MILLENNIUM CHALLENGE ACCOUNT-VANUATU
Reducing Poverty through Improved Infrastructure

Environmental Social Assessment and Environmental Management Plan:

Efate Ring Road Subproject MCA02

FINAL REPORT

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
COC	Council of Chiefs
COM	Commissioner of Mines (Mines and Minerals Section of DGM)
DB	Design and Build
DGMWR	Department of Geology, Mines and Water Resources (of Ministry of Land & Natural Resources)
DLSR	Department of Land, Survey & Records (of Ministry of Land & Natural Resources)
EMP	Environmental Management Plan
ESA	Environmental and Social Assessment
ESU	Engineering Support Unit (of PWD)
FGD	Focus Group Discussion
HIV	Human Immune-deficiency Virus
HSU	HIV and STIs Unit (of Ministry of Health)
LBES	Labour Based Equipment Support
LTU	Lands Tribunal Unit
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MAFF	Ministry of Agriculture, Forestry and Fisheries
MLNR	Ministry of Land and Natural Resources
MOH	Ministry of Health
NGO	Non-governmental Organisation
NKBJ	Nasonal Kaonsel Blong ol Jif/National Council of Chiefs (Malvatumauri)
NKBW	Nasonal Kaonsel Blong ol Women/National Council of Women
OP	Operations Policy (of World Bank)
PAP	Project Affected People
PESA	Preliminary Environmental Assessment
PRA	Participatory Rapid Appraisal
PWD	Public Works Department
SDCC	Supervision of Design and Construction Consultants (TA to FIDIC Engineer)
STIs	Sexually Transmitted Infections
RAP	Resettlement Action Plan
VCC	Vanuatu Culture Council
VKS	Vanuatu Kaljoral Senta/Vanuatu Cultural Centre

Executive Summary

The first priority civil works activity under the Millennium Challenge Account (MCA) Vanuatu Transport Infrastructure Program is the reconstruction of 92 Km of the Efate Ring Road including the upgrade to bitumen seal. This report provides the Environmental and Social Assessment, incorporating the Environmental Management Plan (EMP) for the Efate Ring Road Sub-project.

The purposes of this report are;

- To provide guidance to Downer EDI Works Ltd (the Design and Build Contractor) in fulfilling their contractual obligations prior to construction of works, including finalizing their Environmental Management Implementation Plan (EMIP).
- To provide necessary information to MCA-Vanuatu and MCC for approval and to ensure compliance of Compact obligations governing environmental, resettlement and social sustainability.
- To provide stakeholders and beneficiaries with publicly available information about the program.

An earlier report providing an ESA, EMP, and RAP for the Epule Bridge and the Epau Creek Crossing can be regarded as an addendum to this report.

As part of its commitment to public outreach and information, the report will also be tabled on the MCA website. EMPs and RAPs are "conditions precedent" to the disbursement of construction funds as mandated under the Vanuatu Compact and Disbursement Agreement. EMIPs, prepared by the design and build contractor in response to the ESA/EMP and approved by the Engineer, are preconditions to the commencement of construction works.

This report has been developed utilizing initial reports from international consultants (Maunsell Limited) and their local consultants (the Vanuatu Kaljoral Senta/ Vanuatu Cultural Centre (VKS). MCA-Vanuatu used these reports to work with its implementing entities such as the Ministry of Lands and the Public Works Department's Engineering Support Unit (ESU), the Department of Agriculture, the SHEFA Provincial Council and the Vaturisu Council of Chiefs. Joint field trips with MCA, Downer EDI Works, Queensland Consulting Project Partners (QCPP) FIDIC Engineers, and relevant Government representatives have also contributed to the process. There is a commitment to continue joint consultations and to use a whole of Government and broad consultative approach throughout the programme as required to resolve issues.

Summary of Potential Environmental and Social Impacts and Mitigation Measures

The environmental impacts associated with the Efate Ring Road Subproject are largely positive or neutral as the upgrading works will result in mitigation of many existing environmental problems associated with the existing road. The greatest social impact associated with the Subproject will result from increased access and connectivity and reduction in travel time and travel costs around Efate. These impacts will support increased tourism and agricultural opportunities, improved livelihoods and socio-

economic conditions for those living around Efate. The Subproject is welcomed by the communities affected by the Ring Road.

Amongst the range of positive and negative environmental and social impacts, which have been identified, the key impacts include:

During construction:

- Impacts on the surrounding environment during the construction of the road from increased noise and dust though temporary and localized have the potential to affect communities located on the Ring Road and the adjacent aquatic environments. The management of sediment and runoff during construction using good engineering and construction practice will mitigate any effects on the receiving environment.
- The impacts on communities of having construction workers living in temporary camps in the area include potential health risks and potential conflict related to respect of local village protocols and ownership of property. Relevant awareness campaigns for construction workers and villagers on potential health risks, and training for all construction workers on village protocol will mitigate the potential effects identified. A complaints procedure for local landowners with appropriate grievance redress will be established.

Operation:

- The rehabilitation of the road will reduce the runoff currently causing siltation of adjacent aquatic systems, erosion and scouring particularly at creek crossings, flooding and dust nuisance in communities. The reduction in run-off from the road will improve the water quality of adjacent aquatic systems, therefore supporting healthier eco-systems, protection of water supply for communities and provide pristine water to enhance tourism around Efate.
- Improved access to services (in particular health services) and facilities, the market and economic opportunities for communities around Efate will provide economic benefits to support the reduction of poverty.
- Facilitating better access to markets for agricultural producers, in particular transporting livestock will maximize the maintenance of the health and quality of the stock.
- The road improvement will provide greater opportunities for tourism activities to be located outside Vila, distributing the tourism dollars spent in Vanuatu beyond Port Vila. This will provide opportunities for communities to engage in economic activities without having to relocate to Port Vila.
- Increased speeds by road users and therefore an increase in traffic safety issues will have a potential impact on communities. The use of traffic calming measures throughout the length of the road rehabilitation is proposed, including the use by speed restrictions, speed humps in villages, and signage including maximum speed limit signs. Traffic safety signs and awareness-raising programs for road users may also be necessary to reduce the impact of increased vehicle speeds.

Summary of Environmental Management Plan

An Environmental Management Plan (EMP) has been prepared for the Efate Ring Road Subproject. The EMP provides a detailed framework for managing the construction, operation and maintenance activities so that the potential environmental and social impacts associated with the Subproject segments are avoided or mitigated.

The EMP includes:

- A description of the institutional responsibilities of the various parties involved in implementing the EMP;
- An environmental management plan matrix which identifies specific environmental impacts, associated mitigation measures, performance indicators and party responsible for implementing the mitigation measure;.
- An environmental monitoring plan;
- Contingencies, complaints and incidents procedures; and
- Reporting and review procedures.

The EMP has been prepared in advance of the detailed design for the sub-project segments to facilitate the overall project implementation schedule, therefore the EMP is based on the most current design information available. Procedures are in place to review and update the EMP as required throughout the design, approval and construction phases.

Resettlement Issues

As there will be no permanent physical displacement of people from their dwellings as a result of the Subproject, and in accordance with the criteria and requirements of the World Bank Operational Policy for Involuntary Resettlement Policy OP4.12, no requirement for a large scale RAP has been identified for the Efate Ring Road. However abbreviated RAPs will be required to address a number of resettlement issues:

- Permanent loss of small amounts of road-side land .
- Market stalls and structures associated with small business enterprises,
- Realignment of fences
- Loss of coconuts and other garden resources
- Temporary loss of access to resources or assets

As a result of the phased approach to design and build, the RAPs will be prepared to support the DB schedule. These RAPs will ensure that resolution of any potential issues with affected persons will be agreed prior to construction.

1.0 Introduction

1.1 Project Back Ground

The Government of the Republic of Vanuatu (GoV) has entered into a compact with the Government of the United States acting through the Millennium Challenge Corporation (MCC). The goal of this Compact is to reduce poverty and increase incomes in rural areas by stimulating economic activity in the tourism and agriculture sectors through the improvement of transport infrastructure, which is key to economic growth and poverty reduction in Vanuatu. Copies of the Compact and supplementary agreements are available on www.governmentofvanuatu.gov.vu. All Compact activities operate in compliance with these core documents, the laws of Vanuatu, and relevant MCC guidelines. Under a restructure of the Compact Program in early 2008, the focus of the Program is on the upgrades to the Efate Ring Road and the Santo East Coast Road.

The Government of Vanuatu has established a program management unit, known as the Millennium Challenge Account-Vanuatu (MCA) within the Ministry of Finance and Economic Management with a primary role to oversee the implementation and management of the MCA program. MCA is supported locally by a number of implementing entities and contractors, and by MCC-Vanuatu with support from a specialist team in Washington.

1.2 Scope of this Report

This report (MCA02) provides the ESA and the EMP for the Efate Ring Road Subproject. The Subproject comprises of rehabilitation of the unsealed ring road on Efate including associated drainage and the repair of bridges and creek crossings as they are assessed during construction. The Subproject does not include any new road construction as it is upgrading the existing limestone paved road within the existing alignment to bitumen seal. Existing drainage structures will be examined and replaced where required for safety or performance reasons, with an emphasis on providing erosion protection where road drainage is discharged to creeks and is in close proximity to the coast. It is not anticipated that there will be any significant increase in storm water flows; any increase will be a result of solving existing problems where a lack of drainage allows some storm water to overtop existing undersized drains and discharge on to gardens.

The works will include:

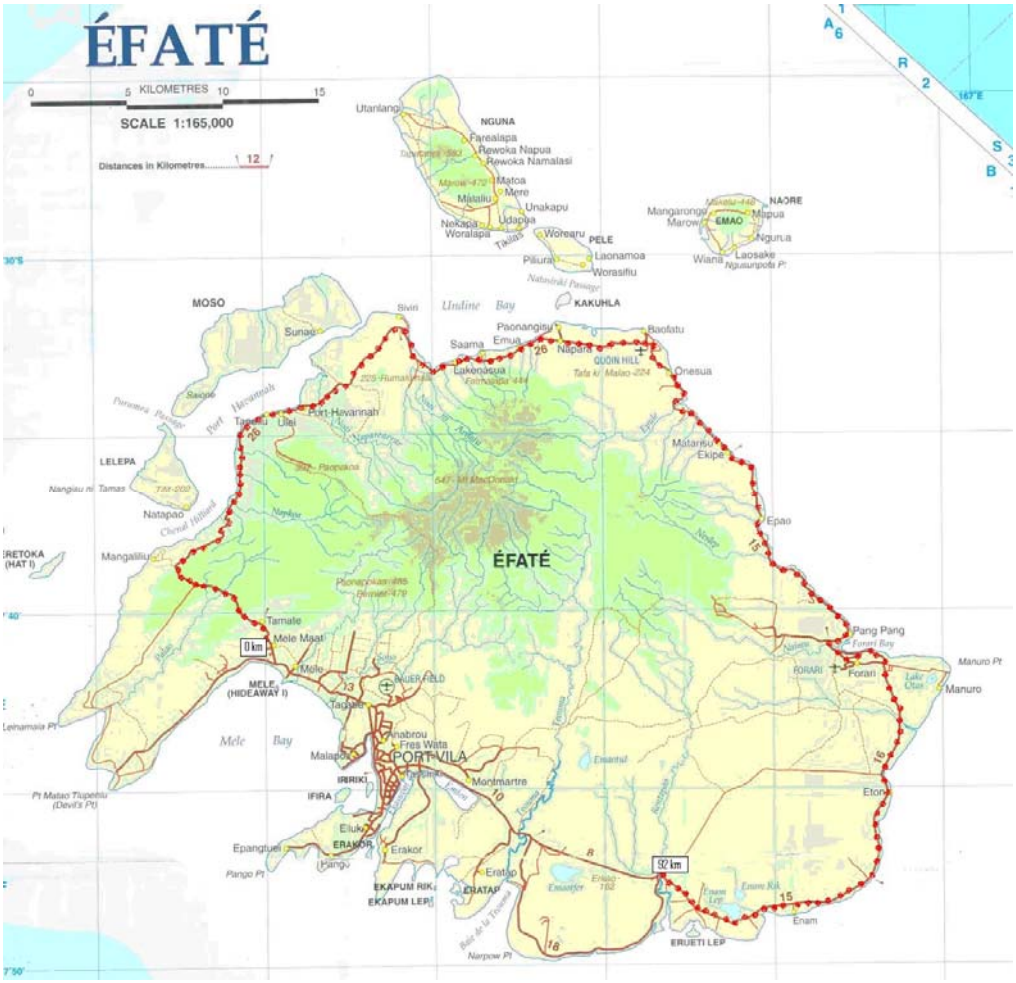
- As part of mobilization and establishment, the construction of a causeway within the foreshore at Havannah Harbor (Land Title 12/0521/004) to be used as a barge landing, an access road and hardstand areas for the discharging/loading of barges and for stockpiling and laying down of materials, plant and equipment. The detailed works related to this include
    - Repair and extend the existing north side wharf by a minimum of 10m using gabion baskets on the West end in addition to a minimum of 15m on both the north and south sides.
    - Construct a permanent coral compacted road from the wharf joining the quarry and the hard stand, avoiding the few big trees.
    - Clear the top soil to the coral base of the land leaving the soil in a tidy fashion.
    - Fill the quarry to above the flood level and slope for drainage.

- Improve and deepen the channel between the north and south wharf up until the creek to approximately 12m wide and 6m deep at low tide.
- Improve the harbour to 80m in diameter with a minimum depth of 5m.
- All material excavated to be used extending the wharf or fill in the quarry.
- All works to be completed within the 1st phase of the road project being the stretch between Klems Hill and the Lelepa Bridge.

- Repair of Epule River Bridges and Epau Creek Crossing (detailed in separate earlier ESA EMP report available from MCA Office) to enable the transport of heavy construction equipment and materials.
- Reconstruction of 92 km of the existing road (section highlighted in red on the map below) on its existing alignment, to a two lane, two coat bitumen seal (6m in width), with a design speed generally of 80 km/hr, but with some sections potentially 50 km/hr. (Based on the design specification provided in the DB Tender Document[1], a maximum 12m roadway is the agreed design standard for the Project. This includes a 6m bitumen sealed pavement and 2 x 1m shoulders and (at a maximum) 2 x 2m wide drainage structures. This indicative design standard allows for a construction zone (beyond the roadway) of between 3m and 8m depending on the width of the surveyed and acquired road reserve (i.e. 15m or 20m)[2];
- Provision of sealed road turnouts to an agreed length for selected branch roads;
- Improvement of road drainage with concrete table drains in steep sections and culvert crossings or concrete floodways for all creeks, with appropriate erosion control where required;
- Remedial work to the existing bridges; and
- Road furniture, including guard rails and signage as required.

[1] The DB Tender Document (as re-issued dated 10th April 2008) includes a 7m width of bitumen seal this has been reduced to 6m as per the revision of specification and scope of work agreed by MCC and MCA.

[2] The Department of Lands, Survey and Records advised the ESA Consultant that the entire Efate Ring Road reserve had been surveyed and acquired. Generally the acquired road reserve is 20m wide but in some sections it is 15m.



Source: HEMA Country Map (5th Edition)

Figure 1: Map of Efate showing Subproject MCA02

2.0 Approach and Methodology

2.1 Research Reports and Surveys

This report is built upon the following work:

- A Preliminary Environmental and Social Assessment (PESA) January 2006 prepared by Parsons Brinckerhoff as part of the MCC's technical, financial and economic assessment of the MCA-Vanuatu program comprising 11 sub-projects.
- A preliminary Reconnaissance Survey and Scoping Report prepared by Maunsell Limited in 2008.
- A preliminary Environmental and Social Assessment Report including Environmental Management Plans for the Efate Ring Road and the Epule Bridge and Epau Creek Crossings, prepared by Maunsell Limited in 2008.
- A preliminary Resettlement Framework for the Vanuatu Transport Infrastructure Program, prepared by Maunsell Limited in 2008.
- Assessments and comparisons of surveys and records of land use and road right of way from the Surveyor-General's Office, the Lands Lease Records Office, and recent survey undertaken by sub-contractors to Downer EDI Works.
- The PEA report for the Barge Landing site and associated works prepared by the SHEFA Physical Planner and Environment Unit.
- A range of locally prepared reports by Government agencies including preliminary environmental assessments, cultural heritage assessments, and reviews for the purposes of granting foreshore development, quarry, and water permits and Provincial Government support.

These reports and surveys form an important backdrop to this report. They are available from the MCA Office.

2.2 Compliance with the Compact and International Standards

The approach taken throughout this report is consistent with the Compact and related agreements, Vanuatu legislation and MCC guidance, specifically;

- MCC Environmental Guidelines;
- Government laws and regulations regarding environment and social issues;
- World Bank Operational Policy (OP 4.12) on Involuntary Resettlement;
- World Bank Rural Roads Checklist;
- MCC Gender Policy; and
- Implementing Agreement with Ministry of Lands to assist in the implementation of the EMP.

2.2 Consultations

A Consultation Plan, (available from the MCA Office and the MCA website), has been prepared to ensure effective communication between stakeholders and to ensure transparency and accountability at all stages of the Subproject. The Consultation Plan

provides guidance to the contractor during implementation and if issues arise during construction a mechanism to address these and should be used by the contractor to prepare a communication plan.

The Vanuatu Kaljoral Senta/ Vanuatu Cultural Centre (VKS) Consultants have undertaken village consultations and identification of sensitive cultural and heritage sites. During the ESA rapid rural appraisal (RRA) consultations were held with the primary stakeholders, with representatives at the meetings from the 21 villages along the Subproject road, and 5 villages located off the main road but for whom the Subproject road is the primary access to Vila and other locations. The consultations were an "open" forum with any parties interested in the Subproject invited to participate. A number of smaller focus group discussions were also held with women and youth of the villages. The meetings were well attended and the results of the consultation process are incorporated into the relevant sections of this ESA report. Details of the consultation attendees are included in Appendix A. As is evident in the consultation attendant lists the nature of the villages on Efate means that representatives from smaller villages may have attended consultations in the larger neighbouring consultation meetings.

For the proposed barge landing, preliminary consultations were managed by the DB Contractor in association with the lessee and custom owners, and with the support of the SHEFA Provincial Government. Joint site visits followed, including representatives from MCA, MCC, the ESA consultant, the Provincial Planning Officer, the Director of the Environment Unit, and the Provincial Affairs Planning Officer. Whilst the site is large with little impact envisaged on neighbors, all neighbors were contacted and consulted on the plans.

Additional field work, consultations, and meetings were undertaken by MCA-Vanuatu supported by implementing agencies, Government Departments, Provincial Government, and Chiefs to different sites around the Subproject from March 2008. These consultations will continue throughout implementation and ensure that a joint whole of government and broader consultative approach is applied and is effective in addressing community concerns and changes in design and construction.

Consultations have occurred with:

- Communities adjacent to or likely to be affected by the road works.
- Affected lease and custom owners.
- Chiefs, Assistant Chiefs, and community spokespersons.
- Women's Associations.
- Young people.

The reports from all consultations are available to the public for review at the MCA Office. Reports of these consultations are being progressively placed on the MCA web-site.

Further consultation and disclosure will be done during implementation through:

- The Project's Consultation Plan;
- Continued up-dating of MCA's website

- Preparation and dissemination of posters and brochures in English and Bislama, explaining the Project, works required and anticipated timing of the works
- Information boards regarding the approved Subproject and the proposed environmental management measures (including the DB Contractors EMIP) will be posted at the day camps during Subproject construction.
- Open Days at the MCA office to enable interested people to learn more about the program and to contribute suggestions and raise any concerns.
- Media announcements.
- Setting up and use of formal grievance redress procedures
- Joint site visits and consultation with Vaturisu, Contractor and MCA for the preparation of the RAPs, and Kastom Welkams at villages prior to the construction of each 5km section.
- Joint site visits with the contractor, client, VKS and relevant Government Departments where issues arise during construction require a whole-of-government approach.
- Monitoring of awareness-raising, such as the STI/HIV campaign.

All key reports are approved through the Government of Vanuatu procedures and by MCC and are available on the MCA website.

2.3 Inventory of Losses

MCA teams (comprising international and local engineers, environmental, social and resettlement experts) have visited and will continue to monitor each section of the road to identify any assets and people who may be negatively affected by the road-works. An inventory of potential losses will be developed for each section and will form the basis of the RAPs. Discussions with affected persons and communities regarding compensation options (Goodwill Entitlements Table) and grievance redress procedures have been completed for some sections of the road and are underway for the remaining sections.

2.4 Consideration of Vulnerable People

Through the consultations and research, special note was taken of any vulnerable people likely to be affected by the road works. Women and children living in villages adjacent to the Subproject have been identified as being vulnerable with regard to the establishment of construction camps. Single parent families who suffer any loss of food crops are another group. In at least one section of the road, there is an extensive squatter community. Measures to mitigate any potential impacts on these groups and to provide any income-generation opportunities have been recommended in the EMP.

2.5 Description of Works

The preparation of the barge landing and hard stand area for the unloading and storage of plant and machinery equipment necessary for construction is part of the preliminary works required before road construction. The Bailey Bridge to be constructed at Epule and the crossing of the Epau Creek are also preliminary works and not included in this

ESA EMP as they have been assessed separately under a previous ESA EMP report approved by MCC on 30th July 2008. The DB Contractor and MCA prioritized the upgrading of these two crossings to facilitate the transport of plant and material around the island.

The final design of the road is being completed in sections as the quality of the existing road, culverts and crossings are assessed. The consultation and issues addressed in the RAPs may also affect the final design to accommodate the needs of the communities.

The proposed works commence at the top of Mele Maat (Klems Hill) traversing steep terrain, which in some places could require some slope cutting and associated slope stabilization design measures. Later, the construction will return to upgrade Klems Hill in the 0 to 1 km part of the road to be upgraded. During construction of this first 1km, temporary road closure and a by-pass road may need to be used. Further research into this option is planned and will be written up as an addendum to this report and/or the RAP for this road section.

The road then drops down to the coast and abuts the Havannah Harbour coastline. It may be necessary to align the road to prevent damage from coastal erosion. The road crosses two perennial streams and 19 ephemeral streams between Mele Maat and Tanoliu, which may require drainage and or floodway/ culvert crossing upgrades. The proposed road alignment through the village of Tanoliu in particular will require further consultation to refine the design and RAP, to protect the road and stalls from the coastal erosion, to mitigate a range of environmental, social, and cultural challenges, and to protect the development plans of the area as a significant tourism precinct. The description of works below is therefore based on the existing alignment of the road. If an alternative alignment is necessary further assessment will be completed in accordance with the Compact and related agreements, Vanuatu legislation and MCC guidance, A joint MCA/MCC team will work closely with the DB contractor and ESA consultant to ensure that all environmental and social issues in this hot spot are identified and mitigated.

After Tanoliu the road abuts the coastline on the north and north eastern sides of the island and crosses 54 ephemeral stream**s,** 9 perennial streams, and 7 intermittent or seasonal streams. Some of these stream crossings have existing crossing structures such as a bridge or culvert while others do not (mainly the ephemeral streams). The crossings are in varying states of disrepair and many will require drainage and or floodway/ culvert crossing upgrades.

From Eton the road is generally flat such that there will be no slope cutting required. There are 7 ephemeral creek crossings, 2 intermittent or seasonal crossings and one perennial stream from Eton to the end of Japanese Road. Special attention will also be focused on the designs for the road through Eton village. There is a short section of the existing road at Dry Creek that is exposed to storm surges resulting in erosion. The road design and alignment will take this threat into consideration.

2.6 Environmental and Social Assessment Methodology

The purpose of the ESA is to identify potential environmental impacts such as impacts on the ecological and physical environment, the use of hazardous materials, solid waste management, construction camps, quarries/ borrow pits, and secondary and cumulative impacts. It also identifies potential social and economic issues including any land acquisition and resettlement requirements, which require a RAP.

2.7 Level of Assessment

The ESA has taken into account Government regulatory requirements and the MCC Environmental Guidelines. The PESA and the Maunsell Resettlement Framework report also undertook comprehensive reviews of the Government's policy legal and administrative framework in relation to environmental management and assessment in Vanuatu. Key documents reviewed by the PESA and during the ESA Consultancy include:

- Environmental Management and Conservation Act (No. 12 of 2002)
- Water Resources Management Act
- Mines and Minerals Act
- Forestry Act
- Vanuatu National Conservation Strategy and Action Plan
- Vanuatu National Cultural Council Act 1985
- Public Roads Act
- Fisheries Act 1982, and Fisheries Regulations; and
- National Parks Act

MCA has established an implementing entity agreement with the Ministry of Lands to provide assistance in addressing any issues and requirements for permits identified during design and construction.

With reference to MCC's Guidelines for Environment and Social Assessment, the PESA classified the overall Project as Category B. Such classification characterizes projects that could have localized environmental impacts with few, if any, being irreversible and that can be managed by appropriate mitigation measures. The Efate Ring Road Subproject clearly falls within Category B since:

- All the upgrading works will be undertaken within an existing road right-of-way (ROW).
- MCA-Vanuatu and research to date has indicated that there is no requirement for any significant realignment.

For a Category B project, MCC requires specific environmental and social impact analyses including preparation of EMPs.

2.8 Environmental and Social Impact Assessment Criteria

The World Bank Rural Roads Checklist was used during the surveys to identify key environmental issues. The completed checklists for the Efate Ring Road Subproject are

available to the public from the MCA Office. A separate screening focusing on land acquisition and resettlement issues were also undertaken, and these form the basis for the abbreviated RAPs in accordance with World Bank OP4.12.

The checklists indicate that the impacts of the activities are largely positive or neutral due mainly to the fact that the upgrading works will result in mitigation of existing environmental problems associated with the road segment. Some minor temporary environmental impacts could result during construction but these can be managed effectively through good engineering and construction practice.

3.0 Environmental Assessment

3.1 Ecological Impacts

3.1.1 Vegetation

Vegetation in Vanuatu, in addition to supporting eco-systems, provides communities with income, food and is part of Kastom culture. The 'gardens' (subsistence crops) are located within and around villages, including adjacent to the Ring Road, or may be located some distance from villages depending on where the soil is fertile. These gardens provide the villages with their own food supply and excess to sell at the Vila Market. There are a number of fruit trees and crops located within the road reserve that may require removal or pruning. The removal of any fruit trees or crops through the road-works will be addressed in accordance with the Goodwill Entitlements Table in the RAPs.

There are also a significant number of Nabanga (Banyan) trees located within a few metres of the existing Ring Road. These trees are significant resources and should not be disturbed by the project. In most cases there appears to be sufficient road reserve available to ensure that the road upgrading works can avoid disturbance to these trees.

Other roadside vegetation from Mele Maat to Tanoliu comprises mainly elephant grass, scrub and small wattle trees although some large Nabanga (Banyan) trees are located within a few metres of the existing road namely at approximately the 11.1Km point and 12km point (refer Figure), 15.1km, 15.4km, 15.7km, and in the village of Tanoliu and the 18.5 km point. Between the 61km point and 63.1km there are 10 Nabanga tree located within of adjacent to the road reserve. Two of these Nabanga have roots encroaching on the existing road. Again at 74.4km the roots of a very large Nabanga tree (located approximately 5m from the road edge) are visible in the middle of the road (see Figure 2). The options for any Nabanga trees with roots encroaching onto the road include realigning the road away from the tree and root system (recommended option), building up the road over the roots or cutting the roots to prevent ongoing maintenance issues (not recommended as may result in the death of the tree). Realigning the road will depend on topography and vegetation on the opposite side of the road. The aerial roots once grounded establish their own underground root systems so could impact on the ongoing maintenance of the road. The realignment of the road is therefore recommended as an option rather than removal of Nabanga trees due to the substantial time required for negotiations for removal (cutting of roots) of Nabanga. An audit of the Nabanga trees potentially affected by the Ring Road will be undertaken and included in further advice to provide the Contractor with relevant information for final design and construction.

Figure 2: Nabanga located adjacent to road at Km 15

From Tanoliu the Efate Ring Road follows the coastline for most of its alignment. The land area either side of the road is already highly modified with land cleared for subsistence farming, coconut plantations and stock grazing. The American Vine (*Mikania micrantha*) is well established along this segment of road, particularly at Forari, smothering native vegetation and productive trees.

Figure 3: Nabanga Tree at 74 showing visible roots in road carriageway

Some vegetation clearance will also be required for the preparation of the Quarry and Borrow Pit sites, including the access ways to these pits. The barge landing site will require minimal clearance for the hard stand area and no significant vegetation will be removed.

3.1.2 Aquatic Environment

There are a number of community established conservation areas that may potentially be affected during construction of the Ring Road. These are:

- Offshore from Tanoliu, a marine conservation area and turtle sanctuary.
- Creek Ai River – important in habouring an endemic freshwater fish species.
- Matarisu marine conservation area (in front of Tanoliu village)
- Epule River (coastal conservation area and custom village)
- Launuaia Conservation Area (Paonangisu coastal conservation area)

- Matanawora World War 2 Conservation Area (Paonangisu marine conservation area)
- Emua Turtle Conservation Area
- Lountangoa – Lakenasua (Emua marine conservation area)
- Saama marine conservation area (in front of village)
- Siviri marine conservation area (in front of village)
- Ekipe marine conservation area (in front of village)
- Suman Sipir terrestrial and marine conservation area
- Takara marine conservation area
- Epau Community Marine Conservation Area
- Erueti island marine sanctuary – Eratap village
- Eton river –rich in biodiversity; important habitat for freshwater species

These community established conservation areas provide protection of habitat for a number of marine species including fish, crabs, turtles, shellfish and green snails. Many of these conservation areas are in place to increase the marine resources in the area and encourage tourists to the area.

The road improvements include the provision of roadside drainage facilities, which provide the opportunity to reduce the existing level of direct runoff from the road into coastal and fresh water. It is recommended that roadside drains be constructed on the landward side of the above coastal and riparian sections and that appropriately sized sediment traps are installed which then discharge to the landward side. Thus, there will be no direct runoff from the upgraded road onto the coastline.

During the construction phase temporary site drainage facilities including sediment fences sediment traps and settlement ponds will be used to avoid direct runoff from the site onto the coastline, thereby mitigating potential impacts on coastal waters. Such provisions are specified in the EMP.

The site for the causeway to provide the barge landing in Havannah Harbor was selected to minimize the impacts on the marine environment. The proposed barge landing is an extension of an existing causeway and will extend below the low water mark adjacent to a freshwater creek. Due to the fresh water creek there is no live coral in the vicinity and the area provides a deeper section of the Harbor, which can be accessed with minimal reclamation.

With the implementation of the above drainage mitigation measures the local marine conservation areas identified will not be significantly affected by road runoff and on completion of the road will be positively affected. Improving the quality of inland coastal waters contributes to the supply of food catch for communities harvesting shellfish and fishing.

3.2 Physical Impacts

The small scale of the construction works proposed including limited cut and fill requirements and the proposal to follow the existing alignment (unless RAP issues require alternative alignments) means that the impact on soils and erosion will be

insignificant. As a result of the upgrading works (sealing and improved drainage and culverts etc) there will be a significant reduction in the existing level of erosion and sedimentation observed along the road and at creek crossings.

There are seven locations where the road closely abuts the coastline at approximately 13.7Km 18.5 km to 19.5, 22km, 37.8km, 32.8 km and 68.5km. At Dry Creek, at point 84.3km, the existing road is affected by storm surges and erosion relating to periodic inundation. To ensure that any future coastal erosion will not have an impact on the upgraded road we recommend that the DB Contractor carefully consider the design and alignment of the road at these points as a joint exercise with MCA's ESA advisors. The only location where works are proposed within the marine environment are at Samoa Point to extend the barge landing. The relevant foreshore permit has been gained and conditions relating to this permit will be met.

The impacts associated with the extension of the barge landing and any retaining structures (should they be necessary) will be minor and temporary and consist mainly of sediment laden runoff discharging into the marine environment. Such impacts can be controlled through appropriate site drainage facilities including the use of diversion channels to sediment traps and settlement ponds. For works within the marine environment, protection measures will need to be installed and the work completed as quickly as possible. Such measures are specified in the EMP.

Dust nuisance particularly at roadside settlements will be significantly reduced after the sealing of the Ring Road.

For the clearing of areas adjacent to the road for the storage of materials, equipment and construction camps (day camps and if necessary overnight camps) during construction site selection criteria should include minimum vegetation clearance. The EMP includes mitigation measures for these cleared sites including drainage and rehabilitation post construction. The RAPs address entitlements for temporary loss of land-use related to these selected sites.

Two bridges and one creek crossing require rehabilitation works at this stage. The Epule Bridge and Epau creek crossing have been assessed in an earlier ESA report and EMP. The Ulei Bridge will require minimal timber replacement on the deck. If during construction any creek crossings or culverts require any works any environmental and social impacts including resettlement will be addressed appropriately as an Addendum to this report.

The proposed barge landing at Havannah Harbor will be an extension of the existing causeway and will be visible from neighboring properties. The quarry, hardstand and material storage will not be visible from the road. Vegetation around the site will be retained providing a visual screen to the works. The additional permanent landing site in the area is likely to bring positive impacts in terms of recreational and transportation activities for both custom landowners and lessees.

3.3 Hazardous Materials and Solid Waste Management

Potentially hazardous substances in the form of petroleum products will be used in the construction of the Efate Ring Road. These substances include (but are not limited to) oil and diesel for equipment. Waste will be generated from the dismantling of existing structures on the Ring Road that are to be replaced, construction of the new crossings and from workers on site. Provisions for ensuring appropriate sanitary and solid waste management facilities, and hazardous materials management procedures are outlined in the EMP.

3.4 Impacts on Fresh Water Resources

The sealing of the road, repair of culverts and consistent standard of drainage design proposed for the Subproject will result in better management of stormwater runoff in road reserve and where storm flows discharge to surface watercourses. The impact will be an increase in the quality of water resources available for safe drinking water to the communities and eco-systems supported by the water resources. The improved water quality will also support eco-tourism activities around Efate. A number of surface fresh water springs, or 'blue holes' exist around the Ring Road, which have the potential to be operated or expanded as locally owned tourism ventures. The Subproject will help maintain the quality of the water to promote sustainable tourist operations. The reduction in the sediment load carried by the streams and rivers into inland costal waters also enhances the quality of coral and sea life. This has ecological and socio-economic benefits related to tourism and supply of food-catch for communities.

Fishing, recreational and tourism activities are known to take place on a number of the streams and rivers that the road crosses. Direct discharge of untreated runoff during construction to streams and rivers should be avoided through the use of diversion drains, sediment traps, and settlement ponds (as appropriate to the individual sites). These mitigation measures are identified in the EMP. Constructed drains, as part of the upgrade, should also carefully consider discharge locations and ideally should drain to land to allow for natural filtration rather than surface water resources.

Water supply for most of the villages on Efate is sourced from the upper catchment, in the mostly forested and uninhabited steep terrain towards the centre of the island rather than from the lower catchment. The villages use a range of sources for water supply, including rain water collection, groundwater and surface water from streams and rivers.

3.4.1 Impacts on Water Supply

At the 1.8 km point the Efate Ring Road crosses the Teaie River at Temoto Bridge. Temoto Village (part of Mele Village) is located on the banks of the Teaie River approximately 100m upstream from the Temoto Bridge. Approximately 400m downstream from the bridge there is a water supply intake, which services the village of Mele and the Hideaway Resort. The Mele community is currently facing problems with decreased water quality as a result of surrounding land uses. The direct runoff from the existing unpaved road occurs around the bridge abutments, exacerbating these water quality problems, refer Figure 4

Figure 4: Temoto Bridge abutment

The Department of Geology, Mines & Water Resources (DGMWR) is piloting a water safety project in the Mele water supply catchment funded by SOPAC and WHO. The Water Section is concerned about the likely cumulative impacts of the road construction activities on the water quality at the intake. The main concern is the likely increase in siltation (limestone, bitumen, sealing aggregate etc) of the river below the bridge, which could clog up the intake and affect the supply of water to the community.

Direct runoff from the road into the river needs to be prevented during the construction stage through appropriate site drainage arrangements. This could be achieved through the use of concrete bunds or other barriers around the bridge area that direct runoff into drainage channels that discharge into areas away from the river. Approximately 70m south of the bridge on the eastern side of the road there is a swampy area, which could be used to discharge site runoff in the immediate vicinity. The swamp would act as a filter to significantly reduce the water quality impact on the Teaie River during construction.

The permanent road and drainage design around Temoto Bridge should also be aimed at preventing or minimizing direct runoff from the road into the Teaie River. This could be achieved through building up the road level across the bridge to establish a drainage gradient that diverts runoff away from the river on both sides of the bridge. Roadside drains should be designed to accommodate and channel the runoff away from the bridge.[3] If the above mitigation measures are properly implemented by the project there would likely be no significant impact on water quality at the intake.

The Subproject will not affect the quality of the water supply of any other villages located on or near the Ring Road. For all other villages, the surface water collection point occurs in the catchment above the road, or uses groundwater, piped or rainwater collection for water supply. Water supply infrastructure from source to the villages is known to be located under the road. This existing community owned infrastructure must be protected from damage during construction and retained within the new road. The potential pollution of groundwater sources that are used for water supply for villages during extraction of material from quarry activity will be mitigated by measures and conditions required by Quarry permits. Consultation with the Water Section of the DGMWR on groundwater systems and village water supply systems is also central to

[3] The DB Contractor was advised of this issue on 17 June 2008.

preventing any negative social impacts on groundwater supplies. This is addressed in the EMP with specific detailed requirements for the Quarry sites in the QMP.

The extraction of water for the compaction of the road during construction from surface water sources may be necessary during dry periods. The quantity of water required for compaction is also dependent on the frequency of rain. Due to the weather dependent nature of the water takes the location and quantity of water takes for the purposes of permitting will be determined during construction. Approval for the contractor to take water in accordance with an agreed schedule of rivers and quantities has been provided by the Water Section for water use related to construction. The agreed schedule of rivers and quantities of water required for construction has been approved based on the capacity of the river to support this level of supply without affecting the quantity of water available for downstream users.

3.5 Construction Camps

It is proposed that the main construction camp will be in Port Vila and workers will be transported each day to the work site. The contractor may be required to accommodate up to 20 workers in construction camps at 2 other possible locations on the Ring Road at Saamoa Point at 16.7km and at Louman Farm at 46.8km. The contractor will assess the need for these camps as the construction programme develops. Construction camps normally include workers' living and eating areas and the grounds where equipment is stored and serviced. They often include areas where materials are stockpiled. The management of the construction equipment operation and servicing should ensure the prevention of spills and pollution. The EMP includes provisions for ensuring appropriate sanitary and solid waste management facilities at construction camps to reduce environmental degradation. Issues such as health and safety, risk of spread of communicable diseases and stress on resources and infrastructure, potentially resulting in issues with communities are also included. Water permits may also be required to supply both overnight construction and day camps with drinking water if a new source needs to be developed.

Day camps will also be established for the storage of equipment and materials for each 5km stretch of road being rehabilitated. These sites will also used by workers during breaks throughout the work-day. There will be sufficient portable toilets located on the sites, a container and area for the workers to eat and rest. It is considered that the temporary use of these sites will have a minimal impact on the surrounding environment. The sewage from the portable toilets must be disposed of at the Teoma landfill sewage treatment ponds. Sanitation systems should be located at a minimum of 100m from surface water.

Construction camps and the day camps provide economic opportunities for nearby communities selling food to the workers. These issues are included in the Social Assessment in Section 5 of the ESA.

3.6 Quarries/Borrow Pits

There are a number of sources for coronus pavement material available for construction of the Efate Ring Road Subproject. Firstly there will some material available as a result of the construction of the road; where cuts are made the material will be used as fill for base material. Additional material will be quarried from existing licensed pits at different points around the Ring Road. A total of 12 existing licensed limestone borrow pits are located close to the Efate Ring Road and in most cases are currently not easily seen due to rapid natural re-vegetation of the pits. Similarly, there are a number of PWD-operated pits. These pits are available to the Contractor for extraction of coral for road pavement materials. Coral will not be mined from coastal zones and no live corals will be mined or used.

In view of the fact that there are a number of licensed borrow pits available for use by the Contractor it is recommended that these existing licensed pits be utilized wherever possible to avoid the need for developing new pits, and the associated environmental impacts from clearing vegetation and extraction. The decision of which quarries and borrow pits are to be used will also be dependent on costs related to transport of materials from pit to site, extraction, access to the pit and fees or royalties to be paid. Initially, the Contractor has identified four potential borrow sites around the Efate Ring Road which are currently being investigated as to the suitability of their materials prior to a formal request for licensing or a review of requirements to extend the current operation.

The four sites include:

- Snake Hill (4.5km)
- Kakola (Mangaliliu Junction), (7.6km)
- Meten Hill /Torotoro (Tanoliu) (24.6km) and
- Saamoa Point, Tanoliu (16.7km)

The Quarry Management Plan (QMP) prepared by the Contractor will provide mitigation measures relating to potential environmental impacts resulting from the extraction of material. The environmental impacts were identified during an environmental screening of the four potential sites listed above. These assessments are available for public review from the MCA Office.

The environmental screening indicated that all of the proposed additional sites have either been previously used as quarries (Snake Hill, Kakola, Meten/Toro), or currently being used as a quarry (Saamoa Point). However, none of these three sites has a current Quarry License. For the purpose of environmental screening these four sites should be considered as existing borrow pits or “highly disturbed” sites. On this basis it is considered that no further environmental assessment other than the mandatory Preliminary Environmental Assessment (PEA) to be undertaken by the Minerals Section of the Department of Geology Mines and Water Resources (DGMWR), would be necessary to progress the application of a quarry license should these sites be selected for use by the DB Contractor. In the case of the Saamoa Point quarry, a permit exemption has been granted by the Commissioner of Mines as the quarry is on leased land, an agreement exists between the DB contractor, the lessee and the custom owner, and any quarry material will be only used on site.

All borrow pits have the potential to contaminate groundwater by exposing the water table to the air and allowing contaminated surface water to leach into the ground. Borrow pits need to be located away from groundwater supply wells during restoration of used borrow pits. The DB Contractor will ensure that the groundwater table is covered and not exposed to contamination.

The EMP includes provisions to ensure that the environmental impacts of all borrow pits and crushing operations are minimized and acceptable. The EMP includes a requirement for the Contractor to prepare QMPs, which will address all the necessary environmental mitigation and site restoration requirements to ensure no unacceptable impacts will arise from quarry operations.

For the Quarry sites any resettlement issues will be addressed if required by RAP procedures. Where it is necessary to extend a quarry, additional ESA issues may need to be addressed and appropriate permits gained from Government. Increased use of the access roads to the Quarry/Borrow Pit sites with heavy machinery may have increased impacts of noise and possible dust nuisance for adjacent landowners that will need to be considered in further assessments.

In the case of the Quarry required for the construction of the proposed barge landing and hard stand area adjacent to Havannah Harbor written confirmation from the Director General of Lands advises that "no permit is required to enable Downer EDI Works to access the quarry to excavate material to be used to extend the barge landing, all of which are on the property leased by Mr. Jonathan Delaney….Should the parties decide to sell any of the quarry material or to use it off the leased site, a quarry permit will be required under the normal procedures including the requirement for 30 days public notice." The EMP includes provisions to ensure that such a permit is secured if plans change.

3.7 Secondary and Cumulative Impacts

Road improvements can lead to secondary impacts associated with improved access. Secondary impacts are difficult to measure but can ultimately have more profound consequences on the environment than primary or direct impacts. Over time they can affect larger geographical areas of the environment than anticipated. Monitoring of these impacts over time is necessary to measure any potential impact. Positive and negative potential secondary impacts may include;

- Increased exploitation of natural resources such as forests and protected areas as these become more easily accessed. This requires the relevant Government Departments to increase monitoring and enforcement procedures for the protection of forest and protected areas.
- Increased runoff from sealed road.
    - Incremental changes within the watershed may occur as a result of a change in drainage systems potentially generating additive effects resulting in damage to the function of ecosystems and communities relying on the ecosystem's services.
    - The effects of roadside drainage systems associated with the Subproject are generally positive. Sections of the road currently prone to flooding

such as in Tanoliu Village will benefit from the implementation of a properly designed road drainage system.

- Growth in tourism activities.
    - Locally designated Marine Protected Areas currently managed and monitored by the communities may be more difficult to protect with greater use of the surrounding marine areas
    - Damage to vegetation and eventual erosion of roadside pull-out areas for tourist buses, in particular on Klems Hill, Snake Hill, and Havannah Harbour sections where spectacular views from various points could encourage tourist buses to stop at particular locations in the absence of designated rest areas. Some mitigation measures that are recommended to the contractor include a number of designated rest or parking areas established at appropriate locations on the Ring Road to support the National and SHEFA Tourism Plans and existing tourist patterns. This will allow tourist vehicles to stop in a safe manner with minimal disturbance to the environment.
- Urban growth adjacent to the road, and expatriate leases.
    - Vegetation clearance,
    - Increased solid waste,
    - Competition for water and land resources.
    - Reduced access to marine resources.
    - Need for construction of improved services such as sanitation, power and telecommunications.

  MCA has committed to increasing awareness and dialogue about these negative impacts as part of all future consultations

Apart from the construction of the roadside pull-out areas, mitigation of all indirect impacts is beyond the scope of this Subproject. However, it is important that Government planning authorities be aware of these issues and give them due consideration in all future development planning for Efate. MCA's whole of Government dialogues and the increased awareness and capacity of MCA's implementing agencies will help to broaden national debate on these important social issues. MCA will continue to work with tourism planning authorities and stakeholders to maximize benefits from the Compact program.

With good planning involving broad stakeholder participation and taking advantage of lessons learned from other countries, many of the potential secondary impacts identified above can be mitigated to a greater or lesser extent. The PEA notes Vanuatu's environmental protection legislation and constitutional provisions, the adoption of multilateral and regional environmental agreements, strategic framework linking planning documents from the national policy level to the local planning areas, and streamlined public administration which should help to maintain and improve environmental quality. However it also notes that while the Vanuatu Government appears able to cope on the surface, budget constraints, lack of political will and a depleted Environment Unit shows a limited commitment to the environment[9]. The potential negative secondary impacts of the project need to be seen alongside the benefits expected from the project. MCA will continue to promote a strengthening of environmental and social impact awareness and mitigation skills through the Program

and with the implementing entities and the strengthened PWD team, especially through the new Environmental and Social Impact Officer position.

4.0 Social Impact Assessment

The Efate Ring Road currently provides villages on Efate access to the capital of Port Vila, national airport and seaport. Of the estimated 50,000 people who live on Efate, about three quarters live in Port Vila, with the remainder living in small villages located within a few kilometres of the northern and eastern coasts, whilst the centre of the island is virtually uninhabited. The Ring Road serves 26 villages, with 21 villages located along the road and 5 other villages in the wider catchment area. There are also a number of close off-coast islands with regular commuters to Vila via coastal villages.

Households in each of the villages are mostly engaged in subsistence agriculture (gardens) including growing of taro, cassava, banana, sugar cane, and yam, and some cash crop production (mostly coconut, banana and taro). Households in Samma, Siviri and Matarisu have livelihoods associated with the forest including harvesting of hardwood, while the milk tree is also harvested in Epule and Matarisu. Households in Mele Maat and Tanoliu have livelihoods associated with the forest including harvesting of hardwood and bean trees. There are small stores in the villages and some home-based shops or canteens operated by women out of their kitchens.

Only Mele Maat is connected to the national electricity grid by UNELCO; the other villages supply their own electricity with household generators, with some solar. Communication networks have recently improved with the roll-out of the Digicel network providing cellular network access to the whole of Efate.

4.1 Contribution to Poverty Reduction

The Subproject can contribute to local poverty reduction and improve the livelihoods and well-being of the people in the Subproject area by provision of income generation opportunities such as construction employment and provision of goods and services to workers. The MCA Steering Committee has directed that preference be given to ni-Vanuatu workers where possible, and that un-skilled work be reserved for ni-Vanuatu workers. This is supported in Vanuatu legislation and complies with MCC guidance that benefits are afforded to local laborers including women wherever reasonable.

The following guidelines are provided to assist the contractor;

(i) Explicit prohibition of the use of foreign unskilled labor;
(ii) Limits on the import of semi-skilled workers where such workers already exist or can be reasonably trained within Vanuatu.
(iii) Unskilled labor for the Efate Ring Road should be sourced locally in the first instance.
(iv) A balanced approach should be taken in procurement for retaining good local labour and provide training with continued employment, where possible selected from local villages
(v) Payment of legal wages to workers;
(vi) No use of child labor for construction activities;

(vii) Encourage the inclusion of women as well as the poor and vulnerable persons in the local construction force;
(viii) Equal wages for men and women for work of equal value; and
(ix) MCC and MCA also encourage the use of locally sourced materials in the road reconstruction to the maximum extent possible.

Following reconstruction and sealing of the road, an improved flow of traffic, goods and passengers will provide opportunities for those seeking employment or economic opportunities outside the village and support greater distribution of tourism activities around the Island. This will help enable the transition from household level subsistence living to greater market production. Improved access to health services and education opportunities for communities will also contribute to poverty reduction.

Additional vehicles (cars and vans) into the Subproject area will increase transport services for passengers and cargo, reduce travel times for both vehicles and pedestrians, as well as reducing costs associated with vehicle travel along the road (vehicle operating cost savings). The consultation in Tanoliu Village found that the community was waiting for the road to be improved before they purchased a truck. The existing poor road conditions damaged vehicles beyond the communities' capacity to maintain them.

An opportunity for contribution to localized poverty reduction is through enhancements to the tourism sector derived from an improved Ring Road. The PESA noted that there has been limited tourism development away from Port Vila. The condition of the road is a disincentive to development causing slow and uncomfortable journeys and considerable wear and tear on vehicles; tour operators are reluctant to use larger more comfortable buses, and tourists are disinclined to take the time needed to visit the outlying parts of the island. Around the island tours provide a reason for tourists to stay longer, spend more, and distribute the spending away from the main areas. The Government has proposed that completing the sealing of the road will promote further tourism development away from Port Vila, and further agricultural and land development. MCA has opened up dialogue with the Tourism and Hospitality industry and has contributed to the new visioning of the industry's development through the early release of its tourism surveys and associated reports. Similar dialogue is being undertaken with the agriculture industry planners. This ongoing work will assist ni-Vanuatu in particular to identify income-generating tourism and agriculture opportunities emanating from the upgrade of the road.

Following completion of the re-construction there will be the need for a maintenance program to ensure the sustainability of the investment and improvements to access. By facilitating this program through the service performance agreements with MCA and PWD there will be increased opportunities for the engagement of community contracts through simple labour-based equipment support (LBES) methods. The main components of the LBES approach include (i) introducing LBES methods of road construction and maintenance whenever cost effective; (ii) training and employing local small-medium sized community contractors, and (iii) supporting access to equipment through leasing, hire purchase and/or other methods. The DB contractor has undertaken to promote and support community road and bridge maintenance skills as part of its obligations to provide an ongoing maintenance plan.

Participation in any proposed LBES maintenance programs will provide opportunities for women and men to acquire skills in road works, which they could then apply to community-level infrastructure. Regular involvement in economic activities empowers women in particular by providing an opportunity to earn money and to be involved in decision making. Access to income provides women an opportunity to acquire productive assets, further contributing to their economic empowerment. Overall, the community will benefit from the increased purchasing power of the workers in their communities.

The potential economic benefits can be summarized and measured in terms of:

- Improved connectivity for communities to health services;
- Improved access for tourism related activities, and benefits to the tourism sector in general;
- Induced agricultural production;
- Time savings (as a result of improved travel and vehicle speeds);
- Passenger and freight cost savings;
- Vehicle operating cost savings;
- Generated traffic; and
- Wages paid to local labor during road rehabilitation and for ongoing maintenance activities.

4.2 Improved Access to Services and Facilities

During the construction phase the benefits derived from improving access will not be realized. Indeed it will be important that construction activities do not unreasonably hamper access and movement of goods and people around Efate during the civil works and road reconstruction. The DB Contractor is required to prepare and submit a traffic management plan that will address this (refer to sub-section 4.6) and must provide appropriate notice for any approved disruption or closure.

During the operations phase, the social impacts and benefits in respect of improved access to services and facilities are the same as those already described for poverty reduction. No mitigation measures are required.

4.3 Land Acquisition and Resettlement

The Department of Land, Survey and Records (DLSR) advised that the reserve for Efate Ring Road had been surveyed and acquired. However further survey has found that there are points where the road has deviated from the alignment. Issues relating to these deviations will be addressed in the RAPs. Generally the reserve is 20m wide but in some sections it is 15m. The corresponding land titles/records were provided.[4] The indicative design standard (12m road including drainage) would allow for a construction zone beyond the roadway of between 3m and 8m depending on the width of the surveyed and acquired road reserve (i.e. 15m or 20m). For the purposes of construction the 3m to be

[4] These land titles were sourced and provided by a member of PWD's ESU who previously worked as a surveyor for the Department of Lands, Survey and Records and was aware of the most updated information available.

cleared of structures and vegetation on either side of the 6m seal may need to be reduced at some points, for example where the width of the road is restricted by steep rock faces. Where the clearance of vegetation and structures is required to preserve sight lines and traffic safety the required 3m will be cleared.

A detailed reconnaissance of the priority road segments was undertaken during which the existing road pavement, shoulders, and drains were measured at various points along the alignment. During the reconnaissance survey measurements were undertaken along the newly reconstructed Japanese Road for comparison with the proposed standard for remaining sections of Efate Ring Road. It was found that the sealed road pavement is 7m wide, the shoulders are 1m each, and the asymmetrical drains on either side are between 1.8 and 2.0m (giving a total width of 13m).

Along both sections of road there are fences, structures, and trees that could require relocation to move back to allow construction of the road or access for plant and machinery for construction. These are being progressively identified to the FIDIC Engineer through the survey that is being undertaken as part of the preliminary investigations.[5] This information will form the basis of any RAPs.

There are also locations where structures and trees are located within the proximity of the ROW, and care will be required when working in these areas so as not to affect them. These will be additionally identified by the DB Contractor as part of the survey and can also be addressed in the RAP. [6] Where simple structures (wood, thatch and corrugated iron), are required to be moved back beyond the ROW this can be done in less than one day, and will therefore have minimal impact on livelihoods. Discussions with owners of any assets that require relocation will be undertaken as per the Consultation Plan. The moving of structures (fences and stalls) can be done with assistance from the DB Contractor and PWD. The full ROW does not need to be completely cleared to facilitate the construction activities, as long as a construction zone can be accommodated. The details of the location of trees, structures and assets within the road reserve will be included in the RAP for each section of the Subproject.

The relocation of telecom and/or power poles may be required where they are located either in the existing shoulder or close to the edge of the road. Depending on the constraints on the opposite side of the road these will be relocated appropriately to accommodate the works.

Ongoing maintenance activities will include such activities as filling of pot-holes and ruts, minor vegetation clearance for the sides of the road in the event it becomes over-grown, and clearing of the culverts and bridge areas. These works are not likely to require land acquisition or create resettlement impacts during operation. It may, however, be necessary to locate new sources of gravel for road maintenance, which may involve resettlement impacts.

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[5] As part of the initial investigations and preliminary design works, the DB Contractor is required to undertake a survey that identifies all structures and trees within 15m either side of the road centreline, this provides a corridor of 30m which is greater than the 20m ROW which has been surveyed and acquired.

[6] During the reconnaissance surveys discussions were held with people in Tanoliu and Eton villages. There is wide knowledge of the PWD's ROW, and some people admitted to having planted small hedge shrubs or erected fences within the ROW. They also indicated they were happy to remove these, or be assisted to move them back.

In the event of any unforeseen land acquisition or resettlement needs during operation of the Ring Road, the Government will prepare a resettlement plan according to relevant laws and regulations and World Bank's policy on Involuntary Resettlement and Project's framework. The PWD-ESU will ensure that no maintenance activities are undertaken until Government has reviewed, and approved, such resettlement plan. The PWD institutional strengthening program implemented as part of the Compact is addressing the capacity issues related to the future management of the environmental, social and resettlement issues during operation of the road.

A RAP assessment and consultation has been undertaken for the barge landing, hardstand and associated quarry. There will be no relocation or loss of shelter, assets, or access to assets, or loss of income sources or means of livelihood. No structures, trees or crops will be displaced. No resettlement issues have been identified and therefore there are no triggers for a RAP.

The RAP for the Epule Bridge and Epau Creek Crossing was completed and forms part of the ESA EMP document, and is available to the public from the MCA Office in Port Vila.

4.4 Impacts on Cultural Environment

A survey of villages located near the Ring Road was undertaken by VKS to identify sites of cultural, historical and archaeological importance that should be documented before the commencement of construction. The results of the consultation with the chiefs and landowners were that no sites of cultural or historical value were identified within the five hundred metre boundary from the road, except for the Nabanga trees identified above in the Ecological Assessment. As elsewhere in the Pacific cultural values are linked with the ecology of the area so ensuring the protection of streams and rivers, marine resources and substantial vegetations such as the Nabanga also supports the protection of cultural values.

Two sites of potential archaeological significance were identified and require some consideration during the construction phase of the Subproject. Lapita pottery found at the sites is linked to of the first arrival of people on the island, some 3,100 years ago, up until roughly 1,000 years ago. The first site is around the Eruwiti area (south Efate). The VKS is planning an excavation in the area in the near future and has requested immediate notification if anything of archaeological significance (i.e. anything that does not occur naturally) is uncovered during construction. The other key area of archaeological interest is Tanoliu and its surrounding area. The area once hosted a large population as evident from the density of surface pottery shards. Early European history in that area includes the first French fort built in Vanuatu in 1886. Missionaries and traders made a base in the area and during the Second World War the Americans had a base there. The VKS has requested immediate notification and adherence to the VKS protocol if any objects of archaeological significance, including human remains, are uncovered during construction.

4.5 Health and Safety

The Subproject's construction phase can cause a range of health and safety impacts. The main impacts on health and safety are associated with

(i) Air pollution and noise;
(ii) Contamination of local water supplies (runoff from road works, groundwater contamination in borrow pits and waste water from construction camps);
(iii) Risk of accidents at work sites;
(iv) Traffic safety issues; and
(v) The risk of spread of communicable disease is considered to be medium to high and is dealt with in the next sub-section.

Observing general health and safety requirements, including provision of safety and protective gear and equipment to workers, will reduce the risk of accidents at the work sites. If construction camps are established they will be equipped with a health post, which will include first aid and basic medical supplies. To reduce the risk of incidents at the camp or work site, access to any construction camps and work sites by other than those authorized will be prohibited.

It should be noted that the Design & Build Tender Document requires that the DB Contractor "Implement health and safety requirements of the approved EMP and directives as issued as a result of periodic inspections to be undertaken as part of the supervisory role required of the Engineer, to ensure compliance with the requirements of the EMPs."

Mitigation measures for reducing and avoiding impacts on health and safety include:

- Provision of adequate protection to the general public in the vicinity of the work site, including advance notice of commencement of works, installing safety barriers if required by villagers, and signage or marking of the work areas;
- Provision of safe access across the works site to people whose villages and access are temporarily affected during road rehabilitation activities;
- Use of signs and other appropriate safety features to indicate construction works are being undertaken;
- Adequate signage and security provided at the work camp site and prevention of unauthorized people (including children) entering the work camp site or workshop area;
- The DB Contractor will include an environmental specialist to undertake environmental management responsibilities such as preparing EMIPs, monitoring and also to address health and safety concerns and liaise with MCA, PWD-ESU and villages (as per the Consultation Plan);
- The DB Contractor will provide adequate health care facilities including a health post and access to first aid facilities if construction camps are set up. The DB Contractor will provide construction workers personal protection equipment and training of all in basic sanitation, hygiene and health care issues, health and safety matters, and on the specific hazards of their work;

- The DB Contractor will ensure that no wastewater is discharged to local water bodies;
- The DB Contractor will ensure safe and clean facilities including sanitation and drinking water is provided to all workers;
- The DB Contractor will ensure any borrow pits used for coronus and other materials extraction are properly restored to ensure groundwater resources are not contaminated;
- No site-specific landfills will be established at the construction camps;
- Septic tanks and garbage receptacles will be set up at construction camp sites camps, which will be regularly cleared by the contractors to prevent outbreak of diseases. Waste will be disposed of at sites approved by the Environment Unit, MCA and local land owners;
- Adequate signage and security will be provided at the work camp site to prevent unauthorized people (including children) entering the work camp site or workshop area; and
- The DB Contractor will ensure that there is adequate drainage throughout the work site (including any camp) to ensure that disease vectors such as stagnant water bodies and puddles do not form.

Following completion of construction activities, health and safety impacts are associated with traffic issues; these are dealt with below in Section 4.6.

4.6 Traffic and Access Issues

The current design for the proposed rehabilitation works do not include road realignments so all proposed works will occur within the existing road 15 – 20 m road reserve. If a realignment of the road is required as a result of RAP consultation an appropriate assessment will be made to address any issues. The DB Contractor is required to submit a traffic management plan that will address access and safety issues during construction.

An increase in traffic movements, in particular heavy vehicle movements will occur on and in the vicinity of the site of the proposed barge landing, hard stand and associated quarry adjacent to Havannah Harbor. The arrival of a loaded barge in mid-August 2008 will require 24 hour operations for approximately 72 hours for unloading, with associated noise and light. It is recognized that there may be some disturbance during this period therefore neighboring properties, though some distance from the site, have been consulted. It is considered that the impacts will mostly be contained within the site.

During construction the longest expected road closure relates to the Klems Hill. As a result of the steep gradient it may need to be closed for up to 3 weeks. To mitigate any adverse effects on around the island traffic an alternative route is being investigated (Old Devils Point Road to Mangaliliu that bypass the Klems Hill segment. Any proposed temporary bypass will be subjected to the standard ESA/EMP and RAP procedures.

Road improvement projects can also inadvertently cause adverse impacts on road and traffic safety as a result of higher vehicle speeds due to improved road conditions. An increased traffic volume and possibility of higher vehicle speeds can create the potential

for accidents involving pedestrians. In Vanuatu children often play on roads, and families traditionally use roads as a central area for social gathering, particularly in the evening. Traffic speed, especially through villages, is a risk requiring management for the operational phase of the Subproject. In general traffic safety will be improved following rehabilitation and routine maintenance of the project road, inclusion of the shoulder and minor widening of existing road formation where it is less than 6m (within the ROW) to allow for safe passing of vehicles.

The design improvements that could encourage higher speeds will be mitigated through signage and physical speed deterrents such as speed humps (favored by villages consulted) or chicanes (already provided by one-lane bridges in some instances such as the entrance to Tanoliu village). A reduced design standard through villages, which force drivers to slow down, is also acceptable Pacific practice. Awareness raising through village meetings and through road safety programs included in schools will help mitigate some dangers. An ongoing traffic safety campaign and awareness is recommended to reinforce behavior change messages.

It should be noted that overgrown vegetation poses a traffic hazard, especially when it reduces sight lines around corners. Vehicles are known to cross to the other side of the road to avoid heavily vegetated areas along sections of the existing Ring Road, posing accident risks to oncoming vehicles. Clearance of road-side vegetation should be included as part of the road maintenance program.

Mitigation measures for reducing and avoiding impacts on traffic and access include:

- Signs and other appropriate safety features will be used to indicate construction works are being undertaken;
- Preparation (by the DB Contractor) of a traffic management plan addressing access issues during construction activities (as required by the tender document);
- Provision of safe access across the works site to people whose villages and access are temporarily affected during road rehabilitation activities; and
- Consideration of a reduced design standard through villages, and/or inclusion of signage and physical measures (such as speed humps and chicanes) to reduce traffic speed in the vicinity of villages.

4.7 Risk of Spread of Communicable Diseases and Trafficking

The transmission of communicable diseases such as sexually transmitted infections (STIs) and Human Immuno-Deficiency Virus (HIV) is a potential impact of the construction phase posed by construction workers engaging in either commercial sex or sexual relationships with local people.

The high risk of spread of STIs and HIV associated with the project is a function of a number of factors including

(i) Lack of knowledge about the risk;
(ii) The length of time large and relatively mobile populations will be located in the Subproject area; and
(iii) Engagement in high-risk behaviors (such as increased alcohol consumption and multiple partners etc).

The Subproject will require a construction workforce of approximately 80 people. The current proposal is for a team comprised of approximately 20 foreigners, and 60 Ni-Vanuatu, with local people from Efate employed as a priority. The workforce is required for supervision, equipment and vehicle operation, vegetation clearing, material sourcing, pipe and culvert crews, erosion control crews, pavement crews, bitumen spraying crews, manager, as well as ancillary staff such as cook, cleaners and security guards. This construction force could be located on Efate for 18 months.

Experience with construction camps in other Pacific Island countries infrastructure projects in areas with limited health awareness, is that during construction phase there is a risk for both the construction workforce and the communities along the road. A STIs/HIV/AIDS awareness and prevention campaign in conjunction with the ongoing efforts of Government, Donors and the NGO partners is considered to be the most effective mitigation of these risks.

There are currently a number of different agencies working on STIs/HIV/AIDS awareness-raising and prevention campaigns. Local NGO, Wan Smol Bag, is part of the ADBs regional HIV/AIDS program and provides information and builds links with other organizations in the delivery of awareness and prevention and supports communities directly with general and reproductive health (including establishing community health clinics). Wan Smol Bag has developed a package of instruction, education, and communication (IEC) materials[7] related to STIs and HIV and a module or standard workshop for delivery, which could be ideal for the contractor's construction force and adjacent communities prior to construction. Wan Smol Bag has also developed relationships with national and provincial health agencies and other NGOs working in the sector. Linking with an already established network in the area would be beneficial in terms of implementing the awareness and prevention aspects of the program aimed at the villages along the Subproject road.

Mitigating the risk of spread of STIs and HIV/AIDS during the construction and operation phase of the Subproject will include implementation of the STIs/HIV/AIDS awareness and prevention program as a preliminary program for all major construction and will include:

- Provision for the DB Contractor to ensure the construction workforce attends STI and HIV/AIDS prevention workshops (including in Bislama for the local workforce). The workshops will be delivered to the contractor's workforce prior to commencement of any civil works;
- Village based community awareness-raising about transmission of STIs and HIV, reproductive health and safe sex[8]. The program will be implemented prior to contractor mobilization in the area;
- The DB Contractor providing adequate health care facilities including an HIV/AIDS education post and first aid facilities within the construction campsite[9]; and

7 The IEC materials are currently being translated into Bislama with funding through SPC (the regional organisation focusing on HIV/AIDS in the Pacific).

8 These include separate meetings for men and women and within each gender group further separating them into groups of teenagers/youth and older people in order that age and gender specific and targeted messages can be included in the workshops.

- If required a follow-up awareness campaign at an appropriate time during construction to be determined by the contractor and the provider.

In addition to the provisions of the EMP, the following measures for the management of social risks are also recommended:

Table 1: Measures for Management of Social Risks

Spread of STIs/HIV/AIDS and Child Exploitation		
Subproject Activity	**Risk Management activity**	**Expected outcome**
Immediate pre-construction	EMP to include provisions for HIV/AIDS education and make condoms accessible to all employers (paid by the DB Contactor) Wan Smol Bag HIV/AIDS training team contracted to provide community awareness program	All households in the Subproject area will be fully informed about the risks of HIV/AIDs; No unprotected sexual activity will occur during construction
Construction	Monitoring by DB Contractor and FIDIC Engineer	HIV/AIDS prevention program is implemented
Maintenance	Reinforcement of HIV/AIDS message during performance service agreement contracts and other maintenance work, including HIV /AIDS education to maintenance contractors	
Conflict between construction workers and villagers		
Subproject Activity	**Risk Management activity**	**Expected outcome**
Immediate pre-construction	DB Contractor to ensure labour-force engaged are aware of relevant provisions of Consultation Plan EMP provisions requiring DB Contractor to set a code of behavior towards girls and women, and requiring workers to treat landowners/villages with respect.	Workers will maintain acceptable codes of conduct on threat of dismissal.
	Contractor visits all villages to explain and negotiate construction activities and access to resources and construction materials (as per Consultation Plan) and maximises local employment opportunities.	All households in the Subproject area will be fully informed about construction works; Negotiations will be conflict-free Local villagers will be employed by the Contractor if appropriate skills are available.
Construction	Monitoring by DB Contractor and FIDIC Engineer	No conflict during construction

4.8 Other Social Impacts – Stress on Resources & Infrastructure

Workers accommodated temporarily in construction camps can place stress on resources and infrastructure of adjacent communities, which could lead to antagonism between residents and the contractor. The DB Contractor will re-construct the road in 5km sections (where possible with the weather dependent construction programme) and will set up satellite day camps to support construction workers within that 5 km section being rehabilitated. These day camp areas will include a container for equipment adjacent to the road, a simple rain shelter and 2 toilets. These areas will be determined in consultation with villages as they will require clearing of roadside vegetation and possible temporary resettlement issues.

The provision of 2 construction camps for the storage of materials, equipment and accommodation for up to 12 workers may also be established during construction. There

9 Under the provisions of the Design & Build tender document (sub-clause 6.7) the Contractor is required to implement an HIV/AIDS awareness program in the Project area as required by the approved EMP.

are additional issues both social and greater environmental impact associated with accommodating construction workers on these sites, which have largely been addressed in the social assessment. Provision of water on these sites may also require water permits to be sought from the DGMWR prior to establishment.

The contractor will where possible utilize the community contract system with the support of PWD to engage local labor to clear scrub and over-hanging vegetation prior to construction. This will reduce the pressure of construction camps on the surrounding resources.

Mitigation Measures:

- If the 2 construction camps (overnight accommodation) are required the contractor will provide temporary facilities such as health care, eating and sleeping areas (including a cook and provision of meals), water and electricity supply, telecommunications, so that existing facilities and services of adjacent villages are not over-burdened.
- The DB Contractor will be responsible for removing all temporary structures and reinstating the land to its pre-project condition at the completion of the works for both day camps and, if necessary, the construction camps.
- Construction workers should be limited to Subproject sites (immediate site of works on the road and camp site).
- Workers should be briefed on land owner and property boundaries and village protocol, rules and terms of conduct (especially when addressing women and elders).
- Contract employment rules will be enforced relating to any damage of productive trees and gardens, and access to the beach, foreshore and freshwater springs.
- MCA to brief the Contractor on the provisions of the Consultation Plan to allow the development of a communications plan for outlining protocol between the project team and community, in particular the contractors Stakeholder Liaison Manager, village chief and elders, as well as communication between the contractor and Project (MCA, FIDIC Engineer).
- The DB Contractor will be responsible for the behavior of construction workers outside working hours for those construction workers accommodated outside Port Vila. In the event that there are complaints about the behavior or conduct of construction workers, complaints will be dealt with immediately and seriously, by the contractor, and the method of addressing the grievance will be relayed to the complainant. If the complainant is not satisfied that the complaint has been resolved, the worker causing the complaint should be restricted to working on another site. The lodgment and resolution of complaints will be recorded and monitored.
- Children and teenagers should be expressly forbidden entry to the construction camp. This would also assist in reducing the risk of coerced or transactional sex and other forms of child exploitation.
- Access to the construction camp and work site should be carefully monitored. Only authorized personnel shall be permitted entry into the construction camp.

The increasing demand for land, in particular coastal land as a result of improved access may have an indirect negative impact on Ni-Vanuatu land owners. The increase in land values in recent years in Vanuatu, in particular in Efate has led to disputes within and

between communities over the rightful owners of pieces of land and therefore who has the right to lease land. These disputes can fracture communities and result in expensive and time consuming court cases. MCA has entered into an agreement with the Ministry of Lands for the appropriate officers to provide timely assistance to mitigate these issues arising as a result of the Ring Road Subproject.

4.9 Gender Issues in Vanuatu

Clear gender differences exist in Vanuatu, in terms of access to resources and entitlements. Current social, economic and political indicators highlight the disadvantaged position of women in all areas. Women's focus group discussions undertaken during the consultations recognized the following issues underlying potential impacts on women of the Subproject:

- The gendered nature of transport in the project area and the differential impacts of failing infrastructure between the genders;
- Women's participation in construction activities; and
- Role of women community contractors and the barriers they face in responding to the implementation of a gender-equitable community road maintenance program.

The results of the focus group discussions identified both negative and positive social impacts on women that could result from the Subproject. The main benefits of the Subproject identified by the women related to improving their economic opportunities as a result of greater access to Vila, the Market and to tourists. The improved access to heath care services in Port Vila was also highlighted by the women.

There will also be economic opportunities during construction with both traditional gender roles such as provision of food to construction workers and potential for employment by the contractor related to construction.

Measures that can be included in the project to maximize benefits for women, and to remove any constraints on the participation of women, can include:

- Identify and remove any potential gender-bias within the procurement processes for construction workers;
- Provide training and information on LBES and maintenance procedures that address gender issues including a greater focus on gender-balanced community participation, enabling an understanding of the gender impact of failing infrastructure, and of the non-economic benefits of investment;
- Encouraging community contractors to include women;
- Identify means (such as micro-finance or revolving credit schemes) to overcome other possible barriers such as difficulty in securing the start-up capital that a small-scale contractor or community contracting group requires to purchase equipment and tools and to provide flexibility with cash flow (especially prior to first invoice being paid);
- Support women's involvement in economic opportunities along traditional gender roles such as provision of food to construction workers while encouraging women's involvement in less traditional roles such as construction activities

- Requirement for equal pay for equal work for both men and women; and
- Requirement for Contractor (construction) and PWD (maintenance) to submit records of labour, dis-aggregated by gender and origin (imported or Ni-Vanuatu local or outside provinces).

The improved access to services and facilities in Port Vila will have longer-term gender benefits of improving the education and health status of women with increased opportunities of employment outside the village (in addition all community members will also be able to access health care services especially during emergencies). The gendered outcomes of the project will be enhanced with women's participation in construction and maintenance activities.

With the implementation of LBES maintenance activities in the villages participation will need to be balanced with the usual (paid and non-paid) workload of women and men. Women may be disproportionately affected since in addition to providing labor, they will continue doing household chores and other unpaid work. This means that they may experience even more fragmented use of their time and have less time for leisure and rest.

Table 2: Summary of Subproject Gender Impact

Level	Labour/Time Issues	Benefits
Women	Acquire skills in road works; Hours spent on road activities can lead to more fragmented use of time and less time for rest and leisure	Access to cash; Increased control over, and access to, productive assets; Empowerment Increased exposure to public life; Increased confidence
Men	Acquire skills in road works; Hours spent on road activities can lead to more fragmented use of time and less time for rest and leisure	Access to cash; May wish to control income of wife/daughter Uneasy about women working on the road
Household	Women have less time for household chores and unpaid work;	Increased household food security; Improved household income; Improved nutrition Spare cash for school fees for children Ability to improve houses i.e. tin roofs/water tanks
Community	Less time for community work, meetings, group leisure; Formation of new networks	Trained community in road works Skills transferred to other community infrastructure works; Improved farm gate prices Reduced commodity prices Better access to markets and social services

4.10 Enhancement of Project Benefits

Overall the Subproject will result in beneficial impacts. The table below outlines how these benefits are maximized.

Table 3: Measures for Maximizing Subproject Benefits

Subproject Activity	Risk Management activity	Expected outcome

Subproject Activity	Risk Management activity	Expected outcome
Immediate pre-construction	Households in Subproject area fully informed about road works and will benefit from them to the maximum extent possible; Contractors are required to rehabilitate and maintain the road with the maximum local labor inputs, commensurate with good quality work paid at least the minimum rural wage; Awareness creation about the potential negative impacts (HIV/AIDS transmission and prevention)	All households in the Subproject area will cooperate with the project
Construction	Consultation regarding formalization of road-side stalls (upgrading standard of construction and inclusion of lay-bys to improve safety for vehicles stopping etc) Inclusion of tourist attraction signage highlighting villages and sites off the regular tourist route. Facilitating the implementation of SHEFA Province and National Tourism Master plan proposed tourism amenities.	Tourists are visiting villages not on regular tourist route; safe parking is provided at road side stalls.
Gender equity measures	Construction procurement in a manner that promotes women's involvement with traditional gender roles and non-traditional; equal pay for women and men; encourage community maintenance contracts for Road to include women.	Women from within Subproject area have opportunity to participate in project; Livelihood and socio-economic status of women improves
Maintenance	PWD and MCA ensure plan for maintenance contracts go to community groups wherever possible (as per PWD performance service agreements)	Road is rehabilitated and maintained with maximum local labor inputs

Proposed amenities to enhance tourism activities around Efate may be presented to communities as an option where possible to enhance the benefits of the Subproject. The SHEFA Provincial Council has provided a list of potential amenities that have been part of consultation with affected communities. The design and alignment of the road should consider the proposed location of these amenities and where possible facilitate access to these parking areas, bus bays and waiting shelters. The amenities listed are those currently being approved, and for which funding will then be sought;

- Pasal's Beach - *parking area / sign post*
- Blue Lagoon (fresh water) – *sign post*
- Eton Village - *bus bay / waiting shelter / bus stop sign / toilets*
- Eton Beach - *parking area / sign post*
- La Cressonaire Cascades – *parking area / sign post*
- Pang pang Village - *bus bay / waiting shelter / bus stop sign*
- Epau Village - *bus bay / waiting shelter / bus stop sign / toilets*
- Epule Village - *bus bay / waiting shelter / bus stop sign*
- Onesua - *bus bay / waiting shelter / bus stop sign*
- Takara Village - *bus bay / waiting shelter / bus stop sign*
- Paunagisu Village - *bus bay / waiting shelter / bus stop sign*
- Emua Wharf - *bus bay / waiting shelter / bus stop sign / toilets*
- Emua (Sky Deck) Look-out - *parking area / sign post*

- Saama Village Fire-Walking - *parking area / sign post*
- Siviri Cave - *sign post*
- Siviri Plains Look-out - *parking area / sign post*
- Torotoro Look-out - parking *area / sign post*
- American Pool - *parking area / sign post*
- Tanoliu Artifact Stalls - *bus bay / waiting shelter / bus stop sign / toilets*
- Lelepa Landing - *parking area / sign post*
  Mangaliliu Junction- *bus bay / waiting shelter / bus stop sign*
- Mangaliliu Hill Look-out - *parking area / sign post*
- Lama Mountain Look-out - *parking area / sign post*
- Klems Hill Look-out - *parking area / sign post*

Note: The GPS coordinates for the proposed locations of these amenities are available from the SHEFA Tourism Officer and the MCA Office. Practical standards for the waiting shelters would need to be consistent and agreed in consultation with the SHEFA Provincial Council, National Tourism office, National Tourism Development Office, and communities.

4.11 Conclusions of Social Assessment

The Subproject is welcomed by the people in villages along the road. The project will have an overall beneficial impact; improving access and connectivity, reducing travel time and travel costs, supporting tourism, while improving livelihoods and socio-economic conditions along the Ring Road.

The overall level of negative social impacts will be minor and the mitigation measures will manage any impact. The risks associated with the Subproject relate to the construction phase, and will therefore be temporary and localized. The mitigation measures include effective management of construction workers by the contractor, appropriate awareness of village protocol and rules to be provided to construction workers, and good environmental practices for construction sites.

The spread of STIs and HIV/AIDS during construction phase has been identified as a potential risk. This can be addressed through implementation of a STIs and HIV/AIDS awareness and prevention campaign aimed at (i) DB Contractor's employees, and (ii) villages along the Subproject road.

Another social risk of the Subproject is potential conflicts between contractors, local land owners and residents of the Subproject area. The communities raised concerns of sexual harassment of village women, damage to property, theft, drunkenness and fights between local men and outsiders. These issues would need to be addressed in the operation and management of the two construction camps being considered by the contractor.

The DB Contractor will be required to provide suitable accommodation for the foreigners and Ni-Vanuatu who do not live locally. Foreigners as well as Ni-Vanuatu from other islands or provinces employed by the DB Contractor can be considered as an 'opportunity' for young people to access money and goods which would normally be out of their reach. Villagers, during the consultations, expressed concern about children and teenagers spending time at the camps.

In addition to mitigating social impacts (or managing the social risks), there are measures that can be included in the project to maximize benefits.

4.12 Specific Issues Relating to Tanoliu Village

The section of road proposed through the village of Tanoliu adjacent to Havannah Harbour has a number of environmental, social and potential resettlement issues that require more detailed assessment due to the complexity of the issues and the impact on design and engineering options. Tanoliu has a history of complex land tenure and leadership issues that have been difficult to resolve. These differences will need to be set aside for an agreement for the alignment of the Road to be reached and accepted by all groups within the community.

The social and environmental issues that need to be considered in the design and alignment of the road include;

- A consultation process which acknowledges the current land ownership and leadership issues in the community and which maximizes the participation and support of all villagers.
- Recognition of the importance of the Tourism precinct and its development plans:
  - The existing tourism activities including the road side stalls with souvenirs and the WWII museum.
  - The community marine conservation area and turtle sanctuary to support tourism activities.
  - The number of tourist vehicles already stopping at this section of road to visit the roadside stalls.
- The current location of the stalls, between the eroding foreshore and the road is already impacting on the space available to operate the stalls.
- A number of Nabanga trees located within the road reserve.
- Tanoliu's archaeological significance (lapita pottery, WWII and missionary heritage, and recent diggings). Care must be taken during construction with any earthworks in the case of discovery of archeological objects including human remains.

The engineering design for the road at this section will therefore need to address the potential coastal erosion, storm water runoff into the abutting marine environment while considering the needs of the community. There are a number of options being considered for the section of road including the narrowing of the road at this point and realignment of the road from the existing location. Further consultation, joint site visits and a RAP assessment will be completed prior to the preparation of final designs. These assessments are scheduled for August-September 2008.

The Ring Road construction gives Tanoliu an opportunity to protect the roadside stalls from damage related to coastal erosion and to enhance its tourism sector further with the potential to provide the following measures;

- Provision of a designated parking area for tourist vehicles in Tanoliu Village would reduce potential cumulative impacts as described above while at the same time enhance the socio-economic benefits of the project for the community.
- Provision of a public toilet at Tanoliu Village for the tourist traffic. Currently there are no formal/sanitary toilet facilities available for tourists.
- The option for relocation of some stalls to a more a stable location.

5.0 Environmental Management Plan

The EMP identifies the potential environmental and social impacts and outlines the mitigation measures for the identified impacts required for the Efate Ring Road MCA02 Subproject. The Contractor is required to produce an Environmental Management Implementation Plan (EMIP) for the Subproject to detail how the Contractor will implement the specific site mitigation measures. This must be completed and approved by the client prior to commencement of the upgrade works. Additional detail is provided in the approved EMP and EMIP for the Epule Bridge and Epau Creek Crossing available from the MCA Office).

Institutional responsibilities and reporting and review requirements associated with all Subproject EMPs implemented under the MCA Project are described below. This is followed by the detailed EMP matrix (Table 4) and Environmental Monitoring Plan for MCA02 The Efate Ring Road Subproject (Table 5).

5.1 Institutional Responsibilities

5.1.1 MCA-Vanuatu

MCA will be responsible for ensuring that the overall project is implemented in accordance with the MCA Compact and related agreements, Vanuatu legislation and MCC guidance. These include:

- MCC Environmental Guidelines
- Government of Vanuatu laws and regulations regarding the environment and social issues;
- World Bank Operational Policy (OP 4.12) on Involuntary Resettlement
- World Bank Rural Roads Checklist
- MCC Gender Policy

5.1.2 The Engineer - Queensland Consulting Project Partners (QCPP) on behalf of PWD

The QCPP as the FIDIC Engineer will initially supervise the overall project works through the specially created Engineer Support Unit (ESU) which includes an Environmental and Social Officer. At an agreed date, this responsibility will transfer to the ESU and PWD, with QCPP providing technical support. The Engineer will be responsible for ensuring, on a day-to-day basis, that the mitigation measures and monitoring activities identified in this EMP are implemented.

The Engineer will be responsible for the following activities:

- Undertaking its specific responsibilities for implementation of environmental mitigation measures as specified in Table 4.
- Carrying out regular monitoring of the Design and Build (DB) Contractor's construction activities to ensure that the work is carried out in full compliance with the EMP and provisions set out in the DB contract.

- Holding monthly site meetings with the Contractor to review environmental performance and compliance with relevant environmental mitigation measures specified in the EMP, identify areas of satisfaction and shortcomings in the Contractor's work and provide guidance to resolve areas where the work is deficient.
- Auditing the DB Contractor's implementation of the Environmental Monitoring Plan (Table 5) including facilitating and co-ordinating the environmental monitoring and supervision responsibilities of external parties such as local communities and appropriate NGOs.
- Prepare monthly environmental monitoring reports, and quarterly summaries for inclusion in progress reports to MCA-Vanuatu/MCC.

5.1.3 The Responsibilities of the DB Contractor

The DB Contractor will be responsible for:

- Preparing an Environmental Management Implementation Plan (EMIP), which indicates how the Contractor will implement the EMP, namely the Contractor's responsibilities as specified in Table 4.
- Implementing the relevant environmental controls and mitigation measures as set out in the EMP (Table 4).
- QMP to be developed for every Quarry.
- Communication Plan for the Subproject.
- Following all reasonable directions and corrective actions given by the Engineer including co-operating with the monthly site environmental performance meetings convened by the Engineer.
- Carrying out all works in such a manner as to cause as little impact as possible to the environment.
- Reporting on environmental issues in monthly site progress reports, environmental issues and complaints.

5.2 Environmental Management Plan

The EMP identifies the following:

- Potential environmental impacts that need to be mitigated.
- Environmental mitigation measures that will be implemented to address the potential impacts.
- Authority responsible for implementing the environmental mitigation measures.
- Schedule for implementing the mitigation.

5.3 Environmental Monitoring Plan

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

- Audit of detailed designs.

- Audit and approval of site environmental planning documents.
- Consultations with communities and other stakeholders (e.g. Environment Unit, Geology and Mines, Vanuatu Cultural Centre) as required.
- Routine site inspection of construction works to confirm or otherwise the implementation and effectiveness of required environmental mitigation measures.

Non-compliance to environmental mitigation measures identified in the EMP will be advised to the DB Contractor (copied to the client and MCC-V) in writing by the ESU including FIDIC Engineer 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 action.

5.4 Contingencies, Complaints and Incidents

5.4.1 Cyclone Preparedness

The Contractor will be required to prepare a Cyclone Preparedness Plan and ensure that in the event of a pending cyclone all staff are fully aware of their responsibilities in respect of human safety and environmental risk reduction. The procedure should clearly delineate the roles and responsibilities of staff, 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 Contractor's staff should undergo training/induction in the Plan. The Engineer will audit preparedness prior to the commencement of cyclone season.

5.4.2 Environmental Complaints and Incidents

Complaints and incidents should be referred to the Contractor's Stakeholder Liaison Manager or designated Environmental Officer) for undertaking complaint/incident investigation procedures. In general the following approach should be followed:

- Log complaint/incident and date of receipt
- Investigate the complaint/incident to determine its validity, and to assess whether the source of the problem
- Identify and undertake any action required
- Log the date of resolution
- Report the complaint in monthly monitoring report including actions, resolution status and any outstanding actions required.

The GoV already has extensive guidelines for managing grievances associated with land and related assets such as crops. Timely redress of any grievances associated with the MCA civil works is vital to the satisfactory completion of resettlement and to completion of the program on schedule. The following Grievance Redress Procedures are intended to complement the Government systems and to provide options for fast-track resolution of grievances.

Affected persons have the right to file complaints or queries in the event that there are any grievances resulting from loss of assets or other concerns because of the road constructions. The following procedures should be followed:

- In the first instance, and in respect to Vanuatu ways, affected persons are encouraged to express their grievances and attempt a resolution through their community and Customary processes. Chiefs have agreed to give priority to speedy hearings. Community field workers are also available to assist. The building contractor will, at all times, have a representative whose duty it is to hear and attempt to resolve any grievances. The Vaturisu has agreed to assist. MCA has employed Chief Mormor to assist with the local resolution of grievances.
- Should customary processes not be appropriate or not lead to a resolution within seven days, the aggrieved person should register their grievance with the MCA Environmental and Social Assessment Officer or the Provincial Planning Officer.
- Within five working days, MCA and the Provincial Office will attempt to settle the grievance with additional explanation efforts and some mediation with the aim of settling the dispute amicably. The DB contractor and the FIDIC engineers and PWD's Engineering Support Unit may provide advice. In some cases, chiefs and customary leaders may be asked to assist. In some cases, other Government agencies such as the Department of Lands or the Department of Agriculture may be asked to assist or to manage the grievance under their normal procedures. These agents will ensure that aggrieved persons have access to information about their rights under the Government's systems and these procedures. MCA may also seek participation from its contractors.
- In cases where a resolution is not easily found within the five days, MCA and the Provincial Government may establish a Grievance Committee comprising knowledgeable persons and community leaders, experienced in the subject area and with skills in mediation to assist with the management of the grievance. Mediation meetings will be held with interested persons. Government agents and chiefs have agreed to provide their time for free as part of their contribution to the Compact. There are no charges for the aggrieved person under these steps.
- Aggrieved people remain free to pursue their grievance under existing Government regulations or to open a court case. Normal charges will apply. It is hoped that the mediation processes will provide effective and quick resolutions so that lengthy processes and courts of law become a "last resort" option.

At all stages of these procedures, special efforts will be made to consider the needs of vulnerable people including sole supporting parents, and people with disabilities. Special attention will be paid to the special needs of women and young children.

MCA-Vanuatu will establish a database to document all grievances and track their outcome, and summarize this information on the MCA website and in its regular reports to the MCA Steering Committee, the Council of Ministers, and MCC. The DB Contractor is required to be proactive in identifying and addressing grievances and to maintain a database and track and report all grievances.

5.5 Reporting and Review

Throughout the construction period, the DB Contractor will prepare monthly environmental monitoring reports and quarterly summaries for MCA-Vanuatu/MCC. These reports will form part of the DB Contractor's monthly and quarterly project progress reports to MCA-Vanuatu/MCC, and will generally cover 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
- Key environmental problems encountered and actions taken to rectify problems.
- Summary of non-compliance notifications issued to DB Contractor during the month.
- Summary of environmental complaints received and actions taken.
- Key environmental issues to be addressed in the coming month.

Table 4: Environmental Management Plan for Efate Ring Road MCA02 Subproject

Potential Impact	Mitigation Measure	Performance Indicator	Responsibility	Cost (US$)
Pre-Construction Stage (applicable to entire Efate Ring Road Subproject)				
Spread of STIs/HIV/AIDS	Implementation of awareness and prevention program - contractor	Program implemented	Contractor & recognized provider	Direct provider cost paid by contractor
	Implementation of awareness and prevention program – community (villages)	Program implemented	Contractor & Recognized Provider	Direct provider cost paid by contractor
Social disruption due to construction workers in area, including concerns about security, stealing, and increased problems for women	Village and works site protocols and grievance redress procedures discussed with communities (including Mamma's groups) and workers; worker awareness campaign as part of mobilization; prohibition on unauthorized people entering camp site/work areas	Worker awareness program completed	Contractor, MCA, communities	No marginal cost
Land acquisition, resettlement, tree, crop and structure clearance	A number of potential losses and relocations have been identified and will be addressed through an IOL and RAP.	RAP implemented	Contractor and MCA with other relevant GoV agencies	Refer RAP
Local custom requirements for access through land, for materials or discharge	Access through or to land to obtain materials or discharge water etc. shall only be done after consultation with MCA, the Engineer, and in accordance with the RAP and the Consultation Plan	Relevant consultations completed	Contractor	TBA
Run-off from Material stockpile locations	Material stockpile areas shall be nominated in the Stockpile Plan and approved by the Engineer prior to construction and managed (including slope angle and run-off diversion ditches) to minimize run-off to surrounding terrain	Stockpile Plan prepared and approved by Engineer. No or minimal observed run-off and no increased turbidity in rivers observed from these sources.	Contractor	No marginal cost
Construction Stage				
Borrow Pits and Quarries	Use existing PWD permitted limestone quarries and haul roads for road base materials. Should use of new or extended quarries be necessitated, note that these require an EIA, EMP, and permits in advance in accordance with Government and MCC guidelines.	Existing borrow pits identified and QMP submitted and approved.	Contractor	No marginal cost

For any proposed new hard rock (basalt) quarries opened: • The approval of applicable land owners, lessee (custom owners, Province or PWD) will be required before extraction of any material can occur[10]. • A quarry permit is required pursuant to the Mines and Minerals (Licences) Regulations. This will require an EIA and EMP in accordance with Government and MCC Guidelines. • In accordance with the Contract a Quarry Management Plan is required incorporating details of quarry opening activities; quarrying operations, quarry closing and site rehabilitation.	Quarry license obtained Approval obtained Quarry Management Plan prepared	Contractor	TBA
For all quarry operations (existing or new quarries): • Drains are to be constructed around the uphill side of the borrow pit to prevent runoff entering the area and will direct all runoff away from the borrow pit into stable disposal areas. • The base of the borrow pit is to be drained at all times (to prevent build-up of still water that provide a suitable environment for mosquitoes to breed). The drains must not directly discharge to waterways. • Borrow pits are to be situated well away from groundwater wells and the water table level managed to prevent contamination of groundwater resources. • Overburden is to be stockpiled for spreading in the borrow pit surface when operations are complete. Runoff is not to pond in the stockpiled area. • The face of the borrow pit is to be stable at all times. • Blasting operations are to be carried out by certified personnel[11].	Uphill drains constructed. Bottom drains operating and no direct discharge to water courses.	Contractor	No marginal cost

10 The material will need to be purchased.

11 The contractor will be responsible for public safety at the borrow pit, particularly during blasting operations. Strict public safety measures are to be implemented at all times, and staff posted at safe distances to prevent entry to the danger zone during blasting operations.

	Where appropriate and/or considered aesthetically desirable, areas that have been quarried will be rehabilitated. A rehabilitation plan should be developed in consultation with the Environment Unit and the local community[12]. Rehabilitation should include covering of the water table to avoid future contamination.	No nearby wells. Overburden stockpiled. Borrow pit face stable. Certified personnel responsible for blasting. Rehabilitation completed in accordance with Quarry Management Plan.		
	For the Quarry providing material to construct the barge landing and hard stand located on Land Title 12/0521/004 existing quarry material on site must be used for the sole purpose for work on site. Should use of new or extended quarries be necessitated, note that these require an EIA, EMP, and permits in advance in accordance with Government and MCC guidelines. Should material from the site quarry be proposed for sale or for use off the site, this will require a permit through the normal procedures.	Use of existing site quarry conforms to Government instruction.	Contractor	No marginal cost
Erosion or sedimentation caused during clearing, earthworks or activities in streams and rivers	Install sediment fences and/or sediment traps to collect sediment prior to any site disturbance and construction works and to be checked after each rainfall	Sediment traps installed	Contractor	TBA once number known
	No dumping of spoil on, or extraction of material within 100m of streams, rivers or coastal area without correct Government permits.	No evidence of spoil dumping or extraction of materials at nearby streams and coastal areas.	Contractor	No marginal cost

[12] The rehabilitation plan need only be a simple commitment operation. Steps could involve a regrade of the surface to allow natural drainage patterns to function, replacement and compaction of the topsoil originally removed and stockpiled, and reseeding/planting to prevent erosion.

	No run-off diversions to be directed to private property, unless approved by a provincial representative and the Engineer, and any run-off management shall be consistent with the site EMIP	Run-off diversions approved by Engineer	Contractor	No marginal cost
	Side slopes of embankments designed to reflect soil strength	No slope failures observed on side slopes	Contractor	No marginal cost
	Gabion baskets or rock rip-rap to be used around bridge abutments as appropriate	Bridge abutments protected	Contractor	No marginal cost
	Embankments and stream or river channels to be monitored for signs of erosion	Site inspection records indicating monitoring undertaken.	Contractor	No marginal cost
	Stones and rocks kept on hand and used in event of bank or channel erosion	Stockpiles of rock and stones around stream courses.	Contractor	No marginal cost
	Minimize size and duration of cleared areas	Minimal vegetation clearance	Contractor	No marginal cost
	Retain topsoil (in stockpiles no higher than 2m, away from drainage paths and including run-off ditches) for use in re-vegetation as required	Topsoil stockpiles observed.	Contractor	No marginal cost
	Undertake progressive re-vegetation of cleared areas if required	No exposed soil areas following completion of works.	Contractor ; PWD Community Contractors	No marginal cost
	Avoid clearing gravel or spreading activities during rain or if rain is imminent	No gravel spreading during heavy rain	Contractor	No marginal cost
	Vehicle traffic to be restricted to designated paths within the site	Temporary traffic lanes clearly designated.	Contractor	No marginal cost
Land and soil stability related to proposed drainage works (Klems Hill)	For all drainage works an assessment of impact on additional water flows on stability of adjacent slopes must be measured. In particular the Klems Hill drainage and silt control measures proposed must not trigger future land stability issues.	No land or soil stability issues.	Contractor	No marginal cost
Sedimentation from Coastal Works	Where appropriate stabilize exposed soil areas including berms, batters and topsoil stockpiles as soon as possible using local and secondary vegetation.	No exposed soil areas following completion of works.	Contractor	No marginal cost
	Identify areas effected by coastal erosion, work with the client on joint design engineering solutions. Client to provide appropriate team for solution.	Design solution agreed by project team.	Contractor/MCA	To be included in engineering cost
	Re-use excavated material wherever possible	Minimal spoil dumps.	Contractor	No marginal cost

	No dumping of spoil on, or extraction of material from within 20m of coast.	No evidence of disturbance to coastal areas resulting from the works	Contractor	No marginal cost
	Rip-rap, retaining structures, gabion baskets, reno mattresses etc to be used wherever necessary for riparian stabilization. Gabions and reno mattresses shall be supplied and installed in accordance with manufacturer specifications and recommendations.	No evidence of erosion related to construction works.	Contractor	To be incl. in engineering cost
Water quality	Install sediment fences and/or sediment traps to collect sediment prior to any site disturbance and construction works and to be checked after each rainfall	No evidence of direct site run-off into water courses or coastal areas or resultant increased turbidity in these water bodies	Contractor	TBA once number known
	Use of silt control grass (appropriate for local ecosystems) or similar at Temoto Village (Taie Bridge 1.8km) to protect water supply at Mele Village from siltation.	No evidence of runoff into Taie River.	Contractor	TBA once design finalised
	River, stream or creek crossing works should not be carried out (or works stopped) during peak flows to prevent washout of sediment and erosion control measures, and waste material affected downstream users	No evidence of equipment or waste material downstream of site.	Contractor	No marginal cost
	Sediment controls measures to be maintained on a regular basis	Evidence of sediment controls operating effectively.	Contractor	No marginal cost
	Placement of diversion ditches around stockpiles, camp (day and overnight)	No evidence of direct run-off from stockpiles into water courses.	Contractor	No marginal cost
	Waterways and coastal area to be protected from pollution, silting, flooding or erosion through the installation of sediment traps, ponds, silt fences and bunds	No evidence of direct site run-off into water courses or coastal areas.	Contractor	TBA once number known
	Debris, spent fuel or oil, waste material not to be dumped along the coast or near streams or rivers. Spills require immediate attention including removal of contaminated material (for disposal in approved landfill) and remediation of the site to the satisfaction of the Engineer	No evidence of dumping of site waste materials in unauthorized areas.	Contractor	No marginal cost
	Site surface water including run-off or groundwater seepage shall not be discharged directly to any aquatic environment. If saturation occurs all work in this locality shall cease and may only resume on approval of the Engineer. Any drying out shall proceed in accordance with Clause 24.26 of the DB Contractor bid documents (dated April 2008).	No evidence of direct site run-off into water courses or coastal areas.	Contractor	No marginal cost

	Culverts to comply with design specifications	Engineer's approval of design specifications.	Contractor	To be incl. in engineering cost
	Spoil and material stockpiles not to be located within 15 m of coast, waterways, streams or rivers or drinking wells.	No stockpiles observed within 15m of water courses	Contractor	No marginal cost
	All waste-water and waste generated by the project to be collected and disposed of in approved manner and location	Solid and liquid waste collection and disposal system operating on site.	Contractor	No marginal costs
	Run-off from potentially polluted surfaces, such as vehicle and machinery storage areas, site huts, construction camps etc., must be captured and treated onsite	Sediment and grease traps installed around plant maintenance areas.	Contractor	No marginal cost
Interference with existing infrastructure (telecommunications, electricity, water)	Consult with relevant authorities (including village water committees) responsible for utility services to minimize physical impacts on public infrastructure and disruption to services	No disruption to public infrastructure or utilities.	Contractor	TBA once design finalised
	Abandoned service infrastructure (as approved by the Engineer) shall be cut (ducts, pipes or cables), removed and stockpiled for later disposal	No evidence of unauthorized waste disposal	Contractor	TBA once design finalised
	Community or individually owned infrastructure uncovered during construction should be protected from damage. Consultation with the owner of the infrastructure to determine whether infrastructure is being used and should be retained within the new road is required.	No disruption to community or privately owned infrastructure or utilities.	Contractor	TBA once design finalised
	In the case of any disruption of utilities for a period that has the potential to affect income generation or health (water supply disruption) an appropriate response (water trucks to deliver water or goodwill entitlements offered) must be facilitated by Contractor with MCA assistance.	No complaints related to disruption of services to households.	Contractor	TBA
Soil contamination from spillage of oil or other chemicals or substances	Provide protective gear and equipment as well as education to workers handling hazardous materials. Store oil, fuel and chemicals in secure area/compound, with concrete floor and weatherproof roof and surrounded by bunds that will prevent spilt oil, other chemicals or substances escaping to the ground.	No evidence of oil and/or chemical seepage into ground around fuel and chemical storage depots.	Contractor	TBA once number known
	Develop a hazardous materials spill response/ clean up plan to implement in the event of a spill occurring	Spill response clean up plan available on site.	Contractor	No marginal cost

	Refueling, oil and hydraulic fuel change to be undertaken in the field in designated areas surrounded by bunds to prevent escape of pollutants to the ground. Such areas should be located at least 30m from the nearest stream or coastline.	Designated refueling and maintenance areas operating.	Contractor	No marginal cost
	Ensure all construction vehicles and equipment are well maintained	oil leakages minimized from site equipment	Contractor	TBA once design finalised
Clearing of vegetated areas	Where appropriate stabilize exposed soil areas including berms, batters and topsoil stockpiles as soon as possible using local vegetation and secondary vegetation.	No exposed soil areas following completion of works.	Contractor	No marginal costs
	Minimize clearance of roadside vegetation as much as possible.	Minimal roadside vegetation clearance.	Contractor	No marginal cost
	Vegetation clearance and grubbing may only commence once sediment and erosion controls are implemented.	Site drainage measures properly established immediately prior to site clearance	Contractor	No marginal cost
	Avoid the felling of road-side trees wherever possible.	Minimal roadside vegetation clearance.	Contractor	No marginal cost
	No felling or removal of culturally significant trees within road reserve (e.g. *Nabanga* trees and fruit trees).	Significant trees remain.	Contractor	No marginal cost
Exploitation of local resources including poaching of fauna	Poaching of fauna (including marine resources) or felling trees that are not required to be cleared or removed by the project within the project areas will be forbidden.	Contract staff notices prohibiting staff from poaching of fauna and felling of trees.	Contractor	No marginal cost
	Extraction of materials/aggregates etc only from licensed or MCA approved quarries.	Approved	Contractor	No marginal cost
	Contractor will impose sanctions on any worker poaching fauna (including marine resources) or felling trees unnecessary for the project works.	Contract staff notices prohibiting staff from poaching of fauna and felling of trees.	Contractor	No marginal cost
Noise	Ensure all construction vehicles and equipment are well maintained.	Low noise levels	Contractor	No marginal cost
	Limit noisy construction activities to daylight hours where ever possible, agree works schedule with village leaders. If operation is required outside daylight hours, local residents and businesses must be consulted and a request must be made prior to commencement and approved by the client.	No noise complaints from nearby residents for times outside agreed work hours	Contractor	No marginal cost

	Provide workers with noise abatement equipment.	Construction workers wearing noise abatement equipment.	Contractor	No marginal cost
Disruptions to traffic movements, property access	Install signage in vicinity of works on road and in accordance with Health & Safety Plan	Road safety signage visible and clear.	Contractor	No marginal cost
	Install temporary access to effected properties	Access to private property provided at all times.	Contractor	No marginal cost
	Notify communities, people living adjacent to the road in advance of schedule and duration of construction works	Notification confirmed by village leaders.	Contractor	No marginal cost
Waste disposal problems (construction activity or wastes generated within construction camp sites)	No dumping of rubbish other than sites approved by the Vanuatu Environment Unit or other applicable regulatory authority	Solid waste collection and disposal system operating on site.	Contractor	No marginal cost
	Train construction workers in appropriate waste disposal methods	No domestic waste observed on site .	Contractor	No marginal cost
	Remove waste regularly from site for disposal to a Government approved landfill or burnt on site in a filed incinerator. Waste from portable toilets to be taken to Teouma Land Fill Sewage ponds.	Solid waste collection and disposal system operating on site.	Contractor	No marginal cost
	Install waste collection facilities in construction camp	Solid waste collection and disposal system operating in construction camp. .	Contractor	No marginal cost
	Wastewater systems from construction camp must not discharge into water bodies, which are used for domestic purpose water supplies. Soak pits for waste water from construction camps to be located at a minimum of 100m from any water source	Sanitary waste water facilities operating in construction camp.	Contractor	No marginal cost
Construction workers cause social disruption (incl. sanitation/health issues)	Ensure construction camp maintained in clean/hygienic condition	Tidy construction site including sanitary waste water facilities operating.	Contractor	No marginal cost
	Train workers on appropriate interactions with local community; implement education awareness program about sanitation and communicable diseases; ensure children/teenagers not entering camp; and Village rules are adhered to.	Awareness raising programs for workers Implemented.	Contractor, communities, MOH & NGO	Incl. in above
	Consult with PWD and landowners to plan for temporary construction worker housing arrangements.	Appropriate housing arrangements provided for workers.	Contractor	No marginal cost
Employment or livelihood benefits from employment of local people	Maximize the number of local people involved in the construction works. Promote gender equity in keeping with the principles in section 4.9 of the ESI Report. Promote LBES maintenance programs in keeping with section 4.1 of the ESI report.	Number of local workers employed.	Contractor	No marginal cost

Risks to public or construction worker health or safety	Provide safety equipment to workers and train them in its use.	Workers observed using safety equipment.	Contractor	No marginal cost
	Secure construction site and restrict access by local community (especially children and teenagers).	Only construction staff present on site.	Contractor /local community	No marginal cost
Generation of excess spoil	Make available to villages (for use in gardens or for local community purposes); or in consultation with MCA (and in agreement with local landowner) locate a suitable disposal location (either temporary or permanent) and stabilize to prevent run-off and erosion.	No unauthorized spoil dumps observed.	Contractor	No marginal cost
Loss of archaeological artifacts or sites	Contractor to notify the Engineer and VKS immediately if any potential archaeological artifacts or sites are unearthed during construction activities. Appropriate VKS protocol then followed for the management of archeological sites.	Awareness raising on artifact discovery procedures provided to workers.	Contractor	No marginal cost
Operation Stage				
Changes to road safety	Installation of road safety signage and/or speed bumps etc through villages and as instructed by the engineer. Promote models and benefits of road safety education to Government agencies, villages, and schools, including use of crossing committees to increase community ownership.	Decreased incidence of road accidents	PWD MCA Contractor	No marginal cost
	Work with police and PWD to carry out enforcement of traffic regulations on the road once upgraded	Decreased incidence of road accidents	PWD	No marginal cost
	Ensure drainage system well maintained and free of blockages	Road drainage operating effectively.	PWD; routine maintenance contractor	No marginal cost
	Retain roadside vegetation where possible, replant or otherwise stabilize drainage systems	Road drainage operating effectively.	PWD; routine maintenance contractor	No marginal cost
Changes to visual amenity & landscape values	Low maintenance Road-side maintenance plan developed for each village, including training of community members on road maintenance, management of roadside local vegetation and the PWD community contract.	No exposed soil surfaces along road margins.	PWD; routine maintenance contractor	Incl. in cost of revegetation

6.0 Environmental Monitoring Plan for Efate Ring Road

The Evaluation and Monitoring Plan for the MCA Compact provides a broad framework for the monitoring and evaluation of the Efate Ring Road Subproject including the collection of baseline and progressive data against key indicators. The data collected relates to tourism, traffic volumes, economic data such as household income and expenditure and road maintenance. This information will be used to measure the different indicators identified in the Compact, to enable measurement of progress against the Compact goal, objectives, outcome and activities.

For the monitoring of environmental impacts of the pre-construction and construction phases the FIDIC engineer (currently QCPP and eventually PWD) will be responsible. Progress will be reported as part of regular reports to the client. Serious non-compliance will be drawn immediately to the client and MCC-V's attention. The following Environmental Monitoring Plan provides requirements for this monitoring.

Table 5: Environmental Monitoring Plan

Parameter	Location	Monitoring (Visual Inspection)	Frequency of Inspection	Responsibility
Pre-Construction Phase				
STI/HIV/AIDS prevalence	Camp	Check contractor records, consultation with employees, discussions with NGO	Prior to construction	Engineer
	Villages	Discussions with NGO, consultation with villages	Prior to construction	Engineer
Village and Site Protocols	Villages and Camp	Check custom welcome and meeting to explain village protocolas and site access and safety rules.	Prior to construction	Engineer
Construction Phase				
Borrow Pits/Quarries	Borrow pit/Quarry sites	Visual inspection to ensure requirements of EMP and Quarry Management Plans are properly implemented.	Daily by Contractor Weekly by ESU	Contractor; Engineer
Spoil areas	Road corridor	Visual inspection (i) ensure vegetation clearance minimized; (ii) no garden or agricultural land used; (iii) no dump sites near waterways or on coastal side	Monthly by Contractor Monthly by ESU	Contractor; Engineer

Parameter	Location	Monitoring (Visual Inspection)	Frequency of Inspection	Responsibility
Erosion	Coastal areas adjacent to road corridor	Visual inspection of culverts, bridges and coastal areas for any occurrence of erosion	Daily by Contractor Weekly by ESU	Contractor; Engineer
Hydrocarbon and chemical storage	Construction camp/workshop area	Visual Inspection of storage facilities as per EMP and emergency response plan. Ensure storage sites are using concrete base with containment bunds.	Weekly by Contractor Monthly by ESU	Contractor; Engineer
Hazardous Materials	Construction camp	Visual inspection of work methods and practices to ensure that workers have protective gear and equipment and training in the use of hazardous materials.	Daily by Contractor Monthly by ESU	Contractor Engineer
Waste management	Construction camps	Visual inspection that solid waste is disposed as per EMP	Daily by Contractor Weekly by ESU	Contractor; Engineer
Surface water quality	Streams and rivers	Visual inspection, consultation with users	Daily by Contractor Weekly by ESU	Contractor; Engineer
	Nearby water courses and coastal areas	Visual inspection that sediment traps, ponds, silt fences and bunds are in place and operating effectively.	Daily by Contractor Weekly by ESU	Water Section of the DGMWR as per IEA
	Directly downstream of pollution event	Visual inspection, consultation with users	After pollution event by Contractor and ESU	Water Section of the DGMWR as per IEA
Air quality	Emissions, dust, particulate matter	Visual inspection	Daily by Contractor After complaint by ESU	Contractor; Engineer
Noise	Sensitive areas	Consultation (ensure schedule being adhered to)	Daily by Contractor After complaint by ESU	Contractor; Engineer

Parameter	Location	Monitoring (Visual Inspection)	Frequency of Inspection	Responsibility
Re-vegetation	Road corridor	Monitoring of progress of re-vegetation activities per EMP	Monthly by Contractor and ESU	Contractor; Engineer
Social impacts	Villages along the Subproject road	Consultation and visual observations - complaints viz-a-viz workers; village rules being adhered to; access to camp prohibited to other than authorised staff	Monthly by Contractor and ESU	Contractor; Engineer
Community	Road corridor	Consult with villages along Subproject road to monitor environmental concerns	Ongoing by Contractor and ESU	Contractor; Engineer
Labor, LBES, and Gender Policies	Road corridor	Check contractors records and observe break-down of local and imported labor and gender breakdown	Ongoing by contractor and ESU	Contractor Engineer MCA
Operation Phase				
Noise	Sensitive areas (villages, schools, health post)	Villages (as per EMP)	Twice/year for 3 years, mid-term and post-evaluation monitoring	PWD
Erosion	Subproject corridor incl. coastal erosion	Visual assessment of erosion protection resulting from project	Twice/year for 3 years, mid-term and post-evaluation monitoring	PWD
Water Quality	Road corridor, streams and rivers	Visual assessment of increased suspended solids from road or areas of erosion, if identified	Twice/year for 3 year, mid-term and post-evaluation monitoring	PWD
Road Safety	Road corridor	Collect road accident data; Safety issues discussed in schools Community crossing and safety committees operating	Twice/year for 3 year, mid-term and post-evaluation monitoring	PWD

Parameter	Location	Monitoring (Visual Inspection)	Frequency of Inspection	Responsibility
Re-vegetation	Road corridor	Ongoing monitoring of re-vegetation as per EMP	Twice/year for 3 year mid-term and post-evaluation monitoring	PWD

7.0 Conclusions and Recommendations

The Efate Ring Road Subproject is the rehabilitation of the road, including the upgrade to bitumen seal, from the base of Klems Hill to Japanese Road. The main conclusions of the ESA for this Subproject are that:

- The Subproject has the potential to create significant positive environmental and social impacts;
- Potential adverse environmental and social impacts associated with the road upgrade will occur mostly during the construction phase and can be avoided or sufficiently mitigated through the application of good design principles, and implementation of the EMP and monitoring plan for the Subproject;
- Specific recommendations have been made:
  - That the culturally significant Nabanga trees that are located adjacent or within the road reserve are protected from any damage, and that those trees with roots visible on the road are addressed in consultation with MCA Environmental and Social Assessment Officer;
  - In areas directly adjacent to the coast to prevent construction and subsequent road runoff discharging directly into the marine environment;
  - Abbreviated RAPs are prepared as required along the length of the Subproject;
  - For works in the location of Snake Hill (Teaie River), measures are taken to protect the local water supply for Mele and Temoto Village and Hideaway Resort;
  - For works through Tanoliu, a combined design and ESA solution that takes into account a reduced traffic speed, potential erosion of the road from coastal processes, location of road-side stalls and museum, frequency of tourists stopping, and the community significant Nabanga tree, while being sensitive to land tenure issues and historical sites existing in the village is necessary;
  - An awareness campaign on traffic safety should be implemented in villages, schools and churches around Efate. An ongoing campaign using regular reinforcement of messages would most effectively promote road use behavior change among communities.

Appendix A – Consultation Lists Efate Ring Road Subproject MCA02