

**Project for Improving Performance in  
Public Financial Management (PAFiM)**

**Environmental and Social Management Plan (ESMP)**

**FINAL**

24 March 2018

Prepared for  
Department of Finance & Administration  
National Government of  
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## Quality Information

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## 1 Introduction

This Draft Environmental and Social Management Plan (ESMP) has been prepared for the *Project for Improving Performance in Public Financial Management (PAFiM)* in the Federated States of Micronesia (FSM). The Project will involve civil works for installation of:

- a data centre and information technology hardware in the FSM National Finance Office building in Palikir, Pohnpei; and
- underground fibre-optic cabling to connect various FSM Government buildings in Yap, Chuuk and Kosrae to a financial management information system (FMIS).

The Terms of Reference for the ESMP preparation are attached as Appendix A.

## 2 Project Description

### 2.1 Project for Improving Performance in Public Financial Management (PAFiM)

The National Government of The Federated States of Micronesia (FSM) requested the World Bank (WB) to support the Department of Finance and Administration's medium-term objectives of systems improvement, including an improved financial management information system (FMIS). The FMIS is the primary tool used for recording, monitoring and reporting on budget execution for public financial management (PFM). The Project for Improving Performance in Public Financial Management (PAFiM) has the following project development objective (PDO): *"to improve tax administration and the completeness, reliability and timeliness of financial reports of the National and State Governments."*

The PFM Roadmap (NGoFSM, 2017) sets out plans to improve overall governance, reduce corruption and improve efficiency and effectiveness of financial systems and procedures. The National Government aims to improve current systems, to better align resources and accountability towards development results, and to present a sound basis for development partners to provide general budget support. The actions identified for achieving these objectives are: a) implementing a new financial management information system (FMIS); b) a complete review of the Financial Management Regulations; c) improving reporting standards (including developing a new website); and d) continued efforts on staff capacity development.

The project will support improvement in systems, processes and procedures around budget formulation and execution covering internal controls, procurement, accounting and financial reporting. This will include building human resource capacity and strengthening human resource management functions in the Department of Finance and Administration (DoFA). The project will contribute to strengthening the government's capacity to manage public resources to deliver services more efficiently and effectively. The project includes four components:

- **Component 1 Strengthening Public Financial Management (PFM) Environment.** The objective of this component is to strengthen the PFM environment by ensuring that the legal and regulatory framework and the procedural guidance governing budget formulation, budget execution and financial reporting for revenues and expenditures is internally consistent, aligned with the applicable accounting guidance and streamlined for efficiency.;
- **Component 2: Financial Management Information System (FMIS) Procurement, Design and Implementation.** The objective of this component is to implement a new financial management

information system (FMIS) which will support effective management of public resources and improve financial reporting for management and accountability. Project scope will include the DoFA office of the National government in Palikir and its satellite offices in each State, State Finance offices and one line ministry, either National or State level.

- **Component 3: Revenue Management System (RMS).** The objective of this component is to improve revenue management efficiency and effectiveness for the FSM National Government.
- **Component 4: Change Management and Human Resource Development.** The objective of this component is to support the successful implementation of FMIS with active stakeholder engagement and development of individual competencies and institutional capacity.
- **Component 5: Project Management.** The objective of this component is to support overall management and coordination of the project across the government.

## 2.2 Data Network Infrastructure

The FMIS will comprise the following elements:

- a proprietary software application, system servers (expected to be cloud-based) and potentially a local server; and
- local area networks (LAN) on Pohnpei, Kosrae, Chuuk and Yap connecting Government facilities to the FMIS. This will require terrestrial optic-fibre connections between Government buildings on each island which will connect to the inter-state submarine cable system.

The following figures show the potential routing of the optic-fibre connections within each state.



Figure 1 Palikir (Pohnpei) Local Area Network





Figure 2 Kolonia (Pohnpei) Local Area Network



Figure 3 Kosrae Local Area Network



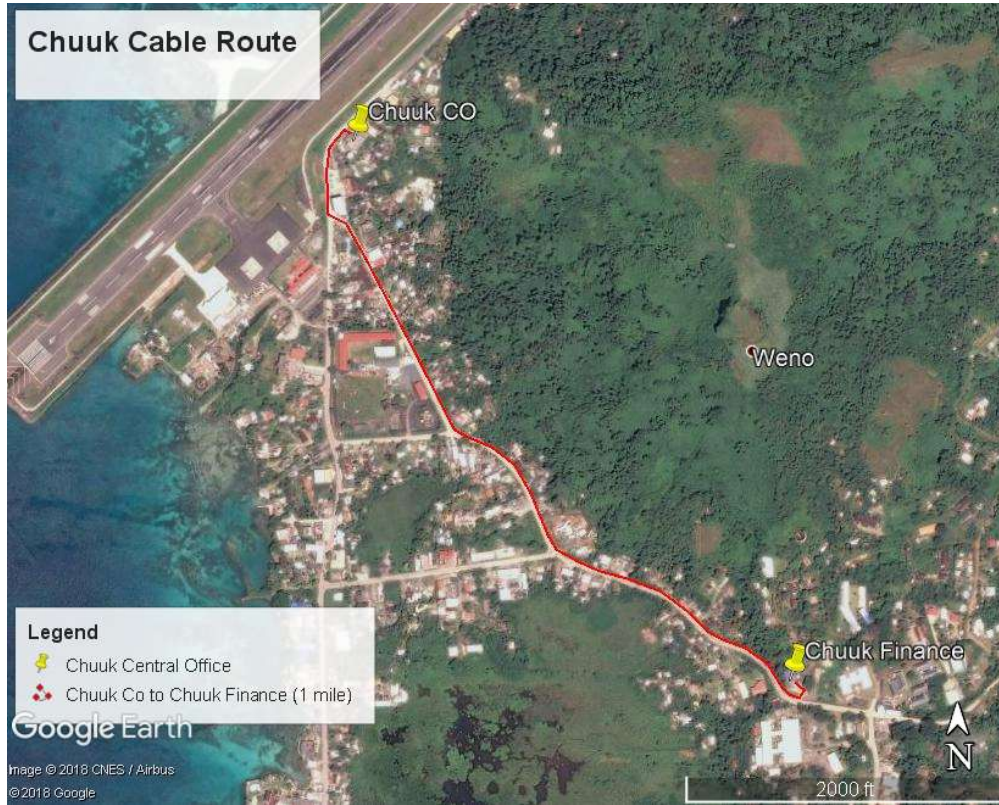


Figure 4 Chuuk Local Area Network



Figure 5 Yap Local Area Network



The LANs will involve below-ground installation of fibre-optic cabling housed in conduit. This will involve digging a narrow trench, using an excavator or trenching machine, to a depth of three feet and emplacement of the conduit. The trench will then be backfilled with excavated material and sealed with concrete at the surface. The cable will be situated beneath the road verges on the various islands and the LAN will also include pits to house conduit connections.

There is the possibility that a data centre will be constructed if required by the vendor solution. A data centre would likely require the following hardware components and would be housed in the DoFA building in Palikir:

- Core computing equipment such as servers and server racks
- Network equipment including routers, switches and modems;
- Storage resources such as hard drives;
- Power and cooling infrastructure including power generators, cooling towers and uninterrupted power supply system (UPS); and
- Other input/output devices such as printers.

### 3 Regulatory Context

Each State of the Federated States of Micronesia has its own legislation relevant to the project and this is summarized below.

#### 3.1 Pohnpei State

##### 3.1.1 Environmental Protection Act 1992

The Pohnpei *Environmental Protection Act 1992* (EPA Act) Section 9(2)(b) refers to the *Environmental Impact Assessment Regulations* which establish standard procedures for preparation of an environmental impact assessment statement prior to any action that may significantly affect the quality of the human environment. The Environmental Impact Assessment (EIA) process is intended to help the public and government officials make decisions with the understanding of the environmental consequences of a proposed action, and take actions consistent with the goal of protecting, restoring, and enhancing the environment. These regulations provide the directions to achieve this purpose.

##### 3.1.2 Solid Waste Management

The Pohnpei *Solid Waste Regulations 1995* (Part 4) under the EPA Act require that *“All solid waste shall be stored in such a manner that they do not constitute a fire, health, or safety hazard or provide food or harborage for vectors, and shall be contained or bundled so as not to result in spillage.”* In addition, under Part 9 *“The aesthetic, non-hazardous and sanitary storage of solid waste is the responsibility of the person owning, operating or managing the property, premise, business establishment or industry where the solid waste is accumulated.”*

The Pohnpei Environmental Protection Agency, is the designated lead agency for solid waste management and development of the regulatory and policy framework. The Departments of Transport and Infrastructure are responsible for management of solid waste disposal facilities in both states.

## 3.2 Kosrae State

### 3.2.1 Kosrae State Code

Title 7 of the *Kosrae State Code 1997* establishes the Development Review Commission whose duties include to (Section 7.402):

*“Protect the environment, human health, welfare and safety, to abate, control and prevent pollution or contamination of air, land and water in accordance with this chapter and commission regulations by balancing the needs of economic and social development with those of environmental quality and adopting regulations and pursuing policies which, to the maximum extent possible, ensure that economic and social development is environmentally sustainable”.*

Further Section 7.405 requires that *“All persons include in their development proposals an environmental impact assessment study in accordance with regulations established by the Commission”* and *“All persons submit an environmental impact statement to the Commission according to Commission specifications, prior to taking any action significantly affecting the quality of the human environment.”*

The Development Review Commission implements the *Regulations for Development Projects* whose purpose is to establish *“...the Environmental Impact Assessment ("EIA") process...intended to help the general public and government officials make decisions with the understanding of the environmental consequences of their decisions, and take actions consistent with the goal of protecting, restoring, and enhancing the environment.”*

### 3.2.2 Kosrae Islands Resource Management Authority

The Kosrae Islands Resource Management Authority (KIRMA) was established in 1992 by the Kosrae State Government. It is a semi-autonomous Agency with responsibility for encouraging sustainable economic and social development. KIRMA is the lead state agency for regulating solid waste management, and development of the regulatory and policy frameworks.

## 3.3 Yap State

### 3.3.1 Environmental Quality Protection Act

The *Environmental Quality Protection Act* (established under Title 18, Division 4 of the *Yap State Code*) establishes the Yap State Environmental Protection Agency. Under Section 1502 of the Act the policy intent is *“...to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of the State of Yap.”* Section 1509 requires that *“All persons shall submit an environmental impact statement to the Agency, in accordance with the provisions of this chapter and the regulations established by the Agency, prior to taking any action significantly affecting the quality of the environment as determined by the Agency.”*

The *Environmental Impact Assessment Regulations* under the Act require (Part II, 2.1 (a)) *“...a Preliminary Environmental Impact Statement...for any and all projects”* with the contents of Preliminary EIS specified in Section 2.3. This ESMP satisfies the requirements under this Section.

### 3.3.2 Waste Management

Yap State Public Service Corporation (YSPSC) has legal responsibility for waste disposal services although these are contracted out to the Public Works and Transport Department.

### 3.4 Chuuk State

#### 3.4.1 Draft Chuuk State Code 2001

The *Draft Chuuk State Code 2001* establishes the Chuuk State Environmental Protection Agency which has “...powers and duties to control and prohibit pollution of air, land, and water...” (Section 1005). Section 1006 of the Code requires that “A person shall submit an environmental impact statement to the Agency, in accordance with regulations established by the Agency, prior to taking any major action which may substantially affect the quality of the environment.”

Chapter 3 of the Code deals with Littering and Section 1301 states that:

*“It shall be unlawful for any person, establishment, corporation, or firm to throw, discard, scatter or abandon any waste materials, garbage or other debris in any form or substance upon any public road, street, easement, land or body of water other than a public dumping ground maintained by the Government of Chuuk or any or the municipalities of the State of Chuuk or subdivision thereof.”*

### 3.5 World Bank Safeguard Policies

#### 3.5.1 OP4.01 Environmental Assessment

As the project involves civil works World Bank Operational Policy (OP) 4.01 Environmental Assessment applies. OP 4.01 “...requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making” (World Bank, 2013). The Bank has undertaken environmental screening of the proposed project has determined that the potential environmental impacts are classified as Category B. This means that the potential impacts are of low to moderate significance, site-specific, mostly reversible and that cost-effective mitigation can be readily designed in the majority of cases.

The purpose of Environmental Assessment is to help ensure the environmental and social soundness and sustainability of investment projects, and to support the integration of environmental and social aspects of projects into the decision-making process. The policy defines procedures to screen and assess potential impacts and mitigation, prepare safeguard instruments, ensure public consultation and transparency and that there are implementation and supervision of commitments relating to findings and recommendations of the environmental assessment.

This ESMP is an integral part of compliance with this policy. All activities proposed for funding and implementation under the Project are subject to the provisions and stipulations within this document.

### 3.6 Occupational Health and Safety

#### 3.6.1 Federates States of Micronesia

A United States Federal Regulation requires that employers in FSM provide a safe workplace and workers may remove themselves from dangerous work situations without jeopardy to their

continued employment. The Division of Immigration and Labor within the Department of Justice is responsible for enforcing these standards.

### 3.6.2 World Bank General Environmental, Health, and Safety Guidelines

The World Bank Group's General Environmental, Health, and Safety Guidelines (EHS Guidelines) (World Bank Group, 2007) represent good international practice for managing occupational health and safety (OH&S) risks. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The fundamental premise for OH&S under the EHS Guidelines is that *"Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers"* and that *"Companies should hire contractors that have the technical capability to manage the occupational health and safety issues of their employees..."*.

The overall OH&S philosophy embodied in the EHS Guidelines is as follows:

*Preventive and protective measures should be introduced according to the following order of priority:*

- *Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc;*
- *Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc;*
- *Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.*
- *Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.*

*The application of prevention and control measures to occupational hazards should be based on comprehensive job safety or job hazard analyses. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.*

## 4 Environmental and Social Management Roles and Responsibilities

The National Department of Finance and Administration (DoFA) is the implementing agency. Within DoFA, the Project Implementation Unit (PIU) established under the Assistant Secretary of Treasury will be responsible for managing the project, including coordination with other donor funded projects and activities. In addition, the Central Implementation Unit (CIU) under the Assistant Secretary for International Investment and Finance will be responsible for supporting and monitoring donor-funded projects. Staffing in the CIU will include a Safeguards Advisor.

Three main bodies constitute the project governance arrangements, which are: 1) a Steering Committee to provide strategic guidance and decisions for the implementation of the Project; 2) an Inter-government Working Group comprising technical leads in finance, budget and IT functions from the National and each of the State governments for horizontal coordination across all; and 3) the Project Implementation Unit (PIU) which will support the proceedings of Steering Committee and the Inter-governmental PFM Working Group.



## 4.1 Environmental and Social Training

The CIU Safeguards Advisor will be responsible for environmental, social and OH&S training to ensure that contractors understand their responsibilities when implementing the ESMP. It is anticipated that the capacity of local contractors to manage environmental, social and OH&S risks will be relatively low so it will be important to focus the training at project inception stage to ensure that civil works are appropriately planned and managed.

## 5 Potential Environmental and Social Impacts and Risks

This chapter describes the potential impacts of the project on the physical and human environment. It is noted that all information is derived from existing sources and no field investigations were undertaken. The majority of impacts are associated with the construction phase of the project.

### 5.1 Asbestos Containing Material

Asbestos containing material (ACM) in this context refers to existing building elements (eg. wall sheeting, roof sheeting, pipework, insulation etc.) that may contain asbestos. Asbestos is a naturally occurring rock fibre that it is harmful to humans. When products containing asbestos are damaged or wear down over time, small fibres are released and become airborne. Breathing in asbestos fibres can cause a range of diseases including cancer (SPREP, 2016).

The Secretariat of the Pacific Regional Environment Programme (SPREP) undertook a regional asbestos baseline survey in 2015 detailing information about the location and relative risk of asbestos materials on 25 different islands across 13 Pacific Island Countries (PICs), including Federated States of Micronesia. The survey included assessment of both residential and non-residential buildings in each country and examined the potential risk to human health from exposure to ACM in each country setting. The risk assessment involved consideration of three factors:

- occupant activity – the activities carried out in an area where ACM is present;
- likelihood of ACM disturbance – evaluated by the extent or amount of ACM and its accessibility/vulnerability; and
- human exposure potential – considering three factors in the area containing ACM: number of occupants, frequency of use and average time of use.

The FSM survey covered the main centres/islands of Yap, Chuuk (Weno), Pohnpei and Kosrae. In the PICs context FSM contains relatively low quantities ACM in non-residential buildings – 3,557 square metres (m<sup>2</sup>) - representing just 1.89% of the total across the 13 countries surveyed by SPREP. In addition, most non-residential ACM in RMI is considered low or very low risk, with 823 m<sup>2</sup> considered moderate risk (SPREP, 2016).

The FSM survey (SPREP, 2015) assessed 14,626 of a total 19,502 residential dwellings and discovered only six dwellings with ACM. In addition to residential households, the survey sought to identify public buildings and government-owned industrial and commercial properties containing ACM. The results of the SPREP assessment are shown in Table 1. The SPREP survey did not identify the DoFA office in Palikir or its satellite offices in the remaining States as containing ACM.

Table 1 FSM Public Buildings with Asbestos Containing Material (SPREP, 2015)

Site Name	Confirmed ACM
<b>Yap State</b>	
Colonia Catholic Church	Yes
Yap State Government administration building	Yes
College of Micronesia: FSM Fisheries and Maritime Institute	Yes
Yap power plant	Yes
Yap State court	Yes
Yap Department of Education Administration Buildings	Yes
Colonia police and fire station	Yes
Yap high school and College of Micronesia, Yap campus	Yes
<b>Chuuk State</b>	
Weno Police Station	Yes
College of Micronesia: Weno campus	Yes
Chuuk State Hospital	Yes
Chuuk State Court	Yes
Former Weno post office building	Yes
FSM Supreme Court	Yes
<b>Pohnpei State</b>	
Pohnpei Fishing Corporation generator shed	Yes
State Hospital Public health department	Yes
State health insurance department	Yes
Public reserve area (asbestos cement waste)	Yes
Attorney General's office	Yes
College of Micronesia: Kolonia Campus	Yes
Tourism office	Yes
Pohnpei Botanic Gardens	Yes
PFC (Pohnpei State Fisheries Corporation) Offices	Yes
Department of Labour and Immigration	Yes
Public market (asbestos cement fence)	Yes
Kolonia police and fire station	Yes
Department of Education Administration building	Yes
<b>Kosrae State</b>	
Kosrae Airport Buildings	Yes
Department of Public Works Depot	Yes
Kosrae Legislature Building	Yes
Kosrae Government Stevedoring Company	Yes

## 5.2 Land Access

Virtually all land in FSM is under customary tenure, with the Government leasing portions for public purposes, including Government offices and road easements. It is expected that the proposed optic-fibre infrastructure can be sited wholly on Government-leased land, comprising Government office compounds and road verges. As the land is already under Government lease there will be no need to enter into further lease arrangements with customary landowners.

## 5.3 Community and Occupational Health and Safety

### 5.3.1 Community Health and Safety

The potential risks to community health and safety are associated with the project's construction phase and would mainly comprise minor dust and noise impacts and pedestrian/traffic hazards. The

excavation works required for the cable installations are relatively minor and will be limited in duration at any one locality and most of the works will be undertaken. Hence, dust and noise impacts are unlikely to be significant.

During the installation of the fibre-optic cable there will be some disruption to vehicle and pedestrian traffic in the works vicinity. As the cable conduit will be laid in the road shoulder traffic disruption is likely to be limited, exceptions being any road crossings which may involve temporary single lane operation for short periods.

There are no risks to community health and safety from the operation of the fibre-optic network.

### 5.3.2 Occupational Health and Safety

The civil works required for the fibre-optic cable installation comprise “*high risk construction work*” as defined in the Australian *Work Health and Safety Regulations 2011*. The specific high-risk activities are (Safe Work Australia, 2013):

- work that is carried out on or near energized electrical installations or services;
- work that is carried out on, in or adjacent to a road, railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians; and
- work that is carried out in an area at a workplace in which there is any movement of powered mobile plant.

The extent and duration of works, the likely workforce involved and the traffic volumes suggest that the OH&S hazards from construction activities are relatively low. While the works involve trenching activities, this will not require work within trenches and the depth is less than 1.5 metres.

### 5.4 Waste Management

The quantities of waste generated from construction activities are likely to be small. There will be some packaging waste from system components and there may be small quantities of residual excavated material from the trenching activities. While the waste quantities are expected to be limited it is important that all waste is stored, handled and disposed of securely to ensure no leakage into the environment. No hazardous waste is anticipated, except for asbestos waste which is unlikely to be encountered.

It will need to be determined whether waste should be disposed to landfill or whether it should be packaged and exported from the various states to Pohnpei and/or exported from FSM.

### 5.5 Water Quality Impacts

There is the potential for minor water quality impacts from sediment contaminated runoff during the cable installation activities. As each section of trench is excavated spoil will be stockpiled adjacent to the trench while the cable is laid. This exposure is likely to be only of short duration with the trenches able to be backfilled immediately after conduit placement.

### 5.6 Vegetation Impacts

During the trenching activities for the cable placement there is the potential for vegetation to be present along the alignment or to encounter tree roots when digging. The cable route should be designed to avoid vegetation as far as possible. Where this is not practicable excavations should be undertaken in such a way as to avoid damage to trees or their roots. Where roots are encountered

during the trenching activities these should be left intact and the cable installed to avoid the roots and not otherwise cause damage.

## 6 Risk Assessment and Mitigation Measures

The risk assessment assesses the likelihood and consequence of the potential impacts identified above with the methodology included in Appendix C. The risk assessments for the various impacts identified in Section 5 are summarized below based on this methodology. *Table 2* is a risk matrix that combines the probability of occurrence of a particular impact with the consequence of the impact to establish the significance of a particular impact. The tables summarise the expected significance of impacts without mitigation, detail the proposed mitigation measures to mitigate the impacts and summarise the residual impact significance following implementation of mitigation measures.

The assessed significance of the impact can be seen both prior to and after the implementation of mitigation measures. The residual impacts in all cases are acceptable however this relies on the mitigation measures being satisfactorily implemented by the contractor.

Table 2 Risk Matrix

		PROBABILITY OF OCCURRENCE			
		Improbable	Possible	Probable	Highly probable
CONSEQUENCE OF IMPACT	Minor	VERY LOW	VERY LOW	LOW	LOW
	Moderate	LOW	LOW	MEDIUM	MEDIUM
	Major	MEDIUM	MEDIUM	HIGH	HIGH
	Massive	HIGH	HIGH	VERY HIGH	VERY HIGH

### 6.1 Worker/public exposure to asbestos during construction

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Local 1	High 3	Long-term 3	Major 7	Improbable	<b>Medium</b>	Moderate
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Where there are “chance finds” of suspected asbestos containing material, construction works should cease immediately at the location and the contractor must seek advice from the CSU Safeguards Advisor on appropriate management measures</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Improbable	<b>Very low</b>	High



## 6.2 Unlawful land access or land acquisition

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Wider catchment 2	Medium 2	Long-term 3	Major 7	Improbable	<b>Medium</b>	High
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Determine the location of any customary land along the proposed cable alignments through consultation with the relevant State agencies.</li> <li>Design optic-fibre route to avoid customary land and route cable along Government-leased road verges</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Improbable	<b>Very low</b>	High

## 6.3 Community health and safety incidents during construction

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Local 1	Medium 2	Long-term 3	Moderate 6	Possible	Low	High
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>DoFA to undertake community and stakeholder consultation prior to construction commencing so residents, employees and business owners are aware of forthcoming works and associated risks</li> <li>Contractor prepares and implements Traffic Management Plan and Pedestrian Safety Plan. Guidance on preparing traffic management is available from DoW (2016) <i>Safe Traffic Control at Road Works</i>.</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Possible	Very Low	Medium

## 6.4 Worker health and safety incidents during construction

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Local 1	Medium 2	Long-term 3	Moderate 6	Probable	Medium	High
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Contractor prepares and implements Worker Health and Safety Management Plan in accordance with the guideline in Appendix B</li> <li>Ensure all existing underground services locations are known prior to trenching for fibre-optic cabling</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Possible	Very Low	Medium

## 6.5 Construction waste deposited into the environment

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Wider catchment 2	Medium 2	Medium-term 2	Moderate 6	Possible	Low	High
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Contractor to manage all waste in accordance with the relevant provisions of the State Codes including requirements for the storage of solid waste such as type of containers.</li> <li>All waste disposed to the relevant state landfill or exported from FSM</li> <li>Contractor to provide evidence of satisfactory waste disposal (eg. receipts)</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Medium-term 2	Minor 4	Possible	Very Low	High

## 6.6 Pollution of receiving waters from construction runoff

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Wider catchment 2	Low 1	Medium-term 2	Moderate 5	Possible	Low	Medium
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Limit the extent of open cable trench at any one time and avoid excavations when rain is anticipated</li> <li>Ensure all hazardous materials (including fuels) are stored in banded/secure enclosures at contractor's compound</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Possible	Very Low	High

## 6.7 Vegetation damage from cable trenching activities

	Extent	Intensity	Duration	Consequence	Probability	Significance	Confidence
<b>Without mitigation</b>	Island 3	Medium 2	Long-term 2	Major 7	Possible	Medium	High
<b>Mitigation measures:</b>							
<ul style="list-style-type: none"> <li>Design cable route to avoid existing vegetation as far as practicable</li> <li>When trenching near existing trees the presence of tree roots should be anticipated. In these situations, it is recommended that excavations be undertaken by hand to identify the extent of root systems and ensure they are avoided</li> <li>If tree roots are encountered during trenching activities these should not be damaged and the cable re-routed to avoid impacts</li> </ul>							
<b>With mitigation</b>	Local 1	Low 1	Short-term 1	Minor 3	Improbable	Very Low	High

## 6.8 Contractor Bid Document Environmental, Social, Health and Safety Clauses

The following environmental, social, health and safety clauses shall be incorporated in the Specifications to the bid documents for the works.

### 6.8.1 General

- The Contractor shall comply with the Statutory Regulations in force in Republic of the Marshall Islands regarding environmental protection and waste disposal and shall liaise with the responsible national environmental authorities.

### 6.8.2 Potential Asbestos Containing Material

- If, during construction, materials, structures or other infrastructure is discovered that has the potential to contain asbestos the Contractor should immediately cease works and contact the Safeguards Adviser for advice.

### 6.8.3 Community and Worker Health and Safety

- The Contractor shall always implement all reasonable precautions to prevent and reduce accidents and injuries to staff and workers and protect the health and safety of the community.
- The Contractor shall prepare and implement a Worker Health and Safety Plan commensurate with the identified health and safety hazards.
- The Contractor shall always provide and maintain construction plant, equipment and systems of work that are safe and without risks to health. This shall include maintaining equipment, engines, and related electrical installations in good working order; maintaining a clean and tidy work space; providing guards and rails, signals and lighting; providing work site rules, safe working procedures and allocating appropriate places to carry out the work.
- The Contractor shall provide, at his/her own expense, the protective clothing and safety equipment to all staff and labour engaged on the Works to the satisfaction of the Engineer. Such clothing and equipment shall include, as a minimum:
  - high visibility vests for workers directing traffic;
  - protective boots and gloves for the workforce undertaking excavation works;

If the Contractor fails to provide such clothing and equipment, the Employer shall be entitled to provide the same and recover the costs from the Contractor.

- All the Contractor's personnel shall, before commencing work, have an induction course on safety and health at the site. The information and training shall be on the site and have duration of at least two hours.
- The Contractor shall prepare and implement and Traffic and Pedestrian Management Plan to ensure that any hazards caused by the works are adequately managed.

### 6.8.4 Waste Management

- The Contractor shall, always, keep the construction area, including storage areas used, free from accumulations of waste materials or rubbish.

- All waste shall be stored, handled and disposed in accordance with the requirements of the relevant State agency or as otherwise directed by the Engineer.
- All waste water and sewage from construction facilities shall be managed in accordance with local government regulations, and where and when such regulations require it the Contractor shall obtain a permit or other appropriate documentation approving the storage, treatment and disposal methods being used.

#### 6.8.5 Prevention of Water and Air Pollution

- The Contractor's construction activities shall be performed by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, and other pollutants and wastes into marine waters and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, sanitary waste, and oil and other petroleum products.
- Excavated materials or other construction materials shall not be stockpiled or deposited near or on waterbody perimeters or in a position where stormwater runoff can entrain sediment and cause turbidity in waterbodies.
- Wastewaters from concrete preparation, or other construction operations, shall not enter waterbodies without the use of control methods such as sediment filters.
- During the conduct of construction activities and operation of equipment, the Contractor shall utilise such practicable methods and devices as are reasonably available to control, prevent, and otherwise minimise atmospheric emissions or discharges of air contaminants.
- Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, shall not be operated until corrective repairs or adjustments are made.
- During the performance of the construction works the Contractor shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance, and to prevent dust which has originated from its operations from damaging dwellings, or causing a nuisance to persons.

#### 6.8.6 Preservation of Vegetation

- All trees and other vegetation shall be preserved and shall be protected from damage by the Contractor's construction operations and equipment.;
- Movement of labour and equipment for access to the work shall be performed in a manner to prevent damage to vegetation or property.

#### 6.8.7 Construction Facilities

- The Contractor's workshops, office, and yard area shall be located and arranged in a manner to preserve trees and vegetation and minimise impacts to local communities.
- On completion of works, all temporary buildings, including any concrete footings and slabs, and all construction materials and debris shall be removed from the site.



## 7 Consultation and Grievance Redress Mechanism

### 7.1 Consultation Plan

Given the limited extent and duration of the civil works, and the location, consultation with project affected people should involve two phases:

1. direct engagement with neighbouring residents and businesses along the proposed fibre-optic cable routes. This consultation will be required to inform the residents and business owners of the potential disruption associated with the cable installation. This consultation should be undertaken face-to-face and should describe the scope of works, timing and likely impacts, together with details of the grievance redress mechanism. Consultation should be undertaken once the cable routes are determined and then again two weeks prior to construction commencing; and
2. public notification of civil works. As the cable installation has the potential to cause disruption and inconvenience to a large proportion of the population on each island public notices should be published to advise of the proposal and the timing and duration of construction works.

Consultation should be undertaken by DoFA and the Consultation Plan developed and overseen by the Safeguards Advisor.

### 7.2 Grievance Redress Mechanism

A grievance redress mechanism (GRM) is presented below to uphold the project's social and environmental safeguards performance. The purpose of the GRM is to record and address any complaints that may arise during the implementation phase of the project and/or any future operational issues that have the potential to be designed out during implementation phase.

The key objectives of the GRM are:

- Record, categorize and prioritize the grievances;
- Settle the grievances via consultation with all stakeholders (and inform those stakeholders of the solutions);
- Forward any unresolved cases to the relevant authority.

As the GRM works within existing legal and cultural frameworks, it is recognized that the GRM will comprise community level, project level and FSM judiciary level redress mechanisms. The details of each of those components are described as follows.

#### 7.2.1 Community Level Grievances

Community level grievances may result from construction impacts such as noise and dust. All project activities are expected to be sited on Government-leased land hence grievances related to customary land ownership are not anticipated.

Issues caused by the project are raised and resolved through existing community level grievance redress mechanisms and will be recorded by DoFA which is responsible for recording all complaints/outcomes, and to provide assistance, as required for their resolution.

### 7.2.2 Project-level Grievance Redress Mechanism

The following grievance redress mechanism (GRM) shall be put in place to register, address and resolve complaints and grievances raised by stakeholders during implementation of the Project. Contractors are required to adhere to this formal process.

Complaints may be submitted in person, via telephone, electronically, in letter to the PIU. All complaints must be formally registered in the complaint register. Should the complaint be received by the Contractor's Site Supervisor directly, they will endeavour to resolve it immediately and submit notification of the complaints and resolution to DoFA for entry into the complaints register. For all grievances DoFA is responsible for ensuring that, on receipt of each complaint, the date, time, name and contact details of the complainant, and the nature of the complaint are recorded in the Complaints Register.

Should the complainant remain unsatisfied with the response of the Contractor's Site Supervisor, the complaint will be referred to the PIU Project Manager (PM). The PM and Safeguards Advisor will take earnest action to resolve complaints at the earliest time possible. It would be desirable that the aggrieved party is consulted and informed of the course of action being taken, and when a result may be expected. Reporting back to the complainant will be undertaken within a period of two weeks from the date that the complaint was received.

If the PM is unable to resolve the complaint to the satisfaction of the aggrieved party, the complaint will then be referred to the Project Steering Committee (PSC). The PSC will be required to address the concern within 1 month.

Should measures taken by the Project Steering Committee fail to satisfy the complainant, the aggrieved party is free to take his/her grievance to the relevant State Court and the Court's decision will be final.

To ensure broad public awareness of the grievance mechanism, the Project shall erect appropriate signage at all works sites with up-to-date project information and summarizing the GRM process, including contact details of the relevant Contact Person. Public information bulletins websites and other public information will also include this information. Anyone shall be able to lodge a complaint and the methods (forms, in person, telephone, non-English language) should not inhibit the lodgement of any complaint.

## References

Department of Works (DoW) (2016) *Safe Traffic Control at Road Works: Field Guide*. Available from [www.works.gov.pg](http://www.works.gov.pg).

National Government of the Federates States of Micronesia (2017) *Public Financial Management Roadmap*.

Safe Work Australia (2013) *Construction Work Code of Practice*. November 2013

SPREP (2015) *Survey of the Regional Distribution and Status of Asbestos-Contaminated Construction Material and Waste - Best Practice Options for its Management in Pacific Island Countries. Report for the Federated States of Micronesia*. May 2015

SPREP (2016) *The State of Asbestos in the Pacific*. March 2016

World Bank (2013) *Operational Manual OP 4.01 Environmental Assessment*. January 1999, revised April 2013.

## Appendix A Terms of Reference

### **SAFEGUARDS SPECIALIST**

**Project:** Strengthening Budget Execution and Financial Reporting Systems in the Federated States of Micronesia (P161969)

**Client:** Department of Finance and Administration, Federated States of Micronesia

**Assignment Location:** Home Office

**Duration:** 5 days

**Expected date of Start:** 1 March 2018

#### **1. BACKGROUND**

The Government of FSM is seeking funding from the World Bank for the 'Strengthening Budget Execution and Financial Reporting Systems Project' (the Project). The Project will support improvement in systems, processes and procedures around budget formulation and execution covering internal controls, procurement, accounting and financial reporting. This will include building human resource capacity and strengthening human resource management functions in the DoFA and the State Finance departments. The project will contribute to strengthening the government's capacity to manage public resources efficiently and effectively to deliver services. The project may involve the renovation of one or more Government buildings and / or the installation of terrestrial fibre-optic cables for increased connectivity. The work could be carried out in Pohnpei, Chuuk, Kosrae and / or Yap States, but the actual investments and locations will be determined during project implementation.

Based on a safeguards screening, the Project is a Category B and requires an Environmental and Social Management Plan (ESMP). The ESMP needs to be prepared and disclosed prior to Project Appraisal.

Involuntary land acquisition and resettlement is not anticipated and a resettlement instrument is not required.

#### **2. OBJECTIVES OF THE ASSIGNMENT**

The Government is seeking to hire a Safeguards Specialist to prepare the ESMP in accordance with World Bank safeguards policies. It is expected that the ESMP would cover the proposed investment typologies described above (renovations and terrestrial fibre installation), and the key

- 1) Complete the screening of the potential environmental and social impacts, such as:
  - a. Potential for asbestos in demolition materials.
  - b. Safe management and disposal of all construction and demolition waste.
  - c. Health and safety risks.
  - d. Avoiding involuntary land acquisition and resettlement issues from cable trenching.
- 2) Prepare practical mitigation tools and procedures in the ESMP. These should include (but not limited to):
  - a. Asbestos Protocol

- b. Code of Practice for construction and demolition waste
  - c. Instructions for bidding documents
  - d. Environmental, Health and Safety clauses for contractor bid documents
  - e. Protocols for identifying fibre optic cable routes that avoid private property.
  - f. Voluntary land lease or easement process
  - g. Grievance Redress Mechanism, based on similar GRM already in place in FSM.
  - h. Consultation Plan (how to identify project affected people, consultation methods, etc).
- 3) In the ESMP, also describe the project and implementation arrangements for safeguards, provide a budget for implementation and, if necessary, a capacity building plan.
- 4) Support DoFA to consult with stakeholders and disclose the ESMP.
- 5) Separate to the ESMP, prepare the safeguards section of the Project Operations Manual, operationalising the ESMP requirements into project management procedures.

### **3. DELIVERABLES**

- Draft ESMP in conformity with World Bank safeguards policies and this TOR – 9 March 2018 for DOFA and WB review and feedback
- Final ESMP – 12 March 2018 (for FSM and WB disclosure)
- Project Operation Manual: safeguards section – 12 March 2018 (or as agreed with DoFA)

### **4. REPORTING**

The Safeguards Specialist will be engaged by DoFA and will also work in close liaison with the World Bank safeguard specialists. The Consultant will perform his/her duties in his/her home office through email correspondence, telephone and other appropriate media. No site visits are required.

### **5. QUALIFICATION AND EXPERIENCE REQUIREMENTS**

1. A bachelor degree in resource management, environmental science, planning, environmental engineering, or similar.
2. At least 3 years' experience in the application of World Bank safeguard policies in the Pacific with specific knowledge on the preparation of Construction-related EHS clauses and small scale ESMP.
3. At least 10 years' experience in environmental assessment.
4. Availability to complete the assignment within the required timeframe.

## Appendix B Health and Safety Management Plan Guideline

### 1. Objective

The objective of this Sub-plan is to provide guidance on the:

- key principles involved in ensuring the health and safety of workers and the community is protected;
- preparation of Health and Safety Sub-plans and associated Job Safety Analyses (JSA); and
- implementation of Health and Safety Sub-plans during project implementation.

The key reference document for this Guideline is the World Bank Group's *Environmental, Health, and Safety (EHS) Guidelines* (April 2007) together with the relevant Industry Sector EHS Guidelines available at [www.ifc.org/ehsguidelines](http://www.ifc.org/ehsguidelines).

### 2. Principles

Employers must take all reasonable practicable steps to protect the health and safety of workers and the community and provide and maintain a safe and healthy working environment. The following key principles are relevant to maintaining worker health and safety:

#### 2.1 Identification and assessment of hazards

Each employer must establish and maintain effective methods for:

- Systematically identifying existing and potential hazards to employees and the community;
- Systematically identifying, at the earliest practicable time, new hazards to employees and the community;
- Regularly assessing the extent to which a hazard poses a risk to employees and the community.

#### 2.2 Management of identified hazards

Each employer must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the safety, health or welfare of employees and the community, and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented in order of priority:

- Eliminating the hazard by removing the activity from the work process;
- Controlling the hazard at its source through engineering controls;
- Minimizing the hazard through design of safe work systems;
- Providing appropriate personal protective equipment (PPE).

The application of prevention and control measures to occupational hazards should be based on comprehensive job safety analyses (JSA). The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.

#### 2.3 Training and supervision



Each employer must take all reasonable practicable steps to provide to employees (in appropriate languages) the necessary information, instruction, training and supervision to protect each employee's health and to manage emergencies that might reasonably be expected to arise during work. Training and supervision extends to the correct use of PPE and providing employees with appropriate incentives to use PPE.

#### **2.4 General duty of employees**

Each employee shall:

- take all reasonable care to protect their own and fellow workers health and safety at the workplace and, as appropriate, other persons near the workplace;
- use PPE and other safety equipment supplied as required; and
- not use PPE or other safety equipment for any purpose not directly related to the work for which it is provided.

#### **2.5 Protective clothing and equipment**

Each employer shall:

- provide, maintain and make accessible to employees the PPE necessary to avoid injury and damage to their health;
- take all reasonably practicable steps to ensure that employees use that PPE in the circumstances for which it is provided; and
- make provision at the workplace for PPE to be cleaned and securely stored without risk of damage when not required.

The application of prevention and control measures to occupational hazards should be based on comprehensive job safety analyses (JSA). The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards.

### **3. Design**

Effective management of health and safety issues requires the inclusion of health and safety considerations during design processes in an organized, hierarchical manner that includes the following steps:

- identifying project health and safety hazards and associated risks as early as possible in the project cycle including the incorporation of health and safety considerations into the worksite selection process and construction methodologies;
- involving health and safety professionals who have the experience, competence, and training necessary to assess and manage health and safety risks;
- understanding the likelihood and magnitude of health and safety risks, based on:
  - the nature of the project activities, such as whether the project will involve hazardous materials or processes;
  - The potential consequences to workers if hazards are not adequately managed;

- designing and implementing risk management strategies with the objective of reducing the risk to human health;
- prioritising strategies that eliminate the cause of the hazard at its source by selecting less hazardous materials or processes that avoid the need for health and safety controls;
- when impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences;
- preparing workers and nearby communities to respond to accidents, including providing technical resources to effectively and safely control such events;
- Improving health and safety performance through a combination of ongoing monitoring of facility performance and effective accountability.

### **3.1 Job Safety Analysis**

Job safety analysis (JSA) is a process involving the identification of potential health and safety hazards from a work activity and designing risk control measures to eliminate the hazards or reduce the risk to an acceptable level. JSAs must be undertaken for discrete project activities such that the risks can be readily identified and appropriate risk management measures designed.

This Guideline includes a template for a JSA that must be completed and included as an attachment to the Health and Safety Sub-plan.

## **4. Implementation**

### **4.1 Documentation**

A Health and Safety Plan must be prepared and approved prior to any works commencing on site. The H&S Plan must demonstrate the Contractor's understanding of how to manage safety and a commitment to providing a workplace that enables all work activities to be carried out safely. The H&S Plan must detail reasonably practicable measures to eliminate or minimise risks to the health, safety and welfare of workers, contractors, visitors, and anyone else who may be affected by the operations. The H&S Plan must be prepared in accordance with the World Bank's EH&S Guidelines and the relevant country health and safety legislation.

### **4.2 Training and Awareness**

Provisions should be made to provide health and safety orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees. Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate.

Visitors to worksites must be provided with a site induction prior to entering and must be escorted always while on site. This induction must include details of site hazards, provision of necessary PPE and emergency procedures. Visitors are not permitted to access to areas where hazardous conditions or substances may be present, unless appropriately inducted.

### **4.3 Personal Protective Equipment (PPE)**

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems.

PPE is a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. The table below presents general examples of occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include:

- active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure;
- identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual;
- proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for Employees
- selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established

<b>Objective</b>	<b>Workplace Hazards</b>	<b>Suggested PPE</b>
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available.

	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits aprons etc. of appropriate materials.

## 5. Monitoring

Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The occupational health and safety monitoring program should include:

- **Safety inspection, testing and calibration:** This should include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection should verify that issued PPE continues to provide adequate protection and is being worn as required.
- **Surveillance of the working environment:** Employers should document compliance using an appropriate combination of portable and stationary sampling and monitoring instruments. Monitoring and analyses should be conducted according to internationally recognized methods and standards.
- **Surveillance of workers health:** When extraordinary protective measures are required (for example, against hazardous compounds), workers should be provided appropriate and relevant health surveillance prior to first exposure, and at regular intervals thereafter.
- **Training:** Training activities for employees and visitors should be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills, should be documented adequately.
- **Accidents and Diseases monitoring.** The employer should establish procedures and systems for reporting and recording:
  - Occupational accidents and diseases
  - Dangerous occurrences and incidents

These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a danger to life or health.

All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses should be investigated with the assistance of a person knowledgeable and competent in occupational safety. The investigation should:

- Establish what happened
- Determine the cause of what happened
- Identify measures necessary to prevent a recurrence

## Job Safety Analysis (JSA)

Add Organisation Name:

Ref:      Version:

Business details			
Business name:		Contact person:	
Address:		Contact position:	
Contact phone number		Contact email address:	
Job Safety Analysis details			
Work activity:		Location:	
Who are involved in the activity:		This job analysis has been authorised by: Name: ..... Position: ..... Signature:..... Date: .....	
Plant and equipment used:			
Maintenance checks required:			
Tools used:			
Materials used:			
Personal protective equipment:			
Certificates, permits and/approvals required			
Relevant legislation, codes, standard MSDSs etc applicable to this activity			

## Risk Assessment

\*\*Use the risk rating table to assess the level of risk for each job step.

		Likelihood				
		1	2	3	4	5
Consequence		Rare The event may occur in exceptional circumstances	Unlikely The event could occur sometimes	Moderate The event should occur sometimes	Likely The event will probably occur in most circumstances	Almost Certain The event is expected to occur in most circumstances
1	<b>Insignificant</b> No injuries or health issues	LOW	LOW	LOW	LOW	MODERATE
2	<b>Minor</b> First aid treatment	LOW	LOW	MODERATE	MODERATE	HIGH
3	<b>Moderate</b> Medical treatment, potential LTI	LOW	MODERATE	HIGH	HIGH	CRITICAL
4	<b>Major</b> Permanent disability or disease	LOW	MODERATE	HIGH	CRITICAL	CATASTROPHIC
5	<b>Extreme</b> Death	MODERATE	HIGH	CRITICAL	CATASTROPHIC	CATASTROPHIC

### Risk rating:

**Low risk:** Acceptable risk and no further action required if risk has been minimised as possible. Risk needs to be reviewed periodically.

**Moderate risk:** Tolerable with further action required to minimise risk. Risk needs to be reviewed periodically.

**High risk:** Tolerable with further action required to minimise risk. Risk needs to be reviewed continuously.

**Critical risk:** Unacceptable risk and further action required immediately to minimise risk.

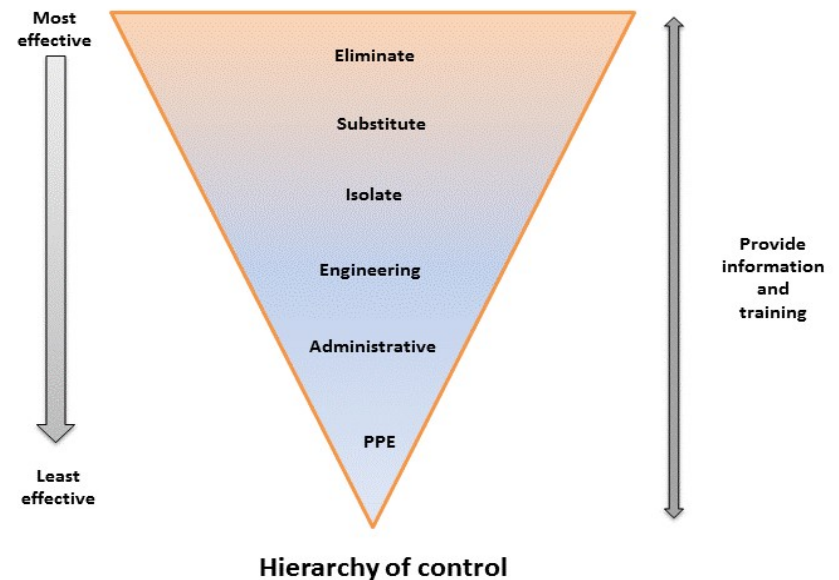
**Catastrophic:** Unacceptable risk and urgent action required to minimise risk.



## Risk controls

The hierarchy of control can be used as an effective tool to deal with health and safety issues at work. Use the type of control suggested as measures to deal with the hazard. Aim to use control measures from as high on the hierarchy of control list as possible. If that is not possible the next option down the list or a combination of the measures should be implemented. The least effective control measure is the use of personal protective equipment (PPE) and it should be used as a last resort or a support to other control measures. Information and training should be integrated with all levels of control to explain how controls work.

1. **Eliminate** – if it is possible, the hazard should be removed completely. For example, get rid of dangerous machines.
2. **Substitute** – replace something that produces the hazard with something that does not produce a hazard. For example, replacing solvent based paint with water based paint. Risk assessment on the substitution must be conducted to ensure that it will not pose another hazard.
3. **Engineering control** – isolate a person from the hazard by creating physical barrier or making changes to process, equipment or plant to reduce the hazard. For example, install ventilation systems.
4. **Administrative control** – change the way a person works by establishing policies and procedures to minimise the risks. For example, job scheduling to limit exposure and posting hazard signs.
5. Use **personal protective equipment (PPE)** – protect a person from the hazard by wearing PPE. For example, wearing gloves, safety glasses, hard hats and high-visibility clothing. PPE must be correctly fitted, used and maintained to provide protection.



### JSA – Action steps

Step No	Job step details	Potential hazards	Risk rating**	How to control risks***	Name of persons responsible for work

Review number:

Version:

Review number:

Version:

<b>This job safety analysis has been developed through consultation with our employees and has been read, understood and signed by all employees undertaking the works:</b>		
<b>Print Names:</b>	<b>Signatures:</b>	<b>Dates:</b>

Review No	01	02	03	04	05	06	07	08
Initial:								
Date:								

## Appendix C Risk Assessment Methodology

### STEP 1

Assign a rating and score for each of the three criteria (A-C) listed in the table below, and then add the scores to determine the consequence rating for an impact.

RATING	DEFINITION OF RATING	SCORE
<b>A. Extent</b> – the area over which the impact will be experienced		
Local	Confined to the project site or study area	1
Wider catchment or province	Extends beyond the project site to the wider, surrounding area.	2
Island or national	Extends to the whole island or nation.	3
Regional or global	Extends to the Pacific region and potentially beyond.	4
<b>B. Intensity</b> – the magnitude of the impact i.e. whether the impact will result in minor, moderate or major environmental, economic and social (including human health) changes		
Low	Minor or negligible changes, disturbances, damages, injuries or health effects. Likely to generate minimal interest or concern amongst the local community/stakeholders. <u>Examples:</u> dust and exhaust gases from construction machinery; temporary or single exceedance of a pollution limit or threshold; first aid cases; minor discomfort or irritation from construction noise; increased traffic on local roads to transport construction materials to a project site.	1
Medium	Moderate changes, disturbances, damages, injuries or health effects. Likely to generate more prolonged interest or concern amongst local community/stakeholders. <u>Examples:</u> generation of hazardous waste; large fish kill incident; frequent exceedance of a pollution limit or threshold; clearance of village food gardens; influx of workers from overseas for project construction; moderate disruption of daily life/work activities within a village; intermittent production of foul odour near a village; infrastructure damage from flooding or strong winds.	2
High	Major or severe changes, disturbances, damages, injuries or health effects. Likely to generate widespread and intense interest or controversy amongst local, national and regional communities/ stakeholders. <u>Examples:</u> clearance of endangered species habitat; drawdown of limited groundwater supplies; large increase in suspended sediment levels from dredging; destruction of cultural artefacts; forced relocation of village settlements; permanent disabilities or fatalities; loss of coastal buildings and infrastructure due to extreme weather events.	3
<b>C. Duration</b> – the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 2 years – impact is reversible or limited to when particular development activities or environmental events are taking place. Remediation or recovery is possible.	1
Medium-term	2 to 15 years – impact is reversible or limited to when particular development activities or environmental events are taking place. Remediation or recovery is possible.	2
Long-term	More than 15 years – impact is permanent or gradually reversible with sustained remediation and recovery efforts.	3

The combined score of the three criteria (extent, intensity, duration) corresponds to a consequence rating, as follows:

Combined score (A+B+C)	3 – 4	5 – 6	7 – 8	9 – 10
Consequence rating	Minor	Moderate	Major	Massive

## STEP 2

Assess the *probability* of the impact occurring according to the following definitions:

Probability – the likelihood of the impact occurring	
Improbable	Unlikely to occur during project lifetime. < 20% chance of occurring
Possible	May occur during project lifetime. 20%–60% chance of occurring
Probable	Likely to occur during project lifetime. > 60%–90% chance of occurring
Highly probable	Highly likely to occur, or likely to occur more than once during project lifetime. > 90% chance of occurring

## STEP 3

Determine the overall *significance* of the impact as a combination of the *consequence* and *probability* ratings, as set out in the matrix below:

		PROBABILITY OF OCCURRENCE			
		Improbable	Possible	Probable	Highly probable
CONSEQUENCE OF IMPACT	Minor	VERY LOW	VERY LOW	LOW	LOW
	Moderate	LOW	LOW	MEDIUM	MEDIUM
	Major	MEDIUM	MEDIUM	HIGH	HIGH
	Massive	HIGH	HIGH	VERY HIGH	VERY HIGH

## STEP 4

State the level of *confidence* in the assessment of the impact as high, medium or low. The level of confidence will depend on the extent and type of information available, whether it is qualitative or quantitative, and whether it is based on direct measurements, extrapolated data, estimations or expert opinion.

## STEP 5

5(a) – identify and describe practical mitigation measures that can be effectively implemented to reduce the impact.

5(b) – assume mitigation measures have been implemented and reassess the impact, by following steps 1 to 4 again. The point of the second assessment is to examine how impact extent, intensity, duration and/or probability are likely to change, after mitigation measures have been put in place.

**STEP 6**

Summarise all the impact assessment ratings in a single table that can be included in the executive summary or concluding section of an EIA report.