GUIDELINE 1

PWD Environment Guide

(E Section)

Version : 2017-2018

Environmental (E) Section Contents

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ABBREVIATIONS / ACRONYMS

DEPC -	Department of Environmental Protection and Conservation
EIA -	Environmental Impact Assessment
EPC -	Environmental Protection and Conservation (Act)
MIPU -	Ministry of Infrastructure & Public Utilities
PCPO -	Provincial Community Partnership Officer
PEA -	Preliminary Environmental Assessment
PWD -	Public Works Department
QMP -	Quarry Management Plan
SSF -	Social Safeguards Framework
VKS -	Vanuatu Kaljoral Senta

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1 Introduction and Purpose

Vanuatu is committed to sustainable development and looking after our environment. National governments have increasingly developed policies and strategies to protect the environment and to reduce the damages to the environment development activities the most recent national policy being the National Sustainable Development Plan that requires all development in Vanuatu to take the environment into account.

This requirement for sustainable development also applies to the road and transport sectors whose potentially negative effects on the natural and human environment is receiving increased attention.

This guide, part of our SSF, is intended for formal use by PWD and its contractors and sub-contractors for roads and roading works under the Environmental Protection and Conservation (EPC) Act and EIA Regulations. This guide has been formally reviewed and approved by the Director of the Department of Environmental Protection and Conservation and therefore forms a type of Environmental Permit under the EPC Act.

By following the requirements of this guide, the potential and actual environmental impacts of our roads and roading activities will be reduced so contributing to the sustainable development of Vanuatu. Following the requirements in this guide also means that PWD, its contractors and sub-contractors can meet our legal obligations without penalty.

2 Why Mainstream Environment Issues into PWD Road Works?

2.1 Reducing the environmental impacts of development

As Vanuatu develops, development activities have impacts on environment and therefore the assessment and evaluation of these impacts are essential. This is why it has become the policy and legal requirement of the Vanuatu Government that Environmental Impact Assessment (EIA) be conducted for proposed activities that are likely to, or will have significant impacts on the environment, inclusive of road works.

2.2 Legal Responsibilities

2.2.1 Environmental Protection and Conservation (EPC) Act

To help protect Vanuatu's natural environment, the Vanuatu Government has put in place the Environmental Protection and Conservation Act [Cap 283]. The Department of Environmental Protection and Conservation (DEPC) is mandated to administer this Act and the accompanying EIA Regulations.

Part Three of the Environmental Protection and Conservation Act [Cap 283] stipulates the following:

> *(11) All projects, proposals or development activities that:*
>
> > *(a) cause or are likely to cause significant environmental, social and/or custom impacts; or*
> > *(b) cause impacts relating to the matters listed in subsection (2);*
>
> *are subject to the EIA provisions of this Part.*

The EIA Regulations state that activities requiring a Preliminary Environmental Assessment are:

> *3) Mining, quarrying and logging activities, for example any activity that involves:*
>
> a. *Mining, prospecting for minerals or reprocessing of tailings;*
> b. ***Quarrying;***
> c. ***Excavations and extractions****;*

and;

8) *Transportation and telecommunication facilities, for example the construction or alteration of any of the following:*
    a. *Airports, airstrips and transport terminals;*
    b. ***Roads;***
    c. *Telecommunications towers; or*
    d. ***Bridges.***

However, as most of the work on roads under PWD are maintenance works, DEPC has agreed that an environmental approval can be given for these maintenance works ***providing these works are undertaken in line with this PWD Environment Guide.***

Therefore PWD has the responsibility for ensuring that all roading and related works are undertaken in line with this guide and that all contractors, sub-contractors and others that are involved with road works are fully aware of and follow the requirements in this guide.

A table setting out responsibilities for environmental management of PWD roadworks is set out in Section 3.1 of this Guide.

If contractors or sub-contractors are in breach of this guide or environmental conditions under the EPC Act then they may be subject to fines of up to Vatu 5 million under the EPC Act and EIA Regulations.

2.2.2 Other legislation

Other legislation that relevant to PWD road works includes:

- Quarry Act (2013)
- Water Resources Management Act (2002)
- Water Supply Act (1993)
- Waste management Act (2014)
- Pollution Control Act (2013)
- Foreshore Development (Amendment) Act (2013)
- Public Roads Act (2013)
- Public Health (Amendment) Act (2008)

Quarry Act (2013) which through regulations requires a permit for most quarries and sand mining. This act is administered by the Department of Geology Mines and Water Resources (DGMWR). DEPC has delegated authority to the DGMWR to undertake PEA on its behalf for quarry applications however the PEA and ensuing environmental permit is still required to be approved by the DEPC.

Water Resources Management Act (WRMA)(2002) also administered by the DGMWR which requires a permit for works in watercourses and provides for buffer zones, river diversions etc.

Water Supply Act (1993) currently administered by the Ministry of Infrastructure and Public Utilities (MIPU) but DGMWR provides permits for water extraction.

Waste Management Act (2014) which sets out a management and licensing system for waste handling and disposal. Partially implemented and administered by the DEPC with some responsibilities devolved to provincial and municipal councils including the development of waste management plans. All PWD roadworks will require to manage waste in line with the Act and waste management plans or licensed operators if these are established in the subproject areas.

Pollution Control Act (2013) which manages discharge or emission of pollution through licensing scheme and controls. Partially implemented and administered by DEPC, PWD will require meet the requirements of the Act should it apply to the roadworks activities.

Foreshore Development (Amendment) Act (2013) requires foreshore development permits for all development taking place below the high water mark in coastal areas, administered by the Department of Local Authorities this legislation only applies to roadworks taking place in the coastal marine area.

In terms of public health and safety two pieces of legislation are of specific relevance to PWD roading works:

The Public Roads Act (2013) Under sub-section 10 of Part 3 a function of a Road Administrator (such as PWD) is responsible;

"(a) to ensure that public roads and road structures on public roads are safe, having regard to traffic, topography, geology and ***environmental conditions****."*

As MIPU is mandated to administer the Public Roads Act **all** roadworks must take environmental conditions into account as part of ensuring safe roads.

Public Health (Amendment) Act (2008) which is concerned with managing public health including notifiable diseases, protection of water supplies and sanitation. Administered by the Department of Health with powers delegated to Municipal and Provincial government councils, requirements of the act must be taken into account for all PWD sanitation elements such as sanitation facilities for workers.

2.3 *Other reasons to reduce the environmental impacts*

2.3.1 Reduction of Long Run Costs

Failure to address the environmental concerns can lead to costs that stall the project due to public concerns against activities of the project. The costs can be both direct and indirect in nature. Sometimes, environmental problems when left unattended may become grave in the long run thus, increasing costs of addressing.

2.3.2 Improved Corporate Image

When a company or a contractor does not address environmental issues, chances of winning subsequent jobs with a client will be reduced. Public opinion on environmentally non-compliant contractors is generally low due to the damage these contractors leave behind.
This is reflected in common complaints received from communities and landowners on environmental and related problems to roading projects including:

- Unrestored / Un-rehabilitated borrow pits & quarries
- Erosion
- Poor drainage
- Loss of cash crops resulting in compensation claims
- Loss of land
- Building and petty trading in road reserves
- Disruption of livelihoods of those settled along improved roads
- Damage to or disruption of taboo sites

3 How to Mainstream Environment Concerns into Road Works

It is important for PWD staff and Contractors to become trained in seeing proposed road construction works through “Environmental Eyes”. This means all staff and contractors must be trained to become aware of and comply with environmental matters associated with their work and the potential of environmental impacts of roading works.

Avoiding environmental impacts is important for all those involved for roads and roading work as under legislation there are fines and penalties for unpermitted environmental impacts, this includes not following the requirements of this guide.

Environmental concerns need to be identified **before** road improvement works begin to help avoid environmental impacts during improvement or maintenance works. The environmental impact identification process requires consideration of the **entire road environment** not only to focus on single items like the road reserves, borrow pits etc. Therefore, the mainstreaming process should be Multi-sectoral in approach to be able to capture a wide range of impacts.

The road improvement cycle has two phases (as indicated in Fig 1 below):

(i). **Planning & Preparation** including:

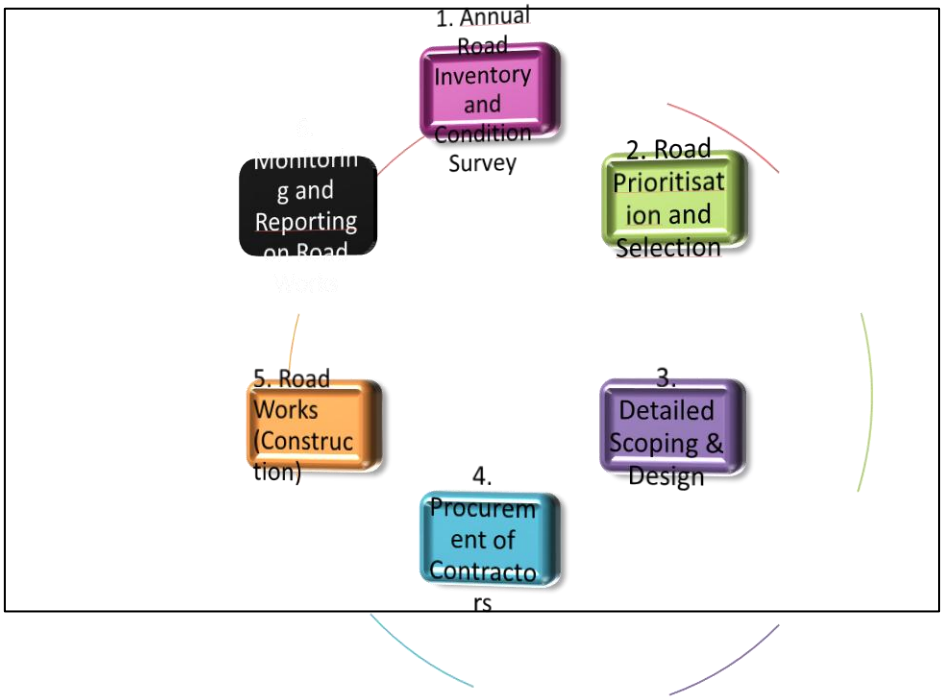
1. Annual Road Inventory & Condition Survey,
2. Road Prioritisation & Selection,
3. Detailed Scoping and Design, and
4. Procurement of Contractors.

(ii). **Implementation** including:

5. Road Works, and
6. Monitoring & Reporting against implementation.

Each of these phases has to include environmental concerns into its activities.

The Road Improvement Cycle



3.1 Responsibilities for environmental management and safeguards for PWD works

In order for this guide and any other environmental requirements to be successfully implemented and the law followed, responsibilities must be clearly agreed and followed. The following table sets out responsibilities for environmental management through the project process.

Table of responsibilities for PWD Environmental Safeguards

RESPONSIBILITY		**RESPONSIBLE POSITION(S)**
Overall responsibility for the Guide and its implementation		**Director PWD, Senior Environmental Safeguards Officer**
PLANNING	Annual road inventory & condition survey – **Completion.**	Divisional Managers /Engineer
	Annual road inventory & condition survey – **Validation.**	Divisional Managers/Engineer
	Road prioritisation and selection – **Confirmation.**	Director, Divisional Manager
	Scoping and design – **Confirmation of environmental issues.**	Divisional Engineer/ Environment & Social Officer
	Scoping and design - Identify **projects requiring Environmental Permit.**	Divisional Engineer /Environment & Social Officer
	Scoping and design – **Make Environmental Permit application to DEPC.**	Senior Environment & Social Officer (Snr ESO)
	Preparation of contract documents – **Ensure Environmental Permit and safeguards conditions are included in contracts.**	Contracts officers, Snr ESO
	Associated Works Consent Form - **Confirmation of environmental issues.**	Divisional ESO
IMPLEMENTATION	Pre works - **All Environmental Permit and safeguards conditions are included in contracts and understood by workers**.	Snr ESO, Divisional ESO
	Pre works – **Confirm location and suitability of campsites, work sites and materials sources.**	Divisional ESO, Contractor
	Pre works - **All environmental safeguards, sensitive locations and safeguards requirements for campsites, work sites and materials sources are identified and understood by workers.**	Divisional ESO, Contractor
	Pre works – **All waste management and pollution control measures identified agreed and communicated to workers.**	Divisional ESO, Contractor
	During works – **PWD Environment Guide safeguards are implemented**.	Divisional & Snr ESO, Contractor
	During works –**Environment Permit conditions are followed or implemented.**	Divisional & Snr ESO, Contractor
	During works –**Environment safeguards and condition compliance (and non- compliance) are monitored and reported.**	Divisional & Snr ESO, Contractor
	Post works – **Monitoring to confirm success of safeguards and Environment Permit conditions for all completed works.**	Divisional & Snr ESO, Contractor
	Post works – **Rehabilitation and demobilizing completed with no remaining environmental hazards present.**	Divisional & Snr ESO

3.2 Planning and Preparation

Activities under planning and preparation include:

1. Annual road inventory & condition survey.
2. Road prioritisation and selection.
3. Scoping and design.
4. Preparation of contract documents.

All these activities need to address environmental concerns as described in the following subsections.

3.2.1 Annual Road Condition Survey / Inventory

The Annual Road Condition Survey or Inventory that is conducted by Divisional Engineers annually, which involves collecting/updating data on the road condition may be made to include the collection of socio-economic data (using **Form A attached as ANNEX 1**), as one of the major planning and preparatory activities for road improvement activities. Form A is **the "Area Council Road Inventory Form**" and it requires the identification of any "Environmentally sensitive areas including rivers, streams, mangroves, dark bush etc."

The Provincial Community Partnership Officer (PCPO) based at each Division will be able to assist with this activity.

3.1.2 Road Prioritisation and Selection

From this survey, road prioritisation and selection is made by the PWD Division and submitted to the PWD Head Office to be included in the relevant annual business plan. Road prioritisation and Selection is made based on the analysis of data captured in **Form A** which requires the identification of any "Environmentally sensitive areas including rivers, streams, mangroves, dark bush etc."

The Head Office then develops and approves the final business plan which details the roads to be rehabilitated, maintained and or new roads to be worked on in that business year.

Once the business plan is approved, then the actual detailed scoping and design of roads can be made.

3.2.2 Detailed Scoping & Design of Roads / Works and Awareness Raising

In carrying out the detailed scoping, data shall be collected on potential environmental impacts, which could include but are not limited to:

- Scope and the nature of planned works in respect to the environment. These works include sourcing and supplies of roading materials, waste management and restoration after the project is completed.
- Influence of the work on
  - protected areas (forest reserves/conservation areas, marine protected areas)
  - wetland or coastal ecosystems
  - domestic water supply sources
  - vegetation resources
  - Social environments (houses, Public institutions and road usage among others.)

- Anticipated changes in:
  - drainage patterns
  - land uses
  - landscape
  - human settlements along improved road.
- Public health impacts
  - noise levels
  - dust levels
  - waste management
- Alternative road re-alignments and their environmental implications.

Depending on the types of activity and the magnitude of the impacts anticipated, an approval from the Department of Environmental Protection and Conservation (DEPC) will be required at this stage. An application is made through the Environment & Social officers based at PWD head-office, with information provided from the Divisional offices, using the DEPC Environmental Permit Application form (**Form B attached herein as ANNEX 2**).

The construction of new roads or the upgrading of existing roads to tar sealed conditions, and the construction or maintenance of road bridges, **requires an Environmental Permit from the DEPC, prior to construction**.

However **routine Maintenance and Rehabilitation works** on existing roads and causeways / crossings / drifts are likely to have low environmental impact thus an Environmental Permit is not required *providing that the environmental safeguards and general conditions including those in this guide are met by PWD and its contractors*.

The process of applying for an Environmental Permit includes submitting an application (Form B attached as Annex 2) which the DEPC evaluates and then either approves or requests a more detailed Environmental Impact Assessment (EIA) on the proposed project. If approved, an Environmental Permit is then issued for the proposed works. Environmental Permits generally include additional conditions that must be followed. For larger projects, a separate Environmental Management and Monitoring Plan (EMMP) may be required and must be followed to ensure that environmental impacts of the project are avoided or minimised.

Table 1 below indicates the steps required at this detailed scoping and design stage:

For New Roads, New Road Bridges or Repairs or maintenance of Road Bridges involving work in rivers, streams or through sensitive or protected areas including coastal areas[1]	**For Maintenance of Existing Roads and Drifts / Causeways and Bridges (excludes repairs and works in rivers or streams)**
1. Apply for an Environmental Permit by filling in **Form B (attached as Annex 2)**	1. Follow the requirements of this Guide and other guidelines or standards for environmental management
2. Obtain relevant consents from Landowners: – For quarry, please use the consent form in the Quarry Management Plan (QMP) template, and follow the steps outlined in the PWD Quarry Guide; – For land to be used as camp sites, stockpile sites (outside of quarry area), disposal sites, drainage works (culvert outlets), realignments and traffic diversions, please use the **Associated Works Consent (AWC) Form C attached as Annex 3**. – For clearing of vegetation and trees, especially high valued trees such as fruit trees, please use the AWC Form C. Also request the relevant provincial Forestry or Agriculture Officer to conduct a valuation on the trees. – For relocation of fence, please use the AWC Form C.	2. Obtain relevant consent from Landowners: – For quarry, please use the consent form in the Quarry Management Plan (QMP) template, and follow the steps outlined in the PWD Quarry Guide; – For land to be used as camp sites, stockpile sites (outside of quarry area), disposal sites, drainage works (culvert outlets), realignments and traffic diversions, please use the **Associated Works Consent (AWC) Form C attached as Annex 3**. – For a large amount of clearing of vegetation and trees, especially high valued trees such as fruit trees, please use the AWC Form C. Also please contact a provincial Forestry or Agriculture officer to conduct a valuation on the trees. – For relocation of fence, please use the AWC Form C.

[1] This is actually a reduced set of requirements from DEPC as the EIA Regulations actually require applications for a much wider scope of works.

From the beginning the design shall incorporate any necessary environmental mitigation (or enhancement) measures as per environmental conditions stipulated in the environment permit or within this guide. Mitigation measures to be included in the design shall be drawn by the Divisional Engineer with assistance from the Environment Officer with the participation of any other relevant technical person such as the consulting experts.

Attempts shall be made to involve the local people in the project process to make best use of the local knowledge. Where environment committees exist at community level, these must also be involved in project design, resource identification (water and quarried materials or sand) and contractor adherence to good environmental management.

The process of obtaining consents also acts as awareness raising for relevant stakeholders with regards to the proposed works.

At Divisional level, the process of obtaining landowner consents would be the responsibility of the PWD Divisions assisted by Provincial Community Partnership Officers (PCPO). At the Area Councils and community levels, this shall be the responsibility of the relevant PCPO staff with the involvement of the Area Council Secretary and the Provincial Authorities.

3.2.3 Preparation of Contract Administration Documents

The entire contract procurement process (from pre-qualification to tender award) is to take into account environmental considerations. Pre-qualification of contractors will favour those who demonstrate capability and willingness to address environment issues. Contracts will also contain penalties for non-compliance with any environmental protection specifications **including the requirements of this Guide, environmental permit conditions and other guidelines or standards for environmental management.**

During contract procurement, all Tenderers shall be reminded of their environmental responsibilities and related issues throughout the tendering process. This includes Pre-tender Site Meetings which are held prior to the Tenderers preparing tender documents to verify the situation on the ground regarding physical works. Pre-tender Site Meetings also provide an opportunity for a formal site investigation on availability of and access to materials, safe and reliable water sources, labour availability, campsite location, availability of storage facilities etc. This means the Tenderers go into the bidding process fully aware of all the relevant environmental issues associated with the contract works.

Further reminders and monitoring of contractors for compliance shall follow through monitoring site visits and meetings. For these to flow smoothly, they shall be provided for in the contract documents. The instructions to tender and the conditions of contract documents must specify the contractor's obligation to:

- Avoid environmental damage by applying wherever possible labour-based methods rather than heavy machinery in sensitive locations and whenever the character of work allows. The bills of quantities should clearly indicate which works shall be carried out with labour-based methods;

- Protect and re-establish natural environment, and mitigation any damage to the natural environment;

- Avoid environmental harm and maintain environmental due diligence as defined and set out by the environment laws and regulations of Vanuatu and set out in this guide;

- Propose in writing the locations of different project sites including camp sites, borrow pits, sanitation facilities, and the measures to be taken to minimise impact on the environment and the people living in the area with regards to surface and underground usage such as bush

clearing, tree removal, drainage and garbage disposal, disruption of water table, and ground water pollution;

- In case of excavation of material from quarries and/or borrow pits, follow the environmental controls and guidelines in the PWD Quarry Guide taking care to ensure the preservation of trees, drainage patterns and natural vegetation growth, drainage ditches and other methods to control runoff and erosion and restoration of site as much as possible to its original state including site revegetation. (Refer to PWD Quarry Guide).

It is important that the relevant PWD technical staff (engineering and environment) make the necessary follow up to ensure contractors' compliance before, during and after the implementation of road works.

Prior to commencement of road works, either through contracts or through the PWD Divisional teams, all necessary documents, such as an environmental permit from the DEPC for new roads or road bridges and the required, signed landowner consents (AWC forms, Form C) must be acquired by PWD.

4 Implementation of Road Works

There are several types of environmental impacts that can occur during road works and maintenance, some of these impacts are temporary and others are permanent. Some of these temporary or permanent impacts can be avoided or reduced by taking them into account during the project planning and design stages.

However most of the other environmental impacts can be avoided and reduced in the implementation stage of the road works process.

Some examples of environmental impacts include:

- Damage to wetlands or coastal resources
- Damage to sensitive environments such as protected areas and forest reserves
- Damage to agricultural land and removal of fruit trees
- Poor road work practices leading to dumping of waste and pollution of water sources
- Loss of vegetation cover leading to erosion or deposition of materials
- Unrestored borrow pits and quarries
- Drainage into agricultural land
- Disruption of livelihoods of those settled along roads

These impacts can be categorised for the sake of this guide as follows:

1. **Erosion, Sedimentation and Flooding**
2. **Waste Management and Pollution**
3. **Damage to the environment including sensitive or protected environments**

Some impacts may be temporary but still impact the natural or human environment such as dust and noise from vehicles and heavy equipment, or the over-extraction of water sources, or social and other impacts due to construction camp sites.

4.1 Erosion, Sedimentation and Flooding

Erosion and sedimentation are the most common types of environmental impacts from roading works. *Erosion* is the damage to land forms including cliffs, slopes and even rivers due to changed drainage patterns and concentration of storm water in locations. *Sedimentation* is the opposite of erosion and is the deposition of eroded materials, typically sand and silt, that can block waterways, alter coastlines and smother wildlife or wildlife habitats.

The roading works processes and activities that cause sedimentation and erosion can also cause local flooding. Erosion, sedimentation and flooding **must be managed and preferably avoided at all times**.

4.1.1 Prevention of Soil Erosion

Wherever possible, erosion needs to be avoided and there are several principles that should be followed to avoid erosion these are:

- Reduce the number of cut surfaces, especially steep cuts or banks
- Think about the impacts of drainage on bare soils
- Protect all waterways (streams and rivers)
- Compact and plant up open surfaces as quickly as possible.

In roading works, soil erosion can arise and should be managed in the following ways:

(i) Roadside / embankments.

Where a road is raised (through wetlands or depressions), the edges of the road slowly erode and can keep slowly breaking off towards the carriageway depositing eroded materials below.

How to control and reduce erosion:

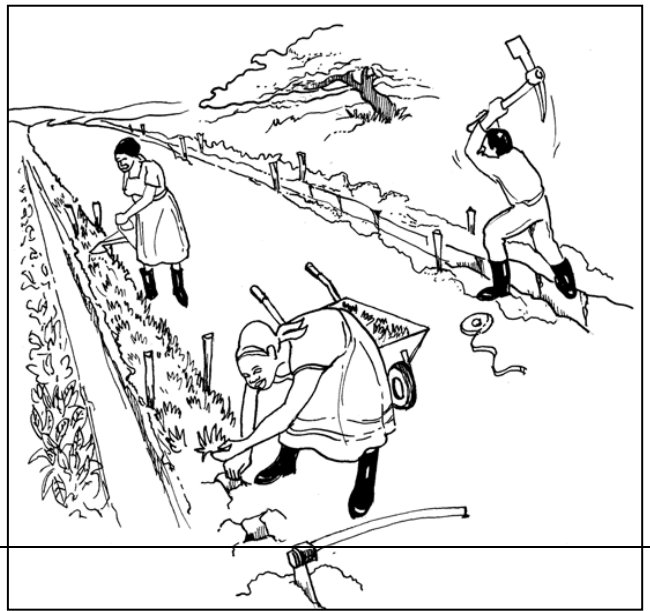
- Creeping grass such as tufts of **Cynodon dactylon** are dug and planted on such surfaces. This grass is a creeper and its stems easily establish thus, forming a cover over such surfaces.

Figure 1- Cynodon dactylon grass (left) and Sporobolus pyramidalis grass (right)

- It is also possible to collect seeds of grass such as **Sporobolus pyramidalis** that can be collected and transmitted on the edges of the road. It is important that tall grass should not be planted, as these will form thick stands, which will affect the safety of road.

(ii) Erosion of loose soil

Erosion is common during re-grading of roads in areas where soil at the sides of the road is left loose and uncompacted. Areas where graders are used to open drainage channels can also be prone to erosion. These and other bare surfaces are prone to erosion.



How to control and reduce erosion:

- After opening of channels with graders, the area should be manually levelled and loose soil evenly spread at the back of the channel.

- After grading, the surface should be levelled, sprinkled with water using

water bowsers for stabilisation and compaction of loose soils.

- The roading works contract should include grass planting on the exposed surfaces to help bind the soil and reduce soil erosion.

(iii) Erosion of open cut surfaces

In hilly areas where hills are cut for roads, the resultant cut surfaces are very prone to erosion particularly as high rains often speed up the erosion process therefore work to reduce exposed cuts and reduce the risk of slips and erosion must take place as soon as possible after the cut is made. When established, the creeping grass forms good cover on open cut surfaces by growing downwards towards the road and should be planted as soon as possible after the cut.

How to control and reduce erosion:

- Creeping grass should be planted at the edges of the cut surface as soon as possible.
- Grade cut slopes to reduce potential for land slips.
- Bench cut taller cuts and plant up terraces with vegetation and grasses.

4.1.2 Avoiding erosion and siltation of wetlands, rivers or streams

(i) De-silting of roadside drainage channels

Regular dredging tends to lead to formation of heaps of soils and silt at the side of channel, which is again washed, back to the channel during the rains. Silt in channels is washed into watercourses and then to rivers streams, wetlands or the coast.

Erosion of materials from drainage channels can be reduced through scour checks. These are made of local sticks woven together and placed at specific intervals along the channel (depending on the gradient). These woven sticks can help trap eroded materials and regularly must be regularly cleaned to keep them working.

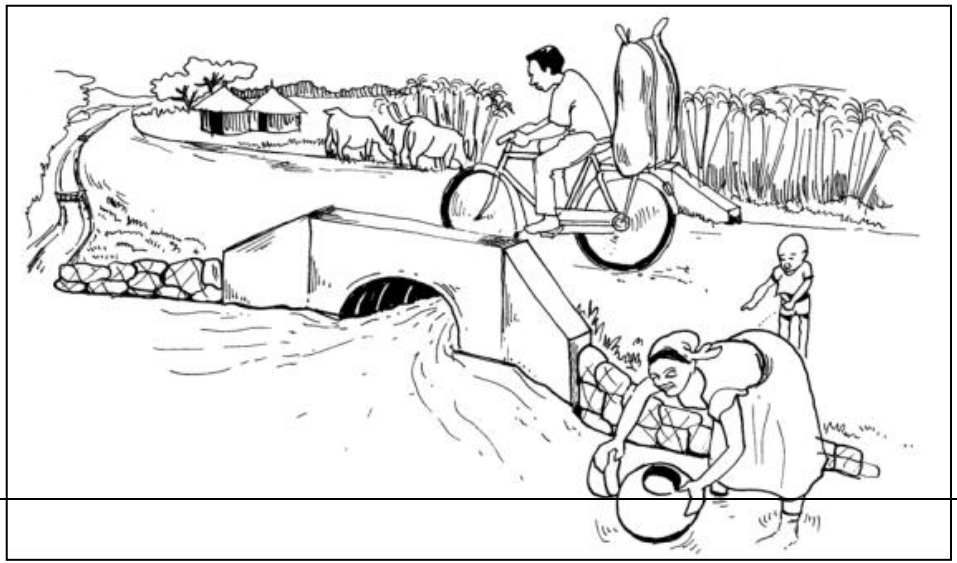
How to control erosion of channels and siltation of waterways:

- Use scour check in drainage channels to trap eroded materials.
- Clear scour checks after heavy rains and replace as often as required.
- All silt removed should be spread away from the channel to avoid it washing back into the channel.

(ii) Work around bridges and river crossings

Siltation of wetlands, rivers or streams arises in road works especially in the construction of bridges which require and environmental permit and will have a set of conditions that will help to avoid or minimise environmental impacts.

However when cutting new roads and realignments the earth works leave exposed surfaces of soil open to erosion. Therefore steps must be in place to avoid siltation of all wetlands, rivers or streams for the eroded soils. Should works be taking place along the coast then coastal erosion and damage must also be taken into account at design and implementation stages.



For example, the sides of the stream where earth works end should be protected with stone gabions as in the

illustration. Grass should be planted above the stone gabions to avoid erosion.

Open earth works surface should be planted with grass to reduce erosion. Creeping grass such as **Paspalum** or **star grass** should be planted.


Figure 3 – Paspalum grass (left) and Star grass (right)

4.1.3 Managing Borrow pits and Quarries

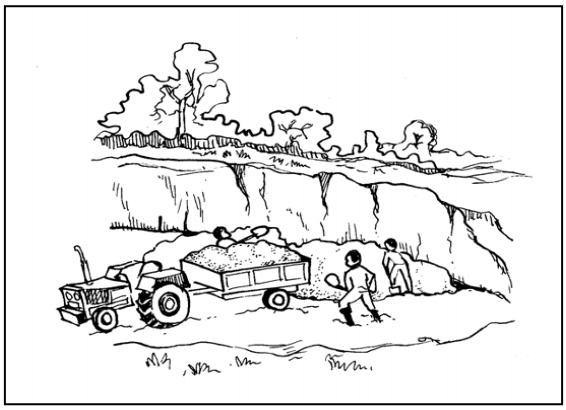
Poorly managed borrow pits or quarries can cause a variety of environmental problems but particularly erosion or flooding through poor drainage. Dust and noise from quarry operations can also cause problems locally The **PWD Quarry Guide <u>must</u>** be used for the management of all quarries used for roadworks.

For smaller sources of quarry materials such as borrow pits, it is important to manage these carefully and ensure they are restored immediately after use.

When opening a borrow pit the following actions are to be undertaken to allow the borrow pit to be restored after use:

- Collect all the vegetation matter on the site (grass, shrubs and possibly trees). This should be stockpiled aside near the pit in case it can be used later for rehabilitation.
- The topsoil, black layer of soil, should be collected on and placed in a pile separately from the vegetation near the pit. Ensure that the sides of the pile are protected so it is not eroded or removed. Topsoil has seed bank that could help in the re-vegetation of the site.
- Also the subsoil materials (brown or red soil) be stockpiled separately once excavated.

After extracting the materials, the borrow pit and any damaged area such as access points should be restored as follows:

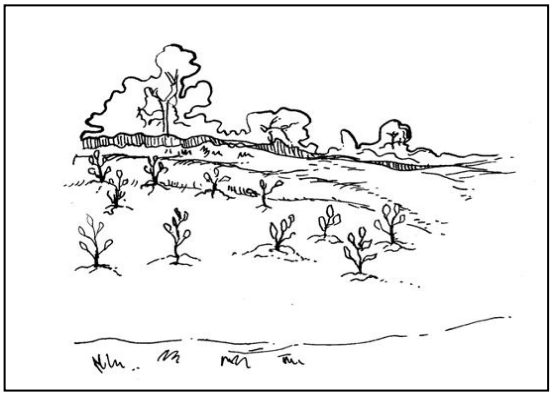


- The sides of the pit must be levelled giving a gentle slope (eliminating any sharp edges or cliffs).
- Levelling should ensure surface water run-off, water collection in the pits should drain naturally in order to avoid erosion.

- All unused/oversized gravel or boulders should be placed back in pit as the first layer of material in the base of the pit.

- The subsoil material should then be placed back and evenly spread over the boulder materials.

- The top soil is eventually returned and spread over and any surviving vegetation placed on top of the site to help re-vegetation.
- In order to enhance regeneration of vegetation, sods (stems) of elephant grass (**Pennisetum purpureum**) or other types of grass can also be planted on the site.



- Depending on the landowner, it is advisable to plant some trees on the site especially, when the site is extensive to facilitate the area to blend well with the adjacent areas. Use surviving cleared vegetation from your stockpiles as part of re-vegetating the restored site. Preference should be for indigenous trees, which do not require formal care or if there is an agreement with the landowner such other trees as agreed and are locally available.

- As indicated in the PWD Quarry Guide, each quarry must have a Quarry Management Plan (QMP) that contains a Rehabilitation Plan, which includes the landowner's preferences for rehabilitation.

4.2 Waste Management and Pollution

Wastes from roading works can vary from rubbish from contract workers such as food packaging through to fuel and oil containers, demolition wastes and packaging or left over project materials.

Pollution usually comes from liquid wastes that are discharged into and contaminate the environment for example pouring out or spillage of oils or chemicals or causing air pollution by burning waste or through dust from operations.

All project wastes must be correctly disposed of and environmental pollution avoided at all times

The process for disposing of all types of project wastes is as follows:

- Confirm suitable disposal site and procedures with the relevant Provincial Council (as the designated waste management operator Provincial councils have responsibility for overseeing waste management in the provinces)
- Collect project wastes and ensure no wastes are disposed of incorrectly or escape into the environment.

4.2.1 Avoiding contamination of soil or water (environmental pollution)

Apart from silt and eroded soils, water and land can often get contaminated through petroleum wastes (oil, grease, fuel, etc.) from service of vehicles and road works equipment. These damage the environment and can even affect groundwater used for drinking and must be controlled as follows:

- Contractors must ensure that servicing of the road works equipment is undertaken at the campsites and all oils are centrally collected and disposed of.
- When vehicles/field equipment breaks down, it should be towed to a service bay at the camp site or PWD yard for repairs.
- Where servicing the vehicle on the road cannot be avoided, the waste oils should be collected and taken to camp site or PWD yard for storage.
- Waste oils should be drawn in cans/drums and if possible returned to suppliers who will ensure its safe disposal. Otherwise waste oils should be disposed of in the manner agreed with the Provincial or Municipal Government Council in lien with their responsibilities as designated waste management authorities.

- Oil filters should be drained on drums with wire mesh on their top to facilitate drainage of oils from the filters. After oil is drained from the oil filters the filters must be disposed of in the appropriate manner in line with the requirements for waste disposal of other project wastes.
- PWD Environment Inspectors/Officers in the province will monitor the projects in their areas for any environment infringements including the safe disposal of wastes.

4.2.2 Reducing dust

During road works and its entire associated improvement works, the transportation of construction materials through villages and buildings such as schools by roadworks vehicles leaves clouds of dust which can be hazardous to the health of workers and the local population.

Dust can also cover and damage vegetation and produce growing in neighbouring gardens.

To help reduce dust nuisance the following should take place:

- The route should be sprinkled with water regularly thrice a day (in the morning, midday and 3 o'clock). The sprinkling should be light in order not to lead to flooding of the road, which can lead to slipping off the road by various forms of traffic.
- Humps should be erected on the access routes to serve as speed regulators in order to reduce dust production.

4.2.3 Location and management of Camp Sites

As campsites are the centre of workers activities and can include a temporary works depot and materials storage the location of campsites is extremely important. Each camp must fully take into account the requirements of this guide and ensure that the are no environmental impacts arising from the location and operation of the camp.
Examples of environmental considerations to be take into account include:

- Avoid setting up close to sensitive or protected areas
- Set out camp especially toilets and washing facilities away from streams and rivers to avoid pollution or discharges into waterways or coastal waters.
- Establish sites where the materials can be safely deposited.
- The operation of the camp from setting up to occupation and finally closure and demolition must be managed in line with this guide
- Waste management and pollution of all types of wastes and chemicals used at the camp must be disposed of correctly
- Water supply must be suitable and not cause damage to the environment by reducing water flows in the stream or river
- Demolition and rehabilitation as agreed with landowners and to avoid ongoing environmental impacts such as erosion.

4.3 Damage to the environment including sensitive or protected areas

Providing road planning and alignment avoids sensitive or protected areas, gravel road works normally have minimal impacts on wildlife and sensitive areas in terms of destroying wildlife and encroachment into ecosystems.

Sensitive areas include mangroves, wetlands or swamps, rivers and streams as well as the coastal area. Protected areas can be formally or informally protected and include habitat for species such as megapodes (namalao), roosting sites for flying fox, nesting beaches for turtles etc.

In the roadworks planning stage potential impacts on sensitive or protected environments need to be identified and **will require an environmental permit from DEPC**. For example, a new bridge or works in the coastal area would require an environmental permit from DEPC and the permit conditions will set out the requirements for environmental protection. ***All road workers must follow the conditions of environmental permits at all times.***

Section 4.1.2 above describes protection measures that should be followed for works around rivers and streams.

There are other potential impacts that should be managed such as hunting by road workers and the collection of firewood and even the cutting of trees or disturbance to native animals and birds in protected areas. This is more likely if campsites or operational centres such as works yards or quarries are located close to these areas.

Therefore the following is required:

- Campsites must be located away from protected or sensitive areas
- Other work areas such as quarries and borrow pits must be located away from sensitive or protected areas
- Workers should be reminded not to enter the protected areas or cause damage to sensitive environments.

4.4 OTHER IMPACTS

4.4.1 Avoiding Interference with Socio-Cultural and Historical Sites

Sometimes realignments needed during road improvement or reconstruction may pass through sites of socio-cultural sites. In that case, the following should be observed:

- Before the final design of the road works, all social and cultural data related to the road should be collected and their distance from the road noted. This should include (but is not limited to) taboo sites or other cultural sites, historical sites such as taboo caves or old burial sites among others.

- Identified sites should be mapped out with attempts made to avoid the socio-cultural sites or the felling trees unnecessarily.

- During the works, should human bones or other archaeological items be found, all works should cease immediately at this site and relevant authorities, such as the Vanuatu Kaljoral Senta (VKS) be informed.

4.4.2 Minimising the loss of productive land

Loss of agricultural land or other productive land such as fruit trees or timber sources can result from roadworks activities. In order to minimise the loss of productive land throughout the road works project phase the principle is to reduce the areas required for road work activities. By reducing the land use then more land will be left for productive uses. In road works three main activities should be managed to minimise use of productive land:

(i) *Quarries and borrow pits*

Some quarry or borrow areas can be extensive sometimes covering up to one hectare in size, thus taking up productive land.

To reduce any losses of productive land, the opening of land for a quarry or borrow pit should be limited to necessary areas for the quarry or pit. Restoration works as described in section 4.1.3 of this guide should be undertaken as soon as the materials are no longer required and as required by the **PWD Quarry Guide**.

(ii) Road re-alignments

Wherever possible, planned road re-alignments should be minimised to avoid damage to productive land or existing fruit trees etc.

Taking into account road reserve requirements, large trees and fruit trees alongside the road and in the road corridor should be retained wherever possible.

Adequate warning should always be given to landowners with crops in the areas to be affected so crops can be harvested before road works begin.

(iii) Campsites and other operational centres including depots, quarries, stone crushing etc.
Campsites and other work sites such as works depots, stone crushing and materials storage areas should be limited in size in order to reduce impacts on productive land.
Workers should not steal or use crops or fruit from surrounding land.
Decommissioning or demobilizing campsites and operational centres must always be planned and approved by PWD.
All work sites sites must completely cleared of all machinery, debris, waste, materials etc.
All work sites must be free of any hazards to the public or environment such as holes, pits or stockpiles that may cause erosion or damage to surrounding land.
If there is a formal agreement with the land owner, then some infrastructure such as roads, concrete slabs, water supply etc ***may*** be left on the site after demobilizing.

Make sure road alignments minimise the destruction of productive land or trees.

5 Supervision and Monitoring of Works

In addition to the supervision of the qualitative and quantitative aspects of construction activities, supervision will also include compliance with the contractual obligation as regards to the natural and working environment.

Supervision and monitoring of works will be done in the following ways:

For Works on Existing Roads:

- For PWD Mobile Teams, the Foreman in charge of the team shall use the **Environment, Health & Safety Daily Monitoring Form (Form D),** annexed as Annex 4 in this guide, to daily monitor the PWD works.

- For Island Based Contractors (IBCs), the Site Inspector shall also use the Environment, Health & Safety Daily Monitoring Form **(Form D),** annexed as Annex 4 in this guide, to daily monitor the IBC.

- For other PWD Contractors, the Foreman in charge of supervision shall also use **Form D** for the daily monitoring of the contractor.

For Works on New Roads, Existing Roads to be Upgraded to Tar Seal conditions and / or Road Bridges:

- The Divisional Engineer, or the Foreman in charge of daily supervision, shall use the **Environment, Health & Safety Daily Monitoring Form (Form D),** annexed as Annex 4 in this guide, to daily monitor the PWD works.

- The PWD Environment Officers shall undertake monthly inspections using the **Environmental Compliance Monitoring Form (Form E)**, annexed as Annex 5 in this guide, for works on new roads and or road bridges.

- For contracted works, monitoring site meetings shall be convened regularly, preferably on a monthly basis as a means to supervising the extent to which contractors are meeting their contractual obligations in complying with environment issues in the course of carrying out works. The monitoring site meeting shall provide an opportunity for co-operation and interaction between the contractor, the communities and the PWD to discuss road related arising issues. Other participants in the meeting shall include Environment Officers and Road Foreman / Inspectors including any other relevant staff.

- In addition to the formal meeting and regular monitoring, all the relevant technical (both engineering and non-engineering) and DEPC staff - as required will do ad hoc supervision.

6 Reporting and Impact Evaluation and Review

Reporting
Reporting will be on contractor's compliance with environmental issues in road works.

Environmental monitoring forms are to be collated by the Divisional Engineers and then submitted to the PWD Environment Officers for preparation and generation of an environmental report.

Impact Evaluation
Data collection for baseline surveys and subsequent impact evaluation shall be on the relevant environment indicators and can be used primarily for new roads, and in the form of the application for an environmental permit.

The baseline survey form (**Form E**) includes provisions for tracking changes in environmental conditions as a result of road works.

Data collection will be done with PWD Divisions and Provincial technical persons.

Review
Review of this document shall be made every two years, or as required by the Director DEPC in consultation with Director PWD and other officers as required.
This version is due to be reviewed by **December 2018.**

REFERENCES

Common Weeds in Vanuatu, sourced at
http://www.fao.org/ag/agp/agpc/doc/publicat/faobul2/b201.htm on 8 December 2015.

District Administrative and Operational Guidelines Volume 5 Manual B: Environmental Guidelines, Ministry of Works, Housing and Communications, The Republic of Uganda, October 2003.

Pacific Island Ecosystems at Risk (PIER), Cynodon dactylon, sourced at
http://www.hear.org/pier/species/cynodon_dactylon.htm on 8 December 2015

Tropical Crops and Pastures, The Vanuatu Pasture Improvement Project, sourced at
http://www.fao.org/ag/agp/agpc/doc/publicat/faobul1/1text.htm
on 8 December 2015.

The Environmental Protection and Conservation Act [CAP 283], Vanuatu Legislation, sourced at
http://www.paclii.org/vu/legis/consol_act/emaca412/ on 4 Dec 2015.

Vanuatu Public Roads Act No.35 of 2013.

PWD Quarry Guide.

PWD Quarry Management Plan template.

Annex 1

Area Council Road Inventory Form

FORM A

FORM A

AREA COUNCIL ROAD INVENTORY

Area Council: _____ **Island:**_____

Province: _____

Collected by: _____ **Date:** _____/_____/_____

1) Area Council Population (no): _____ **(source:**_____ **dated:**_____**)**

2) Area Council Area (km^2): _____ **(source:**_____ **dated:**_____**)**

3) List all Roads that are used by the Area Council *in their order of Priority :*

Area Council Road Name (from-to)	Road No.	Reason for Priority

4) List the *main* Community Access Roads of the Area Council, feeding into the feeder road and/or arterial road network *in their order of Priority* and mark these on the map (See 6 below)

Community Access Road Name (from-to)	Approximate length	Feeding into District Road (No)

5) What is the number of labourers / communities available for road works in the Area Council and in what quarters/months?

Quarter	Month(s) – from to	Number of Labourers / Communities

6) Prepare a sketch map of the Sub-County showing:

- Administrative boundaries and names: Area Council, Areas/Wards

- Residential Areas

- Environmentally sensitive areas including rivers, streams, mangroves, dark bush etc.

- Area Council Roads (and No.) and Community Access Roads

- Socio-Economic Services/Facilities including –

(I) Primary & Secondary schools

(II) Health Facilities (Dispensaries, Clinics, Hospitals, etc)

(III) Markets

(IV) Agricultural Farms / Factories, etc

Annex 2

DEPC Application for Environmental Permit Form

FORM B

FORM B

The Department of Environmental Protection and Conservation

Private Mail Bag 9063
Port Vila, Vanuatu
Phone: (678) 5333830/25302/33430
Email:
eia@vanuatu.gov.vu

How to Complete this Application Form

If you need help to complete this form, please read: Guide to Completing an Environmental Permit Application.

This application form and any supporting information provided with it are for the purpose of enabling an assessment process under the Environmental Protection and Conservation Act and the EIA Regulations.

An assessment must be conducted for any activity that is likely to impact on the environment of Vanuatu and any activity that requires any license, permit or approval under any law (e.g. Quarry Permit or Foreshore Development Consent). A list of activities that require an environmental permit is attached to this form.
Your application will not be considered unless you return to the DEPC:

a. This form, completed and signed
b. All relevant attachments and information required
c. An application fee.

No work may commence unless and until written approval is given by the DEPC.

1. Applicant Details

Full Name

Business details
Please Tick
❑ Registered Business (attach your business licence)
❑ Other Organisation (attach your VFSC certificate)

Organisation Name & CT Number (if applicable)

Address

Physical Address

PO Box Address

Contact Details

Tel:	Mobile:	Email:
Website:		

2. The Project Proposal

You must give <u>full details</u> of your project and attach the required information. Insufficient or unclear information will delay your application. Please use separate sheet(s) if required to give a full description of your project.

If you need help about completing this form, please read <u>Guide to Completing an Environmental Permit Application</u>.

WHAT IS THE NAME OF YOUR PROJECT?	
WHAT IS YOUR PROJECT? *Please describe your project from construction through to operation. Include plans and layout of project on the site with your application. Use another sheet of paper if required.*	
WHERE IS YOUR PROJECT LOCATED? *Give name of island, area and nearest town or village and other directions.* *Please also include a map clearly showing location in relation to neighbouring properties, coastal or other features etc.* *Photos of the project site are helpful.* *Google maps can also be used to show location.*	
WHAT IS THE TIMING FOR YOUR PROJECT? *Please advise proposed start date and duration of construction and also the operational life of the development.*	**Construction (including site preparation):** Start Date: Duration: **Operational life:**
WHAT IS THE LAND STATUS AT THE PROJECT LOCATION? *Please tick box and provide required details. You must include a copy of the land lease. For kastom land, please attach a signed, dated agreement to the proposed project from the kastom owner.*	❑ Leased Land Title number: Lease class: ❑ Customary Land ❑ In the process of acquiring land
WHAT IS THE TOTAL LAND AREA OF THE PROJECT? *Area to be used by the project.*	…….ha/m^2

3. ENVIRONMENTAL IMPACTS

Please complete this section for your project.

For all projects apart from minor projects (see schedule attached), please also fill out the separate form: Supporting Information for an Environmental Permit.

Insufficient or unclear information will delay your application.
If you need help about completing this section please read Guide to Completing an Environmental Permit Application.

WHAT IS THE CURRENT ENVIRONMENT AT THE PROJECT LOCATION? *(such as vegetation cover, fauna, human settlement)* *Is the land already cleared or developed?*	
WHAT OTHER ACTIVITIES ARE CLOSE TO YOUR PROJECT LOCATION? *(such as neighbouring land uses and developments)* *Please also include these on your location map.*	
DOES THE PROJECT LOCATION INCLUDE OR IS NEAR TO: *Please tick yes or no. If Yes, please mark on your location map.*	Coast: ❑ Yes ❑ No River or stream, wetland: ❑ Yes ❑ No Cultural sites: ❑ Yes ❑ No Protected areas: ❑ Yes ❑ No
DOES THE PROJECT INVOLVE RESETTLEMENT OF PEOPLE OR BUSINESS ACTIVITIES?	❑ Yes *(Please provide details in the separate form:* **Supporting Information for an Environmental Permit***)* ❑ No
HOW DO YOU PROPOSE TO REDUCE OR AVOID THE ENVIRONMENTAL IMPACTS OF YOUR PROJECT? *Please briefly describe the steps you will take to reduce impacts on the environment from construction through to operation.* *For all projects apart from minor projects listed in the attached schedule, please provide further information on how you will manage environmental impacts in the separate form:* **Supporting Information for an Environmental Permit**.	

4. APPLICATION CHECKLIST

All Applicants: ***Please tick to confirm each item on this checklist***	**Official use only**
❑ Completed all sections of this Application Form	Y/N
❑ Completed a **Supporting Information for an Environmental Permit** (All projects except minor listed in attached schedule)	Y/N
Attached copies of:	
❑ Draft Plans & Designs	Y/N
❑ Site Plan	Y/N
❑ Location map of area	Y/N
❑ Land lease document (*if leased land*)	Y/N
❑ Application fee (20,000 vatu)	Y/N
❑ Other approvals (e.g. kastom owner consent for coastal developments).	Y/N

Official use only

Date received:

DEPC Reference number:

Due date for decision:

5. APPLICANT DECLARATION

I/We _____declare that all the information presented herein and attached is correct and is an accurate description of the proposed development project.

Applicant signature:_____ **Date**: _____
(*Official Stamp where applicable*)

IMPORTANT: The information contained in this application form and the attached documents and plans forms part of the formal environmental permit application process and the permit terms and conditions. Failure to comply with the project proposal as set out in this application form may result in penalties under the Environmental Protection and Conservation Act. Any changes or variations to the project must be referred to the DEPC <u>before</u> the development goes ahead.

THIS APPLICATION IS FOR A PERMIT UNDER THE ENVIRONMENTAL PROTECTION AND CONSERVATION ACT ONLY.

THE GRANTING OF A PERMIT UNDER THE ENVIRONMENTAL PROTECTION AND CONSERVATION ACT DOES NOT INFER OR ASSUME THE GRANTING OF LICENCES OR PERMITS UNDER ANY OTHER VANUATU LEGISLATION.

GUIDE ON HOW TO FILL IN FORM B

INTRODUCTION

Our environment is important in Vanuatu and that is why we have laws to protect our environment from the impacts of development. As our population grows and development continues it becomes more and more important to look after our environment.

Part of this protection is the legal requirement for the formal assessment of development projects that may damage the environment. Under law all developments that require permits or are part of a schedule must apply for an environmental permit.

This guide is written to assist you completing the application form for your development project as required by the law. The Department of Environmental Protection and Conservation (DEPC) will provide further information and support if you have problems with completing any parts of your application.

APPLICATION FORM - PURPOSE

This form is now in two parts: The first or main part contains the main details of your project. There is also an additional information form for projects not marked on Schedule of Minor Projects. The form is designed to help you fully describe your project and how you will reduce and manage any environmental impacts arising from the project construction or ongoing operation.

THE APPLICATION FORM

Section 1. Applicant Details

Please fill out all parts of this section.

Please give your full name and also the name of your organisation or business. If an organisation or business you must include evidence of this (VFSC certificate or business licence).

Please give your full contact details including an address and mobile phone number. We must have contact details in order to contact you for any questions and to arrange a site visit.

Section 2. The Project Proposal

Department officers need to understand the details of your proposed project. Please include as much information, plans and drawings as possible.

Name of Project. The name of the project is the name used to refer to the project so for example the name could be a description such as "foreshore development at Samson property Efate" or a formal title such as "Port Vila Casino extension".

To fill in the next box of the form please refer to the attached **Schedule** of project types. This will be checked by DEPC officers who will require the required information to be included in your application.

What is your project? Please summarise the whole of your project and include diagrams, drawings and layout of the project on the site.

Where is your project located? So that officers can locate your project, please give an accurate location and include a map that clearly shows the project site and points out other features such as the coastline and neighbouring properties.

Project Timing? Please complete this section as accurately as possible.

Land status? Please complete this section accurately and include a copy of the land title(s) if leased land.

Land area? Please give this in either hectares or square metres for areas less than 1 ha.

3. Environmental Impacts

You need to complete all the parts of this section.

Please give as much information as possible and use additional sheets of paper if required. It is important that you carefully consider the environmental impacts of your project and describe how you will reduce or avoid these impacts.

Unless your project is a minor project on the schedule, you must also fill in the separate Supporting Information for an Environmental Permit as the department will need this level of information required to assess your project

4. Application Checklist

This short section sets out all the information that MUST be included in your application. If you do not complete the application form(s) and provide this information your application will either be rejected or the department will contact you to supply the required information. No assessment will take place until all the required information is included.

5. Applicant Declaration

This is your declaration that your application is complete and that the description of your project and its impacts on the environment and how you intend to protect the environment is accurate and true.

The details in your application are part of your permit under the EPC Act. Any unauthorised change to your projects as set out in the application means that you will be operating outside the conditions of your permit and potentially face penalties under the Act. Therefore please ensure the department is informed of any changes to your project.

Annex 3

PWD Associated Works Consent Form

FORM C

FORM C

PWD ASSOCIATED WORKS CONSENT FORM

Consent No.	

1	**Location:**				
2	**Section:**				
3	**RHS/LHS:**				
4	**Type of road works:**				
	Stockpile site		Realignment		
	Disposal site		Traffic Diversion		
	Vegetation/Tree Removal		Relocation of fence		
	Drainage works		Other		
	If other, please explain: …… …… ……				
5	**Brief Description of the proposed road works:** *(Please attach documents and/or photographs, as applicable).*				
6	**Details of items likely to be affected by the proposed road works:**				

	Description of Asset and Impact of Loss	Agreed solution and entitlement
1		
2		
3		
4		

7 Identification of Potential Environment and Social Impacts

	Potential Environment & Social Impact	Proposed Mitigation Measure
1		
2		
3		
4		

8 Agreement for Access and/or Temporary Occupation of Land

8.1 Status of Land Ownership: *(please circle one)*

Lease State Custom Ownership

8.2 Consent

With reference to a consultation of _____, I , the undersigned, give my consent to allow the Public Works Department of the Government of the Republic of Vanuatu, to proceed with the proposed road works as detailed above.

(For the Leaseholder)

Name:……Signature:……

Title:…… Date:…….

(For the Custom Owner)

Name:……Signature:……

Title:…… Date:…….

Witnessed by:

Name:……Signature:……

Title:……Date:…….

Witnessed by Chief of the Community:

Name:……Signature:……

Title:…… Date:…….

Acknowledged and Agreed on behalf of the Public Works Department:

Name:……Signature:……

Title:…… Date:……..

Annex 4

Environment, Health & Safety
Daily Monitoring Form for IBCs
FORM D

ENVIRONMENT, HEALTH & SAFETY DAILY MONITORING FORM

FORM D

Contractor Name: …… **Location of Work:** ……

Nature and Extent of Work: ……

Date: …… **Monitoring Officer:** ……

1. Environment Compliance:

(i) Destruction of vegetation:

Is clearing limited only to the approved area?

Yes: ☐ No: ☐

Cuttings disposed of appropriately?

Yes: ☐ No: ☐

If No (Specify):

……

……

(ii) Solid waste:

Type of waste:……..

……

Waste disposed of appropriately (in approved landfill)?

Yes: ☐ No: ☐

If No (Specify):

……

……

(iii) Fuel / Oil / Lubricant Use:

- Fuel/Oil used today and if so was the waste disposed of appropriately?

Yes: ☐ No: ☐

If No (Specify):……

- Fuel / Oil storage:

Circle one: Poor, Fair, Good, Very Good

(iv) Dust / Smoke (Fire) Control

Circle one: Poor, Fair, Good, Very Good

(v) Steep slopes, Soil Stability, Erosion and Sedimentation:

If it is raining today, is the increased run off creating any changes in the drainage pattern at the site?

Yes: ☐ No: ☐

Are all silt fences, silt traps, and other mitigation measures in place (in drainage lines) working well?

Yes: ☐ No: ☐

Describe any soil stabilizing / protection works happening today?

……

……

(vi) Material Extraction

Type of Material excavated today:……..

……

Volume extracted today:……..m^3

(vii) Any issue (i.e. pollution) with water bodies (streams, rivers, sea) today?:

Yes: ☐ No: ☐ If Yes (Specify):……

……

2. Health & Safety Compliance:

(i) Workers in Safety Wear?

Yes: ☐ No: ☐

If No (Specify): ……..

……

(ii) First Aid Kit onsite?

Yes: ☐ No: ☐

(iii) Latrine(s) on site and usable?

Yes: ☐ No: ☐

(iv) Adequate drinking water on site?

Yes: ☐ No: ☐

(v) Are the traffic & 'men at work' signs in place?

Yes: ☐ No: ☐

(vi) Any traffic accidents today?

Yes: ☐ None: ☐

If Yes (Specify): ……

(vii) Any worker accidents/injury today?

Yes: ☐ None: ☐

If Yes (Specify): ……

Any Other Remarks:

……

……

Annex 5

PWD Environmental Compliance Monitoring and Evaluation Form

FORM E

ENVIRONMENTAL COMPLIANCE MONITORING AND EVALUATION FORM

FORM E

1. Back ground information:

(i) Name of contractor:……

(ii) Contract Identification……

(iii) Location:……

(iv) Total Distance (km):……

(v) Distance (km) monitored/evaluated……

2. Nature and extent of work:

.....

.....

.....

.....

3. Significant environmental concerns:

(i) Risk to protected areas (Forest/Conservation area, Marine Protected area).

None:……

Significant:……..

Highly significant……..……..(Specify)……..……..

……..……..

(ii) Impact on Wetland Ecology:

None:……

Significant……

Highly significant……..……(Specify)……..……

……..……..

(iii) Impact on domestic Water Supply.

None:……

Significant:……..……...

Highly significant……..…..(specify)……..…….

……..……..……

(iv) Changes in air quality due to vehicle emissions and dust.

None :……………………………………………………………………………….

Significant……………………………………………………………………………..

Highly significant……………….……(Specify)…………………………………..

………………………………………………………………………………………………

(v) Increased run off and changes in drainage pattern.

None:……………………………………………………………………………………….

Significant:……………………………………………………………………………………

Highly significant…………………(Specify)…………………………………….

………………………………………………………………………………………...

(vi) Changes in soil stability and erosion

None:……………………………………………………………………………………………

Significant:………………………………………………………………………………

Highly significant………………….…..(Specify)…………………………….……….…

…………………………………………………………………………………………….……

(vii) Changes in land use pattern and intensification of land use.

None:…………………………………………………………………………… …..….

Significant……………………………………………………………………………….…..

Highly significant…………………......(Specify)….…………………………………..…

……………………………………………………………………………………………….…

(viii) Human Population impact (increased density, congesting, relocation?)

None:……………………………………………………………………………………….…..

Significant:…………………………………………………………………………………………

Highly significant………………...……….(Specify)…………………………………

………………………………………………………………………………………………

(ix) Effects of working environment on workers' health.

None:…………………………………………………………………………………….….

Significant:……………………………………………………………………………….…

Highly significant…………………………….…(Specify)…………………………...

……………………………………………………………………………………….……….…

(x) Traffic Accidents.

None:………………………………………………………………………………………

Significant:……

Highly significant……..…..(Specify)……..…..

……..……...

(xi) Public health impacts.

None:……

Significant:……

Highly significant…….....…….(Specify)……..……..

……..……...

(xii) Social disruptions.

None:……..……..

Significant:……..……

Highly significant…….....…..(specify)……

(xiii) Depletion of forest, fauna, other natural resources.

None:……..……..

Significant:……..…….

Highly significant…….....…..…(specify)…….....…..……

……..……

4. Mitigation Measures Applied

(I). Involvement of rural communities (Poor, Fair, Good, Very good)

(ii) Erosion and sedimentation (Drainage Channel protection). (Poor, Fair, Good, Very good)

(iii) Restoration of borrow pits: (Poor, Fair, Good, Very good)

(iv) Destruction of vegetation and soil.

Harvesting of vegetation (None, Significant, Highly significant)

Site restoration (None, Significant, Highly significant)

(v) Disruption of biodiversity: (None, significant, highly significant)

Specify……

(vi) Cross Drainage (Poor, Fair, Good, Very Good).

(vii) Health Hazard: Dust control (Poor, Fair, Good, Very Good).

(viii) Erosion of land receiving concentrated outflow (None, Significant, Highly significant)

Specify:…….

(ix) Conformity to existing policy and legal framework (Poor, Fair, Good, Very Good).

(x) Conformity to EMAP (Poor, Fair, Good, Very Good).

(xi) Conformity to environmental standards (Poor, Fair, Good, Very Good).

5. General comments/Recommendations

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Name of Monitoring/Evaluation

Personnel:……

Designation:……

Signature:……

Date:……