Environmental Management Plan

Transport Sector Consolidation Project, Additional Financing

Revised Version

Ministry of Infrastructure
Kingdom of Tonga

9 July 2015

Preface

This Environmental Management Plan was updated in July 2015 from the 30 August 2013 version. Updates were made to reflect the proposed TSCP Additional Financing project activities and to meet the requirements of the World Bank safeguards' policies.

The principal changes to the Revised Version consist of:

1. Improved clarity around the need for Contractor environmental management plans; and

2. Improved Grievance Redress Mechanism

Transport Sector Consolidation Project, Ministry of Infrastructure

Environmental Management Plan

REVISION STATUS

As necessary, authorised revisions will be issued to all holders of the document, Revisions shall take the form of replacement or additional pages. Upon receipt, revision pages are to be incorporated in this document and all superseded pages removed.

Version	Edition	Pages Affected	Description	Approved By	Issue Date
0		All	Draft		29 May 2010
1		All	Final	CEO	30 August 2013
2			Draft V2		

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Acronyms

CAD	Civil Aviation Division
DOE	Department of Environment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ENSO	El Nino Southern Oscillation
EUA	‘Eua
GOE	Government Owned Enterprise
GOT	Government of Tonga
HAP	Ha’apai
IA	Implementing Agency (i.e MOI and TAL)
IDA	International Development Assistance
ICR	Implementation Completion Report
IOC	Incremental Operating Costs
ISR	Implementation Status Report
LAD	Land Transport Division
MAD	Maritime Division
MECC	Ministry of Environment and Climate Change
MET	Meteorology
MLCI	Ministry of Labour, Commerce and Industries
MEIDECC	Ministry of Meteorology Energy, Information, Disaster Management, Environment, Communication and Climate Change
MOF	Ministry of Finance
MOI	Ministry of Infrastructure
MOP	Ministry of Police
MOT	Ministry of Transport
MOW	Ministry of Works
NFTO	Niuafo’ou
NFTP	Niuatoputapu
PAT	Port Authority Tonga
PDO	Project Development Objective
RP	Re-structured Project
SDP8	Strategic Development Plan 8
TAL	Tonga Airports Limited
TBU	Tongatapu
TSCP	Transport Sector Consolidation Project
VAV	Vava’u
WB	World Bank

1 Executive Summary

This Environmental Management Plan has been updated and finalized, based on the Draft Version, dated 29 May 2010, and activities proposed under Additional Financing in August 2015.

This Environmental Management Plan (EMP) was developed for the activities planned for funding under the Re-Structured Project (RP) and re-allocation of existing project funds under the Tonga Transport Sector Consolidation Project (TSCP) in 2013. The RP activities involved civil works in aviation, maritime and land transport sectors with a particular focus on a road maintenance program. In the aviation sector, the proposed activities mainly involve construction works on existing infrastructure. In the maritime sector, the proposed activities involve improvements to existing infrastructure. In the land transport sector, the proposed activities focus on the existing minor road network with pavement rehabilitation, drainage clearance and spot and periodic maintenance works aimed at improving and maintaining the existing road network.

Modest and temporary negative environmental impacts may be caused during implementation of the civil works and during operation and maintenance of the resulting infrastructure. The main expected impacts during the implementation period include minor clearing of vegetation, use/opening of earth borrow areas, securing of gravel from existing quarry pits, generation of construction waste, potential pollution from maintenance and operation of construction vehicles and equipment, and generation of noise and dust from operation of construction machinery.

The social and economic impact of the proposed works is overall positive due to improving compliance with core safety and security obligations, creation of employment, and better and faster access to markets, opportunities for jobs and improved social infrastructure. There will be no new land acquisition for any of the proposed RP activities.

Required measures to mitigate the negative impacts for various stages of rehabilitation and operation are described below.

- **For the design phase:**
  Design will be undertaken by suitably qualified design consultants. In the case of aviation activities, the design and supervision of the proposed activities will be self-financed by TAL. For maritime activities, design consultants are likely to be contracted separately by MOT, and where necessary, funded under TSCP. For road maintenance works (land transport sector), responsibility for planning, design and supervision of the works will be held by the design consultants contracted under TSCP. All design will be compliant with the applicable environmental and social legislation of Tonga and consistent with the relevant guidelines and policies of the World Bank.

- **For the construction phase:**
  Contractors will be required to follow the mitigation measures included in this EMP and to prepare Contractor Environmental Management Plans (CEMPs). The CEMP will be prepared by the Contractor and approved by both MoI and the World Bank. The Contractor will also be required to use approved quarries and waste disposal sites which meet general criteria provided by the Design Consultant and are agreed with the relevant authorities and meet World Bank safeguard requirements. Separately, but as part of the Project, MOT will provide road construction and maintenance training to selected local Contractors and Consultants and introduce the EMP with focus on good environmental practices to follow during roads construction and completion of the environmental checklist.

- **For the operation phase:**
  Ongoing maintenance requirements will be incorporated into operational plans of each implementing agency, and will include measures indicated in this EMP, such as provision for storage of hazardous chemicals and contaminant handling, equipping of staff with appropriate safety equipment etc.

2 Introduction

Recognizing the key role that transport plays in the economy and social fabric of such an isolated and dispersed country, the Government of Tonga (GoT) is committed to improving the efficiency of the sector. It began the process of doing so in 2004, with a request to IDA to support a joint review of the country's entire transport sector (responsibility for which was scattered throughout a number of different Ministries), and to recommend strategies and options for improving sector performance. The IDA-supported Tonga Transport Sector Review (TTSR -TF052906) was completed in 2005 and many of its recommendations were adopted as Government policy..

In 2008, the Tonga Transport Sector Consolidation Project (TSCP – TF99585 & H4160) became effective. Originally designed to focus on sector reform, the objectives of TSCP (TF99585 & H4160) were later expanded in 2010 to cover hard infrastructure investments. Since effectiveness, the project has undergone four restructurings:

- November 2010: The project was significantly scaled up through the provision of an additional US$ 10.3 million in grant financing from the Government of Australia, through the Pacific Region Infrastructure Facility (PRIF), with a focus on road maintenance activities as well as priority maritime investments. The closing date of the project was extended from December 31, 2011 until December 31, 2013, to allow sufficient time for the completion of the additional activities added to the project.

- July 2012: The project underwent a Level II restructuring to amend the name of the implementing ministry in the relevant documentation to reflect the recent merger of the Ministry of Works (MOW) and the Ministry of Transport to form the Ministry of Infrastructure (MOI) on July 1, 2012. This restructuring also: (i) amended the PRIF Grant Agreement to include provisions for retroactive financing given the delay described above; (ii) harmonized the disbursement categories to include training and operating costs as eligible expenditure under the project; and, (iii) amended the Financing Agreement so that the project reports would cover a period of one calendar semester and would be furnished to the Bank no later than 45 days after the end of the period covered by such report.

- August 2013: The closing date of the project was extended from December 31, 2013 to December 31, 2015 to allow for the completion of the road maintenance program which had been delayed due to earlier implementation issues and disruptions within the project support team and MOI.

- February 2014: The project's financing agreement was changed to broaden the geographic scope of the project's components to allow for the project to finance urgent reconstruction works in the transport sector following Cyclone Ian which hit the Ha'apai Island Group on January 11, 2014

Under the existing project, the Ministry of Finance and National Planning is the Executing Agency and the MOI is the Implementing Agency. The MOI is responsible for the management of all activities, including procurement, financial management, and reporting. A PST has been recruited, and maintained throughout the implementation period, to support the MOI with the implementation of the project. A Procurement Advisor will continue to support the MOI with World Bank projects. The proposed AF will provide additional financing to provide continued implementation support.

This EMP was updated to ensure continued compliance with World Bank safeguard requirements and to su**pport the management of environmental and social aspects of the proposed** Additional Financing (AF) in an amount of USD 4.0 million to the Kingdom of Tonga for the Transport Sector Consolidation Project (TSCP) (P096931; IDA Grant No. IDA-H4160 and PRIF TF-99585). The proposed AF will be through an IDA credit in an amount of USD 2.0 million and an IDA grant in an amount of USD 2.0 million.

Through the efforts of TSCP, the Government of Tonga (GoT) has successfully created a domestic road maintenance industry, improved maritime and aviation safety, promoted private sector development, and supported the Ministry of Infrastructure (MoI) through a change management process which is setting an example for other ministries on how to proceed with organizational reform.

The proposed AF has been requested by GoT and would help finance: (a) priority maritime investments in infrastructure and maritime safety, which were not completed under the original project because the available funding envelope did not cover all activities recommended by the maritime needs assessment; (b) land transport investments that focus on improving road safety;; and (c) technical advisory services, training and support to continue the project's change management process to assist the MoI in its extensive divestment program to create more efficient and effective operations.

Environmental compliance with the EMP will be monitored primarily through the Works Planning, Design & Supervision consultants, as well as by officials of the Ministry of Meteorology Energy, Information, Disaster Management, Environment, Communication and Climate Change. **(**MEIDECC**).**

3 Project Description

Under the proposed AF, the project's four components would remain:

Component A: Establishment of a sustainable transport sector policy, and institutional and operational framework;
Component B: Provision of high priority strategic investments required to meet with mandatory safety and security standards required under international agreements, treaties and obligations;
Component C: Further investments consistent with the policy/planning frameworks and investment plans developed in Component A for a more sustainable transport sector; and,
Component D: Provision of project implementation support.

Activities under Component A of the TSCP project were completed and no further activities will be financed under this component. Changes will be made to: (i) Component B to accommodate the proposed maritime investments; (ii) Component C to provide further support to the change management process and the transport sectors, and to implement road safety initiatives; and, (iii) Component D to provide sufficient project management support during implementation.

Project Activities: The scope of the activities will be extended to include the following activities:

Component B: Provision of high priority strategic investments required to meet with mandatory safety and security standards required under international agreements, treaties and obligations:

(i) Infrastructure (US$ 1.94 million): Physical investments in maritime infrastructure including: (i) additional aids to navigation for Eua, Tongatapu, Ha'apai, Vava'u and the Niuas; (ii) marine safety, maintenance and environmental protection equipment; and, (iii) improvements to passenger and cargo facilities.

Component C: Further investments consistent with the policy/planning frameworks and investment plans developed in Component A for a more sustainable sector:

(i) Safety (US$ 0.48 million): Investments to improve transport safety including: (i) minor road improvement works to address safety issues; (ii) investments to improve maritime safety; (iii) road safety campaigns; (iv) child restraint program; and, (v) advisory services and support for updating existing safety legislation in the transport sector.

(ii) Capacity Building (US$ 1.67 million): Technical advisory services and training to strengthen the MoI including: (i) advisors for asset management, maritime, roads, and traffic safety; (ii) support for scaling-up change management; (iii) training and capacity building; and (iv) ICT systems, including an asset management system.

Component D: Provision of project implementation support

(i) Project Support (US$ 0.44 million): Funding for the project support team for the MoI for 2.5 years.

3.1 Description of Project Components

The following table lists those activities funded under the RP that may or will have some environmental impact:

Sector	Project Description	Expected Nature of Activity/Impact
Aviation	Transit Screening Point and Terminal expansion (TBU)	Civil works
Aviation	New Rescue Fire Station (TBU)	Civil works
Aviation	CCTV and Access Control (TBU)	Civil Works
Maritime	Ferry Terminal paving, Ramp Reconstruction and Dangerous Goods Isolation – all ports - Resurfacing of existing unsealed surface for passenger facilitation, assembly areas, cargo loading/unloading. - Some ramp reconstruction to widen the existing ramp to facilitate the new inter-island ferry. - Dangerous Goods Isolation area involves a concrete slab foundation, containment and security fencing. (Scope to be determined as a result of the Maritime Needs Assessment)	Civil works
Maritime	Upgrade to coastal watch radio system	Civil works
Land Transport	Road Maintenance programme	Civil works

Table 3.1: RP Activities that may or will have some environmental impact

As indicated in Table 3.1 above, the RP activities are expected to involve issues concerning civil works – construction and road maintenance, with one activity involving provision for safe handling of fire fighting chemicals. Mitigation measures are provided in Attachment 1. The largest environmental impacts are expected to concern the civil works undertaken as part of the three-year road maintenance program. The following sections describe the planned RP activities in more detail.

3.2 Description of Planned Aviation Activities

Planned investments in the aviation sector will improve safety and security compliance of the sector, with national and international legislation and obligations. They involve the following:

- **Rescue Fire Station** – for Fua'amotu International Airport, Tongatapu. The building will provide a 4 bay garaging facility for Fire Rescue Vehicles, with attendant equipment room, staff quarters, watch room and offices/train room. The building would be a simple kit set steel construction on a concrete slab floor with galvanized metal roof. The building will also set the benchmark for further facilities as TAL is committed to the environment and the reuse of rain water and solar heating would form part of the specification. This investment will protect and enhance the lifespan of vital equipment while providing the facilities to maintain CAT 8 ICAO certification requirements and potentially CAT 9, and provide an environment conducive for continued development of Rescue Fire Personnel.

- **Terminal Expansion (Transit Security Screening Point)** – for Fua'amotu International Airport, Tongatapu. TAL is required to provide a transit screening point to facilitate passengers transiting through Tonga before heading to their final destination. They are required to be screened before entering the lounge to mix with already screened departing customers. This activity will involve extension to the existing terminal building inclusive of additional toilet facilities, improvements to existing baggage handling facilities, and making security improvements to the existing passenger viewing area. These issues have been identified in several ICAO audits and TAL currently has a time-bound dispensation whilst this issue is being rectified.

3.3 Description of Planned Maritime Activities

Planned investments in the maritime sector will improve safety and security compliance of the sector, with national and international legislation and obligations. They involve the following:

- **Ferry Terminal Improvements and Navigational Light Installation** – improvements to infrastructure at all ferry terminals are required and will involve, depending on location and requirements, small extensions to existing wharves, re-grading of existing ramps, cargo and dangerous goods isolation areas, improvements to passenger security and facilitation areas, and installation of navigational lights. All works will be undertaken on existing infrastructure.

- **Maritime works for improving passenger and cargo facilities**- specific investments will be confirmed after scoping studies to be completed during the first year of implementation. The maritime sector investments will be located or undertaken at the existing sites of the domestic ferry terminals and ports. If the proposed activities are not covered by the existing EMP, it will be updated to reflect the necessary changes and disclosed again. Should any changes have the potential for more substantial impacts, a limited Environmental and Social Impact Assessment (ESIA) will be prepared.

3.4 Description of the Planned Land Transport Activities

Tonga has a population of approximately 100,000 persons; an estimated total of 20,000 vehicles; and a road network comprising around 1,800km across six islands, of which approximately half is on Tongatapu. The length of minor (feeder or access) roads is estimated at 750km on Tongatapu and 1,350km in total.

The condition of the road network is generally declining due to under-funding of maintenance in the past. In addition, increasing levels of vehicle ownership and introduction of heavy multi-axle vehicles is accelerating damage to the road system. Road program planning, asset management systems and financing arrangements are generally inadequate for current and future needs. Responsibility for road construction, planning and road maintenance currently sits with several agencies, with the Ministry of Lands, Survey, Natural Resource having the legal responsibility for the acquisition of land for road construction. However the functional responsibility currently lies with the Ministry of Works for the

execution of road maintenance, construction and planning, whilst the **Ministry of Infrastructure** is responsible for vehicle and driver licensing, and traffic management devices.

The AF activities will not include traditional road construction or maintenance works. Instead, only road safety infrastructure (such as footpaths, pedestrian crossings) and road safety activities (such as road safety campaigns, a child car seat rental programme and legislation addressing road safety issues) are to be included under the AF. The locations for the road safety infrastructure have yet to be determined but it is anticipated that the activities will take place in locations of existing infrastructure or within the existing right of way.

4 Biophysical Baseline Data

The Kingdom of Tonga is a small island developing country located in the Central South Pacific between 15° and 23° 30' South and 173° and 177° West. It is an archipelago of 172 named islands (total land area of 747km^2), 36 of which are inhabited (land area of 670km^2). Tonga's total population is estimated at 116,921 (July 2007).

Tonga consists of four main island groups extended over a north-south axis: Tongatapu and 'Eua southernmost, Ha'apai, Vava'u and the Niuas (Niuafo'ou and Niuatoputapu).

Nuku'alofa, the capital, is situated in Tongatapu, the largest island.

The Kingdom's islands are comprised of both volcanic and uplifted coral islands and reefs. Tongatapu and 'Eua are limestone capped islands. Ha'apai has high volcanic and low limestone islands. The south of the Vava'u group is generally composed of high volcanic and elevated limestone islands with reef communities or fringing reefs. The Niuas are high volcanic islands surrounded by fringing and barrier reefs.

Population density is high, with the main concentration on Tongatapu (approximately 69% of total population). Vava'u is the next largest population centre with16% of the total population, followed by Ha'apai (8%), 'Eua (5%) and the Niuas (2%).

Figure 1. Map of the Kingdom of Tonga

Climate

Tonga's climate is tropical with an average temperature range from 25°C to 26°C in the Hot Wet season (November – April) and 21°C to 24°C in the Cool Dry Season (May – October). Tonga is also vulnerable to tropical cyclones which occur during the hot wet season.

Rainfall

The wettest months are January, February and March with an average of 250mm per month, and humidity levels up to 75%. Average rainfall in the dry season is less than 250mm per month with humidity levels of 67%. Mean annual rainfall in the major island groups is shown below:

Mean Annual Rainfall (mm)	
Tongatapu	1753mm
Ha'apai	1689mm
Vava'u	2185mm

Table 4.1. Mean Annual Rainfall in major island groups (1947-2001)

Rainfall is highly variable from year to year and abnormally low or high rainfall persisting for more than three months is extremely rare. Two significant causes of rainfall variation in Tonga are ENSO (El Nino Southern Oscillation) which causes prolonged drought, or Tropical Cyclones which result in unusually wet years.

Forestry
There are few remaining natural forests in Tonga and those remaining are primarily restricted to steep, remote, inaccessible areas, uninhabited island, coastal areas, swamps and mangroves. There is one national park located on 'Eua.

Coastal Resources
Coastal resources are important to Tonga's economy and livelihoods. All sea resources and coastal areas 50 feet above the high tide watermark are Crown property and the rights to all resources (sand, dead coral, marine life) are vested in the Crown. Coastal areas include various ecosystems such as mangroves, coral reefs, sea grasses, beaches and diverse species that inhabit the coastal habitats.

Fisheries
Reefs and lagoons are the primary fishery for subsistence supplies. A wide range of shellfish and other marine life are also harvested from tidal flats at low tide for consumption. Commercial fishing is also an important part of the economy and is divided into three categories; offshore, bottom fish and inshore resources. Each category varies in magnitude and is subject to different levels of exploitation. Management of this resource is administered through the Ministry of Fisheries.

Natural Resources
Tonga has limited natural resources and depends almost entirely on imported petroleum products for energy production. Solar photovoltaic technology is used to provide electricity for remote rural communities, primarily on outer islands that do not have a grid power supplier. Solar thermal application for domestic water heating is also well developed on Tongatapu and has expanded in the residential sector and within the tourism industry.

Soil and land use
The road maintenance program involves rehabilitation and maintenance of existing roads and will not involve road extension or new road construction. Hence, no land acquisition is anticipated for the road program. Some of the excess waste soil and construction materials will be reutilized either in the project or for local fill. The rest would be transported to approved dump sites. In the case of Tongatapu, the approved dump site is at Tapuhia, Veitongo. Before commencement of civil works, the Contractor will obtain all relevant permissions/agreements from the relevant authorities and appropriate departments of the Ministry of Environment and Climate Change for use of dump sites and fill areas.

5 Environmental and Social Impacts

Civil works expected under the RP activities will involve renovation or maintenance of existing infrastructure, and in some cases construction of new or extended facilities on existing land e.g. in the case of TAL for Fua'amotu International Airport, as indicated in Table 3.1.

The bulk of the activities is focused on the rehabilitation and maintenance of the existing rural roads. The Project therefore does not involve acquisition of new land and is unlikely to cause any major negative environmental or social impacts.

Possible negative impacts related to road rehabilitation and maintenance and other civil works are expected to be confined to the construction site and will be of short-duration. With timely and proper implementation of this EMP and application of appropriate mitigation measures, most if not all the potential negative impacts can be prevented or minimized. Based on the assessment, these impacts are expected to be limited to:

- **Generation of excess excavated materials and construction waste**. Scarification, replacement of unsuitable road material, clean up of drains, fixing of culverts, etc. would lead to the generation of excess soil and debris waste.
- **Soil erosion**. Although no major clearing of roadside vegetation is envisaged, some soil erosion may occur as a result of the removal of shrubs and earth cover during roads resurfacing, the restoration of verge and side drains. The impacts on vegetative cover will be short-term and reversible through natural regeneration.
- **Pollution by construction run-off**. Negative impacts of soil and water pollution with fuel and lubricants are expected to be temporary and minor.
- **Noise and vibration disturbances during construction and temporary dust generation** related to the transportation of construction materials and truck traffic. These impacts will occur during the construction and rehabilitation works, but will be short-term and affect different people at different times. Impacts include dust from construction activities, noise during road resurfacing and maintenance and airport civil works, possible effect of vibration caused by operation of heavy machinery, increased traffic in some sections of roads, etc.
- **Air pollution from improper maintenance of equipment**. Dust and the bitumen smoke arising from application of chip-seal and road maintenance work may have minor negative impact on the ambient air quality in the vicinity of the works and should be kept low, especially closer to populated areas. However, the roads are in rural areas with lower population density and no major impact is expected as proper construction/equipment functioning practices will be applied.
- **Traffic disruption during construction activities**. These impacts will occur during the roads resurfacing and maintenance works, but will be short-term and related to the transport of different raw/construction materials to work sites.
- **Safety hazards from construction activities and during operation**. No major hazards are expected during the construction of the proposed Project activities, as long as proper construction practices and safety procedures are applied.

The social outcomes of the Project are expected to be positive through the improvement of safety and security compliance in the aviation and maritime sectors, as well as improvements to accessibility in the maritime and land transport sectors. No land acquisition is required for carrying out the planned RP activities and no resettlement will be necessary.

Overall, the proposed RP activities will improve the accessibility of social and economic services, and improve safety and security compliance with national and international obligations.

5.1 Information Disclosure and Public Consultation

As per the Bank's policy and the requirements of the GOT, the EMP will be disclosed in the communities included in any project activities prior to commencement of civil works.

The Communities will be provided with a one page summary giving the information on the Project, the proposed activities, the construction impacts and the proposed mitigation measures and the tentative schedule of construction. This full EMP as well as relevant CEMPs will be made available for review in the local village offices and the community / local government offices.

Consultations will be carried out over a period of at least one week in all project communities.

During initial consultation, there was adequate representation in each project communities. Most of the questions concerned about the clarification regarding the selection of the road segments, the duration of the construction, arrangements for alternative access, dust, noise, safety, land acquisition, etc. There was good support for the project with emphasis on local jobs, adequate compensation in case of land acquisition (there is no land acquisition in this Project) and access to personal properties and construction safety. MOT explained how each of these issues will be dealt with and how they were addressed in the EMP and how they will be reflected in the design.

The maritime activities under the Additional Financing minor in nature and will have minimal impacts. Notwithstanding this, once the project sites and activities are identified, additional community consultation will be carried out to inform the preparation of the CEMPs.

6 Mitigation Measures

6.1 Mitigation measures applicable to all civil works implemented under the Additional Finance facility

Mitigation measures for the design, construction and operation stages of all civil works are detailed in Attachment 1, Table A.1.1. Compliance shall be monitored by the consultant supervising the construction, or in some cases, by the Implementing Agency (IA).

6.2 Mitigation measures applicable to Activities planned in the Maritime Sectors

Mitigation measures for the Maritime sectors are detailed in Attachment 1, Tables A.1.2 and A.1.3 respectively.

Implementation of the non-construction mitigation measures will be undertaken as part of the engineering design/civil works contracts, or as part of the preparation of the procurement specification for equipment. Responsibility for this will lie with the implementing agencies such as MOT.

6.3 Costs of implementing mitigation measures

The cost of implementing the proposed individual mitigation measures is small. In most part, the cost of adherence to the good environmental practice and compliance with this EMP are expected to be integrated into the pricing of various construction activities.

7 Environmental Management

7.1 Requirements for this Project to comply with Government of Tonga and World Bank Safeguards Policies

A technical review of these investment activities in terms of their location, handling, and transportation associated with their use, their construction/civil works needs, and operations and maintenance requirements has concluded the following;

1. There will be no land acquisition required under this project. Maritime activities will be undertaken at the existing sites of the domestic Ferry Terminals in Nuku'alofa, Vava'u, Ha'apai, and the other islands. Similarly, with regards to Aviation, all activities will be located at or undertaken at the existing site of Fua'amotu International Airport on Tongatapu, and other international and domestic airports on the other islands in Tonga. With regards to Land Transport (Roads), all activities are focused on road safety activities do not involve any widening, or lengthening or new road construction. Accordingly, there will be no adverse social impact in terms of land use.

2. Any adverse environmental impact, where it occurs at any stage, will be small, local, and generally confined to the immediate vicinity where it may occur. These impacts can either be readily avoided or mitigated through fairly basic and widely available mitigation measures.

Pursuant to the requirements for category "B" projects in OP4.01, the Government of Tonga (GOT) has prepared this Environmental Management Plan (EMP), which will be integrated into the technical design and contracts for all civil works, and where necessary will also be adopted by the **Ministry of Infrastructure** and Tonga Airports Ltd involving measures to be adopted during operation and maintenance of any of these activities.

Contractor EMPs will be prepared by contractors. These CEMPs will detail construction methodologies, likely social and environmental impacts associated with the activities and necessary impact mitigation processes. The CEMPs will also provide more detail on the Grievance Redress Mechanism (GRM) for each project area/activity to ensure that affected people or entities have the ability to communicate grievances or other project feedback.

OP4.01 and the World Bank's Policy on Disclosure of Information, requires that this EMP be disclosed both locally in Tonga and at the World Bank Infoshop.

This EMP will require approval by the GOT through the Ministry of Environment and Climate Change (MECC), and a review and acceptance by the World Bank. The EMP was submitted to MECC on July 2015 for GOT approval and will be submitted for review by the World Bank pending GOT approval.

7.2 Environmental Regulatory Framework

Tonga has a well established regulatory framework that provides measures to protect and preserve the environment from abuse, pollution and degradation, to manage the environment for sustainable development and to promote environmental awareness.

Legislation concerning the protection and preservation of the environment is found in a number of Acts and is the responsibility of a number of different Ministries according to their focus. Amongst these, are the following key legislations:

- Environmental Impact Assessment Act 2003 **and Environmental Impact Assessment Regulations 2010**
- **Environmental Management Act 2010**
- Marine Pollution Prevention Act 2002

- Parks and Reserves Act 1988
- Fisheries Management Act 2002
- Aquaculture Management Act 2003
- Birds and Fish Preservation Act 1988
- Public Health Act 1992

Copies of these Acts and subsidiary legislation are available online at http://legislation.to

The Ministry of Lands, Environment and Climate Change and Natural Resources (MEIDECC) is the principal agency responsible for the management of the environment, and in administering the environmentally related legislation in Tonga. It provides environmental assessments, reports and recommendations to the responsible Ministry, as well as being mandated under the Environmental Impact Assessment Act 2003 **and the EIA Regulations 2010** to require environmental impact assessments and impose conditions for development projects within Tonga.

Accordingly, activities funded under the TSCP will follow the GOT's established procedures and associated guidelines established under the Environmental Assessment Act 2003, and environmental legislation of the relevant ministry.

The Environmental Impact Assessment Act 2003

The Environmental Impact Assessment Act 2003 is specifically concerned with ensuring development projects are managed, conducted and carried out sustainably and appropriately.

It requires that all major development projects submit an appropriate environmental impact assessment report that will include a review of all relevant impact as determined by the MEIDECC from time to time. The definition of major development projects is provided in Schedule 1 of this Act, and covers a broad range of major development activities such as tourism facilities, abattoirs, marinas, or mining activity. Schedule 1 is attached herewith as Attachment 6.

The MEIDECC is also empowered with imposing appropriate mitigation measures on proposed development projects, in accordance with the outcomes of the environmental impact assessment reports.

No activities funded under the TSCP fall under these categories, although they are required to abide by the legislation of the relevant ministry.

At this stage, the Regulations under this Act providing fuller procedural, compliance and penalty requirements have not yet been approved. As such, the EIA requires only major development projects as defined in Schedule 1 of the Act, to undergo an environmental impact assessment.

In practice, the MEIDECC currently adopts the Regulations as guidelines. It works closely with GOT ministries in assessing development projects and has a process in place for categorising development projects as minor or major according to the likely impact. It also requires the implementing agency to identify any potential environmental risks or impacts, and to propose appropriate mitigation measures. Approval from the MEIDECC is required under these guidelines in order that projects may proceed.

The MEIDECC makes its recommendation for approval, deferral, mitigation, or cancellation of projects in relation to the powers of existing legislation (ie. through the clauses under for example, the Fisheries Management Act 2002, rather than directly through its own DOE legislation).

Non-Compliance with Relevant Legislation

Provisions for non-compliance with legislation are provided for in all environment-related legislation.

Penalties include measures ranging from fines, to imprisonment or both, and are applicable to both individuals and companies.

7.3 Provisions of National Land Laws

Tonga has a complex land system, which is administered through the Land Act 1988 and its subsidiary legislation.

Land Act 1988

The Land Act 1988 is the key piece of legislation governing land in Tonga. It is a comprehensive Act and provides for, amongst other things, the provision of land to estate holders (nobles), rights of Tongans to be allotted land, ownership, inheritance, lease and resumption of land to the Crown.

Land issues are sensitive and are governed by comprehensive legislative processes. Land in Tonga may not be sold, but may be leased or sub-leased. All leases up to 99 years require the consent of Cabinet; longer leases require Privy Council approval. Leases are common in Tonga and may be made between the landholder and individuals, organisations or companies.

Where land is required for public purposes, the MLSNRE, now the Ministry of Meteorology Energy, Information, Disaster Management, Environment, Communication and Climate Change may reserve Crown Land for this purpose. In cases where the required land is not Crown Land, and a lease or other agreement cannot be arranged, the King, with the consent of Privy Council may resume land compulsorily.

Resumption of land, as detailed in the legislation, requires appropriate compensation to the landholder. Whilst it is not often used in Tonga, it is an important clause that provides an avenue for the Crown to reoccupy land when and where it may be needed. There has been some precedent for this in the resumption of land in the Vaini district from the Noble for the construction of Hu'atolitoli Prison.

No activities under the TSCP AF will require the use of any land laws as all activities occur or are undertaken on facilities where appropriate contracts regarding land usage or tenure are in place.

However, the technical assistance studies to be undertaken under Components 1 and 3 will need to consider appropriate arrangements for land management regarding the identification and use of land for roads and associated traffic management.

7.4 Risk Management

TSCP has developed a risk-based management process to be adopted for all activities during design, construction and operation phases that will also apply for TSCP AF activities.

Risk management process and mitigation measures are outlined in this section shall be used to identify project-specific environmental and safety risks and mitigation measures. Notwithstanding the minimum mitigation measures for the Land Transport sector are detailed in section 6.3 and in Attachment 1. In the event that the risk management process identifies deficiencies in the EMP, then the EMP will be revised accordingly.

The risk management has been based on a conventional model, with likelihood and consequences of hazards graduated into levels of risk, as shown in the table below.

		Likelihood				
		Rare	Unlikely	Possible	Likely	Almost Certain
Consequence	Severe	Med	High	High	Extreme	Extreme
	Major	Med	Med	High	High	Extreme
	Moderate	Low	Med	Med	High	High
	Minor	Low	Low	Med	Med	Med
	Negligible	Low	Low	Low	Low	Med

Likelihood of hazards or events occurring has been scaled as follows:

RATING	LIKELIHOOD	PROBABILITY
Almost Certain	The event is expected to occur	>90%
Likely	The event will probably occur	50% to 90%
Possible	The event might occur	10% to 50%
Unlikely	The event probably won't occur	2% to 10%
Rare	The event is very unlikely to occur.	<2%

Consequences of these hazards have been rated on the following criteria and agreed with MEIDECC:

Rating	Project Objectives	Financial	Safety	Environment	Compliance	Reputation
Severe	Failure to meet all three objectives with termination of project	Cost over-run by 25% or financial loss greater than TOP1M.	Fatality or permanent significant disability, long term impairment or illness significantly affecting the quality of life for an employee, contractor or member of the public.	Permanent impacts to populations of significant flora or fauna (e.g. threatened), highly significant heritage items, complete removal of habitat or significant impairment of ecosystem function.	Claim or action could be brought in the Courts; and	Court, regulator or Government/ Cabinet inquiry concludes improper, corrupt or grossly negligent conduct.

Rating	Project Objectives	Financial	Safety	Environment	Compliance	Reputation
					Regulators could bring prosecution and penalties (and potential imprisonment for individuals); and	Other action by MOI results in termination of Minister or CEO.
Major	Project substantially failes to meet one objective of the project	Cost over-run between 15-25% or financial loss between TOP500 and TOP1M.	Long term or permanent disability, impairment or illness not significantly affecting the quality of life for an employee, contractor or member of the public.	Medium-long term (>10 years) physical impacts likely to cause impacts to flora/fauna populations, or direct impacts to flora / fauna populations. Adverse impacts to significant heritage items.	Claim or action could be brought in the Courts; and	Action by MOI results in one or more Executives or senior managers being terminated.
	Project requires restructuring to meet revised project objectives				Regulator could bring prosecution for which the penalty (and potential imprisonment for individuals).	Government or Cabinet inquiry into our actions or operations.
						Prolonged and negative national media attention.
Moderate	Project does not meet the target(s) of at least one indicator for the project objectives	Cost over-run between 5% - 15% or financial loss between TOP100,000 - TOP500,000.	Hospitalisation with medical intervention of an employee, contractor or member of the public.	Medium term (3-10 years) impacts on populations of native flora / fauna including loss of individuals of threatened species, Significant impacts on physical environment.	Claim or action could be brought in the Courts; and	Short term negative national media attention.

Rating	Project Objectives	Financial	Safety	Environment	Compliance	Reputation
	Project requires time extension to meet project objectives				Regulator could bring prosecution for which a penalty or fine for an individual.	Regulator conducts formal inquiry.
						Prolonged and negative media attention.
Minor	Project fails to meet intermediate results, but could with intervention, meet the project objectives	Cost over-run less than 5% or financial loss between TOP10,000 and TOP100,000.	Injury or illness requiring medical treatment of an employee, contractor or member of the public.	Short term (1-3 years) direct impacts on physical environment (water, soil, air) that may impact on flora or fauna. Loss of individuals of common native flora or fauna. May extend outside of work area.	Claim or action could be brought in the Court; and	Formal complaint made to a Regulator.
					Regulator could issue an enforcement or penalty notice.	Short term negative media attention.
Negligible	Intervention required to meet targets and results to achieve project objectives	Financial loss less than TOP10,000K.	Nil to first aid injury, low level short term inconvenience or symptoms for an employee, contractor or member of the public.	Low-level direct impacts on physical environment (water, soil, air) within work area.	Offence is merely reportable; and/or	Negative comment about MOI at Cabinet level.
				Impacts easily remedied.	Regulator could issue a warning notice.	Formal complaint made to MOI.

Rating	Project Objectives	Financial	Safety	Environment	Compliance	Reputation
				No identifiable impact on flora or fauna.		

Levels of controls have been also agreed with MEIDECC as stated below:

Level	Adequacy of Control
Unreliable	Unpredictable environment where **controls** are **not** designed or **in place**
Informal	**Controls** are designed and **in place** but are not adequately documented Controls mostly dependent on people No formal training or communication of controls
Standardised	Controls are designed and in place **Controls** have been **documented** and communicated to employees Deviations from controls may not be detected
Monitored	Standardised **controls** with periodic **testing** for effective design and operation with reporting to management Automation and tools may be used in a limited way to support controls
Optimised	An integrated internal control framework with real-time monitoring by management with **continuous improvement** Automation and tools are used to support controls and allow the organisation to make rapid changes to the controls if needed

Based on the aforementioned criteria and ratings, the risk assessment will be developed and updated at least monthly and as required prior to, during and after execution of works.

Mitigation measures will be monitored and updated in accordance with this section and sections 7.5, 7.6 and 7.7.

7.5 Monitoring Arrangements

The purpose of environmental monitoring is to ensure that the designed mitigation measures are implemented on the ground and then to determine whether they are effective over time. Monitoring will also ensure that changes are introduced if and when they are needed.

Institutional responsibility for implementation and monitoring of the proposed mitigation measures will be shared amongst the following agencies:

i. **Project Support Team** – will be responsible for ensuring that the Environmental Management Plan is appropriately incorporated into the relevant bidding documents, technical specifications and contracts as appropriate.
ii. **Implementing Agencies** – MOT will be responsible for ensuring that the EMP is referenced appropriately within relevant bidding documents, technical specifications and contracts. They will also be primarily responsible for ensuring that any post-construction or delivery mitigation measures are incorporated as appropriate, into their operational plans.
iii. **Executing Agencies** – will be primarily responsible for implementing the mitigation measures required under the EMP and the relevant bidding documents and/or contract. In the case of road maintenance works, responsibility for monitoring construction management issues will lie primarily with the consultant supervising the civil works contractors. This would be the same

consultant that would be supervising the other technical aspects the civil works contractors are required to achieve.

iv. **Monitoring Agency – will be responsible for the monitoring, auditing and compliance assessment of all aspect in accordance with this EMP. The level of monitoring, auditing and compliance assessments will be developed on a case-by-case basis, dependent upon the nature, complexity, duration and potential impacts of the works. At a minimum, the MEIDECC will undertake four audits during a 12 month period with the results provided to MOI.**

Additionally, the World Bank as part of its supervision process will review compliance of this EMP during the project implementation phase and report its findings in its Implementation Status Report (ISR) and Implementation Completion Reports (ICR).

7.6 Reporting Requirements – Mobilization

The Contractor shall be required to present the following reports as a part of the Workplan for approval by the Technical Supervisor prior to commencing any civil works.

- **Site Management Plan:** How the sites will be managed during the civil works (traffic/port management as appropriate).
- **Materials Management Plan:** The location of quarries, borrow and fill areas (temporary and permanent), including copies of all permits, how materials will be handled during construction.

7.7 EMP Compliance Supervision During Construction

The Technical Supervisor shall monitor compliance with the EMP and subsequent CEMPs during the construction and the defect liability period. The Contractor shall cooperate with the Technical Supervisor by facilitating supervisor's access to any work sites and any information pertaining conduct of works which supervisor may reasonably request.

The Technical Supervisor shall be responsible for accurate reporting to the Implementing Agency and the Transport Project Support Team on the status of EMP implementation and on any issues pertaining contractor's adherence to it. To implement regular monitoring of EMP implementation supervisor will use the sample Environmental Supervision Checklist provided in the Attachment 5.

In the event that a violation of the EMP is observed during construction by the Technical Supervisor, the following shall apply:

- For minor infringements, (an incident which causes temporary but reversible damage), the Contractor will be given Notice by the Technical Supervisor to remedy the problem in the first 48 hours following the receipt of Notice and to restore the environment. If restoration is done satisfactorily during this period, no further actions will be taken.
- If in the judgment of the Technical Supervisor no satisfactory action by the Contractor has been started, or no satisfactory action to remedy the problem during the 48 hour period is ongoing, (the Technical Supervisor has the right to extend the period for another 24 hours, provided that remediation was started timely by the Contractor), the Technical Supervisor shall notify the Client in order to arrange for another Contractor to do the restoration, and deduct the cost from the main Contractor's next payment.
- **For major infringements, which are a reportable event in accordance with Environmental Management Act, 2010, the Technical Supervisor shall notify the MEIDECC to undertake a site investigation. The Contractor will comply with the requirements of the Notice to rectify the impact, with all costs borne by the Contractor.**

- In addition, in the event that an infringement causes long-term, irreversible damage or contravenes any applicable legislation, the Contractor is liable for additional penalties as may be decided by the competent authorities.

8 Application of Environmentally Sound Construction Practice

In addition to the project-specific recommendations and measures for mitigating negative environmental impacts of construction works provided in this EMP, Attachment 3 provides general guidelines on the environmentally sound practices applicable to roads construction. Adherence to these guidelines and compliance with the mitigation plan will ensure keeping environmental impacts of the Project to an acceptable minimum level.

9 Grievance Redress Mechanism

Thorough screening and consultation will greatly reduce the risk of grievances being experienced during project implementation. Notwithstanding this, grievances could arise in relation to disputes about ownership or loss of land, assets or elements of livelihood, construction impacts or accidents. Irrespective of cause, the grievance mechanism will address affected people's concerns and complaints promptly, using a transparent process that is responsive, culturally appropriate, and readily accessible to all segments of the affected communities at no cost and without retribution.

Information about how to register a complaint will be given in all public communications and consultations about the project.

The grievance mechanism for the project will comprise a three-stage process which will be modified and strengthened based on the local grievance management systems in each project site. Although this is identified as Stage 3 in the GRM, nothing in the project GRM restricts the aggrieved person referring a case to legal proceedings in accordance with in-country laws and procedures at any time. They may also notify the World Bank which will work with MoI to resolve any grievance.

The GRM will include a system for facilitating anonymous grievances via SMS and/or email which will be automatically recorded via an online database. A system for recording, monitoring and reporting grievances will also be designed so that grievance resolution and management can be carefully managed by MoI.

The overall structure of the GRM will be as follows:

1. An initial stage within the local village or Municipality, in which any person aggrieved by any aspect of the land acquisition or other project process can lodge an oral or written grievance with the MOI, directly or through a village leader. Complainants will be heard on neutral territory in a culturally congenial manner, and will be encouraged to bring a relative or friend as a supporter if they wish. If the complaint cannot be resolved within 30 days of receipt, it advances to the second step of the process.

2. Stage 2: if the aggrieved person is not satisfied with the outcome of initial stage consideration, or if local level review is unable to reach a proposed solution, the aggrieved person can refer the issue to the MoI who will establish a committee to hear the grievance. The grievance committee, which will be chaired by the CEO of MoI and include representatives not directly affiliated with MoI or the in-country member, reviews issues raised in the initial complaint and any actions for resolution suggested at the lower level and makes recommendations for resolution within 30 days.

3. Stage 3: If the aggrieved person is still dissatisfied following review by the grievance committee, the case may be referred to legal proceedings in accordance with in-country laws and procedures and/or notify the World Bank at any time which will work with MoI and relevant stakeholders to address the grievance.

All complaints received will be recorded and sent through the reporting chain to MoI. The MoI will consolidate complaints into a matrix recording the complainant's details, date, cause of complaint, steps taken to resolve the issue, outcome and date, any further steps to be taken, date of ultimate resolution and number of days elapsed from first notification to final resolution. The matrix will be updated and included as part of the Project record, and of the regular reports to the Bank.

Attachment 1: Mitigation Plans

Table A1.1. Mitigation Plan for All Civil Works

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
DESIGN STAGE			
Traffic safety	Provide for traffic management plan to be developed by Contractor	Design Consultant	IA
Soil erosion	Minimize erosion and design erosion protection measures according to Tongan Design norms.	Design Consultant	IA
Dust/Air Pollution	Identify borrow sites, waste disposal sites, and crusher sites to minimize impacts on the environment and nearby population.	sign Consultant	IA
Water pollution	Minimize risk to groundwater, surface and coastal pollution according the Tongan Design norms'	Design Consultant	IA
Flood	Design will make appropriate provision for discharge of storm drainage and minimise effect of water pooling in low-lying areas, to prevent damage to the roads and nearby houses and properties.	Design Consultant	IA
Quarries, borrow pits and construction debris/spoils disposal sites.	Identify existing, licenced/approved quarries, borrow sites and waste disposal sites that could be used for the Project. To the extent possible eliminate the need for opening new borrow area and waste disposal sites.	Design Consultant	IA
CONSTRUCTION STAGE			
Traffic and construction	Develop the traffic management plan to ensure smooth traffic flow and safety for	Construction	IA through

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
safety	workers and passing / local traffic Where appropriate, employ flagmen/women on the road to prevent traffic accidents. The workers shall have relevant safety equipment	Contractor	Technical Supervisor
Soil erosion	Borrow and disposal sites no longer in use will be restored	Construction Contractor	IA through Technical Supervisor
Pollution of water and soil as a result of improper disposal of excavated materials and construction wastes	Obtain permit from the relevant authorities (MEIDECC, Waste Management Authority) for construction and disposal operations. Provide for zones of preliminary accumulation of wastes that will cause no damage to the vegetation cover and other components of the environment. Use the existing right-of-way for preliminary accumulation of wastes, which will cause no damage to the vegetation cover and other components of the environment. Arrange transport and disposal of wastes according to the established procedure and in the approved dump sites designated for the specific purpose.	Construction Contractor	IA through Technical Supervisor
Water pollution	Lubricants shall be collected and recycled, or disposed of according to Tongan regulations. Water samples shall be tested for oil when leakages to surface waters or groundwater is observed	Construction Contractor	IA through Technical Supervisor
Dust related to the transportation of construction materials, truck traffic and implementation of works	Use closed/covered trucks for transportation of construction materials, **when dust will be emitted from carried loads**	Construction Contractor	IA through Technical Supervisor
	Clean the surrounding area from dust by regular water sprinkling (especially in residential areas nearby houses, schools, hospitals, etc.), removal of excess materials and cleaning of sites upon completion of activities. Where possible stockpiling of friable material should be avoided and in-time delivery should be practiced.	Construction Contractor	IA through Technical Supervisor
	Workers dealing with hazardous materials or exposed to dust shall be provided with necessary protection gear	Construction Contractor	IA through Technical Supervisor

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
Noise and vibration disturbances	Minimize nuisance from noise, especially closer to residential areas, through establishment of work time schedule (usually from 08:00 to 20:00) and avoid increase of noise and number of work equipment at peak hours. Adjust working hours nearby schools, hospitals and other similar institutions to avoid disturbing their routine operations.	Construction Contractor	IA through Technical Supervisor
	Regularly check and maintain machinery, equipment and vehicle conditions to ensure appropriate use of mufflers, etc.	Construction Contractor	IA through Technical Supervisor
	Workers in the vicinity of sources of high noise shall wear necessary protection gear.	Construction Contractor	IA through Technical Supervisor
	Workers shall have and use safety equipment. Appropriate training shall be given to the workers in charge for handling oil, chemicals, etc.	Construction Contractor	IA through Technical Supervisor
Accident risks/Impacts on traffic safety	Arrange necessary measures for pedestrian and passer-by safety and all means of transportation safety (e.g., establish protection zones, by-pass these areas during transportation of materials, etc.)	Construction Contractor	IA through Technical Supervisor
	Relevant safety elements such as guardrails, road signs and delineators, pavement markings, barricades and beams, warning lights shall be installed. In some cases a flagman/woman or traffic control supervisor could be engaged	Construction Contractor	IA through Technical Supervisor
Impacts on historic-cultural monuments	Cease the works as soon as historical and cultural relics are encountered during earthworks and provide relevant information to the MEIDECC and Ministry of Commerce, Tourism and Labour for Historical and Cultural Monuments Protection	Construction Contractor	IA through Technical Supervisor
Landscape degradation and soil erosion			
	Arable land shall not be used as earth borrowing. If unavoidable the topsoil (ca 30 cm) shall be removed, stored and reused for rehabilitation after construction is over	Construction Contractor	IA through Technical Supervisor
	Restoration to quasi-original conditions of landscape after completion of rehabilitation works and after use of quarries; restore the vegetation cover as is provided in the design	Construction Contractor	IA through Technical Supervisor

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
	Use plant species characteristic for the landscape in the course of restoration of the vegetation cover along the road and on reclaimed areas	Construction Contractor	IA through Technical Supervisor
Handling of lubricants and fuels for Construction Equipment	Store and handle in prepared containment areas, with measures for cleanup in the event of spills.	Construction Contractor	IA through Technical Supervisor
	Service and maintain equipment in facilities with appropriate capture and disposal of used lubricants.	Construction Contractor	IA through Technical Supervisor
OPERATION STAGE			
Accidents involving hazardous materials	There shall be established an emergency response for traffic incidents and/or accidents to minimise impacts from traffic accidents with hazardous goods.	ARD (maintenance)	Ministries of Nature Protection and Health
Traffic Safety	Accidents due to excessive speeds on the improved roads shall be controlled by establishing and enforcing speed limits and installation and maintenance of traffic calming devices in populated areas	ARD (maintenance)	Traffic Police
Maintenance of drainage systems	Drainage systems shall be periodically cleared to ensure appropriate flows.	ARD (maintenance)	ARD/MoTC

Table A.1.2. Specific Mitigation Plan for Aviation Activities

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
AVIATION SECTOR ACTIVITIES			
Construction Issues	Ref. Table A1.1	Design Consultant	TAL
Hazardous chemicals - inappropriate storage and handling of drums/barrels during placement in onboard tanks leading to possible exposure of the public to harmful chemicals in aviation non-emergency situations.	Strictly apply and enforce manufacturer's recommendations for handling and storage. These measures include sealing of drums, and avoiding extreme heat.	TAL	TAL
	Compliance also with international good practice.	TAL	TAL
	Construction of secure storage area to facilitate transport, handling and placement.	TAL	TAL
	Staff wear gloves and overalls when handling or mixing material	TAL	TAL
	Mixed fluid material is either pumped directly from container to truck tank (ie. no direct handling and very minimal spillage risks), or poured into buckets and loaded manually onto the truck tank (older trucks only). Any spillage is flushed away. Minimal, if any, environmental risk is posed by this, as according to the manufacturer's guidelines, the material is inert.	Design Consultant / TAL	TAL
	Fire engines are to be serviced and maintained at existing airport workshop.	TAL	TAL
Contamination of land and/or water bodies with used oils during servicing and maintenance of Fire engines and other airport transport/servicing equipment.	Workshop to be fitted with bunded area areas for storage of oil and fuel drums.	TAL	TAL
	Bunded areas to be drained through newly built oil-separators. Oil separators to be routinely emptied and material disposed of in approved landfills.	TAL	TAL

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
	All oil (used and new) drums to be stored in bunded areas. All used oils to be stored in drums.	TAL	TAL
	Used oil drums should be returned to the suppliers or should be sold in secondary local market if there is demand for this. Used oils may be used for emergency drills/preparedness exercises as appropriate.	TAL	TAL

Table A.1.3 Specific Mitigation Measures for Maritime Sector Activities

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
MARITIME SECTOR ACTIVITIES			
Construction Issues	Ref. Table A1.1	Design Consultant	MOT (MAD)
Adequate drainage of surface storm water.	Design of adequate slope/gradient on finished pavement surface.	Design Consultant	MOT (MAD)
Contamination of land and/or water bodies with oils in run-off water.	Run-off water channeled through oil-separator before final drainage into sea. Design, Construct, Operate and Maintain adequate size, location, and number OF oil separators.	Design Consultant	MOT (MAD)
	Regular collection of oil waste from oil separator and disposal in approved landfills.	MOT (MAD)	MOT (MAD)
Dangerous Goods Isolation and Lubricants storage area	Provide bunded area which drains into an oil separator. Regular collection of oil waste from separator and disposal in approved landfills	MOT (MAD)	MOT (MAD)

POTENTIAL NEGATIVE IMPACT	ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES	EXECUTING AGENCY	SUPERVISING AGENCY
General Safety and Operations of Ferry Terminals	Ferry and terminal operations are in accordance with both national legislation and international obligations under the IMO	MOT (MAD)	MOT (MAD)
	Planned segregation of cargo and passengers; creation of specific safety zones for isolation of dangerous goods.	Design Consultant / MOT (MAD)	MOT (MAD)
	General safety will be significantly enhanced with the installation of appropriate terminal lighting (non-existent at most terminals) Planned installation of navigational and safety aids will significantly reduce safety issues for vessels on ferry terminal approaches	Design Consultant / MOT (MAD)	MOT (MAD)

Attachment 2: Monitoring Plan

Phase	**What** *parameter is to be monitored?*	**Where** *is the parameter to be monitored?*	**How** *is the parameter to be monitored?/ type of monitoring equipment*	**When** *is the parameter to be monitored? (frequency of measurement or continuous)*	Responsible Agency
Design	*Traffic safety*	Design documents	Ensure inclusion in design	During the design	Design Consultant
	Location of licenced, operating quarries and borrow/disposal sites	Design documents	Ensure inclusion in design and material requirements	During the design	Design Consultant
Construction	*Material borrow sites and quarries*	Construction Contractor's records	Permits from MEIDECC and/or MLSNR	During construction / regular inspection	IA, Technical Supervisor
	Agreement for waste disposal	Construction Contractor's records	Permits from MECC. Inspection of disposal sites	During construction, / regular inspection	IA Technical Supervisor
	Soil erosion	In new clearings	Inspections at sites, grass verges and drains	During construction and after site restoration	IA through Technical Supervisor
	Surface water pollution	Water courses located close to work sites	Site inspections Ad hoc monitoring if discharge is observed	During construction if spill or contaminated run-off is observed	IA through Technical Supervisor
	Dust	At construction sites and adjacent sensitive areas	Site inspections. Regular visual inspection	During earth works and chip seal works On any complaints.	IA through Technical Supervisor
	Noise level	At work site and sensitive locations	Site inspections. Measurement of noise level with hand-held noise meter	During construction and chip seal works Ad hoc monitoring. On any complaints	IA through Technical Supervisor
	Storage of fuel, oil, bitumen, etc.	At work sites and service areas	Regular site inspections	At all time where work sites are used for storing fuel, oil, bitumen, etc.	IA through Technical Supervisor
	Vehicle and pedestrian safety	At and near work site	Regular inspections	Ad hoc day and night inspections	IA through Technical Supervisor

Phase	**What** *parameter is to be monitored?*	**Where** *is the parameter to be monitored?*	**How** *is the parameter to be monitored?/ type of monitoring equipment*	**When** *is the parameter to be monitored? (frequency of measurement or continuous)*	Responsible Agency
	Construction workers and staff safety (personal protective equipment)	At work site	Inspection	Unannounced inspections during construction works	IA through Technical Supervisor
	Proper operation of utilities crossed by road section	On sites where utilities are crossed by road section	Inspection	In case the utility is repaired/relocated during construction works	IA through Technical Supervisor
Operation	*Accidents with hazardous materials or wastes*	On site	Accident report	Immediately after accident	IA/MOT MECC
	Traffic safety	On the road during operation	Observation of obedience of speed and other traffic regulations	Randomly by decision of the Traffic Police	Traffic Police
	Maintenance of drainage system	On site	Inspection	When needed	IA/MOT

Attachment 3: Environmental Supervision Checklist

General information	DD/MM/YY	
	Report prepared by	
	Name of road link and location of construction site	
	Name of contractor/ subcontractor	
Permits, agreements	Permit obtained for quarry opening during construction	❒ Yes ❒ No ❒ N/A
	Agreement obtained for disposal of construction waste	❒ Yes ❒ No ❒ N/A
Management of construction sites	Proper location of construction site/camp	❒ Yes ❒ No ❒ N/A
	Availability of proper storage for fuel, oil and construction materials	❒ Yes ❒ No ❒ N/A
	Proper maintenance of construction machinery and equipment (prevent leakage of fuel, oil, lubricants, etc.)	❒ Yes ❒ No ❒ N/A
	Availability of places of preliminary accumulation of excavated and demolished materials and construction wastes within the existing right-of-way	❒ Yes ❒ No ❒ N/A
	Timely removal of excavated and demolished materials and construction waste from the places of preliminary accumulation and disposal to planned and agreed places	❒ Yes ❒ No ❒ N/A
	Use covered trucks for transportation of construction materials and waste	❒ Yes ❒ No ❒ N/A
	Clean the surrounding area from dust by water sprinkling in construction zone (when necessary)	❒ Yes ❒ No ❒ N/A
	Clean/ wash tires of vehicles before they get to dwellings and/or drive on highways (when necessary)	❒ Yes ❒ No ❒ N/A
	Implementation of works at the established time (e.g. work during daytime)	❒ Yes ❒ No ❒ N/A
	Installation of road signs in construction sites, camps and along access roads	❒ Yes ❒ No ❒ N/A
	Ensure proper sanitary/ hygienic conditions for workers at the construction site	❒ Yes ❒ No ❒ N/A
	Restoration of the area of construction sites and camps when the construction works are over	❒ Yes ❒ No ❒ N/A
Safety measures	Workers are provided with necessary safety uniform (e.g. vests, helmets, high boots, gloves, glasses, etc.) and use them	❒ Yes ❒ No ❒ N/A
	Availability of fire-resistant measures on construction sites/ camps (fireproof shield, fire extinguisher, sand, etc)	❒ Yes ❒ No ❒ N/A

Attachment 4: Schedule 1 of the Environmental Assessment Act 2003

SCHEDULE
MAJOR PROJECTS

Any of the following activities shall be deemed to be major projects;

(a) abattoirs:

(b) brewery works:

(c) building, works, or land associated with the landing, take-off, parking or servicing of aircraft or helicopters;

(d) canning and bottling works in excess of floor space 2000 square meters;

(e) cattle feeding or intensive piggeries with excess of 50 animals;

(f) cement works or concrete batching works in which more than 2,000 tones per annum are manufacture;

(g) ceramic work, being works in which excess of 200 tones per annum are produced of brick, tiles, pipes, glass are manufactured in furnaces or kilns;

(h) chemical factories, or chemical storage areas in excess of 1,000 square meters'

(i) electricity generating stations;

(j) marinas (comprising pontoons, jetties, pier, dry storage, mooring) for more than 20 vessels primarily for pleasure or recreation;

(k) mining, being an activity that disturbs the surface of the land in excess of one hectare;

(l) sand and gravel extraction from any beach within 50 meters of the high tide mark;

(m) liquid, chemical, oil or petroleum refineries, storage or waste processing works;

(n) farms for the propagation of marine, estuaries or freshwater organisms

(o) pre-mix bitumen works;

(p) rubber on plastic works;

(q) the removal of trees (including mangroves) or natural vegetation of any area in excess on half a hectare;

(r) construction of road, wharfs, barrages, embankments, or levees which affect the flow of tidal waters;

(s) any facility involving the use, storage or dumping of nuclear materials'

(t) sawmills where more than 2,000 cubic meters per annum of timber is sawn, milled or machined in any way; or

(u) tourism or recreational resorts, buildings or facilities, involving a total building floor area of greater than 1,000 square meters or a potential total overnight accommodation level (visitors and staff combined) in excess of 20 persons.