Prepared for
Infrastructure Cook Islands
ABN: N/A

AECOM

Environmental Impact Assessment

Manihiki Airport Improvements

21-Sep-2022
Manihiki Airport Improvements
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Environmental Impact Assessment

Manihiki Airport Improvements

Client: Infrastructure Cook Islands

ABN: N/A

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Reviewed by Michiel Jonker

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			Name/Position	Signature
1	11-Nov-2021	DRAFT	Fiona Davies Associate Director – Environment/Team Leader	
2	23-Nov-2021	DRAFT	Michiel Jonker Principal Ecologist	
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4	21-Sep-2022	FINAL	Michiel Jonker Principal Ecologist	

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Executive Summary

The Ministry of Infrastructure Cook Islands (ICI) is planning to reconstruct and surface the existing coral runway at Manihiki Airport on Manihiki Island. The ICI commissioned AECOM New Zealand Limited (AECOM) to produce an Environmental Impact Assessment (EIA) to assess the potential for environmental impacts as a result of the Manihiki Airport Improvements Project (the 'Project'). This EIA has been prepared by AECOM to meet the requirements of the Environmental Act 2003 and the Environment (Permits and Consent) Regulations 2011 for the Project.

Reconstruction and surfacing of the existing coral runway are required due to ongoing maintenance and compliance issues. It is anticipated that this Project will resolve these issues and diversify the type of aircraft that can use the runway. The Project has been initiated following an independent audit by the Civil Aviation Authority (CAA) to drastically improve operational safety and connectivity for Cook Islanders to the region. For this reason, the Project holds important safety and social-economic benefits that will not materialise if the Project is not approved.

The Assessment of Alternatives determined that proceeding with the Project, with the quarrying of construction aggregate (potentially including sand dredging at wharf), with seawall construction, and with a fenced pedestrian road along runway were most suitable for meeting the Project purpose and needs.

Impacts of the Project range from **Low**, **Moderate**, or **High** impact without mitigation and the key potential impacts that are being mitigated are:

- Design and/or Pre-construction Impacts
  - Vegetation Clearance
  - Quarrying of Construction Aggregates
  - Land Use and Ownership
  - Impact on Significant Species
  - Hydrology and Coastal Processes
- Construction Stage Impacts
  - Vegetation Clearance
  - Tree Clearance
  - Impact on Significant Species
  - Invasive Species
  - Harvesting of Natural Resources by Construction Workers
  - Water Resources
  - Solid Waste
  - Wastewater Discharges
  - Historic Properties and Cultural Features
  - Social Interaction
  - Air Quality and Dust
  - Noise and Vibration
  - Traffic

- Hazardous Materials
- Socioeconomic Impact of Airport Closure
- Biosecurity
- Erosion and Sedimentation

- Operational Stage Impacts have been restricted to extreme natural events that may damage the Airport and/or associated infrastructure.

The EIA concludes that overall, potential impacts can be mitigated to a level where impacts are **Low** and mitigation measures are detailed further in the Environmental Management Plan (EMP).
An EMP has been prepared to address impacts and mitigation measures identified at each stage of the Project's execution, namely detailed design, construction and operation. The EMP will form the basis of the Contractor's EMP, and the mitigation measures identified in the EMP will form the minimum requirement for reducing impacts on the environment as a result of works associated with the Project.

Glossary of Terms

Term/Abbreviation	Definition
AECOM	AECOM New Zealand Limited
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ICI	ICI – Ministry of Infrastructure Cook Islands
MFEM	Ministry of Finance and Economic Management
TAIP	The Tonga Aviation Investment Project

1.0 Introduction

1.1 Project Proponent

The Ministry of Infrastructure Cook Islands (ICI) commissioned AECOM New Zealand Limited (AECOM) to produce an Environmental Impact Assessment (EIA) for the Manihiki Airport Improvements Project (the 'Project'). The engagement is part of the Manihiki Airport Improvement Design Services.

This EIA has been developed in consultation with the Client and the scope has been determined by the policy and legal framework as described in Section 1.5.1.

1.2 Project Description

The ICI is looking to reconstruct and surface the existing coral runway at Manihiki Airport. Based on the Aeronautical Study for Manihiki Airport (Ministry of Transport, 2019), the following improvements to the Manihiki Airport are required:

i. Runway pavement to be upgraded and sealed with a bitumen surface having dimensions of 1450 x 30m and turning bays at either end broadening out to 45-50m

ii. Runway be located 8m to the west and northern end/threshold be located 240m further to the south to clear existing buildings and obstacle clearances

iii. Runway strip width be widened to achieve 90m

iv. Stormwater drainage improvements

v. Obstacle limitation surfaces be cleared of infringements

vi. Airside safety and operational improvements including but not limited to:

    a. Fencing, Runway markings, "wing marker" boards, signage and WDI (windsocks)

vii. Sand dredging and coral aggregate quarrying

viii. Manihiki Island Council obtain Airport certification under CICAR Part 139 "Qualifying Aerodrome" requirements which will require documentation and personnel training (not part of this design services but noting that the design documentation under this contract is to be suitably documented to allow the onward certification of the airports).

AECOM has uploaded the client supplied survey and superimposed the Ministry of Transport recommended runway footprint. These have been loaded over Google earth imagery to assess the concept layouts. The proposed Manihiki airfield layout is shown in Figure 1. It is likely that quarrying will take place within the airfield's runway strip and strip end. Sand dredging (if required) will occur around the central lagoon wharf area (Figure 2).

Figure 1 Proposed Layout of Manihiki Airfield

Figure 2 Identified wharf for potential sand dredging operations

1.3 Project Objectives and Scope

Based on the Aeronautical Study for Manihiki Airport (Ministry of Transport, 2019), the following improvements to the Manihiki Airport are considered as the scope of work:

- The runway pavement to be upgraded and sealed with a bitumen surface with dimensions of 1450 x 30 m and turning bays at either end broadening out to 45-50 m.
- Runway to be relocated 8 m to the west, resulting in the realignment of the public road running adjacent to the airfield.
- The northern end Runway threshold to be located 240 m further to the south to clear existing buildings and obstacle clearances.
- Runway strip width be widened to achieve 90 m.
- Stormwater drainage improvements.
- Obstacle limitation surfaces be cleared of infringements (vegetation and trees).
- Airside safety and operational improvements including but not limited to fencing, runway markings, “wing marker” boards, signage and WDI (windsocks).

1.4 Environmental Impact Assessment (EIA) Process

Section 1.4 sets out the methodology and objectives of the environmental impact assessment under the relevant legislation.

1.4.1 Methodology of the EIA

1.4.1.1 Construction Stage Impacts

The environmental impact description considers the Project activities (for design/pre-construction, construction and operational stages) in relation to the baseline environment (described in Section 4.0). Project activities will include:

- Clearance of low habitat value vegetation to provide access and material storage area;
- Clearance of low value vegetation associated with the expanded footprint of the upgrade works;
- The construction of a coral quarry pit for aggregate supply;
- Sand dredging at the central lagoon wharf;
- The potential construction of a new public road;
- Fencing of the public road for safeguard the public from the runway;
- Seawall benching and modifications;
- and the reconstruction and surfacing of the existing coral runway.

The level of impact categories was assigned on a descriptive basis considering the likely intensity (scale, frequency, duration) and likely consequence (sensitivity of the receiving environment). The level of impact categories is defined as:

- **Low** impact: potential impact on local scale (Project footprint), or may have some extent of impact on the feature, resource, community identified, or may occur over a short period (0-5 years);
- **Moderate** impact: may impact beyond Project footprint, or may have a moderate extent of impact on the feature, resource, community identified, or may occur over a medium period (5-10 years);
- **High** impact: may impact on a regional or larger scale or may have a high extent of impact on the feature, resource, community identified, or may occur over a long period (>10 years).

The impact statement assumed a construction period of one year and several imbedded controls to be included within the Contractors EMP these included: an Environmental Protection Plan, an Erosion Control Plan, a Storm Water Pollution Prevention Plan, a Litter-Control Plan, Hazard Analysis and a Critical Control Point Plan. The requirements for these embedded controls are detailed within the Table 6, Appendix A.

1.4.1.2 Operational Stage Impacts

For the scope of this assessment operational impacts have been restricted to extreme natural events that may damage the Airport and/or associated infrastructure and potentially prevent aircraft from landing on the island. The impact of this on local communities is considered **Moderate** prior to mitigation. Operational impacts as a result of increased airport operations (noise, air emissions, hazardous materials etc) have not been assessed as part of the scope of this assessment.

1.4.1.3 Secondary and Cumulative Impacts

Secondary and cumulative impacts tend to be triggered by impacts to environmental resources that function as integral parts of a larger system over time and space and can initially be ‘invisible’ to the normal present time impact assessment. Secondary impacts can include land use changes due to improved accessibility which in turn can impact habitats and pressure on existing resources and utilities (e.g., water supply). Secondary and cumulative impacts also often cannot be managed solely by the project executors.

Secondary and cumulative impacts are not always negative, positive impacts include increased business and supply chain importunities due to improved infrastructure and accessibility, improved access to health facilities and employment (beyond the scope of the Project). The proposed works are

designed to reduce ongoing maintenance and compliance issues and ensure continued safe airport operations.

1.4.2 Objectives of the EIA

The EIA objectives are to provide public information on the need for and likely effects of the Project, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values and demonstrate how environmental impacts can be managed through the protection and enhancement of ethe environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is included in Section 2.2, and the draft EMP is included in Section 5.0.

1.4.3 Submissions

Upon completion of the draft EIA, the document will be available for public submissions for one month.

1.5 Public Consultation

Several initial public engagements have already occurred. Appendix D provides detailed minutes outcomes of the public consultation undertaken to date. Early public consultation included a public meeting with Manihiki Island Council and Manihiki residents in three sessions during February 2021. The meeting reviewed and heard the opinions for the proposed work. Initial public input related to:

- The preferred method of compensation;
- Justification for the length of the runway required;
- Surveying the land was suggested for the Project purposes to show the additional areas required from each affected lot.

In the summary of Stakeholder Consultation Extract and Cook Islands Activity Management, land issues were mentioned as central to all infrastructure sectors and are identified by ICI as potentially the costliest constraint. Improvements and extensions of road, airports and harbours will be dependent on government reaching mutual arrangements with landowners.

In February 2021, ICI took a delegation over to Manihiki which included the Deputy Prime Minister, former ICI Head of Ministry, ICI Project Manager and Landowner Legal Counsel to consult landowners. Landowner approval was granted for the land to be taken by Crown under warrant. Legal documentation is currently underway. As of May 2022, the airport lands will be taken under enduring agreement as opposed to by warrant.

In March 2021 the ICI budget proposal was presented to the Infrastructure Committee (IC) which included a request of $6.5M for the construction of Manihiki Airport. Support was provided by the IC, indicating that ODA funds may be available from the Infrastructure Trust Fund (ITF). The appropriation was approved for the 2022/23FY. In July 2021, Ministry of Finance and Economic Management (MFEM) approved ICI's request for Carry Forward of its Pa Enua Air Infrastructure Budget 2020/21 into the 2021/22 FY to continue funding the Manihiki Airport improvement Project Land Acquisition and Design.

A meeting between the Crown and landowners was undertaken during May 2022, during which the majority of landowners signed a declaration in support of the Project.

Public consultation will continue parallel to the legislated EIA process. Copies of the draft EIA will be provided to all relevant stakeholders and individuals with an interest in the proposal as per the requirement specified in the Terms of Reference document (Appendix E). This will promote discussion on all aspects of the proposal including strategic decision making and design. The EIA will be revised to address stakeholder feedback. All public consultation will be undertaken in line with the relevant legal provisions.

1.5.1 Relevant Legislation and Policy Requirement[1]

The Environment Act 2003 provides for the protection, conservation, and management of the environment in a sustainable manner and provides the legal framework for assessing the environmental impacts of development.

Section 36 of Part 5 states that:

1. *No person shall undertake any activity which causes or is likely to cause significant environmental impacts except in accordance with a project permit issued under this section.*
2. *A person who proposes to undertake an activity of the kind referred to in subsection (1) shall apply to the permitting authority for a project permit in respect of the activity in accordance with the procedures (if any) prescribed by regulations.*
3. *Every application for a project permit shall be submitted to the Service and shall include an environmental impact assessment, setting out details of –*
    a. *the impact of the project upon the environment and in particular –*
        i. *the adverse effects that the project will have on the environment; and*
        ii. *a justification for the use or commitment of depletable or non-renewable resources (if any) to the project; and*
        iii. *a reconciliation of short-term uses and long-term productivity of the affected resources; and*
    b. *the proposed action to mitigate adverse environmental effects and the proposed plan to monitor environmental impacts arising out of the project; and*
    c. *the alternatives to the proposed project.*

The Environment (Permits and Consent) Regulations 2011 have not been formally enacted. In other words, they provide an indication of intent but have no legal weight.

Paragraph 21 of Part 4 states that:

An environment impact assessment shall be required if, on undertaking a review pursuant to the requirements of regulation 19, it is determined by the National Environment Service that:

(a) There is a reasonable likelihood that the project or activity is likely to cause significant environmental impacts;

(b) There is a reasonable likelihood that the project or activity may be significantly affected, or is likely to be significantly affected, by impacts from the environment.

1.5.2 Planning Process and Standards

The Project involves the rehabilitation and upgrade of the existing airfield. The Project has been initiated following an independent audit by the Civil Aviation Authority (CAA) to drastically improve operational safety and connectivity for Cook Islanders to the region. In its current condition, the runway does not have a distinguishable paved surface and is surrounded on three sides by vegetation that does not comply with aircraft obstacle limitation surface requirements.

[1] This section outlines the main provisions of the Environmental Act 2003 and associated regulations (2011). Other relevant national legislation may include the Building Control Standards Act 1991 and its regulations, Public Health Act 2004 and Energy Act 1998. Multilateral Environmental Agreements include Climate Change (UNFCC), Kyoto Protocol, Ozone Layer Convention (Vienna), Montreal Protocol, Copenhagen Amendment, Basel Convention, POP's Convention (Stockholm), UNCLOS (Law of the Sea), SPREP Convention, World Heritage Convention, Convention on Biological Diversity, Biosafety Protocol, Desertification (CCD) and Apia Convention.

The Project site is currently an airfield; therefore the existing land use remains unchanged and the airfield itself will be upgraded in accordance with the standard international regulations and codes. The Detailed Design Report (AECOM, 2022) outlines the design outputs for the Project in accordance with international design standards. The requirements of the Project take precedence over the provision of the Standards. However, any amendments or substitutions of any Standard are indicated within the DDR and EIA where relevant. Therefore, all materials and workmanship shall comply with the Standards unless expressly noted otherwise.

2.0 Project Need and Standards

2.1 Project Justification

Given the remote inhabitations and climatic factors across the Cook Islands, reliable and safe airport infrastructure is considered the cornerstone of logistics. Due to ongoing maintenance and compliance issues, the ICI wish to upgrade Manihiki Airport to improve operational safety and provide a reliable all-weather operational capability, both for current and future operational aircraft types.

2.2 Alternatives to the Project

This section summarises the alternatives that were identified for meeting the Project objectives discussed in Section 1.3. In lieu of building a new airport and runway, it was determined that the existing Airport would be upgraded via reconstruction and surfacing of the runway and other modifications. This was decided as part of the bidding and contract phase of the Project. Generally, this will result in lower environmental impacts.

As part of this EIA the assessment of alternatives included:

- with and without the proposed Project, i.e., Proposed Project and No Action Alternative;
- with and without quarrying construction aggregate (including sand dredging at wharf), i.e., Quarrying Construction Aggregate and Importing Construction Aggregate;
- with and without reconstruction of seawall i.e., Seawall Benching and Seawall Reconstruction
- with and without pedestrian road along runway i.e., Fenced Pedestrian Road and No Action Alternative

2.2.1 Proposed Project and No Action Alternative

With the completion of the Project, the Airport's ongoing maintenance and compliance issues will be resolved, and potential impacts can be mitigated to a level where impacts are low (mitigation measures are detailed further in Section 5.0). In addition, it is likely that there are positive secondary impacts as a result of the Project such as increased accessibility to Manihiki Island for locals and tourist and increased import and export options.

The No Action Alternative has been dismissed as it represents an unacceptable risk to airport operations, particularly after a natural disaster.

2.2.2 Quarrying Construction Aggregate and Importing Construction Aggregate

It is likely that suitable construction aggregates can be sourced on Manihiki Island at identified coral borrow sites within the airfield footprint. The final site selection of the coral borrow pits will be coordinated with the ICI. Additionally, site-based investigations have been coordinated to confirm the suitability of the materials. Following the site selection process and compliance with mitigation measures detailed in Section 5.0, environmental impacts are likely to be **Low**.

The Importing Construction Aggregate Alternative has been dismissed due to the larger carbon footprint, increased biosecurity risk and higher cost that is involved. However, this alternative may be required if appropriate quality or quantity of aggregate material is not available at the identified coral quarries during pre-construction and construction.

Sand dredging at the central lagoon wharf may also be required for boat access and for sourcing sand material to be used during the construction phase operations (refer Figure 2). As detailed above,

importing sand has been dismissed due to the larger carbon footprint, increased biosecurity risk and higher cost that is involved. Additionally, dredging around the wharf for boat access will also improve access options for locals.

2.2.3 Seawall Benching and Seawall Reconstruction

There were two options for improvements to the seawall located east of the runway; bench the runway to the existing mound or dismantle existing mound and construct a new seawall.

Benching the runway to the existing mound means that machinery will not be entering the marine environment, decreased amount of solid waste will be produced, and costs will be lower. However due to the revised configuration of the airfield runway and runway strip plus operational requirements requiring the removal of obstacles in compliance with Civil Aviation rules, the exiting mound must be removed.

The Seawall Reconstruction alternative is the likely course of action and shall be constructed using robust geofrabric seawall bags filled with sand from the borrow pits and potentially recycling material from the removed mound.

2.2.4 Fenced Pedestrian Road and No Action Alternative

A fenced pedestrian road will increase safety for locals, tourists and airport operations as it decreases the likelihood of a child or animal running across the runway/airstrip. The proposed fenced pedestrian road has potential environmental impacts (vegetation clearance, barrier to migration) and social impacts (land ownership). However, these potential impacts can be mitigated to a level where impacts are **Low**.

The No Action Alternative has been dismissed as it represents an unacceptable risk to the public and airport operations.

3.0 Description of the Project

3.1 Location

Manihiki Island is located in the northern group of the Cook Islands and is the second largest northern group island (Figure 3). The island is a coral atoll with 40 coral islets at 5 m elevation that encircle an approximately 72 m deep lagoon (Figure 4). The island population is over 200 with two villages, Tauhunu located on the western side of the atoll, and Tukao located on the north-eastern side of the atoll (MFEM, 2019).

Manihiki Airport is located in the village of Tukao (southeast of the residential area) on the northern-eastern side of the atoll and comprises a coral runway, airstrip and related airport buildings. A narrow lagoon and reef are present on the eastern side of the runway. A seawall (approximately 2-3 m above msl) separates the lagoon and runway and runs the full length of the runway. The western side of the runway is dominated by coconut trees and numerous residential dwellings, beyond which is the central lagoon (ICI, 2021).

Figure 3 Geographical location of the Cook Islands (Blacka et al., 2013)

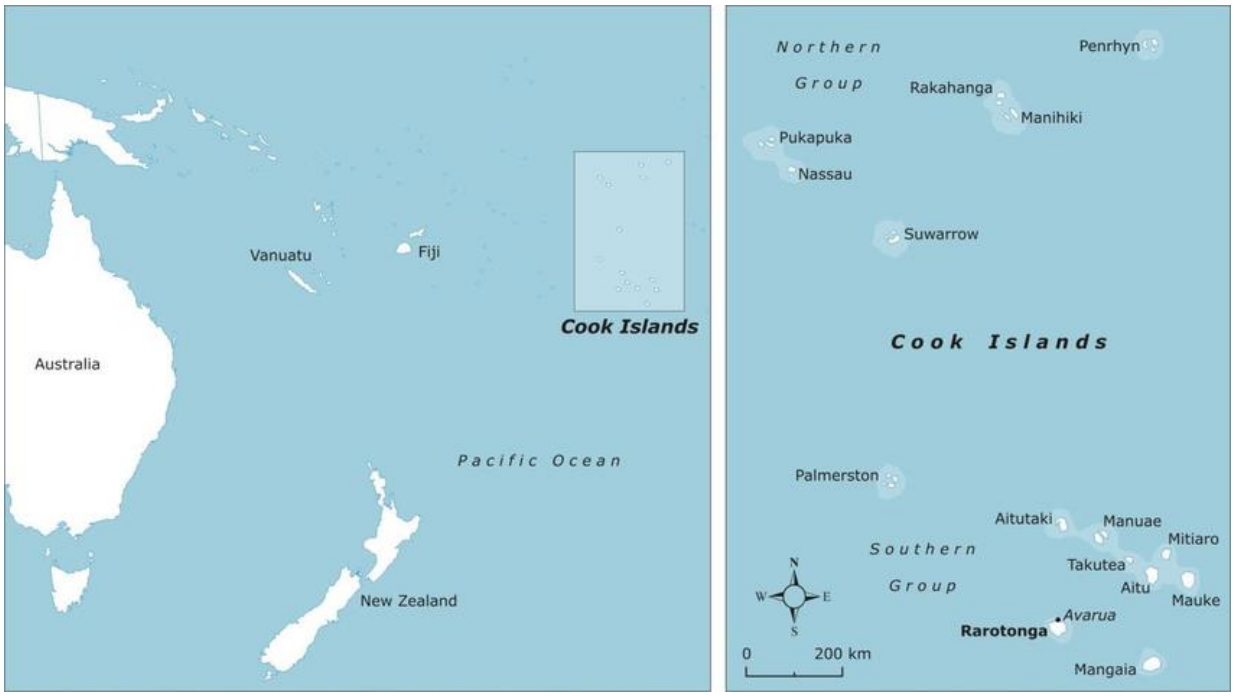


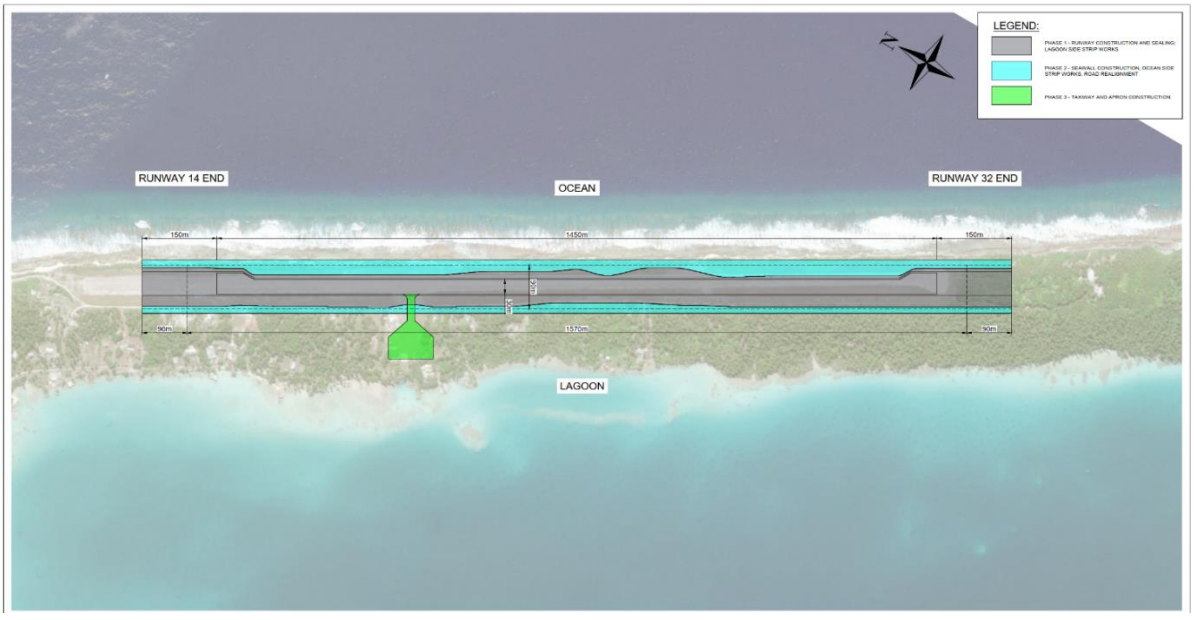
Figure 4 Aerial overview of Manihiki Island (Google Maps, 2021)

3.2 Staging

The execution of the physical works be split into three stages to spread the costs over a two- or three-year period (period to be confirmed). The stages are further detailed below and presented in Figure 5.

- **Phase 1: Runway construction, 2-coat spray sealing to 30 m wide, runway markings, lagoon-side runway strip grading and full Obstacle Limitation Surfaces (OLS) clearance (10 months/40 weeks)**
  - Establish borrow site within airfield and win material from runway strip areas with excavation, crusher, and screening plant.
  - Runway works; construct pavement, prime coat and 2-coat spray seal.
  - Install runway markings.
  - Runway strip works; reprofile lagoon-side and establish invert of open drain, tie into edge of the existing road corridor. Grade to existing levels at 5% on the ocean-side.
  - Undertake full OLS clearance of trees.
  - Install windsocks and “wing board” at thresholds.
- **Phase 2: Seawall construction, road realignment, complete runway strip grading**
  - Seawall; construct a 1,300 m long seawall and profile ocean-side runway strip accordingly.
  - Road works; realign and reconstruct road formation (2 km long and 4 m wide) outside of 90 m wide runway strip.
  - Runway strip works; profile remaining lagoon-side runway strip to new edge of road corridor.
- **Phase 3: Taxiway and Apron construction and 2-coat spray sealing, markings, plus fence construction**
  - Establish borrow site within airfield and win material from runway strip areas with crusher and screening plant (or utilise stockpiled materials from Phase 1).
  - Taxiway and Apron works; construct pavement, prime coat and 2-coat spray seal. Install apron concrete edging.
  - Install taxiway and apron markings.
  - Install fencing.

Figure 5 Proposed construction phases and boundaries



3.3 Emergency Management

The Contractor shall be responsible for preparing and implementing a client approved emergency management plan that is suitable for the Project location, including consideration for the local population that will mitigate all forms of emergency and natural disaster.

3.3.1 Emergency Access

Access to the airfield by aircraft shall be maintained as long as possible, however alternative strategies for access during emergencies when the works reach a stage that closes the airfield will need to be prepared. Alternative access to the island will consider sea/coastguard and helicopter options.

3.3.2 Disruption to Utility Networks

There will be no disruption to community utility networks. All equipment, machinery, and materials needed for the Project will be transported to site via tug and barge (or similar). The Project has no option other than to be self-sustaining in this respect due to the lack of resources available on island relating to utilities.

3.3.3 Road Closures or Vehicle Limitations

During Phase 2, temporary traffic management shall be required when works are conducted on the existing roadway adjacent to the airfield. Access for the public will be maintained at all times, with minimal disruption to public road vehicle movements.

3.4 Infrastructure Requirement

The following section outlines the logistics of moving material and plants, and the responsibilities of the Contractor for all equipment machinery and materials within the airfield. The framework for management and mitigation of any impacts associated with these logistics is included in the draft EMP (Section 5.0).

3.4.1 Transport

Below is the list of plant and materials to be located within the confines of the airfield footprint;

- Up to six trucks for transporting aggregates
- Quarry equipment including two excavators, crushing plant and screening plant
- Road construction plant including a grader, rollers, a bitumen spray truck, a water cart
- Containers for the purposes of storing materials, bituminous products, general supplies, spare parts for machinery, temporary offices and maybe accommodation

It is anticipated that up to 20 workers of varying skill sets (to operate machinery) will mobilise to the Project location to undertake the works. All construction activity shall be contained within the airport site, with traffic only occurring outside of the airfield during the mobilisation and demobilisation phase. During periods prior to and after workdays, it is anticipated that light vehicle movements will involve transfers to accommodation and for general purposes.

All heavy-duty transport shall be confined to the airport, however the only heavy duty loads outside of the airfield will occur during mobilisation and demobilisation, when the plant is transported to and from the wharf. Large and heavy items shall include mobile crushing plant, screening plant, grader, rollers and excavators (on transporters).

3.4.2 Storm Water Drainage

In the current state, there is no existing stormwater infrastructure at the Project location, overland flow and soakage is the primary means of storm water drainage. The Project scope will include storm water drainage improvements via the installation of numerous soakage pits.

Localised flooding on the shoulders of the runway, taxiway and apron were observed and improved drainage has been included in the detailed designs. The runway will be 30 m wide and 1,450 m long with a consistent 2% cambered cross-sectional profile to improve drainage runoff into the runway strip soak pits. Vegetated swales are effective in reducing the speed of overland flows and providing a level

of treatment by trapping sediments. Runoff will then filter through the underlying soils via the soakage pits prior to reaching the groundwater. This natural filtration will assist in removing particulate contaminants. The soakage pits will require periodic cleaning to remove sediment that has been deposited. Grass within the swales should be maintained at a slightly longer length than the surrounding runway shoulders and re-seeded if dieback occurs.

During construction, clean water diversion bunds will be used to direct any runoff from undisturbed areas away from work areas, borrow pits, stockpiles, and storage areas. The diversion bunds will direct this clean water to land for soakage. There are no surface water bodies adjacent to the airfield.

Water required for construction activities such as dust suppression and concrete production will need to be managed carefully so as not to impact on the island's freshwater supply or the airport's needs for Project. Where possible rainwater should be collected or non-potable water should be used, provided there will be no risk of contamination of groundwater.

3.4.3 Mining/Quarrying of Materials

The construction phase will begin with the establishment of borrow pits, extraction, setting up screening plant and crushing site within the airfield footprint. The original plan was to utilise land to the south of the airfield but gaining approval to use this land has been declined by the land occupants/owners. It is likely that the quarry operation will require the use of a mobile crusher and power screen to manufacture the basecourse aggregates won from the airfield's runway strip and strip ends. The production of aggregates must be closely monitored to ensure a quality product is manufactured for the construction of the structural strengthening layer of nominal 150 mm deep.

The process begins by firstly removing all overburden and unsuitable soils from the surface, which can be from 100 mm to 200 mm deep in the runway strip. Once cleared, the excavation of the in-situ coral can be undertaken down to a predetermined depth or until such time ground water is encountered.

Initial observations from the test pit investigations are that there will be a fair quantum of large coral rock and oversize gravels initially extracted, which will require a mobile crusher to break down the rock into manageable sizes for screening. The power screen produces the blend of aggregates required for the structural overlay layer in accordance with the technical specification. The mobile power screen shall be calibrated to produce the basecourse material using a number of screens of varying sizes.

The DDR (AECOM, 2022) provides information on the plant required and the risks associated with the operation. The potential mining/quarrying of materials is described in further detail in Section 2.2.2.

3.5 Waste Management

3.5.1 Character and Quantities of Waste Materials

It is anticipated that the Project will generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection, or other factors as well as minimising over packaging and poor quantity estimating.

The type of waste expected to be generated are:

- Building materials from demolition.
- Excess rubble generated from milling of the runway surface and excavations.
- Green waste from clearing the area for the construction camp.
- Packaging materials from imported supplies.
- Waste oil, lubricants etc.
- Wastewater from sanitary facilities (dependent on system used).

3.5.2 Solid Waste Disposal

Of the inevitable waste that is generated, disposal to landfill 100 m away of the south of the airfield and clean fills shall be minimised. This means maximising reuse and recycling of job site waste. The Contractor shall produce a Waste Management Plan and provide advice on which solid waste is

disposed of at the landfill. Where waste produced by the Project cannot be disposed to landfill, reused, or recycled, then it shall be collected accordingly and transported to the main island (Rarotonga) in secure containers for appropriate disposal.

4.0 Environment Values and Management of Impacts

4.1 Land

4.1.1 Description of Environment Values

4.1.1.1 Topography, Geology and Soils

The island is a coral atoll with 40 coral islets that encircle an approximately 72m deep lagoon. The general topography is flat, rising only 4 m above sea level (MFEM, 2019).

Tukao is underlain at the south end by yellow-brown phosphatic limestone (likely of Pleistocene age), overlain by beach sand and rock. The thickness of the coral cover in the middle of Tukao was determined seismically to be between 30 to 40 m (Wood, 1967).

The soils of the northern group are derived from reef material with a thin organic mantle. Therefore, they are largely infertile due to their coarse, coral-derived and very porous nature (SPREP, 1992). Previous investigations at the Project area revealed the Site is underlain by coral sands and rock sedimentary deposits which area overlain in places by a superficial layer of fill, natural beach sand and rocks (ICI, 2021).

4.1.1.2 Landuse/Characteristics

The airfield is located 650 NM north of Rarotonga. It was constructed in the 1980s and features an unsealed runway and narrow runway strip with a coral formation. The strip is surrounded by trees to the west and south and the sea to the east. Since initial construction it has not had a major upgrade.

4.1.1.3 Landscape Character

Landscape character including climate, flora and fauna has been described in Sections 4.1.1.3.1 to 4.1.1.3.3.

4.1.1.3.1 Climate

Manihiki Island has a tropical climate. Temperatures are warm to hot year-round with an annual average of 28°C with high humidity. The wet summer season is from November through March and the drier season is from June through October (Cook Islands Meteorological Service, 2013). The average annual rainfall in the Northern Group Islands ranges from 1900 to 2800 mm and tropical storms are more prevalent during the rainy season (Climates to Travel, n.d.). The Manihiki's climate is affected to some degree by El Niño and La Niña episodes.

Assessments of climate trends indicate that surface air temperature, sea surface temperature, annual and seasonal mean rainfall, intensity and frequency of days of extreme heat and days of extreme rainfall are projected to increase. The incidence of drought is projected to decrease, and tropical cyclone numbers are projected to decline. Ocean acidification and mean sea-level rise are also projected to continue (Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation, 2011).

4.1.1.3.2 Flora

Manihiki is dominated by coastal strand vegetation with coconut and broadleaf forest (NES, 2011) which provide nesting grounds for seabirds and marine turtles. It has several large stands of pandanus or Ara-taatai (*Pandanus tectorius*). The airport is located at the northern end of the atoll and this ecosystem was modified when the runway was originally constructed. The runway location is visible in historical aerial imagery from 2001 (the earliest clear imagery from Google Earth) and it is likely that vegetation clearance took place for the original construction (Figure 6). The next available imagery is from 2006 where further vegetation has been cleared at the southern end of the runway (Figure 7). The most recent imagery available is from 2015 and shows little to no changes in vegetation in the Project area since 2006 (Figure 8).

Figure 6 Historical aerial imagery of Manihiki Airport (2001) (Google Earth Pro)

Figure 7 Historical aerial imagery of Manihiki Airport (2006) (Google Earth Pro)

Figure 8 Historical aerial imagery of Manihiki Airport (2015) (Google Earth Pro)

Vegetation around the Project area is comprised predominantly of grassed areas and coconut trees, however other vegetation is expected to be present (Cranwell, 1933). Six endangered plant species that are recorded as 'known to be present' or 'possibly present' on Manihiki Island were identified using the Cook Islands Biodiversity Database (CIBD) (McCormack, 2007) and listed in Table 1.

The habitat represented by the existing Project footprint and the proposed upgrade footprint (Figure 1) is modified and no plant species of conservation or cultural significance is expected within the proposed upgrade footprint.

Table 1 Endangered plant species present (or possibly present) on Manihiki Island and their threat status (McCormack, 2007; IUCN, 2021)

Common Name	Scientific Name	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Pacific Rosewood/Miro	*Thespesia populnea*	Locally endangered	Least Concern
Pisonia/Pukatea	*Pisonia grandis*	Locally endangered	Not Listed
Polynesian Mahogany/Tamanu	*Calophyllum inophyllum*	Locally endangered	Least Concern
Rarotonga Haloragis	*Haloragis stokesii* QQBS	Globally endangered (seriously)	Critically Endangered
Sweet Potato/Kūmara	*Ipomoea batatas*	Locally endangered	Data Deficient
Weaving Pandanus/Rau 'Ara	*Pandanus spurius*	Locally endangered	Not Listed
Pandanus/Ara-taatai	*Pandanus tectorius*	Locally endangered	Least Concern

4.1.1.3.3 Fauna

Species of birds, herpetofauna and invertebrates are potentially present within the Project area and area of potential effects. Each group is briefly discussed in the following sections.

Birds

The northern group islands mainly support seabirds, however one land bird is resident on Manihiki Island, the Pacific Pigeon/Rupe (*Ducula pacifica*) (NES, 2011). Four endangered bird species that are recorded as 'known to be present or possibly present' on Manihiki Island were identified using the CIBD (McCormack, 2007) and listed in Table 2.

The habitat represented by the existing Project footprint and the proposed upgrade footprint (Figure 1) is not representative of nesting or breeding habitat utilised by species listed in Table 2 with the exception of the brown booby. The brown booby is known to utilise coral atolls for breeding purposes and nests on the ground in a variety of habitats such as beaches, sand bars and coral rubble (Department of the Environment, 2021). Due to this diversity in nesting habitat, it is possible that nesting brown booby may be encountered within the Project footprint, or the larger works such as coral aggregate quarrying.

Table 2 Endangered birds present (or possibly present) on Manihiki Island and their threat status (McCormack, 2007; IUCN, 2021)

Common Name	Scientific Name	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Black-naped Tern/Kakavai Māui	*Sterna sumatrana*	Nationally endangered (seriously)	Least Concern
Bristle-thighed Curlew/Teue	*Numenius tahitiensis*	Globally endangered (seriously)	Near Threatened
Brown Booby/Kena	*Sula leucogaster*	Nationally endangered (moderately)	Least Concern
Red-tailed Tropicbird/Tavake	*Phaethon rubricauda*	Locally endangered	Least Concern

Herpetofauna

Four endangered herpetofauna species that are recorded as 'known to be present or possibly present' on Manihiki Island were identified using the CIBD (McCormack, 2007) and listed in Table 3.

Since sea turtle nesting at Manihiki is unlikely to be substantial (White, 2012), it is unlikely that hawksbill or loggerhead turtles use the Island for nesting purposes. Additionally, although green turtles have been confirmed to nest at Manihiki Island, the best potential nesting beach is on the western side of Tauhunu, more than 5km southwest of the Project footprint (White, 2012). Therefore, these turtle species are not expected to be within the existing Project footprint or proposed upgrade footprint (Figure 1). However, it is possible that these turtle species may be encountered during general boat traffic movement associated with the Project, or during sand dredging works.

Only recently discovered, little is known about the ecology of the mournful parent-gecko. Similar species within the same genus, such as *Lepidodactylus lugubris* are nocturnal, arbeoreal and found in woody vegetation (Karunarathna et al. 2015). It is possible that mournful parent-gecko inhabits vegetation that is proposed to be cleared as part of the Project.

Table 3 Endangered herpetofauna present (or possibly present) on Manihiki Island and their threat status (McCormack, 2007; IUCN, 2021)

Common Name	Scientific Name	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Green Turtle/'Onu Kai	*Chelonia mydas*	Globally endangered (seriously)	Endangered
Hawksbill Turtle/'Onu Taratara	*Eretmochelys imbricata*	Globally endangered (seriously)	Critically Endangered
Loggerhead Turtle/Onu	*Caretta caretta*	Globally endangered (seriously)	Vulnerable
Mournful Parent-Gecko	*Lepidodactylus* new (TCase)	Nationally endangered (moderately)	Not Yet Assessed

Invertebrates

A total of 22 endangered marine invertebrates and one endangered terrestrial invertebrate species that are recorded as 'known to be present or possibly present' on Manihiki Island were identified using the CIBD (McCormack, 2007) and listed in Table 4. Two pā'ua species (Fluted Giant-Clam - *Tridacna squamosa* and Small Giant-Clam – *T. maxima*) occur and reflect an IUCN Red List status of 'Lower Risk/conservation dependent'. In addition, both species are protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Manihiki Island Council has banned the export pā'ua, however it is likely that the species are still harvested for use (food and/or ornament) on the island (Ministry of Marine Resources, 2020). Two additional marine invertebrate species were identified as culturally significant species that have been seriously impacted by increasing fishing pressure in recent times and are listed in Table 5.

The habitat represented by the existing Project footprint and the proposed upgrade footprint (Figure 1) is not representative of the habitat utilised by species listed in Table 4, therefore no invertebrate species of conservation significance is expected within the proposed upgrade footprint. However, it is possible that marine species may be present on the seabed in the area proposed for sand dredging. It is also possible that *Paratheuma andromeda* may be present in vegetation proposed to be cleared.

Additionally, it is possible that the culturally significant coconut crab (Table 5) is present within the existing Project footprint and the proposed upgrade footprint, including the vegetation clearance and coral quarrying areas. The likelihood of encountering coconut crabs within the Project footprint is expected to increase during the summer months due to their migration to beach areas as part of the reproductive cycle (McCormack, 2005).

Table 4 Endangered invertebrate species present (or possibly present) on Manihiki Island and their threat status (McCormack, 2007; IUCN, 2021)

Common Name	Scientific Name	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Marine species			
Arthritic Spider-conch	*Lambis chiragra arthritica*	Locally endangered	Not Listed
Banded Ear-shell/Roro'ara	*Melampus fasciatus*	Locally endangered	Not Listed
Common Egg-cowrie/Pōre'o	*Ovula ovum*	Locally endangered	Not Listed
Episcopal Mitre/Rōroa	*Mitra mitra*	Locally endangered	Not Listed
Fluted Giant-Clam/Pā'ua	*Tridacna squamosa*	Globally and Nationally endangered	Lower Risk/conservation dependent
Graceful Harp	*Harpa gracilis*	Locally endangered	Not Listed
Helmet Urchin/Poke	*Colobocentrotus atratus*	Nationally endangered (moderately)	Not Listed
Major Harp	*Harpa major*	Locally endangered	Not Listed
Minor Harp	*Harpa amouretta*	Locally endangered	Not Listed
Neritina porcata	*Neritina porcata*	Nationally endangered (seriously)	Not Listed
Pacific Partridge Tun/Pū	*Tonna perdix*	Locally endangered	Not Listed
Papal Mitre	*Mitra papalis*	Locally endangered	Not Listed
Pontifical Mitre/Pū	*Mitra stictica*	Locally endangered	Not Listed
Rhododendon Cone	*Conus adamsonii*	Locally endangered	Least Concern

Common Name	Scientific Name	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Seba's Spider-conch	*Lambis truncata sebae*	Locally endangered	Not Listed
Serrated Swimming-Crab/ Ūpaki	*Scylla serrata*	Nationally endangered (seriously)	Not Listed
Small Giant-Clam/ Pā'ua	*Tridacna maxima*	Globally and Nationally endangered	Lower Risk/conservation dependent
Tapestry Turban/Ariri	*Turbo (Marmarostoma) petholatus*	Locally endangered	Not Listed
Tortoise-shell Cowrie	*Cypraea testudinaria*	Locally endangered	Not Listed
Yellow Ear-shell/Roro'ara	*Melampus luteus*	Locally endangered	Least Concern
Yellow Necklace-Shell/Pūpū	*Orobophana pacifica*	Locally endangered	Not Listed
Terrestrial species			
Paratheuma andromeda	*Paratheuma andromeda*	Globally endangered (seriously)	Not Listed

Table 5 Culturally significant marine invertebrate species present on Manihiki Island and the reason for their significance (McCormack, 2007; IUCN, 2021)

Common Name	Scientific Name	Significance	Threat Status (McCormack, 2007)	Threat Status (IUCN Red List)
Black-lipped Pearl-oyster/Parau	*Pinctada margaritifera*	Pearls used for ornament and export.	None	Not Listed
Coconut crab	*Birgus latro*	Used by Manihikians for food.	None	Vulnerable

Fish

Milkfish/Ava (*Chanos chanos*) are considered culturally significant as they provide supplementary food supply during periods of rough seas. The traditional breeding/raising grounds for this species are brackish water ponds. For this reason, the salt-marsh lakes of Lake Porea and Repuka Roto are currently classified as Cook Island Protected Areas (NES, 2011). No endangered fish species were identified in the CIBD (McCormack, 2007).

The habitat represented by the existing Project footprint and the proposed upgrade footprint (Figure 1) is not representative of the habitat utilised by milkfish, therefore the species is not expected within the proposed upgrade footprint.

Mammals

Terrestrial mammals are depleted and mostly restricted to introduced species like the pig, dog, cat, and goat (SPREP, 1992).

Marine mammals in Manihiki Island waters include the nationally endangered (moderately) humpback whale (McCormack, 2007). The humpback whale is protected by the Cook Islands whale sanctuary[2] that was established in 2011.

[2] The Cook Islands Exclusive Economic Zone (EEZ) (200 nautical miles from coastlines) is an established whale sanctuary (Cet Law, 2021).

The habitat represented by the existing Project footprint and the proposed upgrade footprint (Figure 1) is not representative of the habitat utilised by humpback whales, therefore the species is not expected within the proposed upgrade footprint. However, it is possible that humpback whales could be encountered during general boat traffic movement associated with the Project, or during sand dredging works.

4.1.2 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Sections 4.1.2.1 to 4.1.2.4 . Mitigation measures are detailed in the draft EMP (Section 5.0).

4.1.2.1 Vegetation Clearance

Pre-Construction

Prior to construction works it is expected that vegetation clearance will take place for site preparation, vehicle accessways and material/equipment storage areas. Aside from the localised removal of low habitat value vegetation, it is not expected that any other terrestrial vegetation will be damaged or destroyed as part of the proposed works. Therefore, impacts on the terrestrial environment due to vegetation clearance are considered to be **Low** prior to mitigation.

Secondary impacts caused by pre-construction vegetation clearance also include soil erosion, increased noise and decreased air quality. These impacts are expected to be local and temporary, therefore are considered to be **Low** prior to mitigation.

Construction

During construction works it is expected that vegetation clearance, tree clearance and tree topping will take place for expansion of the runway, apron area and re-introduction of fly-over obstacle free limitation surfaces. Aside from the removal of low value vegetation, it is expected that coconut trees (or other) will be removed or 'topped' as part of the proposed works beyond the proposed footprint to achieve compliance with obstacle free flyover zones. Therefore, impacts on the terrestrial environment due to vegetation removal are considered to be **Medium** prior to mitigation.

Secondary impacts caused by pre-construction vegetation clearance also include soil erosion, increased noise and decreased air quality. These impacts are expected to be limited and minimal, therefore these impacts are considered to be **Low** prior to mitigation.

4.1.2.2 Impact on Significant Species

Pre-construction

It has been proposed that the new public road alongside the runway will be fenced. It is possible that the migration of endangered or culturally important species will affected by the design. For example, the culturally significant coconut crab (IUCN Red List status of Vulnerable) migrates between inland and coastal areas during the reproductive season (Sato & Yoseda, 2013) and an unsuitable fence design may impact on this migration. Therefore, the impact to this species is considered to be **High** prior to mitigation**.**

Construction

As described in Section 4.1.1.3 endangered species and culturally significant species are known to be present within the vicinity of the Project area. For example, the culturally significant coconut crab is likely to be encountered during the works and sea turtles, humpback whales and marine invertebrates of significance may be encountered during general boat traffic movement associated with the Project, or during sand dredging works. Additionally, mournful parent-gecko and *Paratheuma andromeda* may be present in vegetation proposed to be cleared. It is also possible that nesting or breeding may be disrupted or destroyed by construction works. For example, it is possible that the brown booby may nest within areas within the Project footprint. Therefore, impact is considered to be **High** prior to mitigation.

4.1.2.3 Invasive Species

Areas of bare soil exposed during site preparation will provide a substrate for invasive plant species to become established, particularly if there is a prolonged time lapse between site preparation and construction phases. Due to the modified nature of the Project area, it is likely that some invasive plant species are present with a seed base that may opportunistically spread when disturbed.

Importing materials and ducking ships may increase the risk of introduced invasive animal species from other Cook islands, such as the Ship rat, the troublesome “sandfly” of Aitutaki, the No-see-‘em Sandfly (*Culicoides belkini*) which have not arrived to Manihiki yet. Similarly, the exist invasive species in Manihiki, such as mosquito (*Aedes aegypti*) may reach to other islands as well and cause widespread damage.

The spread of alien and invasive plant and animal species may extend well beyond the Project footprint and is this impact is considered **Moderate** prior to mitigation.

4.1.2.4 Harvesting of Natural Resources by Construction Workers

It is expected that several construction workers will temporarily reside in the area during the construction phase. The presence of many workers could result in impacts on the local wildlife. During the construction phase, there is a risk that some individuals of the workforce could consume local wildlife species (e.g., coconut crab).

4.2 Water Resources and Quality

4.2.1 Description of Environmental Values

Manihiki Island primarily relies on rainwater and groundwater and the majority of drinking water is supplied by community and household rainwater tanks. Generally, water resources are adequate during normal years but can face significant stress during drier years.

Previous water investigations (Ecowise Environmental, 2006) demonstrated that fresh groundwater in the form of ‘freshwater lenses’ occurs in some parts of Tukao and Tauhunu. These freshwater lenses are thin layers of fresh groundwater occurring above seawater, which underlies all the islands. High salinity zones are also found in parts of the two villages. Additionally, samples obtained from groundwater showed that the water is hard, nitrate levels are below WHO guideline values, and no evidence of faecal contaminations. The groundwater sources were recommended as a supplementary source of water for non-potable purposes such as washing clothes and toilet flushing.

Groundwater was identified as a potential water supply source in 2016 but more research was deemed necessary (IGRAC, 2016). There is some risk of seawater inundation or intrusion (resulted from waves caused by cyclone) which causes a significant (but temporary) increase in groundwater salinity. Other potential water supply options were suggested, such as building rainfall collection and storage system adjacent to the airstrip, providing desalination units, and importing water to Manihiki, however the evaluations speculated uneconomic and/or impractical for local communities.

4.2.2 Potential Impacts and Mitigation Measures

Freshwater will be required for workers and some construction activities (e.g., dust suppression, and concrete and bitumen production). The impact on current water supply could be significant if not properly mitigated through good resource planning. Water efficiency, conservation and reclamation practices will be adopted, for example use of non-potable water where suitable, use of an osmosis plant for non-potable water purification or a mobile desalination plant.

Groundwater has the potential to be adversely impacted by the installation of the soakage pits to improve drainage at the western end of the runway. Contaminants can be transported in runoff from the runway pavement and surrounding land and reach the groundwater faster without the filtration that occurs with natural soakage. The design, particularly depth of soakage pits, and operational procedures at the airport will need to address the interaction with groundwater of the soakage pits.

The use of freshwater may be required during the construction phase. As freshwater is limited on the island, the use of freshwater for construction may impact on local communities and natural resources (for examples loss of stream habitat due to abstraction). The impact on water resources is considered **High** prior to mitigation.

Mitigation measures are detailed in the draft EMP (Section 5.0).

4.3 Waste

4.3.1 Description of Environmental Values

4.3.1.1 Solid Waste

Manihiki Island does not have a proper waste management facility for solid waste. Historically, Pacific Island Countries and Territories have disposed of solid waste by open air burning. In more recent year's landfills have become popular, however this may not be a sustainable practice due to the limited availability of land on the island (SPREP, 2010).

4.3.1.2 Wastewater

Wastewater disposal is a challenge for the Northern Group islands. Manihiki Island has poor liquid waste disposal systems, although the extent of the problem is currently unknown (AECOM, 2021).

4.3.2 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Sections 4.3.1.1 and 4.3.1.2. Mitigation measures are detailed in the draft EMP (Section 5.0).

4.3.2.1 Solid Waste

The predominant waste that will result from construction works is likely coral aggregate and local marine makutu (lagoon mud). It is anticipated that this can be recycled and re-used.

Other waste types such as sanitary waste and general waste are anticipated to result from the works, however it is not expected that large quantities of solid waste will be generated and the risk of adverse impacts on the environment or local communities is considered minimal. However, if best management practices are not implemented, the re-mobilisation of debris and rubbish has the potential to adversely impact the surrounding terrestrial and marine environment extending beyond the Project footprint and which may result in habitat changes for an extended duration. The impact on the surrounding environments is therefore considered **Moderate** prior to mitigation.

4.3.2.2 Wastewater Discharges

Wastewater must be managed in such a way to prevent the spread of vector-borne diseases and contamination of soil and water bodies. Sanitary facilities for workers must be provided to prevent water bodies or other areas being used. Given the relatively serious consequence of poor wastewater management the impacts on workers, residents and surrounding soil/water environments are considered **High** prior to mitigation.

4.4 Social

4.4.1 Description of Environmental Values

4.4.1.1 Land Use and Ownership

The predominant land-uses on Manihiki Island are residential and agricultural. Generally, in the Cook Islands all land is private (except for a small area of Crown Land used for public purposes). Land sales are prohibited, and the only permitted transfers, other than inheritance, are by lease and occupation rights. Land use can still be managed through a process of consultation and cooperation involving the people (SPREP, 1992).

4.4.1.2 Historic Properties and Cultural Features

No historic properties or cultural features have been identified within the immediate vicinity of the physical works.

4.4.1.3 Social Interaction

For their part, the Contractor has an obligation to respect the rights, expectations, culture, and property of local communities, and to work in harmony so as to avoid conflict with the communities at all times.

4.4.2 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Section 4.4.2.1 to 4.4.2.3 Mitigation measures are detailed in the draft EMP (Section 5.0).

4.4.2.1 Land Ownership

The construction of a new public road alongside the runway has been proposed. The location of the new road is located within the property boundaries of numerous private properties. In addition, the quarrying of construction aggregates is likely to also take place on private property (including access/egress to the quarrying site). As described in Section 4.4.1.1 , land ownership can be complex in the Cook Islands. Therefore, the potential social impact is considered to be **High** prior to mitigation.

4.4.2.2 Historic Properties and Cultural Features

In the immediate vicinity of the physical works, no historic properties or cultural features visible have been identified. Impacts on historic properties or cultural features are considered to be **Low** prior to mitigation.

4.4.2.3 Social Interaction

The construction efforts may import temporary (approximately six months) labour from Rarotonga or other islands. Social impact related to temporary workforce may relate to misconduct, including, solicited prostitution, alcohol abuse, venereal diseases and negative family planning outcomes. Due to the long-term consequences of these the potential impact of temporary labour is considered **High** prior to mitigation.

4.5 Health and Safety

4.5.1 Description of Environmental Values

4.5.1.1 Air

Ambient air quality on Manihiki Island is likely to be of good to very good quality as the current existing sources of air emissions are low. Emissions are restricted to the small number of vehicles and boats that are used on the island, barges that infrequently transport people, materials and equipment to the island, and small aircraft. The nearest sensitive receptors of the Project area are the residential dwellings located on the western side of the runway. There are no known air monitoring stations on the island.

4.5.1.2 Noise and Vibration

The baseline noise levels on Manihiki Island are likely to be low. Noise pollution is restricted to the small number of vehicles and boats that are used on the island, barges that infrequently transport people, materials and equipment to the island, small aircraft, pearl farming operations and normal day-to-day activities. The nearest sensitive receptors of the Project area are the residential dwellings located on the western side of the runway. There are no known noise monitoring stations on the island. The airport is currently active resulting in noise under baseline conditions.

4.5.2 Traffic

It is anticipated that there will be live traffic, marine traffic, and aviation traffic throughout the Project construction. It is also expected that members of the public will be within vicinity of the Project area.

4.5.3 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Section 4.5.3.1 to 4.5.3.4. Mitigation measures are detailed in the draft EMP (Section 5.0).

4.5.3.1 Air Quality and Dust

Air pollution can arise due to improper maintenance of equipment. Impacts are expected to be localised and short-term with only minor negative impact on the ambient air quality in the vicinity of the construction areas. Some minor dust may be generated however these impacts will be localised and temporary, therefore impacts on air quality are considered to be **Low** prior to mitigation.

4.5.3.2 Noise and Vibration

Noise and vibration disturbances to the local community are particularly likely during excavation, construction and heavy machinery movement. These impacts will be localised and temporary, therefore noise and vibration impacts are considered to be **Low** prior to mitigation.

4.5.3.3 Traffic

These pose potential risk to both construction workers and members of the public and the impact is considered to be **High**.

4.5.3.4 Hazardous Materials

Waste oil and chemicals may be generated as part of the construction works and may be required on the work area. These substances represent a risk to the environment and people, beyond the Project footprint with lasting consequences. The impact on soil and water quality is therefore considered **Moderate** prior to mitigation.

4.6 Economy

4.6.1 Description of Environmental Values

4.6.1.1 Employment

In the Northern Group islands, employment opportunities are almost entirely limited to the agricultural and fisheries sectors. Pearling is the main economic activity on Manihiki (SPREP, 1992), and is the second most important economic sector after tourism (Cook Islands Government, 2000). Rito (a natural fibre extracted from young coconut tree fronds) is a speciality on Manihiki Island, large quantities are produced for weaving and the goods are exported to Rarotonga and international markets (Cook Islands Government, 2000).

4.6.2 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Sections 4.6.2.1 and 4.6.2.2. Mitigation measures are detailed in the draft EMP (Section 5.0).

4.6.2.1 Socioeconomic Impact of Airport Closure During Construction

The airport will not be operational for a period of two years. Economic activity and associated livelihoods dependent on airport operations will therefore experience a temporary loss in revenue. This loss needs to be contextualised against the additional economic opportunities associated with the construction activity (an increase in demand for food, entertainment, lodging, leisure etc.) as well as the long-term benefits of the airport improvements. An additional consideration is that the main economic activity (pear farming) will remain unaffected by the proposed Project. The overall impact of no airport operations on economic activity is considered **Moderate** prior to mitigation.

4.6.2.2 Biosecurity

Some equipment and material may need to be imported to Manihiki Island for the Project. Imported materials can harbour plant and animal pest species which may pose a threat to biodiversity and ecosystems on Manihiki Island. The Coconut rhinoceros beetle (CRB-G) is considered an “imminent threat to the livelihoods and economy of Pacific Islands reliant on coconut, oil palm and other palms” (SPC Land Resources Division, 2016), therefore impacts are considered to be **High** prior to mitigation.

4.7 Hazards and Risk

4.7.1 Description of Environmental Values

4.7.1.1 Hydrology and Coastal Processes

In the baseline state, a seawall (approximately 2-3 m above msl) separates the lagoon and runway and runs the full length of the runway.

4.7.1.2 Extreme Natural Events

As described in Section 4.1.1.3.1, Manihiki can be affected by tropical storms and extreme weather. Additionally, the climate is affected to some degree by El Niño and La Niña episodes.

4.7.2 Potential Impacts and Mitigation Measures

Potential impacts are detailed in Sections 4.7.2.1 and 4.7.2.2. Mitigation measures are detailed in the draft EMP (Section 5.0).

4.7.2.1 Hydrology and Coastal Processes

There is the potential for seawall benching and seawall modifications to affect hydrology and coastal processes if it is not designed in response to the natural wave, current and tidal hydrology and coastal processes of the specific areas in which they will be constructed. For example, modifications may increase wave or current energy deflection. Therefore, this impact is considered to be **High**.

4.7.2.2 Extreme Natural Events

During the construction stage of the Project, extreme natural events and/or storms may cause spills as a result of damage to machinery and hazardous materials storage. Additionally, during the operational stage of Manihiki Airport, extreme natural events may damage the Airport and/or associated infrastructure and potentially prevent aircraft from landing on the island. The impact of this on local communities is considered **Moderate** prior to mitigation. Operational impacts as a result of increased airport operations (noise, air emissions, hazardous materials etc) have not been assessed as part of the scope of this assessment.

4.8 Erosion and Sedimentation

4.8.1 Description of Environmental Values

The baseline erosion and sediment impact in the terrestrial environment is likely to be very low. It is expected that limited erosion effects are caused by traffic (air and vehicle), people, fauna, weather, and sea. However, in the coastal environment, there is continued erosion of the shoreline along the ocean side of the airfield.

4.8.2 Potential Impacts and Mitigation Measures

Soil erosion may occur as a result of the removal of vegetation (including grass), and earth cover during resurfacing, and restoration of pavement areas in the terrestrial environment. Sediment has the potential to be generated during any excavations, particularly for the turning bays at either end of the runway and improvement of the stormwater collection and soakage at the southern end of the runway. These impacts are considered to be short-term and reversible. Additionally, the construction of the sea wall will mitigate the continued erosion of the shoreline along the ocean side of the airfield. Therefore, these impacts on the terrestrial environment are considered **Low** prior to mitigation.

Any stockpiling of fine material and movement of machinery within the foreshore has a high likelihood of mobilising sediments into the marine environment that may have an impact extending on marine habitat extending beyond the Project footprint. The impact on the marine environment is considered **Moderate** prior to mitigation.

Mitigation measures are detailed in the draft EMP (Section 5.0).

5.0 Environmental Management Plan (EMP)

This EMP addresses impacts and mitigation measures identified at each stage of the Project's execution, namely detailed design, construction and operation. The EMP will form the basis of the Contractor's EMP and the mitigation measures identified in this EMP will form the minimum requirement for reducing impacts on the environment as a result of works associated with the Project.

5.1 Mitigation Measures

Due to the nature of the construction activities proposed there are some mitigation measures which are applicable to all aspects of the Project, whilst others are specific to particular components. Sensitive

receptors, environmental and cultural values have been identified around the Project area which will require specific mitigation measures for safety, environmental and social protection.

This EMP assesses potential impacts associated with the design, pre-construction, construction and operational phases. The mitigation measures provided against potential impacts are outlined in detail in the tables provided in Appendix A. The mitigation tables detail the impact or issue, the mitigation required, where this is to occur, when this mitigation is to be applied, estimated costs, implementation responsibility and supervision responsibility. The measures are defined at the pre-construction, construction and operational stages of the Project.

This EMP requirements should be included in all bidding documents and form the basis of the Contractor's EMP which will detail implementation of the mitigation measures identified in this EMP. EMPs are dynamic documents which should be updated to include any variation from the current scope or addition of newly identified impacts and mitigation measures that may arise through the bidding and contracting process (if not addressed in the Contractor's EMP) or consultation.

5.2 Responsible Parties

The ICI is responsible for the delivery of the Project, any funding received, and contracts awarded under the Project. ICI will also undertake the day-to-day management of the Project. ICI will be required to assess compliance with the EMP monitoring and mitigation aspects of the project and the implementation of the EMP is the responsibility of the Contractors.

5.2.1 Staffing and Equipment Requirements

Implementation of the EMP should be undertaken by suitably experienced and permitted individuals. Appropriate equipment and training should be provided to those individuals to ensure that a successful outcome is achieved and that all legal requirements are met.

5.2.2 Grievance Redress Mechanism

A process for managing and responding to stakeholder concerns or complaints.

All complaints and incidents should be referred to the designated Public Liaison Officer (nominated by Contractor) for undertaking complaint/incident investigation procedures. All complaints must be acknowledged with the complainant within 24 hours. In general, the following procedure should be followed:

- Log complaint/incident, date of receipt and acknowledge complaint receipt;
- Investigate the complaint/incident to determine its validity and to assess the source of the problem;
- Identify and undertaken any action required, communicate response action to complainant (if requested by complainant);
- Log the date of the resolution;
- Report the complaint in monthly monitoring report including actions, resolution status and any outstanding actions required.

Prior to the commencement of the Project, the ICI and Contractor should determine the method in which community grievances may be communicated e.g., drop box or communication through a nominated ICI representative.

Signage at site will be displayed by the Contractor and outline the complaints procedure and contact details for making complaints.

Incidents and complaints will be discussed during Contractor meetings. It is recommended that the ICI nominate a representative to liaise with the Contractor on a regular basis and be available to attend progress meetings as required; it is recommended that the Contractor holds weekly construction meetings with ICI.

5.2.3 Incident/Emergency Response

A process for responding to unanticipated or emergency incidents will be prepared as part of the Contractor's EMP.

5.2.4 Reviews and Auditing

Provision will be made for periodic review of the EMP during each stage of the Project and once the activity becomes operational. Provision will also be made for independent auditing of the Contractors management against the provisions of this EMP.

5.3 Compliance and Monitoring Plan

5.3.1 Environmental Monitoring Plan

The Environmental Monitoring Plan (Appendix B) identifies the environmental monitoring requirements to ensure that all the mitigation measures identified in this EMP are implemented effectively. Environmental monitoring methodology includes:

- Review of detailed designs;
- Audit and approval of site environmental planning documents;
- Consultation with communities and other stakeholders as required;
- Routine site inspection of construction works to confirm or otherwise the implementation and effectiveness of required environmental mitigation measures.

Non-compliance to the environmental mitigation measures identified in the EMP will be advised to the Contractor in writing by the ICI officer as required. The non-compliance notification will identify the problem, including the actions the Contractor needs to take and a time frame for implementing the corrective actions.

A Monitoring Plan Inspection Checklist is attached in Appendix C. The Contractor must conduct daily inspections to ensure compliance with the EMP. The checklist shall be updated to include any additional requirements by the ICI. It is responsibility of the Contractor to update the checklist.

5.3.2 Environmental Monitoring Plan Reporting

Throughout the construction period, the Contractor will include results of the EMP monitoring in regular reports for submission to the ICI. The format of the reports shall be agreed with all agencies but is recommended to include the following aspects:

- Description and results of environmental monitoring activities undertaken during the month;
- Status of implementation of relevant environmental mitigation measures pertaining to the works;
- Copy of the visual surveys undertaken by the competent observer (e.g., biologist);
- Key environmental problems encountered, and actions taken to rectify problems;
- Summary of non-compliance notifications issued to the Contractor during the month;
- Summary of environmental complains received and actions taken;
- Key environmental issues to be addressed in the coming month.

A day-to-day contract diary is to be maintained pertaining to administration of the contract, request forms and orders given to the Contractor, and any other information which may at a later date be of assistance in resolving queries which may arise concerning execution of works. This day-to-day contract diary is to include any environmental events that may arise in the course of the day, including incidents and response, complaints and inspections completed.

5.3.3 Contingency Planning

It is recommended that the Contractor prepares a Contingency Plan encompassing tsunami, cyclone and storm events. The purpose of the Plan is to ensure all staff are fully aware of their responsibilities in respect to human safety and environmental risk reduction. Procedures should clearly delineate the roles and responsibilities of employees, define the functions to be performed by them, the process to be followed in the performance of these functions including tools and equipment to be kept in readiness, and an emergency medical plan. All of the Contractor's staff should undergo training/induction to the Plan.

The wet season on Manihiki Island/Northern Group is usually November through March which coincides with the tropical storm season. The works are proposed for 2022-2023 and it is probable that storm and rain events may occur during this period causing tidal surges, flooding and high winds. The Contractor is responsible for monitoring weather forecasts, inspecting all erosion and sediment control measures and undertaking any remedial works required prior to the forecasted rain or storm events.

In general, the Contractor will:

- Inspect daily weather patterns to anticipate periods of risk and be prepared to undertake remedial works on erosion and sediment control measures, including foreshore protection of stockpiles to suit the climatic conditions;
- Monitor the effectiveness of such measures after storms and incorporate improvements where possible in accordance with mitigation measures;
- Ensure appropriate resources are available to deal with the installation of additional controls as and when needed;
- Inform the ICI of any concerns associated with the measures in place.

6.0 Summary and Conclusion

This EIA concludes the following:

Project impacts range from **Low**, **Moderate**, or **High** impact without mitigation. Overall, potential impacts can be mitigated to a level where impacts are **Low** and mitigation measures are detailed further in the Environmental Management Plan (EMP).

An EMP has been prepared to address impacts and mitigation measures identified at each stage of the Project's execution, namely detailed design, construction and operation. The EMP will form the basis of the Contractor's EMP, and the mitigation measures identified in the EMP will form the minimum requirement for reducing impacts on the environment as a result of works associated with the Project.

The key potential impacts that are being mitigated are:

- Design and/or Pre-construction Impacts
  - Vegetation Clearance
  - Quarrying of Construction Aggregates
  - Land Use and Ownership
  - Impact on Significant Species
  - Hydrology and Coastal Processes
- Construction Stage Impacts
  - Vegetation Clearance
  - Tree Clearance
  - Impact on Significant Species
  - Invasive Species
  - Harvesting of Natural Resources by Construction Workers
  - Water Resources
  - Solid Waste
  - Wastewater Discharges
  - Historic Properties and Cultural Features

  - Social Interaction
  - Air Quality and Dust
  - Noise and Vibration
  - Traffic
  - Hazardous Materials
  - Socioeconomic Impact of Airport Closure
  - Biosecurity
  - Erosion and Sedimentation
- Operational Stage Impacts have been restricted to extreme natural events that may damage the Airport and/or associated infrastructure.

The EMP is designed to address these issues through:

- Implementation of this EMP into the Contractor's EMP
- Regular supervision and monitoring of the implementation of this EMP.

7.0 Assumptions, Limitations and Client Inputs

This EIA is based on the assumptions listed below:

- The desktop review relies on Client-provided environmental information and any available data that can be retrieved from desktop research. Limitations of this EIA include (but are not limited to) the following:
  - At the time of writing, the final design plans and precise construction methodology is unknown. Once this information is available, it should be updated into this EMP;
  - Aggregate demands for the Project are currently unknown. It is assumed that large volumes of coral aggregate will be required;
  - The laydown site(s) generally will consist of the project offices, storage areas, stockpile site(s) and associated facilities. The proposed location and required number of laydown sites are not yet known;
  - Detailed ecological information of endangered species or culturally significant species present on Manihiki Island is limited.
- The EIA does not include a site assessment due to Covid-19 restrictions and was based on desktop review and communication from the Client. Further assessments may be required to inform the EIA based on detailed design and EIA findings.
- Submission of an EIA to the NES for permits and consenting (Environment Regulations 2011) has not been included. It is assumed that any required permit application will be undertaken directly by the Client.
- Several initial public engagements have already occurred. Appendix D provides detailed minutes outcomes of the public consultation undertaken to date. Copies of the draft EIA will be provided to all relevant stakeholders and individuals with an interest in the proposal as per the requirement specified in the Terms of Reference document (Appendix E).
- It is assumed that the Client has provided AECOM with existing site procedures and relevant information to inform the EIA and be collated into the EMP.

8.0 Standard Limitations

AECOM New Zealand Limited (AECOM) has prepared this EIA and EMP in accordance with the usual care and thoroughness of the consulting profession for the use of ICI and only those third parties who have been authorised in writing by AECOM to rely on this Report.

It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this Report.

It is prepared in accordance with the scope of work and for the purpose outlined in the contract 'Manihiki & Tongareva Airport Improvement Design Services (Contract No. CK202109)' dated 3 August 2021.

This Report was prepared between October 2021 and August 2022 and is based on the conditions encountered and information reviewed at the time of preparation. AECOM disclaims responsibility for any changes that may have occurred after this time.

This Report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This Report does not purport to give legal advice. Legal advice can only be given by legal practitioners.

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9.0 References

AECOM New Zealand Limited (AECOM). (2021). Bid document.

AECOM New Zealand Limited (AECOM). (2022). Manihiki Airport: Detailed Design Report.

Blacka, M., Flocard, F. & Parakoti, B. (2013). Coastal Adaptation Needs for Extreme Events and Climate Change, Avarua, Rarotonga, Cook Islands. Project Stage 1: Scoping and Collation of Existing Data.

Cet Law. (2021). Legislating the Cook Islands Whale Sanctuary. Retrieved from: https://www.cetaceanlaw.org/project/legislating-the-cook-islands-whale-sanctuary/.

Climates to Travel. (n.d.). Climate – Cook Islands. Retrieved from: https://www.climatestotravel.com/climate/cook-islands.

Cook Islands Government. (2000). Cook Islands Initial National Communication. Retrieved: from https://www.unfccc.int.

Cook Islands Meteorological Service (CIMS). (2013). Pacific-Australia Climate Change Science and Adaptation Planning Program. Current and future climate of the Cook Islands. Retrieved from: www.pacificclimatechangescience.org.

Cranwell, L, M. (1933). Flora of Manihiki, Cook Group. Records of the Auckland Institute and Museum, 25th September, 1993, Vol. 1, No. 4, pp. 169-171.

Department of the Environment. (2021). Sula leucogaster in Species Profile and Threats Database, Department of the Environment, Canberra. Retrieved from: https://www.environment.gov.au/sprat.

Ecowise Environmental. (2006). Manihiki, Cook Islands Report on Water Investigations, November 2005 – September 2006. Prepared for GHD Services Pty Ltd, AusAID & Cook Islands Government.

Infrastructure Cook Islands (ICI). (2021). Geotechnical Investigation Report. Project: Manhiki Airport Improvement.

International Groundwater Resources Assessment Centre (IGRAC). (2016). Groundwater Monitoring in Small Island Development States in the Pacific. Retrieved from: www.un-igrac.org.

International Union for Conservation of Nature (IUCN). (2021). The IUCN Red List of Threatened Species. Version 2021-2. Retrieved from: https://www.iucnredlist.org.

Karunarathna, D. M. S. S.; Surasinghe, T. D.; Madawala, M. B.; Wellappulli-Arachchi, S. M.; Kandambi, H. K. D.; Kusuminda, T. G. T.; Priyadarshana, T. M. T. S. & Perera, B. N. H. (2015). Distribution, Natural History and the Conservation Status of Hemiphyllodactylus typus and Lepidodactylus lugubris (Reptilia: Gekkonidae) in Sri Lanka. In Biological Sciences Faculty Publications. Paper 54.

McCormack, G. (2005). Cook Islands Natural Heritage Articles: The Young Coconut Crab. Retrieved from http://cookislands.bishopmuseum.org/.

Ministry of Finance and Economic Management. (2019). Island Profiles: Manihiki. Retrieved from: www.mfem.gov.ck.

Ministry of Marine Resources. (2020). Giant clams of the Cook Islands. Retrieved from: www.mmr.gov.ck.

Ministry of Transport Report, Aeronautical Study for Manihiki Airport (Ministry of Transport, 2019), October 2019.

National Environment Service (NES). (2011). Cook Islands 4th National Report to the Convention on Biological Diversity.

Sato, T., & Yoseda, K. (2013). Reproductive migration of the coconut crab, *Birgus latro*. Plankton Benthos Research 8: 49-54.

South Pacific Regional Environment Programme (SPREP). (1992). National Report of the Cook Islands to the United Nations Conference on Environment and Development. Retrieved from: www.sprep.org.

SPC Land Resources Division. (2016). An emerging biotype of Coconut Rhinoceros Beetle Discovered in the Pacific. Retrieved from https://www.lrd.spc.int.

SPREP. (2010). Pacific Regional Solid Waste Management Strategy 2010-2015. Retrieved from: https://www.sprep.org.

White, M. (2012). Sea Turtles in the Cook Islands. Volume One: 2009-2012.

Winterer, E. L., Lonsdale, P. F., Matthews, J. L. & Rosendahl, B. R. (1974). Structure and acoustic stratigraphy of the Manihiki Plateau. Deep. Res. 21, 793–814. doi: 10.1016/0011-7471(74)90001-1.

Wood, B, L. (1967). Geology of the Cook Islands. New Zealand Journal of Geology and Geophysics, 10:6, 1429-1445. DOI: 10.1080/00288306.1967.1042322.

Appendix A – Mitigation Measures

Table 6 Environmental and Social Mitigation Plan

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
DETAILED DESIGN/PRE-CONSTRUCTION MOBILISING STAGE							
General	High	The following plans should be included (but not limited to) in the Contractor's EMP: Environmental Protection Plan, Erosion Control Plan, Traffic Management Plan, Health and Safety Management Plan, Waste Management Plan, Emergency Management Plan, Storm Water Pollution Prevention Plan, Litter-Control Plan, Hazard Analysis and Critical Control Point Plan. The EMP should be reviewed and approved by appropriate regulatory agencies before physical works commence. All workers associated with this Project, irrespective of their employment arrangement or affiliation (e.g., employee, contractor, etc.) shall be fully briefed on the mitigation measures in this EMP and will be required to adhere to them for the duration of their involvement in this Project.	Low	All locations	Minimal (part of mobilisation and construction planning).	Contractor	ICI
Aviation traffic safety	High	The Contractor is to develop a Health and Safety Management Plan which will include details of site works scheduling around known flight timetables and procedures for emergency response for all workers.	Low	Manihiki Airport	Minimal (standard construction practice).	Contractor	ICI
Public access	High	The Contractor is to develop a Health and Safety Management Plan which will identify, assess, and control potential hazards to members of the public.	Low	All locations	Minimal (part of standard design practices).	Detailed Designer	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Hydrology and Coastal Processes	High	The seawall benching will be appropriately designed in response to the natural wave, current and tidal hydrology and coastal processes of the specific areas in which they will be constructed. This will avoid or mitigate any secondary or cumulative impacts resulting from large permanent seawall footprints or increasing wave or current energy deflection thus potentially causing impacts in areas outside the Project area. The seawall footprints shall also be designed to be as small as practicable to reduce the area of permanent habitat loss.	Low	Foreshore	Minimal (requirement of bidding documents and standard construction practices).	Consultant / Contractor	ICI
Vegetation clearing	Moderate	The Contractor will be responsible for clearing all work sites of loose litter and debris (regardless of origin) prior to commencing any Project works. This is to reduce to re-mobilisation of debris and rubbish which has potential to adversely impact listed endangered species and the marine environment. Collected debris must be disposed of or recycled at licensed facilities.	Low	All locations	Minimal (part of mobilisation and construction planning).	Contractor	ICI
Sourcing coral aggregate material	Moderate	Materials extraction is likely to begin prior to construction on site to ensure enough material is available for the works. Ensure aggregate is sourced from an approved quarry that is operating in accordance with the relevant legislation. Aggregate sources must be approved by the NES prior mobilisation stage. Site runoff and wastewater from quarrying areas is prohibited from being discharged directly to the marine environment. Site processing and stockpiles should be located off-site (preferably at the Contractors yard) or inland.	Low	All locations	Minimal (part of standard design and construction practices).	Contractor	ICI
Water supply	High	The Contractor should provide their own water supply for the Project. It is possible that seawater can be used for construction activities e.g., dust suppression. Any sediment laden run-off must be prevented from flowing directly into the marine environment.	Low	All components	Minimal (part of standard design practices).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Soil erosion	Moderate	The Contractor should implement measures to minimise erosion. The Design Consultant/Contractor is to design erosion protection measures according to international good practice standards, including consideration of tidal influence and surface flow paths.	Low	All locations	Minimal (part of standard design practices).	Contractor	ICI
Biosecurity impacts-Importation of equipment and materials	High	The Government of The Cook Islands requires that imported equipment is free of pests. The Contractor is required to clean equipment before departure from the exporting country. On arrival, equipment will be inspected, and it must be free of soil, any plant material and any other biosecurity risk material. Obtain import permits and quarantine certification prior to export from country of origin. All plant, equipment and materials imported to the Cook Islands shall comply with the Cook Islands Biosecurity Act 2008 and any other specific requirements relating to biosecurity.	Low	All locations	Minimal (part of mobilisation and construction planning).	Contractor	ICI
Land Ownership	High	Site selection for quarrying construction aggregates and for the construction of the new public road alongside runway will be coordinated with the Island Council of Chief stakeholders to check the properties are available for use. All works within private property boundaries require landowner agreements before works can begin.	Low	All private property	Minimal (part of mobilisation and construction planning).	Detailed Designer/Contractor	ICI
Barriers to Migration	High	The design/selection of fencing for the public road alongside the runway should be suitable for Coconut crab migration. For example, there should be limited clearance between the fence and ground to prevent animals and children from accessing the runway, but enough clearance to allow Coconut crabs to pass underneath.	Low	New public road alongside runway	Minimal (part of standard design practices).	Detailed Designer/Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Significant Species Protection - Sedentary wildlife	High	Prior to construction activities commencing the Project area is to be assessed and surveyed with assistance from a qualified and experienced ecologist or biologist. Any endangered species are to be identified. Mitigation measures that will reduce the risk of impacting these species must be implemented; consultation with a qualified and experience ecologist should be undertaken to identify adequate measures. Mitigation measures may include relocation of wildlife, if practicable, to suitable areas outside the Project area, or staging Project works around nesting/breeding times as required.	Low	All locations	To be determined (part of construction planning).	Detailed Designer / Contractor / Qualified and Experienced Ecologist or Biologist.	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Significant Species Protection – Turtles and mobile marine wildlife	High	During construction aggregate sourcing, the Contractor will designate a competent observer (e.g., Ecologist/Biologist) with responsibility to undertake visual surveys of the Project areas specifically for sea turtles and any other listed endangered species which may enter the Project area. This individual must have authorisation to stop works if listed species are found within 50 m of the Project areas. This individual must keep records of all surveys undertaken (including but not limited to time survey started and finished, weather conditions and specific location) and observations. When works are directly above the water there is greater potential to directly impact sea turtles. When these activities are programmed the works area must be surveyed by a competent observer (e.g., Ecologist/Biologist) prior to the start of work each day and prior to work resuming following any break of 30 minutes or more. Survey times and observations must be recorded. If a sea turtle is seen within 50m of the proposed work site and activities have the potential to impact or disturb species, all works shall be stopped and only resume after the animals have voluntarily departed the area. Activities which will not impact or disturb the present species may continue. Work should be performed during daylight hours to avoid disorienting any nesting sea turtles. If work is required after daylight working hours, sea-turtle-friendly lighting is to be used to reduce the brightness of the emitted light. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any listed marine species.	Low	All locations	To be determined (part of construction planning).	Detailed Designer / Contractor / Qualified and Experienced Ecologist or Biologist.	ICI
CONSTRUCTION STAGE							

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Health & Safety	High	The Contractor is to develop a Traffic Management Plan (TMP) to include signage, flag operators, personnel protective equipment (e.g., high visibility vest), and specific actions (e.g., regulating working hours for vehicles and setting speed limits) to be implemented around sensitive receptors (e.g., residential dwellings). TMP to include vehicle and pedestrian traffic. Include transport of materials and equipment from quarry to site construction areas in the TMP e.g., covering of loads, maximum speed, and designated travel times. It is anticipated that staged airport operations would persist during construction with minor restrictions on plane movements. All work should be completed in accordance with the Health and Safety Management Plan.	Low	All vehicle transport locations	Minimal (part of standard construction practice).	Contractor	ICI
Marine traffic safety	High	The Contractor should develop and implement a boat users marine TMP. This should include PPE requirements (e.g., life vest) and specific actions (e.g., regulating working hours and setting speed limits) to be implemented around sensitive receptors (e.g., marine habitats and lagoon users).	Low	All maritime locations	Minimal (part of standard construction practice).	Contractor	ICI
Significant Species Protection	High	During all seawall work and construction aggregate sourcing, the Contractor will designate a competent observer (e.g., Ecologist/Biologist) with responsibility to undertake visual surveys of the Project areas specifically for sea turtles and any other listed endangered species which may enter the Project area. This individual must have authorisation to stop works if listed species are found within 50 m of the Project areas. This individual must keep records of all surveys undertaken (including but not limited to time survey started and finished, weather conditions and specific location) and observations.	Low	All locations	To be determined (part of construction planning).	Detailed Designer / Contractor / Qualified and Experienced Ecologist or Biologist.	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		When works are directly above the water there is greater potential to directly impact sea turtles. When these activities are programmed the works area must be surveyed by a competent observer (e.g., Ecologist/Biologist) prior to the start of work each day and prior to work resuming following any break of 30 minutes or more. Survey times and observations must be recorded. If a sea turtle is seen within 50m of the proposed work site and activities have the potential to impact or disturb species, all works shall be stopped and only resume after the animals have voluntarily departed the area. Activities which will not impact or disturb the present species may continue. Work should be performed during daylight hours to avoid disorienting any nesting sea turtles. If work is required after daylight working hours, sea-turtle-friendly lighting is to be used to reduce the brightness of the emitted light. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any listed marine species.					
Historic Properties and Cultural Features	Low	The Project works are unlikely to cause any adverse impacts on historic properties or cultural features; however, mitigation measures should be implemented to safeguard any historic properties or cultural features identified in the vicinity of the Project area. If site access traverses close to a historic property or cultural feature, an exclusion zone must be demarcated by installing e.g., a fence or roped buoys around the structure and all Project personnel must be briefed about it. No cultural features or historic properties have been identified within the Project area. However, the Contractor must include an Accidental Discovery Protocol (ADP) in their EMP, in the case that historical	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI/Ministry of Cultural Development Cook Islands.

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		properties are encountered. If during site works it is suspected that a historical or cultural artefact has been exposed, the Contractor will immediately stop works within 10 m of the property and will call the Ministry of Cultural Development Cook Islands (+68 2 27 025/mocd.staff@cookislands.gov.ck) to advise whether the remains are historical and if so to record them. Site works will be resumed when the Ministry of Cultural Development approves it. The Contractor shall ensure a safe working environment for the Ministry of Cultural Development during the site investigation.					
Soil erosion and sedimentation	Moderate	Minimise time and size of ground and marine bed disturbance activities to workable size at any one time. Vegetation to be removed manually and strictly no use of herbicides/pesticides. Fine grained material stockpiles (e.g., sand) are to be positioned on impermeable surfaces (e.g., geotextile). Stockpiles should be covered and bunded with sandbags to prevent material being washed away. These stockpiles should be located in inland areas e.g., lay downs areas. Unless in use for foreshore construction works, the Contractor should keep construction vehicles and equipment in defined areas inland, away from the foreshore. Construction materials used will predominantly comprise clean coral aggregate. It is important that these materials remain clean. The Contractor must consider the storage/stockpile locations for this material as to not contaminate it with sediment. Turbidity and sedimentation from Project-related work shall be minimised and contained through the appropriate use of erosion-control practices and effective silt containment devices (e.g., silt fencing,	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		marine silt curtain, bunding), and the temporary stabilisation of exposed areas prior to and during adverse weather and tidal/flow conditions. If possible, foreshore work shall be conducted below the Mean Lower Low Water (MLLW) line during the dry season and low tides when feasible. Construction work for the seawall will not require the installation of silt curtains as no excavation activities will be required in this area, rather the placement of clean quarry rock armour on top of the existing seawall structure.					
Waste disposal – Site housekeeping practices	Moderate	Contractors shall adopt a reduce → reuse → recycle→ recovery→ landfill strategy. The primary waste generated will be coral aggregate and local marine makutu (lagoon mud) from the existing runway and it is anticipated that these materials can be recycled. Solid and sanitary waste disposal procedures and facilities shall be implemented. The Contractor shall ensure all non-hazardous general waste is re-used, recycled, returned to supplier, removed to the island landfill (least preferred option) or out of country (for hazardous waste). Ensure areas for waste collection, recycling and off-site disposal are clearly marked/sign posted. Segregate waste to avoid cross contamination, such as with contaminated material (hazardous substance). Install waste collection facilities at construction lay down area to allow for collection and packing of waste. Strictly no dumping of rubbish. Ensure waste collection containers (waste bins) are in good condition and not leaking. Include awareness training in general environmental training.	Low	All locations (stockpile storage area, designated areas).	Minimal (part of standard construction practice).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		Workers must be provided with a sanitary system to prevent fouling of surrounding soils. Construction debris must be removed immediately and not stored in the Project area. Debris includes excavated material and materials from the existing runway.					
Water and soil pollution	High	Waste oil and chemicals may be generated as part of the construction works; the Contractors shall collect it in labelled drums. Waste material will be held in a storage compartment and disposed of at an approved waste facility according to Cook Island regulations. Waste governance falls under the following legislation: • Environment Act 2003 • Public Health Act 2004 • Infrastructure Act 2019 • Dangerous Goods Act 1984 • Pesticides Act 1987 The Contractor shall provide spill response plan training for all construction workers. Precautions should be in place to prevent wastewater and hazardous substances/materials entering the environment (e.g., fuel spillage, wastewater), however should an incident occur; the Contractor must have a spill response plan in place. The response plan should include details on the use of spill kits and absorbent items to prevent spills entering the receiving sensitive environment (ground, marine environment). This spill response plan should be applicable to all Project works areas. Zones for preliminary accumulation of wastes are designated in areas that will cause no damage to the vegetation cover or leach into groundwater (e.g., within construction lay down area on hard surface).	Low	All locations (stockpile storage area, designate areas)	Minimal (part of standard construction practice).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		Any sediment laden runoff from fine material stockpiles must be directed to the bunded settling areas; it could also be collected for dust suppression provided the runoff is not contaminated with any chemicals (e.g., fuel). All equipment and material will be clean of soil, lubricant or oil residue and invasive species before entering the marine environment. All Project-related materials and equipment placed in the water shall be free of pollutants. In water activity is to be restricted with all machinery to be positioned on the land (where practicable). All objects that are to be placed in the water shall be lowered to the bottom in a controlled manner. This can include the use of cranes, winches, or other equipment that affect positive control over the rate of decent to minimize turbidity potential. The contractor shall perform daily pre-work equipment inspections for cleanliness and leaks. Should a leak be detected the affected equipment will be taken out of operation immediately and moved away from the shoreline. The equipment shall not be put into operation until the leak is repaired and the equipment cleaned of any residue. Off-site fuelling sites shall be used to the maximum extent practical. Should fuelling of Project-related vehicles or equipment need to occur on-site a designated fuelling area will be established at least 15m from any body of water (shoreline, streams, drainage, etc.). Project personnel shall be trained on proper fuelling and fuel spill clean-up procedures (land and marine spill response).					

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		Stockpile, staging, and material storage areas shall be kept at least 15m from any body of water (shoreline, streams, drainage, etc.). The contractor shall take appropriate precautions in advance of predicted hurricane or storm events to prevent material losses during surge or flood events, such as relocating materials and equipment inland and to be at least 15m from the shoreline and away from overland flow paths. Hazardous materials and petroleum products shall be transported, used, and stored on-site in a manner to prevent contamination of soils and water.					
Hazardous substances and safety	Moderate	Soil and water pollution from construction run-off with fuel and lubricants are not expected if the mitigation measures are in place. The Contractor should store and handle hazardous substances in bunded, hard stand or designated areas only (preferably at the Contractors yard). Any fuel storage areas must not be located within 15m of the marine environment. Spill kits will be provided for the Project, this includes marine spill kits. Only trained and skilled personnel must handle and use the hazardous substances. The Contractor shall provide hazard specific PPE to workers directly involved in handling hazardous substances (e.g., chemical or heat resistant clothing, gloves). Hazardous liquids (e.g., fuel and lubricants) must be managed within hardstand and bunded areas to prevent runoff to surrounding permeable ground.	Low	All locations	Safety equipment included in construction cost. Minimal (part of standard construction practice).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		Bunded areas (secondary containment) must contain the larger of 110 percent of the largest tank or 25 percent of the combined volume in areas with a total storage volume equal or greater than 1,000 litres. Bunded areas are to be impervious (watertight), containers constructed from chemically resistant material and be sheltered from the rain. Rainwater allowed to collect within the bund could be contaminated if there is any hazardous substance residue on storage containers or spilt product within the bund. A spill response plan must be in place and all workers trained in correct implementation of the spill response plan. All hazardous substances must be properly labelled. The Contractor should complete a list, including safety data sheets (SDS) for each hazardous substance stored or used shall be accessible at all times. Signage should be posted in storage areas identifying all chemicals present. Precautions should be in place to prevent wastewater and hazardous substances/materials entering the environment (e.g., fuel spillage, wastewater), however should an incident occur, the Contractor must follow the spill response plan that is in place. Spill kits and training of use to be provided to all workers during toolbox meetings. Spill kits to contain PPE for the spill clean-up (e.g., appropriate gloves [nitrile] and overalls), material to contain the spill and absorbent pads, and a heavy-duty rubbish bag to collect absorbent pads or material. Used oil to be collected and taken to an approved facility (for disposal or cleaning) at completion of works. Material is to be taken disposed of at an approved facility. When vehicle and machinery are not in use in the Project area, a drip tray should be placed under the potential leaking areas (e.g., under fuel tank). The Contractor must ensure that vehicles and machinery are not leaking oil and/or hydraulic fluids. All drip trays must be emptied in a					

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		waste oil drum and disposed of in approved facility for hazardous waste. Vehicles and machinery are not to be refuelled within 15 m from any body of water (shoreline, streams, drainage, etc.). Only trained people in fuel handling procedures can refuel machinery and vehicles. If oil changes or machinery repairs have to be undertaken, the procedures must be carried out over heavy grade plastic sheeting or drip trays. Spill material must be used for cleaning hydrocarbons dripped on to the plastic sheeting.					
Generation of dust/air pollution	Low	Use closed/covered trucks for transportation of fine construction materials (e.g., sand or soil). Any vehicle which is overloaded (exceed designed load limit) or is not covered properly shall be refused. Cover stockpiles containing fine material (e.g., sand) when not actively being used. Reduce the movement of some material during windy conditions and spray water on exposed areas. Where possible, the Contractor shall keep work areas clean with regular sweeping. Due to freshwater supply constraints large scale water sprinkling should be kept to a minimum and only as required. Seawater could be utilised rather than freshwater for controlled dust suppression. Dust masks and personnel protective equipment must be available for workers during dust generating activities. The Contractor should ensure all equipment is serviced and issued with warrant of fitness (as required). Any machinery deemed to be polluting the air must be replaced or fixed. Conduct daily checks of the equipment to ensure they are maintained and in good working order.	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
Noise and vibration disturbances	Low	Minimise nuisance from noise by following standards and procedures for noise and vibration at all Project areas. Ensure all workers are trained. Before works commence and prior to specific activities that may cause noise and vibration issues, the Contractor shall advise the residents about the works and its duration. If required, a noise assessment should be completed at nearby sensitive receptor locations using a noise meter. Work can only be performed during approved hours and designated areas. Regularly check and maintain machinery, equipment, and vehicle conditions to ensure appropriate use of mufflers, etc. Workers in the vicinity of sources of high noise shall wear necessary protection gear rated for the situation they are being used. Signage to outline complaints procedure and contact details of recipient of complaints (e.g., phone number, physical address).	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI
Loss of archaeological artefacts or sites	Low	Work to stop in specific location of unexpected discovery of artefacts or site. An exclusion area should be demarcated to limit access. The Project Engineer, NES and Ministry of Cultural Development should be notified immediately and consulted for further instruction. Work can continue in other Project areas outside of the exclusion zone.	Low	All locations	Minimal (part of standard construction practice).	Contractor/ NES/Ministry of Cultural Development.	ICI
Invasive species	Moderate	Control of alien and invasive species through continuous monitoring and control of construction areas and the physical removal and/or chemical treatment of alien and invasive species) and monitoring (monthly, for all areas disturbed by construction).	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI
Landscape degradation	High	The Contractor should include provision for lay down area (if required) rehabilitation following the completion of the construction phase.	Low	All locations	Minimal (part of standard	Contractor	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		The Contractor shall restore the landscape after completion of rehabilitation works; restore the vegetation cover in accordance with the surrounding landscape and any required design (e.g., re-planting of trees if any were removed). Use plant species characteristic for the landscape during restoration of the vegetation cover.			construction practice).		
Public Access	High	The Contractor must not completely block public access to the pathway along the runway. As mitigation measures, the Contractor must install warning signs on the work areas and where plant, machinery and materials are stored. If it is required, the contractor must install fences to demarcate areas. The fences must be installed to prevent damage due to wind or people.	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI
Damage to assets and infrastructure	High	As a result of Project activities any damage to assets or infrastructure must be reported to ICI and rectified at the expense of the Contractors. The Contractor shall provide assistance with reinstatement, in the event of any disruption.	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI
Community grievances	High	The Contractor should ensure that public consultation and disclosure communication is completed at regular intervals to ensure that the public are fully aware of the Project program of activities. Signage should be used in public areas around the project sites advising the complaints procedure and contact details of key Project individuals responsible for responding to issues raised.	Low	All locations	Minimal (part of standard construction practice).	Contractor	ICI
Health and safety	High	First aid training to be provided as required to site workers with basic first aid services to be provided by Contractor e.g., stretcher, transport to hospital. The Contractor shall obtain approval from the Airport Authority of the Cook Islands (AACI) prior to using a two-way radio system or any other	Low	All locations	Minimal (part of standard construction practice).	Contractor/AACI	ICI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
		communicating system on the site, which could cause interference with airport or airline communications. All plant, equipment and materials are to be secured at all times and in a location where materials will not be moved by the wind. Aircraft operations must not be compromised by the plant and equipment storage locations. The AACI will indicate if it is required that all vehicles and plant working on or near to operational aircraft areas shall display flashing orange lights when they are moving to and from work areas. Any lighting operated by Contractor shall comply with AACI requirements. Lights shall not cause confusion, distraction, glare, or be considered a hazard by the AACI.					
Social impact associated with importing temporary labour	High	Contractor shall implement a Workers Code of Conduct covering working hours and conditions, safety, vehicle use, care for the environment, and socially and culturally acceptable behaviour in the villages of the Project area	Low	Project area	Minimal (part of standard construction practice).	Contractor	ICI
Socio-economic impact of temporary airport closure during upgrades	Moderate	The ICI to consult with Project-affected people to determine the need for a temporary compensation plan.	Low	Project-affected enterprise and peoples	To be determined (will depend on the need for restitution)	ICI	AACI
OPERATION STAGE							
Maintenance of seawall, airport and runway after extreme natural events (e.g., tsunami,	Moderate	Structures may become dislodged following an extreme natural event (e.g., tsunami, earthquake, cyclone) which could prevent aircraft from landing on the island. Inspection of structures to be completed and if possible, materials to be replaced on structure following any dislodgement.	Low	Seawall, airport, runway and associated infrastructure.	Minimal (part of standard maintenance practice).	ICI	AACI

POTENTIAL NEGATIVE IMPACT	PRE-MITIGATION IMPACT LEVEL	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	POST-MITIGATION IMPACT LEVEL	IMPLEMENTING LOCATION	ESTIMATED MITIGATION COSTS	EXECUTION AGENCY	SUPERVISING AGENCY
earthquake, cyclone)							

Note: “All locations” refers to all Project related areas which will be impacted by the Project activities, namely the airport/runway area, quarrying site, lay down area, accessways/roads (for delivery of equipment and material), and the road corridor between work locations.

Appendix B – Environmental Monitoring Plan

Table 7 Environmental and Social Monitoring Plan

PARAMETER TO MONITOR	LOCATION	MONITORING	FREQUENCY	RESPONSIBILITY
DETAILED DESIGN/ PRE-CONSTRUCTION PHASE				
Traffic safety	As per Contractor EMP	Ensure TMP completed.	Prior to sign-off of final designs.	Contractor
Aviation safety	As per Contractor EMP	Ensure Health & Safety Plan is complete with details of staged airport operations, flight schedules and emergency procedures.	Prior to sign-off of final design.	Contractor
Soil erosion	As per design documents	Designs to include erosion protection measures (e.g., stormwater outfalls).	Prior to sign-off of final designs.	Design Consultant
Endangered Species Protection	As per Contractor EMP	Ensure consultation with government stakeholders, site inspections (if possible) and baseline study has been completed.	Prior to sign-off of final designs.	Contractor
Importation of materials and equipment	As per importation permits	Ensure inclusion in design and material specifications that material and equipment to be fumigated and free of contamination. Approval to import material and equipment is given prior to material and equipment leaving country of origin.	Contractor to organise prior to export from country of origin.	Contractor
Spill response	As per Contractor EMP	Ensure a spill response plan is included in Contractor EMP.	Prior to Project commencement.	Contractor
Wastewater	As per Contractor EMP	Proposed wastewater management processes to be included in Contractor EMP.	Prior to Project commencement.	Contractor
CONSTRUCTION STAGE				
Waste disposal	All Project sites	Inspection to ensure waste is not accumulating and evidence waste has been stockpiled for removal to landfill, removal from Manihiki Island as hazardous, recycling or returning to supplier.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor

PARAMETER TO MONITOR	LOCATION	MONITORING	FREQUENCY	RESPONSIBILITY
		Inspections to ensure waste streams are sorted for re-use, recycling or waste to landfill.		
Endangered species	All Project sites	Ensure a competent observer (e.g., Ecologist/Biologist) undertake visual surveys of the Project areas. Ensure the survey's records are properly kept.	Every day prior works commencement and at all times during foreshore works.	Contractor
Soil erosion	Stockpile and foreshore areas	Inspections at sites to ensure any bunds are constructed as needed and stockpiles are constructed to prevent erosion and ensure safety. Inspection to ensure restoration work completed.	Weekly inspection as applicable to schedule of works and after site restoration.	Contractor
Water and soil pollution	All Project sites	Inspection of sites to ensure waste collection in defined area; spill response plan in place and workers trained at all Project locations. Complete spill kits (including marine varieties) available where hazardous substances sorted and handled.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Invasive Species	All Project sites	Continuous monitoring of construction areas and the physical removal and/or chemical treatment of alien and invasive species and monthly monitoring for all areas disturbed by construction.	Continuous monitoring in construction areas and monthly monitoring for all areas disturbed by construction.	Contractor
Dust	At stockpile areas and adjacent sensitive receptors	Site inspections. Regular visual inspections to ensure stockpiles not producing dust and that trucks transporting material are not overloaded. Wet down stockpiles if they are dry.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Air pollution	At work sites	Site inspections to ensure equipment and machinery operating without excessive emissions. If an issue is reported the contractor is responsible for replacing or fixing the equipment.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor

PARAMETER TO MONITOR	LOCATION	MONITORING	FREQUENCY	RESPONSIBILITY
Noise	At work sites and sensitive receptors	Site inspections to ensure workers wearing appropriate PPE (hearing protection) when required. Public signage detailing complaints procedure and contact people/person on display. Noisy machinery is replaced or fixed as soon as problem arises.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Storage of fuel, oil, chemicals	At work sites, barge and dredge. Contractor's training log.	Regular site inspections to ensure material is stored within bunded area and spill response training for workers completed. Visual inspection of spill kit for completeness and accessibility.	Weekly as applicable to schedule of works and on receipt of any complaints.	Contractor
Vehicle and pedestrian safety	At and near work sites	Regular inspections to check that TMP is implemented correctly (e.g., speed restrictions) and workers wearing appropriate PPE.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Marine safety	Marine work sites	Regular inspections to check that marine TMP is implemented correctly (e.g., speed restrictions) and workers wearing appropriate PPE.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Construction workers and staff safety (PPE)	At work sites	Inspections to ensure workers have access to and are wearing (when required) appropriate personnel protective equipment (e.g., for handling hazardous materials).	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Community safety	At work sites	Inspections to ensure signs and fences restricting access are in place and pedestrian diversion routes clearly marked.	Weekly inspection as applicable to schedule of works and on receipt of any complaints.	Contractor
Community grievances	At work sites	Monitor public awareness campaigns and community engagement procedures.	Weekly or as applicable to schedule of construction works and on receipt of any complaints.	Contractor
OPERATION STAGE				

PARAMETER TO MONITOR	LOCATION	MONITORING	FREQUENCY	RESPONSIBILITY
Seawall and runway	Foreshore and airport	Visual inspection of seawall and/or runway for damage.	On report of any damage.	ICI

Appendix C – Monitoring Plan Inspection Checklist

EMP – Monitoring Plan General Works Inspection Checklist

Location:	
Auditor:	
Audit Date/Time (Start):	
Audit Date/Time (Finish):	

Environmental Issue:	Inspection areas:	Requirements met?
1.0 Construction Phase		
1.1 Endangered Species Protection	• Competent observer (e.g., Ecologist/Biologist) has undertaken daily visual surveys of the Project areas prior to work start and during the day. • Survey times and observations must be recorded and kept. Positive identification of endangered species must be reported to the NES. • Work is performed during daylight hours to avoid disorienting nesting sea turtles. If work is required after daylight working hours, sea-turtle-friendly lighting is used to reduce the brightness of the emitted light.	Yes □ No □ If No, details:
1.2 Soil Erosion	• Stockpiles covered and bunded. • Appropriate use of erosion-control practices and effective silt containment devices (silt curtains) are in place.	Yes □ No □ If No, details:
1.3 Waste accumulation and Disposal Agreements	• Good housekeeping around the work sites. • Waste stockpiled in defined areas with signage ready for removal. • Waste/recycling permits/agreements in place.	Yes □ No □ If No, details:
1.4 Soil and Water Pollution	• Waste collected in defined area on impermeable ground. • Appropriate spill response plan/kit in place for waste area. • Plant and machinery regularly maintained. No oil leaks. • Toilet facilities provided and do not discharge to environment (approved chemical system. proprietary system or septic tank). • All materials and equipment are clean and free of pollutants before entering the water.	Yes □ No □ If No, details:

Environmental Issue:	Inspection areas:	Requirements met?
	• Daily pre-work equipment inspections for cleanliness and leaks has been conducted. • Stockpile, staging, and material storage areas are kept at least 15 m from any body of water.	
1.5 Invasive Species	• Construction areas checked for alien and/or invasive species and removed if found.	Yes □ No □ If No, details:
1.6 Dust	• Fine material stockpiles covered or kept wet when not in use. • Visual inspection of ambient dust conditions on site and at nearby sensitive locations. • Trucks transporting fine materials are covered.	Yes □ No □ If No, details:
1.7 Noise	• Workers wearing ear protection as required. • Noise assessment to be completed at nearby sensitive receptor locations using a noise meter.	Yes □ No □ If No, details:
1.8 Hazardous Substance Storage (fuel/oil)	• Hazardous substances within bund on impermeable surface. • Spill kit complete and accessible. • Spill training completed. • SDS available.	Yes □ No □ If No, details:
1.9 Personal Protective Equipment (PPE) Use	• Workers have access to, and using appropriate, PPE for the task.	Yes □ No □ If No, details:
1.10 Community / Airport Concessionaires / Local Business Safety	• Public signage of complaints procedure. • Signs and fences restrict or direct pedestrians and public where appropriate.	Yes □ No □ If No, details:
1.11 Traffic Management Plan Implementation	• TMP (island and marine) implemented and evaluated to assess appropriate throughout course of construction phase. • PPE is being worn be workers.	Yes □ No □ If No, details:
1.12 Community Grievances	• Public signage of complaints procedure. • Signs and fences restrict or direct pedestrians and public where appropriate.	Yes □ No □ If No, details:

Actions Required:

Issue No.	Action Required? By Whom?	Date Action Required?

Signoff

Signature: ……

Date: ……

Appendix D – Documentation of Public Consultation

Browne Harvey & Associates P.C.

Barristers, Solicitors & Notary Public
A Professional Corporation

Principals:
Tina Pupuke Browne LLB Notary Public
Karen Jane Harvey LLB

To: Diane Charlie-Puna
Secretary, Infrastructure Cook Islands (**ICI**)

From: Tina Browne and Hinano Ellingham
Browne Harvey & Associates PC

Subject: Manihiki Airport Runway Upgrade – summary of trip to Manihiki 18 February to 20 February 2021

Date: 26 February 2021

Introduction

1. Following our successful trip to Manihiki to engage with customary landowners on the proposed Manihiki Airport Runway Upgrade (the **Project**), we thought it would be useful to summarise the key points of discussion at the various meetings held in Tukao, Manihiki. This memorandum summarises the discussions from the following meetings:

   (i) Meeting with Manihiki Island Council (the **Council**) at (approximately) 12:15 p.m. on Thursday 18 February 2021 held at the Tukao Cyclone Shelter (the **First Meeting**), attended by:

   a. Eight members of the Council;

   b. Deputy Prime Minister and Minister of Infrastructure, the Honourable Robert Tapaitau (**DPM**);

   c. Member of Parliament for Manihiki, the Honourable Henry Puna (**MP Puna**);

   d. Diane Charlie-Puna (ICI Secretary, **Diane**) and Maruia Willie, Project Manager (also from ICI, **Maruia**); and

   e. Tina Browne (**Tina**) and Hinano Ellingham from our office;

   (ii) Meeting with customary landowners and members of the Manihiki public, held immediately after the First Meeting, at approximately 1:15 p.m. on Thursday 18 February 2021 (the **Second Meeting**), also held at the Tukao Cyclone Shelter with all those from the First Meeting also in attendance;

   (iii) A follow up meeting with the Council at the end of the Second Meeting (**Follow up Third Meeting**);

(iv) An informal meeting between the DPM, MP Puna, Diane, Maruia, Tina and Hinano, after the Follow Up Third Meeting on Thursday, followed by a quick meeting on Friday morning ahead of the Final Meeting (**Project Team Meeting**); and

(v) Meeting with customary landowners and members of the Manihiki public, held at 11:40 a.m. on Friday 19 February 2021 at the Tukao School grounds with all those from the First Meeting also in attendance (the **Final Meeting**).

Summary

2. There was unanimous support from those present at the meetings for the work to proceed. The overall feeling from those in Manihiki was that the Airport lands had already been gifted to the Government for the purposes of the Airport, and so the Project should proceed without having to formally identify the owners and re-seek the consent of present-day landowners to the Project. Further, rather than paying the owners compensation at a rate comparable to that paid to owners for the lands acquired for the solar farms at Tukao and Tauhunu in Manihiki, token compensation at a rate of $100,000 up front was offered to and accepted by those members of the Manihiki public who were present at the Final Meeting.

3. ***The First Meeting***

3.1. The first speaker was Diane who noted that:

a) there had been two previous scoping trips;

b) the current runway is 1.7km long by 30m wide;

c) Ministry of Transport regulations require the length to be at least 1.7km long and 90m wide for day operations, in order for bigger planes to land in Manihiki. That would require at least an extra 30m on either side of the width of the runway. It was also noted that night operations would require a width of 150m; and

d) So as not to disrupt or have to cause too many existing buildings to be moved, there is a suggestion to move the end of the runway 200m back away from the main Tukao town centre where there will likely be less houses and buildings affected.

3.2. Trainee Samson (**Trainee**), a member of the Council and also the Chairman of the Committee of Landowners (the **Committee**) that collects the landing fees from the Airport, along with Joe Hiro, the Deputy Mayor for Manihiki and a Council member, noted that

there are three houses on the 'tua' side of the runway that would be affected even by the 200m length move, but they noted the houses were abandoned. It was noted that these three houses belonged to Rua Merota, Pati Johnson and Tau Hiro.[1]

3.3. Tina then spoke and noted that:

a) The land titles needed to be investigated to confirm owners.

b) Landowners should consider incorporating so that there is "one party" dealing with the Government on behalf of the owners of the approximately 46 – 48 lots comprised in the Airport.

3.4. Trainee noted that there are 49 lots now collecting money from Manihiki airport operations. So those now collecting the funds should be the "owners" that go on the Register of Title for each lot.

3.5. It was noted that the 200m shift of the end of the runway would be from Lot 34 and 34A to Lot 30.

3.6. Tina noted there would be a similar meeting of owners residing in Rarotonga once the owners who reside in Manihiki are satisfied.

3.7. In terms of "process", it was noted that there was a need to highlight the benefits that will result from the Project to expand the airport.

3.8. The DPM was the last to speak at the First Meeting. He noted that Manihiki should not "*throw this opportunity away like what happened in 2008*". He also noted that the Project would benefit not just Manihiki, but also Rakahanga and Penrhyn.

3.9. The First Meeting finished at about 1pm.

4. **The Second Meeting**

4.1. Tina led the discussion at the Second Meeting.

a) There is a Committee of landowners.

b) Keeping the Airport as is will affect existing houses and buildings.

---

[1] A scoping trip conducted by Maruia in the afternoon of Friday 19 February 2021, which Hinano also attended, suggested that the house designated as belonging to Pati Johnson was actually occupied.

c) The proposed shift of the end of the runway by about 240m south will lessen the number of buildings affected by the Project.

d) 48 lots were designated in 2008.

e) There is a need to widen the existing runway by about 30m each side.

f) There was not any opposition in 2008 to the airport upgrade itself. The opposition arose in relation to identifying the correct owners of certain lots.

(i) The Court could not confirm owners.

(ii) Owners could not meet to decide to lease the land to Government.

(iii) Court could not confirm a lease between owners and Government.

g) There is a Committee of Management for the Airport that collects and distributes funds to owners. Perhaps they can assist with identifying owners from their records.

4.2. A landowner asked whether the additional 30m each side of the runway had been surveyed.

4.3. Diane answered the question, advising that Nama Benson (a surveyor from Rarotonga) came over in November 2019 (or was it November 2020?) to survey the land for Project purposes but not for land survey purposes. It was also noted that the surveyor would need to return to Manihiki to re-survey the land to show the additional areas required from each affected lot.

4.4. Another member of the public expressed concerns that the expansion of the runway, with the additional regulatory requirements of 90m width, would mean half of Tukao would be lost for use by the people because they would not be able to building the protected areas.

4.5. It was clarified that the Ministry of Transport regulations have certain requirements for bigger aircraft that Manihiki people want to fly to Manihiki. Diane clarified as to why the 30m extension (each side) is on the table, noting that it was not something that ICI just came up with. Diane also noted that the existing runway could be resealed in its current measurements, but that the size of incoming aircraft would not change as a result.

4.6. Another papa from the audience said that he thought some people were already collecting money from within the proposed 30m x 30m proposed extension. It was then clarified

(perhaps by Trainee) that those on the runway and those in the clearance areas collect their money on the same basis.

4.7. The DPM then addressed the audience and asked what it is that they want? He said he can make that decision there and then, and that he was looking to "future proof us".

4.8. Diane noted that:

a) The tender for the design of the Project closes at the end of March 2021, and that whoever wins the tender will be given the design job.

b) The tender for construction would go out in April / May 2021.

c) ICI business plan for funding was due Friday 19 February 2021.

d) A similar meeting will be held in Rarotonga of Manihiki owners residing in Rarotonga, to ensure there is no opposition or differing views from Manihikians residing in Rarotonga.

e) Once the land side / ownership issues are sorted, ICI can commence construction which will likely commence in the next financial year (2021/2022).

5. **The Follow up Third Meeting**

5.1. Following the end of the Second Meeting, there was another meeting with the Island Council (with all those present at the First Meeting in attendance).

a) Tina noted that she thought it would be best to proceed with the work now rather than try to determine the correct owners, because that may take too long and could stall the Project. She also said it would be good to survey the additional area now that would be noted on the old plan from 2008.

b) Tina also noted that she thought that the Court would be concerned more with the thoughts of those living on the island versus those Manihikians that do not live in Manihiki.

c) The Lot 49 lots are all in agreement.

b) Maruia noted the height restrictions in the clearance area are 7m : 1m at the edge of the runway, and that the restriction lessens the further you get from the edge of the runway.

d) Someone from the Council noted that the three houses to be affected within the 240m extension proposed area are OK with the land being acquired for the Airport, subject to compensation.

e) Another person from the Council asked who would pay the landowners' legal costs to investigate the lands? Tina replied that the landowners would give the land to the Crown by warrant, and in exchange the Government would pay the landowners' legal costs to investigate the titles.

6. **The Project Team Meeting**

6.1. At the end of the Follow Up Third Meeting, Tina had a quick discussion with the DPM, MP Puna and Diane (with Maruia and Hinano also in attendance). The options for formal legal acquisition of the additional lands required for the expanded runway were discussed. Tina suggested that the lands be taken by warrant. There was a concern from Puna as to payment of compensation. Tina was of the view that given the mood of the meeting and the statements made by the owners a "token" compensation might be acceptable to the owners. All agreed to acquire the land by warrant, whereby the land would be "gifted" by the people of Manihiki to the Government (rather than the Government taking the land).

6.2. On the morning of Friday 19 February 2021, there was another informal Project Team Meeting where compensation payable to landowners was discussed. Compensation to the Tukao and Tauhunu solar farm landowners was paid at a rate of about $25 per square metre. It was noted that such a level of compensation was appropriate for that project, as the total area of land acquired for the solar project was quite small in comparison to the land required for the Project. If compensation was to be paid to airport landowners at a similar rate, total compensation would exceed $5 million. MP Puna put forward that a nominal compensation of about $100,000 should be paid to airport landowners, which was agreed to by the DPM, Tina and Diane.

7. **The Final Meeting**

7.1. MP Puna led the discussions at the Final Meeting. He noted that, in essence, we are now trying to "correct" the gift (of land from the pa metua) so that it fits with present legal requirements. He also noted the need to gift the land "kia tau ki te vaerua oranga".

a) MP Puna mentioned the solar lands, in that when the warrant expires, the land would go back to owners even though they have already been compensated.

b) He also noted that compensation would likely exceed $20 million if compensation for the Airport land was to follow the solar lands model.

c) Compensation would be payable for the coconut trees that would need to be removed for the Project.

d) The Government would maintain the Airport, at no extra cost to owners.

e) A "tuanga atinga" would be given to owners, in the form of $100,000 up front.

7.2. Tina noted that:

a) Owners would need to be clarified.

b) ICI had acknowledged that legal costs would be borne by ICI for investigating ownership. There are a number of outstanding applications in the Land Court to be confirmed. This will require the land areas (of the approximately 49 lots) to be surveyed and the owners to be confirmed, all at ICI cost.

7.3. Papa Pikitika put forward a motion that the work should push forward. This was supported by Mama Helen Uneke McKenzie. She noted that the work should go ahead, and that the smaller issues, such as ownership, could be sorted out along the way and should not hold up the work.

7.4. Ruhau said that greed had set in when talks commenced about paying landowners compensation. Then difficulties arose because people began arguing about who owns the land and who should be entitled to payment. He thought that owners should follow the "gift" of the forefathers when the Airport land was initially gifted to the Government for airport use and any talk of compensation payments should be disregarded.

7.5. MP Puna clarified that compensation would be paid for coconut trees and houses and buildings that would be affected. In addition, airport landing fees would be payable.

7.6. The DPM stated that the surveyor would return in two to three weeks' time.

7.7. Jean Marie Williams asked if two seats could be kept available on future flights for sick passengers that needed to be brought to Rarotonga. He stated that, apparently when the land was initially gifted for airport purposes, a promise was made by the Government of the day that there would always be a seat available on flights bound for Rarotonga for sick Manihikians trying to get to Rarotonga, but that over the years that "promise" had been forgotten. He asked if it could be considered as part of the Project. No firm commitment or comment was made to this by MP Puna, the DPM, the ICI team or by Tina.

MEETING WITH AIRPORT LANDOWNERS

DATE:	*3rd May 2022*
VENUE:	*Vainga, Te Marae*
TIME:	*2.30pm*

PRESENT:

DPM	*Robert Tapaitau*
MP	*Akaiti Puna*
CIIC Legal	*Henry Herman*
CIIC	*Sally Hosking*
MAMA MAYOR	*Ngamata Napara*
COUNCILLOR	*Trainee Samson*
COUNCILLOR	*Mareta Elipata*
COUNCILLOR	*Carol Tepano*
COUNCILLOR	*Wireless Pupuke*
COUNCILLOR	*John Mcleod*
EX O	*Nimeti Nimeti*
GR	*Toka Makira*
MINUTE WRITER	*Justine William*

LAND OWNERS

Helen McKenzie	*Tuatoru Tuatoru*	*Tupou Tahiri*
Luka Tobia	*John Napara*	*Tani Mussel*
Ruhau Tamaunu	*Ka Kaitara*	*Toumiti Katuke*
Jean Marie Williams	*Umurua Tuhe*	*Rua Samson*
John Matangaro	*Puna Tahiri*	*Jemina Tangi*
Party Johnson	*Kamuta Ioane*	*Here Kaina*
Paninga Tamata	*Mayor John*	*Emma Kaitara*
Arii Makita	*Nikau Mii*	*Tereapii Nikoro*
Vaine Makita	*Tumukau Saitu*	*Kairenga Uea*
Ricaldo William	*Agnes George*	*Junior Napara*
Tangi Napara	*Veru Toka*	*Toka Charlie*
Dora Charlie	*Boaza Kaina*	*Tarau Kaina*
Tepania Tepania		

Opening prayer :	*Reverend Tumukau*
Welcome speech	*Councillor Trainee Samson (Chairman of Aiport Committee)*

Henry Herman
Introduces himself and his ties to Manihiki.
The agenda for today is about providing information and an update for the Manihiki Community and in particular the landowners (atu enua) for the airport.
Its is important to hear from the Govt that the same spirit that you all showed in our last few meetings in 2021 hasn't changed and has shown us that this project will be a benefit for all of us and for the island of Rakahanga
In 2021 we talked about the warranting of the land and you all had agreed to it. But after much discussions about the warrant, we found that it would not be right or best for us in this project, there could still be a lot of issues with for example overseas owners and delays with compensation proceedings. And so, the govt has changed its views on this, and agrees with the change recommended by the lawyers.
In summary - what we discussed and agreed in 2021 about the goodwill payment ($100k), payment of the landing fees will still come to you and the costs for upgrading and sealing airport, operation and maintenance of the airport, will still come under us (Govt).
The only change that we propose is to change from the warrant to an enduring agreement.
We have the draft papers here (drawn up recently for this agreement) and has been provided to Tina who as I understand is currnelty busy with Court.
The only thing that we are asking is if we can leave those papers here so you can all go through it and with your lawyer if you wish.

The govt is ready, the papers are ready. All you have to do is go through the agreement with your lawyer and consider whether you will sign.
We are asking if all the landowners can work with us and if all agreed then we can sign as soon as possible so that the work we have and are planning for can go ahead. After all we have been waiting a very long time to upgrade the airport.
We will leave the papers here as we leave tomorrow, and the Ex O and the Mayor can if you wish, witness the signing by the land owners when after getting advice you are ready.

Mayor
This document, does it relate to the last meeting?

Robert Tapaitau
Greetings to you all.
The lawyer has explained to you all about the project, and about the enduring agreement.
The govt wants to have an agreement with the landowners and the CIIC (Govt).
The warrant that we discussed before meant that we take the land forever.
If we were to do the warrant, then the Compensation could take years and will go through the courts.
The enduring agreement ensures that we will only work on your lands to complete the project.
That's the main difference between this warrant and the agreement.
All the discussions that we had in the past; nothing has changed except for this type of agreement.
Its past March now and nothing has been done. We have been waiting for too long to get this project started.
The lawyers for Govt all looked at this and this for us is the best avenue to follow to allow us to carry on with this project in the right spirit. But this decision is yours – the only change is the form and type of agreement.

Luka Tobia
Greetings to you all.
All of us are talking about our blood rights on all these lands, we are all blood related.
Our lawyers are the ones that guided us from the beginning and we cut all our trees, because they recommended that. You are correct, it's our land and we have rights too.
We are part of all of this, part of the government.
Our Descendants have all ready given their decree for the airport lands to be freely given and we are going to honour that decision.
Give us the agreement papers to sign.

Pikitika Tepaano
We have all given our answer to this already in the past meetings and we will stick to that decision.
I want this to happen because our ancestors already gave that land.
I agree for this agreement to go ahead.

Toka Toka
This evening, I am surprised that you have all come back for this same decision. We have already agreed on this decision from our ancestors for the benefit for all our children and their children.
Our love for our people is why we have all agreed and so why wait any longer when we know what we want. I totally agree that we should all sign this, and this evening.

Ruhau Tamaunu
Kia Orana and greetings
I would like to pass a resolution to pass these papers out right now for us to sign.

Paninga Tamata
Kia Orana to you all
I say that this will be our last meeting, share out the papers right now so we can sign.
Thank you for bringing this back to us, Kia Orana to everyone

Party Johnson

Kia Orana and greetings to you all
In our last meeting that we had with the Prime Minister I had already given my support for our Airport, we have waited for a long time for this project to go ahead.
So just listening to this subject come up again, I am surprised.
I strongly support this agreement to go ahead.

Jean Marie Williams
Kia Orana
I already told you to not come back until you send our money into our account.
Like what was said previously, please share the papers out and let us all sign the papers.
When you all go back to Rarotonga, please send the money into our account.

Pikitika Tepaano
The money is not the main thing here tonight, the main thing is that the work goes ahead.

Trainee Samson
I think that everyone has spoken up about this, Ill hand it back to the Deputy Prime Minister.

Robert Tapaitau
For some of you to say that we should not have another meeting, I just need to explain that there is a need because we are changing from a warrant to an agreement.
I am very humbled and overwhelmed to hear all the support for this agreement to go ahead.

Helen McKenzie
I give my full support for this but I also think that we should vote on this.

Trainee Samson
Mama Uneke wants to have a vote and that the vote is counted.
I am moving the motion in support for this agreement
Moved by Mama Uneke
Second by Toka Toka and all the landowners and all present voted in favour. No objections noted.

Luka Tobia
There are 2 kopu's that I would like to have a quick meeting so that we decide who will sign the papers.

Jean Marie Williams
That's how it always has been done, all reps on those lots are identified and have their reps.

Mama Mayor
Just a word of encouragement to all the landowners, some of them are not here to sign this document.
I think that if you know who is in your Kopu, then why don't you all sign? to have all your names on the agreement so that there is no problems in the future.

Robert Tapaitau
Our lawyer cannot witness the signatures, but the Ex O and the Mayor could do this.
The lawyer works for us (Govt) and cannot and does not work for both sides and you have Tina.

Ruhau Tamaunu
I think that with all of us here today, we can sign on behalf of those landowners who are not here.

Luka Tobia
During the time when the Solar lands were done, some landowners received some money and they were not identified as landowners who signed the papers here. That's why I think that each family should have a meeting and pick their reps to sign the document.
All these families, especially the big ones, should meet and discuss this properly.

Trainee Samson
For those who would like to sign the documents now, they can do so. The other families can have time to have a meeting to pick their reps and get further advice (legal) if they wish.

Mama Mayor
We can print some papers out and leave it here, for those who want to sign them now,
We can do that while we are all here.

Robert Tapaitau
However you want to get this done, that's on you all. If you want to get it done now, that's up to you. We are just here to inform, update and facilitate this meeting

Toka Toka
I like that point. I think that we should use the Mayor and the Ex O while they are still here to get these papers signed.

Mayor
We just have to print out some more copies

Trainee
For those of us in Tukao who want to sign now, please do so and then our boat will return when we are ready.

Closing Prayer: *Reverend Tumukau Saitu*

TRAINEE Samson
CHAIRMAN Ata Henua.
17/8/23.

Asset Information

Most existing assets have no construction records, such as design documents, quality assurance reports, as builts, etc. This information is important to assist with the effective operation and maintenance of the assets including determining if the asset is able to meet expected levels of service. Information is also utilized to cost effectively facilitate modifications and improvements to existing infrastructure.

Moving forward, it is suggested that that contractors sign into long term maintenance contracts (5 years) after the Final Completion of the Construction Contract – a direction which ICI is heading towards.

Land

Land issues are central to all infrastructure sectors and are identified by government as potentially the most costly constraint. Improvements and extensions of roads, airports and harbours will be dependent on government reaching mutually agreeable arrangements with landowners.

All land is customary or native land and the Land Court of the Ministry of Justice are generally the sole adjudicators of any and all acquisition (i.e. establishment of new title or transfer of an existing lease) and resettlement. Custom law and traditional land tenure instruct the formal system on all islands except on Mangaia, Mitiaro and Pukapuka. On these islands, the Land Court has no jurisdiction and all authority lies with the traditional chiefs (also known as Ariki).

The Land Court maintains a register of landowners for all surveyed land. Succession of surveyed and registered land from deceased landowners needs to be registered with the Land Court. The Land Registers are not always up-to-date.

The Crown has the right to 'expropriate' land by warrant either in perpetuity or for a limited period. The use of this process is generally disliked by traditional landowners. The process is however legal though politically also not always palatable.

The accepted process is for negotiation to be undertaken with landowners (the process is made easier if the land is registered and the Registers are up-to-date) or with customary chiefs, leaders and the community in cases where land is not surveyed and registered.

The difficulties, costs and time associated with land acquisition and permission for usage should not be underestimated. Government agencies continue to highlight land issues as a crucial constraint to the development of roads, water, sewage, airports and power transmission. The Ministry of Justice has noted that land disputes outnumber all other categories of cases before the courts. Prior and timely identification of land requirements is a critical element of infrastructure works and well conducted social and economic surveys and broad-based culturally sensitive consultations will likely contribute to successful outcomes.

Stakeholder Analysis

The below outlines the key discussions which have taken place in relation to the proposal.

Prior to 2018, the following stakeholders' discussions were consulted;

GHD with (2013)

During the GHD works significant consultation was undertaken and is detailed further within their report. Key discussions with the Island Council are as below;

- A desire to see the airport sealed and extended to take SAAB aircraft
- Looking to expand Agricultural exports if had greater freight capacity
- Using Manihiki as a hub for other outer Islands in vicinity
- Developing the vacant houses for (healthy) retirees from New Zealand
- Landowners cannot afford to maintain airport- Airport authority needs to supply equipment and maintain

Air transport agencies – Airport Authority and Air Rarotonga

Consultation was held with Air Rarotonga and the Cook Islands Airport Authority who indicated their support for the project and advised their ideal outcomes relating to runway length and type, and operation, and support infrastructure. These have been assessed and incorporated into the design specifications and will be incorporated into the physical works as necessary. The Cook Islands Airport Authority advised that they have had discussion relating to taking over management and operation of the Manihiki Airport but noted that land and ownership issues would need to be resolved and their preference was that the Airport Improvement was completed prior to accepting management responsibility for the Airport.

Political

Discussions with the former current Prime Minister and Deputy Prime minister who all expressed the need to Improvement the Manihiki Airport to support the island communities through improved transportation access and enabling further economic growth relating to tourism, which would also benefit the wider Cook Islands. Potential options relating to funding of this work were also discussed. It is also understood that during late 2016 the Manihiki MP advised publicly that the Manihiki Airport would be sealed.

From 2019 until Dec 2021 when Revision A of this document was submitted to MFEM, the following stakeholders were consulted;

CIIC

Between 2019 to 2020 land ownership issues were discussed with CIIC as Crown land and asset managers, but it was determined at the time that CIIC did not have the capacity to progress land acquisition. As such, ICI undertook the responsibility of land acquisition. The ICI and CIIC have since entered a memorandum of understanding which shares responsibility of land acquisition for the Project.

Landowners

In February 2021, ICI took a delegation over to Manihiki which included the Deputy Prime Minister, former ICI Head of Ministry, ICI Project Manager and Landowner Legal Counsel to consult landowners. Landowner approval was granted for the land to be taken by Crown under warrant. Legal documentation is currently underway. As of May 2022, the airport lands will be taken under enduring agreement as opposed to by warrant.

MFEM & Infrastructure Committee

In March 2021 the ICI budget proposal was presented to the Infrastructure Committee (IC) which included a request of $6.5M for the construction of Manihiki Airport. Support was provided by the IC, indicating that ODA funds may be available from the Infrastructure Trust Fund (ITF). The appropriation was approved for the 2022/23FY.

In July 2021, MFEM approved ICI's request for Carry Forward of its Pa Enua Air Infrastructure Budget 2020/21 into the 2021/22 FY to continue funding the Manihiki Airport improvement Project Land Acquisition and Design.

Tourism Cook Islands

CEO of Tourism Cook Islands (TCI) was contacted in September 2021, who welcomed Government's strategy for airport improvements as it will increase air capacity to Manihiki. In terms of TCI's Destination Development strategy for Manihiki which relates to tourism development, TCI has a positive outlook for Manihiki based on its '7 A's of Tourism' (Access, Accommodation, Activities, Attractions, Amenities, Attitudes, Advertising).

In January 2022, the ITF Committee and MFEM returned to ICI with feedback on the project proposal, expressing concern for the estimated cost of construction as provided by contracted Manihiki & Tongareva Airport Improvement Design consultant, AECOM New Zealand Ltd. The construction of the Manihiki Airport Improvement was estimated at $26,198,000.00, for total construction of the runway and runway furniture, apron, taxiway, road and fencing, and coastal protection, within the 22/23FY. Instructions were given to explore alternative options in order to reduce construction cost. Alternative options that were explored include;

- Changes in design parameters
- Changes in design solutions
- Changes in construction methodology
- Alternative aircrafts

Between **January 2022 and now**, ICI consulted with the following stakeholders about the abovementioned options as well as other aspects of the project;

Cook Islands Airport Authority
Consulted about OLS clearance requirements and regarding existing and future homes within the OLS clearance zones, the conditions and requirements for CAA dispensation requests. Representative, Tony Wearing, provided information on operation and maintenance considerations and also concluded that whilst CIAA are under-resourced, CIAA would assume the responsibility of operating and maintaining the improved Manihiki Airport if instructed to, provided government assists with funding to enable this.

Local Contractors
Discussions with Triad Pacific Ltd about an alternative product (Aggrebind) to chip seal. Further research determined that this product was not suitable for the Manihiki Airport. Discussions with local aggregate suppliers (T&M Heather, Triad Pacific Ltd, The Quarry – Tina Iro, Pa Enua Island Government quarry operations and operators) and local freight service providers (Cook Islands General Transport and Taio Shipping) to understand supply capability and costs. Discussions with overseas consultants about aircrafts (and costs) that may be able to operate on the existing runways. This option was discarded due to not being feasible for Air Rarotonga.

Appendix E – Terms of Reference (TOR) for Manihiki Airport Improvement Project

TERMS OF REFERENCE (TOR) FOR AN ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Infrastructure Cook Islands (ICI) – Manihiki Airport Improvement Project

Tukao

Manihiki Island

Table of Contents:

Part A. Information and Advice on the preparation of the EIA.

1. Introduction

This document forms the Terms of Reference (TOR) for an Environmental Impact Assessment Report (EIA) for the Cook Islands Project. The objective of the TOR is to

identify those matters that should be addressed in the EIA report. The TOR is based on the outline of the proposed proposal given as part of the application and also the National Environment Service's (NES) own assessment of the project site.

In order to clarify the nature and level of investigations that are envisaged in the TOR, the proponent may consult further with relevant stakeholders, ie. Government representatives and authorities, community interest organisations and groups to participate in the process especially during the preparation of the EIA to ensure that all matters as conveyed in the TOR are addressed.

An executive summary should be provided in the EIA and be able to be provided separately for public information.

2. EIA Objectives

The objective of the EIA is to identify potential environmental, social and economic impacts of the proposal and to ensure that adverse impacts are avoided where possible. Consistent with this objective, the EIA should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts. This document should provide:

- *for interested bodies and persons*: a basis for understanding the proposal, alternatives and preferred solutions, the existing environment that would be affected, both on and off the site, the impacts that may occur, and the measures to be taken to mitigate all adverse impacts.

- *for groups or persons with rights or interests in land*: an outline of the effects of the proposed proposal on that land, including access arrangements.

- *for government decision makers*: a framework against which decision-makers are able to consider the environmental aspects of the proposed proposal in view of legislative and policy provisions and provide sufficient information to decide whether the proposal can proceed; OR as appropriate, set conditions for approval to ensure environmentally sound development and, where required by legislation, recommend an environmental management and monitoring program.

- *for the proponent*: a definitive statement of measures or actions to be undertaken to minimise any adverse impacts during and following the implementation of the proposed proposal. A draft Environmental Management Plan (EMP) that describes acceptable impacts and environmental management strategies to agreed performances criteria is the recommended means of achieving this objective.

The proponent is required to address the TOR to the satisfaction of the National Environment Service and the completion of the EIA does not mean that the proposal will necessarily be approved.

The EIA should be a standalone document and it should contain sufficient information and other appended studies/surveys to avoid the need to retrieve previous reports.

3. Stakeholder Consultation

To facilitate the assessment process, the proponent is strongly encouraged to regularly consult with relevant/appropriate stakeholders throughout the EIA process.
It is the responsibility of the proponent, in consultation with appropriate stakeholders, to identify legislation, policies and methodologies relevant to the EIA process, and to determine the appropriate parts of the community to be consulted. Copies of the EIA shall be provided to the community and, on request, to relevant individuals with an interest in the proposal.

4. General EIA Format

The EIA should be written in a format matching the TOR. The EIA must include appendices containing at least the following:

- a copy of this TOR
- a list of persons and agencies consulted during the EIA with their contacts
- the names of, and work undertaken by, all personnel involved in the preparation of the EIA.

Maps, diagrams and other illustrative material should be included in the EIA.
The EIA should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. An electronic copy of the EIA should also be submitted to the National Environment Service for display on the NES website during the consultation period of the project

Part B. Content of the EIA.

(It is strongly recommended that the Environmental Impact Assessment (EIA) Report follow the heading structure of the Terms of Reference (TOR))

EXECUTIVE SUMMARY

The Executive Summary should be written as a standalone, able to be reproduced on request and distributed to interested parties who may not wish to read or purchase the EIA as a whole. The structure of the Executive Summary should generally follow that of the EIA but focus on key issues to enable the reader to obtain a clear understanding of the proposal and its potential adverse and beneficial environmental, social and economic impacts and the management measures to be implemented by the proponent to mitigate all residual impacts.

The Executive Summary must include:

- the title of the proposal;
- name and contact details of the proponent, and a discussion of previous projects undertaken by the proponent and their commitment to effective environmental management;
- a concise statement of the aims and objectives of the proposal;
- the legal framework, decision-making authorities and advisory agencies;
- an outline of the background to and need for the proposal, including the consequences of not proceeding with the proposal;
- an outline of the alternative options considered and reasons for the selection of the proposed development option;
- a brief description of the proposal (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate;
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts.

GLOSSARY OF TERMS

A glossary of technical terms, acronyms and abbreviations should be provided.

1. INTRODUCTION

The function of the introduction is to explain why the EIA has been prepared and what it sets out to achieve. In particular, the introduction should address the level of detail of information required to meet the level of approval being sought (for example, whether the proponent is seeking only a preliminary approval or a full approval from NES).

1.1 Proposal Proponent

Provide details of the proposal proponents, including details of any joint venture, if any.

1.2 Proposal Description

A brief description of the key elements of the proposal should be provided and illustrated. Any major associated infrastructure requirements should also be summarised. A brief description should be provided of studies or surveys that have been undertaken for the purposes of developing the proposal and preparing the EIA. This should include reference to relevant baseline studies or investigations undertaken previously.

1.3 Proposal Objectives and Scope

A statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, including alternatives, envisaged time scale for implementation, anticipated establishment costs and actions already undertaken within the proposal area. Describe the current status of the proposal and outline the relationship of the proposal to other developments or actions that may relate whether or not they

have been approved. The consequences of not proceeding with the proposal should also be discussed.

1.4 Environmental Impact Assessment (EIA) Process

The purpose of this section is to make clear the methodology and objectives of the environmental impact assessment under the relevant legislation.

1.4.1 Methodology of the EIA

This section should provide a description of the EIA process steps, timing and decisions to be made for relevant stages of the proposal. This section should also indicate how the consultation process (which will be described in detail in section 1.5) would integrate with the other components of the impact assessment, including the stages, timing and mechanisms for public input and participation.

The information in this section is required to ensure:

- that relevant legislation is addressed;
- readers are informed of the process to be followed;
- that stakeholders are aware of any opportunities for input and participation.

1.4.2 Objectives of the EIA

While the TOR provides guidance on the scope of the information requested for the proposal, the TOR should not be seen as exhaustive or limiting. It is important for proponents and their consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIA of what the EIA studies may find.

In addition, it is essential that the main text of the EIA should address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft environmental management plan (EMP).

The EIA is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. As such the main text should be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in appendices. The main text should not assume that a reader would have a prior knowledge of the proposal site. It should not be necessary for the reader to have visited the site to understand the issues involved in the proposal.

In brief, the EIA objectives should be to provide public information on the need for and likely effects of the proposal, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIA.

The role of the EIA in providing the proposal's draft EMP should also be discussed, with particular reference to the EMP's role in providing management measures that can be carried over into conditions that would be attached to NES approval.

1.4.3 Submissions

The reader should be informed as to how and when public submissions on the EIA will be addressed and taken into account in the decision-making process.

1.5 Public Consultation

It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact assessment process. Copies of the draft EIA will be provided to all relevant stakeholders and individuals with an interest in the proposal.

Public consultation should commence as early as possible especially in **Tukao, Tahunu, Manihiki Island** and should be comprehensive and promote discussion on all aspects of the proposal including strategic decision making and design. It may include interviews with individuals, public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern and provide information to local community and specific interest groups. Consultation should have a specific focus on impact identification and mitigation of adverse social, economic and environmental issues, and it should directly inform all other relevant components of the EIA (particularly social impact analysis).

Details of the public consultation process and the major issues emerging from that process should be clearly addressed in the EIA. The consultation process should be integrated with the social assessment component of the EIA. Matters which become apparent through the consultation process such as community conflict or concerns which derive from fears about impacts from the proposal on the natural environment should be included in the social impact assessment section of the EIA.

1.5.1 Relevant Legislation and Policy Requirement

This section should explain the legislation and policies controlling the approval process. Reference should be made to the Environment Act 2003 and other relevant Cook Islands laws relevant to the proposal.

This information is required to assess how the legislation applies to the proposal, which agencies have jurisdiction, and whether the proposed impact assessment process is appropriate

1.5.2 Planning Process and Standards

This section should discuss the proposal's consistency with existing land uses or long-term policy framework for the area, if any, and with legislation, standards, codes or guidelines available to monitor and control operations on site.

2. PROPOSAL NEED AND STANDARDS

2.1 Proposal Justification

The justification for the proposal should be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the proposal may provide.

2.2 Alternatives to the Proposal

This section should describe feasible alternatives especially in terms of the sites and designs. For example if the **Manihiki** Community are not in favour of the proposed site, will there be any alternative site for the project OR are there any alternative designs if the community asked for other alternative designs? Such alternatives, if any, should be discussed in sufficient details to enable full understanding of such options.

3. DESCRIPTION OF PROPOSAL/DEVELOPMENT

3.1 Location

This section should describe the local context of the proposal and associated infrastructure and illustrated on maps at suitable scales, including identification and potential impacts on surrounding land uses. Real property descriptions of the proposal site should be provided. This section shall also demonstrate how the proposal relates to the **Tukao** village and also the **Manihiki** Island as a whole.

Maps should show the precise location of the proposal area, and in particular the location and boundaries of land tenures, in place or proposed, to which the proposal area is or will be subject

The following information should be provided for all components of the proposal:

- distances to boundaries of land resumptions;
- slopes and elevations;
- site drainage and erosion controls;
- proposals for rehabilitation, if any;
- access arrangements, daily traffic generated, and internal roads.

3.2 Staging

Details of the likely staging of the proposal and timing of the staging are required, if any. A plan showing the likely sequencing of such development stages for the project should be incorporated and indicate the natural features to be retained

during the stages and management measures to maintain the natural features during these stages.

The staging of the project should be described and illustrated showing approximate site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed during the life of the project should also be provided.

3.3 Emergency Management

In relation to emergency management, provide:

- details of emergency management plans to be put in place during construction, including procedures and notifications;
- emergency access provisions;
- an assessment of the potential disruption to community utility networks (i.e., water, electricity);
- details as to any permanent and/or temporary road closures or vehicle limitations to existing public road access.

3.4 Infrastructure Requirement

This section should provide descriptions, with concept and layout plans, of requirements, if any, for constructing, upgrading or relocating all infrastructures required supporting the proposed development

The matters to be considered include such infrastructure as roads (traffic), pedestrian pathways, and power lines and other cables, telecommunications, water etc.

3.4.1 Transport

Describe:

- existing road infrastructure Airport Infrastructure and all other infrastructure contained within the reserves within of the site boundaries, including private roads and public roads which are disrupted or expected to be used by construction employees especially for the transportation of materials to the site during construction and operational phases for each stage of development;

Information should also be provided on road transportation requirements on public roads for each of the proposed stages, including:

- Connectivity from the proposed development site to the existing main road. It is anticipated that the proposed scale of development will disrupt normal traffic movements at the **Tukao** area;

- The volume, composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, wastes, hazardous materials , if any;
- The volume of traffic generated by workforce personnel, visitors and service vehicles;
- Details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition);
- Any alternate proposal for relocation or realignment of access to the project site which will surely be disrupted by heavy transportation during the construction process;

3.4.2 Storm Water Drainage

A description should be provided especially to the existing storm water drainage system in the area. The EIA should indicate the sources of the drainage water, e.g. wetlands, road and the potential quality and location of discharge to the lagoon.

Surface water runoffs will also collect on site especially at times of construction therefore will there be any new drainage to be done for that?

− Storm water collection/drainage systems.

- A detailed environmental management plan that sets out the framework for management and mitigation of environmental impacts including contingencies for managing system failures and incidents.

- A description of any potential releases of contaminants, the environmental impacts and the actions that will be taken to prevent the likelihood of environmental harm.

3.4.2 Mining of Materials

A description should be provided especially to identify the existing materials present in the area. The EIA should indicate the sources of where the materials will be mined, the amount of materials that will be mined for the project.

- The general location of the area of which the material will be mined (e.g. Maps, Design etc.)
- A detailed environmental management plan that sets out the framework for management and mitigation of environmental impacts including contingencies for managing system failures and incidents.
- Any alternate source sites for mining if the proposed site is not enough to complete the work.
- Indicate what equipment's or machinery will be used to carry out the mining phase.
- A description to be provided as to how the mined site will be restored to its natural state after the project is complete.

3.5 Waste Management

3.5.1 Character and Quantities of Waste Materials

Provide an inventory of wastes, likely to be generated by the proposal and methods of disposal having regard to the best practice waste management strategies. In particular, identify proposals for waste avoidance, reuse, recycling, treatment and disposal in the appropriate sub-section below.

3.5.2 Solid Waste Disposal

In general terms describe the proposed location, site suitability, dimensions and volume of any landfill/disposal site requirements for solid wastes generated by the proposal.

4. ENVIRONMENT VALUES AND MANAGEMENT OF IMPACTS

The functions of this section are to:

- Describe the existing environmental values of the area which may be affected by the proposal;
- Describe the potential adverse and beneficial impacts of the proposal on the identified environmental values. Any likely environmental harm on the environmental values should be described;
- Present environmental protection objectives and the standards and measurable indicators to be achieved;
- Examine viable alternative strategies for managing impacts. These alternatives should be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed. This section should detail the environmental protection measures incorporated in the planning, construction, operations, decommissioning, rehabilitation and associated works for the proposal. Measures should minimise environmental harm and maximise socioeconomic and environmental benefits of the proposal. Preferred measures should be identified and described in more detail than other alternatives.

This section should address all elements of the environment, such as land, water, coast, air, waste, noise, nature conservation (incl biodiversity and any relevant protected areas), cultural heritage, social and community, health and safety, economy, hazards and risk, in a way that is comprehensive and clear. To achieve this, the following issues should be considered for each environmental value relevant to the proposal:

- **Environmental values affected** — describe the existing environmental values of the area to be affected.

- **Impact on environmental values** — describe quantitatively the likely impact of the proposal on the identified;

- **Monitoring programs** — describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals. Auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed. Include scope, methods and frequency of auditing proposed;

- **Management strategies** — describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented eg. continuous improvement framework including details of corrective action options, reporting (including any public reporting), monitoring, staff training, management responsibility pathway, and any environmental management systems and how they are relevant to each element of the environment;

- **Information quality** — information given under each element should also state the sources of the information, how recent the information is, how any background studies were undertaken (e.g. intensity of field work sampling), how the reliability of the information was tested, and what uncertainties (if any) are in the information

4.1 Land

4.1.1 Description of Environment Values

This section describes the existing environment values of the land area that may be affected by the proposal. It should also define and describe the objectives and practical measures for protecting or enhancing land-based environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.1.1.1 Soils

A soil profile for the surrounding **Tukao** area should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential and storm water run-off quality.

Information should also be provided on soil stability and suitability especially the proposed site.

4.1.1.2 Landuse/Characteristics

The EIA should provide a description of past and current land tenures and land uses of the site and surrounding areas, and also maps at suitable scales showing

existing land uses and tenures, as well as the proposal footprint, should be provided for the entire proposal area and surrounding land that could be affected by the development. The maps should identify areas of conservation value and areas in any locality that may be impacted by the proposal.

4.1.1.3 Landscape Character

This section should describe in general terms the existing character of the landscape that will be affected by the proposal.
The landscape character of the property and its surrounds should be described in the context of landscape ecology and incorporate the concepts of patch-corridor matrix in describing the pattern of existing vegetation.

4.1.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing the land-based environmental values identified through the studies outlined in the previous section. It should describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.1.2.1 Land use Suitability

The potential for the proposal to change existing and potential land uses on the site and adjacent areas should be detailed.

The potential environmental harm caused by the proposal on the adjacent areas currently used for nature conservation, agriculture, urban development, transport corridors, recreation, tourism, other business.

4.1.2.2 Land Contamination

The EIA should describe the possible contamination of land from aspects of the proposals including waste, irrigation with treated effluent, reject product/materials and spills at chemical and fuel storage areas.
The EIA should also address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from project activities.

4.2 Water Resources & Quality

4.2.1 Description of Environmental Values

This section describes the existing environment for water resources & quality that may be affected by the proposal in the context of environmental values. i.e. - Surface waterways

- Groundwater - General (temp, salinity, pH, clarity, BOD etc…)
- Turbidity of suspends solids
- Eutrophications (DO, N, P)
- Harmful or Toxic substances

- Sanitation (Coli form, E Coli)

4.2.2 Potential Impacts and Mitigation Measures

This section is to assess potential impacts on water resource environmental values identified in the previous section. It will also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Water management controls should be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface and groundwater should be discussed, along with the proposal for the diversion of affected creeks and the stabilisation of those works. Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction and operation of the proposal.

4.3 Waste

4.3.1 Description of Environmental Values

This section should complement other sections of the EIA by providing technical details of waste treatment and minimisation, with proposed emission, discharge and disposal criteria, while other sections describe how those emissions, discharges and disposals would impact on the relevant environmental values. The purpose of this format is to concentrate the technical information on waste management into one section in order to facilitate its transfer into the EMP. Ensure that waste is stored and disposed of appropriately, with minimum impacts on the environment

4.3.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by wastes, describes how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

This section should assess the potential impact of all wastes to be generated and provide details of each waste in terms of:

- on-site treatment methods proposed for the wastes ;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on the surrounding community due to nuisance;
- proposed discharge/disposal criteria for liquid and solid wastes;

- Plan works to minimise the waste of materials; Reuse old materials suitable for other uses where possible;
- Recycle waste where possible;
- Store waste from ablution facilities appropriately (eg in tanks)
- Store waste in enclosed bins with no exposure to the elements
- Avoid large stockpiles of materials on site
- Avoid overloading bins
- Avoid storing waste on site for long periods of time
- Provide sufficient recycling and waste bins on site
- Use licensed contractors for the disposal of waste
- Dispose of waste on a regular basis or as needed
- Maintain records of disposal times and contractors

4.4 Social

4.4.1 Description of Environmental Values

This section describes the existing social values that may be affected by the proposal and should also include future social benefits resulting from the proposal including increased access and mobility.

The social amenity and use of the proposal area and adjacent areas for recreational, industrial, educational, community and government, centres, residential and other relevant purposes should be described. Consideration should be given to:

- Community infrastructure and services, access and mobility;
- Description of how the environmental impacts (noise, dust, water quality, waste treatment etc) of any onsite accommodation, during construction, will be managed;
- Recreational, cultural, leisure, community and sporting facilities and activities in relation to the affected area.

4.4.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing social values, describes how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The social impact assessment of the proposal should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the proposal's impact, both beneficial and adverse, on the local community. The impacts of the proposal on local residents, community services and recreational activities are to be analysed and discussed.

4.5 Health and Safety

4.5.1 Description of Environmental Values

This section describes the existing community values for public health and safety that may be affected by the proposal. For proposals proposing air emissions, and/or those with the potential to emit odours, nearby and other potentially affected populations should be identified and described. Particular attention should be paid to those sections of the population, such as children and the elderly, who are especially sensitive to environmental health factors.

Consideration must also be given to health and safety aspects of erosion control structures and water storages or other structures that may impact on public health and safety especially for children in and near waterways and drainage infrastructure.

The protection of the health and safety of the public, is to ensure that the hazards and risk to public health and safety is minimised

4.5.2 Potential Impacts and Mitigation Measure

This section defines and describes the objectives and practical measures for protecting or enhancing health and safety community values, describes how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The EIA should assess the effects on the proposal workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from proposal operations and emissions. Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise.

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4.6 Economy

4.6.1 Description of Environmental Values

This section describes the existing economic environment that may be affected by the proposal. The character and basis of the local economy should be described including:

- existing housing market, particularly rental accommodation which may be available for the proposal workforce, transportation etc.
- economic viability (including economic base and economic activity, future economic opportunities)

The economic impact statement should include estimates of the opportunity cost of the proposal.

4.6.2 Potential Impacts and Mitigation Measures

The function of this section is to define and describe the objectives and practical measures for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic management, and how the achievement of the objectives will be monitored, audited and managed.

4.7 Hazards and Risk

4.7.1 Description of Environmental Values

This section describes the potential hazards and risk that may be associated with the proposal. An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the proposal on existing and proposed sensitive areas such as residential areas, water reserves, roads, places of residence and work, and recreational areas. The degree and sensitivity of risk should be detailed
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4.7.2 Potential Impacts and Mitigation Measures

The EIA should define and describe the objectives and practical measures for protecting people and places from hazards and risk, describes how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed. Storms and Sea surge may pose risks and procedures to minimise the impacts on the project.

4.8 Erosion Control

4.8.1 Description of Environmental Values

This section addresses the reduction of potential erosion of sand, soil and waterways by ensuring that works are managed to minimise risk of erosion

4.8.2 Potential Impacts and Mitigation Measures

- Manage storm water appropriately - Establish sediment and erosion controls around stockpiles where appropriate
- Minimise size of stockpiles
- Minimise the creation of hard, impervious surfaces
- Establish diversion drains around disturbed area
- Drain storm water into appropriate infrastructure
- Minimise the risk of erosion caused by machinery and disturbance to soils/land - Control access points to a limited number
- Fence off and restrict access to areas with a high potential for erosion (e.g. waterway outlets)
- Minimise the use of large machinery

Store machinery and construction materials away from sensitive areas

- Minimise the risk of erosion caused by vegetation clearance -Minimise extent of clearance required
- Progressively mulch and re-vegetate areas cleared as part of works
- Prepare re-vegetation plan for larger operations
- Use drift fencing to control sand movement created by vegetation clearance restrict access to areas of high erosion potential
- Beach erosion
- Sediment deposition

5. ENVIRONMENT MANAGEMENT PLAN (EMP)

The EMP should be developed from the mitigation measures detailed above. Its purpose is to set out the proponents' commitments to environmental management. That is, how environmental values will be protected and enhanced.

The EMP is an integral part of the EIA, but should be capable of being read as a stand-alone document without reference to other parts of the EIA. The EMP should not raise any issues or propose mitigation measures not already addressed in the body of the EIA.

The general contents of the EMP should comprise:

- The mechanisms for implementation of the EMP in association with the staging and timing of the development and ongoing management once the development is completed;
- The proponents' commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental harm, performance standards and associated measurable indicators, performance monitoring and reporting;
- Impact prevention or mitigation actions to implement the commitments to the project;
- Corrective actions to rectify any deviation from performance standards;

A complaints mechanism should be established as part of the EMP to address community issues. A complaints register could log details of all complaints received and action taken.

Through the EMP, the EIA's commitments to environmental performance can be used as regulatory controls through conditions to comply with those commitments. Therefore, the EMP is a relevant document for proposal approvals, environmental authorities and permits, and may be referenced by them.

6. REFERENCES

All references consulted should be presented in the EIA in a recognised format

7. RECOMMENDED APPENDICES

A1 Final TOR for this EIA

A copy of the TOR should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIA, the TOR at least should be bound with the main body of the EIA for ease of cross-referencing.

A2 Final Project Design/Drawings

All A3 OR A4 drawings and designs be included

A3 Study Team

The qualifications and experience of the study team and specialist sub consultants and expert reviewers should be provided.

A4 Consultation Report

Outcomes of consultation meetings in the **Manihiki** community should be recorded and included. The Consultation Report should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The discussion should include the methodology used in the community consultation program including criteria for identifying stakeholders and the communication methods used. The consultation process should be integrated with the social impact assessment component of the EIA. Matters which become apparent through the consultation process such as community conflict or fears about impacts of the proposal on the natural environment should also be recorded in the social impact assessment of the EIA.

A5 Specialist Studies

Any reports generated on specialist studies undertaken as part of the EIA are to be included as appendices. These may include:

□ geology □ soil survey and land suitability □ groundwater □ flora and fauna □ coral survey □ noise and air quality □ Hydrographical Survey □ Environmental Action plan to supplement EMP □ Site investigations □ Excavation plans and equipment Biodiversity & ecosystems

A6 Contacts

Contacts of relevant experts/professionals interviewed or has contributions to the EIA.