Safety to community	Cause safety risk to the community		X	
15. Public health	Cause concerns on public health/ sanitation /hygiene in the local community		X	
16. Worker's health & safety	Cause workers health and safety concerns		X	
17. PCR	Impact cultural sites such as church, historical site, graveyard, etc.		X	
18. Community support	Does the project enjoy broad community support?		X	
19. Sustainability	Does the community have a plan for the management and maintenance of assets after implementation?		X	
20. Land acquisition	Does the subproject involve voluntary land acquisition		X	
Others:			X	
<b>OPERATION PHASE</b>				

	<i>Will the subproject:</i>			
1. Water/soil pollution	Generate wastewater from the site? e.g. slaughterhouse wastewater, fertilizer runoff etc.		X	
2. Waste	Generate solid waste e.g. slaughterhouse waste		X	
3. Nuisance noise, odour	Result in noise or odour impacts to nearby receivers (houses, schools, community facilities etc.)		X	
4. unhygienic conditions, public health risks			X	
5. Worker's health & safety	Require training and health and safety management for workers to allow for safe operation		X	
6. visual impacts		X		Positive impact especially on the face-lift of the office
7. Conflict with downstream water users?			X	
8. Others			X	

Conclusion: Based on the above screening preparation of the below ESF documents/instruments is recommended:

- ECOP (in the ESMF) (Solomon Islands & WB)  
An ESCOP is recommended.
- ESIA/ESMP (Solomon Islands/WB)  
\_\_\_\_\_
- Full EIA incorporating ESMP (Solomon Islands)  
\_\_\_\_\_
- Waste or Wastewater Management Plan

- 
- Land Commitment Letter (in the ESMF)
-

## APPENDIX 2 CHANCE FIND PROCEDURE

The following Chance find Procedure (CHF) would be applicable if artifacts or objects are exposed during the construction phase. The contractor and relevant stakeholders will follow the procedures described below:

Stop the construction activities in the area of the chance find.

Delineate the discovered site or area.

Notify village leaders and secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a nightguard or other relevant protection shall be present.

Notify the construction supervisor, who in turn would notify the Project Engineer (within 72 hours).

Contact the responsible authorities who would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out. This would require a preliminary evaluation of the findings to be performed by the Ministry of Culture and tourism. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, including the aesthetic, historical, scientific or research, social and economic values.

Ensure that decisions on how to handle the finding be taken by the responsible authorities. This could include changes in the layout (such as when the finding is an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage

Implementation for the authority decision concerning the management of the finding shall be communicated in writing; and

Construction work will resume only after authorization is given by the responsible authorities concerning heritage protection.

During the project supervision, the two E&S Consultants shall monitor the above regulations relating to the treatment of any chance find encountered are observed. Relevant findings will be recorded and included in the progress reports for submitting to the World Bank for review.

There is also the potential to encounter UXO during construction. While construction sites are expected to be swept for and cleared of UXOs, a chance finds procedure for handling the UXOs in accordance with national legislation will be the responsibility of the contractor. Ultimately, MAL or the project staff will be responsible for the supervision and monitoring of the contractor.

## APPENDIX 3 GBV/SEA/SH CODE OF CONDUCT AND ACTION PLAN

### CODES OF CONDUCT AND ACTION PLAN FOR IMPLEMENTING

#### ESHS AND OHS STANDARDS, AND

#### PREVENTING GENDER BASED VIOLENCE (GBV)/SEXUAL EXPLOITATION AND ABUSE (SEA)/SEXUAL HARASSMENT(SH) ON

#### SOLOMON ISLANDS AGRICULTURE AND RURAL TRANSFORMATION PROJECT

##### Background

The purpose of these *Codes of Conduct and Action Plan for Implementing ESHS and OHS Standards, and Preventing Gender Based Violence/SEA/SH* is to introduce a set of key definitions, core Codes of Conduct, and guidelines for application on WB financed SIART Project that:

- i. clearly define obligations on all project staff (including sub-contractors and day workers) with regard to implementing the project's environmental, social, health and safety (ESHS) and occupational health and safety (OHS) requirements, and;
- ii. help prevent, report and address Gender Based Violence (GBV)/SEA/SH within the work site and in its immediate surrounding communities.

The application of these Codes of Conduct will help ensure the project meets its ESHS and OHS objectives, as well as preventing and/or mitigating the risks of GBV/SEA/SH on the project and in the local communities.

These Codes of Conduct are to be adopted by all those working on the project—including subcontractors—and are meant to:

- i. create awareness of the ESHS and OHS expectations on the project;
- ii. create common awareness about GBV/SEA/SH and:
  - (a) ensure a shared understanding that GBV/SEA/SH has no place on the project; and,
  - (b) create a clear system for identifying, responding to, and sanctioning GBV/SEA/SH incidents.

Ensuring that all project staff understand the values of the project, understanding expectations for all employees, and acknowledging the consequences for violations of these values, will help to create smoother, more respectful and productive project implementation thereby helping ensure that the project's development objectives will be achieved.

##### Definitions

The following definitions apply:

##### ESHS and General Project

**Environmental, Social, Health and Safety (ESHS):** an umbrella term covering issues related to the impact of the project on the environment, communities and workers.

**Occupational Health and Safety (OHS):** OHS is concerned with protecting the safety, health and welfare of people engaged in work or employment, and the surrounding communities. The

enjoyment of these standards at the highest levels is a basic human right that should be accessible by each worker.

#### **Key Documents:**

- **Project Environmental and Social Management Plan (ESMP):** The safeguards document prepared prior to project approval by the WB identifying the activities to be undertaken, key risks (based on ESIA if available), and their mitigation measures.
- **Contractors Environmental and Social Management Plan (CESMP):** the plan prepared by the contractor outlining how they will implement the works activities in accordance with the project's environmental and social management plan (ESMP). The CESMP also contains a number of management plans, in particular, the OHS Management Plan.
- **Codes of Conduct:** the Codes of Conduct adopted for the project (or individual companies) covering the commitment of the contractor, and the responsibilities of managers and individuals with regards to ESHS, OHS and GBV/SEA/SH.

#### **Key Project Actors:**

- **Consultant:** is as any firm, company, organization or other institution that has been awarded a contract to provide consulting services to the project, and has hired managers and/or employees to conduct this work.
- **Contractor:** is any firm, company, organization or other institution that has been awarded a contract to conduct infrastructure development works for the project and has hired managers and/or employees to conduct this work. This also includes sub-contractors hired to undertake activities on behalf of the contractor.
- **Manager:** is any individual offering labour to the contractor or consultant, on or off the work site, under a formal or informal employment contract and in exchange for a salary, with responsibility to control or direct the activities of a contractor's or consultant's team, unit, division or similar, and to supervise and manage a pre-defined number of employees.
- **Employee:** is any individual offering labour to the contractor or consultant within country on or off the work site, under a formal or informal employment contract or arrangement, typically, but not necessarily (e.g. including unpaid interns and volunteers), in exchange for a salary, with no responsibility to manage or supervise other employees.

**Grievance Redress Mechanism (GRM):** is the process established by a project to receive and address complaints related to the project—not just GBV/SEA/SH but related to any aspect of the project. The GRM needs to: (i) allow for multiple channels to receive complaints; (ii) be readily accessible, allowing complaints to be made in different ways; and, (iii) have appropriate protocols or mechanisms to refer complaints to GBV service providers as uncertified/untrained individuals should refrain from trying to address GBV/SEA/SH related complaints.

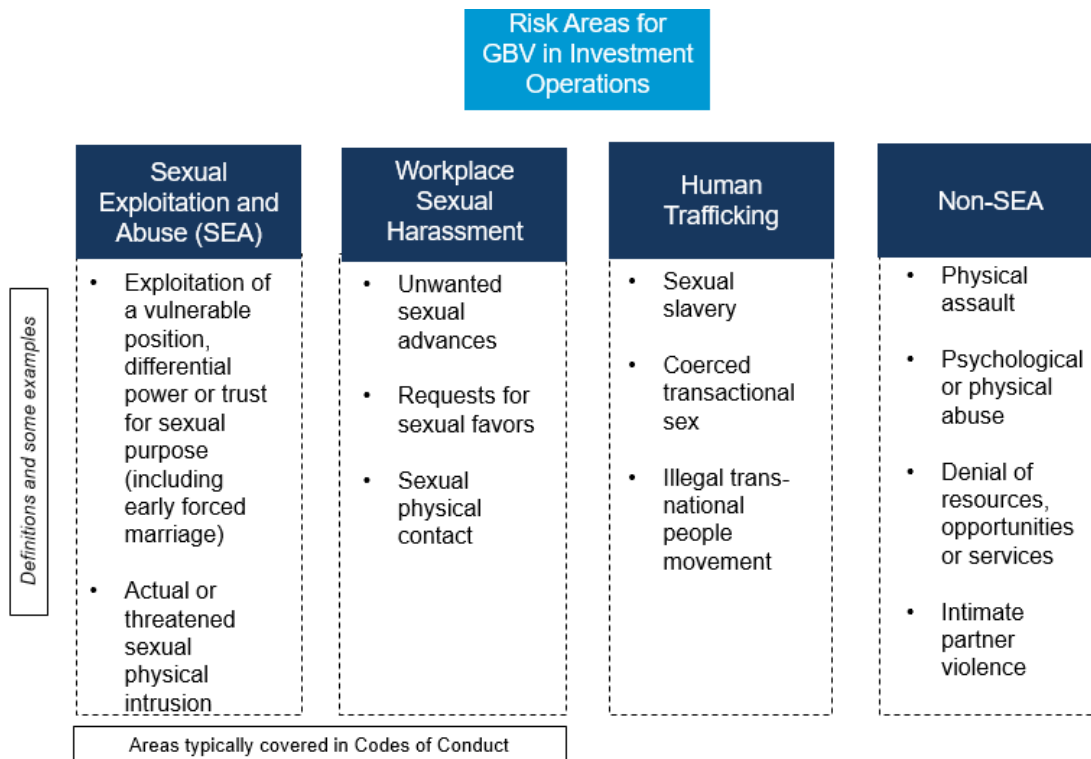
**Work Site:** is the area in which infrastructure development works are being conducted, as part of the project. Consulting assignments are considered to have the areas in which they are active as their work sites.

**Work Site Surroundings:** is the 'Project Area of Influence' which are any area, urban or rural, directly affected by the project, including all human settlements found in it.

GBV/SEA/SH

**Key definitions:** With reference to the focus areas for in Figure 1, there are a number of key definitions for understanding GBV/SEA/SH:

Figure 1: Examples of GBV/SEA/SH



Note: Types of GBV that may be Exacerbated by Investment Operations

**Codes of Conduct Focus**

These Codes of Conduct specifically focus on the following forms of GBV - Sexual Exploitation and Abuse (SEA) and Sexual Harassment as they represent high risk areas in the context of investment operations.

- Gender Based Violence (GBV):** is an umbrella term for any harmful act that is perpetrated against a person’s will and that is based on socially ascribed (that is, gender) differences between male and female individuals. GBV includes acts that inflict physical, mental, or sexual harm or suffering;

threats of such acts; and coercion and other deprivations of liberty, whether occurring in public or in private life.

**Sexual Exploitation and Abuse (SEA):** Sexual exploitation is a facet of GBV that is defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust for sexual purposes, including but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In the context of WB supported projects, SEA occurs against a beneficiary or member of the community.

- **Sexual abuse** is further defined as the actual or threatened physical intrusion of a sexual nature whether by force or under unequal or coercive conditions.
- **Child sexual abuse:** is defined by the age of the survivor. It includes different forms of sexual violence, involves either explicit force or coercion or cases in which the survivor cannot consent because of his or her age. Sexual activity with anyone below the age of 18, except in cases of pre-existing marriage, constitutes child sexual abuse. Mistaken belief regarding the age of the child and/or receipt of consent from the child is not a defence.

**Sexual harassment:** occurs between personnel and staff on the project and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. (e.g. looking somebody up and down; kissing; whistling and catcalls; in some instances, giving personal gifts). The distinction between the SEA and sexual harassment is important so that agency policies and staff trainings can include specific instruction on the procedures to report each.

- **Sexual favours:** is a form of sexual harassment and includes making promises of favourable treatment (e.g. promotion) or threats of unfavourable treatment (e.g. loss of job) dependent on sexual acts or other forms of humiliating, degrading or exploitative behaviour.

**Child protection:** Is an activity or initiative designed to protect children from any form of harm, particularly arising from child abuse and exploitation.

- **Child:** is used interchangeably with the term ‘minor’ and refers to a person under the age of 18. This is in accordance with Article 1 of the United Nations Convention on the Rights of the Child.
- **Child Abuse and Exploitation:** the physical, sexual or psychological harm of children including using for profit, labour, sexual gratification, or some other personal or financial advantage. This also includes other activities such as using computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any mediums
- **Grooming:** are behaviours that make it easier for a perpetrator to procure a child for sexual activity. For example, an offender might build a relationship of trust with the child, and then seek to sexualize that relationship (for example by encouraging romantic feelings or exposing the child to sexual concepts through pornography).
- **Online Grooming:** is the act of sending an electronic message to a recipient who the sender believes to be a minor, with the intention of developing a relationship of trust that can be abused by procuring the recipient to engage in or submit to sexual activity with another person, including but not necessarily limited to the sender. This includes engaging in online sexual activities, such as messages, videos and photos with sexual content either sent to or procured from a child.

**Other definitions:** In addressing the issues raised above related to GBV/SEA/SH there are a number of considerations which need to be clearly defined:

**Rape:** non-consensual penetration (however slight) of the vagina, anus or mouth with a penis, other body part, or an object.

**Consent:** refers to when an adult makes an informed choice to agree freely and voluntarily to do something. In accordance with the United Nations Convention on the Rights of the Child, the WB considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defence. There is **no** consent when agreement is obtained through:

- The use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation,
- The use of a threat to withhold a benefit to which the person is already entitled, or,
- A promise made to the person to provide a benefit.

**Perpetrator:** the person(s) who commit(s) or threaten(s) to commit an act or acts of GBV/SEA/SH.

**Survivor/Survivors:** the person(s) adversely affected by GBV/SEA/SH. Women, men and children can be survivors of GBV.

**GBV/SEA/SH Service Provider:** is an independent organization trusted by the local communities with the skills and resources to provide support to survivors of GBV/SEA/SH, as well as training to reduce the risks of GBV/SEA/SH.

**Third-Party Monitor (TPM) or Independent Verification Agent (IVA):** an organization commissioned to independently monitor and report on the effectiveness of the implementation of the GBV/SEA/SH activities on the project. TPMs are financed independent of the project; IVAs are financed by the project.

**Investigation and resolution of GBV/SEA/SH allegations:**

- **GBV/SEA/SH Allegation Procedure:** is the prescribed procedure to be followed when reporting incidents of GBV/SEA/SH.
- **Accountability Measures:** are the measures put in place to ensure the confidentiality of survivors and to hold contractors, consultants and the client responsible for instituting a fair system of addressing cases of GBV/SEA/SH.
- **Response Protocol:** are the mechanisms set in place to respond to cases of GBV/SEA/SH.

## APPENDIX 4      CONTRACTOR CODE OF CONDUCT FOR SIART

### Implementing ESHS and OHS Standards

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

The contractor is committed to ensuring that the project is implemented in such a way which minimizes any negative impacts on the local environment, communities, and its workers. This will be done by respecting the environmental, social, health and safety (ESHS) standards, and ensuring appropriate occupational health and safety (OHS) standards are met. The contractor is also committed to creating and maintaining an environment where children under the age of 18 will be protected, and where Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) have no place. Improper actions towards children, SEA and SH are acts of Gender Based Violence (GBV) and as such will not be tolerated by any employee, sub-contractors, supplier, associate, or representative of the contractor.

Therefore, to ensure that all those engaged in the project are aware of this commitment, the contractor commits to the following core principles and minimum standards of behaviour that will apply to all contractor employees, associates, and representatives, including sub-contractors and suppliers, without exception:

#### **General**

1. The contractor—and therefore all employees, associates, representatives, sub-contractors and suppliers—commits to complying with all relevant national laws, rules and regulations.
2. The contractor commits to full implementing its CESMP as approved by the client.
3. The contractor commits to treating women, children (persons under the age of 18), and men with respect regardless of race, colour, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status. Acts of GBV/SEA/SH are in violation of this commitment.
4. The contractor shall ensure that interactions with local community members are done with respect and non-discrimination.
5. Demeaning, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behaviour are prohibited among all contractor employees, associates, and its representatives, including sub-contractors and suppliers.
6. The contractor will follow all reasonable work instructions (including regarding environmental and social norms).
7. The contractor will protect and ensure proper use of property (for example, to prohibit theft, carelessness or waste).

#### **Health and Safety**

8. The contractor will ensure that the project's OHS Management Plan is effectively implemented by contractor's staff, as well as sub-contractors and suppliers.
9. The contractor will ensure that all persons on-site wear prescribed and appropriate personal protective equipment, preventing avoidable accidents, and reporting conditions or practices that pose a safety hazard or threaten the environment.
10. The contractor will:

- i. prohibit the use of alcohol during work activities.
  - ii. prohibit the use of narcotics or other substances which can impair faculties at all times.
11. The contractor will ensure that adequate sanitation facilities are available on site and at any worker accommodations provided to those working on the project.
  12. The contractor will not hire children under the age of 18 for construction work, or allow them on the work site, due to the hazardous nature of construction sites.

### **Gender Based Violence (GBV)**

13. Acts of GBV/SEA/SH constitute gross misconduct and are therefore grounds for sanctions, which may include penalties and/or termination of employment and, if appropriate, referral to the Police for further action.
14. All forms of GBV/SEA/SH, are unacceptable, regardless of whether they take place on the work site, the work site surroundings, at worker’s camps or within the local community.
15. Sexual harassment of work personnel and staff (e.g. making unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct of a sexual nature) are acts of GBV and are prohibited.
16. Sexual favours (e.g. making promises of favourable treatment such as promotions, threats of unfavourable treatment such as losing a job, payments in kind or in cash dependent on sexual acts) and any form of humiliating, degrading or exploitative behaviour are prohibited.
17. The use of prostitution in any form at any time is strictly prohibited.
18. Sexual contact or activity with children under 18—including through digital media—is prohibited. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
19. Unless there is full consent<sup>12</sup> by all parties involved in the sexual act, sexual interactions between the contractor’s employees (at any level) and members of the communities surrounding the work place are prohibited. This includes relationships involving the withholding/promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex (including prostitution). Such sexual activity is considered “non-consensual” within the scope of this Code.
20. In addition to contractor sanctions, legal prosecution of those who commit acts of GBV/SEA/SH will be pursued if appropriate.
21. All employees, including volunteers and sub-contractors are highly encouraged to report suspected or actual acts of GBV/SEA/SH by a fellow worker, whether in the same contractor or not. Reports must be made in accordance with project’s GBV/SEA/SH Allegation Procedures.
22. Managers are required to report and act to address suspected or actual acts of GBV/SEA/SH as they have a responsibility to uphold contractor commitments and hold their direct reports responsible.

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<sup>12</sup> **Consent:** refers to when an adult makes an informed choice to agree freely and voluntarily to do something. There is **no** consent when agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation; the use of a threat to withhold a benefit to which the person is already entitled, or; a promise made to the person to provide a benefit. In accordance with the United Nations Convention on the Rights of the Child, the WB considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defence.

## Implementation

To ensure that the above principles are implemented effectively the contractor commits to:

23. Ensuring that all managers sign the project's 'Manager's Code of Conduct' detailing their responsibilities for implementing the contractor's commitments and enforcing the responsibilities in the 'Individual Code of Conduct'.
24. Ensuring that all employees sign the project's 'Individual Code of Conduct' confirming their agreement to comply with ESHS and OHS standards, and not to engage in activities resulting in GBV, child endangerment or abuse, or sexual harassment.
25. Displaying the contractor and Individual Codes of Conduct prominently and in clear view at workers' camps, offices, and in public areas of the workspace. Examples of areas include waiting, rest and lobby areas of sites, canteen areas and health clinics.
26. Ensuring that posted and distributed copies of the contractor and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.
27. Ensuring that an appropriate person is nominated as the contractor's 'Focal Point' for addressing GBV/SEA/SH issues, and names and contact of specialized local GBV/SEA/SH Service Provider.
28. Ensuring that an effective GBV/SEA/SH Action Plan is developed in consultation with the specialized GBV/SEA/SH service provider which includes as a minimum:
  - i. **GBV/SEA/SH Allegation Procedure** to report GBV/SEA/SH issues through the project Grievance Redress Mechanism ;
  - ii. **Accountability Measures** to protect confidentiality of all involved ; and,
  - iii. **Response Protocol** applicable to GBV/SEA/SH survivors and perpetrators .
29. Ensuring that the contractor effectively implements the agreed final GBV/SEA/SH Action Plan, providing feedback to the specialized GBV/Sea/SH service providers for improvements and updates as appropriate.
30. Ensuring that all employees attend an induction training course prior to commencing work on site to ensure they are familiar with the company's commitments to ESHS and OHS standards, and the project's GBV/SEA/SH Codes of Conduct.
31. Ensuring that all employees attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the project's ESHS and OHS standards and the GBV/SEA/SH Code of Conduct.

*I do hereby acknowledge that I have read the foregoing 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 project's OHS and ESHS standards, and to prevent and respond to GBV/SEA/SH. I understand that any action inconsistent with this Contractor Code of Conduct or failure to act mandated by this Contractor Code of Conduct may result in disciplinary action.*

Contractor name: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

### Implementing ESHS and OHS Standards

#### Preventing Gender-Based Violence

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I, \_\_\_\_\_, acknowledge that adhering to environmental, social, and health and safety (ESHS) standards, following the project’s occupational health and safety (OHS) requirements, and preventing Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) is important.

I understand that failure to follow ESHS and OHS standards, or to partake in activities constituting GBV/SEA/SH—be it on the work site, the work site surroundings, at workers’ camps, or the surrounding communities—constitute acts of gross misconduct and are therefore grounds for sanctions, penalties, or potential termination of employment. Prosecution by the Police of those who commit GBV/SEA/SH may be pursued if appropriate.

I agree that while working on the project I will:

1. Consent to a Police background check.
2. Attend and actively partake in training courses related to ESHS, OHS, and GBV as requested by the project.
3. Will wear my personal protective equipment (PPE) at all times when at the work site or engaged in project related activities.
4. Take all practical steps to adhere to the project’s environmental and social management requirements.
5. Implement the contractor’s OHS Management Plan.
6. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can impair faculties at all times.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, nationality, ethnicity, or social origin, property, disability, birth or other status.
8. Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not sexually exploit or abuse project beneficiaries and members of the surrounding communities.

10. Not engage in sexual harassment of work personnel and staff—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature is prohibited. E.g., looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; in some instances, giving personal gifts.
11. Not engage in sexual favors—for instance, making promises of favorable treatment (e.g. promotion), threats of unfavorable treatment (e.g. loss of job) or payments in kind or in cash, dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.
12. Not use prostitution in any form at any time.
13. Not participate in sexual contact or activity with children 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.
14. Unless there is the full consent<sup>13</sup> 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 (including prostitution). Such sexual activity is considered “non-consensual” within the scope of this Code.
15. Consider reporting through the GRM or to my manager any suspected or actual GBV/SEA/SH by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.

With regards to children under the age of 18:

16. Bring to the attention of my manager the presence of any children on the construction site or engaged in hazardous activities.
17. Wherever possible, ensure that another adult is present when working in the proximity of children.
18. Not invite unaccompanied children unrelated to my family into my home unless they are at immediate risk of injury or in physical danger.
19. Not use any computers, mobile phones, video, and digital cameras or any other medium to exploit or harass children or to access child pornography (see also “Use of children's images for work related purposes” below).
20. Refrain from physical punishment or discipline of children.

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<sup>13</sup>**Consent** is defined as the informed choice underlying an individual’s free and voluntary intention, acceptance, or agreement to do something. No consent can be found when such acceptance or agreement is obtained using threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.

21. 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.
22. 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.
23. Take appropriate caution when photographing or filming children .

### **Use of children's images for work related purposes**

When photographing or filming a child for work related purposes, I must:

24. Before photographing or filming a child, assess and endeavour to comply with local traditions or restrictions for reproducing personal images.
25. Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this I must explain how the photograph or film will be used.
26. Ensure photographs, films, videos, and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.
27. Ensure images are honest representations of the context and the facts.
28. Ensure file labels do not reveal identifying information about a child when sending images electronically.

### **Sanctions**

I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action against me which could include:

1. Informal warning.
2. Formal warning.
3. Additional Training.
4. Loss of up to one week's salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Report to the Police if warranted.

*I understand that it is my responsibility to ensure that the environmental, social, health, and safety standards are met. I will adhere to the occupational health and safety management plan. I will avoid actions or behaviors that could be construed as GBV/SEA/SH. Any such actions will be a breach of this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS, and GBV/SEA/SH issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.*

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX 6 CONTRACTOR’S WORKERS CODE OF CONDUCTS

Note: Workers Environmental Code of Conducts will also be integrated into the bidding/contractual document

DO:	DO NOT:
<ul style="list-style-type: none"> <li>◆ USE THE TOILET FACILITIES PROVIDED – REPORT DIRTY OR FULL FACILITIES</li> <li>◆ CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.</li> <li>◆ REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY &amp; STOP THE SPILL FROM CONTINUING.</li> <li>◆ SMOKE IN DESIGNATED AREAS ONLY AND DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)</li> <li>◆ CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.</li> <li>◆ USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.</li> <li>◆ PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.</li> <li>◆ ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY “HOT WORK” IS UNDERTAKEN e.g. welding, grinding, gas cutting etc.</li> <li>◆ REPORT ANY INJURY OF WORKERS OR ANIMALS.</li> <li>◆ DRIVE ON DESIGNATED ROUTES ONLY.</li> <li>◆ PREVENT EXCESSIVE DUST AND NOISE</li> </ul>	<ul style="list-style-type: none"> <li>◆ REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION.</li> <li>◆ MAKE ANY FIRES.</li> <li>◆ POACH, INJURE, TRAP, FEED OR HARM ANY ANIMALS – this includes birds, frogs, snakes, etc.</li> <li>◆ ENTER ANY FENCED OFF OR MARKED AREA.</li> <li>◆ DRIVE RECKLESSLY OR ABOVE SPEED LIMIT</li> <li>◆ ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM</li> <li>◆ LITTER OR LEAVE FOOD LYING AROUND.</li> <li>◆ CUT TREES FOR ANY REASON OUTSIDE THE APPROVED CONSTRUCTION AREA</li> <li>◆ BUY ANY WILD ANIMALS FOR FOOD;</li> <li>◆ USE UNAPPROVED TOXIC MATERIALS, INCLUDING LEAD-BASED PAINTS, ASBESTOS, ETC.;</li> <li>◆ DISTURB ANYTHING WITH ARCHITECTURAL OR HISTORICAL VALUE</li> <li>◆ USE OF FIREARMS (EXCEPT AUTHORIZED SECURITY GUARDS)</li> <li>◆ USE OF ALCOHOL BY WORKERS DURING WORK HOURS</li> <li>◆ WASH CARS OR MACHINERY IN STREAMS OR CREEK</li> <li>◆ DO ANY MAINTENANCE (CHANGE OF OILS AND FILTERS) OF CARS AND EQUIPMENT OUTSIDE AUTHORIZED AREAS</li> <li>◆ DISPOSE TRASH IN UNAUTHORIZED PLACES</li> <li>◆ HAVE CAGED WILD ANIMALS (ESPECIALLY BIRDS) IN CAMPS</li> <li>◆ WORK WITHOUT SAFETY EQUIPMENT (INCLUDING BOOTS AND HELMETS)</li> <li>◆ CREATE NUISANCES AND DISTURBANCES IN OR NEAR COMMUNITIES</li> </ul>

	<ul style="list-style-type: none"><li>◆ USE RIVERS AND STREAMS FOR WASHING CLOTHES</li><li>◆ DISPOSE INDISCRIMINATELY RUBBISH OR CONSTRUCTION WASTES OR RUBBLE</li><li>◆ SPILL POTENTIAL POLLUTANTS, SUCH AS PETROLEUM PRODUCTS</li><li>◆ COLLECT FIREWOOD</li><li>◆ DO EXPLOSIVE AND CHEMICAL FISHING</li><li>◆ USE LATRINES OUTSIDE THE DESIGNATED FACILITIES; AND</li><li>◆ BURN WASTES AND/OR CLEARED VEGETATION.</li></ul>
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
APPENDIX 7 SIART INFRASTRUCTURE INVESTMENT WEEKLY CESMP INSPECTION




<b>SUBPROJECT:</b>	The Renovation of the KGV1 Slaughter Facility, Pig Breeding Facility and Research HQ Office	<b>IMPLEMENTING AGENCY:</b>	MAL
<b>DATE:</b>		<b>CONTRACTOR:</b>	
<b>PREPARED BY:</b>		<b>SUPERVISION ENGINEER</b>	




Inspection Participants: (insert names and positions)

CESMP Items (edit as necessary based on approved CESMP for relevant subproject)	Applicable		Compliance			Issues	Status (R)/(O)	Action Required/Taken	Target/Actual Date
	Yes	No	Green	Yellow	Red				
<b>1. Mitigation &amp; Management Measures: Construction Phase</b>									
Soil Erosion: <ul style="list-style-type: none"> <li>- Silt fences and diversion drains in place</li> <li>- Replanting and restoration work completed</li> </ul>									

CESMP Items (edit as necessary based on approved CESMP for relevant subproject)	Applicable		Compliance			Issues	Status (R)/(O)	Action Required/Taken	Target/Actual Date
	Yes	No	Green	Yellow	Red				
<p>Water Accumulation and Disposal Agreements:</p> <ul style="list-style-type: none"> <li>• Good housekeeping around the work sites</li> <li>• Waste collected in defined area on impermeable ground or containers</li> <li>• Separation of waste into (i) Recyclable waste (i.e. certain plastics, metals, rubber etc. that can be recycled); (ii) Organic biodegradable waste (i.e. waste that will decay / break down in a reasonable amount of time, such as green waste, food waste; (iii) Inorganic non-recyclable waste (i.e. waste that cannot decompose / break down and which cannot be recycled) and, (iv) Hazardous waste (i.e. , waste oil etc.)</li> <li>• Hazardous waste stored in safe and appropriate manner.</li> <li>• Waste management plan in place and operating for proper disposal</li> </ul>									
<p>Soil and Water Pollution:</p> <ul style="list-style-type: none"> <li>• Appropriate spill response plan/kit in place for waste area</li> <li>• No visible spills on soil or uncovered ground</li> <li>• Drainage and soakage systems clear and fit for purpose</li> <li>• Surface water monitoring on a quarterly basis</li> </ul>									

CESMP Items (edit as necessary based on approved CESMP for relevant subproject)	Applicable		Compliance			Issues	Status (R)/(O)	Action Required/Taken	Target/Actual Date
	Yes	No							
Dust and Materials Transport: <ul style="list-style-type: none"> <li>• Stockpiles covered or kept wet when not in use</li> <li>• Visual inspection of ambient dust conditions on site and at nearby sensitive locations</li> <li>• Truck transports are covered</li> <li>• No evidence of aggregate spills on haulage route</li> </ul>									
Noise: <ul style="list-style-type: none"> <li>• Workers wearing ear protection as required</li> <li>• Noise level maximum of 45dB between 2200-0700</li> <li>• No complaints received relating to noise</li> </ul>									
Air Pollution: <ul style="list-style-type: none"> <li>• Equipment operating without excessive emissions</li> </ul>									
Fuel and Oil Storage: <ul style="list-style-type: none"> <li>• Substances stored in self-bunded vessels or within bund on impermeable surface</li> <li>• Spill kit complete and accessible</li> <li>• Spill training completed</li> <li>• No evidence of spills on the ground</li> </ul>									
Traffic Management Plan (TMP) Implementation: <ul style="list-style-type: none"> <li>- TMP under effective implementation</li> </ul>									

CESMP Items (edit as necessary based on approved CESMP for relevant subproject)	Applicable		Compliance			Issues	Status (R)/(O)	Action Required/Taken	Target/Actual Date
	Yes	No							
Community and Local Business Consultation: <ul style="list-style-type: none"> <li>Public signage of complaints procedure</li> <li>Signs and fences restrict or direct pedestrians and public where appropriate.</li> </ul>									
Materials Supply: <ul style="list-style-type: none"> <li>Quarry establishment and operations in fully compliance with ESMP</li> <li>All quarries licensed to supply materials</li> <li>All imported materials with appropriate biosecurity clearances</li> </ul>									
Laydown Area: <ul style="list-style-type: none"> <li>Laydown areas established on pre-approved sites</li> <li>Laydown areas dust levels managed efficiently</li> <li>Traffic management plan correctly implemented at laydown site</li> <li>Water run off management systems operating correctly</li> <li>Dust management effectively implemented</li> </ul>									

CESMP Items (edit as necessary based on approved CESMP for relevant subproject)	Applicable		Compliance			Issues	Status (R)/(O)	Action Required/Taken	Target/Actual Date
	Yes	No							
Workers Camp (if applicable): <ul style="list-style-type: none"> <li>• Camp established in accordance with Code of Practice in ESMP.</li> <li>• Septic system cleaned and fully operational.</li> <li>• Waste stored in an appropriate location in a clean and tidy manner, segregated by waste type.</li> <li>• Workers living and recreational areas clean and properly equipped.</li> <li>• OHS, Communicable Diseases, GBV/SEA/SH, Human Trafficking, and other information available</li> </ul>									
Monitoring - Weekly safeguards compliance report completed									

Compliant, Minor Non-Compliance, Significant Non-Compliance      Status: (R) Resolved Issues, (O) Ongoing Issues

**Notes:**

**Required Actions:**

Environmental Specialist:

Signed:

Date

## APPENDIX 8      MONITORING PLAN FOR THE OPERATION OF THE SLAUGHTER AND PIG BREEDING FACILITIES

**Objective:**

To ensure environmental sustainability and compliance with social and safety standards during the operation of the slaughter and pig breeding facilities. This plan aims to monitor key environmental and social parameters, identify potential risks, and implement mitigation measures effectively.

**1. Environmental Parameters to be Monitored**

Parameter	Frequency	Location	Methodology	Budget (yearly)	Responsibility
<b>Wastewater Quality</b>	Quarterly	Outflow from septic tank and soakaway	Sampling and laboratory analysis (pH, BOD, COD, TSS, nitrates, phosphates, pathogens, heavy metals)	MAL operational budget	MAL/Private Investor
<b>Solid Waste Disposal</b>	Weekly	Slaughter and pig breeding areas	Visual inspection, record-keeping of waste segregation, collection, and disposal	MAL operational budget	MAL/Private Investor
<b>Air Quality (Odor)</b>	Biweekly	Around piggery and slaughter facility	Olfactory observation, odor complaints from nearby communities	MAL operational budget	MAL/Private Investor
<b>Noise Levels</b>	Quarterly or upon complaints	Facility perimeter	Sound level meter (dB readings)	MAL operational budget	MAL/Private Investor
<b>Effluent Discharge</b>	Monthly	Nearby streams (Burnscreek)	Sampling of water bodies for contamination (pH, BOD, nitrates, E. coli)	MAL operational budget	MAL/Private Investor

<b>Biodiversity</b>	Semi-annually	Facility grounds and nearby areas	Visual assessment and documentation of flora/fauna	NA	MAL/Private Investor
<b>Groundwater Quality</b>	Biannually	Borehole and surrounding area	Sampling and laboratory analysis for nitrates, ammonia, pathogens	NA	MAL/Private Investor
<b>Soil Quality</b>	Annually	Slaughter waste discharge areas	Soil sampling and laboratory testing for pathogens, heavy metals, organic content	NA	MAL/Private Investor

## 2. Social and Safety Parameters to be Monitored

<b>Parameter</b>	<b>Frequency</b>	<b>Location</b>	<b>Methodology</b>	<b>Responsibility</b>
<b>Health and Safety Compliance</b>	Daily	Throughout the facility	Regular inspections, PPE usage checks, hazard reporting	MAL/Private Investor
<b>Worker's Code of Conduct</b>	Monthly	Staff and operational areas	Staff training logs, incident reports, random checks for compliance	MAL/Private Investor
<b>Accident and Incident Reporting</b>	Ongoing	All operational areas	Accident report forms, interviews, safety drills	MAL/Private Investor
<b>Community Engagement</b>	Quarterly or as needed	Surrounding communities	Public meetings, grievance redress mechanism reviews	MAL/Private Investor
<b>Waste Management (Sludge and Solids)</b>	Monthly	Slaughter and pig breeding facility	Record-keeping of sludge removal, disposal logs, waste transportation	MAL/Private Investor
<b>Labor Conditions</b>	Monthly	Worksite	Ensure adherence to Labor Management Plan (LMP) and Solomon Islands Labor Law (working hours, wages, safety conditions)	MAL/Private Investor

<b>Hygiene and Sanitation</b>	Weekly	Worker facilities and animal areas	Inspection of cleaning schedules, disinfectant usage	MAL/Private Investor
<b>Traffic Management</b>	Weekly during peak times	Access roads, loading/unloading areas	Visual inspection, traffic logbooks, signage installation checks	MAL/Private Investor

**3. Reporting and Record-Keeping**

- **Daily Reports:** Safety inspections, incidents, waste management logs.
- **Monthly Reports:** Wastewater quality analysis, health and safety compliance, waste disposal, and community feedback.
- **Quarterly Reports:** Environmental audits (air and noise quality), water quality monitoring, and grievance redress outcomes.
- **Annual Reports:** Comprehensive environmental and social impact reviews, with a focus on biodiversity and soil quality assessments.

**4. Mitigation Measures**

- **Wastewater Management:** Installation of filters and regular maintenance of septic tanks and soakaway pits to prevent contamination of nearby water bodies.
- **Solid Waste Management:** Segregation of hazardous and non-hazardous wastes and ensuring timely disposal to certified landfill site at Ranadi.
- **Community Engagement:** Maintaining clear communication channels with surrounding communities to address concerns and report any potential impacts.
- **Safety Protocols:** Implementation of worker training on safety measures, use of PPE, and emergency preparedness in line with the Labor Management Plan (LMP) and national regulations.

This monitoring plan will be regularly reviewed and updated to ensure that both environmental and social parameters are well managed and align with World Bank standards and Solomon Islands regulations.

APPENDIX 9      STAKEHOLDERS CONSULTATION REPORT



**Consultation report on the proposed construction of the KGVI  
Agriculture Slaughter House Project, East Honiara**



**Prepared by  
SIART PMU  
September 2024**

## **1. Introduction**

This brief report highlights the information collected through conducting of consultations with relevant stakeholders and communities, located within the vicinity of the proposed slaughter house project at the MAL KGVI farm area. The initial consultation was planned by the Environmental and Social Safeguard team and was conducted by the Social Safeguard Officer over a duration of two (2) days from 4 – 5 September 2024.

The purpose of the consultation is to inform the public about the planned construction of the slaughter house project for pigs at the former Taiwanese farm area and to notify people on the benefits and the likely impacts (environment and social) of the project, to those residing close to the KGVI Slaughter House.

The consultation is part of the requirement of the World Bank's Environmental and Social Management Plan (ESMP) under Environmental and Social Standard (ESS) Ten (10) – Stakeholder Engagement and Information Disclosure; specifically, on social commitment and risks involving the project. The establishment of the project may generate and contribute to unexpected social issues, thus, requires early consultation process to inform the public about the nature of the project and possible environmental and social implications.

About nine (9) locations were identified and visited during the consultation activity. Five locations were covered on the first day and four other locations were visited on the second day. Most of the respondents talked too, have supported the implementation of the project. Piggery farmers will have access to the services of the slaughter facility which might trigger increase in their productions.

## **2. Objective**

The objective of the consultation is to distribute first-hand information by consulting with relevant stakeholders and communities on the proposed Slaughter House Project at the KGVI Agriculture farm area and its likely impacts to people, their livelihood and the environment in which they live and thrive.

## **3. Brief background**

The Ministry of Agriculture and Livestock (MAL) has planned to re-establish the defunct slaughter house purposely for slaughtering of pigs. MAL will operate the facility and, in the future, may venture into SIG-private partnership with potential investor to operate the facility. About 20 pigs can be slaughtered in the facility per day.

Solid wastes are segregated at the source. Some solid wastes will be taken to a designated area at the site for decomposing and used later as organic fertilizer.

Wastewater will be treated using a septic tank and soak away pit system ensuring minimal wastewater is discharged into the stream.

Collection of some water quality samples for testing will be done as the baseline to understand the current status of the Burns Creek stream.

## **4. Consultation process**

As part of the planning effort, the SIART Environment Officer provided a google earth map to identify the location of the relevant stakeholders and communities (affect persons) within a 300m radius in and

around the KGVI farm and Burns Creek areas, along with the related information to pass onto those concerned. A total of nine (9) locations were identified, visited and had been shared the information about the project (see map – Attachment 3).

Activities implemented include the following; 1) visited the actual locations and discussed MAL's proposed plan to revive the slaughter facility, funded by the World Bank. 2) Notification letters and public notices were handed to a downstream residential area, a company, a school and pinned up at public spaces in Burns Creek and surrounding communities, to ensure people received clear information about the project. 3) Discussion was done with mostly individual representatives and recording their views regarding SIG's plan to revive the slaughter facility.

## **5. Comments and Responses**

Generally, the stakeholders, residences and communities (piggery farmers) have shown support for the implementation of the KGVI Slaughter House, supporting local piggery farmers and their productions. One of the stakeholders indicated that they are aware of this important project and assured to work close with MAL on the project. A well-known piggery farmer at the small-town community was glad to learn about the proposed slaughter facility. He is keen to learn more about ideas on the setting up of the bio-digester and the biogas systems. Also, he is interested to utilize the slurry as fertilizer for his piggery farm. Individuals including youths, farmers and community leaders consulted at most of these locations have shared similar views. The construction of the facility is a boost to our local piggery farmers which will help to enhance their level of productions. They are looking forward to working together with MAL in future consultation engagements in preparation for the construction and usage of the slaughter facility.

However, a few environmental and social issues had also been highlighted. The Principal of Perch Christian School had raised the importance of safety for her students. She said they have experiences with past projects like the construction of the SIFF Academy before the 2023 Pacific Games. School children were exposed to excess noise from machines, dusts and safety issues. The above threats were inevitable since the location of the school is at the frontage of the main High way. She said the school supports the project, however, would like to request MAL to consider the issues raised. In addition, the Lee Kwo Kwin residential area located downstream of the KGVI slaughter house project site also conversed on similar concerns. The operation of the facility may pose health risks to their homes through possible pollution activities. The residents wished to see MAL taking the necessary measures to minimize the likely impacts they will face, once the facility is operational.

Overall, there is wider public support towards the establishment of the slaughter house facility project to support local piggery farmers in the Burns Creek and surrounding communities and Solomon Islands.

## **6. Challenges**

A few challenges were faced during the consultation. The availability of project vehicle – due to the only vehicle available for SIART project staff to use, it has affected the timing of the officer to go out to the field. The consultation was conducted quite late in the afternoons, although booking had been done prior to the consultation dates. It delays the timing of the activity. Second challenge is bad weather. The first day of consultation was disturbed with heavy rain, thus, affected the flow of work on that day. The second day was fine and so managed to complete the consultation work.

## **7. Conclusion**

The two (2) days consultation was conducted successfully. Stakeholders and communities at nine (9) locations were identified and distributed with letters and public notices. During the consultations, it was communicated clearly that it is the intention of SIG through MAL to revive the KGVI slaughter facility as part of its plan, to increase meat (pork) productions from piggery farming in and around Honiara and Solomon Islands. The World Bank is the donor for the project. Positive feedbacks were received supporting the plan to rebuild the slaughter facility at the current location. On the other hand, views concerning environmental and social impacts anticipated from implementing the Slaughter House project were also highlighted. The likely affected persons requested MAL to consider appropriate mitigation measures to minimize impacts on their health and living environment.



**SOLOMON ISLANDS GOVERNMENT**

Date: 29 August 2024

## Public Notice

**To: Residents, communities, business houses & companies in and around the Agriculture KGVI farm area**

**From: Ministry of Agriculture and Livestock (MAL)**

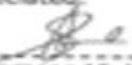
**Subject: Information to notify the public on the proposed construction of a pig slaughter facility at the Agriculture KGVI farm**

1. The Ministry of Agriculture and Livestock would like to inform you that development activities had been planned to re-establish the KGVI slaughter house purposely for slaughtering of pigs at the former Taiwanese farm.
2. MAL will operate the facility and may enter SIG – private partnership with any potential investor to operate the facility later
3. Capacity – estimated total of 20 pigs may be slaughtered per day
4. Solid waste will be treated in the bio-digester and biogas will be harvested. Slurry will be cleared and supplied to farmers for organic fertilizers. Some solid wastes will be taken to a designated area at the site for decomposing and used later as organic fertilizer.
5. Wastewater will be treated using a septic tank and soak away pit system so that minimal wastewater will be discharged into the nearby stream.
6. Some water quality samples will be collected for testing as the baseline to understand the current status of the Burns Creek stream.

We wish to thank you for your time to share the information with your members as we look forward for the establishment of the proposed development of the KGVI Agriculture slaughter facility, 2024/25.

The attached map shows the location of the proposed project site (in yellow) and the likely affected communities.

Your understanding and support towards the project is much appreciated.

  
-----  
Dr. Samson Visulu  
Permanent Secretary (PS)

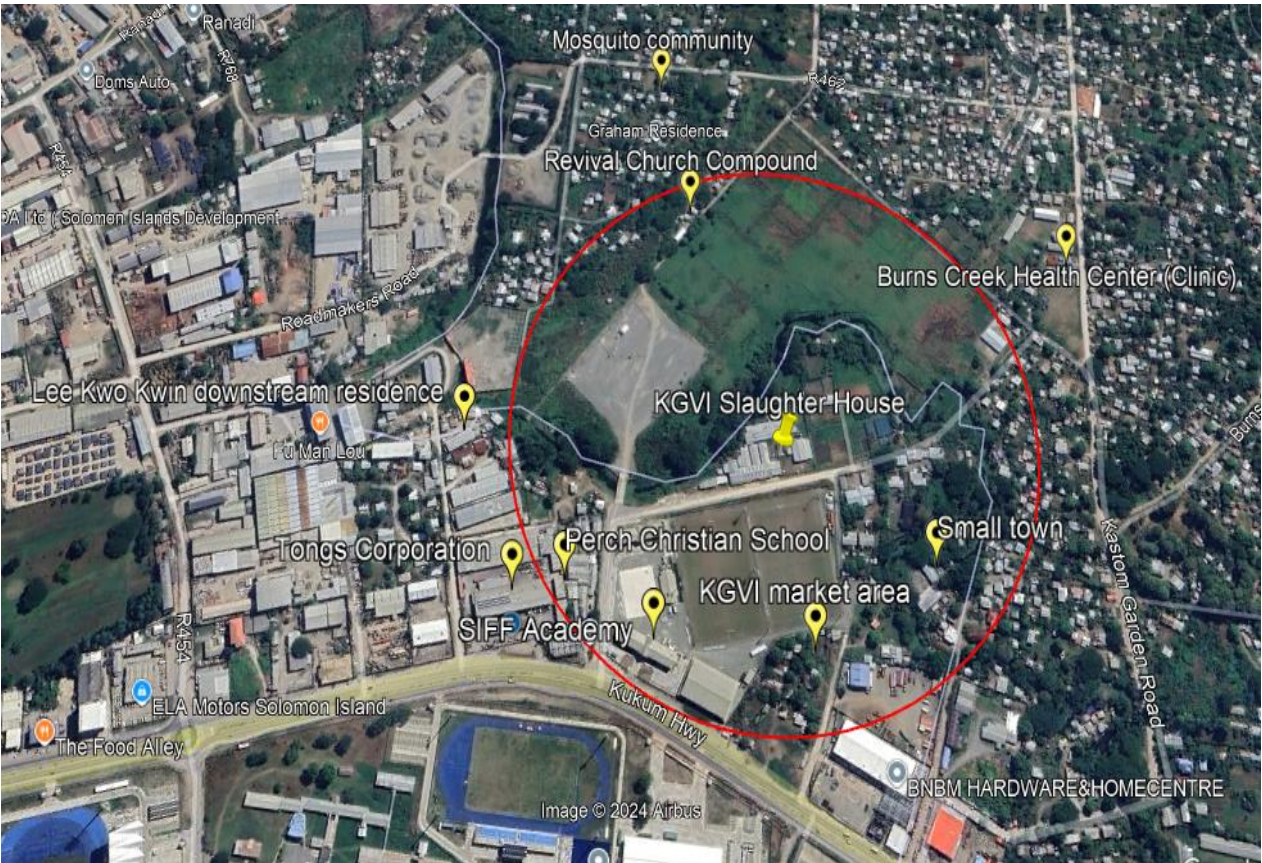
For enquiries please contact The Permanent Secretary, or The Deputy Secretary Corporate, on Phone: 22143/4/5.

**Attachment 2 – List of names and contacts of stakeholders and communities accessed during the consultation**

Location	Name	Description	Contact	Remarks
1	Perch Christian School	Few meters away from the KGVI stream, very close to the main highway, situated between Tongs Company and SIFF Academy	School Principal Contact (phone): 24257/24889/7514394	Exposed to effects of past projects, eg; Construction of current SIFF Academy which generated dust, noise and posed safety issues to the school and especially little children
2	SIFF Academy	Adjacent to the venue for the slaughter house facility	Contact Admin Officer: Alison Ramo, phone: 44166	SIFF already aware of the proposed project for the slaughter facility through a meeting with MAL few months ago
3	Tongs Corporation	A big fenced area not far from the slaughter house location at KGVI farm,	Contact Admin Officer: Margie Galo Phone: 38159	Support the consultation process in informing them about the proposed project
4	Lee Kwo Kin downstream residential area	Situated by the stream, retain wall erected to protect the homes	Contact Resident Waga, phone: 7728366	The whole residential area is highly exposed to impacts of the facility, support the consultation process
5	KGVI market & farm (residential area)	Opposite the facility, separated by the SIFF academy soccer field	Contact Lorina Taebo Phone: 7135919	Support the reviving of the project
6	Small town farming area	Within Burns Creek community	Contact: Paul Damari Phone: 7479528	A farmer who strongly supports the project
7	Burns Creek Health Center (Clinic)	Within Burns Creek Community	Contact: Elizabeth Liame (7215084)	Keen to know more about the project

8	Mosquito community	Within Burns Creek Community	Contact: Allen Idu 7642546	A youth leader who also support the Slaughter House project on behalf of their piggery farmers
9	Revival Church Compound	Part of Burns Creek Community	Contact: Fanly Robsin 7774375	A farmer who also engages in piggery farming

**Attachment 3 – Map of the consultation locations**



Attachment 4: Photos



Tongs Company



Perch Christian School



SIFF Academy



Lee Kwok Quen Residence



Burns creek Area Health Center



Small town farm (Burns Creek community)

Attachment 5: Participant List

COMMUNITY CONSULTATION FOR KGV1 SLAUGHTER HOUSE PROJECT

PARTICIPANTS LIST

Date: 04/09/24 Time: 1-5 pm Day: 1

#	Names	Male	Female	Contact	Remarks
1	Serahyn Iputu		✓	7514394	Perch School Principal (stakeholder)
2	Alison Ramo		✓	44166	Admin Officer, SIFF Academy (stakeholder)
3	Margie Gale		✓	38159	Admin Officer, Tonga Corporation (Business owner)
4	Philip Waga	✓		7728366	Lee Kwo Kwen resident
5	Lovina Taebo		✓	7135919	Farmer (mother)
6					
7					

COMMUNITY CONSULTATION FOR KGV1 SLAUGHTER HOUSE PROJECT

PARTICIPANTS LIST

Date: 05/09/24 Time: 2-6 pm Day: 2

#	Names	Male	Female	Contact	Remarks
1	Paul Namarii	✓		7479528	Piggery farmer (Supplier)
2	Elizabeth Liame		✓	7215084	Nurse In-charge of Burns Creek Health Centre
3	Athen Idri	✓		7692546	Farmer (youth leader)
4	Fauky Robsin	✓		7774375	Farmer
5					
6					
7					

## APPENDIX 10. MINUTES OF ESMP DISCLOSURE CONSULTATION

### Environmental and Social Management Plan (ESMP) Disclosure Consultation

**Date:** 19<sup>th</sup> December 2024

**Time:** 10:00 AM – 12:30 PM

**Location:** Research Office HQ, KGVI, West Honiara.

**Facilitator:** Environmental Safeguards Officer

**Attendees:** (see Attendance List for Names)

1. Environmental Safeguards Officer (Facilitator)
2. A Representative from Perch Integrated School
3. A Representative of local farmers and community members
4. Government officials
5. Project implementation team

Participant list

19 DECEMBER 2024

No.	Names	M	F	Status/Position	Remarks (Contact)
1	Solomon Yeo	✓		EP, Perch School	7988600
2	BEVERLYN RITA		✓	YP	7686145
3	JELINA HAI		✓	YP	7983914
4	Damus Saega		✓	HR/Admin	7567275
5	Hilda I. Wetha		✓	PRO/Research	7671005
6	Armsten Loto	✓		SRO/Research	7458482
7	Jerry Rufaoinae	✓		PRO/Research	7842267
8	Paul Danny	✓		FARMER	7479528
9	Obed-Maneang	✓		CLO/Livestock	7555879
10	Godfrey Hou	✓		SIART (PMU)	7214111
11	Simon Baete	✓		MAL	7131501
12	MARY AFUNA		✓	MAL RESEARCH	7765763
13	William Okokim	✓		SIART/MAL	7555151
14	Christella Alfred Njela		✓	YP	7293463
15	Steve See	✓		ESO - SIART	7169624
16					
17					
18					
19					

## Agenda

1. Welcome and Opening Remarks
2. Presentation of the ESMP by Environmental Safeguards Officer
3. Open Forum – Stakeholder Feedback and Concerns
4. Summary and Closing

## Discussion Details

### 1. Welcome and Opening Remarks

- The Environmental Safeguards Officer welcomed participants and provided an overview of the project, emphasizing the importance of stakeholder feedback in ensuring the successful implementation of the ESMP.

### 2. Presentation of the ESMP

- The Environmental Safeguards Officer presented the ESMP, explaining its key chapters, including environmental and social safeguards measures, risk mitigation strategies, and monitoring mechanisms.
- Participants were informed about specific actions to address environmental impacts, community safety, and operational protocols.

### 3. Stakeholder Feedback and Concerns

- **Support for the Project:** Participants expressed strong support for the revival of the slaughter facility, acknowledging its potential to enhance local livelihoods and boost agricultural revenue.
- **Perch Integrated School Concerns:**
  - A school representative raised concerns about safety risks for students, particularly those in primary classes.
  - Recommendations included requiring service trucks and dump trucks to reduce speed near the school to minimize dust, noise, and potential hazards.
- **Worker Induction Programs:** Stakeholders emphasized the need for contractors and workers to receive proper training on construction protocols and respecting community norms.
- **Community Engagement:** Participants appreciated the project's commitment to transparency and agreed that ongoing communication would be vital during implementation.

### 4. Summary and Closing

- The Environmental Safeguards Officer summarized the key points raised, assuring attendees that their feedback would be integrated into the project's implementation plan.

- Participants were thanked for their active involvement and were informed about the next steps in the project timeline.

#### **5. Action Points**

1. Incorporate speed limits and dust suppression measures for service trucks near Perch Integrated School.
2. Develop a worker induction program to address construction safety protocols and respect for local community norms.
3. Maintain regular engagement with stakeholders to address concerns during project implementation.

**Prepared by:**

Steve Sae

Environmental Safeguards Officer

SIART Project

## ANNEXES

### ANNEX 1: TENTATIVE OUTLINE OF HAZARDOUS MATERIAL MANAGEMENT PLAN

#### **Introduction**

This Hazardous Materials Management Plan (HazMP) should provide a brief sub-project overview and purpose and scope of the report particularly how the arrangements for the management of hazardous materials are set out at the sub-project site to prevent any negative impact on the environment or human health and safety

#### **Hazardous material storage**

All potentially hazardous materials are to be stored at a contained site and handled into bunded, hard stand i.e., concrete slab foundation, and shall be fully fenced. Specific hazardous substances such as fuel, lubricants and oil shall be stored in a self-bunded tank. The storage site will be properly fenced and identified in the proposed construction site or at a site agreed with the provincial authority.

You also need to provide the Material Safety Data Sheet (MSDS) for all your hazardous materials.

#### **Roles and Responsibilities**

This section should provide the necessary human resources to ensure that the organizational structure can work to implement this HazMP and achieve compliance with all relevant standards. A description of the key positions and their responsibilities for implementing this Plan are to be provided here.

#### **Emergency Preparedness Measures**

This section should have measures that will be implemented in order to prevent the sub-project site and infrastructure being exposed to risk (e.g., major fuel/oil leakage or spill). There should be detailed Emergency Procedure for this.

#### **Risk assessment and Management**

A risk assessment needs to be conducted to identify the project activities which might present a hazard or risk relating to the use of hazardous materials and their effects, and assess the potential impacts which may arise. A range of mitigation measures and management approaches need to be identified, to achieve a reduction in the initial perceived risk. The objective in implementing these measures and approaches is to reduce the level of residual risk to a lower (and acceptable) level.

#### **Monitoring, Reporting and Auditing**

The contractor shall carry out its own internal daily, weekly and monthly monitoring. Monitoring of storage, usage and disposal of potential hazardous materials substance. These need to be factored into the relevant contractor's monitoring checklists. The daily, weekly and monthly monitoring of hazardous materials/substances will be done by the contractor's ESO. You may to provide a detailed monitoring programme for emergency response if you want to.

The ESO will prepare monthly report and submit to Project Engineer who shall include a section of Safeguards report as part of monthly update report to the Project Engineer, on behalf of the Client (Ministry of Agriculture and Livestock). The report shall contain activities done for the monthly period, non-compliances and the rectification measures.

The contractor will be subject to internal and external audit. The internal audit will be conducted by the onsite team including the Site Engineer, Contractor's supervisor, and the ESO. The internal examinations performed by the onsite staff are referred to as inspections. External audits will be conducted by the Safeguards Specialist of the of the project support team of the World Bank.

### **Appendix**

There should be relevant annexes to be appended to this Plan.

## ANNEX 2: TENTATIVE OUTLINE OF WASTE MANAGEMENT PLAN

### **Responsibilities**

This section should show roles and responsibility of workers responsible for waste management

### **Approach to solid waste management**

This should involve Identification of solid waste types, risk assessment, waste management hierarchy, and solid waste management methods/actions

### **Approach to liquid waste management**

This should involve Identification of liquid waste types, and liquid waste management methods/actions

### **Material use and handling**

This section should show how the contractor will use and handle materials which can be classified as waste.

### **Monitoring**

Monitoring of the management of solid and liquid waste should form a key part of the monthly Safeguards Compliance report of the contractor. Checklist for waste management has been factored in the weekly monitoring/inspection Checklist in Appendix 7.

### **Communication and training**

Information on the Waste Management Plan should be communicated to all workers/employees of the contractor at the Project Induction and shall be discussed regularly at Pre-Start Meetings, Tool-Box Meetings or whenever a special meeting is convened for discussion on this topic.

The contractor's ESO will be the one spearheading the trainings and awareness for the workers regarding Waste management. The type of trainings that could be done for the workers to address the Waste Management Plan are:

- Waste Management Hierarchy
- Waste Management Strategies available
- Waste Handling
- Nature and significance of waste minimisation hierarchy
- Waste types, stream and characteristics
- Waste Management Plan
- Company requirements
- Occupational Health and Safety requirements

All these meetings should be recorded.

### **Appendix**

There should be relevant annexes to be appended to this Plan.

**Water Quality Assessment Report**

**6 September 2024**



**GO2 Consulting**  
*Where quality matters*

**Naha 2**  
**Honiara, Solomon Islands**  
**Tel: (+677) 7206478**

## 1. PROJECT DETAILS

Project Name	Solomon Islands Agriculture & Rural Transformation Project World Bank Project, P173043
Address	Ministry of Agriculture and Livestock Honiara, Solomon Islands
Purpose	Baseline Water Assessment of Burns Creek Stream, Lunga, Honiara
Date	28 August 2024

## 2. STUDY SITE

	Site 1	Site 2
GPS Coordinates	9°25'42.75"S 160°1'29.11"E	9°25'23.75"S 160°1'7.34"E
Altitude	4.04 m	1.65 m



Figure 1. Sampling points for sites 1 & 2



Figure 2. Sampling Point 1 - 85 meters upstream of the Burnscreek culvert



Figure 3. Sampling Point 2 - 25 meters downstream of the new PG bridge

### 3. METHODOLOGY

Duplicate water samples for sites 1 and 2 were collected on 27/08/2024 using US Environmental Protection Agency (EPA) Standard Operating Procedure. Samples were stored in sterile PTFE plastic bottles, packed in a chilled icebox (< 4°C) and were transported to the National Public Health Laboratory in Honiara for standard TSS and BOD analysis. Other parameters such as COD, P, and NH<sub>4</sub>-N were tested independently using EPA certified Hach TNT methods. The results were compiled and presented in this report.

### 4. WATER QUALITY RESULTS

Table 1. Water Quality Results for Sites 1 & 2

	Biochemical Oxygen Demand, BOD (mg/L)	Chemical Oxygen Demand, COD (mg/L)	Phosphorus, PO <sub>4</sub> -P (mg/L)	Ammonia, NH <sub>4</sub> -N (mg/L)	Total Suspended Solids, TSS (mg/L)
Site 1	54	7.6	<1.6	0.382	0.7
Site 2	52	6.4	<1.6	0.103	8.7
Method of Analysis	Respirometric Method 10099	TNT Method 821	TNT Method 846	TNT Method 830	APHA 2540-D TSS
Limit of Detection	0-700 mg/L	3-150 mg/L	1.6-30 mg/L	0.015 - 2.00 mg/L	0.01-2000 mg/L
WB/IFC EHS Guideline for Wastewater and Ambient Water Quality	30	125	2	1.5*	50

\* World Health Organization Guideline for drinking-water quality. (2022). 4<sup>th</sup> edn, pp 241.

### 5. ANALYSIS OF RESULTS

#### I. Site 1: Upstream

- BOD result of 54 mg/L exceeds the World Bank (WB) recommended levels of 30 mg/L for ambient waste water quality. This implies that the site is heavily polluted with direct waste water discharges possibly from municipal sources.
- COD levels of 7.6 mg/L is within WB standard of 125 mg/L.
- Phosphorus was not detected in site 1.
- Ammonia levels of 0.382 mg/L appears to be higher for site 1. However, the concentration still falls within the World Health Organization (WHO) recommended guideline of 1.5 mg/L.
- TSS levels of 0.7 mg/L is within the WB recommended standard of 50 mg/L.

#### II. Site 2: Downstream

- BOD readings of 52 mg/L for site 2 exceeds the WB water quality standard. However, the concentration is lower compared to site 1. This could be due to higher level of untreated sewage discharge from upstream which is broken down by microorganisms and used up by aquatic plants as it reaches site 2. In addition, communities

downstream may have proper sanitation facilities compared to those living upstream. The results indicate a slight variation of 2 mg/L between each site.

- COD levels of 6.4 mg/L is lower than readings from site 1. The results however are within the recommended WB water quality standard. The low levels of COD indicate low levels of organic chemical pollutants in the water body.
- Phosphorus was not detected in site 1. The low levels of phosphorus in both sites imply there is limited chemical discharge from industrial pollutants such as detergents or cleaning agents into the water body. Any excess phosphorus produced from agriculture runoffs may have been used up as nutrients by aquatic plants.
- Ammonia levels of 0.103 mg/L is reportedly lower for site 1. However, the concentration still falls within the WHO recommended guideline of 1.5 mg/L. As with BOD, site 1 appears to contain higher amounts of organic pollutants when compared to site 2.
- TSS levels of 8.7 mg/L is within the WB recommended standard of 50 mg/L. The higher levels of suspended particles in site 2 implies there is considerable natural or human interferences through farming practices, development or construction work which elevates the level of soil particles, algae, and microscopic organisms in the water body.

## 6. CONCLUSION

A baseline water quality assessment of Burns creek stream was conducted 27/08/2024. Samples were collected and analyzed independently for five different water quality parameters. All results fell within the World Bank and World Health Organization water quality guidelines except for Biochemical Oxygen Demand (BOD) with concentration exceeding by almost twice that of the limits provided WB guideline. The analytical results from BOD, COD and Ammonia levels indicate that Site 1 (upstream) is more polluted from organic sources such as sewage discharges. While TSS readings revealed that Site 2 (downstream) has a higher amount of suspended solid particles possibly due to increased human induced interferences downstream. A frequent water quality monitoring program is recommended to assess any changes in biochemical pollutants during redevelopment of the slaughterhouse facility.

## 7. SUPPLEMENTARY INFORMATION

### A. Definitions

- **Biochemical oxygen demand (BOD)**  
The amount of oxygen required to breakdown the pollutants, biologically with microorganisms. High levels of BOD can deplete dissolved oxygen in the water which is detrimental to aquatic life.
- **Chemical Oxygen Demand (COD)**  
The amount of Dissolved Oxygen (DO) that must be present in water to chemically break down organic pollutants. High levels of COD result in lower DO which can be stressful for ecological health.
- **Phosphorus**  
A critical nutrient of life which usually exists as phosphate molecule in water bodies. Sources of phosphate include soil, rocks, agricultural runoffs from fertilizer, waste treatment plants, detergents, cleaning products and sewage discharges. High levels of phosphorus may lead to eutrophication and algal blooms in water bodies.
- **Ammonia**  
Ammonia is a soluble gaseous compound formed naturally as a product of the microbiological decay of nitrogenous organic matter. The presence of ammonia in ground water indicates pollution. Excess ammonia can damage vegetation and is incredibly toxic to aquatic life, especially at elevated pH and temperature levels.
- **Total Suspended Solids (TSS)**  
TSS is the concentration of suspended particles, which include soil particles (clay, silt, organic matter), algae, and microscopic organisms<sup>1</sup> in the water body that are larger than two microns in size. TSS is an important indicator of water pollution from natural sources, urban run-off, municipal and industrial waste, chemicals used in treating water and the actual plumbing infrastructure. High levels of total suspended solids can affect turbidity, increase water temperatures and decrease dissolved oxygen (DO) levels. This can cause the water to heat up more rapidly because the suspended particles absorb more heat and deplete oxygen, which can adversely affect aquatic life.

**B. Laboratory Analysis Report**



**National Public Health Laboratory (NPHL)**

P.O. Box 349, Honiara, Solomon Islands.

Telephone: (677) 38171

Test Report No: **CTR 76 / 24**

Page 1 of 1

**CHEMISTRY TEST REPORT**

<b>Job Number: J2468</b>	Customer: Solomon Islands Agriculture & Rural Transformation Project World Bank, Ministry Of Agriculture & Live Stock	Date of Issue: 2 / 06 / 24
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Description of goods : Environmental Water  
Customer Product Code : NA

Destination : Customer      Number of samples: 2  
Dateline received : 27 / 08 / 24, 1:00 pm      Dateline tested : 28 / 08 / 24, 12:30 pm

Part A		Physical & Chemical Tests		
Ser No.	Sample No.	Sample ID	Physical	Chemical
			Total Suspended Solids (mg/l)	Biochemical Oxygen Demand (mg/l)
1	J2468-1	Site 1	0.7	54
2	J2468-2	Site 2	8.7	52

Results apply to samples as received.  
Results in bold indicate the exceedance of the WHO drinking water guidelines for drinking water.  
Results not in bold indicate that the parameters fall within the WHO drinking water guidelines for acceptable drinking water.

The table below shows the relevant recommended World Health Organization (WHO) drinking water quality guidelines and analytical methods used in producing this report:

Parameter	WHO Guideline Value	Analytical Method
Total Suspended Solids (mg/l)	5	Gravimetric
Biochemical Oxygen Demand (mg/l)	5	5000ml

Authorised by: Oliver Lukos (Ag)  
Signature: *[Signature]*  
Soilion Head, Chemistry

Released by: *[Signature]* (Ag)  
Signature: *[Signature]*  
Director



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## ANNEX 4: SOLID AND LIQUID WASTE MANAGEMENT PLAN FOR THE OPERATION OF THE PIG BREEDING AND SLAUGHTER FACILITY

**Objective:** To ensure effective, sustainable, and environmentally sound management of solid and liquid wastes generated during the operation of the pig breeding and slaughter facilities. The plan aims to minimize pollution, enhance resource recovery, and safeguard public health and the environment.

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### 1. Solid Waste Management

#### Sources of Solid Waste:

- **Pig Breeding Facility:** Manure, bedding materials (straw), feed leftovers, and deceased animals.
- **Slaughter Facility:** Offal, bones, hair, hooves, carcass trimmings, and packaging materials.

#### Management Measures:

- **Waste Segregation:** Solid wastes will be categorized into organic (manure, offal) and inorganic (packaging, plastic materials). Segregation will be done at source to allow for appropriate treatment and disposal.
- **Composting of Organic Waste:** Manure, straw, and biodegradable waste from slaughter operations (e.g., offal, blood) will be collected in designated bins and sent to composting facilities. The compost can be reused as fertilizer for surrounding farms.
- **Animal Mortality Management:** Dead pigs will be disposed of using a designated **burial pit** or incinerated in an animal crematory. Strict protocols will be followed to prevent disease spread.
- **Recycling:** Non-biodegradable materials such as packaging and plastics will be sorted and sent to recycling facilities where possible.
- **Hazardous Waste Handling:** Any hazardous waste, such as expired veterinary medicines, will be stored in marked containers and handed over to licensed waste contractors for safe disposal.

#### Monitoring and Reporting:

- Regular inspections of waste segregation, composting activities, and storage areas.
- Monthly reports on waste generation volumes and disposal methods.
- MAL will hire or employ a competent person to be responsible for monitoring and reporting (TOR in annex 10).

---

### 2. Liquid Waste Management

### Sources of Liquid Waste:

- **Pig Breeding Facility:** Manure slurry, wash water from pens, and urine.
- **Slaughter Facility:** Blood, wash water, and wastewater from cleaning carcasses and equipment.

### Management Measures:

- **Septic Tank and Soakaway System:** Wastewater from the pig breeding and slaughter operations will be channelled into a septic tank for primary treatment, where solids will settle and the liquid will flow to a soakaway pit for further percolation and absorption into the soil. The system will be monitored regularly to ensure proper functioning.
- **Regular Desludging of Septic Tank:** The septic tank will be desludged every 12 months to prevent overflow and contamination of nearby water bodies.
- **Wastewater Treatment for Slaughterhouse Effluent:** Blood and other effluents from the slaughterhouse will be treated before discharge into the septic system. Pre-treatment mechanisms, such as blood being collected separately and handed over to farmers as incentive which they will use as food or for pig feed/meal, screening for solids, installed at inlet to prevent clogging of the septic tank.
- **Zero Discharge to Water Bodies:** No untreated liquid waste will be discharged directly into nearby stream or watercourse. Instead, it will pass through treatment systems to reduce its environmental impact.
- **Effluent Monitoring:** Regular monitoring of effluent quality (e.g., BOD, COD, TSS, pathogens) to ensure compliance with regulatory standards.

### Monitoring and Reporting:

- Monthly water quality checks (including pH, BOD, COD) at the outflow from the septic tank and soakaway.
- Annual inspection of the septic tank and soakaway to ensure structural integrity and functionality.

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## 3. Contingency Measures

- **Spill Response Plan:** In case of accidental spills of liquid waste, immediate containment, clean-up, and treatment procedures will be implemented.
- **Emergency Waste Disposal:** If the septic or soakaway system fails, alternative temporary containment measures will be used until repairs are completed.

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## 4. Training and Awareness

- All workers at the facility will undergo regular training on proper waste segregation, disposal practices, and emergency response to ensure compliance with the waste management plan.

**Responsibilities:**

- **Environmental Officer:** Oversees the implementation of the waste management plan, conducts training, and reports any issues.
  - **Site Supervisor:** Ensures daily operational compliance and manages contractors responsible for waste disposal.
- 

By implementing this Solid and Liquid Waste Management Plan, the facility will minimize its environmental footprint, protect surrounding water bodies from contamination, and contribute to a cleaner, safer working environment. This Plan will be reviewed on a yearly basis.

## ANNEX 5: HEALTH AND SAFETY/BIO-SECURITY PLAN FOR PIGS AT THE KGVI FACILITY DURING CONSTRUCTION/RENOVATION STAGE

Given the live pigs currently housed at the KGVI pig breeding facility, the following health and safety/biosecurity measures will be implemented to prevent contamination risks, including viruses potentially brought in by construction workers during renovation activities.

### 1. Biosecurity Measures

**Objective:** Minimize the risk of disease transmission between construction workers and pigs.

- **Controlled Access:** Only essential personnel will be allowed into the pig breeding area. Workers involved in renovation will not be allowed direct access to areas housing pigs unless absolutely necessary.
- **Footwear and Clothing Protocols:** Workers entering the pig breeding facility must change into designated clean clothing and footwear before entering the area. This reduces the risk of carrying contaminants into the pig breeding environment.
- **Hand Hygiene:** Workers must sanitize their hands thoroughly before entering the breeding facility. Disinfection stations will be established at entry points for this purpose.
- **Disinfection of Equipment:** Any tools or equipment used in the pig breeding facility or adjacent areas must be thoroughly disinfected before entering or exiting the facility to prevent any cross-contamination.

### 2. Health Monitoring and Screening

- **Health Screening of Workers:** Workers will undergo regular health checks to ensure they are not carrying any diseases that could infect the pigs. Workers showing any signs of illness will not be allowed to work near the pig facility.
- **Regular Pig Health Monitoring:** Routine health assessments of the pigs will be conducted by qualified veterinary staff to detect any early signs of illness. If contamination is suspected, immediate isolation measures and veterinary intervention will be initiated.

### 3. Site-Specific Controls

- **Separation of Work Areas:** Clear separation will be maintained between construction zones and pig housing areas to minimize dust, noise, and potential contamination.
- **Protective Barriers:** Temporary barriers, such as plastic sheeting or fencing, will be erected to physically separate the renovation activities from the breeding facility to prevent accidental entry of workers or materials into the pig area.
- **Waste Management:** Waste generated from renovation activities (e.g., construction debris, dust) will be managed carefully to prevent it from reaching the pig housing area. Proper disposal will be enforced to avoid biosecurity breaches.

### 4. Worker Training and Awareness

- **Biosecurity Training:** All workers involved in the renovation will receive training on biosecurity protocols, emphasizing the importance of preventing disease transmission to pigs.
- **Code of Conduct:** A clear worker code of conduct will be implemented in line with the Labour Management Plan (LMP) and Solomon Islands' national labor law. This will include strict guidelines on worker behavior around the breeding facility to reduce the risk of contamination.

## 5. Emergency Response Procedures

- **Disease Outbreak Plan:** In case of any suspected contamination or disease outbreak among pigs, an emergency response plan will be activated. This includes immediate isolation of affected animals, contacting veterinary services, and halting renovation work in the vicinity until the issue is resolved.

This plan ensures that health and safety protocols are prioritized during the renovation process while protecting the welfare of the live pigs at the KGVI facility. By enforcing biosecurity and hygiene measures, the risk of contamination from workers is minimized.

## ANNEX 6: EMERGENCY RESPONSE PLAN FOR KGVI FACILITY (PIG BREEDING AND SLAUGHTER FACILITY)

This Emergency Response Plan is designed to address potential hazards, accidents, and disease outbreaks at the KGVI Pig Breeding and Slaughter Facility. The plan aims to protect workers, animals, and the environment, ensuring quick and coordinated responses to minimize impacts.

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### 1. Natural Hazards

#### Potential Hazards:

- Earthquakes
- Flooding
- Severe storms

#### Response Actions:

- **Evacuation Plan:** Designated evacuation routes for workers and safe areas for pigs will be established. All personnel will be trained in evacuation procedures.
  - **Structural Safety Inspections:** Post-earthquake or storm assessments of all buildings (e.g., pig pens, slaughter facility) will be conducted to identify structural damages.
  - **Pig Safety:** If there is time before a natural hazard event, pigs will be moved to higher ground or sheltered areas. In case of flooding, drainage systems will be inspected to ensure water is diverted from the pig pens.
- 

### 2. Accidents and Injuries

#### Potential Incidents:

- Worker injuries (e.g., slips, trips, falls)
- Machinery/equipment malfunctions
- Fire hazards during construction or operation

#### Response Actions:

- **First Aid:** On-site first aid kits will be available, and personnel trained in basic first aid will be stationed at the facility. Immediate medical assistance will be sought for serious injuries.
  - **Emergency Drills:** Regular fire and safety drills will be conducted to prepare workers for rapid evacuation and emergency response.
  - **Fire Safety:** Fire extinguishers and fire suppression systems will be installed and inspected regularly. Flammable materials will be properly stored.
-

- **Incident Reporting:** All accidents will be documented, and corrective measures implemented to prevent recurrence.
- 

### 3. Disease Outbreak in Pigs

#### Potential Risks:

- Contamination or viral/bacterial disease transmission affecting pig health
- Spread of zoonotic diseases (i.e., diseases that can transfer from pigs to humans)

#### Response Actions:

- **Immediate Isolation:** Any pig suspected of illness will be isolated from the main herd to prevent the spread of disease.
  - **Veterinary Intervention:** A qualified veterinarian will be contacted immediately to assess and treat affected pigs.
  - **Facility Quarantine:** In the case of a suspected outbreak, the entire facility will be quarantined to prevent the spread of the disease.
  - **Sanitation:** Biosecurity protocols (e.g., disinfection stations, personal protective equipment) will be reinforced. All areas in contact with affected pigs will be sanitized thoroughly.
  - **Animal Welfare:** The health of unaffected pigs will be monitored daily, and additional measures (such as enhanced cleaning and sterilization) will be implemented.
- 

### 4. Coordination and Communication

#### Roles and Responsibilities:

- **Emergency Coordinator:** The facility manager or assigned personnel will act as the Emergency Coordinator, responsible for overseeing all responses.
  - **Communication:** All workers and relevant authorities (e.g., veterinary services, local emergency services) will be informed immediately of any hazard, accident, or outbreak.
  - **Worker Training:** All workers will receive training in emergency procedures, including how to respond to natural hazards, accidents, and disease outbreaks.
- 

### 5. Emergency Contact Information

A list of emergency contacts (local health services, veterinary services, fire department, etc.) will be maintained at prominent locations throughout the facility to ensure rapid communication in case of an emergency.

This Emergency Response Plan aims to ensure that the KGVI Facility remains safe and that both the workers and pigs are protected from potential hazards, accidents, or disease outbreaks

## ANNEX 7: ENVIRONMENTAL AND SOCIAL, AND HEALTH AND SAFETY AUDIT

### Environmental and Social Risk and Health & Safety Audit

**For:** KGI Anaerobic Digester Facility

**Date:** 25<sup>th</sup> October 2024

**Prepared by:** Steve Sae

---

#### 1. Introduction

This audit examines the current environmental and social risks, as well as health and safety concerns associated with the non-operational anaerobic digester at the KGI facility. The facility was previously used to treat solid waste from the pig breeding facility but has not been functional for the past six years, following the departure of the Taiwanese Technical Mission (TTM).

#### 2. Objective

- Assess the environmental impacts caused by the non-functional digester.
- Identify social risks that might affect the surrounding communities or facility workers.
- Review health and safety risks posed by the current condition of the facility.
- Provide recommendations for risk mitigation and potential rehabilitation or decommissioning of the digester.

#### 3. Scope of the Audit

- **Location:** KGI Facility, West Honiara.
  - **Facility Overview:** Anaerobic digester used for pig waste treatment (currently non-functional).
  - **Timeframe:** Non-functional since the Taiwanese Technical Mission left six years ago.
  - **Area Covered:** Environmental, social, and health and safety aspects.
- 

#### 4. Environmental Risks

##### 4.1. Waste Accumulation

- **Observation:** The non-functional digester may result in untreated solid waste being accumulated or stored improperly.
- **Risks:**
  - **Water Contamination:** Leakage from waste storage can seep into groundwater or nearby surface water body, the Burns Creek stream. The water quality was tested and results show that the stream is polluted mainly due to high organic and inorganic

compounds due to other human related activities along the stream. See result in Annex 3 of the ESMP.

- **Soil Contamination:** Overflow or spills from waste storage can lead to nutrient buildup and contamination of the soil.
- **Air Quality Impact:** If not managed, organic waste can emit methane and other gases, contributing to greenhouse gas emissions and unpleasant odors.

#### 4.2. Biogas Leakage

- **Observation:** The digester may have residual gas trapped inside, which could slowly leak over time.
- **Risks:**
  - **Greenhouse Gas Emission:** Methane is a potent greenhouse gas that can have a significant environmental impact. However, this is expected to be in small volume.
  - **Odor Issues:** Residual gases may lead to localized odor problems, affecting nearby workers or communities.

#### 4.3. Structural Integrity

- **Observation:** The structure of the digester may have deteriorated due to a lack of maintenance.
  - **Risks:**
    - **Potential for Spills:** A weakened digester structure could lead to future containment failures and possible environmental contamination.
    - **Leakage:** Cracks or damage to pipes or digester could allow untreated waste or gas to escape, impacting the surrounding environment.
- 

### 5. Social Risks

#### 5.1. Impact on Nearby Communities

- **Observation:** The non-functional state of the digester may pose risks to nearby communities, especially in relation to odors, contamination, or poor waste management practices.
- **Risks:**
  - **Health Concerns:** Odors, potential leakage, and gas emissions can affect air quality, posing respiratory issues for nearby residents.
  - **Community Perception:** Communities might perceive the inactive facility as a source of environmental degradation, leading to complaints or opposition to future facility operations.

#### 5.2. Worker Exposure

- **Observation:** Any workers at the facility may be exposed to risks due to the poor condition of the digester.
  - **Risks:**
    - **Health and Safety:** Workers may be exposed to toxic gases, improper waste management conditions, or physical dangers if maintenance or clean-up activities are not properly planned.
- 

## 6. Health and Safety Risks

### 6.1. Biogas Explosion or Fire Hazards

- **Observation:** Biogas (methane) trapped inside the inactive digester or associated piping may pose an explosion or fire hazard.
- **Risks:**
  - **Explosion Risk:** Methane is highly flammable, and if proper ventilation is lacking, the buildup of gases could pose a risk of explosion.
  - **Fire Hazards:** If any ignition sources are present (such as faulty electrical wiring or equipment), there could be a risk of fire.

### 6.2. Structural Deterioration

- **Observation:** Over time, structural deterioration may compromise the safety of the facility.
- **Risks:**
  - **Collapse or Equipment Failure:** Aging structural elements (such as digester and pipe) may fail, leading to accidents or hazardous spills.
  - **Physical Harm to Workers:** Workers who are unaware of the structural weaknesses may face physical injury or equipment failure.

### 6.3. Odor and Air Quality Hazards

- **Observation:** Uncontrolled gas emissions and untreated waste can lead to odor problems and potentially harmful air quality.
- **Risks:**
  - **Respiratory Issues:** Exposure to foul odors, hydrogen sulfide, or other gases can lead to short-term or long-term respiratory issues for workers or nearby residents.
  - **Discomfort and Reduced Productivity:** Persistent odors can make the working environment unpleasant, reducing worker efficiency and comfort.

### 6.4. Handling of Solid Waste

- **Observation:** If solid waste from the facility has not been managed properly, workers may face exposure to hazardous materials during clean-up or rehabilitation.
  - **Risks:**
    - **Biohazard Exposure:** Waste from the pig breeding facility may carry pathogens or contaminants that pose a biohazard.
    - **Inadequate Protective Measures:** Without proper personal protective equipment (PPE), workers may be at risk when handling or disposing of waste.
- 

## 7. Recommendations

### 7.1. Environmental Recommendations

- **Waste Management Plan:** Develop a comprehensive waste management plan for proper storage and disposal of accumulated solid waste.
- **Biogas Monitoring:** Test for any residual gas in the digester and associated pipelines. Install gas monitoring systems if rehabilitation is considered.
- **Leakage Prevention:** Inspect the structure for potential leaks and cracks. Repair or upgrade as necessary.

### 7.2. Social Recommendations

- **Community Engagement:** Conduct consultations with nearby communities to address their concerns, particularly regarding odors or potential environmental impacts.
- **Social Risk Management:** Provide clear communication about the rehabilitation or decommissioning plans to improve community confidence in the project.

### 7.3. Health and Safety Recommendations

- **Risk Assessment for Workers:** Conduct a detailed risk assessment of the facility's structural integrity and develop appropriate safety protocols.
  - **PPE for Workers:** Ensure that all workers have adequate personal protective equipment (PPE) when handling hazardous materials or operating in unsafe conditions.
  - **Gas Ventilation System:** Install or repair gas ventilation systems to mitigate explosion risks. Consider biogas flaring as an alternative to contain gas build-up.
  - **Structural Assessment:** Perform a full structural assessment of the digester and pipes. If deemed unsafe, either rehabilitate the structure or proceed with safe decommissioning.
- 

## 8. Conclusion

The KGVI anaerobic digester poses environmental, social, and health and safety risks due to its current non-operational state. Immediate action is needed to assess structural integrity, manage waste, and mitigate potential hazards to both workers and nearby communities. This audit provides a foundation for further decision-making regarding the rehabilitation or safe decommissioning of the facility.

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*This audit highlights the key areas of concern and outlines the necessary steps to address risks associated with the inactive anaerobic digester.*

## ANNEX 8: EMERGENCY RESPONSE PLAN FOR ANAEROBIC DIGESTER AT KGI FACILITY

### Emergency Response Plan for Anaerobic Digester at KGI Facility

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**Location:** KGI Facility, Solomon Islands

**Prepared by:** Steve Sae

**Date:** 25<sup>th</sup> October 2024

**Contact Information:**

#### Local Emergency Services and Hotline:

<b>Police</b>	<b>999</b>
<b>Fire</b>	<b>988</b>
<b>Ambulance and Hospital</b>	<b>111</b>
<b>National Disaster and Disease</b>	<b>955</b>

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### 1. Emergency Scenarios

This emergency response plan covers the following potential incidents involving the anaerobic digester at the KGI Facility:

- **Gas Leak or Explosion:** Methane and hydrogen sulfide (H<sub>2</sub>S) gas leaks or explosions.
  - **Structural Failure:** Collapse of the digester structure.
  - **Waste Spill:** Leakage or overflow of untreated slurry, leading to environmental contamination.
  - **Fire:** Ignition of gases or other flammable materials near the digester.
- 

### 2. Response Procedures

#### 2.1 Gas Leak or Explosion

- **Immediate Action:**
    - **Evacuate** all personnel from the immediate area.
    - **Avoid** using electrical equipment or open flames.
    - **The area** is situated in an open space; hence, ventilation is not an issue.
-

- **Shut off gas supply** valves if trained to do so.
- Alert nearby workers using alarms or loud signals.
- **Contact:**
  - Call emergency services on toll free numbers provided above.
  - Notify the site supervisor.
- **Post-Evacuation:**
  - Await the arrival of emergency personnel. Only trained professionals should attempt to fix the leak.
  - Once the situation is resolved, perform gas monitoring before resuming operations.

## 2.2 Structural Failure

- **Immediate Action:**
  - **Evacuate** all personnel from the area if the digester tank or any structural components show signs of collapse.
  - Set up a **safe perimeter** around the affected area to prevent access.
- **Contact:**
  - Notify the site supervisor and maintenance team.
  - Contact engineering or structural experts for inspection and repairs.
- **Post-Evacuation:**
  - Do not re-enter the area until the structure has been inspected and declared safe.

## 2.3 Waste Spill

- **Immediate Action:**
  - **Contain** the spill using sandbags, barriers, or available materials to prevent waste from spreading to uncontaminated areas.
  - Wear **protective equipment** (gloves, masks, etc.) when handling waste.
- **Contact:**
  - Notify the National Disaster response team at toll free number 955, of the spill immediately.
  - Report the spill to Environmental and Conservation Division (ECD) if contamination of soil or water occurs.
- **Clean-up:**

- Clean up using appropriate waste management protocols, including transferring spilled material to storage or disposal facilities.

## 2.4 Fire

- **Immediate Action:**
    - Activate the **fire alarm** and evacuate the area.
    - Use **fire extinguishers** (CO<sub>2</sub> or foam) if the fire is small and manageable, and you are trained to do so.
    - Do not use water on a gas fire.
  - **Contact:**
    - Call the local fire department: Toll free number 988 (see table above)
    - Notify the site supervisor.
  - **Post-Fire:**
    - Await the fire department's clearance before attempting any repairs or re-entering the area.
- 

## 3. Evacuation Plan

- **Evacuation Routes:** Identify and mark all exit routes from the facility.
- **Assembly Point:** See Map
- **Accountability:** Ensure all workers report to the assembly point for a headcount.

### Emergency Escape Route and Assembly Point



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#### 4. Emergency Contacts

- **Site Supervisor:** [Name, Phone Number]
- **Emergency Services:** See Table above

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#### 5. Post-Emergency Actions

- Conduct a full investigation into the cause of the incident.
- Ensure repairs and safety measures are completed before resuming normal operations.
- Update safety procedures and provide additional training if necessary.

## ANNEX 9: WASTE MANAGEMENT PLAN FOR SEPTIC TANK SLUDGE REMOVAL

### Waste Management Plan for Septic Tank Sludge Removal and Composting at KGVF Pig Breeding Facility

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#### 1. Project Overview

- **Objective:** Safely remove and compost organic sludge that has been sitting in a 3m x 2m septic tank for over five years, converting it into organic fertilizer.
  - **Facility:** KGVF Pig Breeding Facility.
  - **Tank Location:** Septic tank of dimensions 3 meters by 2 meters.
- 

#### 2. Waste Characterization and Preliminary Assessment

- **Waste Type:** Organic sludge with soil-like consistency due to extended storage.
  - **Volume Estimation:** Calculate the tank's volume to assess sludge quantity (3m x 2m with assumed 1.5m depth yields approximately 9 cubic meters).
  - **Composition:** Nutrient-rich organic material with potential pathogen presence, needing stabilization through composting.
- 

#### 3. Waste Removal Process

##### 1. Safety and PPE:

- Equip workers with PPE, including gloves, masks, boots, and coveralls, due to the confined space and possible microbial hazards.
- Conduct a safety briefing on confined space entry and handling of potentially pathogenic materials.

##### 2. Pump Out and Manual Removal:

- Use a sludge pump to extract the sludge. If it has thickened, assist with manual removal using shovels and other hand tools.
- Place the removed material into sealable containers for transport to the composting area.

##### 3. Confined Space Safety Measures:

- Implement confined space entry protocols: ensure proper ventilation in the tank and use a gas monitor to detect hazardous gases before and during entry.

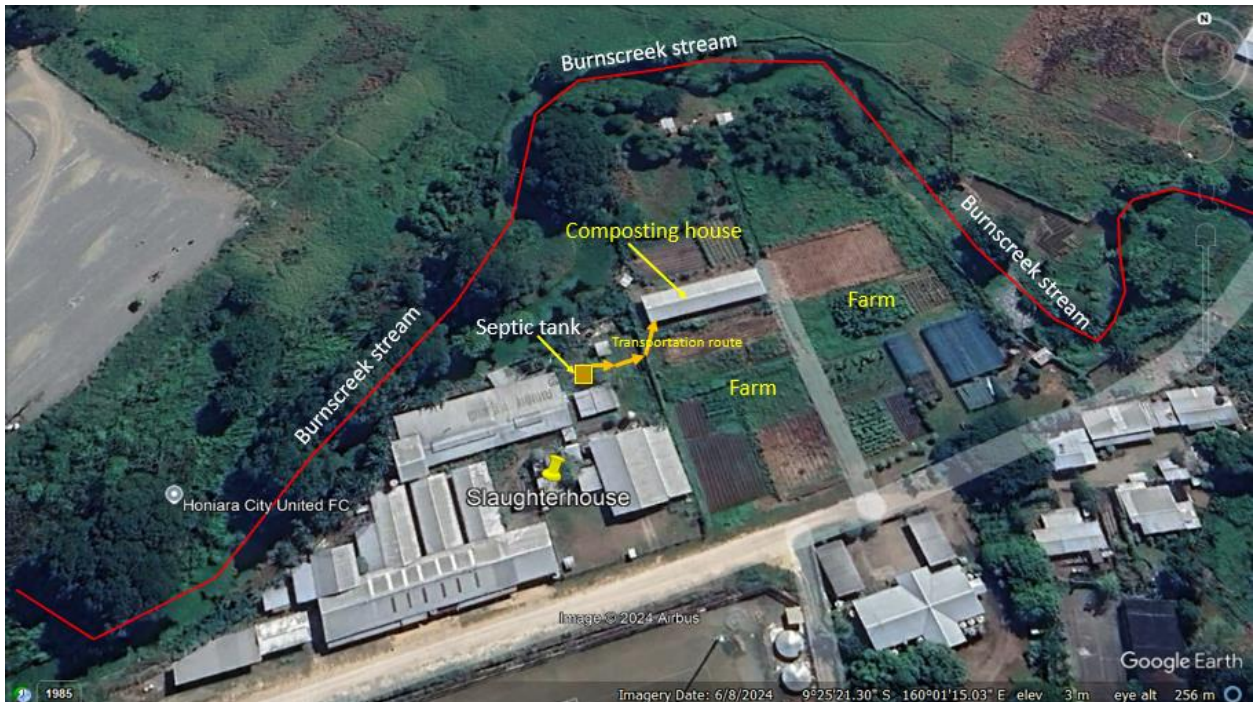
- Use a harness and safety line for personnel entering the tank, supervised by an external observer trained in confined space procedures.

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#### 4. Transport to Composting Site

- Transport sludge in sealed containers to a designated composting area close to the facility to minimize transit risks. See Map below.
- Ensure transport pathways are clear and secured to prevent accidental spills.

##### Location of septic tank, composting house and transport route



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#### 5. Composting Process

##### 1. Composting Site Preparation:

- Select a location with proper drainage, away from water sources and residential areas, to set up a composting pad.
- Create a gravel bed or line the pad with an impermeable layer to manage leachate.

##### 2. Composting Pile Setup:

- Form compost piles by layering sludge with high-carbon materials like straw, sawdust, or wood chips. This improves aeration and balances the C ratio.
- Aim for a C ratio of 25–30:1 for optimal composting efficiency.

### 3. **Aeration and Regular Turning:**

- Turn the compost piles every 2-3 weeks to maintain aerobic conditions, essential for breakdown.
- Monitor and adjust moisture levels, aiming for 50–60% moisture. Add water as needed, or cover piles during rain to prevent excess moisture.

### 4. **Temperature and Pathogen Control:**

- Track internal pile temperature, maintaining it at 55–65°C for at least three consecutive days to neutralize pathogens.
- Regularly test pH and temperature as indicators of composting progress.

### 5. **Composting Duration:**

- Composting should take 3-6 months. The compost is ready when it turns dark brown, cools, and has an earthy smell.

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## 6. **Environmental and Social Safeguards**

- **Leachate Management:** Control leachate flow to prevent contamination. Consider a leachate collection system if high volumes are anticipated.
- **Odor and Dust Control:** Regularly turn the pile to minimize odor. Use dust suppression methods, like light watering, if necessary.
- **Community Engagement:** Notify nearby residents about the composting process, emphasizing odor control measures and composting benefits.

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## 7. **Final Use of Compost**

### 1. **Quality Testing:**

- Conduct quality tests for nutrient levels and ensure pathogen-free compost before application.

### 2. **Application as Organic Fertilizer:**

- Apply the compost around crops or landscaping areas within the KGVl facility or offer it to local farmers as an organic fertilizer.

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## 8. **Health and Safety Measures**

- **Training:** Provide safety training on handling sludge, confined space entry, and composting.
- **PPE Compliance:** Enforce the use of PPE during sludge removal and composting.

- **Emergency Response Plan:** Have a plan in place for incidents such as accidental spills, equipment failure, or health emergencies during sludge removal (similar process covered in Annex 6 and 8 will be followed).
- 

## 9. Documentation and Reporting

- Maintain records of sludge volumes removed, composting process details, temperature and moisture monitoring, and quality test results for the compost.
  - Compile a report on sludge removal and composting outcomes for record-keeping and future reference.
- 

## 10. Responsible Parties

- **SIART PMU Environmental Safeguard Officer:** Oversee the waste removal, composting operations, and monitoring to ensure compliance with environmental standards.
  - **Contractor's Health and Safety Officer:** Manage confined space entry, enforce safety measures, and provide emergency response support.
- 

*This plan is designed to safely remove and repurpose the sludge as organic fertilizer, transforming a waste product into a resource that benefits the facility and local agriculture.*

## ANNEX 10: TERMS OF REFERENCE (TOR) FOR ENVIRONMENTAL CONSULTANT

**Project Title:**

Environmental Monitoring and Health & Safety Audits for the KGVI Slaughter and Pig Breeding Facilities

**Client:**

Ministry of Agriculture and Livestock (MAL)

**Contract Type:**

Quarterly Engagement

**Duration:**

One-year contract with quarterly reviews and renewal based on performance.

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**1. Background**

The KGVI Slaughter and Pig Breeding Facilities under MAL require regular environmental and health and safety monitoring to ensure compliance with regulatory standards, protect worker health, and mitigate environmental impact. This consultancy will support MAL by performing quarterly water quality assessments and comprehensive environmental, health, and safety (EHS) audits. These audits will provide actionable recommendations and quarterly reports to aid in improving facility sustainability and safety.

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**2. Objective of the Consultancy**

The primary objective of this consultancy is to:

- Conduct water quality monitoring at two specified sites to assess potential impact on surrounding water resources.
  - Perform a thorough environmental, health, and safety audit of facility operations, focusing on worker safety and environmental health.
  - Provide comprehensive reporting to MAL, including data analysis, findings, and actionable recommendations to support regulatory compliance and sustainable practices.
- 

**3. Scope of Work**

The consultant will undertake the following tasks on a quarterly basis:

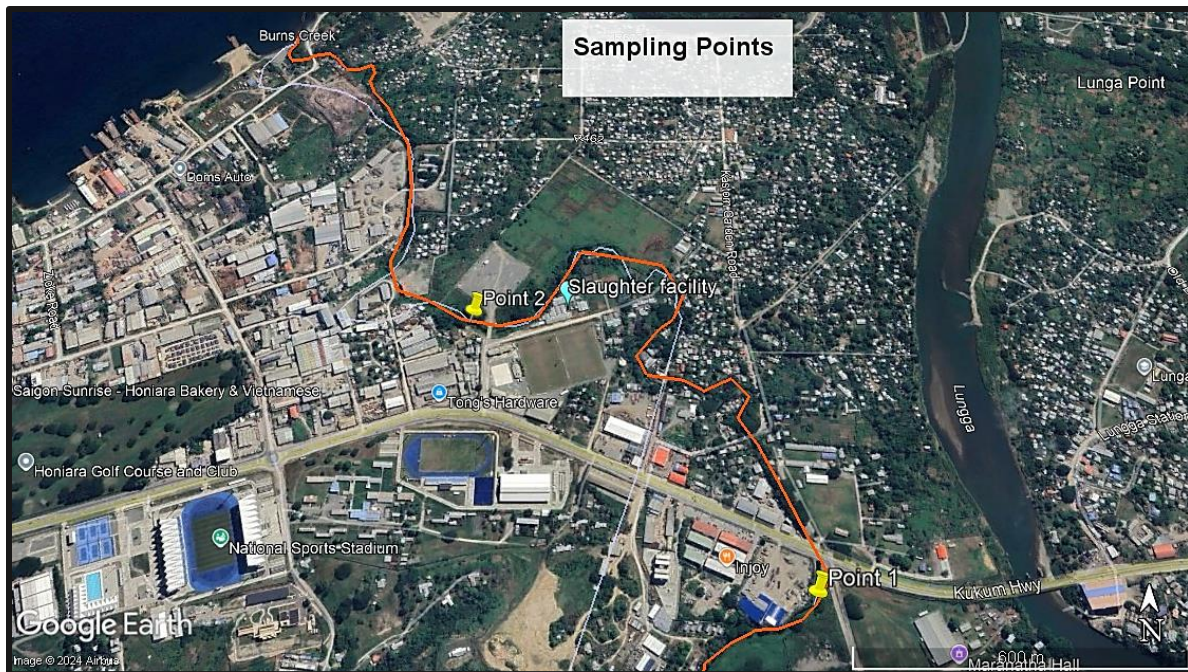
**3.1 Water Quality Monitoring**

- **Sampling Locations:**

- Site 1: Upstream of facility.
- Site 2: Downstream of facility.

	<u>Site 1</u>	<u>Site 2</u>
<b>GPS</b>	9°25'42.75"S	9°25'23.75"S 160°
<b>Coordinates</b>	160°1'29.11"E	1'7.34"E
<b>Altitude</b>	4.04 m	1.65 m

- **MAP of Sampling points for sites 1 & 2**



- **Parameters to Monitor:**

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Phosphorus (PO<sub>4</sub>-P)
- Ammonia (NH<sub>3</sub>-N)
- Total Suspended Solids (TSS)

- **Methodology:**

- Collect water samples following standardized methods at both sites.
- Perform laboratory analysis for each parameter and compare results against environmental standards to assess the facility's impact on water quality.

### 3.2 Environmental, Health, and Safety Audit

- **Scope:**
  - Assess the facility's environmental compliance, including waste management practices and pollution control measures.
  - Evaluate health and safety practices, including use of Personal Protective Equipment (PPE), emergency response preparedness, and risk management for workers.
- **Audit Checklist:**
  - Environmental management practices, waste handling, and disposal methods.
  - Health and safety protocols, including workplace conditions and equipment safety.
  - Employee training on EHS standards and compliance with best practices.

### 3.3 Reporting and Recommendations

- **Quarterly Report:**
  - Submit a comprehensive report covering findings from water quality monitoring and EHS audits.
  - Include data analysis, observed non-compliances, potential risks, and detailed recommendations for corrective actions.
- **Presentation to MAL:**
  - Present findings and recommendations to MAL's management team each quarter and address any clarifications or follow-up actions.

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## 4. Deliverables

The consultant is expected to provide the following deliverables each quarter:

- **Quarterly Water Quality Monitoring Report:** Including sampling data, analysis, comparison against standards, and interpretation.
- **Environmental, Health, and Safety Audit Report:** Detailing audit findings, risk assessment, and recommendations.
- **Action Plan:** A list of recommended corrective actions to address identified issues, with prioritization based on risk level.
- **Presentation of Findings:** A summary presentation for MAL's management, highlighting key issues, impacts, and recommended actions.

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## 5. Qualifications and Experience

The consultant should possess the following qualifications:

- **Educational Background:** Minimum bachelor's degree in environmental science, environmental engineering, public health, or a related field.
  - **Professional Experience:** At least 5 years of experience in environmental monitoring and EHS audits, preferably within livestock or agricultural sectors.
  - **Technical Expertise:** Demonstrated knowledge of water quality analysis and EHS standards for facility-based operations.
  - **Reporting Skills:** Strong analytical and reporting skills, with experience in environmental data analysis and risk-based assessment.
- 

## 6. Consultant Responsibilities

- Conduct water quality monitoring and EHS audits as specified and in alignment with local and international standards.
  - Maintain objectivity and adhere to professional standards in all assessments and reporting.
  - Ensure that all data collected and reported is accurate and supports MAL's environmental compliance efforts.
  - Provide ongoing guidance and support to MAL staff, as necessary, to implement recommended actions.
  - The consultant will be reporting to the Deputy Secretary Technical of MAL.
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## 7. MAL's Responsibilities

- Facilitate access to relevant facilities and provide necessary support for water quality sampling and audits.
  - Provide access to previous reports, facility records, and background information as needed for the consultancy.
  - Review and provide feedback on reports to ensure alignment with project goals.
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## 8. Timeline and Payment

- **Timeline:** Each quarterly assignment will consist of two weeks for fieldwork, analysis, and reporting.
  - **Payment Terms:** Payment will be issued upon completion of deliverables and approval of the quarterly report by MAL.
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## **9. Application Procedure**

Qualified consultants should submit their CV, cover letter, and a proposal including an outline of methodology, estimated budget, and timeline to MAL by [Insert Application Deadline].

ANNEX 11: PHOTOS

**Plate 1: MAL team (Loti Vaisekavea – former PS & Elda Wate- Deputy Secretary (corporate), inspecting the pig holding pen that will be improved**



**Plate 2: The Director of Livestock explaining the need to improve the pig holding pen.**



**Plate 3: Deteriorated interior of the Slaughter house.**



**Plate 4: Michael Ho'oto- Deputy Secretary (Technical) inspect the slaughter house**



**Plate 5: Part of the Pig Breeding Facility that needs to be improved/updated.**



**Plate 6: SOME OF THE PIGS AT THE CURRENT PIG BREEDING FACILITY**



**Plate 7: FRONT VIEW OF THE RESEARCH HQ OFFICE**



**PLATE 8: BACK VIEW OF THE RESEARCH HQ OFFICE**



**PLATE 9: Godfrey Hou- Project engineer and Marista Kapini- WB Social Development Specialist chatting with the facility’s handy man during the team’s combine visit to the Slaughter/Pig breeding site (date: 5<sup>th</sup> July 2024).**

