

EAST MICRONESIA CABLE PROJECT

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ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT

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Executive Summary

The Governments of the Federated States of Micronesia, Kiribati and Nauru have proposed their joint participation in a regional fibre optic cable system to link the FSM island state of Kosrae, and the island nations of Kiribati and Nauru, to the existing Hannon-Armstrong (HANTRU)-1 cable which currently connects the FSM state of Pohnpei to Guam. The proposed multi-national cable system is known as the East Micronesia Cable (EMC). To fund their respective participation in the EMC Project, the Governments of FSM and Kiribati are each seeking grant funding from the World Bank (WB), and the Nauru Government is seeking grant funding from the Asian Development Bank (ADB).

This Environmental and Social Impact Assessment (ESIA) for the EMC Project addresses the potential impacts relating to the installation and operation of the EMC by each of the three participating EMC parties. An Environmental & Social Management Plan (ESMP) is also provided which defines work area boundaries, work restrictions and time limits, to be included in the construction contract specifications which the contractor will need to comply with. Compliance will be monitored by a Safeguards Advisor who will be part of the project implementation unit in each country.

The EMC Project will require limited land-based infrastructure, will have minimal mainly marine-based impacts which are limited in scale and extent and can be fully mitigated, will require no involuntary land acquisition, and will use existing infrastructure for landing stations and for conveying land based cable or where new infrastructure is required will use existing government easements and leases. The sub-marine cable will affect a corridor no more than 3-4 m wide on the sea floor in the open ocean and nearshore zone.

The final design of the cable route will be decided during project implementation. For project preparation this ESIA has assessed the likely / probable cable routes and terrestrial infrastructure locations. The cable route will be designed to avoid sensitive habitats such as corals and Conservation Areas with placement guided by divers who will place the cable according to instructions from a marine ecologist. These measures will assist with mitigating potential impacts on the marine environment. Several viable options have been identified for sites to be used for each beach manhole (BMH) site and as cable corridors to each Cable Landing Station (CLS). Most sites are Government owned or leased and none require involuntary land acquisition or resettlement.

Given the small-scale impact of the work, and the fact that nearly all of the work is on board a vessel at sea, no negative social impacts are expected. Sensitive sites such as sea mounts and vents will be avoided to protect the cable and avoid potential environmental impacts.

The construction of the BMH facility on land will require a local sub-contractor. In Kosrae, a key potential impact relates to the disturbance to road users and adjacent land uses from the trenching of the cable within the Government owned road reserve; to address this reinstatement of the disturbed areas will be required as specified in the ESMP. In Kiribati and Nauru no impacts are envisaged given the infrastructure is already in place to convey the terrestrial cable.

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1. Introduction

1.1 Proponent & Purpose of ESIA

The Government of the Federated States of Micronesia (GoFSM) is seeking assistance with funding from the World Bank (WB) for a regional fibre optic cable to link the FSM State of Kosrae, and the island nations of Kiribati, and Nauru, to the existing Hannon-Armstrong (HANTRU)-1 cable (Figure 1) which currently connects the FSM States of Pohnpei to Guam. Concurrently, the Kiribati Government is seeking financing from the WB to finance Kiribati's participation, and the Nauru Government is seeking financing from the Asian Development Bank (ADB) for its participation. This Project has been named the East Micronesia Cable (EMC) Project.

The Implementing Agencies for the participating countries in the EMC Project are: FSM Department of Transportation, Communication & Infrastructure (DTCI); the Ministry of Information, Communication, Transport & Tourism Development (MICTTD) in Kiribati; and the Information & Communications Technology (ICT) Department in Nauru.

One of the main challenges facing the region is the need to overcome its remoteness and dispersed geography by developing infrastructure to connect people domestically and internationally. The EMC Project is intended to provide essential backbone infrastructure to promote and support social and economic development across all sectors in each country and within the region. The long-term viability of the region hinges on domestic and international economic integration.

The new fiber optic cable procured under the EMC project will connect the Pohnpei Spur to Kosrae and on to Nauru terminating in Kiribati. The length of the new cable will be approximately 2,000 km. A significant portion of the cable is well beyond the territorial seas of the participating countries.

This ESIA was prepared to identify all potential environmental and social impacts that may arise as a result of implementation of the project and to mitigate any impacts, with a focus on coastal zones and near-shore marine areas which form the majority of the project influence area (PIA). Terrestrial infrastructure is relatively limited in extent and utilises existing facilities (e.g., in ground ducting, telecoms buildings and premises for landing stations, etc) or is confined to public road reserves on existing easements.

1.2 Project Rationale

The proposed project will support investment in a submarine fibre optic cable that would connect Kosrae, Kiribati and Nauru with Pohnpei to Guam and from there to the rest of the world via the global Internet. At present, Kosrae, Kiribati and Nauru rely entirely on satellite for Internet connectivity. The high cost, and the variable and limited availability of international bandwidth are major constraints to their ability to participate in the global Information Age and the concomitant opportunities for economic and social development that arise when cheap and accessible high speed Internet services are made available.

The proposed project will contribute to improved public services (including online government services such as health, education and financial services), will support the tourism sector, and will facilitate better trade and communication among north Pacific island economies.

1.3 Project Status & Documentation

At the time of preparation of this document, a project concept has been completed. At the outset of the EMC Project, it has been agreed by ADB and World Bank to adopt a 'common

approach' to complete a combined ESIA and ESMP that meets in-country laws as well as their respective safeguards policies.

Given that the focus of this assessment is on coastal zones and nearshore marine areas, various marine surveys have been undertaken and are attached as a detailed report in Appendix 1. The outcome of the land due diligence assessment is provided in Appendix 2.

Detailed design, including a detailed marine survey and identification of the final cable route and location of infrastructure, and land acquisition will occur during project implementation. These activities will be guided by the ESMP. The ESMP will be updated if any new sites or routes are identified through the detailed design phase.

1.4 ESIA Methodology

An initial evaluation of potential cable alignments was undertaken based on in-country consultations with officials from the respective Governments. Then, further scoping activity was undertaken to evaluate these locations based primarily on eliminating the requirement for private or custom owned land acquisition and minimizing coastal zone environmental impacts. This initial scoping exercise identified a number of beach manhole sites and landing stations that facilitated the completion of the evaluation for this ESIA.

In addition, the assessment included a review of relevant secondary information sources, site visits, key stakeholder interviews, and public consultations to determine existing environment conditions in the PIA corridor, at BMH sites and along landside routes where cables are to be located. This was followed by an analysis of the potential impacts that the installation and operation of the fibre optic cable could have on the corridor's natural and socio-cultural environment. Data collected included the following:

- Potential land acquisition requirements;
- Sensitive environmental receptors within the PIAs, including Conservation Areas, Fish Attraction Devices (FADs) and special tourism sites, such as dive sites;
- Marine ecology of the coastal zone and nearshore waters likely affected by the cable project, including benthic and coral reefs conditions along the PIA corridor;
- Poverty and gender conditions in relation to the proposed work;
- Social impacts of faster and more reliable Internet connections; and
- Cultural heritage and archaeological sites within the PIA corridor.

The evaluation of the marine and terrestrial ecological resources in the three countries was undertaken in late October and early November 2016. Assessment methodology, specific site locations and detailed findings are presented in Appendix 1.

This information was then used to assess potential environmental impacts and identify potential mitigation options during cable deployment. The ESMP forms part of the ESIA (Section 8).

2. Policy, Legal & Administrative Framework

2.1 Kosrae

2.1.1 Resource Management

There are a considerable number of government and semi-government agencies involved with marine resource management at national and state levels in the FSM. Each State operates independently in fisheries matters within State territorial waters.

The FSM Government's Marine Resources Division (NMRD) of the Department of Resources and Development is responsible for providing the government (national and state) with technical information, advisory services and support for development and management activities in marine resources including fisheries, aquaculture and coastal resource management. It is additionally responsible for non-living marine resources within the 200 mile EEZ. A major function is to liaise with foreign and international agencies concerning marine resources.

The Micronesian Maritime Authority (MMA) was established to regulate the use of and to manage and conserve the resources within the 200 mile EEZ. One of the MMA's key functions is to adopt and promulgate regulations for the conservation, management, and exploitation of all living resources in the EEZ.

In Kosrae, the Marine Resources Division (KMRD) of the Department of Conservation and Development is the state agency responsible for the management and development of marine resources. The Kosrae Island Management Resources Authority (KIRMA) is the state agency responsible for assessments relating to land usage, permitting for developmental programs, identification of Conservation Areas, enforcement, development of environmental regulations, and development and implementation of environmental management plans. An EIA is required to be prepared (Section 19.104 of the State Code) if a development or activity affects "the environmental quality of fishery waters".

The Kosrae Conservation and Safety Organization (KCSO) is a non-governmental organization whose purpose is "*to further projects relating to awareness and protection of the natural environment and to public health and safety; to conduct community programs and related programs applicable to these projects within Kosrae ...*"

The Kosrae National Biodiversity Strategy and Action Plan (NBSAP) outlines the state of the nation's biological resources and the current biological and human-related threats that affect their continued existence.

2.1.2 Land & Tenure

The State Government controls a major part of the land in Kosrae, namely government owned lands, mangrove areas, nearshore areas, and lagoon areas. Primarily, government lands are of the interior, above the 'Japanese line'¹; and foreshore areas. Kosraeans can own land but not outsiders (foreigners). The land is owned in "Fee Simple" with a certificate of title issued when the registration process is complete for individual landowners. However, if the land is inherited by multiple heirs or if customary family land is held in common, then a Tenancy in Common title is issued.

Accessing land through usufruct or access rights (customary practice) was common for hunting or gathering purposes. Nowadays, this is more common in the upland and government owned

¹A line which sets aside the upper elevation of Kosrae Island; land above the line is designated as Government and land below the line is where private-own designations begin.

areas. Accessing land and use rights for productive lands, particularly in settled areas, is done through leasing agreements.

As a protectorate measure, foreign ownership of land is through leasing titles only. Kosrae state law allows locals and foreigners alike to lease for up to a 55-year term renewable for an additional 55 years. Although this provides secure access and use for the lease period, issues such as land ownership disputes, lack of certainty, poor surveying capabilities, absence of records, and uncertain parameters for customary usage often hinder foreign investment. As in other Pacific island land tenure systems, land transactions are often made under customary practice, which is frequently undocumented. This makes accurate determination of ownership rights and pricing of land difficult to determine.

The Kosrae Constitution is the primary rule of law in the State of Kosrae. In its preamble, it declares Kosraeans are one, as people, in their language, in their traditions, and in their family and communal life. The Preamble acknowledges the bounty and beauty of Kosrae pledging to preserve those natural riches. Thus the legal foundation for the State's environmental protection and conservation, both human and physical, is laid.

The Kosrae State Code Title 11, Land and Environment, sets out the requirements regarding the acquisition and use of land. Under Titel 11, the Governor can transfer title or interest in public land on behalf of the State of the Government but only with the Legislature's resolution. The Governor also has the authority to designate suitable areas of the public land for homesteading to eligible persons.

In managing land and land use, the Kosrae State Code provides for land use planning, surveying practice, homesteading and establishment of the Land Court. The Land Court determines and registers land titles. Further, the deed of trust allows for the transfer of an estate in real property or freehold or leasehold interest in real property to secure an obligation. This practice allows land transactions for monetary or customary obligations.

2.1.3 Legal Framework

As described in Section 2.1.1, there is significant legal provision in existing law for managing and conserving the environment of Kosrae. Table 2.1 lists state and national laws relevant to the Kosrae portion of the Project.

The Development Review Commission (DRC) is a five-member body that reviews development proposals and is mandated to "*protect the environment ... balancing development with those of environmental quality ... ensuring that economic and social development is environmentally sustainable*". The DRC has the authority to enter, enforce, and issue injunctions, mandamus, or other remedies requiring compliance through the Attorney General. Further, the DRC has the authority to protect the environment and antiquities.

The State can acquire an interest in private land for public purpose. The Constitution and Article XI, Land and Environment, provide for fair compensation should there be a need for land acquisition for the purpose of resettlement. The process must be done in good faith with reasonable effort to avoid substantial hardship to the interested parties².

An EIA may be required particularly if any development or activity affects the environmental quality of fishery waters, which is determined following consultation with the Director of the Marine Resources. If an EIA is required then the Director has the right to submit comments before a decision is made by any State Government Authority such as the DRC

² Palik vs Kosrae, 5 FSM Intrm. 147. 152-154 (Kos. C. Ct. Tr. 1991).

Based on the initial consultation regarding the Project an application will need to be submitted to determine whether an EIA is required for the installation and use of the cable and associated facilities, for State approval.

Table 2.1: Relevant national & state legislation for Kosrae

NATIONAL LEGAL FRAMEWORK	
FSM Constitution	The supreme law and it establishes the national, state, and municipal governance.
Federated States of Micronesia Environmental Protection Act 1984	Provides for the protection of the environment, culture, historic and natural aspects of Micronesian heritage.
Marine and Freshwater Quality Standards Regulations 1986	Identifies the uses for which waters of FSM shall be maintained and protected (water quality).
Trust Territory Solid Waste Regulations 1979	Establishes the minimum standards for the design, construction, installation, operation and maintenance of solid storage, collection, and disposal systems.
FSM Earthmoving Regulations 1988	Earthmoving activities permits are issued by the Secretary of Human Resources.
FSM EPA Environmental Impact Assessment Regulations 1989	Requires the National Government and its agencies to submit Environmental Impact Statement (EIS) to the Secretary of Human Resources prior to any “major” action significantly affecting the quality of the human environment.
FSMC, Title 26 Historical Sites, and Antiquities	Policy to protect and preserve the diverse cultural heritage of the people of Micronesia.
STATE LEGISLATION	
Constitution of the State of Kosrae	Primary rule of law in the State of Kosrae
Kosrae State Code, Title 17, Chapter 4	Establishes the Kosrae EPA
Kosrae Code Section 11.201	Land use and subsidiary regulations
Kosrae Code, Section 14.1302	Foreign fishing agreement
Kosrae Code, Section 11.1601	Endangered species
Kosrae Code, Section 13.514	Water quality
Kosrae Code, 13.523	Unauthorised procuring of marine life
Kosrae Code, Section 13.524	Endangering a species
Kosrae Code, Section 11.1401	Protection of antiquities and traditional culture
Kosrae Code, Section 13.506	Littering

2.2 Kiribati

2.2.1 Resource Management

Marine resources are very important to the people of Kiribati, as it is their main protein source. Subsistence and small-scale fishing operations are carried out throughout the islands with fishing activities focused both within lagoons for reef fish and shellfish and nearshore for tunas and other pelagic species.

The Maritime Zones (Demarcation) Act (1983) establishes Kiribati jurisdiction over an exclusive economic zone including description of areas within these limits relating to

international and archipelagic waters and the territorial sea. Kiribati is not however, a party to the United Nations Convention on the Law of the Sea which established the international basis for supporting the claim over 200 miles of exclusive economic zone.

The Foreshore and Land Reclamation Ordinance Act 1969, as amended in 2005, proclaims State ownership of the foreshore and sea bed, subject to public rights and navigation. This means that the legislation does not seek to override customary rights in marine areas.

The Laws of Kiribati Act 1989 acknowledges customary law in that it may be applied to:

- The ownership by custom of rights in, over, or in connection with any sea or lagoon area, inland waters or foreshore or reef, or in or on the seabed, including rights of navigation and fishing; and
- The ownership by custom of water, or rights in, over or to water.

The Ministry of Fisheries and Marine Resources Development (MFMRD) is the Kiribati Government Agency responsible for developing and managing the nation's fisheries as well as other marine resources (marine aggregates, deep-sea minerals). The Ministry has two main technical divisions, the Fisheries Division and the Mineral Resources Division.

The development and management of the marine resources within Kiribati falls under the jurisdiction of the Fisheries Division of the MFMRD. The Fisheries Division works under two pieces of fisheries-related legislation: The Fisheries Ordinance (CAP 33) and the Fisheries (Pacific Island States' Treaty with the United States of America) Act 1988. The Fisheries Ordinance has been amended by the Fisheries (Amendment) Act 1992; the Fisheries (Amendment) Act 1995 and the Fisheries (Amendment) Act 1997. In addition, the Republic of Kiribati has a National Development Strategy that also addresses marine resources.

Kiribati has a number of statutory provisions that address environmental management issues. The key ones are the Environment Act 1999 and 2007 Amendment; the Draft Environmental (General) Regulation, 2009; the Schedule of Environmentally Significant Activities, i.e. a list of actions/projects that would likely trigger environmental effects needing assessment.

The 1999 Act established the Environment and Conservation Division (ECD) within the Ministry of Environment, Land and Agricultural Development (MELAD) as the mandated Division for environmental protection, resource conservation and sustainable development.

Kiribati has also established a system of marine protected areas (MPAs) that aim to conserve marine biological diversity and serve as ecologically representative networks of protected areas at sea. Currently there are twelve MPAs primarily set up for stock enhancement of marine species that have been identified and confirmed to be declining in numbers, yet important for Kiribati's livelihood and economic wellbeing.

There is no current legislation in Kiribati to protect national heritage except for vague references in the Mineral Development Licensing Ordinance (1978) (in relation to the reporting of finds by prospectors and the authority of the Minister in respect of the preservation of finds) and the Local Government Act (1984) (the role of Local Councils in the preservation, control and removal of any antique artefacts).

2.2.2 Land & Tenure

The Kiribati land tenure system is encapsulated in six legislations, namely the Native Land Ordinance of 1956, the Gilbert and Phoenix Islands Lands Code, the Landowners Taxation Ordinance, the Neglected Lands Ordinance, the Non-Native Land (Restriction on Alienation) Ordinance of 1974, and the Native Land (Amendment No.2) Ordinance.

It is important to note that almost all land in Kiribati belongs to the I-Kiribati, except for the Phoenix and Line Islands, small portions of reclaimed land owned by the Government, and lands belonging to the Catholic and Protestant churches. I-Kiribati land rights and interests are inherited and can also be gifted (Gilbert and Phoenix Islands Lands Code 1956). Also, any environmental management and resource conservation effort requires the cooperation of the landowners.

Land ownership is fundamental to the I-Kiribati socio-cultural way of life. Land is owned by families, whom the head has the right to distribute land to its members. In effect, land is a source of power and prestige among local people. Land is central to community's socio-political environment, particularly among the older generation.

Family members have equal rights to family lands, to use (build) and access (collect produce). Traditionally, land ownership infers ownership of groundwater, provides fishing rights, harvesting rights, and a social security.

Government, businesses, non-government organisations, and churches lease large areas of family land. In addition, there are substantial areas of South Tarawa occupied by internal migrant settlers from other parts of Kiribati.

The government owns some land, namely state land. This is confined to Temwaiku Bight, which is 200ha of reclaimed land. It also leases lands in Betio, Bairiki and Bikenibeu from private landowners.

The Kiribati land tenure system upholds the rights of landowners, as stipulated in the Native Land Act; landowners 'controls the use of his property. Accordingly, the Land Planning Act provides for land use planning in the 'public interest.' It is significant to note that even on Government leaseholds on South Tarawa, the landowner retains the right to veto applications for sublease on his land. The landowner can either consent or refuse to sign on the planning application form.

Due to the depleted land supply and the tenure situation, a large segment of the urban population either constructs houses illegally or enters formal or informal agreements with landowners to occupy the land. In Betio, Bairiki, and Bikenibeu, some homes and squatter settlements are found amongst shops and offices.

About two thirds of the 5,584 households in South Tarawa live on land that is owned by their families. One in ten household's live on land that is neither owned nor leased. These households are built on informal or other arrangements with the landowners. These types of arrangements have no legal or contract basis. However, many land disputes are due to poor informal agreements.

2.2.3 Legal Framework

As described in Section 2.1.1, there is significant legal provision available within the existing legislation for managing and conserving the environment of Kiribati. Table 2.2 presents reference to legislation considered relevant to this project.

The Constitution, the Native Land Ordinances of 1977 and the State Acquisition of Lands Ordinance of 1979 provide for compensation arrangements in case of involuntary resettlement. This is only applied if those who are resettled have not breached any law. The large number of people who occupy land as squatters, or with informal arrangement are not covered.

Table 2.2: Relevant National & State legislation for Kiribati

The Republic of Kiribati Constitution	All natural resources of Kiribati vests in the people and Government of Kiribati. In implementing the Constitution, the customs and traditions will be upheld.
Native Land Ordinance 1956	Native lands cannot be alienated to non-native person. Title to native land registered by the Native Lands Commission.
Neglected Land Ordinance 1959	Provides for the purchase of lands that, in the opinion of the Minister responsible, are neglected.
Land Planning Ordinance 1973	Provides for control of land use and development only in areas designated under the Ordinance.
Environment Act 1999 Environment Amendment Act 2007	Provides for integrated systems for development control, environmental impact assessment and pollution control. Reduce risks to human health and prevent the degradation of the environment. Protect and conserve natural resources.
Local Government Act 1984	Provides for building control and town and village planning is the function of Local Council.
Plants Ordinance 1976	Provides for the protection of plants in Kiribati and also for control of plant importation.
Maritime Zones (Demarcation) Act 1983	Establishes Kiribati jurisdiction over an exclusive economic zone. Also, defines international and archipelagic waters and territorial sea.
Foreshore and Land Reclamation Ordinance 1969	Proclaims State ownership over the foreshore and seabed, subject to public rights and navigation.
Laws of Kiribati 1989	Acknowledges customary law that it may be applied to ownership in, over, or in connection with any sea or lagoon area, inland waters or foreshore or reef, or in or on the seabed, including rights of navigation and fishing.
Fisheries Ordinance 1977	Provides for Minister's role in developing the fisheries resources for the full benefit of Kiribati.
Public Utilities Ordinance 1977	Grants exclusive rights over the provision of water in any declared water supply area.
Wildlife Ordinance 1975	This provides for the establishment of wildlife sanctuaries in Kiribati.
Protected Area Ordinance 1957	Provides for the Minister responsible, on the advice of Cabinet, to declare all of any island a prohibited area wherein entry is forbidden without permission.
Closed District Act 1990	Provides for the President, acting on Cabinet advice, to declare closed districts over parts of islands.
Mineral Development Licensing Ordinance 1978	Provides for reporting by prospectors. There is no current legislation to protect national heritage.

Although not identified as a prescribed requirement (Schedule of Environment Act 1999), in consultation with MELAD it was indicated that an EIA would likely be required before an "environmental licence" can be provided. This would be determined following provision of a development application for review.

2.3 Nauru

2.3.1 Resource Management

The key environmental management, environmental health and resource management and conservation legislation in Nauru is detailed in Table 2.3.

The Nauru Fisheries and Marine Resources Authority Act establishes the Nauru Fisheries and Marine Resources Authority (NFMRA) as the authority responsible for regulating and developing Nauru's fisheries and marine resources.

The Authority is responsible for the management of offshore fisheries, coastal fisheries and aquaculture; as well as owning the Nauru Fisheries Corporation (NFC) that acts as the commercial arm of the Authority. The key fisheries laws are the Nauru Fisheries and Marine Resources Authority Act of 1997, which regulates the fishing industry, both inshore and within the 200-Mile Exclusive Economic Zone (EEZ), and the Fisheries Act of 1997.

Although there is currently no specific EIA legislation in Nauru the Department of Commerce Industry & Environment is in the process of developing environment policy with assistance from Secretariat of the Pacific Regional Environment Programme (SPREP) and the Justice Department to develop appropriate legislation to provide a much clearer EIA process.

2.3.2 Land & Tenure

Government and corporate entities do not own land in Nauru. They must enter into leasing agreements with the rightful land owner. Further, non-Nauruans cannot own land in Nauru. In most Pacific island countries including Nauru, a large majority (80%-100%) of the land is customary land. The customary land is owned collectively or jointly by indigenous families.

“(2) Any person who transfers ... the freehold of any land in Nauru to any person other than a Nauruan person shall be guilty of an offense; (3) Any person who, without the consent in writing of the President, transfers, sells or leases, or grants any estate or interest in any land in Nauruans...is guilty of an offense” s3 Lands Act 1976.

The majority of lands held by individuals are unsevered separate shares of portions of land held originally by families or individuals. Ownership of customary land can be both male and female. Nauru is one of the countries that has homogeneity in the customs of indigenous people. Unlike other countries, Nauru has customary land but not customary chiefs. Instead, a Land Committee is appointed by Cabinet.

Utilising customary land as a security for a loan is neither authorised nor prohibited by legislation, but the practice has developed. For example, the outright transfer of individually owned land to Nauruan money lenders is practiced.

The Government can only lease land. Under the Lands Act 1976 compulsory acquisition by the Government is possible, but rarely used.

All land transfers, sales or leases, or grants of any land estate or interest therein, of any land in Nauru must be consented by the President. The Constitution (s26) and the Lands Act 1976 provides for Nauruans' rights to land. The Lands Act provides for compensation in cases of involuntary resettlement with compensation fees prescribed under the schedules of the Act.

Table 2.3: Relevant legislation for Nauru

Constitution of Nauru 1968	Provides the basis for Nauru's government and legal authority.
Lands Act 1976	Repealed Lands Ordinance (1921-1968), and made provision for the leasing of land for the purpose of phosphate industry. For leasing land for other public purposes, it covers the removal of trees, crops, soil, and sand, and payment of compensation respectively.

Land (Declaration of Ownership) Ordinance 1962	Provision for compensation to Nauruans landowners who were not compensated for phosphate mined from the German Wireless Station land area.
Land Committee Act 1956	Established the Nauru Land Committee to determine questions on ownership and rights in respect of land where issues involve Nauruans and Pacific Islanders.
Customs and Adopted Laws Act 1971	Provisions relating to the institutions, customs, and usages of Nauruans, and adopted laws.
Sea Boundaries Act 1997	This demarcates Nauru's sea boundaries and maritime zones and declares the rights of the Republic of Nauru in these zones.
Wild Bird Protection Act 1937	Prohibition on taking of magpies, snipe, quail, Nauru canneries, and noddies.
Agricultural Quarantine Act 1999	Provides for the protection of plants, animals and public health. Also the protection, development, and utilization of the natural resources and the environment by preventing introduction and spread of diseases and pests.
Fisheries Act 1997	Established the Nauru Fisheries and Marine Resources Authority to manage, develop, conserve and protect the fisheries and marine resources of Nauru.
Nauru Antiquities Ordinance 1935	Provides for the protection of the Nauru antiquities, relics, curios and article of ethnological and anthropological interest and scientific value.
Telecommunication Act 2002	Provides for establishment, maintenance, operation and retaliation of telecommunication services in, to and from Nauru.
Public Health Ordinance 1925-1967 / Health (Eatinghouse) Regulations 1974	Provisions for safety of the public health of Nauru.
Criminal Procedure Act 1972	This is relevant to any criminal prosecutions which may be undertaken in relation to offenses against any environmental law.
Criminal Justice Act 1999	Provisions for appropriate penalties to be applied for persons committing littering and other offenses which affect the environment.
Nauru Rehabilitation Corporation Act 1997	This affords specific provisions for the rehabilitation works in Nauru.
Port Authority Act 2006	Establishes the Port Authority with vested powers that covers the marine environments.
Litter Prohibition Act 1983	Provides for abatement of litter.
Animals Regulation 2000	Extends the provisions of the Animal Act to include most other animals.

Although there is currently no EIA legislation in place it is likely that the Nauruan Government will request an EIA to be provided.

2.4 International and Regional Treaties, Conventions & Agreements

The three countries are signatories to a range of International Conventions and Treaties of relevance to this Project (see Appendix 3).

2.5 World Bank & ADB Policy Framework

2.5.1 Introduction

The Project spreads across three different countries where different in-country and development partner policies and laws apply. Each country therefore has its own project appraisal requirements with its own categorisation. However, for simplicity and for cohesion with the overall project requirements, a single environmental assessment document has been prepared.

Set out below is an analysis of the WB and ADB operational policies that have been triggered by the Project and apply to this environmental assessment.

2.5.2 Kosrae & Kiribati

A review of relevant WB operational policies is provided below and an evaluation of compliance in Table 4A in Appendix 4.

Operational Policy 4.01 - Environmental Assessment

The WB requires an Environmental Assessment (EA) of Category A and B Projects proposed for WB financing to ensure they are environmentally sound and sustainable, thereby improving decision-making. Operational Policy (OP) 4.01 requires (i) detailed qualitative and quantitative analysis to determine project impacts, (ii) determination of tangible measures to prevent, minimise, mitigate or compensate for those adverse impacts, (iii) public consultation and disclosure as part of the EA process and (iv) requires an Environmental Management Plan (EMP) to address set mitigation along with monitoring and institutional measures to be taken during design, implementation, operation and maintenance phases of the project.

This policy is triggered for the Kosrae and Kiribati projects. Both projects are Category B, as the impacts are readily mitigatable and reversible. This ESIA and ESMP satisfy the EA requirements of OP4.01.

Operational Policy 4.04 - Natural Habitats

OP 4.04 requires the conservation of natural habitats and specifically prohibits the support of projects that involve significant conversion or degradation of critical habitats, as defined by the policy. The policy further requires the EA to identify impacts on biodiversity and species and to determine endemism, endangered species and to determine project impacts on these species and to propose acceptable mitigation and monitoring measures.

This OP is triggered as natural habitats may be disturbed temporarily during cable laying in the intertidal zone. No protected areas are located within the PIA for either Kosrae or Kiribati. The ESIA has been informed by ecological surveys of subtidal and intertidal reef and foreshore in Kosrae and Tarawa. Although there are areas of sensitive habitat (i.e., corals and seagrass beds), mitigation measures will be adopted to avoid and minimise disturbance. Significant seabed habitats, such as hydro-thermal vents and seamounts, will be surveyed during the detailed design phase and avoided. There are no natural habitats in the footprint of the terrestrial infrastructure.

Operational Policy 4.10 - Indigenous Peoples

OP 4.10 requires engagement in a process of free, prior and informed consultation with Indigenous Peoples (IP's), as described by the policy in situations where IP's are present in, or have collective attachment to, the project area and for the preparation of an Indigenous Peoples Plan (IPP) and /or Indigenous Peoples Planning Framework (IPPF).

An assessment completed by the World Bank into the application of OP4.10 in Pacific Islands Countries concluded that the Kosrae and Kiribati projects do not trigger this policy.

Operational Policy 4.11 - Physical Cultural Resources

OP 4.11 seeks to avoid the disturbance and/or destruction of Physical Cultural Resources (PCR) as defined by this policy by the projects activities. PCR includes places of worship, buried artefacts, cemeteries, and archaeological assets, etc. The policy further requires, (i) EA to undertake an exhaustive desk review and/or site investigation to pre-identify and locate PCR's in the PIA, (ii) EA/EMP to propose management measures and (iii) to include "chance find" clauses in civil works contracts during construction and maintenance stages.

No PCR were identified during the baseline surveys. Due to the small infrastructure footprint, there is a low likelihood of PCR being discovered during construction. A chance find procedure has been included in the ESIA (Appendix 5) and the policy is triggered as a precautionary measure in case a PCR is discovered.

Operational Policy 4.12 - Involuntary Resettlement

This policy addresses direct economic and social impacts from the projects activities that will cause (a) involuntary taking of land resulting in loss of income sources or of livelihoods and (b) involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons. This policy requires siting of project infrastructure to be chosen as to avoid these impacts altogether or to minimise them to the extent possible. Where these cannot be avoided, the policy requires the preparation of either or both of these instruments: (i) resettlement policy framework, (ii) Resettlement Action Plan. The policy also requires meaningful consultations with potentially affected people. The policy prohibits community donations of lands for location-specific infrastructure.

All land acquisition will be voluntary at the three landings for this Project. The location of the cable is flexible and can be changed to accommodate voluntary land acquisition. The land due diligence study (see Appendix 2) indicates that there are several suitable Government-owned or leased sites available for the location of infrastructure, none of which will cause any involuntary resettlement. If private or custom-owned land is required, this will be acquired voluntarily, using lease or easement arrangements. Therefore this policy is not triggered.

2.5.3 Nauru

Table 4B in Appendix 4 sets out an evaluation of the Nauru-related elements of this ESIA against ADB Safeguard Policy Statement (SPS) Requirements - Environmental and Involuntary Resettlement (ADB 2009³).

The objectives of the SPS are to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process.

The requirements apply to all ADB-financed and/or ADB-administered sovereign and non-sovereign projects, and their components regardless of the source of financing, including investment projects funded by a loan; and/or a grant; and/or other means, such as equity and/or guarantees (hereafter broadly referred to as projects). In broad terms Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

³ Asian Development Bank "Safeguard Policy Statement" June 2009

This evaluation confirms that the ESIA addresses all matters identified in the Environmental Safeguards Requirements set out in the ADB SPS.

This ESIA demonstrates that the Project will not involve involuntary resettlement and therefore the ADB requirements for Involuntary Resettlement are not addressed separately.

3. Project Description

3.1 Project Components

The EMC Project involves installing a submarine fibre optic cable from Pohnpei to Kosrae (approximately 550 Km) and to Kiribati (approximately 1,250 Km) with either an intermediate landing or a spur to Nauru (approximately 250 Km). The newly constructed portion of the EMC system will total over 2,000 km, much of it in deep ocean water. Subject to final determination after technical review, a possible configuration for the EMC system is pictured in Figure 3.1.



Figure 3.1: Proposed EMC subsea cable route

The key components of the EMC subsea and terrestrial infrastructure include:

- Fibre optic cable and repeaters (approximately every 200 km) laid on or beneath the sea floor using a trenching machine.
- At the shoreward ends of the cable across the intertidal zone, between the subtidal zone and a 'beach manhole (BMH) structure', the cable will be covered with lightweight protection consisting of standard articulated piping bolted to the substrate.
- A Beach Manhole (BMH) landing facility which will likely comprise a small concrete manhole approximately 2m x 2m x 2m (Figure 3.2) in Kosrae and Nauru.
- Use of existing fibre optic cable already installed adjacent to the road (Nauru), or corridor within road easement currently used for existing telecommunications infrastructure (as is the case in Kosrae) along the main road to the Cable Landing Station (CLS).
- In Kiribati, a secure facility (including DC power feed (located nearby), back up diesel generator and battery supply, earth mat, control systems, etc) to power the cable repeaters to be located at the CLS (to minimise the risk of human contact with the buried or conduited power supply cable).

The CLS's are proposed to be located as follows:

- Kosrae - in or adjacent to the FSM Telecommunications Corporation earth station premises in Tofol.

- Kiribati - either at the existing provider ATH Kiribati facility in Bairiki or a new facility to be constructed adjacent to the PBS aerial on Government leased land in Nanikai (to be confirmed).
 - Nauru - Information & Communications Technology (ICT) Department building in Yaren.
- Project implementation arrangements are described in Section 8.3.

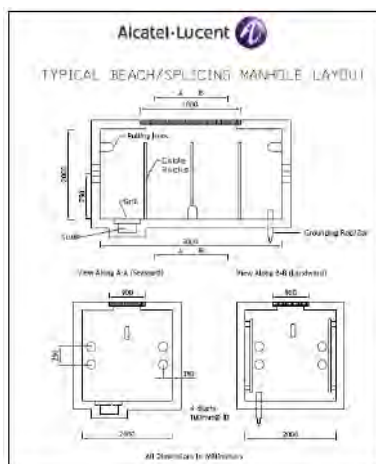


Figure 3.2: Typical layout of a beach manhole landing facility

The subsea cable, consisting of double armoured cable to 200 m depth and single armoured cable to 1,000 m depth (Figure 3.3), will range in diameter from 4 - 7.5 cm.

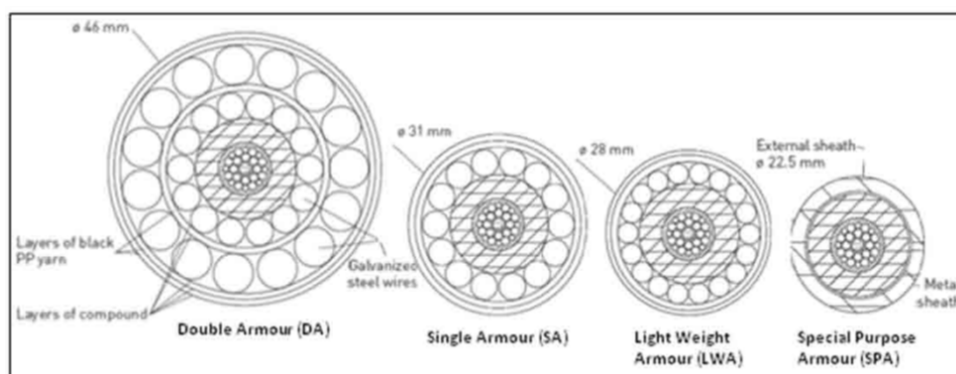


Figure 3.3: Fibre optic cable options

The subsea cable will be buried in a trench dug by a towed submarine plough, requiring a corridor no more than 0.75m wide (see Section 5 for further detail). It is also the preferred method for the cable laying Project in north western Micronesia connecting undersea cable to Palau and the FSM States of Yap and Chuuk⁴.

The trench, which will be approximately 25 cm wide by 0.5-0.75m deep, is opened and then closed once the towed plough lays the cable into the trench (Figure 3.4).

⁴FSM Government 2016. Environmental & Social Impact Assessment. Palau FSM Connectivity Project. Environmental & Social Safeguards: Yap & Chuuk Cable System Components. Grant No. D004-FM. Project No. P130592. March 2016 (amended).

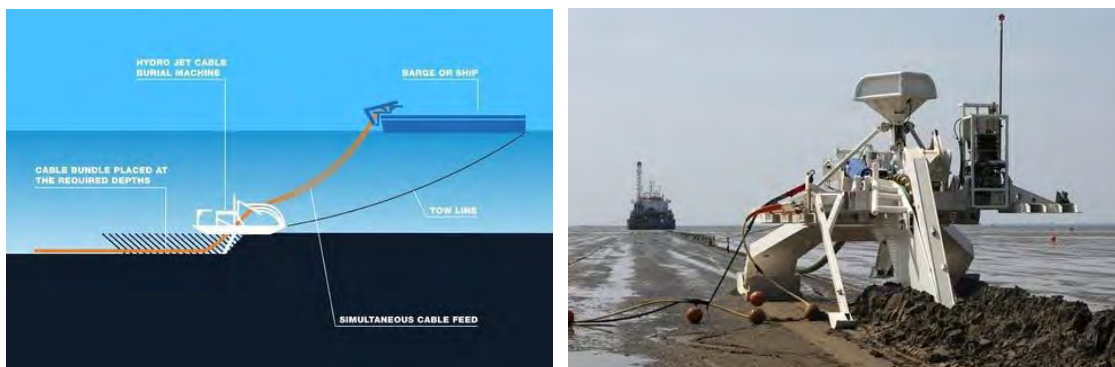


Figure 3.4. An example of submarine cable ploughs at sea and being towed from shore to deeper water by a cable laying ship

In the intertidal, the cable will be either trenched using an excavator (approximately 1m wide by 0.5m deep) or the armoured cable will be attached directly to the reef surface. This will be up to the discretion of the appointed contractor but either method is expected to have similar minimal environmental impacts.

Where there isn't existing capacity to deliver the land-side fibre cable from the BMH to the CLS the cable could be installed using several methods including trenching (which may require removal of vegetation where present) using a small excavator or thrusting, whereby cable conduit is pushed underground in advance of pulling the cable (see Figure 3.5). This technique is often used where there is sensitive infrastructure is present at the surface (i.e., road crossings, driveways, buildings, sensitive vegetation, etc).

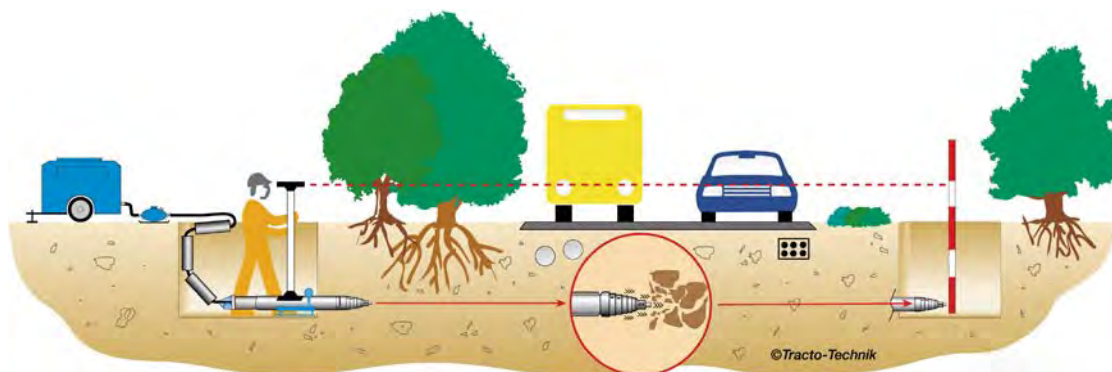


Figure 3.5: Schematic showing typical conduit thrusting approach.

No hazardous wastes and little or no non-hazardous wastes are expected to be generated. Where non-hazardous wastes are generated these will be disposed of at approved facilities.

3.2 Project Location

3.2.1 Submarine Component

Subject to further technical review for the final route and configuration, the submarine component of the project will involve cable placement on the sea floor in the open ocean connecting Pohnpei to Kosrae then Kiribati, with a spur providing a connection to Nauru. Three “shore end” installations will be required; the potential locations are described in detail below. The shore end installations will connect the open ocean segment to the terrestrial infrastructure traversing the fringing reef at each location. The exact location of the cable routes will be determined following a detailed bathymetric marine survey to be conducted during the detailed design phase. Hence, the cable alignments described in the following sections are indicative and are subject to refinement.

The marine survey will characterize the proposed cable route and allow avoidance of hazards and/or environmentally significant zones. Surveys include water depth and seabed topography, sediment type and thickness, and potential natural or human-made hazards. A marine route survey for a cable installation commonly assesses a seabed corridor from 1 to 10 km wide with repeat passes where necessary. The marine survey will determine the final cable route which will avoid sensitive submarine features such as sea mounts, hydrothermal vents, coral assemblages, seagrass beds, fishing reserves and other important environments. There is sufficient flexibility in alignment design such that individual coral heads in near shore environments, for example can be avoided.

The marine survey will also inform the detailed design of the submerged infrastructure - the cable and repeaters. This will determine the cable types and quantities, and clarify the nature of its deployment on the seafloor - surface laying, or trenching and burial - and the need for supplementary cable protection.

3.2.2 Shore end of Cable

A number of alternative BMH and CLS sites were investigated as follows:

- Kosrae - Kosrae Airport at Okat (BMH1); Phoenix Hotel site (BMH2); the 'bench' site (BMH3); the Yacht Club in Lelu Harbour (BMH4); Tofol (BMH5); Sanskrit Elementary School (BMH6); The 7 Day store in Melem (BMH7); and Otwe Harbour (BMH8). The CLS is proposed to be located at the Telecom earth station premises in Tofol.
- Kiribati - Bonriki International Airport (BMH1); King George V High School (BMH2); the Public Broadcasting Service (PBS) Radio tower site adjacent to Nanikai Village at the eastern end of the causeway (BMH3); and a site located at the eastern end of Bairiki Village at the western end of the causeway (BMH4). The CLS is proposed to be located either at the ATH Kiribati facility in Bairiki or a new facility to be constructed adjacent to the PBS aerial in Nanikai.
- Nauru -- Government Buildings (BMH1) and Gabab Boat Ramp (BMH2). The CLS is proposed to be located at the ICT building in Yaren.

Figures 3.6-3.8 presents the potential BMH and CLS sites. Appendix 6 presents more detailed potential alignments. Further evaluation of the shore-side locations and landing stations options is provided in Section 5.2.

Based on the analysis provided in Section 5.2 the following BMH sites are preferred:

- Kosrae - Kosrae Airport at Okat (BMH1); Sanskrit Elementary School (BMH6).
- Kiribati - the Public Broadcasting Service (PBS) Radio tower site adjacent to Nanikai Village at the eastern end of the causeway (BMH3); and a site located at the eastern end of Bairiki Village at the western end of the causeway (BMH4).
- Nauru -- Government Building (BMH1) site.

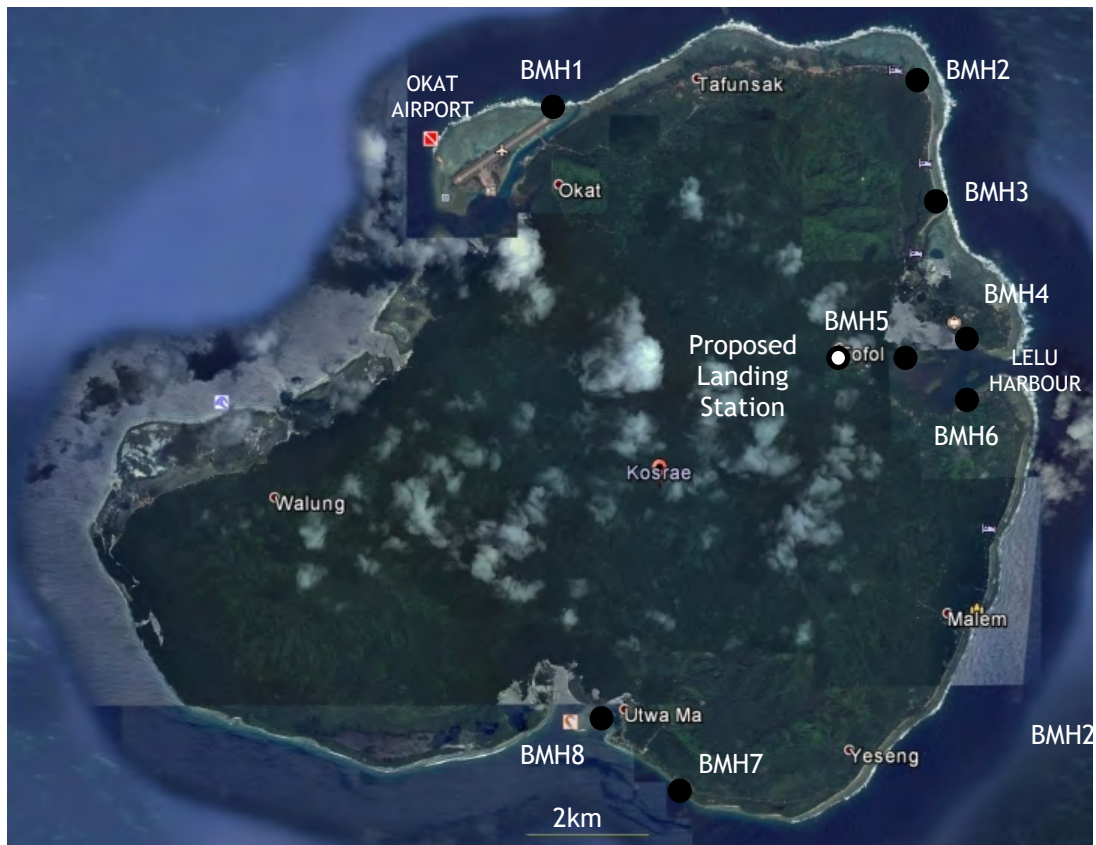


Figure 3.6: Approximate locations of potential BMH and Landing station sites in Kosrae



Figure 3.7: Approximate locations of potential BMH and CLS sites in Kiribati



Figure 3.8: Approximate locations of proposed BMH and CLS sites in Nauru

4. Baseline Data

The baseline data report (Appendix 1) presents baseline data describing the physical, biological and socio-economic elements of the environment, which can be used to benchmark future monitoring. As described in Section 3.2.2, a number of sites were evaluated; all of the data from the evaluation of these sites is included, including that of the preferred sites.

The Project Influence area (the PIA) considered for assessment of baseline conditions consists of the cable route as it enters the nearshore coastal environment, the beach manhole (BMH) sites and the terrestrial cable route to the CLS site. The PIA is defined through consideration of the project footprint including all ancillary project components and potential impacts on environmental, economic and social resources.

Table 4.1 outlines the guidelines that have been followed in determining the PIA for this Project which is based on best practices from previous similar studies and by adopting a precautionary approach.

All data was obtained by desktop study and field surveys conducted in late October / early November 2016.

Table 4.1: Project influence areas delineations and conditions

Environment	PIA
Offshore (>3nm from coastline)	The accuracy of the placement of the cable on the sea floor reduces with depth and the increased influence of ocean currents. A 500m corridor either side of the cable has been adopted as a precautionary limit for the PIA.
Inshore & Coastal Waters (<3nm from coastline)	As the accuracy of cable placement increases, the PIA reduces. Taking a precautionary approach, a 100m corridor either side of the cable (200m total) has been used for the foreshore PIA.
Intertidal zone	10m wide (5m on either side of the cable) area on the shore approach of the cable through the intertidal zone
Beach Manhole Stations	20m radius from the center point of new terrestrial structure within existing government easements for public works.
Terrestrial cable route	A 20m corridor has been assessed for any terrestrial trenching activities.
Important Species Habitat	To give specific regard to migratory cetaceans, a 1km belt either side of the cable (2km in total) has been identified in water depth less than 200m.

5. Analysis of Alternatives

5.1 Alternative Technologies

Both fibre optic cable and satellite connections were considered during the pre-approval period in feasibility studies. Satellite connections are currently used in all three countries and have provided a partial solution but do not provide a long term solution to connectivity needs due to limitations in available bandwidth, maintenance and deployment issues, and ongoing cost.

Fibre optic cable connectivity will provide much broader bandwidth and sustainable, long term service. If feasible, satellite contracts can be redeployed for backup redundancy but should not remain the sole or primary connection to international bandwidth. Alternative cable configurations were also considered with other potential landing and transit parties. After comparative options were reviewed, a proposed route and configuration with landings in Kosrae, Kiribati and Nauru was deemed optimal by each of the three EMC parties. It was therefore agreed by the EMC parties that the EMC would be pursued.

5.2 Cable Alignment & Landing Station Options

5.2.1 Introduction

The alignment options for each country are described in Section 3.2. The options were screened according to the following criteria in order of importance:

1. Least amount of encroachment on private or customary land;
2. Least amount of interference with marine protected areas;
3. Least effect on sensitive coastal and nearshore marine features;
4. Lowest risk of impacts on BMH site due to coastal erosion processes;
5. Proximity of the BMH site to the proposed/likely landing site;
6. Deep water access close to potential BMH site; and
7. Least effect on tourism/fishing/boating/shipping activities.

A matrix analysis has been performed rating each alternative against these criteria using a scale of 1 to 5 being least to most desirable. Table 5.1 presents the outcome of this analysis.

5.2.2 Kosrae

The evaluation of the eight options indicates the most favourable locations for BMH sites are Kosrae Airport at Okat and Sanskrit Elementary School on the southern side of Lelu Harbour (Score 28). As described in Table 5.1, the key points regarding these locations are as follows:

- Kosrae Airport is located on State land, has a short intertidal reef section adjacent to the potential BMH site which is located outside the operational runway area, and has existing coastal erosion protection. The only negatives are that the site is located at considerable distance from the potential CLS at Tofol. Cable trenching activities would be required from the likely CLS in Tofol back to the Airport facility. In addition, there are plans to extend the runway to the north east. The cable however, could be installed in such a way as it is not disturbed by construction activities.
- Sanskrit Elementary School is located on State land adjacent to the deep water in Lelu harbour potentially allowing the cable laying vessel closer access to the BMH site, and it

is located in close proximity to Tofol. The only negative aspects are the potential interference with existing shipping (although Lelu Harbour is not heavily utilised), and the potential cable alignment would be located in relatively close proximity to a proposed Conservation Area.

Given the uncertainty around of the subsea cable route from Pohnpei, these two options (i.e., Kosrae Airport in the north-east, Lelu Harbour in the east) allow flexibility for the cable laying contractor to make a final decision regarding the most favourable BMH site based on other installation considerations.

The preference is that CLS be located at the existing Telecommunications Building earth station premises in Tofol as it is the current centre of telecommunications operations in Kosrae.

5.2.3 Kiribati

The evaluation of the four options indicates the most favourable location for a BMH site is the Public Broadcasting Radio tower site adjacent to Nanikai Village at the eastern end of the causeway (Score 32).

As described in Table 5.2, the site is located on Government leased land, it has existing coastal erosion protection in place, and is located in closer proximity (approximately 1.1 km) to the potential CLS at ATH Kiribati in Bairiki than the Bonriki International Airport site for example.

However, if Ocean Links confirm they are to construct their facility on land adjacent to the PBS aerial, BMH3 may be more preferable with a CLS located in their facility (assuming Ocean Links were agreeable) due to the fact that there is only a short distance to the BMH for the required power supply.

5.2.4 Nauru

The evaluation of the four options indicates the most favourable location for a BMH site is the Government Building site (Score 32). As described in Table 5.2, the Gabab site had a similar score but is considered less favourable due to the fact that; the land is not government leased; the narrow access channel is used regularly by local vessels; and there is a view (identified through community consultation) that the channel is dangerous under certain sea conditions.

The proposed CLS is the existing ICT Building in Yaren as it is the current centre of telecommunications operations in Nauru.

5.3 Alternative Installation Methodologies

5.3.1 Subsea & Intertidal Cable Installation

Cable placement can be undertaken in one of the following three ways:

- 1) Placement on the seafloor
- 2) Burial of the cable, or
- 3) A combination of the two.

Burial is done using a trenching machine (Figure 3.4) which is either via a mechanical plough or a high pressure water jet. For either method the cable is laid into the trench and covered in one movement as the device is pulled along.

A second method used in the deep open ocean is to simply set the cable on the seafloor, sometimes with additional weights. In shallow sensitive areas, the cable is often floated into place and sunk with divers assisting with specific placement.

These options were assessed in relation to the sensitive habitats potentially affected, most importantly coral formations. Hydro-jet trenching in the nearshore zone has been ruled out as it can create considerable sediment plumes. The combination of plough-trenching and cable placement using divers was selected for this project as it creates minimal bottom disturbance minimising sediment plumes.

However, the final decision will be made by the cable contractor and will be informed by the ESMP. Any deviation from the recommended method and from the ESMP will require environmental evaluation to establish possible additional impacts and necessary mitigation actions.

5.3.2 Terrestrial Cable Installation

In Kosrae, consideration was given for the terrestrial cable to be suspended on the existing power poles adjacent to the road or buried adjacent to the road alongside the existing telecommunications infrastructure. It was the clear preference from Government officials that the cable is buried.

In Kiribati, apart from the short section from the BMH site to the roadside, no cable trenching or thrusting is required to connect the BMH to the CLS as there is conduit in the existing road for cable installation.

In Nauru, apart from a short section of trench required to get to the roadside, no additional trenching of the terrestrial cable is required as the cable has already been installed.

Table 5.1. Screening of Alternative Fibre Optic Cable alignments

NATION	LOCATION	SCREENING CRITERIA							TOTAL	KEY NOTES
		1.	2.	3.	4.	5.	6.	7.		
Kosrae	1. Kosrae Airport at Okat	5	4	4	5	2	4	4	28	State land, short intertidal reef, coastal erosion protection, considerable distance to CLS
	2. Phoenix Hotel site	1	5	3	2	3	4	4	22	Private land, longer intertidal reef, potential coastal erosion issues
	3. 'Bench' site	1	5	3	1	3	4	4	21	Private land, longer intertidal reef, potential coastal erosion issues
	4. Yacht Club in Lelu Harbour	3	3	5	4	3	3	3	24	State land, moderate distance to CLS.
	5. Tofol	5	1	1	2	5	3	3	20	State land, sensitive mangroves, proposed CA
	6. Sanskrit Elementary School	5	3	5	5	4	3	3	28	State land, close to proposed CA, deep water harbour, potential shipping issues
	7. 7 Day store in Melem	1	5	5	4	2	4	3	24	Private land, potential coastal erosion issue, close proximity to reputed dive sites
	8. Otwe Harbour	5	5	3	4	1	3	4	25	State land, considerable distance to landing station, coastal erosion protection.
Kiribati	1. Bonriki International Airport	5	5	5	5	1	5	4	29	Government land, coastal erosion protection, considerable distance to CLS.
	2. King George V High School	5	5	4	2	2	5	4	27	Government land, possible coastal erosion issue
	3. Public Broadcasting Radio tower	5	4	4	5	4	5	5	32	Government land, coastal erosion protection, closer to potential CLS
	4. Western end of the causeway	5	5	3	3	5	5	5	31	Government land, possible coastal erosion issues, closer to potential CLS
Nauru	1. Government Buildings	5	5	3	5	5	5	4	32	Government land, coastal erosion protection
	2. Gabab Boat Ramp	1	5	5	5	4	5	2	27	Private land, coastal erosion protection, heavily used access channel through reef.

6. Anticipated Impacts & Mitigation Measures

6.1 Introduction

The EMC Project has the potential to create a variety of impacts which can be either positive, negative or negligible or neutral depending on the receptors involved. The impact of the Project on the physical, ecological and social environment has been assessed using methodology described in this chapter.

The impact assessment process initially involves identification of the Project's activities and potential environmental and social impacts resulting from each activity during project phases. Project activities include preconstruction activities, cable installation and operation, and ongoing maintenance.

Within this ESIA, an impact is defined as “any change to the physical, biological or social environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services”.

6.2 General Environment

6.2.1 Deep Ocean Waters

The environmental issues associated with submarine cable deployment and maintenance have been identified in relevant literature⁵. Disturbances and impacts caused by cable laying and maintenance should be viewed in the context of the frequency and extent of these activities. The one-off disturbance associated with cable placement is restricted mainly to a strip of seabed less than 5-8 m wide and unless a cable fault develops, the seabed will not be disturbed again within the system's design life (approximately 25 years).

By comparison, commercial bottom trawl and dredge fishing operations are repetitive and more extensive and a single bottom trawl can be tens of metres wide, sweep substantial areas of seabed in a single operation and is likely to be repeated at the same site within a year. A single impact, such as a cable placement or burial, is preferred to continuous, multiple or recurring impacts.

The United Nations Convention on the Law of the Sea (UNCLOS) advocates the freedom to lay, maintain and repair cables outside territorial seas, but these are not necessarily inconsistent with the need to protect deep-ocean habitats and ecosystems, described as follows:

- Cable deployment in the deep ocean, i.e. laying of a 17-20 mm diameter tube on the surface of the ocean floor, has a minor if not negligible one-off impact; and
- Cable repairs can result in substrate disturbance. However, cable failures in deep water are relatively rare and are mainly caused by major natural events.

In addition, the submarine cable industry, together with environmental regulators, attempt to reduce or avoid any impact on vulnerable deep-water ecosystems by:

- Utilizing modern seabed mapping and navigation systems that allow identification of benthic habitats in unprecedented detail and accuracy. Together with modern cable-laying techniques, it is now possible to deploy cables to avoid ecologically and biologically sensitive areas; and

⁵See e.g. Carter, L., Burnett, D., Drew, S., Marle, G., Hagadom, L., Bartlett-McNeil, D., and N. Irvine., 2009. Submarine cables and the oceans - Connecting the World. UNEP-WCMW Biodiversity Series No. 31 - ICPC/UNEP-WCMC.

- Avoiding the deployment of cables on or through habitats such as seamounts, submarine canyons and hydrothermal vents, which are also unsuitable as cable routes due to the risk of natural hazards. For example, canyons are often swept by powerful currents that may abrade or break cables; and seamounts can be volcanically active and subject to landslides and hydrothermal venting.

Modern deep-water fibre-optic cables are composed of several pairs of hair-like glass fibres, a copper power conductor and steel wire strength member, which are all sheathed in high-density polyethylene.

Where extra protection is required (as for areas of rocky seabed or strong wave and current action) additional steel wire armour is included. Of these materials, cable-grade polyethylene is essentially inert in the ocean. Processes such as oxidation, hydrolysis (chemical breakdown in water) and mineralization are extremely slow; the total conversion of polyethylene to carbon dioxide and water would take centuries.

The effects of ultraviolet light (UV-B) (the main cause of degradation in most plastics) are minimized through the use of light-stabilized materials, burial into the seabed and the natural reduction in light penetration through the upper ocean, where the photic zone rarely extends beyond 150 m depth. Any mechanical breakdown of a cable's plastic sheathing to fine-grained particles on the energetic continental shelf, a potential hazard for marine life, is minimized by armouring and burial.

In addition, the diesel powered vessels used to survey the seabed and lay cable (as described in Section 3.1) will emit greenhouse gases. As the relative contribution of these ocean going vessels to overall greenhouse gas emission is so small it is considered "*de minimis*".

Offshore anchoring for fishing in each of the three countries is also limited due to significant water depths. In addition, potential impacts on offshore ecotourism operations in Kiribati and Nauru can be avoided primarily due to the limited number of operations present. The short duration of cable laying activities, providing adequate notice of the proposed activity and the flexibility of the alignment will also ensure that economic or livelihood impacts will be avoided or minimised. In Kosrae where there is an established recreational dive industry, specific targeted dive sites for tourism operators are significant distances from potential cable routes.

Hence, the overall potential environmental impacts arising from the Project in the deep ocean are limited. The key environmental interactions are in the near shore areas where cable requires burial to avoid potential entanglement with fishing activities and other human activities.

6.2.2 Intertidal Coastal Areas

A range of potential impacts could arise at all of the BMH sites in each of the three countries. The key potential impacts to both the intertidal reef and soft bottom communities include:

- Direct loss of habitat along the cable route.
- Physical effects of sedimentation on benthic communities as a result suspension of fine materials and off-site deposition.
- Reduction in water clarity due to increases in water-borne suspended solids concentrations and potential impacts on fish communities.
- Temporary restrictions to local villagers to fishing areas during the installation period only.

The potential impacts are not expected to be significant due to:

- The area disturbed represents a very small proportion of the total intertidal habitat present.
- Ability of the marine benthic community to recolonise over time.
- The short duration of installation activities with adequate notice of the proposed activity being provided.

Overall, it is not expected that that any economic or livelihood impacts will be avoided or minimised.

6.2.3 Terrestrial Areas

Kosrae

The proposed CLS at the national Telecommunications Corporation premises is located in the township of Tofol, and is located approximately 13.7 km & 3.2 km from Kosrae Airport and Sanskrit Elementary School respectively.

The terrestrial cable route for both locations is along the road corridor in the easement where the existing telecommunications infrastructure (copper cable) is installed. Evaluation of the potential route indicates it is comprised of a combination of vegetation that encroaches on the road corridor, intersecting roads, drive way crossings, etc. There appear to be no activities of a particular sensitive nature (e.g., hospital access road) along the route access to which would be unnecessarily impeded.

Overall, the potential impacts of cable installation are not expected to be significant due to the fact:

- the vegetation present is typically comprised of a range of common species and there is nothing of particular conservation concern present.
- The installation period is of short duration so disruption to traffic etc will be temporary.
- The use of methods (i.e., cable thrusting under sensitive areas) will mitigate any potential impacts.

The proposed CLS itself has no ecological resources of any description on or immediately adjacent to the site that would be impacted.

Kiribati & Nauru

No impacts are anticipated for either Kiribati or Nauru. In Kiribati, only a short section of trenching or cable thrusting is required to reach the roadside conduit. In Nauru, existing cable is available minimising any potential impacts of terrestrial cable installation. Any impacts to traffic etc will be temporary.

As described in Section 3.1, there is a requirement for a diesel powered generator in Kiribati to power cable repeaters. As this requirement is small scale any issue associated with Greenhouse Gas emission is *de minimis*.

In addition, measures will be taken so that alien or pest species are not introduced particularly in relation to hull fouling organisms (hull cleaned before works commence), ballast waters (discharged at sea) or machinery that needs to be imported for use on land (cleaned prior to transport).

6.3 Poverty & Gender Impact

Section 6.3 of the Baseline Data Report (Appendix 1) describes the relevant poverty, vulnerable population and gender issues in each of the three countries. In terms of potential impact overall, the Project will ensure lower cost Internet access for consumers, including low income households. As a result, the Project will contribute to improved social welfare, provide expanded access to information and services, and increase income-earning opportunities.

In addition, the Project is expected to have a positive impact on women's access to affordable Internet services in all three Countries particularly Kiribati. This is important because access to affordable, high-speed Internet in employment particularly in the education and health sectors is known to be associated with economic and social empowerment. Improved Internet access can facilitate new livelihood opportunities for women who tend to stay on-island whereas many young men travel overseas (e.g. to work on merchant ships).

An added benefit is in the area of disaster risk management such as: (a) facilitating the deployment of disaster risk monitoring tools and applications that require large volumes of data transmission (including access to regional databases) by improving the quality and reducing the cost of Internet; (b) providing additional options/media for early warning systems and post-disaster communications.

6.4 Land Acquisition & Resettlement

The World Bank Operational Policy OP4.12 2a) states that *"Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs."* The ADB Safeguard Requirements 2: Involuntary Resettlement Policy *"seeks to avoid involuntary resettlement wherever possible; minimize involuntary resettlement by exploring project and design alternatives ..."*

The incountry PMUs initially identified BMH and CLS options, and the subsequent evaluation of these options in this ESIA, that avoid the requirement for involuntary resettlement. Involuntary resettlement will not occur as a result of:

- There are legal mechanisms available in each country for leasing or acquiring an easement over private land. There is no appetite from any of the Governments to compulsorily acquire land, even where there is enabling legislation to do so for public infrastructure.
- The size of land parcels required are small and there is considerable flexibility in terms of siting of Project infrastructure.
- The outcome of public consultation process indicates that there is overwhelming support for the Project and great benefit to the community as a whole. Experience with land acquisition for the Palau-FSM Connectivity project (in Yap and Chuuk) have shown that it is possible to obtain voluntary consent because the land owners want to support the project and do not see the BMH / cable laying as a significant impact on their ability to use their land.

As a result the WB Operational Policy 4.12 (for Kiribati and Kosrae) and ADB Safeguard Requirements 2: Involuntary Resettlement (Nauru) is not triggered and therefore a Resettlement Policy Framework (RPF) has not been prepared.

The Due Diligence report addressing the issue of involuntary resettlement for Kosrae, Kiribati and Nauru is provided in Appendix 2. The report concludes that as the vast majority of the BMH and CLS sites will be located on Government owned or leased land, and as there will be

no need for private or custom owned land to be used or accessed, no involuntary land acquisition will be required. In Kosrae, one of the BMH options consist of a strip of private coastal land. If, during the detailed design phase of the Project, it is determined that this land cannot be voluntarily acquired, it will no longer be considered as an option.

In addition, terrestrial cable routes will be located in public road reserves.

The majority of location options will enable shore side BMH installations to connect the open ocean segment to the terrestrial infrastructure as it traverses the fringing reef. An option in Kosrae is to bring the cable through Lelu Harbour and into the State owned school. The exact location of the cable route will be determined following a detailed marine bathymetric survey during the design stage. Similarly, the locations of land-based infrastructure (other than utilisation of existing facilities) will be subject to detailed design.

The proposed CLS's (which will house the necessary equipment to enable the high-speed connection) will likely be sited either within existing Government owned facilities or on Government leased land.

In conclusion, the majority of the BMH and CLS sites will be located in Government owned or leased land, and as there are mechanisms available to allow for use of or access to private or custom owned land voluntarily, without the need for involuntary resettlement.

6.5 Risk Assessment & Impact Identification Methodology

Risk Assessment is routinely undertaken as part of the ESIA process. In assessing a project’s environmental risk, impacts are rated to determine the appropriate response or management actions that should be implemented to minimise potential impacts. The risk assessment methodology for the SCS Project is described in this Section.

The commonly adopted Australasian Standard for Risk Management has been used to assess the level of risk posed by the activities associated with the Project and is based on the following: the likelihood or probability of an event; and the consequences of the impacts of that event occurring (see Table 6.1).

Table 6.1: Qualitative risk analysis matrix

Likelihood	Consequence					Risk Map Color Code
	1	2	3	4	5	
	Catastrophic	Major	Moderate	Minor	Insignificant	
A - Almost certain	E	E	H	H	M	
B - Likely	E	E	H	H	M	
C - Possible	E	E	H	M	L	
D - Unlikely	E	H	M	L	L	
E - Rare	H	H	M	L	L	

This is a conventional risk management framework and is considered applicable in the context of this assessment which has a focus on high level identification of biodiversity and ecosystem services risks. It is envisaged that the subsequent ESIA process will provide detail on these risk areas as appropriate.

There are four main levels of risk after combining the ‘likelihood’ and ‘consequences’ factors (see Tables 6.2 & 6.3). Each level has a response or management control action. The four ‘Risk Levels’ are:

- Extreme (E) Risk - those impacts that require immediate action at the highest level of management.
- High (H) Risk - those impacts requiring action at senior management level.
- Moderate (M) Risk - those that require policies in place to address impacts and monitoring programs.
- Low (L) Risk - those impacts that do not require any specific management actions but may be part of routine management and monitoring plans.

Table 6.2: Qualitative measures of consequence

Level	Descriptor	Env/Social Impacts	Legal	Public/Media Attention	Financial
1	Catastrophic	Significant extensive detrimental long term impacts on the environment, community or public health. Catastrophic and /or extensive chronic discharge or persistent hazardous pollutant. Damage to an extensive portion of aquatic ecosystem. Long term impact on water resource.	License to operate likely to be revoked or not granted	Probable public or media outcry with national/international coverage. Significant green NGO campaign.	> \$1 million
2	Major	Off-site release contained with outside assistance. Short to medium term detrimental environmental and social impact off-site or long term environmental damage on-site.	May involve significant litigation and fines. Specific focus from regulator.	May attract attention of local and state media and local community groups.	\$500,000-\$1,000,000
3	Moderate	Onsite release contained with outside assistance. Significant discharge of pollutant, possible source of community annoyance. Non persistent, but possible widespread damage to land. Damage that can be remediated without long term loss or very localised long persistence damage.	Probably serious breach of regulation. Possible prosecution and/or fine. Significant difficulties or delays experienced in gaining future approvals.	May attract attention of local media, heightened by local community.	\$50,000-\$500,000
4	Minor	On site release immediately contained without outside assistance. Ongoing or repeat exceedances of odour, dust or noise/vibration limits.	Minor on the spot fines or formal written correspondence from regulator.	Local community attention or repeated complaints.	\$5,000-\$50,000
5	Insignificant	Negligible environmental impact. Minor transient release of pollutant including odour, dust and noise/vibration. Minor social impact.	No serious breach of regulation. Minor license non-compliance.	Local landholder verbal discussion/complaint.	< \$5,000.

Table 6.3: Qualitative measures of likelihood

Level	Descriptor	Example	Frequency
A	Almost certain: Environmental issue will occur, is currently a problem or is expected to occur in most circumstances.	Is expected to occur in most circumstances	> once per year
B	Likely: Environmental issue has been a common problem in the past and there is a high probability it will occur in most circumstances.	Will probably occur in most circumstances	Once per year
C	Possible: Environmental Issue may have arisen in the past and there is a high probability that it should occur at some time.	Could occur	Once every 5 years
D	Unlikely: Environmental issue may have occurred in the past and there is a moderate probability that it could occur at some time.	Could occur but not expected	May happen within Project Life
E	Rare: Environmental issue has not occurred in the past and there is a low probability that it may occur in exceptional circumstances.	Occurs in only exceptional circumstances	Not likely to happen with Project Life

6.6 Outcome of Risk Assessment & Impact Identification

The potential impacts on ecological and socio-cultural resources as a result of implementation of the EMC Project have been identified in Sections 6.2 to 6.4.

Tables 6.4 and 6.5 present an evaluation of the risks to ecological and socio-cultural resources associated with the EMC Project. Overall, all risks identified as 'Extreme' or 'High' Risk Project activities initially have been determined to be low risk following implementation of proposed mitigation measures.

6.7 Other Potential Impacts & Benefits

6.7.1 Cumulative Impacts

No cumulative impacts are anticipated given cable installation involves the placement of a small diameter solid cable (containing no liquids, and not needing transmission of electricity) in a narrow trench on the seabed and will be carefully placed (via divers and/or a cable floated into place if required) in coastal waters over a relatively short period of time. There are no other known activities occurring at the same time that the cable is to be placed on the seafloor. There may be other construction activities on land, but since the CLS's will only require the construction of a single room, which may be a simple addition to an existing structure, no cumulative impacts are anticipated.

In addition, there are no expected cumulative social impacts due to the small project footprint, and the fact that it is not expected to cause permanent loss of communal fishing grounds and local people's livelihoods.

6.7.2 Irreversible & Irrecoverable Impacts

Given the very small disturbance to the environment from the cable installation and landside building (30-50 m²) construction, there will be no irreversible or irretrievable impacts from the Project. Implementation of measures outlined in the ESMP will serve to mitigate any potential impacts.

6.7.3 Transboundary Impacts

Transboundary impacts are likely to be limited to:

- Potential emission of greenhouse gases from the survey and cable laying vessels; and
- Impacts on endangered species and habitats.

Overall, the impacts of greenhouse gas emissions are expected to be no more than minor given the relative contribution of the vessels compared to other emitters, and no endangered species and habitats were identified that could be potentially adversely affected following implementation of mitigation measures.

6.7.4 Environmental & Social Enhancements / Benefits

The Project will not only improve people's access to income and social services but may also enhance social networks and contact with family members living abroad. Faster Internet is expected to facilitate regular and affordable connections among local and overseas-based groups, particularly women's organizations who rely on Internet for communication.

A fibre optic system was installed on Pohnpei, FSM, in 2010 and improvements in health care and education services have been reported. Better Internet connections should also help with remote medical services and distance education.

Table 6.4: Issues & risk assessment - Cable Installation

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation / General Comments	Post-Mitigation Residual Impact
			C	L	Rating		
1. ECOLOGICAL RESOURCES							
1.1 Marine ecology							
Cable installation	Sub-tidal cable laying using cable trencher	Disturbance to soft bottom benthic communities	5	A	H	Minor construction footprint, sediments already prone to disturbance, no mitigation required	L
	Vessel movements associated with sub-tidal cable laying	Disturbance to pelagic species such as whales, dolphins, turtles	4	C	M	Limited occurrence with species in nearshore coastal environment, vessel movement slow, a trained independent observer to be present on board	L
	Cable installation along subtidal coral reef	Disturbance to coral reef communities due to presence of cable, colonization of cable	5	C	L	Very minor cable footprint, no specific mitigation required apart from microscale avoidance of significant coral outcrops (in Nauru in particular)	L
	Intertidal earthworks during cable trenching	Disturbance of intertidal reef communities / seagrass beds / birds	5	A	H	Minor earthworks required, small construction footprint, short duration activity, mitigation consists of immediate trench re-instatement	L
	Subtidal & intertidal works affecting informal fishing reserve	Direct & indirect impacts on fish & benthic communities within the adjacent fish reserve (Kiribati).	4	D	L	Significant separation between Project site and fish reserve	L
1.2 Terrestrial Ecology							
Cable installation	Minor vegetation removal and earthworks during cable trenching	Direct loss of terrestrial habitat	5	C	L	Little or no significant vegetation present, no mitigation required	L
		Terrestrial habitat fragmentation, general disturbance, pathway for invasive species	5	C	L	Little or no significant vegetation present, no mitigation required	L
	Earthworks machinery	Noise & vibration creating bird (and other species) disturbance	5	C	L	No species of conservation significance identified, Construction period of short duration, no mitigation required	L
	Soil disturbance, spoil disposal	Sediment runoff into downstream watercourse, visual effects	4	D	L	Minor earthworks required, no spoil disposal required, mitigation consists of immediate trench re-instatement	L
2. SOCIO-CULTURAL RESOURCES							
2.1 Subsistence & livelihoods							
	Cable trenching activities in subtidal areas	Impacts on fish harvested for subsistence as a result of vessel movements	4	D	L	Nearshore cable installation of short duration, mitigation to include notice to locals of upcoming activities	L

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation / General Comments	Post-Mitigation Residual Impact
			C	L	Rating		
	Cable trenching activities across intertidal reef	Impacts on both subsistence commercially targeted benthic fauna (e.g., sea cucumbers, octopus, clams, seaweeds, etc) in immediate areas of cable trenching	4	D	L	Construction footprint small and installation activity of short duration, subtidal reef already impacted, mitigation to include notice to locals of upcoming activities	L
	Cable laying activities through subtidal areas across intertidal reef	Impact on ecotourism operations due to loss of business as a result of construction activities	4	D	L	Limited marine ecotourism operations in Kiribati / Nauru. In Kosrae dive sites sufficiently separated from proposed cable routes. In addition, as construction period is of short duration, no mitigation required	L
2.2 Employment & OHS							
Cable trenching, Manhole construction, cable installation	Earthworks, vegetation clearance, etc	Employment opportunities	3	B	H	Positive overall benefit, no mitigation required	H
	OHS risk due to earthworks, vegetation clearance, etc	Potential human hazards due to large machinery, noise, dust	1	C	E	Appropriate OSH policy implemented and OSH training offered	L
2.3 Recreational & Heritage							
Cable trenching, Manhole construction, cable installation	Earthworks activities	Loss of or disturbance to potential recreational & heritage resources	2	H	H	There are no known heritage resources or areas used for recreational purposes at the proposed BMH & landing sites apart from the known resources in Lelu Harbour (Kosrae).	L
2.4 Traffic							
Cable installation, manhole construction, etc	Additional land traffic movements, lane closures	Issues due to additional traffic movements, congestion, increased risk of accidents, etc	2	H	H	Existing roads will be used to deliver and remove construction materials, and equipment to and from the proposed BMHs and CLSs. Additional vehicle movements expected to be minimal. No mitigation required.	L
	Vessel activity in nearshore coastal environment	Potential impact on existing recreational and commercial vessel activity	4	C	M	Ports Authority & local villagers will be notified in advance	L
2.5 Solid Waste							
Manhole construction, etc	Residual materials following construction	Impacts on waste handling facilities	4	D	L	No mitigation required	L
2.6 Noise & vibration							
All construction activities	Construction machinery and related traffic	Impacts on adjacent sensitive receptors from excessive noise	4	C	M	Construction activity of short duration, limited sensitive receptors in close proximity. Apart from appropriate noise attenuators on machinery, no additional mitigation required.	L
2.7 Air quality							

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation / General Comments	Post-Mitigation Residual Impact
			C	L	Rating		
All construction activities	Construction machinery and related traffic	Impacts on adjacent sensitive receptors from excessive dust	4	D	L	Construction activity of short duration, limited sensitive receptors in close proximity, apart from dust suppression using a water cart (if required), no additional mitigation required.	L

Table 6.5: Issues & risk assessment - Operation (including maintenance activities)

Activity	Source of Risk	Description of Potential Impact	Assessment of Risk			Mitigation / General Comments	Post-Mitigation Residual Impact
			C	L	Rating		
1. SOCIO-CULTURAL							
1.1 Employment & livelihoods							
Use of Cable to access internet	Access to cable for internet use	Improved telecommunications access to businesses and residents leading to additional employment opportunities	2	B	E ¹	Positive overall benefit, no mitigation required	E ¹
1.2 OHS							
Installed power cable	Powered cable (Kiribati only)	Potential for the public to come in to contact with powered cable and associated electrocution risk	1	C	E	Ensure CLS is located in close proximity to BMH, deep burial of powered cable and signage allowing cable route advising of risk of excavation	L
1.3 Sea vessel traffic							
Installed subsea cable	Vessel activity in nearshore coastal environment	Entanglement of anchor on cable	4	D	L	Due to burial and trenching of cable there is low risk of this occurring.	L

Notes: ¹The 'extreme' rating refers to a positive 'risk' and residual impact.

7. Information Disclosure, Consultation & Participation

7.1 Introduction

The consultation undertaken with stakeholders is detailed in Appendix 7. Appendix 8 presents lists of meeting attendees. Set out below is a summary of consultations undertaken.

7.2 Kosrae

Stakeholder meetings and public consultations were held during the site visit to Kosrae by the safeguards team from 14th to 23rd October, 2016.

Overall, stakeholder feedback during meetings and public consultation was very encouraging and positive. Primarily, people just wanted information on the nature and timeframe for the project. In fact, the limited connectivity in Kosrae prompted a lot of people to demand quicker implementation of the Project. The desire to obtain better Internet and communication services at an affordable rate was high.

Government and non-government organisations indicated the aspiration to offer more products and better services particularly private businesses and financial institutions (banks). In addition, there is a high rate of emigration from Kosrae in search of better economic opportunities. Better communication will be welcomed by Kosraean families with loved ones living abroad who wish to keep close contact with family members at home.

A key issue raised related to land access and ownership. However, it was mentioned that the priority was locating the BMH and CLS sites on Government land. Further, it was highly likely that the existing utility corridor (telephone and electricity lines) would be used for the fibre cable networking on land. The purpose provision in the Government easement lease, which clearly identifies the 60 feet wide easement, will accommodate the duct route of the fibre cable from the BMH to the CLS. However, an issue was raised that landowners may potentially claim that land on the seaward side of the road, which has been eroded in recent times, belongs to them when in fact it is within the road easement. To avoid the issue of ownership and to ensure long term viability of the cable in these areas, it is proposed that the cable be installed on the inland side of the road.

The issue of accessing inappropriate information specifically by children was raised by women. The response was described as an issue of managing the risk. Education will need to be provided on how to manage access to Internet content at home.

7.3 Kiribati

Stakeholder meetings and a public consultation exercise was held during the site visit conducted between 24th and 29th October 2016.

Due to the current land tenure, and WWII history, the proposed sites were generally accepted as potential locations for the BMH sites.

The sense of public need for the project, seen as a potential improvement of the existing Internet and communication services, was overwhelming. Strong support from both the Government and non-government entities was evident.

Kiribati has a large contingent of its population overseas, and communication is an important part of their daily lives. There was a perception that the fibre cable will bring with it an accessible and affordable service.

The concerns were generally around the impact on fisheries (as a result of bringing the cable ashore), potential costs, and social impacts. The importance of fishing to the people of

Tarawa was evident, as some raised concerns of potential impacts of the fibre cable on fish. However, an explanation of the project and potential impacts alleviated these concerns.

It was explained that costs will likely depend on the Kiribati Government and the selected operator for the cable and that in theory it should be cheaper compared to the current satellite services, which was generally accepted.

The concerns with respect to the social impact of this project were a subject matter of discussions which differed between different age groups and gender. Women and children, were seen as the most vulnerable people to the negative impact of the new cable. Overall, the need for a public awareness and information assistance, from government for example, was apparent.

The Kiribati Government, particularly confirming the structure of Telcos access rights to use of the cable and confirming the CLS, was needed to be progressed in advance of Project delivery.

7.4 Nauru

Stakeholder meetings and a public consultation exercise was held during the field trip to Nauru (30th October & 2nd November 2016). Stakeholders included both government and non-government including environment, conservation, legal, gender, youth, women, and NGOs.

The technological gap between the younger generation and their parents was evident. Public awareness and education was raised as a prerequisite prior to the implementation phase. This will be a necessary component of managing the risk of opening Nauru to global Internet.

The project has great potential for Nauru. However, the legal framework and local infrastructure must be developed leading up to the fiber optic submarine cable landing date. Thus allowing the people and government of Nauru to fully utilised the cable. Freedom of speech is embedded in the Constitution. However, Internet freedom is still an area that requires further development. In fact, that Cyber Crime Act passed in May 2016, which certainly will assist with monitoring and managing Internet usage.

The potential negative impact both on the environment and people's lives were perceived to be nil. On the other hand, the positive impacts were overwhelmingly expressed. Overall, the perceived positive impacts appear to far outweigh any negative impact.

7.5 Disclosure

The draft ESIA was publicly disclosed on Implementing Agency websites in FSM (on 6th January 2017), Kiribati (11th January 2017) and is available in hard copy at government offices in each Country. The World Bank (16 January 2017) has disclosed the document on their website. ADB and Nauru have not yet disclosed the ESIA as it is a Category B Project. The final ESIA is to be disclosed in late February 2017. A public notice will advise stakeholders when the document is available to view.

7.6 Ongoing Consultation & Participation

During project implementation the Implementing Agencies in each country will be responsible for keeping the public and stakeholders informed of progress. Further consultation will be undertaken before the detailed marine survey, during any land access negotiations and before and during installation. Each Implementing agency will develop a consultation plan for their project and will be supported by an in-country Project Management Unit (PMU) or an individual Project Coordinator (PC) to implement the plan.

8. Environmental & Social Management Plan

8.1 Introduction

The Environmental & Social Management Plan (ESMP) is described in this section of the report. Mitigation measures and monitoring actions that the Implementing Agency has committed to implement, from the planning through to the operating period of the project, are summarised in the environmental mitigation table (ESMiT) and monitoring table (ESMoT) (Appendix 9). The ESMP will inform the Contractor's ESMP which will be prepared following detailed design.

The ESMP also consists of:

- Chance Find Procedures (Appendix 5).
- ECOP(Appendix 10)
- Land acquisition process (Appendix 11)

8.2 Performance Indicators

Given that nearly all of the potential negative impacts could arise during cable installation, and that robust environmental contract clauses will be able to avoid all impacts, key performance indicators will be as follows:

- i) confirmation that the ESMP tasks are defined as specific individual or grouped environmental and social clauses in the contract bid documents for cable laying;
- ii) confirmation that environmental management criteria are included as part of the cable-laying contractor selection process, including their experience preparing and implementing ESMPs, working in sensitive tropical locations such coral reefs, recognizing fish aggregation/spawning areas, seagrass meadows and seamounts;
- iii) a safeguards advisor with marine ecology expertise located and retained as an advisor by each country's Implementing Agency (IA) providing assistance with ESMP implementation, contractor briefing on marine habitat protection, contractor ESMP supervision (including observations during cable laying within the reef), and participation in community consultation;
- iv) a written record of the briefing on safeguards and inspection of vessels, according to the tasks as they are defined in the ESMP and contract specification, completed with the survey and cable placement contractors, as soon as the contractors have been selected.
- v) compliance monitoring checklists prepared and being used by the contractor and safeguards consultant and due diligence notes, completed as defined in the ESMP, and making the notes available in an easily accessible file for the contractor, PC, PMU, and others to use.
- vi) a written mitigation and monitoring completion report, listing all mitigation and monitoring measures defined in the ESMP, their implementation timing, monitoring and any follow up actions; and,
- vii) a written record of interviews with local fishers, examining any cable placement issues, vis-à-vis fishing gear damage.

The safeguards advisor for each EMC party will be responsible for preparing a performance indicator report on behalf of that party's PMU, by listing the seven items above and providing

a short text to indicate how these items were implemented and their success as of the start of the operating period of the project.

8.3 Implementation Arrangements

8.3.1 Overview

The Project involves three countries (FSM, Kiribati and Nauru), each with their own project funding supported by either the World Bank or ADB.

The development and implementation of the joint components of the EMC Project are administered through the East Micronesia Cable Steering Committee (EMC SC), which is comprised of two members from each of the participating countries. A joint technical project manager reporting to the EMC SC will be responsible for finalizing the system specifications and conducting the tender for the undersea components of the EMC.

During implementation of the cable supply contract(s), each country's IA may establish a PMU and/or hire a PC to manage the project as delegated by the IA. For Kosrae, the implementing agency is the FSM DTCl; for Kiribati, the MICTTD; and for Nauru, the Nauru ICT Department. Each IA is responsible for implementing the ESMP and complying with the safeguards policies of its development partner (WB or ADB) as per its funding agreement.

A cable-laying contractor will be contracted to supply all undersea components of the project up to the BMH at each landing. Each of the parties will be separately responsible for letting the contracts for the associated terrestrial works at the respective landings.

Each IA will be responsible for day-to-day project delivery including the supervision of the cable-laying contractor. This responsibility may be delegated by the IA to its government PMU or its PC. Each country's PMU or PC will continue this role until the country establishes a State-Owned Entity or other Special Purpose Vehicle (SPV) for the purpose of owning and operating each country's long term interest in both the undersea and terrestrial components of the EMC.

Each IA's PMU/PC will be responsible for identifying the final location of land-based infrastructure (BMH, CLS and cabling), securing land access (lease or easement), procuring contractors and supervising the land-based works, public and stakeholder consultations and managing complaints and grievances in their respective country.

8.3.2 ESMP Implementation Arrangements

ESMP activities relating to cable laying will be coordinated and managed by the IA or the IA's PMU or PC which may delegate responsibility to a Safeguards Advisor, part-time, as needed for the duration of the implementation period. ESMP activities during undersea cable laying include:

- Ensure safeguards clauses in the cable laying bid documents
- Review and clearance of the cable laying Contractor's CEMP
- Review and comment on detailed design, detailed marine surveys and other technical outputs
- Remote and site-based supervision of the cable laying contractor, particularly when the cable is being laid in the nearshore / foreshore environments.
- Updates to the ESMP, if required
- Reporting safeguards activities and progress to the IA on a quarterly basis

- Training, oversight, support and capacity building to the IA as required, but particularly for consultation, voluntary land acquisition, management of non-compliances and incidents, and obtaining local permits and approvals.

A Safeguards Advisor hired by each IA may also support the IA's project team in ensuring compliance with the ESMP for associated terrestrial works and stakeholder engagements, including:

- Ensuring land acquisition and resettlement is voluntary and is carried out in accordance with World Bank or ADB safeguards policies.
- Ensuring land access documentation is obtained before construction starts.
- Managing consultation, disclosure of information, keeping records of consultations and providing feedback to the IA.
- Receiving and recording grievances and complaints and managing their resolution.
- Remote and site-based supervision of local contractors for compliance with the ESMP, including managing any non-compliances and incidents.
- Obtaining local permits or environmental approvals, including preparing any documentation and communications with environment agency staff.
- Reporting safeguards activities and progress to the IA on a six monthly basis.

A Safeguards Advisor serves as additional support to each party's local environmental protection agency, and will have specific experience with World Bank and / or ADB safeguards policies to ensure compliance with both government and donor safeguards requirements. A Safeguards Advisor may be based overseas. If they are based overseas, they will be required to travel to the project location at key milestones.

8.4 Institutional Capacity Assessment

Kosrae, Kiribati & Nauru appear to have competent staff that work in the various environmental consenting agencies who have had some, if limited, experience with processing EIAs.

However, in light of the fact that the impacts of this Project are expected to be minor in nature and extent, the capacity within the environmental agencies appears adequate, and there is not considered to be any need for changes to related institutional or organizational arrangements, capacity development or training measures.

The respective IAs have indicated that they have capacity to take on the responsibilities required to implement the Project subject to provision of technical assistance offered by the WB and ADB. The Safeguards Advisors recruited for the Project will be required to have experience in the implementation of WB or ADB safeguards. The IAs and their respective project implementation teams will coordinate with their Safeguards Advisors to ensure that the supplier complies with ESMP requirements, which will be incorporated into the supply contract(s). Each IA's project team will fill existing safeguards capacity gaps and ensure that there is adequate expertise and resources to implement the ESMP for that country.

In addition, the cable supplier, installation contractor and building contractors will be required to have sufficient ESMP implementation skills and resources within their team for the duration of their contract.

The World Bank and ADB will support the IAs to prepare Terms of Reference for the Safeguards Advisors, as needed, and will provide ongoing safeguards support for the duration of the project. No specific training is proposed.

8.5 Mitigation & Monitoring Costs

8.5.1 Environmental

The ESMP identifies mitigation and monitoring actions. Monitoring will be required during cable installation field (likely to be 1-2 days), when the cable placement is ongoing nearshore. For the deep ocean work the oceanographic survey is expected to be completed several weeks ahead of the cable placement operation.

Assuming that each Safeguards Advisor will be an individual who is sourced from outside these countries, safeguards monitoring costs are estimated as follows:

- Safeguards Specialists for Kosrae, Kiribati and Nauru is estimated to be 55 days total annually (\$US46,000, plus \$30,000 travel & disbursements budget).

In addition an allowance of \$US25,000 each has been provided for Kiribati and Nauru for a UXO survey.

8.5.2 Social Development Programs & Resettlement Costs

Social mitigation and monitoring will involve at least five tasks (ESMP-Annex 2). Cost of community awareness activities such as community meetings/public consultations and information materials prior to construction, during and after construction is expected to be approximately \$30,000.00, or about \$10,000 for each country, for the complete development period.

As access on Government or State land will be voluntarily donated, there is no land acquisition required for the project and therefore no budget allocated.

8.5.3 Total Costs

Combining both the environmental and social mitigation and monitoring costs the total estimated collective costs for all three EMC parties are expected to be approximately US\$76,000 for the entire project, or about \$25,333 each (not including the UXO surveys for Kiribati and Nauru). These cost estimates assume efficiencies to be gained from either a joint or coordinated procurement of the Safeguards teams. Additional costs especially for travel will need to be considered if the Safeguards Advisors are procured/coordinated severally.

8.6 Reporting & Monitoring Requirements

All reporting requirements are specified in the ESMP (see ESMP 2.15 and 3.1). In summary quarterly progress reports from each country's Safeguards Advisors to its respective IA (as delegated to a PC or PMU) is required, and 6 monthly PMU reports to WB/ADB (as per normal reporting requirements under funding agreements).

At the end of the preconstruction period each country's Safeguards Advisor will prepare mitigation and monitoring completion reports for their respective IAs to submit to the WB and ADB as required. The contractor will be required to submit progress reports to the IAs, in addition to the oceanographic survey findings and a semi-annual summary of ESMP implementation. Each PMU or PC or Safeguards Advisor through its respective IA will prepare and submit a semi-annual compliance monitoring summary report, as well as the construction period mitigation and monitoring completion reports, once the facilities are fully installed.

Monitoring requirements are specified in the ESMP monitoring table, the ESMoT.

8.6.1 Environmental Code of Practice

The Environmental Code of Practice (ECOP) for corridor selection, placement of the cable, and siting of the landing stations is provided in Appendix 10. The ECOP details many of the items defined in the ESMP and adds further detail on boundaries and restriction to be adhered to by contractors conducting work in the marine environment and on shore.

9. Grievance Redress Mechanism (GRM)

9.1 Introduction

Although at this stage there are no identified environmental and involuntary resettlement complaints associated with the proposed project, a grievance redress mechanism (GRM) is presented, to be applied by each Country in the event that at any time during project implementation a grievance or complaint is received and requires action. The GRM lasts for the duration of the project but each of the three countries can continue this beyond the project if they wish, under their own system. For example, there could be a grievance filed as a result of fishing gear becoming snagged on the cable, presumed to be due to faulty cable placement.

The GRM is scaled to the risks and adverse impacts of the project. If promptly addressed, concerns and complaints of potentially affected people using a clear and transparent process that is gender responsive, culturally appropriate, and at no costs and without retribution, can be resolved. The mechanism will not impede access to national or state judicial or administrative procedures. The PMU will inform affected people (AP) about this GRM before commencement of any civil works, as part of the consultation process.

A grievance redress committee will be established to:

- (i) Record, categorize and prioritize the grievances;
- (ii) Settle the grievances in consultation with complainant(s) and other stakeholders;
- (iii) Inform the aggrieved parties about the solutions; and
- (iv) Forward the unresolved cases to higher authorities.

The committee will be comprised of one member of each implementing agency PMU, the PC and other members (as required), with a chair being appointed.

9.2 Proposed GRM

The following seven-step mechanism (Table 9.1) is proposed for grievance redress of social and environmental matters.

During implementation, the PMU Project Manager will be responsible for managing the GRM. The PMU Project Manager will be the grievance focal point, and receive and address project related concerns. The PMU Safeguards Advisor will maintain the database and support the PMU Project Manager as required. Concerns will be resolved first by the PMU. Affected people will be made fully aware of their rights regarding land ownership and environmental degradation. During the installation / construction period the contractors will be a key participant in the grievance redress process, and the PC and the PMU will need to confirm that each contractor has assigned a GRM coordinator and has a GRM system that is consistent with the Project GRM.

Any complaint will be recorded and investigated by PMUs and the contractor (as appropriate). A complaints register will be maintained by each PMU, and will show the details and nature of the complaint, the complainant's name, the date and actions taken as a result of the investigation. It will also cross-reference any non-compliance report and/or corrective action report or other relevant documentation filed under that complaint.

When construction starts, a sign will be erected at all sites providing the public with updated project information and summarizing the GRM process including contact person details at the PMU. All corrective actions and complaints responses carried out on site will be reported in the six monthly safeguards reports prepared by the PMU Safeguards Advisor.

Throughout this process, the respective Country Courts and Environment Protection Agencies will be available to hear public complaints and provide advice if the complainant feels that the PMU's responses are unsatisfactory.

On receipt of a complaint in any form (in person, telephone, written) the PMU Project Manager will log the details in a complaints register. The PMU Project Manager or Safeguards Advisor (at the Manager's request) will respond within 1 week with advice on corrective actions to be taken. The PMU Safeguards Advisor will review and find solution to the problem in consultation with village/island/state or affected party and relevant local agencies.

If the complainant is dissatisfied with the outcome, or has not received advice in the allotted time period, he or she can take grievance to the national/state level. The relevant authorities will review the case and report back to the PMU Project Manager who will discuss the outcome the complainant.

If unresolved, or if at any time the complainant is not satisfied, the matter can be taken through the courts. Both successfully addressed complaints and unresolved issues will be reported to the World Bank or ADB by the PMU.

Table 9.1: Grievance Redress Process

Step	Process	Duration
1	Affected Person (AP) / village elected or traditional chief takes grievance to PMU or Contractor	Any time
2	PMU Project Manager and Safeguards Advisor reviews issue, and in consultation with island/state or relevant agencies and contractor (if appropriate), agrees to a solution and records the results.	2 weeks
3	PMU Project Manager reports back to island/state/AP and gets clearance the complaint has been resolved.	1 week
<i>If unresolved</i>		
4	Island/state/AP take grievance to Committee for resolution	Decision within 2 weeks
5.	Committee refers matter to relevant national agency	2 weeks
6.	Committee can deliberate for up to four weeks	4 weeks
7.	Committee reports back to AP	1 week
<i>If unresolved or if at any stage and AP is not satisfied with progress</i>		
AP can take the matter to appropriate state or national court.		

10. Conclusions & Recommendations

Overall, the proposed EMC Project will require very limited land-based infrastructure, will have minimal mainly marine-based impacts which are limited in scale and extent and can be fully mitigated, will require no involuntary land acquisition, and will prioritise the use of existing building and infrastructure for landing stations and conveying land based cable.

The project will impact a corridor of no more than 3-4 m wide (including the footprint of the submarine water-jet trenching machine on the sea floor and to a depth of 0.75 m beneath the sediment). The cable, about 4 cm in diameter in the nearshore zone, will be buried. Burial of the cable will be done to reduce interference with coastal fishing gear and reduce the risk injury to corals and people during storm events.

The cable route will be surveyed to avoid sensitive habitats such as corals and Conservation Areas with placement guided by experienced divers who will place the cable according to instructions from a marine ecologist. These measures will serve to mitigate any potential negative impacts on the marine environment.

All priority land options to be traversed by the cable and associated infrastructure are either government owned or leased, including the seafloor.

Given the small-scale impact of the work, and the fact that nearly all of the work takes place on board a vessel at sea with specially trained crew, no negative social impacts are anticipated during any stage of the project.

The construction of the BMH facility on land will require a local sub-contractor. In Kosrae, a key potential impact relates to the trenching of the cable adjacent to the road; to address this reinstatement of the disturbed areas will be required as specified in the ESMP. In Kiribati and Nauru no impacts are envisaged given the infrastructure is already in place to convey the terrestrial cable.

The ESMP defines a full set of working area boundaries, work restrictions and timing limits, which will be included in the construction contract specifications and which the contractor will have to comply with. Compliance will be monitored by safeguards advisors in each country PMU.