

# Environmental Assessment and Review Framework

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## Papua New Guinea: Rural Primary Health Services Delivery Project

Endorsed for Implementation

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Secretary for Health

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## ABBREVIATIONS

ADB	-	Asian Development Bank
AP	-	Affected Person
BCD	-	Bid and contract documents
BOQ	-	Bill of Quantities
CEMP	-	Construction Environmental Management Plan
CHP	-	Community Health Post
DoL	-	Department of Labor
DEC	-	Department of Environment and Conservation
EA	-	Executing Agency
EARF	-	Environmental Assessment Review Framework
EMP	-	Environmental Management Plan
EP	-	Environmental Permit
ESO	-	Environmental and Safety Officer (contractor)
GRM	-	Grievance and Redress Mechanism
IA	-	Implementing Agency
IES	-	International Environmental Specialist (in CSC)
IEE	-	Initial Environmental Examination
EPAR	-	Environmental (Prescribed Activities) Regulation
NGO	-	Non-Government Organization
NDOH	-	National Department of Health
PCR	-	Physical Cultural Resources
PE	-	Project Engineer
PH	-	Permit Holder (under EPAR)
PHA	-	Provincial Health Authority
PNG	-	Papua New Guinea
PSU	-	Project Support Unit
QPR	-	Quarterly Progress Report
SDEC	-	Secretary, Environment and Conservation
SPS	-	Safeguard Policy Statement
SS	-	Safeguards Specialist (in PSU)
SEC	-	Secretary of Environment and Conservation

## CURRENCY EQUIVALENTS

(as of 29 April 2013)

Currency Unit – Kina (K)

K1.00 = \$0.44

\$1.00 = K2.28

## I. INTRODUCTION

1. Following project preparatory work undertaken in 2011 and consideration and approval by the Board, the Asian Development Bank (ADB) has agreed to finance the Rural Primary Health Services Delivery Project in Papua New Guinea (PNG). The project objective is to increase the coverage and quality of primary health care services for the majority rural population in partnership with state and non-state health service providers (private sector, churches, nongovernment organizations [NGOs], and civil society). It will support the government in implementing the National Health Plan 2011-2020 as it relates to rural health.

2. An essential part of the project will create the foundations for broader system development at the provincial and district levels through establishing community health posts (CHPs), as well as human resource development. The project will build on ADB experience in strengthening health service delivery in rural areas in partnership with the private sector. The location of the proposed CHPs will be in two districts in each of the eight selected provinces of Western Highlands, Eastern Highlands, Enga, West New Britain, Morobe, Milne Bay, and East Sepik, and the Autonomous region of Bougainville.

3. The project will be delivering six outputs as follows: (i) national policies and standards for CHPs; (ii) sustainable partnerships between provincial governments and non-state actors; (iii) human resource development in the health sector; (iv) community health facility upgrading; (v) health promotion in local communities; and (vi) project monitoring, evaluation and management.

4. An Environmental Assessment and Review Framework (EARF) presenting the scope, approach, and results expected for the project's environmental matters and a project-wide initial environmental examination (IEE) were compiled during the project preparation in 2011. The project's IEE contained a generic but comprehensive environmental management plan (EMP) covering expected works and waste management and treatment needs, and both the IEE and the EARF contained a number of appendices covering information relevant to updating of the EMP and integration of the EMP into the bid and contract documents (BCD).

## II. SCOPE OF APPLICATION

5. As the site locations, designs, and civil works of output 4 are to be determined after ADB approval of the loan and during project implementation, in accordance with ADB policy and procedures, the project has been treated as a sector-like project for the purposes of the environmental assessment and review.<sup>1</sup>

6. The general process requires; (i) initial screening and categorization (undertaken at project level with Category B determined as applicable for sub-projects given limited size of sites (0.25 – 0.5 ha) and scale of works);<sup>2</sup> (ii) preparation of an environmental assessment including the identification and establishment of required environmental mitigation and management measures (undertaken at project-level, with updated EMPs to be prepared for each subproject); and (iii) monitoring of compliance with the approved measures.

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<sup>1</sup> Relevant policy and procedures include Safeguard Policy Statement (2009), OM/OP/F1 Safeguard Review (2010); OM D3/OP Sector Lending (2003).

<sup>2</sup> Projects are categorized as category B if the potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be readily designed. The appropriate level of assessment for category B subprojects is IEE.

7. This updated EARF proposes improvements to further streamline environmental safeguards in subproject implementation.

8. Although the entire project is subject to the EARF, most of the project's environmental assessment and review efforts are associated with output 4, which includes the project's civil works activities.

### **III. LEGAL AND POLICY FRAMEWORK**

#### **1. Papua New Guinea's Environmental Assessment and Review Framework**

9. Environmental legislation in Papua New Guinea falls within the Environment Act of 2000. This act and its regulations are administered by the Department of Environment and Conservation (DEC).

10. The Environment (Prescribed Activities) Regulations (EPAR) 2002 categorizes projects as "Prescribed Activities" in two schedules according to the anticipated potential environmental impact or level of investment. Level 2A activities require an environmental permit but do not require environmental assessment. Projects that are likely to have significant adverse environmental impact (Level 2B and Level 3) are required to undergo assessment prior to obtaining an environmental permit from DEC.

11. The refurbishment of existing and construction of small health facilities are not defined in the EPAR as either Level 2B or Level 3 activities – hence from the perspective of the environmental legislation, there is no need for submission of environmental assessments under the government's environmental assessment framework. The National Department of Health (NDOH) will disclose the scale and scope of subprojects to DEC so that DEC can decide whether any specific environmental requirements will be needed for the proposed upgrading and rehabilitation of health facilities. Some works associated with the CHP construction and operation will be Level 2A activities and permits for wastewater discharge, water extraction, and air discharge will be required. The updated site-specific EMP will be submitted with the applications.

#### **2. ADB Environmental Safeguards**

12. The implementation of the project will also need to comply with and fulfill the environmental safeguards requirements of ADB. The SPS sets out the policies and principles for the protection of the environment and communities.

13. The SPS requires that through a process of screening, categorization and assessment the project will (i) reflect fully the policy objectives and relevant policy principles and safeguard requirements governing preparation and implementation of projects and/or components; (ii) explain the general anticipated impacts of the project and/or components; (iii) specify the requirements that will be followed for information disclosure, meaningful consultation, and grievance redress mechanism; (iv) describe implementation procedures and responsibilities, including budgets, institutional arrangements, and capacity development requirements; and (v) specify monitoring and reporting requirements.

14. This will be achieved through the identification of the impacts and the establishment of appropriate mitigating measures to minimize, or if at all possible, eliminate the adverse impacts of the development and/or provide compensation for impacts that cannot be avoided, as established by the process and procedures included in this EARF.

15. It is likely that the Project would relocate its construction activity rather than enter into compensation arrangements for any unavoidable environmental impacts.

16. The ADB will review, evaluate and assess the capacity of the borrower/client to properly manage the environmental and social impacts and risks of the project and to implement the relevant national laws and regulations and the ADB requirements. If gaps are identified relative to the existing national laws for safeguards and ADB requirements or if there are apparent gaps in the borrower/client capacity, details of the specific requirements to fill gaps will need to be incorporated in the EARF to ensure that the policy and principles of the ADB's SPS are complied with.

### 3. Responsibilities for Environmental Management in the Project

17. Table 1 sets out the responsibilities and authorities of key organizations involved in the application of the EARF and environmental management activities during project implementation.

**Table 1 - Responsibilities for EARF Implementation**

Organization	EARF Implementation Responsibilities
National Department of Health (NDOH)	Overall responsibility for environmental assessment and management of the project; and Submission of semiannual safeguard monitoring reports to ADB.
Implementing Agencies (IA) - provincial health authorities and governments	With assistance and support from PSU, overall responsibility for applying the EARF, and implementing and reporting on EMP activities to the government and ADB. This includes: <ul style="list-style-type: none"> <li>- delegating staff as safeguards officer (SO);</li> <li>- conduct consultation and disclosure events during project preparation and implementation;</li> <li>- coordinate the Grievance Redress Mechanism in accordance with guidance provided in project documents;</li> <li>- submit CEMPs to PSU for review, comment, endorsement; approve CEMPs;</li> <li>- ensure monitoring and reporting of CEMPs in accordance with the EMP;</li> <li>- support actions to address noncompliance of CEMPs;</li> <li>- maintain regular communications, coordination, and support for in-province activities of PSU on environmental matters.</li> </ul> <i>Note: Relevant staff from implementing agencies will receive environment training from PSU as required.</i>
Project Support Unit (PSU)	Advise NDOH and IAs on safeguards matters; Assist the executing agency to prepare semiannual EMP reports to ADB; Participate in the Grievance Redress Mechanism; and Engage consultants to support environmental assessment as required
Safeguards Specialist (SS) in PSU	Monitor EARF implementation; Provide training to SOs as required; Consult with DEC on permit applications and documentation requirements; Update EMP as site-specific document for each CHP site; Assist IAs and NDOH make environmental permit applications; Assist PSU and IAs to integrate EMP requirements into bid documents, Assist implementing agencies to evaluate bid documents; Provide training to contractors as required; Review and comment on construction EMPs (CEMP); and Establish systems and tools to monitor implementation of the CEMPs and provide technical on-the-job training and support to partners, including IAs, contractors, local community, and government to ensure successful CEMP

Organization	EARF Implementation Responsibilities
	implementation, including mitigation, monitoring and reporting; Participate in consultation and disclosure events as per the EMP; and Draft key text for progress reports and semiannual monitoring reports.
ADB	Review and approve project-wide IEE and provide comment, as required, on EMPs and/or CEMPs; As requested, assist the implementing agency to approve CEMPs, review bid documents, or other matters related to implementing the EARF; and Review and approve semiannual monitoring reports.
Contractor	Participate in training as required and prepare CEMP; Submit to PSU for approval; Implement and report on CEMP; Include compliance and monthly accident/incident reports in the Monthly Report submitted to PSU.
Department of the Environment and Conservation (DEC)	Advice on permits and documentation submissions; Administration and enforcement of Environment Act 2000 and its regulations.

ADB = Asian Development Bank, CEMP = Construction Environmental Management Plan, DEC = Department of Environment and Conservation, NDOH = Department of Health, EARF = environmental assessment and review framework, IEE = initial environmental examination, EMP = environmental management plan, PSU = project support unit, SS = Safeguards Specialist, SO = Safeguards Officer.

#### IV. SCOPE OF WORKS AND IMPACTS

18. The rehabilitation and upgrading of existing and/or construction of new CHPs will involve limited construction works within small sites (0.25 – 0.5 ha) including:

- civil works for CHP upgrading;
- civil works for new CHP construction, including staff housing, water supply, renewable energy sources (mini-hydro 10-20 kW or solar), and sanitation;
- solid waste management facilities at existing or new CHPs;
- water supply and wastewater treatment facilities at existing or new CHPs; and
- small-scale construction works including access roads, fencing, drainage, and landscaping works.

19. The environmental impacts anticipated in the implementation of the project will be generally insignificant as the works are minor (as described above). Based on the IEE, Table 2 summarizes the potential impacts and proposed mitigation measures for the main civil works activities that will form the basis of the site specific EMP for each CHP site.

**Table 2 - Project Environmental Impacts and Mitigation Measures**

<b>Issue</b>	<b>Performance Objective</b>	<b>Mitigation Measure</b>	<b>Responsibility for Implementation</b>
<b>Preconstruction Stage</b>			
Land use/acquisition	Minimize financial and social impacts on local people. Project certainty	Identification of suitable land possessing titles on government or church-owned land Resettlement plan for sites planned for acquisition	NDOH, PSU, provincial lands officers
Provision of climate change requirements in design	Minimize risk of damage to infrastructure by flooding.	Site designation above potentially flooded sites	PSU
<b>Construction Stage</b>			
Access	Agreements with local land owners; Minimize vegetation clearance and erosion of exposed surfaces	Temporary access arrangements agreed Minimize size and duration of cleared areas Undertake progressive re-vegetation of cleared areas	Construction contractor, PE, SS
Preparation of site (including Contractors' facilities)	Maintain integrity of the site.	Minimize vegetative loss Soakage areas not to discharge to surface water streams Parking areas and workshops (if any) to have oil separators	Construction contractor, PE, SS
Septic tank installation	Minimize pollution of soil and adjacent water courses	Install as per design standard and specifications stipulated by PSU	PSU – architect Construction contractor
Gravel and material extraction	Reduce use of materials from unsuitable sites, Sustainable extraction and use of materials	Use existing quarry where possible Agreements with resource owners in place Obtain permits as required Submit quarry management plan or gravel extraction plan to PSU	Construction contractor, PE, SS
Excavation of construction sites	Loss of topsoil	Minimize excavation area Apply soil conservation and erosion prevention technologies Use sediment basins Avoid using machinery in adverse condition. Re-vegetation/protection as soon as possible	Construction contractor, PE, SS
Removal and disposal of excavated waste material (if any)	Re-use of material as much as possible	Excavated material to be stored away from site at location where it can be reused if required Material that cannot be reused is to be landscaped so as not to cause erosion All disposal areas to be protected to avoid erosion All waste disposed of as per agreed waste management plan in compliance with NDOH guidelines	Construction contractor, PE, and SS
Erosion and sedimentation	Minimize erosion of exposed surfaces	Install sediment capture devices Construct diversion drains to direct clean runoff away from disturbed areas Minimize size/duration of cleared areas	Construction contractor, PE, SS

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation
		Undertake progressive re-vegetation	
Storage and handling of construction materials, fuel, and lubricants	Secure storage, minimize generation of potential water pollutants, minimize accidental spills and emergency response plan in place in case accidental spills occur	Store chemicals in secure area, with concrete floor and weatherproof roof Ensure that construction equipment and vehicles are maintained in good condition. All refueling to be done at least 20 m from waterways Accidental spill action plan on site. Install sanitary toilets and washing facilities at construction site Remove waste from site regularly for disposal to landfill All waste disposed of as per agreed waste management plan in compliance with NDOH guidelines	Construction contractor, PE, SS
Noise and vibration	Minimize nuisance to surrounding communities	Limit noisy activities to daylight hours Generally noise not to exceed 45 dBA at boundary of workplace	Construction contractor, PE, SS
Dust generation	Maintain air quality	If dust is carried towards residential areas or becomes problematic on site, the contractor is to apply dust control measures	Construction contractor, PE, and SS
Conflict between workers and local community	Minimize friction with surrounding communities.	Any activities such as (i) use of timber/wood as fuel; (ii) hunting; (iii) clearing of areas for gardening by construction workers prohibited	Construction contractor, PE, and SS.
Public access to site	Accident prevention	Erect barriers and warning signs around work areas Site can be accessed only by permission from contractor	Construction contractor, PE, and SS
Risks to public and worker health and safety	Minimize risk of accidents involving the public or construction workers.	Provide safety equipment to construction workers and train them in its use Secure construction site and restrict access by local community. All vehicles to be properly maintained and operated in accordance with road laws All loads to be secured properly	Construction contractor and PE, SS
Use of hazardous materials	Reduction in health dangers to workers and the environment	Contractor to provide list of all hazardous chemicals/materials to be used on site. Contractor to display information sheets in work areas All such materials used and stored in compliance with NDOH guidelines	Construction contractor, PE, SS
Disposal of waste materials	Prevent soil and water pollution	All waste materials to be collected and sorted into those that can be re-used and those that need to go to an approved landfill site All waste disposed of as per agreed waste management plan in compliance with NDOH guidelines	Construction contractor, PE, SS
Construction of power supply	Renewable and sustainable energy sources used	As per design standard and specifications stipulated by PSU Environmental permits, as required, obtained	Construction contractor, PE, SS, NDOH

Issue	Performance Objective	Mitigation Measure	Responsibility for Implementation
		No impacts on existing users (mini-hydro)	
Archaeological discoveries	Prevention of the loss of cultural values	Chance discoveries are to be notified to SS	Construction contractor, PE, SS
Clearance and rehabilitation of construction sites and removal of contractors' facilities	Re-established environmental amenity	All solid waste to be removed from sites and disposed of in approved landfills. All contaminated soils to be removed. All sites to be rehabilitated and restored to near-original condition. To be included as part of final inspection before final payment is made.	Construction contractor, PE, SS
<b>Operation Stage</b>			
Water supply	No impact on existing users	As per design standard and specifications stipulated by PSU Environmental permits, as required, obtained	PSU and NDOH
Power supply	Renewable and sustainable energy sources used	As per design standard and specifications stipulated by PSU Environmental permits, as required, obtained	PSU and NDOH
Prevention of discharge of any untreated wastewaters into the environment	Prevention of disease spread – and environmental contamination	Sewerage systems to be built in accordance with CHP specifications (as per Appendix 1) All waste disposed of as per agreed waste management plan in compliance with NDOH guidelines	PSU and NDOH
Correct disposal of all medical wastes	Prevention of disease spread – and environmental contamination	Incinerators to be built in accordance with CHP specifications (as per Appendix 2) All waste disposed of as per agreed waste management plan in compliance with NDOH Infection Prevention Policy – 2 <sup>nd</sup> Edition – October, 2008	PSU and NDOH

Abbreviations: CHP = community health post, NDOH = National Department of Health, PSU = project support unit, P = project engineer (in PSU), SS = safeguards specialist (in PSU).

## V. PREPARATION, REVIEW AND CLEARANCE OF DOCUMENTS

### 1. Environmental Criteria for CHP Site Selection

20. The environmental criteria for CHP site selection are set out below:

- (i) Avoid direct or indirect significant, negative impacts on protected areas defined as wildlife management areas, national parks, or conservation areas.
- (ii) Avoid sites that possess any areas of forest or undisturbed natural vegetation. Only sites that have been previously cleared are to be accepted.
- (iii) Avoid direct or indirect significant, negative impacts on important items of cultural heritage.
- (iv) Avoid areas that are currently under direct human habitation as well as sites that are being gardened.

- (v) Do not cause any other environmental impacts that would trigger categorization as a Category A project in accordance with the ADB's Safeguard Policy Statement (2009) and OM/F1/OP Safeguard Review.

## **2. Environmental Assessment and Management Documents**

21. The environmental assessment and review process produces several documents, including the following:

- (i) Initial Environmental Examination (IEE). A project-wide IEE was prepared during project preparation. This will be distributed widely to the executing agency, implementing agencies, PSU, other government agencies, and contractors.
- (ii) Environmental Management Plan (EMP). The EMP will address environmental mitigation and monitoring activities, institutional arrangements and strengthening requirements, the grievance redress mechanism, public consultation activities during project implementation and operation, and environmental monitoring and reporting requirements. More detailed and location specific EMPs will be prepared for each site/CHP such that they can adequately guide daily operations.
- (iii) Bid and Contract Documents (BCD). The EMP's mitigation and monitoring measures relevant to the construction stage will be incorporated into the BCD.
- (iv) Construction Environmental Management Plan (CEMP). This plan will be prepared by the contractor and respond to the mitigation and monitoring measures stipulated in the BCD and will also identify the site-specific requirements (including access, renewable energy and water supply) based on the design for the site and contractor bidding documents.
- (v) Environmental compliance reports. These reports are prepared by both contractors and the PSU. They report on compliance of the contractor with the approved CEMP and the effectiveness of mitigation measures.
- (vi) Safeguards monitoring reports. These reports are prepared by PSU and NDOH and submitted to ADB and disclosed locally.

22. Environmental assessment is required and has been undertaken at project-level, given the small scale of works and similarity between and small size of sites, the IEE generally identifies the project civil works activities with potential adverse environmental impacts. Guidance on the preparation of these documents is found in the following pages.

## **3. Requirements for Environmental Management Plans**

23. The SPS provides guidance on the preparation of the EMP. The EMP is the result of the environmental assessment. The EMP provides the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

- **Mitigation:** (a) identifies and summarizes anticipated significant adverse environmental impacts and risks; (b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and (c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.
- **Monitoring:** (a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and (b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.
- **Implementation arrangements:** (a) specifies the implementation schedule showing phasing and coordination with overall project implementation; (b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; (c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan; and (d) performance indicators: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

24. Appendix 3 contains the EMP from the approved IEE. The EMP from the approved IEE will be updated as required for each site based on (i) the CHP standard design prepared by NDOH, revised as required for each site; (ii) the need for site access; and (iii) provision of renewable energy and water supply to the CHP. The IA will incorporate the requirements of the updated EMP, along with all other relevant safeguards provisions, in the BCD. Where modifications to designs are incorporated at a later stage, if required (based on advice sought from ADB), additional or further updated assessments (including EMPs) will be prepared and submitted to ADB for review and clearance.

25. The EMP includes the requirements for monitoring (see Section VII). Monitoring and reporting of EARF implementation will be undertaken to ensure that the procedures are being adequately implemented and to identify any modifications or corrective action that may be required to improve the efficiency of the EARF throughout project implementation. The monitoring of EARF implementation will be incorporated into the overall project monitoring and evaluation and reporting system.

#### **4. Requirements of the Construction Environmental Management Plan**

26. Based on the EMP included in the approved IEE, at the onset of project implementation, model construction contracts will be prepared which incorporates the general environmental safeguards and practices required for CHP development. These will be modified specific to each site to ensure that all special or particular safeguard requirements and mitigation measures, recommended in the EMP provisions based on detailed design, are incorporated within the BCD of each subproject (site). The IA's safeguard officers and contractors will be provided with the necessary training on the preparation of the CEMP, safeguards requirements of the ADB and the requisite environmental regulations of GoPNG especially those that relate to the materials sourcing and opening and operation of quarries if sourcing of materials locally is required for a subproject. This training will be undertaken by the PSU's PE and SS.

27. The CEMP will respond to the mitigation and monitoring measures stipulated in the BCD. Each contractor will be required to prepare a site-specific plan for mitigating measures to avoid or reduce impacts of proposed works and the contractor will further detail their construction methodology in the CEMP. During the construction and/or CHP upgrading works, it shall be ensured that the contractor strictly implements the approved CEMP.

28. The CEMP will set out how the contractor will achieve environmental safeguards, identify the staff designated with responsibility for ensuring and reporting CEMP implementation including implementation of the grievance redress mechanism. The CEMP will also establish how the contractor will report on CEMP implementation and corrective actions as part of Monthly Reporting to PSU. The contractor may move to the site and commence work only after the CEMP has been approved by the implementing agency and endorsed by the PSU.

29. Typically, contractors have limited experience in preparing, implementing, and reporting on CEMPs. Therefore, the PSU, through the PE and SS, will need to provide substantial guidance and training for contractors early in implementation to ensure that they can prepare the CEMP, and throughout the contract to ensure that they can implement and report on the CEMP.

30. Appendix 4 provides guidance on how to prepare a CEMP. Appendix 5 provides a sample site environmental compliance inspection and monitoring form for the PSU and implementing agency to use to monitor CEMP implementation.

#### **5. Review and Clearance of Documents**

31. The IEE and the site-specific EMPs will be submitted to relevant government authorities and ADB, which will each review the documents for compliance with their environmental safeguards requirements. The two conditions of civil works contract award are; (i) DEC has granted final approval of the IEE and updated EMP, indicating if environmental permits are required; (ii) the site-specific EMP and relevant provisions from the IEE have been incorporated into the BCD.

## **VI. PUBLIC CONSULTATION, DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM**

### **1. Public Consultation**

32. As required by the SPS and Public Communications Policy (2011) of the ADB, communities and stakeholders are to be consulted as part of project preparation and implementation and that relevant project information is disclosed publically. Public consultation and information disclosure will take place for each project activity during preparation of the initial environmental examination in a manner compliant with ADB's Safeguard Policy Statement. The following minimum requirements for public consultation and disclosure must be met for each project activity.

33. At the outset of the preparation of the environmental assessment, provincial and local government and community representatives in the vicinity of, or who are likely to be affected by, the project should be informed of the project activity and given an opportunity to provide feedback on potential environmental issues or required management measures. The following activities will be carried out for each project activity:

- (i) District level workshops in each district in the project area will discuss project interventions, potential environmental impacts of project activities, and required mitigation measures. Representatives at the workshops will include stakeholder agencies, NGOs, church groups, and other relevant district level organizations.
- (ii) Meetings with potentially affected households, sensitive receivers (schools, churches, etc.) and landowners will discuss specific issues of concern and mitigation measures required.

33. In addition, information on project activities and consultation activities will be provided to the local community through radio announcements and where available through newspaper notices. The public consultation activities carried out and the subsequent outcomes must be documented and the records of the public consultation appended to the document. See Appendix 6 for guidance.

### **2. Disclosure**

34. ADB's disclosure of environmental and social safeguards require that (i) NDOH ensure that all environmental assessment documentation, including any environmental due diligence and monitoring reports, are properly and systematically kept as part of the project-specific record; (ii) all environmental documents are subject to public disclosure, and therefore may be made available to public, on request; and (iii) NDOH will consult the public, particularly the project affected persons. Moreover, disclosure of relevant environment safeguards documents will be in an appropriate form, manner, and language and at an accessible location to be understandable to the affected people and local stakeholders.

35. Information regarding the approved project and the proposed environmental management measures will be posted at suitable locations on the project site. Following updating of the EMPs, a copy will be sent to all relevant local government offices. This will include information about the environmental permit if required for works at a particular site.

### **3. Grievance Redress Mechanism**

36. A grievance redress mechanism (GRM) is a process for receiving, evaluating, and addressing project-related grievances from affected people (APs) at the level of the project. Except in the simplest cases, a grievance mechanism typically includes a procedure for receiving grievances, recording/documenting key information (e.g., the name of the individual or organization, the date and nature of the complaint, any follow up actions taken, the final decision on the complaint, how and when relevant project decision was communicated to the complainant, and whether management action has been taken to avoid recurrence of community concerns in the future), and responding to the complainants in a reasonable period of time. Any concerns raised through the mechanism will need to be addressed quickly and transparently, and without retribution to the AP.

37. The following process is to be used and commences with an attempt to sort out the problem directly at the project level. If grievances cannot be resolved, then the grievance moves to the resolution process outlined in Section 87 of the Environment Act 2000. The process is also shown in the flow chart.

#### **a. During Construction**

38. During construction the implementing agency will be initially responsible for monitoring and supervising compliance with the EMP. The implementing agency will be assisted by the Safeguards Specialist (SS) to supervise the contractor, while the SS will monitor the work and report any defects to the Project Engineer (PE) as required. The local community will be encouraged to seek work on the project sites and will be advised of opportunities by a series of planned awareness meetings, which will commence during preconstruction

39. Most complaints arising during construction are expected to be minor complaints concerning dust or noise that should be able to be resolved quite easily and acted upon immediately at the local level by the PE. When the complaint is of a more serious nature, the PE will have up to two weeks to resolve it.

- (i) All complaints arriving at the site office are to be entered in a register that is kept at the site by date, name, contact address, and reason for the complaint. A duplicate copy of the entry is given to the AP at the time of registering the complaint. The register will show who has been directed to deal with the complaint and the date when this was made, together with the date when the AP was informed of the decision and how the decision was conveyed to the AP. The register is then signed off by the person who is responsible for the decision and dated. The register is to be kept at the front desk of the site office and is a public document. The duplicate copy given to the AP will also show the procedure that will be followed in assessing the complaint, together with a statement affirming the rights of the AP to make a complaint. For anybody making a complaint, no costs will be charged to the AP.
- (ii) The PE will consider the complaint and within a maximum of two weeks will convey a decision to the AP. The AP or the ward councillor may, if so desired, discuss the complaint directly with the PE or representative. Prior to the dismissal of a complaint, the PE will present the case to the manager of the PSU for review. Should the PIU concur that the complaint be dismissed, the AP will be informed of his/her rights in taking it to the next step. A copy of this decision is to be sent to the manager at the Project Support Unit.

- (iii) Should the AP not be satisfied, the AP may take the complaint to the Secretary-DEC (SDEC) and continue the grievance in accordance with Section 87 of the Environment Act 2000. Procedure for dealing with compensation claims for environmental impacts. The procedure is described in the following steps. Given that the only aspect of CHP construction that may require an environmental permit is an incinerator, this process is highly unlikely to occur.
- (iv) The AP meets with the environment permit holder (PH) to formally register concern over impact and seek redress. A copy of the alleged impact is submitted to the SDEC.
- (v) The PH determines whether the impact has occurred due to its activities.
- (vi) If the PH accepts responsibility for the impact, it can negotiate a mutually acceptable settlement with the AP within 90 days.
- (vii) If the PH rejects responsibility for the impact, the AP can request DEC to carry out a verification investigation.
- (viii) If DEC confirms that the impact has occurred, it will advise the PH and AP to negotiate a settlement within 90 days.
- (ix) If a negotiated settlement is not reached under either step 3 or 5, the PH or AP can request the SDEC to formulate a determination. Once this request is made, DEC will have 90 days to reach a determination.
- (x) If either party is dissatisfied with the determination, it can appeal to the National Court.
- (xi) The SDEC will have 4 weeks to consider the complaint. The SDEC will arrange for any complaint to be dealt with under the same procedure, i.e., there will be no charge made to the AP for making a complaint.
- (xii) Should the AP not be satisfied with the ruling of the SDEC, the AP may take the grievance to the PNG judicial system. This will be at the AP's cost, but if the court shows that the SDEC or the administration has been negligent in making their determination, the AP will be able to seek costs.

#### **b. During Operation**

40. The same procedure is followed except that the complaint is now directed to the CHP manager/director to rectify. During operation, the same conditions apply; i.e., there are no fees charged to the AP for making a complaint; the complainant is free to make the complaint, which will be treated in a transparent manner; and the AP will not be subject to retribution for making the complaint.

41. Each implementing agency, as part of the environmental assessment, will determine a suitable grievance redress mechanism. The mechanism will include a system by which parties affected by project activities can raise their concerns to contractors, relevant government officials, and officers of the implementing agency. A grievance redress committee will be established for each province, and will include representatives of the project-affected persons, contractors, government officials, and the implementing agency. Each committee will establish a procedure on how complaints will be received and resolved, and will have regular meetings to discuss and resolve complaints.

42. The meetings will be open to the public, and decisions will be recorded and distributed among those present. All records of the committee meetings and how grievances were addressed will be maintained by the respective implementing agency, and the public will have access to these records. See Appendix 7 for an example of a grievance intake form.

## VII. MONITORING AND REPORTING

### 1. Monitoring

43. An integral part of environmental protection is ensuring compliance with the approved CEMP and periodic monitoring of the condition of the immediate environment to ensure corrective actions required are implemented as quickly as possible and to determine any occurrence of undesirable changes as a result of the project during construction and operation phases. The monitoring program will be conducted on two levels (i) compliance monitoring and (ii) baseline and conduct of monitoring to determine the extent of variations and changes in the levels of pollutants in the environment and other parameters and indicators considering the implementation or operation of the project.

44. The PSU will have overall responsibility for the management, monitoring and reporting for the implementation of the EMPs for the project. The provincial based Safeguards Officers (SO) will receive training and capacity building from the SS and PE. The SOs will be responsible for liaising with the contractor and providing training, advice and assistance in the preparation of the CEMP and its implementation as well as assisting in monitoring and reporting on implementation.

45. Monitoring will relate to compliance with construction contracts (including EMP measures and provisions), the state and health of the nearby environmental resources, and the effectiveness of mitigation measures and complaints. Monthly progress reporting will include a summary of the environmental monitoring report submitted to the PSU/NDOH on a monthly basis and to ADB semi-annually. Reporting of EARF implementation will take place on a semiannual basis. Each project site will report to the PSU on the monitoring parameters contained in Table 3, and the PSU will consolidate these reports, together with the results of the project-level monitoring, for submission to ADB. An example of the format of a monitoring report is provided in Appendix 8.

**Table 3 - Environmental Monitoring Plan**

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility
<b>Construction</b>					
Vegetation loss	Trees and vegetation	Throughout construction site	Visual observation	Before/after	Construction contractor, SO, SS
Dust suppression	Dust in air	Throughout construction site	Visual observation	During windy conditions	Construction contractor, SO, SS
Water quality protection	Visible sediment, waste, or other pollutants in waterways	Surface waters and wells in vicinity of construction site	Observation	Weekly or after rain events	Construction contractor, SO, SS
Prevention of worker-related issues	Fuel wood collection/hunting/gardening monitored	Around construction zone/ nearby village areas	Observation	Continuously	Construction contractor, SO, SS

Mitigation Measure	Parameters	Location	Methods	Frequency	Responsibility
Noise minimization	Noise levels near sensitive receivers	Throughout construction site	Observation	During noisy activities	Construction contractor, SO, SS
Rehabilitation of disturbed areas/spoil zones	Vegetative cover	Throughout construction site	Observation	Project completion	Construction contractor, SO, SS
<b>Operation</b>					
Air emissions control	TSP, SOx, NOx,	Ambient conditions at site boundary	As specified in NDOH standards	Weekly for first 6 months and monthly thereafter	NDOH
Waste management	Bio-waste generated in the CHP	In CHP boundary and adjacent water bodies	As specified in NDOH standards	Weekly for first 6 months and monthly thereafter	NDOH
Water quality protection	BOD, COD, TSS, total coliform, <i>E. coli</i> , oil/grease	In waterways and wells in vicinity of effluent discharge from solid waste or wastewater facilities	As specified in NDOH standards	Weekly for first 6 months and then monthly thereafter	NDOH

## 2. Reporting

46. The PSU will be the primary entity responsible for reporting progress of components of the project to NDOH and ADB. Monitoring will include review of contractor's monthly reports which will cover progress of CEMP implementation and compliance (including general good practice). A section on safeguards activities and compliance with the CEMP for each subproject will also be included in quarterly progress reports (QPR) prepared for NDOH and ADB.

47. The reporting will be as per the following schedule:

- A monthly report prepared during construction by the contractor reporting on progress of CEMP activities, issues and corrective actions;
- A report prepared every three months (the QPR) prepared by the PSU. The QPR will include a section on safeguards activities and CEMP compliance for each subproject and will summarize the monthly reports submitted by the contractor and any actions or citations made by the PE or PE;
- A semi-annual safeguards monitoring report (prepared every six months) by the NDOH, submitted to ADB and disclosed; and
- The project completion report will include a section on safeguards implementation and make recommendations as required for modifications to the processes set out in the EARF and EMP procedures based on the review undertaken at the end of the project. The safeguards section will be prepared by the PSU three months prior to the end of the project.

**VIII. STAFFING REQUIREMENTS AND BUDGET FOR EARF IMPLEMENTATION**

48. Table 4 summarizes the estimated staffing requirements for EARF implementation for each project activity. The level of effort for each position is presented in the project administration manual (PAM). The budget for EARF activities such as capacity building, consultants, consultations, mitigation, grievance redress, monitoring, and reporting are included as appropriate line items of the project budget.

**Table 4 - Staffing for EARF Implementation**

<b>Organization</b>	<b>Responsible Personnel</b>	<b>Position</b>	<b>Inputs (months)</b>
PSU	Safeguards Specialist (SS)	National	36
Province	Safeguards officer (SO)	National	36

## APPENDIX 1 – PNG WATER QUALITY STANDARDS

WATER QUALITY CRITERIA FOR AQUATIC LIFE PROTECTION		
Parameters	Fresh water	Seawater
Ammonia –nitrogen	Dependent on pH and temperature (see Table 2.)	
Arsenic	0.05	0.05
Barium	1.0	1.0
Boron	1.0	2.0
Cadmium	0.01	0.001
Chlorine (total residual)	0.005 at pH 6	0.005
Chromium (as hexavalent form)	0.05	0.01
Colour	No alteration to natural colouration (for both fresh and seawater)	
Cobalt	Limit of delectability (for both fresh and seawater)	
Copper	1.0	0.03
Cyanide (as HCN)	0.005	0.01
Faecal Coliform Bacteria	>200 per 100 ml (see Note below)	
Fats	None	None
Fluoride	1.5	1.5
Grease	None	None
Insoluble residues	No insoluble residues or sludge formation to occur (both fresh and seawater)	
Iron (in solution)	1.0	1.0
Lead	0.005	0.004
Manganese (in solution)	0.5	2.0
Mercury	0.0002	0.0002
Nickel	1.0	1.0
Nitrate (as No <sub>3</sub> -+NO <sub>2</sub> -)	45.0	45.0
Odour	No alteration to natural odour (for both fresh and seawater)	
Oil	None	None
Oxygen	Not less than 6.0	Not less than 5.0
Pesticides	None	None
pH	No alteration to natural pH (for both fresh and seawater)	

<b>WATER QUALITY CRITERIA FOR AQUATIC LIFE PROTECTION</b>		
<b>Parameters</b>	<b>Fresh water</b>	<b>Seawater</b>
Phenols	0.002	0.002
Potassium	5.0	450.0
Radioactivity	None	None
Selenium	0.01	0.01
Silver	0.05	0.05
Sulfate (as SS4)	400.0	-
Sulfide (HS)	0.002	0.002
Tars	None	None
Taste	No alteration to natural taste (for both fresh and seawater)	
Temperature	No alteration greater than 2C (for both fresh and seawater)	
Tin	0.5	0.5
Toxicants (miscellaneous)	None	None
Turbidity	No alteration greater than 25 N.T.U (for both fresh and seawater)	
Zinc	5.0	5.0

Notes:

1. All values are in mg/litre unless otherwise specified.
  2. Metal concentrations are for dissolved substances (passing through a normal 0.45µm medium).
  3. Criteria for Faecal Coliform Bacteria is based on not fewer than five samples taken over not more than a 30 day period, in which the medium value of the faecal coliform bacteria content of the waters shall not exceed 200 per 100 ml.
  4. N.T.U. – Nephelometric Turbidity Unit.
- Source: [Environment Act](#) 2000.

## APPENDIX 2 – GUIDELINES FOR INCERATOR USE

*Note: From Chapter 13 - Infection Prevention Policy 2<sup>nd</sup> Edition (October 2008) which is the current approved procedure in remote rural areas.*

### CHAPTER 13

#### SAFE HANDLING AND DISPOSAL OF WASTE FROM HEALTH CARE SETTINGS

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The infection prevention tasks described in this chapter include;

1. Classification and definition of health care waste
  2. Safe segregation, collection and disposal of general or non-contaminated waste
  3. General tips for safe waste disposal
  4. Safe segregation, collection and disposal of biomedical or contaminated waste
  5. Safe collection and disposal of sharps
  6. Needle stick injury management protocol
- 

#### INTRODUCTION

The correct segregation, containment and handling of waste generated by hospitals and clinics is of prime importance to maintain occupational health and safety. All health services personnel must ensure that they and their co-workers realise their responsibilities when disposing of waste.

Safe disposal of health care waste from a point of generation and to the point of disposal helps to:

- Prevent spread of infection to the health care workers, the general public and the scavengers.
- Protect those who handle waste (the cleaners and the dump site operators from accidental injuries.
- Prevent open files of waste which can become breeding grounds for flies, others insects and rodents which can carry disease causing pathogens.
- Provide a pleasant atmosphere. (Uncontrolled waste causes foul smells and may pose fire hazards).

Important points to remember

- Open piles of waste are dangerous
- Disposal of health care related waste into specifically designated waste bins and plastic bags prior to burning, incineration or burial.

#### 1. CLASSIFICATIONS AND DEFINITION OF HEALTH CARE RELATED WASTE

Any waste generated from health care settings, hospitals, Health Centres and Aid Post can be classified as general/non-contaminated and biomedical/contaminated waste.

Definitions

- **General or non-contaminated waste**  
Any waste generated from health care settings that does not come in contact with blood and body fluid substances. These waste groups do not carry harmful microorganisms.

Examples: kitchen refuse, office stationeries, empty boxes, plastic containers, vegetable matters, store products, peanut cells, sugar can scraps, banana skin, leaves etc.

Note: All this waste can be a health hazard if not collected and disposed on timely manner.

- **Biomedical or Contaminated Waste**  
Any waste generated from health care settings that do come in contact with blood and body fluid substances. Waste groups that carry harmful microorganisms and are likely to cause infection among health care workers, the patients and the general public.

Examples: human tissue waste: Blood, pus, urine, stool, discarded laboratory specimens and specimen bottles, dressing materials, urine catheters, Intravenous lines, blood giving sets, human tissues, maternal waste, (placentas), drainage tubes, sharps, needles, lancets, suture materials, syringes etc. and all wastes from the single room of a patient on additional precautions.

- **Clinical Waste**  
Anatomical wastes (bags marked as “Anatomical Waste”).

Examples: Identifiable / recognizable body parts, placenta, limb etc.

- **Cytotoxic waste** (plastic bags clearly marked as “Cytotoxic waste”).

Examples: drugs which are used in the treatment of cancer.

- **Pharmaceuticals**

## **2. GENERAL TIPS FOR SAFE WASTE DISPOSAL**

1. Use separate containers or bins for contaminated waste. Internationally recommended are yellow bins and yellow plastic bags and green or black bins and plastic bags for general waste.
2. Use washable waste containers or bins that are strong and will not rust (plastic is best). All containers and bins must have lids.
3. Do not use waste bins, containers and plastic for other purposes apart from its designated purpose in a health care setting.
4. Disposable needles, syringes, lancets, scalpel blades, and other sharp items. Place them in puncture proof containers specifically labelled as ‘sharps containers’ so that they do not cause injury. This waste can spread blood born disease pathogens.
5. Non- burnable solid waste like glasses, metals, and thick rubbers can be buried at least

two (2) metres deep.

Note: Always wash hands after handling waste even though you used a pair of gloves.

### 3. SAFE SEGREGATION AND COLLECTION OF GENERAL WASTE

Purpose

To prevent open piles and scattering of waste

#### Equipment

1. Black or green bins and containers
2. Black or green plastic bags
3. Heavy-duty gloves
4. Broom and shovel

Procedure:

1. Disposable gloves and aprons must be worn when removing bags from receptacles, when tying the bags and carrying them.
2. Gloves must be removed after waste collection is completed in each ward/unit area and hands must be washed before proceeding to the next area.
3. Bags must be carried in a way that they do not touch the body or brush against legs.
4. All waste bags must be removed on a regular basis from all areas of the hospital.
5. Bins must have signs saying "Contaminated Waste".
6. No sharps.
7. Segregate and collect general waste in plastic bags and bins that do not let fluid out.
8. Place bins at convenient locations so that they can be easily accessible for use.
9. Encourage patients, the guidance and the visiting public to use the bins.
10. If burning or incineration is used for waste disposal, provide separate containers for non-burnable waste such as bottles, cans, broken glasses etc.
11. Wear thick heavy duty or utility gloves when handling and transporting waste. This will help to prevent injuries.
12. Collect buckets or bins daily, or more often if needed and transport to disposal site for burning, incineration, burial or collection by city council service. A large covered bucket or mobile bins can be used to help transport waste from the point of generation to the disposal site.
13. Clean up all spillage immediately with broom and shovel.
14. Wash all rubbish bins with liquid soap and water and keep them dry.
15. Wash hands after handling rubbish.

### 4. SAFE SEGREGATION AND COLLECTION OF BIOMEDICAL OR CONTAMINATED WASTE

Purpose:

To prevent spread of micro-organisms from contaminated waste to staff, patients, the community or the general public.

Contaminated wastes are wastes that carry harmful microorganisms and are likely to cause infection among patients, health care workers or people in the community.

Examples are used dressings, gauze or other items contaminated with blood, pus, faeces, urine, blood or body fluids, human tissue, body parts, paper specimen collection cups, pathology samples, needles, scalpel blades.

Note: Clinical solid waste should be burned or incinerated.

#### Important Point To Remember

- Contaminated solid waste must be burned, incinerated or it can be buried in a dug pit hole. To prevent flies or any pest feeding and breeding on every disposal of waste in a dug pit hole, it must be covered with soil.

#### Equipment:

1. Yellow plastic bags and bins without any holes with lid
2. Heavy-duty utility gloves
3. Broom or shovel
4. Chlorine solution or other disinfectant

#### Procedure:

1. Collect waste in yellow coloured plastic bags and bins with lids
2. Put yellow bins together with yellow plastic bags in places where they can be easily accessible and used
3. Wear thick utility gloves when handling and transporting biomedical waste
4. Collect waste bins daily or more often when needed and transport to disposal site for burning, incineration or burial
5. Clean up all spillage with broom and shovel and decontaminate the area with 0.5% of available chlorine. (Sodium Hypochlorite-Liquid Bleach).
6. Each day decontaminate all waste buckets or bins with solution of 0.5% of available chlorine and then wash with detergent soap and water. (Chapter 6).
7. Wash hands after handling waste bins and plastic bags.

## 5. SAFE COLLECTION AND DISPOSAL OF SHARPS

(Needles, syringes, razors, lancets, and scalpel blades).

#### Purpose:

To prevent needle stick injuries that risks Health Care Workers, Patients, general public and the scavengers from contacting HIV and Hepatitis B and C infections.

#### Important Points to remember:

The most common way in which health care workers are at risk to HIV and Hepatitis B & C infections at the workplace is through accidental injuries with sharps contaminated with blood and body fluid.

#### Guidelines for Safe Sharps Containers

- Sharps containers shall be labelled and puncture resistant

- The opening of the sharps container should be visible for all users when in position
- Sharps containers should not be affixed close to other fixtures
- Sharps containers should be securely sealed with a lid before disposing in general clinical areas
- Sharps containers should be secured to the trolley using a sharps affixing bracket, or be securely located at the back of a workbench where accidental spillage is unlikely to occur
- Sharps containers are not to be placed on the floor whilst in use.
- Sharps containers are not to be placed where they would cause an obstruction.
- Allow at least 25cm of free space above the opening to the sharps container when in position.
- The height of the sharps container (when in position) is not to exceed 135cm from the ground.
- The height of the top of the sharps container (when in position) is not to be less than 105cm from the ground.
- Sharps should never be forced into a sharps container

#### Restricted Areas (eg: Theatre, Emergency)

- The container is required to be placed so the opening is accessible and visible, but secure enough so that accidental spillage is unlikely to occur. This may include large floor-positioned sharps containers and mobile sharps trolleys.

#### Health Centres and Aid Posts

- Smaller sharps containers with screw top lids may be carried with the health care worker on patrols. General principles of security and safety are to be followed.

#### Equipment:

1. Puncture proof container.
2. Bamboo sharps container as alternative.

A puncture proof container can be made from thick plastic, cardboards, metal or bamboo. Use locally available items such as tin cans, heavy cardboard box or empty detergent containers. Bamboo sharps container can be used at rural health settings. (Refer to Bamboo Concept next page).

#### Procedure:

1. Do not break or bend needles, lancets or other sharps objects before disposal.
2. Do not recap needles. However, if recapping is needed, then use one hand technique. (Figure 13.1).
3. Collect all sharps in a puncture proof container
4. Put containers in places where they will be used. For example, sharps containers must be placed on a medicine trolley, procedure rooms and treatment or immunization rooms.

5. When the sharps containers are  $\frac{3}{4}$  full, close puncture proof containers with lid or tape and dispose container together with the contents into the biomedical waste bins so that it can be incinerated, burned or buried together with the contaminated waste.
6. Wear thick utility gloves when handling and transporting sharps containers. This will help to prevent injury.
7. Collect waste bins on daily or more often if needed and transport to disposal site for burning, incineration or burial.
8. Wash hands after handling sharps containers and bins.

Note: Reuse of sharps container after emptying of the contents into main biomedical waste bins or at the disposal site.

## **6. THE BAMBOO SHARPS CONTAINER**

Procedure:

1. Cut the bamboo from two joint ends
2. Make a small circular opening on top end to dispose needles/sharps
3. Ensure that the bottom end is not open
4. Label that bamboo as a sharps container and position them at the locations where procedures are performed.
5. Encourage staff members to dispose sharps or needles through the opening
6. When the bamboo sharps container is  $\frac{3}{4}$  full, collect for burning and replace with new sharps bamboo container.
7. The  $\frac{3}{4}$  full bamboo container must be burned using fire and remains must be buried in the dug pit holes.

## **7. NEEDLE STICK INJURY AND MANAGEMENT PROTOCOL**

Introduction

The main aim of drafting this needle stick injury management guideline is to enhance health care workers awareness of the dangers associated with accidental needle stick injuries, cuts or lacerations sustained from scalpel blades, lancets needles and any other sharp items that are contaminated with blood and body fluid substances. Moreover, the content of this management guideline describes the classification of needle, safe method of sharps disposal, methods of prevention, first aid steps to take following needle stick, scalpel blade or any sharp item contaminated with blood and body fluid substances.

Annex 4 provides the full details of the management of health workers post- needles stick and sharps injuries including the protocol for post-exposure prophylaxis (PEP) for HIV prevention after needle-stick injury of health workers (NDoH 2008 Guidelines for HIV Care and Treatment in PNG).

#### Classification category of used needles and sharps

All sharps, including injection needles, scalpel blades, lancets, suture needles, intravenous needles and other sharps instruments that comes in contact with blood and body fluid substances are potentially infectious. Therefore, this health care waste is classified as biomedical or infectious waste and must be handled with extra precautions to prevent accidental injuries.

#### Recommended method of disposal

The used needles and sharps must be disposed into the designated sharps containers specifically labeled with biohazard symbol. Once when it is three quarter full, the whole content together with the sharps container must be incinerated or buried in a dug pit hole. The sharps and needles must not be disposed together with the general waste because it is an unsafe practice and can potentially endanger general public, drug users and scavengers to possible accidental needle stick injuries.

#### Risk of infection after needle stick or sharps injuries.

The health care workers especially doctors, nurses, laboratory technicians are at the potential risk of getting blood-borne diseases following exposure to blood and body fluid substances through needle stick or sharps injuries from an infected patient or client. The risk is not only limited to health care workers but to scavengers and general public if the waste is not properly managed from a health care setting. The blood-borne diseases are hepatitis B virus, or human immunodeficiency virus (HIV).

- What to do immediately after needle stick or sharps injuries.

Before you seek medical attention and other necessary assistance from trained personnel, it is essentially important to follow this first aid steps after needle pricks, cuts or lacerations from contaminated needles and sharps with blood and body fluid substances.

1. Encourage bleeding by squeezing
2. Wash thoroughly with soap and water
3. Cover with waterproof dressing using povidine iodine
4. Report and document the injuries to your supervisor following the needle stick, blood and body fluid exposure flow chart, complete the incident report and the occupational injury and illness register audit form
5. Get Hepatitis B Immune globulin if source infected with Hepatitis B.
6. If source known with HIV and AIDS
  - Collect blood for initial testing of antibody status.
  - Arrange for pre and post-test counselling of the injured victim.
  - Arrange for special antiviral drugs such as Zidovudine if available.
  - Retest antibody test after three months and six months.

- Methods of Preventing Needle Stick Injuries

Needle stick or sharps injuries are caused by needles such as hypodermic needles, blood collection needles, intravenous needles, needles use to connect parts of Iv delivery systems, scalpel blades, lancets, or any sharps contaminated with blood and body fluid substances. The prevention of needle stick injuries can protect health care workers and public at the increased risk of serious and potential fatal infections with blood born disease pathogens. These injuries can be prevented or avoided by eliminating unnecessary use of needles, lancets, scalpel blades, using device with safety features, promoting education on safe work practice for handling needles, sharps and related systems. The compliance of following recommended prevention strategies can minimize or obviously prevent needle stick or sharps injures.

- Avoid using invasive procedures unless essential
- Use safety equipment such as gloves, goggles and sharps containers
- Use disposable equipment as much as possible
- Avoid recapping needles
- Avoid passing needles and sharp items from one person to another Dispose used needles and sharps into the designated sharps container.

Report all needle stick and other sharp related injuries promptly to ensure that you receive appropriate follow up care.

Report to the employer any hazards or poor behaviour in the use of needles or any sharp that you observe in your work environment.

- Participate in blood borne pathogen education e.g. infection control protocols and standard precautions, and follow recommended infection practice, including getting of hepatitis B vaccination.

- How do needle stick injuries occur?

Health Care Workers use many types of needles and other sharp devices to provide patient care services. The needle stick and sharps injuries can occur before disposal, after used and during use. Most injuries can occur due to carelessness and non-compliance of set policy guidelines on how to manage and use needle. Most injuries are avoidable, however few can happen accidentally and they are inevitable. Most of the injuries can occur when recapping needles, passing sharp item from one person to another, surgery, and suturing, after setting IV lines, during and after drawing blood, after giving injection, after fingertip pricks using lancets and failing to properly dispose of used needles in puncture resistant sharps containers.

- Recommendation

It is highly recommended to all health care settings to handle sharps and needles with extra care and precautions because careless handling of needle can lead to accidental needle stick or sharps injuries. Such injuries can lead to increased risk of being exposed to blood-borne diseases like hepatitis B, and HIV etc. Safety measures like provision of sharps containers and appropriate methods of disposal such as incineration and dug pit hole with the minimum of 2 metres deep and about 50 metres away from the water source. Continuous awareness education on safe disposal and management of needle stick injuries is also highly recommended.

## 8. DISPOSAL OF LIQUID WASTES

(Blood, urine, faeces, pus, sputum, spinal and peritoneal fluids, etc.)

Purpose:

To prevent spread of micro-organisms from contaminated liquid waste to staff, patients, and the and the general public.

Equipment:

1. Utility sink drain, toilet or latrine
2. Chlorine solution or other disinfectant
3. Gloves

Procedure:

1. Wear thick utility gloves when handling and transporting wastes.
2. Carefully pour blood, urine or other body fluids directly into toilet, utility sink drain, or latrine. Avoid splashing.
3. Rinse the sink or toilet carefully and thoroughly with water.
4. Decontaminate specimen container with solution of 0.5% available chlorine.
5. Decontaminate and clean-up all spillage immediately with solution of 0.5% available chlorine or other chemical disinfectant.
6. When stool or sputum is collected in paper specimen cups, treat as contaminated solid waste.
7. Wash hands after handling liquid waste.

## 9. DISPOSAL OF MICROBIOLOGY LABORATORY WASTES

Purpose:

To prevent the spread of micro-organisms from microbiology laboratory wastes (for example used culture plates and specimen containers) to staff, patients and the general public.

Equipment:

1. Autoclave or pressure cooker
2. Use yellow plastic bag and bins without any

holes Procedure:

1. Autoclave all Petri dishes and test tubes which have been used to microorganisms.
2. After sterilising, discard disposable petri dishes and test tubes into yellow waste bins.

3. After sterilising, remove the culture media from reusable petri dishes and test tubes and discard into yellow waste bins.
4. Wash and dry re-useable petri dishes and test tubes.
5. Collect waste bins daily, or more often if needed, and carry with other wastes to disposal site for burning, burial or incineration.
6. Each day, decontaminate with solution of 0.5% available chlorine, then wash with detergent soap and water.
7. Wash hands after handling waste buckets.

## 10. DISPOSAL OF USED CHEMICAL CONTAINERS

Purpose:

To prevent poisoning from containers which have been used to store toxic substances, for example formaldehyde or glutaraldehyde.

Equipment:

1. Powdered soap (detergent)
2. Clean water
3. Utility gloves

Procedure:

1. Wear gloves.
2. Glass containers - Rinse well with water, then wash with detergent soap and water, rinse and re-use.
3. Plastic containers - Rinse three times with water, then discard with other solid wastes by burial. Make sure these containers are not available for use in the community.
4. Wash hands after handling used chemical containers.

Note: Plastic containers, which have been used to store chemicals that are dangerous. Do not re-use these containers for other purposes.

## 11. METHODS OF SOLID WASTE DISPOSAL

Incineration or burning

Incineration is a process of burning wastes at very high temperatures. Incineration requires special equipment and bottled gas or other fuel source. Incineration is the best way to destroy contaminated wastes. However, where incineration equipment is not available, burning can be done in simple large stoves.

The advantages of incineration and burning are:

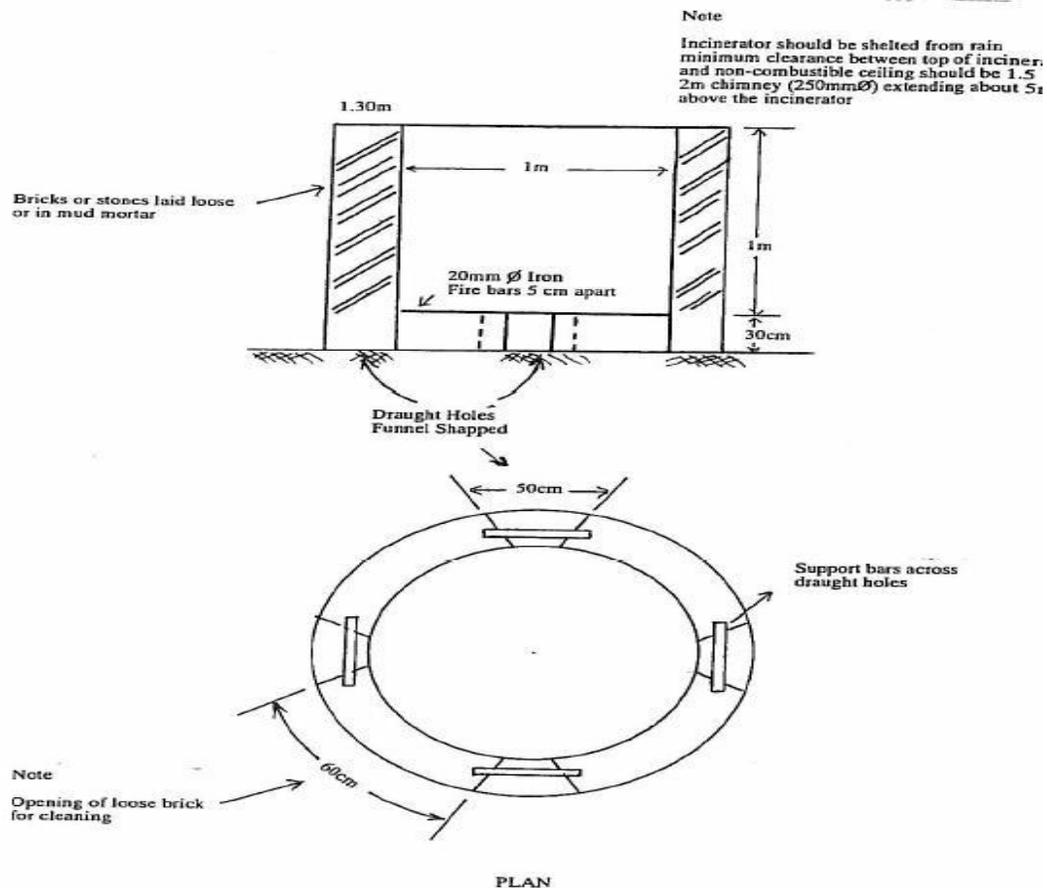
- Microorganisms are destroyed by the heat
- Large amounts of wastes that can require a lot of space are reduced to ashes.

Note: Open burning is dangerous. Burn or incinerate all wastes in special stoves located in enclosed areas.

How to build and use a simple stove for burning wastes:

1. Select a site downwind from the hospital or clinic.
2. Build a simple stove using local materials (mud or stone), or a used oil drum.
3. Place the stove on hardened earth or on a concrete base.
4. Burn all burnable waste, such as paper and cardboard, as well as used dressings and other contaminated wastes.
5. If the waste is wet, add kerosene so that a hot fire burns all the waste. Store waste for incineration in covered rubbish bins.
6. Ash from the stove or incinerator can be treated as non-contaminated waste.

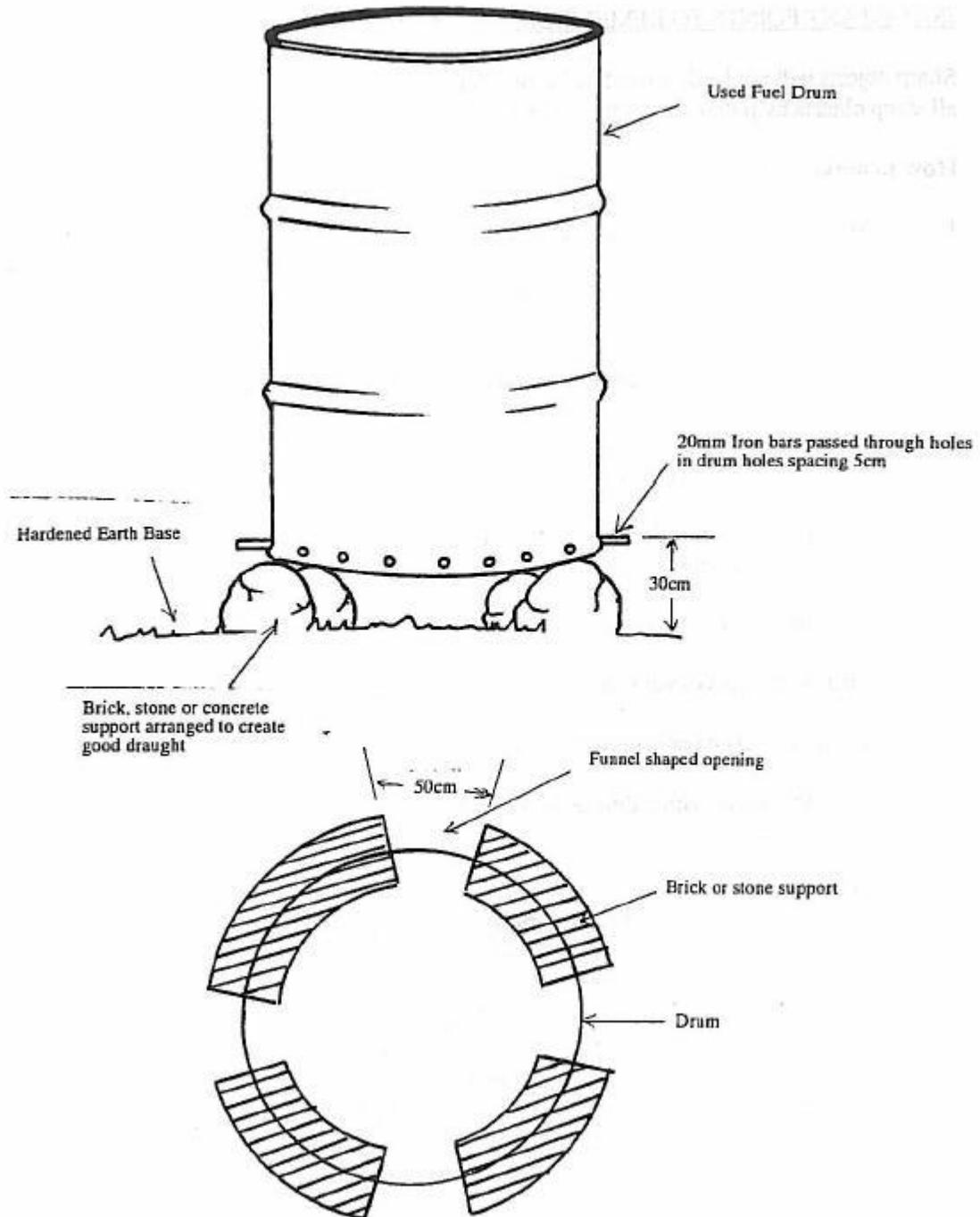
**FIGURE 13.1 - SIMPLE STONE OR MUD INCINERATOR**



Make sure the stove has:

- Sufficient air inlets underneath to burn well
- Loosely placed metal bars to hold wastes and allow ashes to fall below
- Enough space to add waste at the top and to remove ashes from below
- Long enough chimney to allow for good draught and removal of smoke.

**FIGURE 13.2 - SIMPLE OIL DRUM INCINERATOR**



## 12. WASTE DISPOSAL BY PUTTING RUBBISH UNDER THE GROUND

When contaminated and non-contaminated wastes cannot be burned or incinerated, wastes must be put under the ground. Even if wastes are collected by a city collection system, it is good for health care administrators to make sure the waste is disposed of safely. When wastes are put under the ground, certain requirements must be met, so that children and animals cannot dig up the wastes.

Important Points To Remember:

Sharp objects will not be destroyed by burning and may later spread tetanus infection. Dispose of all sharp objects by putting under the ground, even after burning.

How to make and use an underground site for waste disposal:

1. Make a hole in a specified location:

Select a site at least 50 meters away from any water source, to prevent contamination of the water supply.

The site should have proper drainage, be located downhill from any wells, and be free of standing water.

Make certain the site for the hole is not an area, which floods.

2. Dig a pit 1 meter wide and 2 meters deep. The bottom of the pit should be 6 feet above the water table.
3. Fence in the site to keep animals and children away.
4. Wear heavy gloves when handling waste buckets.
5. Empty buckets of non-burnable waste into the pit every day.
6. Cover the waste with a thin layer of earth each day. The final cover should be 10 centimetres deep.

**APPENDIX 3 - ENVIRONMENTAL MANAGEMENT PLAN**

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
<b>PRE-CONSTRUCTION ACTIVITIES</b>								
Use or acquisition of land	0.25 -0.5 ha areas of land required in project districts. Potential for use disputes	NDOH and Provincial Authorities identify suitable lands with titles; or Church land in village areas under land use agreement Resettlement plan (RP) prepared for sites under acquisition	NDOH, Provincial Lands Officers	As per agreement or purchase price for acquired site	Availability of Title, or agreement with village councils. As per RP	Once or as per RP	PSU	To be determined
Provision of climate change requirements in design	Siting of CHPs needs to reflect future flooding potentialities	Clear site designation above potentially inundated sites	PSU, SS, PE	Nil	Design Plans	Once	PSU	Nil
Siting of project facilities - avoiding vegetation losses	Loss of habitat/environmental amenity	CHP sites only suitable if they are devoid of intact vegetation	SS, PSU	Nil	Site condition	Once	PSU	Nil
<b>CONSTRUCTION ACTIVITIES</b>								
Access to site	Access issues, loss of vegetation, erosion	Agreements with land owners; Minimize vegetation removal and exposure of cleared areas	Contractor	Costed by contractor and cost carried into contract.	Access developed according to EMP specifications.	Weekly or as required until site has been established. Verify that contractor's facilities meet EMP requirements.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.
Preparation of site and establishment of contractor's facilities	Loss of vegetation, erosion, siltation of adjacent waterways	i. Site area limited to reduce clearing of vegetation. ii. Remove & store topsoil iii. No direct discharge to surface water systems iv. Storage areas and workshops to be provided with oil and water separators	Contractor	Costed by contractor and cost carried into contract.	Site developed according to EMP specifications.	Weekly or as required until site has been established. Verify that contractor's facilities meet EMP requirements.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
Excavation of construction (or other) sites (if any)	Loss of topsoil	i. Limit excavation area. ii. Remove and store topsoil. iii. Sort and store other excavated materials as required	Contractor	Costed by contractor and cost carried into contract.	Topsoil recovered	Monthly and then as required. Topsoil recovered and stored for later re-use.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.
Installation of septic tanks	Pollution of soil and adjacent waterways	No direct discharge to water systems; Install as per specifications stipulated by PSU	Contractor	Costed by contractor and cost carried into contract.	Water and soil quality	Monthly and then as required.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.
Gravel and material extraction	Unsustainable extraction, unsuitable materials sourced	i. Use existing quarry where possible; ii. Agreements with resource owners for new sites; iii. Obtain permits as required; iv. Submit quarry management plan or gravel extraction plan to PSU	Contractor	Costed by contractor and cost carried into contract.	Volume of materials extracted and used	Monthly and then as required.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.
Construction activities	a. Soil erosion from excavation  b. Eroded soil interfering with construction activities.	i. Limit excavation area. ii. Apply soil conservation and erosion protection technologies. iii. Use sediment basins. iv. Avoid operating machinery in adverse ground conditions. v. Protect and re-vegetation as soon as possible.	Contractor	Costed by contractor and cost carried into contract.	Soil erosion and sediment supply to water courses controlled	Monthly and then as required.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU.
Removal and disposal of excavated waste material if any	a. Loss of significant vegetation from poor siting of spoil dumps. b. Lowered water quality from eroded material. c. Loss of visual amenity from poorly located dumpsites	i. Excavated material unsuitable for re-use disposed of at agreed site ii. Material which cannot be re-used to be landscaped/benched to avoid eroding back into stream and re-vegetated. iii. All disposal areas to be protected to avoid movement of material	Contractor	Costed by contractor and cost carried into contract.	Sites properly prepared and maintained.	Monthly and then as required.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
Prevention of soil erosion on finished work areas	a. Loss of soil resources. b. water quality affected.	Rehabilitation of all excavated sites including replacement of topsoil and re-vegetation of disturbed areas.	Contractor and SS will advise on re-vegetation requirements	Costed by contractor and cost carried into contract	Completed work areas are stable (non-eroding).	Monthly and then as required.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Storage and handling of construction materials, fuel and lubricants.	Pollution of soil and water resources	i. Storage areas to be prepared to avoid deterioration of materials. ii. Fuel should be stored in properly sealed containers. iii. All fuel storage areas to be security fenced and provided with oil and water separators. Fuel hoses to be locked and provided with a shut off valve at the tank. iv. All re-fueling to be done at least 20 m away from waterways by trained personnel. v. All waste oil and oil filters to be collected and if possible recycled, otherwise to be disposed of to landfills. vi. Accidental spill handling action plan prepared and submitted to PSU	Contractor	Costed by contractor and cost carried into contract	Storage areas prepared. Fuel and oil storage and handling procedures practiced and well understood.	Initially once to approve storage and handling procedures then as required. Verify that storage and handling of construction materials, fuel and lubricants meet these requirements.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Noise and vibration	Noise and vibration nuisance to surrounding communities	i. If particularly noisy activities are required work may need to be limited to daylight hours. ii. Noise not to exceed 45dBA at boundary of workplace.	Contractor	Costed by contractor and cost carried into contract	i. Noise complaints from surrounding communities. ii. Noise measurement	Start of activities. Community complaints. 45 dBA measured at workplace boundary.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Dust generation	Dust may be generated. Will affect air quality of workplaces and surrounding areas	Contractor is to apply dust control measures	Contractor	Costed by contractor and cost carried into contract	Work areas are acceptable with regards to generation of dust.	i. Determined by wind/site conditions. ii. Complaints from communities.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
Public access to site	Accidents to surrounding communities	Erect warning signs and barriers around work areas. Site can only be accessed with permission of contractor	Contractor	Costed by contractor and cost carried into contract	Warning signs and barriers erected around work places. Access to work areas controlled.	Weekly. Accident reports involving community.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Community safety from increased vehicle movements	Accidents to surrounding communities from vehicles transiting villages.	i. All vehicles to be properly maintained and operated in accordance with road laws. ii. All loads to be properly secured and fugitive loads to be covered. iii. Drivers to be fined if ignore safety requirements	Contractor	Costed by contractor and cost carried into contract	Trucks and vehicles operated safely	Weekly. Accident reports involving community.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Generation of waste, debris and construction by-products	Impacts on surrounding communities (litter, smell, rodents)	i. Waste management plan (WMP) to cover all waste streams prepared and submitted to PSU ii. All waste disposed of as per agreed WMP and in compliance with NDOH Infection Prevention & Control Guidelines	Contractor	Costed by contractor and cost carried into contract	Cleanliness of site, receptacles provided at work sites, removal of rubbish	Weekly	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Use of hazardous materials and SPS Appendix 5 Prohibited Activities	Health dangers to workers and the environment. Loss of water quality	i. Contractor to provide list of all hazardous chemicals (HAZCHEM) products to be used on site ii. List verified against HAZCHEM. iii. Contractor to display MSDS sheets in work areas. iv. Contractor to abide by Appendix 5 Prohibited Activities (SPS, June 2009)	Contractor	Costed by contractor and cost carried into contract	a. List of chemical compounds and their hazard ratings. b. Appendix 5 activities	At start of work and whenever any hazardous compounds are to be brought to site. b. No Appendix 5 activities initiated	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Worker issues - use of fuel wood	Causes social friction	Collection banned by contractor and all meals provided to workers	Contractor	Costed by contractor and cost carried into contract	Staff behaviour	Continuously	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
Worker issues - hunting and sale of wildlife	Causes social friction	Hunting banned by contractor	Contractor	Costed by contractor and cost carried into contract	Staff behaviour	Continuously	Contractor, SO, PE and SS	As above
Worker issues - clearing of forest for gardens	Causes social friction	Clearing/gardening banned by contractor. Contractor to provide adequate and nutritionally balanced rations	Contractor	Costed by contractor and cost carried into contract	Staff behaviour	Continuously	Contractor, SO, PE and SS	As above
Disposal of waste materials	Soil and water pollution.	All waste materials to be collected and sorted; (i) those that can be recycled and (ii) those that need to go to an approved landfill site for disposal.	Contractor	Costed by contractor and cost carried into contract	Sites cleaned of materials. Materials dumped in approved sites	Spot checks and weekly inspections. Waste being collected and disposed of to meet requirements.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Chance discovery of archaeological and cultural sites	Loss of cultural values	Chance discoveries are to be notified to the PE who will advise the SS.	Contractor	Costed by contractor and cost carried into contract	Contract document and specification	Yearly. Notification of chance discoveries	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
Clearance and rehabilitation of construction sites and removal of contractor's facilities	Re-establishes environmental values	i. All solid waste to be removed from sites and disposed in approved landfills. ii. All contaminated soil to be removed. iii. All sites to be rehabilitated and restored to original condition. iv. Drainage to be re-established. v. To be included as part of Final Inspection before payment made.	Contractor	Costed by contractor and cost carried into contract	Sites cleared, waste removed, sites landscaped and revegetated.	At completion of construction. Site has been cleared of materials, rehabilitated and returned to original state.	Contractor, SO, PE and SS	Contractor's monitoring costs met by contractor. SS and PE costs met by PSU
<b>OPERATION ACTIVITIES</b>								
Provision of water supply	Effect on existing downstream users	i. As per specifications stipulated by PSU ii. Permit, as required, obtained	PSU and NDOH	Covered under O&M	Downstream users	Quarterly	NDOH	NDOH

Impact Mitigation					Impact Monitoring			
Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Implementing Responsibility	Cost	Parameter to be Monitored	Frequency and Means of Verification	Monitoring Responsibility	Monitoring Cost
Power supply	Effect on existing downstream users	i. As per design standards and specifications stipulated by PSU ii. Permit obtained	PSU and NDOH	Covered under O&M	Downstream users	Quarterly	NDOH	NDOH
Ensuring that there is no discharge of any untreated wastewaters into the environment	Contamination of water sources used by local communities with infectious materials. Spread of disease	i. Septic tanks and/or sewerage systems to be built in accordance with CHP specifications (as per Appendix 1) ii. Discharges in compliance with NDOH Infection Prevention & Control Guidelines	PSU and NDOH	Covered under O&M	Ongoing coliform monitoring	Quarterly	NDOH	NDOH
Ensuring that all medical wastes are disposed of correctly	Spread of disease	i. Incinerators to be constructed and used at CHPs according to CHP specifications (as per Appendix 2); ii. All waste disposed of as agreed and in compliance with NDOH Infection Prevention Policy (iii) Incinerator ash and residues shall be disposed of in a special area within an approved landfill unless handled otherwise in accordance with permission from NDOH.	PSU and NDOH	Covered under O&M	Site inspections	Quarterly	NDOH	NDOH

## **APPENDIX 4 - GUIDELINES FOR PREPARATION OF CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN**

### **1. PREPARATION**

1. The contractor is responsible for preparing the Construction Environmental Management Plan (CEMP). The CEMP is prepared after the award of the contract and is to meet the conditions of the relevant contractor bidding documents. The contractor can move to the site and commence work only after the CEMP has been approved by the project support unit (PSU). The PSU will provide training to the contractor so they can prepare and submit the CEMP.
2. The CEMP is a contractually binding document and applies equally to the main contractor and to subcontractors under its control.
3. The CEMP must be compliant with (i) the EMP and conditions as set out in the bid and contract documents (BCD), and (ii) any legislation established by any administering organization. All licenses and permits issued by any outside organization that are required to meet the CEMP conditions are to be attached to the CEMP. The contractor will notify the PSU within 24 hours of any inspections or visits from any outside organization.
4. The PSU may require the contractor to assess the CEMP activities. When any inspection by the contractor, PSU, or outside organization is undertaken and the work is found to be unsatisfactory, a notice will be issued to the contractor. The contractor will implement corrective action to address the issues raised in the notice. When the work is shown to be nonconforming with the CEMP, the contractor will be responsible for meeting costs of all investigations and associated corrective actions.
5. After a period, the contractor may request that the CEMP be changed, but any requests and alterations to the CEMP can be approved only by the PSU.
6. The contractor is to keep a daily record of all work done to meet the CEMP requirements. The daily record is to be available to the PSU. The contractor is to provide monthly reports to the PSU regarding compliance with the CEMP.

### **2. CONTENT**

7. The CEMP needs to be a concise and well-focused document that clearly sets out how the contractor will meet the requirements of the project EMP. The CEMP consists of the following sections:

#### **a. Introduction and Purpose**

Identify the project and state the purpose of the CEMP. Identify who prepared the CEMP together with the contacts of the person who prepared the document.

#### **b. Management Responsibilities**

This section must clearly identify those persons within the contractor's team who will be directly responsible for supervising the CEMP activities. Each person and position is to be identified and contact details provided for their work, after-hours phone numbers for emergency situations, and their email addresses.

Details are to be provided as to whether these persons are available on a full-time or part-time basis at the construction site. As a minimum, details are required for the following positions:

- The contractor's environmental manager.
- The back-up person for the environmental manager whenever the environmental manager is away from the site.
- The contractor's site engineer, who is responsible for supervising the contract on behalf of the contractor.
- Any other persons on the contractor's team who will have management responsibilities as required to meet the activities outlined in the CEMP conditions.

**c. Legal Requirements**

This section will outline the various environmental laws, regulations, and standards that the contractor must comply with during construction.

**d. Licenses and Permits**

Provide details of licences and permits that the contractor will require to undertake the works and to properly implement the CEMP.

**e. Special Environmental or Cultural Issues**

Show whether there are any special issues associated with the location of the work area that is, whether it is located inside or close to environmentally or culturally sensitive areas. Advise what approvals will be required and how work will be undertaken in these areas. Locate the boundaries to the areas in the plan of works.

**f. Scope of Works**

Define the construction requirements so that these clearly identify all of the work to be undertaken by the contractor.

**g. Plan of Works**

The contractor is to provide an overall plan of works that shows the location of all of the construction sites and the contractor's support facilities. The plan of works should be based on the detailed engineering site plans and should show the following:

- boundaries of the construction sites showing the extent of the disturbed area;
- boundaries of any culturally or environmentally sensitive areas;
- access roads (temporary and permanent);
- contractor's facilities (show the location of offices, workshops, vehicle and machinery parking areas, material storage areas, fuel stores, etc.);
- worker camps;
- areas to be excavated;

- areas where excavated fill will be dumped both as temporary and permanent dumps;
- locations of material sources, sand, and stones;
- waste disposal sites (nonhazardous and hazardous); and
- north, the map scale, contours, and existing drainage lines.

**h. Machinery and Support Equipment Brought to Site**

The contractor is to provide:

- a list of all the machinery, vehicles, and support equipment that will be brought to the project;
- the age of the machinery;
- an assessment of the condition of the machinery<sup>3</sup> as good, average, or poor; where average or poor machinery is listed, describe the defect;<sup>4</sup>
- where vibratory rollers are to be used, indicate the weight of the roller and the safe operating distances where the machine can be operated without causing harm to surrounding buildings or other susceptible infrastructure (the zone of vibration); and
- any machinery that will create noise above 45 dBA is to be listed.

**Table 1 - Example of Table for Machinery that will be Brought to Site**

<b>Make and Type</b>	<b>Age (years)</b>	<b>Condition</b>
ABC utility	2	Good
DEF tractor	3	Average
GHI excavator	4	Average
JKL 7-ton truck	1	Good

**i. Details of Sites Used to Source Raw Materials**

The CEMP is to detail raw materials to be sourced for the works this includes borrow pits and quarries. As quarries and materials extraction is a Prescribed Activity under EPAR, an environmental permit may be required. This will need to be obtained from DEC. This section of the CEMP can be submitted to DEC as part of the consideration of the application for the permit. The CEMP is to provide the following details:

- location of material supply areas;
- type of activity and material extracted, e.g., borrow pit for sub-base or quarry for aggregate;
- requirement for any permits or approvals to open the borrow pit or quarry;
- estimated amounts to be extracted – total volume required and daily amounts as numbers of truckloads for how many days/months;
- names of villages and distances along road (in kilometers) that the haul road may need to traverse before reaching the site;
- machinery that will be operated at the site; and
- health and safety issues that will be required to be addressed at the site.

<sup>3</sup> Condition relates to the age and the maintenance of the machinery or vehicles. Any vehicles or machinery that are leaking oil or fuel and are operated without satisfactory silencing or are deficient in safety equipment must be classified as average or poor.

<sup>4</sup> Under the contract, the PSU is able to reject any machinery or vehicles that are unsatisfactory.

**j. Contractor’s Facilities and Worker Camps**

Provide details of the facilities that the contractor will erect on-site for (i) its own use, and (ii) worker camps. The contractor is to show the location of these facilities on the plan of works and provide the following details:

- For contractor facilities: show the areas required in square meters for all facilities such as administration offices, stores and workshops, vehicles and machinery parking areas. Show sources of electricity and water supply.
- For worker camps: provide details of (i) number of people occupying the camps; and (ii) areas (m<sup>2</sup>) and facilities installed for (a) washing and sanitation areas, (b) cooking, (c) sleeping areas, and (d) recreation areas.

For both the contractor and worker facilities, describe the following:

- type of construction of facilities (floor, walls, and roof);
- stormwater drainage, collection systems, flow paths, and disposal areas;
- source of water and type of treatment required for cooking, washing, and drinking;
- effluent systems to handle the disposal of washing, sanitation, and kitchen waste water;
- source of energy to be used for heating and cooking;
- confirm as “yes” or “no” if the facilities or camps are to be located within or closer than 2 kilometers of a protected or forested area;
- how long the camps will be required to be used; and
- procedure for closing and dismantling the camps.

Enter details in a table like Table 2.

**Table 2 - Example of Contractor’s Facilities to be Used during Construction**

	Facility	Area (m <sup>2</sup> )	Construction			Stormwater drains to...	Effluent drains to...
			Floor	Walls	Roof		
1	Administration offices	300 m <sup>2</sup> (30 m x 10 m)	New transportable building			Freshwater tanks	Closed septic system
2	Workshop and machinery washdown areas	200 m <sup>2</sup> (20 m x 10 m)	concrete	c.g.i.	c.g.i.	Oil & water separator > sediment basin > natural drainage system	Closed septic system
3	Vehicle and machinery parking area	800 m <sup>2</sup> (40 m x 20 m)	Compacted coral aggregate			sediment basin > natural drainage system	n.a.
4	Storage area – materials	400 m <sup>2</sup> (40 m x 10 m)	Coral aggregate	c.g.i.	c.g.i.	Sediment basin > natural drainage system	n.a.
5	Storage area – fuel (5,000 liter) skid tank	15 m <sup>2</sup> (5 m x 3 m)	Concrete bunded base			Oil and water separator > sediment basin > natural drainage system	n.a.

c.g.i. = corrugated iron; n.a. not applicable.

### **3. ENVIRONMENTAL PROTECTION WORK PROCEDURES**

8. The CEMP is to provide a series of procedures that are designed to protect the environment. These are called environmental work procedures (EWP) and outline how work will be arranged to address the various issues that have been outlined in the CEMP.

9. The CEMP will review and build on the project EMP requirements to develop more detailed procedures for implementation in the construction activity. While the project EMP provides a list of mitigation requirements that will require procedures to be developed for each of them, the contractor is required to review the adequacy of the requirements and if necessary include additional procedures. Should the contractor consider that a procedure that is shown in the project EMP is not required, the contractor will need to justify that decision.

10. The following is a list of procedures that may be required to be included in the CEMP. The project EMP will confirm which of these procedures or others will be required.

- Site preparation
- Excavation of construction sites
- Removal and disposal of excavated waste
- Erosion and sedimentation
- Storage and handling of construction materials, fuel, and lubricants
- Noise and vibration
- Dust generation
- Public access to site
- Risk to public and worker health and safety
- Use of hazardous materials
- Worker issues (e.g., use of fuel wood, hunting, clearing areas for gardening)
- Disposal of waste material (solid and liquid)
- Archaeological discoveries
- Rehabilitation of construction sites and contractor facilities

### **4. MONITORING OF WORK**

11. The CEMP is to provide details of how each activity will be monitored: how frequently the monitoring will be carried out, what criteria will be monitored, and who will undertake the monitoring. A monthly report on monitoring activities is to be included in the monthly CEMP report.

### **5. STAFF AND WORKER TRAINING**

12. The CEMP is to provide details of staff and worker training and awareness programs that will be required to ensure compliance with the CEMP. Awareness of staff and workers about safety and environmental regulations, the CEMP requirements, and in special circumstances where work will need to be carried out within or adjacent to protected areas or areas of cultural heritage will be particularly important. The program will need to show who will be responsible for implementing the program and where the program will be introduced so as to ensure that all workers are aware of the CEMP requirements before commencing work.

## **IX. REPORTING**

13. The contractor is to provide details in a monthly CEMP report. The report will be prepared by the person who has been identified within the contractor's team as responsible for overseeing the CEMP procedures. The report will outline progress with regard to the project's physical monitoring targets and implementation of the CEMP for these works. The report should note which tasks have been completed and have been approved for payment by the PSU. The report is to specify if any notices have been issued by the PSU to correct work and what has been done by the contractor to address these issues.

14. Any complaints or issues that have been received from the public are to follow the general requirements of the GRM and be listed in the report. Three copies of the report are to be sent to the PSU. The report will address the following topics:

- Status of work program: work completed, construction under way, and work planned
- Environmental unit and staff situation for the month
- Staff and worker awareness training carried out
- Waste volumes, types, and disposal (inorganic and organic)
- Areas revegetated and rehabilitated
- Dust control report
- Discovery of artefacts
- Safety and monthly accident report
- Status of CEMP environmental mitigation measures
- PSU notices issued and status of all nonconforming work
- Environmental Incidents
- Complaints received (as per GRM)
- Other relevant environmental issues

**APPENDIX 5 - SAMPLE SITE ENVIRONMENTAL COMPLIANCE INSPECTION AND MONITORING FORM**

**Project** : \_\_\_\_\_ **Implementing Agency** : \_\_\_\_\_

**Province** : \_\_\_\_\_ **Monitoring Agency** : \_\_\_\_\_

**Location** : \_\_\_\_\_ **Enforcement Agency** : \_\_\_\_\_

**Date** : \_\_\_\_\_ **Contractor(s)** : \_\_\_\_\_

**Reporting Period** : \_\_\_\_\_ **Implementation Phase:** Preconstruction / Construction / Operation

**1. Contractor(s)**

Contractor(s)	Environmental Awareness	Yes / No	Actions Required	Contractor Response / Comment
	Contractor(s) aware of mitigation requirements?			
	Contractor(s) have a copy of EMP?			

**2. Mitigation Compliance Inspection**

Impact / Mitigation Measure (From EMP)	Mitigations Implemented (Yes, No)	Mitigations Effective? (1 to 5)*	Impact Observed / Location	Action Required	Contractor Response / Comment	Endorsed by:	
						Implementing Agency	Monitoring Agency

Mitigation Effectiveness Rating Criteria (Indicative examples)

1. Very Good (all required mitigations implemented)
2. Good ( the majority of required mitigations implemented)
3. Fair (some mitigations implemented)
4. Poor (few mitigations implemented)
5. Very Poor (very few mitigations implemented).

**APPENDIX 6 - DOCUMENTATION OF PUBLIC CONSULTATION ACTIVITIES**

**Table 1 - Summary of Key Information Required for Consultation**

CONSULTATION METHOD	DETAILS OF ACTIVITIES		CONSULTATION OUTCOMES	
Public Notice	Date(s) of notice		n/a	
	Location of notice			
Newspaper Notification	Date(s) of notice		n/a	
	Name of newspaper			
Public announcement/ radio	Date(s) of announcement		n/a	
	Time(s) of announcement			
Newsletter / questionnaire	Date(s) sent		Number received	
	Number sent		Main issues raised	
	Area of distribution			
	Feedback sought (Yes / No)			
Public meeting	Date(s) held			
	Location(s) held		Attendees	
	Invitees			
	Methods of invitation			
	Agenda attached (Yes / No)			

Note: you may need to include agendas, list of attendees, minutes of meetings etc. as Annexes to the EMP.

**Table 2 - Summary of Key Information Required for Consultation**

**Name of Subproject  
Location**

**Date:**

**Time:**

**Location:**

---

**MEETING AGENDA**

1. Introduction ....
2. Presentation and key points.....:

**PARTICIPANTS**

Name (if possible) number, associated organization, gender.

**COMMENTS OF PARTICIPANTS AT MEETING**

- 1.
- 2.
- 3.
4. etc

**REPLIES OF EMPLOYER**

- 1.
- 2.
- 3.
4. etc

*The meeting was ended at XXX same day, all participants agreed with the minutes of meeting.*

Signed by person taking minutes:

Position:

## APPENDIX 7 – GRIEVANCE INTAKE FORM (GRM)

**Name of Subproject:**

**Site Location:**

Project \_\_\_\_\_ welcomes complaints, suggestions, comments, and queries regarding project implementation and its stakeholders. We encourage persons with grievances to provide their name and contact information to enable us to get in touch for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing "(CONFIDENTIAL)" above your name.

Thank you.

### Contact Information

Name		Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
Home Address		Age	
		Phone No.	
City/Province		Email	

**Complaint/Suggestion/Comment/Question** Please provide the details (who, what, where, and how) of your grievance below:

How do you want us to reach you for feedback or update on your comment/grievance?

**Portion to be filled in by the staff:**

Date received:	
Received through:	<input type="checkbox"/> In person <input type="checkbox"/> mail <input type="checkbox"/> email <input type="checkbox"/> fax <input type="checkbox"/> phone <input type="checkbox"/> sms
Name of staff who received comment/complaint	
Position of staff:	
Type of grievance:	
Remarks	
Signature of staff	

**Update on the case:**

Date:	Update

## APPENDIX 8 - OUTLINE OF AN EMP MONITORING REPORT

1. The borrower is required to prepare and submit to ADB semiannual monitoring reports that describe progress with implementation of the project EMP, compliance issues, and corrective actions. A sample outline that can be adapted as necessary is provided below.

**1. Introduction**

Report purpose  
Project implementation progress

**2. Verification of environmental assessment preparation and approval before commencement of construction**

Verify that each project implementing agency (i) produced an environmental assessment document, and (ii) received ADB's no-objection before commencement of construction. Include a copy of the document providing approval in appendixes.

**3. Incorporation of environmental requirements into project contractual arrangements**

Confirm that EMP requirements were incorporated into contractual arrangements, such as with contractors or other parties. Provide example clauses of contractor bidding documents in the appendixes.

**4. Summary of environmental mitigations and compensation measures implemented during the reporting period**

Summarize key mitigations listed in the subprogram's EMP. This may include measures related to air quality, water quality, noise quality, pollution prevention, biodiversity and natural resources, health and safety, physical cultural resources, capacity building, and others.

**5. Adequacy of public consultation / disclosure activities**

Provide information on the number and type of public consultation and disclosure events and key issues raised for all project environmental assessments. It may be useful to provide this information in a table (See Table 1 example).

**6. Summary of environmental monitoring**

Compliance Inspections. Describe the inspection schedule and methods by the PSU and/or government. Include inspection reports as appendixes. Provide information on mitigation compliance and effectiveness.

Emission Discharge (Source) Monitoring Program (if relevant). Include summary of monitoring, results, and assessment of results. Note that discharge levels should be compared with the relevant discharge standards and/or performance indicators noted in the EMP. Noncompliance should be highlighted for attention and follow-up.

Ambient Monitoring Program (if relevant). Include summary of monitoring, results, and assessment of results. Note that ambient environmental conditions should be compared to the relevant ambient standards and/or performance indicators noted in the EMP. Any exceedences should be highlighted for attention and follow-up.

**7. Key environmental issues**

Key issues identified during this reporting period (including any grievances or complaints made and how they have been recorded/documentated)

Action taken during this reporting period

Additional action required during the next reporting period

**8. Conclusion**

Overall progress of implementation of environmental management measures

Problems identified and actions recommended

**Appendixes**

1. Site Inspection / Monitoring Reports
2. Ambient Monitoring Results
3. Public Consultation Results
4. Photographs
5. Others

2. Note: compliance in each section could be described in qualitative terms or be evaluated based on a ranking system, such as the following:

1. Very Good (all requirements implemented)
2. Good (most requirements implemented)
3. Fair (some requirements implemented)
4. Poor (few requirements implemented)
5. Very Poor (very few or no requirements implemented)

3. Additional explanatory comments should be provided as necessary.

**Table 1: Summary of Key Information Required for Consultation**

CONSULTATION METHOD	DETAILS OF ACTIVITIES		CONSULTATION OUTCOMES	
Public notice	Date(s) of notice		n/a	
	Location of notice			
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	Name of newspaper			
Public announcement/ radio	Date(s) of announcement		n/a	
	Time(s) of announcement			
Newsletter / questionnaire	Date(s) sent		Number received	
	Number sent		Main issues raised	
	Area of distribution			
	Feedback sought (Yes / No)			
Public meeting	Date(s) held		Meeting minutes attached (Yes / No)	
	Location(s) held		Attendees	
	Invitees			
	Methods of invitation			
	Agenda attached (Y/ N)			