Environmental Assessment and Review Framework

May 2013

PNG: Civil Aviation Development Investment Program - Tranche 2

Prepared by the Government of Papua New Guinea for the Asian Development Bank.

TABLE OF CONTENTS

CURRENCY EQUIVALENTS

(as of 16 April 2013)

Currency Unit	–	kina(K)
K1.00	=	$0.46
$1.00	=	K2.15

ABBREVIATIONS

ADB	Asian Development Bank
CAA	Civil Aviation Authority
CADIP	Civil Aviation Development Investment Program
CEMP	contractor's environmental management plan
DEC	Department of Environment and Conservation
EA	executing agency
EARF	environmental assessment and review framework
EIA	environmental impact assessment
EMP	environmental management plan
EO	Environmental Officer
EP	Environmental Permit
GoPNG	Government of Papua New Guinea
GRM	grievance redress mechanism
IEE	initial environmental examination
IES	International Environmental Specialist
MFF	Multi tranche finance facility
NAC	National Airports Corporation
NPW	Notification of Preparatory Work
PCMC	Provincial Coordination and Monitoring Committee
PIU	project implementation unit
PFR	periodic financing request
PNG	Papua New Guinea
QPR	quarterly progress report
SPS	Safeguard Policy Statement

I. INTRODUCTION

1. The Government of Papua New Guinea (GoPNG) has requested the Asian Development Bank (ADB) to provide a multi-tranche financing facility (MFF) to facilitate investments to support the proposed Civil Aviation Development Investment Program (CADIP). Tranche 1 has commenced and Tranche 2 (another four domestic airports) in the country has been identified for upgrading and rehabilitation. The airports have been selected on the relative importance as domestic hubs for tourism and economic development on a regional basis. This environmental assessment and review framework (EARF) has been prepared to guide the screening, assessment and implementation of subprojects under the MFF to ensure that the environmental impacts are appropriately addressed and mitigated to acceptable levels. The EARF established procedures that comply with both the requirements of PNG's Environment Law 2000 and ADB's Safeguard Policy Statement 2009 (SPS).

2. This EARF identifies the broad scope of the MFF and outlines the policy, procedures and institutional requirements for preparing and implementing sub-projects under the MFF. The executing agency (EA) will be the National Airports Corporation (NAC). The implementation of the Program will be managed by a project implementation unit (PIU) located in the NAC.

3. The MFF provides project financing in a staged approach (tranches). Tranche 2 will be focused on upgrading and rehabilitation of four airports namely: Girua, Goroka, Chimbu, and Vanimo. The objective is to upgrade the airports so that they can safely operate a larger aircraft such as Fokker 100 in addition to the existing Dash 8 aircraft which can already use the airports.

II. SCOPE OF APPLICATION OF THE EARF

A. Requirements for Multi-tranche Financing Facility

4. Under the MFF procedures, preparation and implementation of safeguard measures will be achieved by screening and categorization, environmental assessment, implementation of requisite environmental mitigation and management measures, and monitoring of each subproject. Following approval of the SPS in 2009, this EARF updates the earlier framework which had been prepared to comply with ADB's Environment Policy (2003).

B. Lessons Learnt from Tranche 1

5. A number of lessons were learnt from the implementation of CADIP Tranche 1 and these will be integrated in the frameworks and procedures adopted for Tranche 2. The main lessons were in the area of: (i) information disclosure and local participation; (ii) ability of local contractors to perform, working conditions, project classification by the Department of Environment and Conservation (DEC); and (iii) establishment of grievance redress mechanism (GRM).

6. Around Port Moresby, an issue arose when the project sourced sub base material for the pavement strengthening work. Adjourning land holders disputed where the material was sourced and stated that it was their land. This however did not hold when copies of title deed to the land was asked for. In order to foster amicable relations between CADIP and the adjacent landowning clans, a number of unskilled labor tasks such as grass clearing were given to them as small contracts.

7. In another incident, a local contractor bid for a major task around the perimeter of the airport. It was later discovered that the contractor did not have the capability to be able to perform the scope of work which was awarded to it. This was a lesson where all screening of local contactors was imperative to ensure they could perform tasks within a time frame and had the necessary equipment and supply.

8. Activities in the subprojects in Tranche 1 were all performed during the dry season and work ceased during the rainy season. This allowed for the controlling of possible spoils, or oil and grease being released into the drains within the boundaries of the airport.

9. Another lesson learnt was from the submission of documents to the DEC for approval. Notification of Preparatory Works (NPW) for each of the airports were submitted to DEC and for pavement strengthening work, this was given a classification of Level 2 A. Initial environmental examinations (IEEs) submitted were acknowledged with subsequent permits awarded. The environment permits awarded attracted annual fees. Hence even for a subproject which lasted for only six months, the annual permit fees were still applicable.

10. The fencing activities were classified as Level 1 activities, having the lowest impact on the surrounding environment. The requirements for submitting an IEE was waived and a written approval was granted from DEC to proceed with the fencing activities without further environmental assessment.

11. Finally, all provincial administrations acknowledge the importance of the airports which was of immense economical importance where goods and services would travel into the province. The affordability of people in PNG to travel by air around the country meant that airports must be open to allow air travel.

12. A GRM was established in all Tranche 1 provinces through a Provincial Coordination and Monitoring Committee (PCMC) with leadership from the Provincial Administrator to ensure that grievances were addressed amicably. Similar arrangements will be in place with Tranche 2 and this is set out in Section VIII.

C. Scope of EARF

13. According to criteria established in the SPS each of the subprojects identified under Tranche 2 can be classified as Category B because the potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed readily. The appropriate level of assessment for category B subprojects is IEE and five IEEs have been prepared covering rehabilitation works at four airport and a fifth IEE covering minor works associated with fencing at several airports.

14. The EARF covers:

(i) Scope of works proposed under Tranche 2 and anticipated environmental impacts;
(ii) Preparation, review and clearance of environmental assessment documents,
(iii) Preparation of the contractor's environmental management plan (CEMP),
(iv) Requirements for public consultation and disclosure
(v) Grievance redress mechanism,
(vi) Monitoring and reporting, and
(vii) Institutional arrangements and budget.

III. LEGAL AND POLICY FRAMEWORK

A. Papua New Guinea

15. Environmental safeguards in PNG are administered under the Environment Act, 2000 (the Act) and its accompanying regulatory instruments including the Environment (Prescribed Activities) Regulation, 2002, and four guidelines issued in 2004.

16. The Act, Regulation and Guidelines are administered by the DEC. *The Environment Act, 2000 and Environment Act 2000, Amended*[1] *are the defining legislation* and contain significant detail of the process to be followed in environmental assessment. The Regulation establishes three levels of activities that require varying intensity of environmental assessment prior to the issue of an environmental permit (EP) from the DEC which allows the development to proceed.

17. The upgrading and rehabilitation works proposed for the airports are not listed as Level 2[2] and Level 3 of the "Prescribed Activities". However certain associated project activities commonly associated with upgrading and improvement works such as earthworks, surfacing, discharge of waste water, establishment of borrow pits, sourcing and extraction of aggregate materials from surface water courses are Level 2 activities that may require an EP depending on the duration and scale of those activities.

18. Security fencing to be installed around the perimeter of an airport is classified as a Level 1 activity and there is no need for the project to apply for an EP or prepare any environmental documentation to meet GoPNG requirements. Level 1 activities are those activities that have low levels of environmental harm and are exempted from the permitting process. Fences in Tranche 1 were given written approval by DEC to proceed.

19. In Tranche 1, the Civil Aviation Authority[3] (CAA) notified DEC of the scale and scope of the subprojects through submission of a NPW and DEC then required that CAA apply for an EP for the work. Based on this established process, NAC will be submitting NPWs for Tranche 2 subprojects in order to obtain approval for the proposed airport upgrading and rehabilitation. Upon approval, CEMP will need to be provided to meet DEC's requirements.

B. ADB Safeguard Requirements

20. In addition to complying with country safeguards, Tranche 2 will also need to comply with SPS which sets out the policies and principles for protecting the environment and people by wherever possible avoiding impacts and mitigating and/or compensating for impacts that cannot be avoided.

21. ADB's SPS is policy document in respect of safeguards and avoiding, minimizing or mitigating adverse impacts on people and the environment. Safeguard frameworks 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 subproject screening and categorization, assessment, and planning, information disclosure, meaningful consultation, and grievance redress mechanism; (iv)

[1] The Amendment which limited DECs authority has since been repealed.
[2] Level 2 activities are further divided into Level 2A or 2B activities, with Level 2B creating greater impacts than Level 2A but less than Level 3. The Level 3 requirements are also triggered if an investment is 50 million Kina or more.
[3] CAA is the predecessor for NAC.

describe implementation procedures, including budgets, institutional arrangements, and capacity development requirements; (v) specify monitoring and reporting requirements; and (vi) specify the responsibilities and authorities of the borrower/client, ADB, and relevant government agencies in relation to the preparation, submission, review, and clearance of safeguard documents, and monitoring and supervision.

22. To determine whether the application of safeguard frameworks is appropriate, ADB will assess the borrower's/client's capacity to manage environmental and social impacts and risks and to implement national laws and ADB's requirements. If gaps exist between ADB's requirements and the countries' laws, or where gaps in borrowers' capacity are apparent, the safeguard frameworks should include the details of the specific gap-filling requirements to ensure that policy principles and safeguard requirements are achieved.

IV. SCOPE OF WORKS IN TRANCHE 2

23. When implementation of Tranche 2 works is sufficiently underway, NAC will submit the Periodic Financing Request for subsequent tranches, under Tranche 3 and Tranche 4 subprojects will follow the procedures and processes established in this EARF and assessments will follow the IEEs prepared under Tranche 2 as examples. Table 2 lists subsequent ones under Tranches 3 and 4. Subsequently, CEMPs and EMPs will be similar from near identical scope of work.

24. Table 1 sets out the overall scope of CADIP by each Tranche.

Table 1: Airports Proposed for Improvement under CADIP

Tranche 1	Tranche 2	Tranche 3	Tranche 4
Hoskins	Vanimo (incl. fence)	Mt. Hagen Stage 2	Buka
Jackson	Girua (incl. fence)	Wewak Stage 2	Madang Stage 2
Wewak	Goroka	Hoskins Stage 2	Gurney Stage 2
Gurney	Chimbu (incl. fence)	Chimbu	Mendi
Mt Hagen	Momote (fence)	Kiunga	Kieta
Kavieng (fence)	Buka (fence)	Vanimo	Wapenamanda
Goroka (fence)			

A. Works at Vanimo Airport

25. Vanimo Airport is located in Sandaun Province. Works fall into two categories; aircraft pavement and associated airside works and landside works, airfield lighting and electrical works, and associated works.

(i) Aircraft Pavements and Associated Airside Works

- Strengthen existing Runway including turning nodes;
- Strengthen existing Taxiway including taxiway fillets;
- Strengthen existing Apron;
- Strengthen existing Stop way at southeast end of runway;
- Construct Apron Extension;
- Construct 3.0 meters (m) wide full strength shoulders to existing Runway on both sides;
- Construct 5.0 m wide half strength shoulders to existing Taxiway on both sides including fillets;

- Construct 5.0 m wide half strength shoulders to existing and extended Apron;
- Prime and two-coat bituminous spray seal (10 millimeters (mm)/7 mm) and sand overcoat to strengthened and constructed pavements including shoulders;
- Construct 1 x reinforced concrete wheel pad for F100 aircraft parking bay;
- Apply fuel resistant membrane ('Master Seal II TM') on1 x F100 and 2 x Dash 8 aircraft parking bays;
- Apply pavement line markings;
- Runway Strip and Taxiway Strip preparation including earthworks, grading, top soiling and grassing;
- Flank areas adjacent to Apron including top soiling and grassing; and
- Improvements to existing airside drainage system.

(ii) Landside Works, Airfield Lighting and Electrical Works, and Associated Works

- Construct Cable Duct Bank beneath existing taxiway;
- Decommission and remove existing T-VASIS lighting system including base footings and storage of removed materials at NAC depot;
- Install PAPI lighting system including concrete base footings, trenching, electrical reticulation, inspection pits, flight testing and commissioning;
- Replace existing apron floodlights and install 2 x new Flood lights to the apron extension;
- Supply and install 2 x new Wind Indicators;
- Refurbish existing Terminal Building;
- Reinstate carpark including kerb and gutter and associated works;
- Construct Power House including electrical reticulation;
- Supply and Install 2 x 150kVA Generator set including electrical reticulation;
- Construct 1 x 3 Bedroom elevated L40/96 high Post House with storeroom underneath in NAC compound;
- Construct 1 x lockable 4 bay Shed for Tractor, Slasher, Trailer and Hay Bailer; and
- Supply and deliver to site 1 x MF 435 4WD 80HP Diesel Tractor with Canopy and 1 x Heavy Duty 2.40 m dia Superior LX240 Slasher complete with connections to link to MF 435 Tractor including Trailer and Hay Bailer.

B. Works at Goroka Airport

26. Goroka Airport is located in Eastern Highlands Province. Works fall into two categories; aircraft pavement and associated airside works and landside works, airfield lighting and electrical works, and associated works.

(i) Aircraft Pavements and Associated Airside Works

- Strengthen existing Runway including turning nodes;
- Strengthen existing Taxiway including fillets;
- Strengthen existing Apron;

- Extend Runway by 250 m to give 1,900 m overall length including new turning node;
- Construct Stop way at extended runway end;
- Construct 3.0m wide full strength shoulders to Runway both sides including stop way and turning nodes;
- Construct Runway End Safety Area (RESA) unsealed at extended runway end
- Construct 5.0m wide full strength shoulders to Apron and Taxiway;
- Prime and two-coat bituminous spray seal (10 mm/7 mm) and sand overcoat to strengthened and constructed pavements including shoulders;
- Widen Runway Strip to 150 m wide;
- Flank earthworks along runway, taxiway and apron;
- Construct 1 x reinforced concrete pad on 1 xF100aircraft parking bay;
- Install Earthing Points on the aircraft parking positions;
- Apply fuel resistant membrane on aircraft parking position on Main Apron;
- Apply pavement line markings;
- Reseal General Aviation (GA) Apron, Secondary Runway, and associated Taxiways with single coat bituminous seal (7 mm) and sand overcoat;
- Apply fuel resistant membrane on GA Apron; and
- Improvements to airside drainage system including construction of subsoil drainage and Open Lined Drains (OLD).

(ii) Landside Works, Airfield Lighting and Electrical Works, and Associated Works

- Install Airfield Lighting System including testing and commissioning;
- Install PAPI lighting system including concrete base footings, trenching, electrical reticulation, inspection pits, flight testing and commission;
- Construct Power House including electrical reticulation;
- Supply and Install 2 x 150 kVA Generator set including electrical reticulation;
- Construct 1 x lockable 4 bay Shed for Tractor, Slasher, Trailer and Hay Bailer;
- Supply and deliver to site 1 x MF 435 4WD 80HP Diesel Tractor with Canopy and 1 x Heavy Duty 2.40 m dia Superior LX240 Slasher complete with connections to link to MF 435 Tractor including Trailer and Hay Bailer; and
- Construct New Airport Market.

C. Works at Chimbu Airport

27. Chimbu Airport is located in Chimbu Province. Works fall into two categories; aircraft pavement and associated airside works and landside works, airfield lighting and electrical works, and associated works.

(i) Aircraft Pavements and Associated Airside Works

- Repairs to existing aircraft pavements;
- Strengthen existing aircraft pavements (Runway, Taxiway and Apron);
- Construct Runway widening to 30 m width;

- Prime and two-coat bituminous spray seal (10 mm/7 mm) and sand overcoat to strengthened and constructed pavements including shoulders;
- Apply fuel resistant membrane ('MasterSeal II TM') on 1 x Dash 8 aircraft parking bay;
- Apply pavement line markings;
- Flank Earthworks to runway;
- Flank Earthworks to runway, taxiway and apron including Topsoil and Grassing; and
- Improvements to airside drainage system including construction of subsoil drainage and Open Lined Drains.

(ii) Landside Works, Airfield Lighting and Electrical Works, and Associated Works

- Supply and install 2 x new Wind Indicators;
- Construct 2 x Signal Circles;
- Construct 1 x 3 Bedroom elevated L40/96 high Post House with storeroom underneath in NAC compound;
- Construct 1 x lockable 4 bay Shed for Tractor, Slasher, Trailer and Hay Bailer; and
- Supply and deliver to site 1 x MF 435 4WD 80HP Diesel Tractor with Canopy and 1 x Heavy Duty 2.40m dia Superior LX240 Slasher complete with connections to link to MF 435 Tractor including Trailer and Hay Bailer.

D. Works at Girua Airport

28. Girua Airport is located in Oro Province. Works fall into two categories; aircraft pavement and associated airside works and landside works, airfield lighting and electrical works, and associated works.

(i) Aircraft Pavements and Associated Airside Works

- Strengthen existing pavements;
- Construct 3 m wide shoulders to existing Runway.
- Construct 5 m wide shoulders to existing Taxiway and Apron;
- Prime and two-coat bituminous spray seal (10 mm/7 mm) and sand overcoat to strengthened and constructed pavements including shoulders;
- Apply pavement line markings;
- Apply fuel resistant membrane ('Master Seal II TM') on 1 x Dash 8 aircraft parking bay;
- Flank earthworks including top soiling and grassing; and
- Drainage Improvements.

(ii) Landside Works, Airfield Lighting and Electrical Works, and Associated Works

- Supply and install 2 x new Windsock (Primary and Secondary);
- Terminal Building Refurbishment;
- Construct Power House including electrical reticulation;

- Supply and install 1 x 90kVAGenerator set including electrical reticulation; and
- Construct 1 x 3 Bedroom elevated L40/96 high Post House with a storeroom underneath.

E. Fencing Works

29. Security fencing will be erected at Girua, Momobe, Vanimo, Buka and Chimbu airports. The work will entail replacement of original perimeter fencing with galvanized palisade fencing with razor sharp wire around the perimeters of the five airports. The period of construction for the five fencing projects will be between eight and ten months.

F. Anticipated Environmental Impacts

30. Based on experience in identifying and mitigation impacts in Tranche 1, the environmental impacts associated with Tranche 2 will be generally insignificant as the works only involve upgrading and rehabilitation of the airports within the existing airport boundary for durations of up to 18 months or so. The anticipated environmental impacts associated with the subprojects particularly occur during the construction and operation phases, which will typically involve:

- **Earthworks, siltation and run-off.** During earthworks spoil will need to be managed. During the rainy season run-off and soil erosion problems can be expected in some areas.
- **Water quality.** As noted above sedimentation and silt laden run-off may cause surface water quality problem in nearby water courses.
- **Pollution and waste.** Problems of pollution related to the disposal of sewage, waste fuel, oils spillage and leakage, and solid wastes generated during construction (from worker camps) and operations may be happened. Temporary site contamination and dust generation associated with construction, and pollution associated with firefighting drills may cause environmental impacts.
- **Noise.** Construction activities may cause noise impacts from vehicle movements for a short duration. Noise from aircrafts is already existing and it will be intermittent and in short duration. Significant incremental increase of flight frequency is not expected.
- **Health and safety.** Potential issues affecting both workers and communities will need to be addressed following World Bank Group's Environment Health and Safety Guidelines as required by SPS.
- **Material and plant sourcing, transportation and disposal.** Requirements for construction materials and equipment will mean that transportation means and routes will need to be carefully identified and managed so as not to create traffic issues. Disposal of waste materials will follow the disposal permit instructions.

31. Adherence to best engineering practices during rehabilitation/reconstruction, and implementation of the EMP included in the IEE prepared for each subproject will avoid or adequately mitigate all of the rehabilitation/reconstruction-related impacts. Subproject environmental selection criteria will ensure that the Tranche does not adversely affect communities, or any ecologically or culturally sensitive areas.

V. PREPARATION, REVIEW AND CLEARANCE OF ASSESSMENTS

A. Subproject Screening and Categorization

32. Each subproject will undergo a screening and categorization, according to SPS criteria. The screening will be based on at least preliminary design and sufficient information as to ascertain the extent and scale of the works and anticipated significance of environmental impact. Based on this the environmental categorization of each subproject can be determined and the level of environmental assessment required can be identified.

33. Any subprojects that are classified as environmental category A will require an environmental impact assessment (EIA) and at least two rounds of public consultation which will be documented in the EIA. The second consultation will be conducted after the draft EIA is prepared which include the EMP. A summary of the EIA will be made available to the ADB's Board of Directors and general public at least 120 days before Board consideration of the CADIP. Similar disclosure procedure will also apply to Category "B Sensitive" subprojects (i.e. subprojects that will affect ecologically sensitive environment such as national parks, conservation areas, forests, sensitive marine protected areas, etc). In both cases the EIA/IEE and/or summary will be posted on the ADB website at least 120 days before the periodic financing request (PFR) is submitted to ADB.

B. Environmental Assessment

34. An environmental assessment will need to be undertaken of each subproject that requires physical works. The environmental assessment will be prepared according to SPS requirements and cover the following items:

- Provide a description of the subproject works and timeframe;
- Describe the legal and policy framework for environmental protection and management;
- Based on the proposed works, assess pre-construction, construction and operation impacts on physical and biological environment including water quality and habitat, as the aviation infrastructure is already existing it is not likely that rare, threatened, or endangered species, and ecologically-sensitive habitats will be affected by the subprojects but this should be confirmed in the assessment;
- Assess pre-construction, construction and operation impacts on socio-cultural and economic environment , including identification of possible physical cultural resources at materials sources/sites;
- Provide potential impacts of climate change on the subprojects, and recommendations for adaptation measures to climate proof or increase resilience in project design;
- Present detailed measures to mitigate impacts to acceptable levels in a targeted and specific EMP. The EMP will include (i) mitigations measures; (ii) institutional arrangements; and (iii) monitoring requirements and plan;
- Consult with affected people and stakeholders in coordination with specialists preparing social assessments and resettlement plans (if required);
- Establish procedures for disclosure of the draft environmental assessments; and
- Based on the GRM established for the previous Tranche 1, prepare a grievance redress mechanism.

35. The assessment will be prepared following ADB prescribed format (Appendix 1) which also complies with requirements of Environment Act and Environment Regulations. During the assessment at least one public consultation will be conducted with local community (beneficiaries and affected people), small businesses, the local and national government, and other stakeholders.

36. The NAC will be responsible for ensuring that environmental assessments are prepared, and EMPs are implemented for subprojects as outlined in this framework. The assessment reports should be submitted to ADB together with the PFR for review and approval prior to commencement of any work proposed under the Tranche 2. NAC's PIU will monitor the progress of the environmental work stream to ensure that environmental safeguards as set out in this EARF are implemented and Tranche 2 complies with country safeguards requirements and ADB's SPS.

37. The assessments and other relevant project information will be disclosed to the local community before commencement of construction (refer to Section VII).

VI. REQUIREMENTS FOR ENVIRONMENTAL MANAGEMENT PLANS

A. Environmental Management Plans

38. Appendix 2 provides guidance from the SPS on preparation of EMP to be included in the environmental assessment.

39. 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 Tranche.
- **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; and (c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan; and (iv) 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. Appendix 3 provides a typical EMP matrix setting out the potential impacts and proposed mitigation measures for the pavement strengthening and rehabilitation activities (based on the assessments prepared for Tranches 1 and 2 subprojects).

40. The EMP included in the IEE will be updated as required based on detailed design. The NAC will include the requirements of the updated EMP, along with all other relevant safeguards provisions, in the bid documents. Where modifications to designs are incorporated at a later stage, additional or further updated assessments (including EMPs) IEE/EIA will be prepared and submitted to ADB for review and clearance.

B. Contractor Environmental Management Plan (CEMP)

41. Early in the implementation period, model construction contracts will be prepared incorporating general environmental safeguards and practices. The model contracts will be modified specific to each subproject so that all special or particular safeguard requirements and mitigation measures, recommended in the EMP provisions, are incorporated within the contract of each subproject. The NAC will also allocate sufficient resources to supervise EMP implementation including monitoring of the environmental mitigation measures of all construction contracts (Section X).

42. Based on the EMP included in the bid documents the contractor will be prepare a construction EMP (CEMP) which will specify the construction methodologies they will use and identify where materials (such as aggregates and gravel) will be obtained from. The CEMP will respond to the mitigation and monitoring measures stipulated in the contract (as adapted from the IEE/EMP). The CEMP will set out how the contractor will achieve environmental safeguards, and identify the staff designated with responsibility for ensuring and reporting CEMP implementation, and implementation of the GRM. The Contractor may only move to the site and commence work after the CEMP has been reviewed and approved by NAC. Appendix 4 provides guidance for preparation of a CEMP.

VII. CONSULTATION AND INFORMATION DISCLOSURE

43. The SPS and ADB's Public Communications Policy (2011) require that communities and stakeholders are consulted as part of project preparation and implementation and that relevant project information is disclosed publically. Consultations will be undertaken as part of the environmental assessment and poverty and social assessment processes as well as for preparation of social safeguard documentation such as resettlement plans. The safeguards documents will document the consultations including date, locations and number of participants (by male and female) for all meetings, main issues raised and response to those issues or concerns.

44. In disclosing the environmental documents to the public, (i) NAC through the PIU is responsible for ensuring that all environmental assessment documentation, including the 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; (iii) for category A and B-sensitive subprojects, the documents will be publicly disclosed through ADB's websites 120 days before a PFR is submitted to ADB, while the EIA/IEE be reviewed by ADB prior to disclosure; and (iv) NAC-PIU will consult the public, particularly with project affected persons.

45. 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. During Tranche 1, NAC established arrangements with provinces for coordination with a PCMC. A PCMC is set up within all 21 provincial administrations and this committee will oversee all concerns and grievances from the local communities and affected parties. As for the Autonomous Region of Bougainville, a PCMC mechanism exists and there is also the inclusion of Community Liaison Representatives, village elders and chiefs to deliberate on issues. This forms part of the GRM as explained in Section VIII.

46. Where indigenous people or a linguistic group requires translation assistance, CADIP will ensure that translators and translation of information materials will be available. This will be done in a manner to ensure full consultation with and disclosure to affected people and communities regarding the requirements for land acquisition, as well as the policies and procedures of the CADIP.

VIII. GRIEVANCE REDRESS MECHANISM

47. A GRM was established for CADIP during Tranche 1. The GRM to be implemented for Tranche 2 should reflect the steps and procedures already established but modify them to account for lessons learned. The GRM is a procedure for addressing environmental and land issues and concerns that may arise. During the course of the project it is possible that people may have concerns with the project's environmental performance or land issues including the implementation of the Tranche 2. Issues may occur during construction and again during operation. Any grievances dealing with construction and again during operation will need to be addressed quickly and transparently, and without retribution to the affected persons.

48. As noted in the previous section, NAC has an arrangement with provincial administrations through which grievances can be addressed. While the NAC may have safety officers and operational managers at the seven major domestic airports, they cannot be given the full responsibility of having to address grievances. Provincial Administrations as partners in the provinces have in place PCMC. The PCMC is chaired by the provincial administrator and is made up of the provincial lands advisor; inter governmental officers and other government sectors represented in the province. Their role is to oversee project development in the provinces.

49. Where there are affected people for any airport development work, a grievance redress mechanism is in place through the PCMC and there is constant liaison between NAC and the Provincial Administration, should the need arise to address any such land/social issues.

50. Papua New Guinea, the Land Disputes Settlement Act establishes procedures that have, as a first step, a mediation process whereby a designated mediator meets with the disputing parties to resolve grievances. CADIP will adopt this mediation process. This grievance redress process is established involving PCMC and appropriate community representatives.

The NAC person on site such as a Safety Officer or the Operational Manager will be the first person to be contacted who will then liaise with PCMC to clarify and mediate potential issues.

51. The GRM will apply equally to the contractor who will be required to maintain a complaints registry recording complaints or issues raised and how they have been resolved. The registry will be subject to monitoring as part of CEMP compliance checks.

52. Issues brought to the designated mediator within the community will be resolved within a timely manner. The mediator must meet with the disputing parties to resolve grievances be between 2–14 days. In the event of grievances that cannot be resolved through mediation at the local level, the PCMC and Provincial Lands Officer will hold the compensation amounts in trust. Compensation will be paid in full upon final resolution of the case in the courts or other forum, in accordance with the entitlements of the affected person. This must be completed within three months.

IX. MONITORING AND REPORTING

A. Monitoring

53. Environmental monitoring will consist of regular systematic checking that the environmental management measures are being implemented effectively during each stage of the Tranche 2, i.e., pre-construction and design, construction and operation.

54. Monitoring during construction will be the responsibility of the contractor and NAC (carried out by environmental officer (EO) and international environmental specialist (IES) within the PIU). 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 this monitoring submitted to the NAC on a regular basis (at least quarterly) and to ADB semi-annually. Guidelines as to content of a monitoring report are provided in Appendix 5.

55. Table 2 presents the key activities for environmental monitoring that will be incorporated into the EMP.

Table 2: Key Activities in Environmental Monitoring Plan

No	Environmental Monitoring Tasks	Implementation Responsibility	Implementation Schedule
1	**Design Phase**		
1.1	Disclosure of subprojects to DEC and monitor permitting.	NAC-PIU, EO	Prior to construction
1.2	Audit project bidding documents to ensure IEE and EMP included in bids and environmental criteria are included in evaluation.	NAC-PIU (by IES and EO)	Prior to issue of bidding documents.
2	**Construction Phase**		
2.1	Orientation and briefing of contractor's management, site agents with regards to all IEE and EMP requirements.	NAC-PIU (by IES and EO)	First orientation/briefing 1 month prior to commencement of each contract and refresher orientation/briefing at least yearly during construction period.

No	Environmental Monitoring Tasks	Implementation Responsibility	Implementation Schedule
2.2	Monitor the performance of environmental training by contractor and briefings and of the environmental awareness of Contractors staff, tool box talks and & refresher courses.	NAC-PIU (by IES and EO)	Ongoing, prior to and during implementation of works and operation.
2.3	Regular (monthly) monitoring and reporting (quarterly) of contractor's compliance with statutory environmental requirements	NAC-PIU (by IES and EO)	Continuous throughout construction period.
2.4	Regular (monthly) monitoring and reporting (quarterly) of contractor's compliance with contractual environmental mitigation measures including EMP.	NAC-PIU (by IES and EO)	Continuous throughout construction period.
2.5	Regular (monthly) monitoring and reporting (quarterly) of complaints and responses or environmental mitigation measures	NAC-PIU (by IES and EO)	Continuous throughout construction period.
2.6	Monitor adjustments to the EMP for unexpected impacts and the thorough implementation of detailed EMP.	NAC-PIU (by IES and EO)	During all phases of the Subprojects
2.7	Commissioning phase monitoring of facilities versus environmental contractual performance criteria. Check EMP compliance.	NAC-PIU (by IES and EO)	At commissioning.
3	**Operation and Maintenance Phase**		
3.2	Post construction monitoring of air/noise/water quality at any sites where complaints about water quality from works were justified in construction phase.	NAC-PIU (by EO)	Semi-annual up to 3 years after completion of construction or until air, noise and water quality meets baseline conditions.

B. Reporting

56. The PIU will be responsible for reporting progress of Tranche 2 to NAC and ADB. Monitoring of each contractor will cover monthly progress and 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 NAC and ADB.

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

- A report at the end of detailed design incorporating a section prepared by the IES and EO on how detailed design has reflected environmental impact avoidance or mitigation and climate resilience;
- A monthly report prepared during construction by each contractor reported on progress and CEMP activities, issues and corrective actions,
- A report prepared every 3 months (the QPR) prepared by the PIU. The QPR will include a section on safeguards activities and CEMP compliance for each subproject and will summarize the monthly reports submitted by the contractors;
- A semi-annual safeguards monitoring report (prepared every 6 months) by the IES and EO; 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 IES and EO three months prior to the end of Tranche 2 .

X. INSTITUTIONAL ARRANGEMENTS AND BUDGET

A. Roles and Responsibilities

58. The overall MFF program will have oversight by a steering committee. The executing agency of the CADIP will be the NAC. PIU will be responsible for daily management and implementation of the subprojects comprising Tranche 2.

59. The NAC, through the PIU, will be the main agency/entity responsible in coordinating the implementation of the EARF. This will include, but not be limited to; ensuring that the EARF procedures are strictly adhered to and that preparation of environmental assessments will be carried out in a timely and adequate manner, environmental monitoring and institutional requirements will be fully met while meaningful public consultations are carried out satisfactorily. NAC will submit the categorization environmental assessments, and monitoring reports to ADB for review in a timely manner. Table 3 provides the responsibilities and authorities of key organizations involved in the implementation of the EARF.

60. The PIU will be staffed with the EO and be supported by the IES. The IES will be part of the NAC during the Tranche 2 with the primary tasks to: (i) strengthen the environmental management of the tranche during detailed design, bidding process, contract process, construction, and implementation, (ii) provide induction training to contractors prior to preparation and submission of the CEMP for each subproject. Provide assistance to EO and PIU for review and clearance of the CEMPs; (iii) supervise/monitor compliance with the approved CEMP of each subproject; (iv) undertake the necessary institutional strengthening including on-the-job training for the EO of NAC-PIU by giving major tasks to the EO in all of these activities under IES supervision; (v) prepare reports on environmental safeguards activities as required; and (vi) update the EARF and supervise and guide the environmental assessment process for subprojects to be implemented in the subsequent Tranche 3 as part of the PFR.

Table 3: Institutional Responsibilities for Implementing Environmental Safeguards

Organization	Implementation Responsibilities
NAC –Project Implementation Unit (PIU) Environment Officer (EO) and International Environmental Specialist (IES)	**Prior to the submission of the PFR for subsequent projects the NAC will:** • Prepare the environmental assessments (IEE or EIA), including an Environmental Management Plan (EMP) for each subproject and submit to ADB and public disclosure. • Ensure that adequate public consultation has been undertaken with affected groups and local stakeholders review the environmental assessments and submit the IEE/EIAs documents as required, to ADB. • Submit the necessary environmental assessments to ADB in sufficient time to permit the necessary disclosure by ADB. • Undertake the necessary actions to ensure environmental compliance with the GoPNG's and ADB's requirements;
NAC –PIU EO and IES	**Prior to the commencement of civil works the NAC will:** • Submit any of the environmental assessments required for regulatory approval of the DEC and obtain approval, e.g., environmental clearance, environmental permit or permits from other statutory authorities as required

Organization	Implementation Responsibilities
	by the Government. • Ensure that all regulatory clearances for the subproject that are obtained from the relevant Government authorities are submitted promptly to ADB. • Ensure that the required mitigation measures during construction, the IEE and the EMP are included in the bidding document of the subproject and that all bidding contractors have access to the environmental assessments and EMP. • Ensure that the EMP and all required mitigation measures during construction, including conditions stipulated in the DEC's clearance or environmental permit, are included in all the contracts signed by the Contractor(s) with requirements to update the EMP in response to any unexpected impacts and that all selected contractors have agreed the to implement the full suite of environmental mitigation measures prescribed in the EMP. • Receive environmental safeguard clearance on subproject(s). • Provide EMP induction training to contractors; • Review and clear the contractors CEMP for each subproject
NAC –PIU EO and IES	**During the implementation of civil works the NAC will:** • Ensure that a contractor's environmental management plan (CEMP) including all proposed mitigation measures and monitoring programs and relevant provisions of the environmental assessments is updated as required, and is properly implemented by the contractors. • Monitor the implementation of CEMP and present the monitoring reports to ADB. • In case unpredicted environmental impacts occur during project implementation, inform ADB, review the CEMP with the contractor, and implement alternative environmental mitigation program. • In case a subproject changes in scope, inform ADB and reconfirm the environmental classification, determine whether a supplementary IEE or EIA study is required, and carry out the study including the requirement for information disclosure and public consultation; • Submit the requisite reports on progress with social and environmental compliance and implementing the CEMP as required by the DEC and ADB. • Ensure that ADB be given access to undertake environmental due diligence for all subprojects. However, the NAC will have the main responsibility for undertaking environmental due diligence and monitoring of all the subprojects. The due diligence report as well as monitoring reports on CEMP implementation, as required, will be systematically prepared and be made available to the public, if requested
ADB	**During the implementation of Tranche 2, ADB will:** • Regular reviews and approval of subproject IEE/SIEEs and EIA/SEIAs. • Provide technical guidance to the NAC as needed. • Reviewing regular monitoring reports and officially disclosing the summary environmental assessments for selected subprojects (Category A and B sensitive) on the ADB website. • Review environmental assessment reports as a basis for subproject approvals. Disclose assessments of category A subprojects, and category "B sensitive" subprojects for 120 days via ADB websites (as required) before a PFR is submitted to ADB. • Monitor the EMP implementation, as required, and conduct due diligence

Organization	Implementation Responsibilities
	as part of MFF reviews. • Provide assistance to NAC, if required, in carrying out its responsibilities and for building capacity for safeguard compliance. • Ensure that the NAC will conduct the required consultations with project affected groups and local NGOs in PNG, and that the NAC as project sponsor disclose relevant environment information on the project's environmental issues in an appropriate form, manner, and language(s) accessible to those being consulted. Such information disclosure with affected people will be guided by the Public Communication Policy (2011).
Contractors	• Based on site specific conditions, prepare CEMP for each site • Implement and report on CEMP as part of pavement strengthening and rehabilitation activities • Prepare monthly CEMP report as part of progress reports and submit to PIU. The report will also include the Monthly Accident Report and measures undertaken to address any non-compliance issues identified by the PIU (or DEC).
DEC	• Administration and enforcement of the Environment Act 2000 and its regulations as it pertains to the Tranche 2 project • Identify whether EPs (with or without conditions) required for any identified site • Review IEE and other documentation required • Administer Contractor Waste Disposal permit applications and performance

61. The IES will be engaged intermittently for eight person-months during the Tranche 2 period and will be assigned on an intermittent basis to undertake training and capacity building for environmental management in NAC and to guide the EO of PIU in preparing assessments, monitoring and reporting. The IES and EO will jointly be responsible for overall environmental management of the Tranche.

62. The IES and EO will report directly to the Director of NAC-PIU, they will be accountable and responsible for implementation of the EMP. The IES and the EO will coordinate the implementation of the EMP of the Investment Program. The NAC will allocate sufficient resources to the IES and the EO to undertake their tasks to supervise and monitor the EMP implementation and other tasks related to environmental management of the Tranche 2.

B. Budget

63. The budget needed for the environmental management of Tranche 2 will be incorporated into the overall costs. The costs for environmental management under Tranche 2 can be broken down into costs associated with obtaining permits, staffing, mitigation and management, monitoring, and preparation of Tranche 3 PFR documentation.

64. There will be a cost in securing the services of the IES as part of the DSC. An EO has been recruited to support NAC-PIU in addressing environmental management of the overall MFF. The EO, as NAC staff, is funded as part of government contribution to the Tranche 2.

65. Implementation of mitigation measures will be part of the construction costs, and will be included in the Bill of Quantities as a monthly, line item for implementation of CEMP. The cost for the monitoring activities (e.g. lab activities, collection of samples, etc.) is a separate cost item

(not part of the construction cost) and will be part of the total project cost. In terms of preparation of Tranche 3 PFR documentation, time for EO and IES for writing up the assessments will be included as part of their inputs. However, multiple field visits will be required to each subproject site, plus at least one public consultation for each subproject. A presentation for other government agencies and other stakeholders will also be included. Therefore adequate travel and accommodation budgets need to be included.

66. Table 4 provides the estimate of costs for environmental management during Tranche 2.

Table 4: Indicative Estimated Costs for Environmental Safeguards Implementation

Item	Provision	Estimated Cost (US$)
Permitting	Based on Environment Act and Environment regulations	50,000
Staff	EO – 36 months (NAC staff, incl. as government contribution) IES – 8 months intermittent	- 96,000
Mitigation	EMP/CEMP measures (line item in Bill of Quantities)	640,000
Monitoring	As detailed in EMP (site visits etc and sampling as required)	197,000
PFR Tranche 3	Site visits, accommodation	25,000
TOTAL		1,080,000

APPENDIX 1: OUTLINE OF AN ENVIRONMENTAL ASSESSMENT REPORT

1. This outline is based on SPS Safeguard Requirements 1. An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

2. This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

3. This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

4. This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project’s layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

5. This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

6. This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2, paragraph 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Analysis of Alternatives

7. This section examines alternatives to the proposed project site, technology, design, and operation—including the no project alternative—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

G. Information Disclosure, Consultation, and Participation

8. This section describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders. It also summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples. In addition, the section describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

H. Grievance Redress Mechanism

9. This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

I. Environmental Management Plan

10. This section deals with 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):

(i) 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.

(ii) 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.

(iii) 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; and (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.

J. Conclusion and Recommendation

11. This section provides the conclusions drawn from the assessment and provides recommendations.

APPENDIX 2: GUIDELINES FOR ENVIRONMENTAL MANAGEMENT PLAN

1. This appendix identifies mitigation and management measures to avoid, reduce, mitigate or compensate for adverse environmental impacts identified in this report. The Civil Aviation Development Investment Program (CADIP) proposes to rehabilitate and strengthen pavements of all twenty one domestic airports in PNG.

2. The EMP will cater for mitigating impacts as a result of impacts due to (i) airport location, (ii) design, (iii) during construction, and (iv) operations and maintenance phase. The phase (iii) and (iv) activities will be elaborated by the Contractor in the CEMP, the phase (i) and (ii) activities will be elaborated by NAC.

Airport Location

3. A number of potential impacts are envisaged as a result of the airports location and these are: (i) disruption of surface water, (ii) disruption of ground water, (iii) change in nearby land values and (iv) loss of aesthetics.

4. Within the disruption of surface waters, there are the possible changes in the hydrological regimes and pollution as leaking from stockpiles and spoils. Mitigation measures would be (i) the dimensions of drains, (ii) diversion of stream, and (iii) the use of grassed area for runoff. To mitigate against pollution from stockpiles and spoils, the stockpiles will need to be located on paved areas, stockpiles must be removed after construction and re vegetation commence after construction.

5. The disruption of ground water has similar impacts as with surface water and there will be possible changes in hydrological regimes and pollution by spoil leachate. Change in nearby land values and loss of aesthetics will be mitigated by landscaping and re – vegetation. Overall impacts within the airport location are not significant and are small with mitigation costs negligible except for landscaping and re vegetation which entail transportation and equipment costs.

Design

6. Impacts anticipated due to design are minimal and are classified into slope erosion and human and chemical wastes. For slope erosion, there is the potential for siltation of rivers that may affect hydrology and water quality. A mitigation measure for this would be the installation of silt traps on all drains.

7. For human and chemical wastes, there is the potential pollution of surface and ground water resources. Mitigation measures for this would be: (i) installation of oil and water separator and silt traps on all drains, (ii) development of safe storage areas and proper handling of hazardous and toxic material, (iii) proper disposal of hazardous and toxic materials, and (iv) connection of airport to the main sewer line or construction of proper septic tanks of adequate capacity.

Construction

8. Impacts during construction are limited in scale and magnitude and include: (i) sediment runoff, (ii) safety of workers, (iii) communication disease hazards, (iv) HIV and other communicable diseases, (v) slum creation risks, (vi) cultural differences risk/social conflicts, (vii)

escape of hazardous material, (viii) increase in levels of Total Suspended Particulates (TSP), SO_2 and NO_2, (ix) noise pollution, (x) water pollution; (xi) Ground and water contamination from oil and grease, (xii) disruption of utilities, (xiii) increase in traffic, (xiv) demobilization. These potential impacts are unlikely to be significant and can be managed with adequate care and mitigation. Mitigation measures for each of these impacts are as follows:

- Silt control - stockpiles, sub grade and sub base material to be placed quickly after top soil has been removed;
- Construction work to be for only dry seasons and all spoils and construction debris to be removed; ii) all workers will be induced by the contractor's safety officer to be made aware of the occupational health and safety plan; iii) As for communicable disease hazard, the contractor is to source laborers and workers from the landowner clans adjacent to the airport; iv) similarly for HIV and other communicable diseases, local labor will be sourced and awareness to be made to the employees; v) slums while listed here has an insignificant effect and all structures should be demolished as part of the abandonment plan; vi) As for cultural difference and risks of social conflict, this will be mitigated by contractors having to source laborers and workers from nearby villages; In addition, workers will be provided with Personal Protection Equipment (PPE);
- Noise pollution, construction equipment will be well-maintained and regularly checked; vehicle speed will be controlled within the work and sensitive areas. In addition, ancillary facilities will need to be located away from residential and settlement areas and workers given PPE;
- For the escape of hazardous materials, mitigation measures will be the installation of oil and other traps on drains, development of safe storage areas and proper handling of hazardous and toxic materials;
- For the potential increase in the Total Suspended Particulates (TSP), SO_2 and NO_2, ancillary facilities will be located away from the residential and settlement areas;
- Water pollution from domestic sewage and wastes can be mitigated by having a proper solid waste management system that is practiced in the work area; and xi) ground and water contamination from oil and grease will be mitigated by collecting and recycling petroleum products, development of a spill contingency plan, construction of bund walls and drainage systems around fuel storage areas; and
- For the disruption of utilities, a mitigation measure would be to minimize the use of utilities so that there is less chance of these utilities being disrupted; xiii) Increase in traffic will be mitigated by the preparation of a traffic management plan; and finally xiv) the demobilization of ancillary facilities may produce solid waste generation and therefore a demobilization plan must be prepared which contain details of demolition for the offices and depot area and re vegetation of exposed areas and the proper disposition of construction debris.

Operations and Maintenance

9. Four impacts are identified for the operation and maintenance phase of the CADIP activities under Tranche 2. This is the potential of: (i) noise nuisance, (ii) water pollution, (iii) air pollution, and (iv) increased traffic. Noise nuisance can be mitigated by the establishment of buffers between airport and nearby settlement areas and the preparation of operation procedures by airport operator based on ANZECC 1992 or Australian Noise Exposure Forecast (ANEF).

10. Water pollution can be mitigated by having a proper handling, storage and disposal of petroleum, hazardous, and toxic materials and the development of a spill contingency plans. Air pollution will be mitigated by regular monitoring of air quality in the vicinity of the airport and sensitive receptors. Transport management plans will ease traffic congestion in and around airports.

Monitoring and Reporting

11. Monitoring of Contractor activities will largely be the responsibility of the NAC - PIU and the contractors who will be on site during the pavement strengthening activities. Contractors will submit a CEMP together with monthly reports and the EO/IES will be responsible for either rejecting or signing off on the reports. If a report is rejected, non-compliance issues must be identified and corrected prior to the Contractor undertaking any further construction activities.

12. The NAC will submit reports to ADB as specified in the reporting schedule.

APPENDIX 3: TYPICAL EMP MATRIX

IMPACT MITIGATION				MONITORING		
Activity	**Issue**	**Impact**	**Mitigation Measure**	**Implementation Responsibility**	**Means of verification**	**Timing**
A. IMPACTS DUE TO AIRPORT LOCATION						
Anticipated impact on drains, streams and stockpiles	Airport and surrounding areas	i) Impairment of aquatic ecology ii) Drainage disrupted iii) Drinking water source	i) Dimension of drains ii) Diversion of stream iii) Use of grassed areas for runoff iv) Location of stockpiles on paved areas v) Removal of stockpiles after construction	PIU - NAC	Observation	Contractor report to EO PIU
Loss of aesthetic value of land	Airport and surrounding areas	Loss of aesthetic value of land	Re-vegetation after construction	PIU - NAC	Consultation	Contractor report to EO PIU
B: IMPACTS DUE TO DESIGN						
Anticipated impacts due to design of construction works Anticipated human and chemical wastes	Airport and surrounding areas	i) Siltation of rivers affecting hydrology and water quality ii) Pollution of surface and groundwater resources	Installation of silt traps on all drains i) Installation of oil and water separators, and traps on drains ii) Development of safe storage areas and proper handling of hazardous and toxic materials iii) Proper disposition of hazardous and toxic materials iv) Connection of Airport to main sewer line or construction of proper septic tanks of adequate capacity	PIU - NAC	Observation	Contractor report to EO - PIU
C: IMPACTS DURING CONSTRUCTION						
Pavement replacement works including grubbing, laying of sub base and base coarse	Downstream of Airport sites and waterways	Damage to aquatic ecology and or flooding issues	i) Locate stockpiles in controlled areas ii) Sub-grade and sub-base material placed quickly after removal of topsoil iii) Planned construction work during dry season iv) Removal of spoils and construction debris	Contractor	Observation	Contractor report to EO - PIU
Operation of trucks, heavy equipment graders	Airport sites	i) Hazards to worker's health and safety	i) Construction methodology under control of Safety Officer and CSC ii) Approved Contractor's Occupational Health and Safety Plan including fitting mufflers on equipment	Contractor	Contractor	Contractor report to EO - PIU
Perceived potential of HIV and other communicable diseases	Airport site and adjacent villages and settlements	i) Risks to worker's health ii) Risks to residents	i) Contractor to source laborers and workers from the landowning clans ii) Contractors to increase awareness of workers	Contractor	Contractor	Contractor report to EO - PIU

Potential of cultural and social differences	Airport site and adjacent villages and settlements	Social disruption	Contractor to source laborers and workers from the nearby villages	Contractor		Contractor report to EO - PIU
Fueling and changing equipment during earthworks with increased levels of Total Suspended Particulates (TSP) SO2 and NO2 and Noise	Airport site and adjacent villages and settlements	Health risks to residents of nearby communities /villages	i)Installation of oil and other traps on drains ii) Development of safe storage areas and proper handling of hazardous and toxic materials iii) Locate Ancillary Facilities away from residential and settlement areas ii) Provide workers with Personal Protective Equipment (PPE)	Contractor		Contractor report to EO - PIU
Domestic sewage and wastes from construction activities	Ancillary facilities	Contamination of nearby water courses and land	Proper solid waste management system to be practiced in work areas	Contractor		Contractor report to EO - PIU
Storage of oil and grease for machinery	Ancillary facilities	Damage to surrounding areas from improper handling of materials	i) Collect and recycle petroleum products ii) Development of spill contingency plans iii) Construction of bund walls and drainage systems around fuel storage areas	Contractor		Contractor report to EO - PIU
Provision of utility services Utilities	Nearby settlements	Disruption of services	Investigate limits to required services and minimize disruptions	Contractor		Contractor report to EO - PIU
Increase in project traffic	Surrounding areas	Traffic congestion in major roads	Prepare traffic management plans	Contractor		Contractor report to EO - PIU
Demobilization of temporary offices and ancillary facilities	Ancillary facilities	Solid waste generation	i) Preparation of abandonment plan ii) Demolition of temporary offices and Contractor's Depot Area iii) Dismantling of ancillary facilities iv) Re-vegetation of exposed areas v) Proper disposition of construction debris	Contractor		Contractor report to EO - PIU

D: IMPACTS DURING OPERATIONS AND MAINTENANCE						
Noises from arriving and departing aircrafts	Nearby settlements	Noise pollution	i) Establishment of buffers between airport and nearby settlement areas ii) Preparation of operational procedures by Airport Operator based on ANZECC 1992 o Australian Noise Exposure Forecast (ANEF).	NAC - PIU	EO- NAC - PIU	EO to report to ADB
Tractor and other ancillary machines activities operation	Downstream of Airports	Contamination of surface and groundwater resources	i) Proper handling, storage and disposal of petroleum, hazardous and toxic materials ii) Development of spill contingency plans	NAC - PIU	EO- NAC - PIU	EO to report to ADB
Fumes from operating aircrafts	Airport vicinities	Health hazards and nuisances to nearby villages and settlements	Regular monitoring of air quality in the vicinity of the airports and sensitive receptors	NAC - PIU	EO- NAC - PIU	EO to report to ADB
Increased traffic	Airport vicinities and major roads into the Airports	Traffic congestion in major roads	Preparation of Traffic Management Plans	Contractor	Contractor	Contractor report to EO – PIU

APPENDIX 4: GUIDELINES FOR PREPARATION OF CEMP

1. The Contractor is responsible for preparing the contractor's environmental management plan (CEMP). The CEMP is prepared after contract award and is required to meet conditions of the relevant contractor bidding documents and be specific to the subproject sites. The Contractor can only move to a work site and commence work after the NAC international Environmental Specialist (IES) and the Program Director (PD) have approved the CEMP.

2. The CEMP is a contractually binding document and applies equally to the main Contractor and to sub-contractors under his control.

3. The CEMP must comply with (a) all EMP conditions and (b) any legislation established by any Administering Organization. All licenses and permits issued by any outside organization that are required to meet the CEMP conditions must be attached to the CEMP.

4. After a period the Contractor may request changes to the CEMP, but any requests or alterations to the CEMP can only by approved by the PD.

5. The Contractor is to keep a Daily Record of all work done to meet the CEMP requirements. The Daily Record is to be available at any time to the NAC Environmental Officer (EO) and IES. The Contractor will provide monthly reports to the project implementation unit (PIU) regarding compliance with the CEMP.

A. Contents of the CEMP

6. The CEMP must be a concise and well-focused document that clearly sets out how the Contractor will meet all requirements of the environmental management plan (EMP). The CEMP consists of the following sections at a minimum.

1. Introduction and Purpose

7. 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.

2. Management Responsibilities

8. This section must clearly identify those persons within the Contractor's team who will be directly responsible for supervising CEMP activities. Each person and their position is to be identified and contact details provided for their work, after-hours telephone numbers for emergency situations, and their email address(es). Details should be provided indicating whether these persons are available to the Contractor on a full-time or part-time basis. As a minimum, details are required for the following positions:

(i) The Contractor's Environmental Manager (EM)
(ii) The back-up person for the EM whenever he/she is unavailable
(iii) The Contractor's Site Engineer (SE) who is responsible for supervising the contract on behalf of the Contractor
(iv) Any other persons on the Contractor's team having management responsibilities as required to meet activities outlined in the CEMP conditions.

(a) Legal Requirements

9. This section will outline the various environmental laws, regulations and standards with which the Contractor must comply during construction.

(b) Licenses and Permits

10. Provide details of licenses and permits that the Contractor will require to undertake the CEMP.

3. Special Environmental or Cultural Issues

11. Discuss whether there are any special issues associated with locations of the work areas, such as whether they are located inside or near environmentally or culturally sensitive areas. Advise what approvals will be required and how work will be undertaken in these areas. Locate the boundaries of the areas in the Plan of Works.

4. Scope of Works

12. Define construction requirements such that all of the work to be undertaken by the Contractor will be clearly identified.

5. Contractor's Applicable Equipment and Facilities

13. Provide details of the facilities and equipment the Contractor will utilize on site, with emphasis on compliance with EMP stipulations and conditions.

B. Monitoring of Work

14. The CEMP is to provide details of how each activity will be monitored, including the frequency of monitoring, what criteria will be monitored, who will undertake the monitoring, and forms and checklists intended for tracking monitoring activities. A monthly report on monitoring activities will be included in the Monthly CEMP Report.

C. Staff and Worker Training

15. The CEMP must provide details of staff and worked training and awareness programs required to ensure compliance with the CEMP. Awareness of staff and workers to safety and environmental regulations, the CEMP requirements, and special circumstances where work will need to be carried out within or near protected areas or culturally significant areas is particularly important. The program will show who is responsible for implementing the program and where the program will be introduced to ensure that all workers are aware of the CEMP procedural requirements before commencing work. As required the PIU's environmental specialists will provide training to the Contractor to ensure that EMP and monitoring requirements as set out in the Contract are complied with.

D. Reporting

16. The Contractor is to provide details of CEMP implementation in a Monthly Report. The report will be submitted to the PIU, a section of the report will cover CEMP implementation and issues and be prepared by the person identified with the Contractor's team as responsible for overseeing CEMP procedures. The report will outline progress regarding the Project's physical monitoring targets and implementation of the CEMP for these works. The report will note which tasks have been completed and approved for payment by the PIU. The report will specify if any notices have been issued by the PIU to correct work and what has been done by the Contractor to address these issues. Any complaints or issues received from the public will be listed in the report. Three copies of the report will be sent to the PD. The report will address the following topics at a minimum:

(i) Status of work program; work completed, construction underway, and work planned
(ii) Environmental unit and staff situation for the month
(iii) Staff and worker awareness training carried out
(iv) Waste volumes, types and disposal (inorganic and organic)
(v) Discovery of artifacts

APPENDIX 5: OUTLINE OF A MONITORING REPORT

The borrower is required to prepare and submit to ADB quarterly progress reports and semi-annual monitoring reports describing progress with implementation of subproject contractor's environmental management plans (CEMPs) and 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 pavement strengthening scope of work and all bid documents are in order prior to the commencement of any construction works.

3. Incorporation of Environmental Requirements in Project Contractual Arrangements

Confirm that environmental management plan (EMP) requirements were incorporated into contractual arrangements, such as with contractors or other parties. Provide example clauses of contractor bidding documents in the appendices.

4. Summary of Environmental Mitigations and Compensation Measures Implemented during the Reporting Period

Summarize key mitigations listed in the project EMP. These may include measures related to water quality, noise, pollution prevention, permitted waste disposal, biodiversity and natural resources, health and safety, physical cultural resources, and others as appropriate.

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 activities. Monitoring of the complaints registry and compliance with the grievance redress mechanism (GRM).

6. Summary of Environmental Monitoring

Describe operational monitoring procedures used by the National Airports Corporation (NAC) Environmental Officer (EO) and international Environmental Specialist (IES) and all monitoring reports produced during the reporting period. Provide copies as appendices if requested.

7. Key Environmental Issues

Key issues identified during this reporting period
Action taken during this reporting period
Additional action required during the next reporting period

8. Non-Compliance Conditions for Defects Notices

The NAC EO will regularly inspect works undertaken by the Contractor to check on implementation of the environmental management and monitoring requirements as indicated in the environmental assessment and review framework (EARF). A Defects Notice (DN) will be issues to the Contractor if NAC requires action to be taken. The

Contractor is required to prepare a Corrective Action Plan (CAP) to be implemented by a date agreed with NAC. Non-compliance will be ranked according to the following criteria:

- **Non-Compliance Level I** represents a situation inconsistent with requirements of the EARF, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns May cumulatively become Level II concerns if left unattended.
- **Non-Compliance Level II** indicates a situation that has not yet resulted in clearly identified damage of irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns my cumulatively become Level III concerns if left unattended.
- **Non-Compliance Level III** signifies a critical situation that will result in significant social of environmental damage occurring or a reasonable expectation of very severe impending damage. Intentional disregard of DNs or specific prohibitions is also classified as a Level III concern.

Failure by the Contractor to prepare a CAP or to implement it within the required timeframe may reasonably result in NAC taking sanctions against the Contractor, including termination in an extreme case.

The Contractor will have a system for recording any DNs received by any person employed by or sub-contracted to the Contractor. All DNs will be acknowledged by the Contractor together with a statement from the Contractor advising how the Non-Compliance Notice will be addressed and within what time frame. The Contractor will be required to address all DNs in writing to NAC within one working week of their receipt.

9. Conclusion

Overall progress of implementation of environmental management measures
Problems identified and actions recommended

Appendices

1. Site Inspection/Monitoring Reports
2. Monitoring Results
3. Public Consultation Reports
4. Photographs
5. Other Relevant Materials

Note: Compliance in each section may 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)

Additional explanatory comments should be provided as necessary.