

Environmental Monitoring Report

Semi-annual Monitoring Report

January 2019

MARITIME AND WATERWAYS SAFETY PROJECT

Reporting period covering July to December 2018.

Prepared by National Maritime Safety Authority for the Asian Development Bank (ADB).

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National Maritime Safety Authority

Maritime and Waterways Safety Project

Project Number: 44375-013

Loan Number: 2978-PNG: Maritime and Waterways Safety Project

Environmental Safeguard Monitoring Report

Period Covering:

July – December 2018

Prepared by: National Maritime Safety Authority

Date: 01 January 2019

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ACRONYMS

ADB	Asian Development Bank
CAM	Community Awareness Meeting
CAMM	Community Awareness Meeting Minutes
CDD	Community Development Department (within NMSA)
CEPA	Conservation and Environment Protection Authority
CLC	Community Lighthouse Committee
CLCO	Community and Lands Coordinator
CSMA	Community Security and Monitoring Agreement
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
EO	Environmental Officer (of NMSA's PIU)
EP	Environmental Permit
ES	Environmental Specialist (International) of NMSA's PIU
FPIC	Free, Prior and Informed Consent
GCLS	Gender, Community and Lands Specialist
GRM	Grievance Redress Mechanism
IEMP	Installation environmental management plan
IERM	Installation Environmental Management Report
LIR	Land Investigation Report
MAC	Maintenance Activity Checklist
MARPOL	International Convention for the Prevention of Pollution from Ships
MWSP	Maritime and Waterways Safety Project
NIC	Navaid Installation Contractor
NMSA	National Marine Safety Authority
NPW	Notification of Preparatory Work
PIA	Pre-Installation Assessment
PIAR	Pre-Installation Assessment Report
PIU	Project Implementation Unit
PLC	Provincial Lighthouse Committee
PM	PIU Project Manager
PNG	Papua New Guinea
QPR	Quarterly Progress Report
SPS 2009	Safeguard Policy Statement (2009)
TL	Team Leader of NMSA's PIU
TOR	Terms of Reference

ENVIRONMENTAL MONITORING REPORT

1. Introduction

This semi-annual environmental monitoring report for the Maritime Waterways Safety Project (MWSP) informs the Asian Development Bank (ADB) on Environmental Safeguard activities and compliance to ADB Safeguards Policy Statement 2009 (SPS 2009) as of project progress to date. It covers the six-monthly reporting period from July to December 2018.

1.1. Background

The Government of Papua New Guinea (the Government) has requested the Asian Development Bank (ADB) to provide further assistance in the maritime sector through replacement of existing or previously evident coastal navigational aids (navaids) as well as installation of new navaids.

The project will enhance the social and economic development in coastal areas by providing safer transit of international shipping in PNG shipping lanes, and by providing navigational assistance to community coastal traffic.

The projects was initially scoped to include 132 navaids including replacement (99) and new navaids (33), and for which site surveys and assessments are required to be undertaken to refine requirements and suitability. It is anticipated by the Project Implementation Unit (PIU) that the navaids project will now be undertaken through three (3) separate contract packages. Separate pre-installation assessments (PIAs) for navaid locations under each of these contract packages are required to be conducted and report prepared and submitted after the conduct of such activities.

Contract Packages 1 & 2 were tendered out in November 2016. Only package 2 contract has been awarded in October 2018 with installation works expecting to start around May 2019. It includes a total of 20 navaids installation in the Autonomous Region of Bougainville, Manus, New Ireland, East New Britain and West New Britain. Contract Package 1 is still yet to be awarded. It includes a total number of 48 navaids installation in Milne Bay and Central Provinces distributed over eight (8) sites. Contract Package 3 was recently tendered out in August 2018. It includes a total of 48 navaids installation distributed over the New Guinea mainland coast. All the sites had been subjected to pre-installation assessment and PIA reports were prepared, submitted and ultimately cleared by ADB.

The Maritime and Waterways Safety Project (MWSP) was prepared in 2012 with the project executing agency and implementing agency being the PNG National Maritime Safety Authority (NMSA) through a Project Implementation Unit (PIU). The PIU is staffed with an Environment Officer (EO) who is a country National, supported by an Environmental Specialist (International). Their responsibilities are described in detail in the Environmental Assessment and Review Framework (EARF).

The project was categorized B for environment thus an Environment Assessment and Review Frameworks (EARF) was prepared, approved by ADB and disclosed on ADB website in May 2015.

1.2. Report Purpose

The NMSA is required to prepare and submit to ADB quarterly progress reports describing progress with implementation of the MWS Project. According to Environmental Assessment and Review Framework (EARF), the NMSA is required to

submit a semi-annual Environmental Monitoring Report (EMR) to ADB for disclosure. The EMR sets out safeguard activities, Installation Environment Management Plan (IEMP) and compliance issues and corrective actions.

This environmental monitoring report follows the outline provided in the EARF for the project. This informs the ADB on Environmental Safeguard activities and compliance as of project progress to date ending June 2018. It should be noted that as of reporting date, since the project commencement, no navaid installation activities has commenced.

This report will be updated as necessary to reflect activities and available information as the project moves forward with the implementation and as navaid installation activities under each contract package.

1.3. Project Implementation Progress

Since the last reporting period not much activity has taken place under the Maritime and Waterways Safety Project. Pre-installation Activities for sites under packages 1, 2 and 3 have all been completed and reports were provided at the end of the last reporting period. The PIA reports for package 1 & 2 were cleared by ADB on the 02nd of December 2017 and PIA Report 3 was cleared on the 22nd of February this year. The Project now awaits the awarding of contracts for these packages to commence with installation activities.

Pre-installation Activities. A total of 104 proposed sites were validated for under packages 1, 2 and 3. Assessments were done for the 104 sites with substrate conditions determined for each locations and subsequent reports and EMPs produced and submitted to ADB and CEPA respectively.

The projects' Community and Lands team conducted visits to the navaid sites for the establishment of Community Lighthouse Committees (CLC) and initiated the Land Investigation Report (LIR). Where disputes arise regarding reef site ownership sites were removed by the project. This has occurred for several sites in all reported packages. Initially a total of 127 sites were visited under the project but due to disputes 23 sites were removed and only 104 sites now remain.

There have been consultations done with ADB regarding the selection-criteria for the Post-Installation Environmental Audit sites. The EARF requires 15% of total installation sites to be randomly selected and audited by an independent contractor. Given the project has multiple locations and characteristics of sites, a random selection may not be adequate in giving a fair representation of the different site conditions. Consultations with ADB has led to this understanding and of ADB's concurrence with the Project for the use of a non-random system of selection for the 15% sites to be audited. This was agreed upon on the 27th of February, 2018.

The Terms of Reference (ToR) for this assignment and the methodology for the selection of candidate sites have been prepared and yet to be submitted to ADB pending contract awards for the packages.

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

During the project Inception Period, the PIU registered NMSA's intention to carry out preparatory works on the proposed activity through a Notification of Preparatory Works (NPW) to the Conservation and Environment Protection Authority (CEPA). This was aimed

to seek their determination of the project' Environmental Permitting requirements. The CEPA informed the PIU NMSA that the activities under the project are well below the requirements of Level 2 and 3 Prescribed Activities under the Environment Prescribed Regulation 2002 and the Environment Act 2000.

The installation of a navaid is classified as a Level 1 activity and is therefore exempt from the Environment Permitting Process. However, even though Level 1 activities are exempt from the obligation to have an Environment Permit, the CEPA reminded that "activities under this category are required to observe the appropriate environmental guidelines and code of practice that are relevant to the activities. More importantly, Level 1 activities should be carried out in accordance with the requirements under the Environment Act Regulations and any Policies established under them."

Lease agreements with communities have been established through the LIR process though had not been fully executed pending government officers undertaking the LIR process as well as approval from contract awards.

Contracts for CP1 and CP3 have not yet been awarded by the NMSA therefore NIC pre-installation activities cannot commence for those two packages however contract for CP 2 has been awarded and installation activities are expected to start in May 2019.

3. Incorporation of environmental requirements in bid documents

Environmental Management Plan (EMP) requirements for all Contract Packages were incorporated into the tender documents issued to prospective bidders (Navaid Installation Contractors (NICs) by the National Maritime Safety Authority (NMSA). Only the contract for package 2 has been awarded as of this reporting period.

Sample Clauses of Contractor Bidding Documents are presented in Appendix 2 of this report.

4. Summary of environmental mitigations and compensation measures implemented

4.1. Pre-installation

- I. Community awareness/consultation and interaction which were conducted during the PIU Pre-installation assessment but which shall continue through with the NIC activities;
- II. Conduct of PIU-NMSA pre-installation assessments (PIA);
- III. Preparation of PIU-NMSA PIA Report, and NIC PIS as part of the installation environmental management reports;
- IV. Identification of land owners or custodians to be facilitated by the PIU in coordination with the Department of Lands and Physical Planning on an on-going basis;
- V. Initiate the land acquisition process (either lease agreements or outright purchase). This will be an on-going activity and is only facilitated by the PIU. Actual negotiation will have to be concluded by the CDD of the NMSA in conjunction with Government processes.
- VI. Clarification of the Grievance Redress Mechanism (GRM) which was explained to each of the communities during the PIU pre-installation assessment activities but which will be reiterated when a NIC is selected and mobilizes to the locations;
- VII. Inclusion of EMP conditions in bid documents;
- VIII. Selection of navaid installation Contractor NIC;
- IX. Pre-installation orientation meetings between PIU and NIC; and

- X. Preparation of Work Method Statement, and Installation Environmental Management Plan by the NIC.

4.2. Installation Activities

The NIC' are required to provide the PIU with work method statement and installation environmental management plan. In addition, they are also required to provide a Marine Ecologist as part of their Team. It shall be also further guided by MARPOL requirements in the management of wastes and hazardous substances.

No actual construction work has commenced yet, nothing can be reported at this stage.

4.3. Post-installation Audit

The PIU shall arrange for the engagement of a Post-installation Audit of NIC activities for at least 15% of installed navaid as per the EARF requirements. ADB through consultations with the Project team has agreed for a non-random system of selection for the 15% sites as opposed to what was initially stated in the EARF.

The Terms of Reference for this assignment and the methodology for the selection of candidate sites have been prepared and is yet to be submitted to ADB pending contract awards for the packages.

No actual construction work has commenced yet; nothing can be reported at this stage.

4.4. Operation and Maintenance

The NIC will prepare a Maintenance Activity Checklist (MAC) to comply with EMP requirements that are relevant to the planned maintenance activity. The Contractor shall be required to complete this checklist at each navaid location and to sign each with his legal signature.

No actual construction work has commenced yet, nothing can be reported at this stage.

5. Public consultation / disclosure activities

Public consultations and disclosure activities under the project were conducted separately by the PIUs International Community, Gender and Lands Specialist (CGLS) together with the counterpart National Community and Lands Coordinator (CLO) via pre-installation community awareness.

The pre-installation community awareness preparations have been based from the NMSA's Community Engagement Program but followed the PIUs process ultimately, including particularly the FPIC process that also involved representatives from the Provincial Government, Districts, and the Department of Lands staff. Community awareness meetings resulted in signed FPIC forms that are considered significant outcomes under the Pre-installation Assessment (PIA) because it confirms community agreement and acceptance of the project and permission by the community for the installation of the navaid in advance of the finalization of an appropriate mode of land acquisition (purchase or lease agreement).

Issues raised are discussed separately in detail in the Pre-installation Assessment Report, and in the Social Monitoring Report as provided by the PIU.

6. Environmental monitoring procedure

No specific monitoring procedures have been applied yet at this time of monitoring reporting. These will be made available during the next reporting period when NIC installation activities begin. It is anticipated that the PIU will be using compliance checklists based on random spot installation inspections, and assessment of NICs installation environmental management reports against its installation environmental management plan and work method statement

For this reporting period, the environmental monitoring report information are based on actual PIU pre-installation site visits and assessment activities following EARF requirements.

7. Environmental issues and mitigation plan

There are no environmental issues identified yet during this reporting period therefore no corrective action measures were undertaken.

No additional action is required during this reporting period.

8. Conclusion

8.1. Overall progress of implementation of environmental management measures

There are no NIC activities commencing on site that can be subjected to environmental monitoring in compliance with contract requirements. Contract Packages 1 and 3 have yet to be awarded while Contract Package 2 has recently been awarded and installation work is expected to start in May 2019.

8.2. Problems identified and actions recommended

Physical environmental problems during installation do not exist yet, because there is no contractor on site. These shall be reported accordingly when situations arise in the next monitoring period.

LIST OF APPENDICES

- Appendix 1. Monitoring Results. *To be appended when NIC activities progresses.*
- Appendix 2. Sample Clauses of Contractor Bidding Documents.

Appendix 2. Monitoring Results (Reserved)

ENVIRONMENTAL MANAGEMENT PLAN (to be replaced with NIC IEMP as per Contract)

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
PRE-INSTALLATION ACTIVITIES						
Community awareness meetings, consultation and Interaction	Local communities and landowners/ caretakers	Project awareness, and community acceptance; Confirms good faith agreements, solidifying partnership between landowners and NMSA	Meeting with local communities; confirm lease conditions; review GRM procedures; identify local cultural issues to be respected; identify mutual performance expectations	PIU GCLS, and CLCO	PIU	Concurrent with PIAs and the PIAR submitted to ADB for clearance; Documented by NIC in the IEMR during its pre-installation activities and submitted to PIU
Pre-Installation Assessment (PIA)	PIU	Locate actual navaid locations and identify bottom types to minimize environmental impacts	Visit each navaid sites and locations concurrently with the community awareness meetings; dive on site to evaluate bottom habitat characteristics and identify bottom types following the hierarchy of preferred location (sand is highly preferred while vigorous coral growth the least preferred) & record with accurate GPS coordinates.	PIU PM/TL EO/ES	PIU/ADB	PIAR provided to ADB for Clearance; copy provided to CEPA for information
Preparation of Pre-Installation Assessment	PIU	Assures that advance planning will be preserved as	Provide formal report of PIA results and recommendations. Includes surface photography characterizing the area and underwater photography indicating	PIU ES/EO	PIU/ADB	PIA Report provided to ADB for Clearance; copy together with NPW provided to CEPA

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
Reports (PIAR)		reference for future actions and Project evaluation, preserving environmental integrity of Project	benthic habitat types and other relevant features, as well as the specific recommended navaid installation site. Report must also include minutes from local community meetings.			for review to see if EPs are required
Identify landowners or custodians	Each navaid location	Determine proper stewardship roles	Identify stakeholders with whom to properly negotiate lease	PIU CLCO and GCLS initiating the process with the Department of Lands and Physical Planning (DLPP), and the Provincial Government Levels	PIU during the project life; and NMSA post-project	Progress report to PIU during the project life; and NMSA-CDD follow up work post-project
Initiate facilitation of land acquisition process (either lease agreements or outright purchase)	Each navaid location	Provides navaid security and local compensation opportunity, avoiding social disaffection	<ul style="list-style-type: none"> - Establishes long term lease agreement of specific area; - Creates easement for construction and maintenance as provided for in the signed FPIC; - Establishes rental fees and local revenue stream; - Provides for local protection of navaid facility through the signed CLCs 	NMSA, Provincial and National Departments for Lands and Physical Planning	PIU during the project life; and NMSA post-project	Monitoring report to PIU during the project life; and NMSA-CDD follow up work post-project
Clarify Grievance	All landowners	Provides clarity and local confidence	Explain GRM and introduce key participants.	PIU GCLS and CLCO during the community	PIU EO	Verbally during CAMs

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
Redress Mechanism	& stakeholders			awareness meetings; Navaid Installation Contractor (NIC) concurrently with installation works.		
EMP Conditions included in bid documents	Bid and Contract documents	Loss of environmental values and project sustainability	Assure that EMP provisions are adequately covered in bid documents, Contractor proposals and contract documents.	PIU ES/EO in coordination with PIU Procurement Specialist (PS)/Procurement Officer (PO)	PIU/ADB	Pre-bid release; PIU draft to ADB
Selection of Contractor(s)	PIU	Selection of competent Contractor assures environmental integrity of Project is maintained	Evaluate each bid for environmental competence of Contractor. Rank bids and advise bid evaluation panel.	PIU PM, TL, and ES/EO in coordination with PIU Procurement Specialist (PS)/Procurement Officer (PO)	PIU/ADB	After bid evaluation; decision submitted to ADB for review
Preconstruction Orientation Meeting(s)	NIC, and PIU	Communicates expectations concerning environmental compliance and care	Conduct post-contract award meetings to review environmental, social and cultural issues to assure Contractor understanding and commitment to compliance.	PIU PM/TL, ES/EO and GCLS/CLCO	PIU	After Contract Execution; minutes to file and to ADB, signed by PIU and Contractor Representative

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
Preparation of Work Method Statement	NIC	Maintains environmental integrity of Project	Contractor prepares method statement based on IEMP and reviewed as part of tender assessment and award process, establishing Contractor's management and compliance requirements. Must be reviewed and approved by ES/EO and PM/TL prior to work proceeding.	NIC	PIU ES/EO	During the tender process after PIU PIAs
INSTALLATION ACTIVITIES						
Establishment of Contractor's facilities	NICs Work barge and associated vessels	Avoids site damage/pollution by assuring well planned and adequate facilities and equipment	Assure appropriate anchoring capability, sewage and grey water containment, hazardous materials and waste handling, availability of spill control equipment, adequate bunding to contain spills aboard, appropriate personnel safety provision, etc.	NIC, Reviewed and approved by PIU PM/TL and ES/EO prior to onset of works	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Storage and handling of fuel and lubricants	NICs Work barge and associated vessels	Accidental spills resulting in water pollution or habitat damage	Fuel to be stored in properly sealed containers in adequately bunded area of minimum 110% capacity. Contractor to carry sufficient spill and emergency response equipment on board the barge. Contractor required to develop emergency response plan (as part of CEMP), and train all personnel in use of spill control equipment.	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Use of hazardous materials	NICs Work barge and	Health dangers to workers and	Contractor to provide list of all HAZCHEM products carried or planned for use on work vessels, if any.	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement;

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
	associated vessels	the environment	Contractor to display MSDS sheets in work areas.			Verification/Monitoring Report; Review of IEMRs
Workplace health and safety	NICs Work barge and associated vessels	Workplace accidents and health of workers; loss of productivity	No drugs or alcohol allowed on-site. All workers to be provided with safety equipment appropriate for tasks in which they are employed, including personal floatation devices. Sufficient potable water and sanitary toilet facilities to be provided. Medical and first aid facilities to be provided together with a person qualified in first aid.	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Sewage Management	NICs Work barge and associated vessels	Spillage resulting in water pollution	Sewage and grey waters shall be stored in on-board sullage tanks until they can be discharged into port reception facilities as best practice, or in accordance with MARPOL Annex IV – Regulations for the Prevention of Pollution by Sewage from ships. PNG is a signatory to the MARPOL (The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 Relating Hereto)	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Inorganic and solid waste disposal	NICs Work barge and associated vessels	Prohibition of dumping to maintain environmental values	Inorganic and solid waste that will not degrade will be stored aboard work barge or other work vessel for later appropriate disposal at approved municipal facilities.	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
Manoeuvring and stabilizing work barge	NICs Work barge at navaid installation site	Significant physical habitat damage possible if improperly conducted	<ul style="list-style-type: none"> - Contractor will be required to engage a Marine Ecologist as part of the team. - Contractor must use great care in approaching each navaid installation site. - NIC required to exercise due diligence based on its work method statement and installation environmental management plan. 	NIC	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Pile Installation	Navaid installation site	Unnecessary bottom community disturbance or destruction	Noise and bottom disturbance should be minimized. The NICs Marine Ecologist will guide accurate placement to areas of least environmental impact, as decided beforehand based on the PIA, as well as the NICs work method statement and installation environmental management plan.	NIC, observed by ES/EO and/or PM	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Debris Removal	Navaid installation site and environs, including entire 400m ² lease area on water; or 100m ² on land	Maintains or even improves environmental integrity of local habitats and ecosystems	<p>Old navaid structures will be removed and transported to an agreed location for appropriate disposal or recycling. All construction equipment and waste materials shall be removed from the site.</p> <p>A diver survey shall be made of each entire lease area to determine presence of debris, even if unrelated to navaid installation.</p>	NIC with IES and PM consultation	PIU EO Verification/ Inspection	Site presence, Compliance to Method Statement; Verification/Monitoring Report; Review of IEMRs
Post-installation audit	At least 15% of navaid locations	Ensure compliance with	Recommendations on compensation and/or penalties for non-compliant works and/or environmental damages	Independent organization	PIU CEPA	Audit Reports

IMPACT MITIGATION (Answerable with Yes or No)					MONITORING (Compliance Column to be provided in final version)	
Project Activity	Applies to	Potential Environmental Impact &/or Consequence	Proposed Mitigation Measure	Implementation Responsibility	Monitoring Responsibility	Timing & How Reported
		Environment Act		(Specialist in Marine Ecology)		
OPERATIONS PHASE						
Develop MAC	NIC	Prevent Environmental Impairment	Assure compliance with safety measures	EO	PM	As Needed; Communication between EO and PM
On-site audits	EO	Prevent Environmental Impairment	Assure compliance with safety measures	EO	PM	As needed; Checklist review, personal observation, Memos to file; action on non-compliance issues

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.

Appendix 5. Other Relevant Materials (Reserved)

Sample Clauses of Contractor Bidding Documents

Section 6 – Employer’ Requirements

1. Introduction

1.1 Project Objective

The project objective is to improve safety and efficiency of international and national shipping in coastal areas and waterways in PNG. The output is replaced, installed and maintained navigational aids (navaids) incorporating climate change adaptation, periodic maintenance, and community engagement program to sustain good condition of navaids.

1.2 Scope of Work

- i. The Scope of Work of the Bidders shall include, but not be limited to, the items listed below.
 - a) Design, manufacturing, assembly, and Factory Acceptance Tests (FAT) (as necessary) of items listed in Schedule of Price, meeting the requirements herein. Bidders shall also be responsible for ancillaries including, but not being limited to, the following:
 - (i) Mooring configuration, including chains or other moorings;
 - (ii) All required wiring and accessories to provide complete operational unit in accordance with technical requirements given in this narrative data sheet; and
 - (iii) Topside platforms and connection flanges to structural support for navaid.
 - b) Bidders shall supply standardized navigation aid parts, including but not limited to, lights, buoys, daymarks, regulators, batteries, mounting holes, solar panel framework, platforms and stairs.
 - c) Design, fabrication and supply of anchor blocks.
 - d) Complete inspection, QA/QC and testing requirements herein.
 - e) Surface preparation, coating and painting.
 - f) Preservation and packing.
 - g) Provision to comply with HSEQ and Quarantine requirements.
- ii. Fixed lights and markers shall be provided with access ladders and adequate facilities for personnel access and delivery of spare parts. Access platforms shall be designed for a live load of 10kPa in combination with dead loads and buoyancy loads, plus serviceability wind and wave loads. These should be such that it prevents unauthorised access.
- iii. Inspections by Contractor or Third Party Agencies shall be conducted in accordance with inspection intervention points defined in Inspection and Test Plan, refer to the Subsection 6 of this Employer’s Requirements (Bidding Document Section 6).
- iv. The Contractor shall follow or adhere to IALA Guidelines and Recommendations as listed under 2. General Requirements; 2.1 – Codes and Standards in the provision of this service. IALA Industrial Membership would be considered advantageous in

demonstrating an understanding of requirements and design and maintenance principles.

- v. The Contractor is to be certified under ISO 9001:2000 for the quality management system.
- vi. The Contractor is to be certified under ISO 14001:2004 for the environmental management system.
- vii. The Contractor is to be certified under ISO 18001:2000 for the safety management system.
- viii. Pre-installation Survey. The NIC as part of the work requirement shall undertake/ conduct (but not necessarily be limited to) the following:
 - a) The PIU as part of its initial Pre-Installation Assessment activities has already identified site details (coordinates) from which a defined 20m x 20m lease survey area is under preparation for underwater installations, or 10m x 10m for above ground installations;
 - b) For the purposes of measurement of impacts, we require as part of the NIC works, assessment of the areas of installation and associated activity (including but limited to items such as anchors, chains & wires, offcuts, old nav aids, etc), that suitably qualified marine ecologists / divers assess the area prior to installation work as well as on completion. Assessments of cover and impacts will be important for ongoing or future socio-economic analyses as well;
 - c) It is considered that some form of habitat mapping and identification of key marine species will be required as part of the NIC planning for barge works and for impact assessment and may require techniques such as transects or photo quadrats. The NIC shall identify how work will be done as well as how it will be scheduled, and data that will be available after surveys for future assessment and audit purposes;
 - d) Attend pre-installation orientation meetings between PIU and NIC;
 - e) Preparation of Work Method Statement, and Installation Environmental Management Plan by the Bidder to be included in the technical bid;
 - f) Preparation of installation environmental management plan; and
 - g) It is expected that dive work will be undertaken in accordance with Australia/New Zealand Standard Occupational Diving Operations Part 2: Scientific Diving (ASNZS 2299.2:2002) or equivalent. The NIC shall detail in the tender how they will comply with these requirements including appropriate certification of divers / ecologist(s).
 - h) NIC shall also identify PNG and / or regional experience relevant to the types of work and environment. Experience in actual installation works for this similar project will be highly desirable
- ix. Installation Requirements. Manoeuvring and Stabilizing the Work Barge:
 - a) Provide a Grievance Redress Mechanism (GRM) from which communities can provide complaints during installation works;
 - b) Maneuvering and stabilizing the work barge entails the most potential environmental risk and must be conducted carefully with great attention to detail. If done correctly, environmental impact will be minimal, but inattention or accident can result in contact between the barge and reef, which could inflict serious environmental damage if the process is undertaken without due care

and attention to the environment and meteorological conditions prevailing at the time.

- c) No barge positioning should be undertaken when weather and sea state conditions impose inappropriate risk. These factors must be evaluated prior to approaching any installation site, and if deemed unsafe, the approach must be postponed to another, more favorable, day or another location where appropriate.
 - d) Evaluation of local bathymetry should have resulted in NIC planning the best approach of the barge to the installation site. Divers in the water during the actual approach and stabilization procedures must validate and confirm on-site efficacy of the pre-planning process.
 - e) Prior to the barge approach, NIC must revisit the site and mark the actual navaid installation point with a floating buoy to guide the barge approach.
 - f) Divers are responsible for assessing locations and logging details where anchors/spuds etc will be placed. Also, divers shall assess the bottom prior to anchor deployment to assure appropriate bottom and habitat types are present.
 - g) Tugs and other support vessels will generally be moored to the work barge when not in operation. When safety dictates the use of anchors, these vessels will always be relocated to deeper water and/or more appropriate substrate for anchoring.
 - h) Before and after underwater photographs accompanying ecological assessments will be taken of all anchoring and pile locations.
- x. Pile Installation. Once the work barge is in position and stabilized, the pile driving process is relatively straightforward.
- xi. Debris Removal:
- a) When navaid installation results in replacement of a pre-existing navaid, the old navaid structure will be removed and transported to land for appropriate disposal or recycling when it is evaluated as a potential boating or environmental hazard. When old structures are being removed, all due care must be taken to minimize environmental damage. If possible, old structures still embedded in the seabed will be removed using chains and/or hammers to loosen and pull them from the substrate. If the structures break off underwater, the NIC must consider cutting them off at seabed level using underwater cutting equipment. Decisions concerning appropriate removal must be made with on-site consultation with the PIU-NMSA Representative monitoring construction activities. All removal and/or damages should be logged by NIC, with penalties as attached. If the subsequent audit finds that damage has in fact been misreported then contractual penalties will apply.
 - b) Upon completion of all other activities, the site will be examined and thoroughly cleaned to assure that no construction materials or other extraneous materials are left behind on the seabed or surrounding reef. These materials will be stored on the construction barge until they can be disposed of at an appropriate municipal facility or recycled.

- xii. Management of Waste and Hazardous Substances:
- a) Fuels and lubricants will be contained in spill-proof containers or tanks. All fuel storage and refueling areas aboard the work barge will be adequately banded to contain accidental spillage. Oil containment booms and skirts, absorbent pads, and other spill control equipment will be stored in easily accessible locations for rapid deployment and all crew shall be trained in their use prior to departing the barge's home docking facility.
 - b) Oil containment boom shall be deployed around the navaid monopole prior to its being driven into the bottom substrate. It shall be deployed in such manner as to contain any hydraulic or lubricant materials discharged from the vibratory or impact hammer used to drive the pile. If such materials are collected with the boom during the installation procedure, they will be cleaned up and contained prior to removal and cleaning of the oil spill boom and skirt.
 - c) Sewage and Grey Waters shall be stored in on-board sullage tanks until they can be discharged either into land-based treatment facilities or in accordance with MARPOL Annex IV – Regulations for the Prevention of Pollution by Sewage from ships.
 - d) Inorganic and Solid Waste that will not degrade will be stored aboard the work barge or other work vessel for later appropriate disposal at approved municipal facilities. Specifically, the NIC shall conform with "The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 Relating Hereto", MARPOL and its Annexes as follows:
 - Regulations for the Prevention of Pollution by Oil (October 1983).
 - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (April 1987).
 - Regulations for the Prevention of Pollution by Harmful Substances Carried at Sea in Packaged Form
 - Regulations for the Control of Pollution by Garbage from Ships (December 1998).
- xiii. Operation Requirements. Operational activities related to navaid consist of periodic inspection, maintenance and repair. These tasks will form part of the NIC contract for defect liability period.
- xiv. Environmental Protection Requirements:
- a) The environmental welfare of all personnel engaged in the Works, the general public, the community where the installations shall take place, avoidance of damage to community resources, and the prevention of adverse impacts on the environment, cultural heritage and social values is of paramount importance to the Employer.
 - b) The NIC shall ensure that all installation works are conducted in such a manner as to minimise to acceptable levels or eliminate the negative risks to the environment and where opportunities exist, maximise the beneficial factors to the environment.
- xv. The NIC shall comply with all applicable Government of Papua New Guinea environmental laws and regulations as well as the ADB Safeguard Policy Statement 2009 and/or ISO certificated management systems (i.e. Quality Management, Environmental Management, Occupation Health and Safety Management, etc).

- xvi. An Environmental Management Plan (EMP) has been prepared for the Project to address potential adverse impacts during pre-installation, and installation and phases. The EMP's detail the mitigation and monitoring requirements that will ensure compliance with the Papua New Guinea environmental laws and regulations as well as with the ADB Safeguard Policy Statement 2009. The NIC shall base its Installation Environmental Management Plan (EMP) on this EMP, by preparing an Installation Environmental Management Plan (IEMP). The EMP is included in this bidding document (it could be also downloaded from ADB website).
- xvii. The NIC's overall philosophy for environmental management shall embody a culture of continuous improvement via the plan, do, check, act cycle as documented by ISO 9001. The NIC shall regularly review the performance of the environmental management system, and implement improvement actions as and when required, providing evidence to the Employer's Representative of the same.
- xviii. Breach of Environmental Obligations:
- a) Serious or repeated breaches of the statutory regulations for the environment, or other disregard for the environment, may be reasons for the Employer's Representative to exercise its authority to require the removal from the Site of any employee of the NIC or a Sub-Contractor.
 - b) Once removed, such person shall not be re-employed on the Contract.
 - c) The Employer's Representative shall have the right to order the suspension of any or all of the NIC's activities where it is deemed that to continue such activity or activities may have an impact on the environment.
 - d) Where the Employer's Representative orders a suspension of the NIC's activities, such suspension shall continue until the NIC has satisfied the Employer's Representative that satisfactory corrective action has been taken to eliminate the impact that was the subject of the suspension.
 - e) PIU-NMSA will regularly inspect works undertaken by the NIC to check on implementation of the environmental management and monitoring requirements. A Defects Notice (DN) will be issued to the NIC if PIU-NMSA requires action to be taken. The NIC is required to prepare a Corrective Action Plan (CAP) to be implemented by a date agreed with PIU-NMSA. Non-compliance will be ranked according to the following criteria:
 - Non-Compliance Level 1 represents a situation inconsistent with requirements of the EARF, but not believed to represent an immediate or severe social or environmental risk. Repeated Level 1 concerns may cumulatively become Level II concerns if 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 may cumulatively become Level III concerns if left unattended.

- Non-Compliance Level III signifies a critical situation that will result in significant social or 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.
 - f) Failure by the NIC to prepare a CAP or to implement it within the required timeframe may reasonably result in NMSA taking sanctions against the NIC, including termination in an extreme case.
 - g) The NIC will have a system for recording any DNs received by any person employed by or Sub-contracted to the NIC. All DNs will be acknowledged by the NIC together with a statement from the NIC advising how the Non-Compliance Notice will be addressed and within what time frame. The NIC will be required to address all DNs in writing within one working week of their receipt.
- xix. Monitoring and Reporting. Monitoring of NIC activities will largely be the responsibility of the PIU-NMSA monitor that will be present during all installation activities undertaken by the NIC. While the NIC shall prepare all required reports, the Employer Representative or PIU-NMSA monitor shall 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 NIC undertaking any further installation activities. The following reports shall be required:
- a) Pre-installation Community Awareness Meeting Minutes (CAMM) will be provided for each meeting;
 - b) Pre-installation Survey Reports (PISRs) shall be provided for each site surveyed. The pre-survey, together with the post survey inspection will be part of each specific completion report;
 - c) Vessel Operation Reports shall be prepared weekly to assure that waste is being stored appropriately, waste is being disposed of at only approved municipal facilities, all fuel containers are in good condition and re-fueling is being conducted properly, accidental discharges if any are to be reported and corrective actions undertaken, and discharge of sullage tanks is occurring only in accordance with "The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 Relating Hereto", MARPOL and its Annexes.
 - d) Installation Environmental Management Reports (IEMRs) will be prepared for each site noting that piles are installed in positions selected during the PIA and recording accurate GPS coordinates, that the construction barge and other vessels were maneuvered and stabilized properly, oil containment gear was easily accessible for rapid deployment, the installation site was inspected by divers and certified as clean, and before and after pile photographs are provided.
 - e) Incident Reports shall be prepared as incidents occur, indicating details of environmental issues, accidents, or other significant events either non-compliance or otherwise determined significant by the NIC and/or NMSA Monitoring Representative. Corrective actions shall be emphasized and integrated in the completion report, including all details of installation including environmental assessments (installation site + anchors, species lists, damage assessments, and all other relevant installation information and incidents.)

xx. Installation Environmental Management Plan (IEMP):

- a) The NIC is responsible for preparing the IEMP. It is prepared during the tender process and is required to meet conditions of the relevant NIC bidding documents and be specific to the sites and navaid locations. The NIC can only move to a work site and commence work after the PIU-NMSA had approved the IEMP.
- b) The IEMP is a contractually binding document and applies equally to the main NIC and to Sub-NICs under his control.
- c) The IEMP must comply with (a) all EMP conditions and (b) any relevant legislation of the Government. All licenses and permits issued by the Conservation and Environment Protection Authority (CEPA) that are required to meet the IEMP conditions must be attached to the IEMP.
- d) After a period the NIC may request changes to the IEMP, but any requests or alterations to the IEMP can only be approved by the PIU-NMSA PM.
- e) The NIC is to keep a Daily Record of all work done to meet the IEMP requirements. The Daily Record is to be available at any time to the EO and IES and Project Engineer. The NIC will provide monthly reports to the PIU regarding compliance with the IEMP.
- f) NIC shall prepare and implement an Installation Environmental Management Plan (IEMP) which addresses the conditions and proposed work activities for the installation phase of the Works.
- g) The IEMP shall include a policy statement signed by the Chief Executive Officer of the NIC (or other Senior Officer) declaring that environmental management shall be given high priority in all aspects of the Contract and in the discharge of their contractual obligations.
- h) The IEMP shall also set out in detail the approach that will be adopted in dealing with the potential environmental impacts from the various different installation activities. The IEMP shall address all the potential impacts (both positive and negative) and shall follow the IEMP outline contained herein. The NIC shall submit the IEMP for review by the Employer's Representative in the submission of technical bid.
- i) The IEMP shall be based on the recommendations of the Project EMP and the Pre-installation Assessment (PIA) done by the PIU-NMSA.
- j) The IEMP shall include, but need not be limited to, the following plans:
 - A. Noise Control Plan;
 - B. Spill Management Plan;
 - C. Wastewater Management Plan;
 - D. Occupational and Community Health and Safety Plan; and
 - E. Emergency Response Plan.

SECTION 8 – PARTICULAR CONDITIONS OF CONTRACT

82 (b). Compliance with Laws

The following Sub-Clauses are to be inserted after the Sub-Clause 82 (b) of Section 7: General Conditions of Contract:

82. (c) The NIC is expected to undertake all installation works with the utmost care and attention to the surrounding environment. All impacts associated with the work are to be reported in the individual Completion Reports for each site, on the basis of pre-installation survey and records and comparison with post installation surveys.

82. (d) Due to the sensitive nature of these systems, often reef environments and upon which locals rely for subsistence living, it is not sufficient that penalties against the PNG Environment Act, (2000) be used to address any possible extensive damage. As such the Employer will also engage independent ecological / dive teams to undertake an audit of approximately 15% of all installation sites, on a random basis. If these audits find significant discrepancies, particularly in respect of 'under-reporting' of damage attributable to installation activity, the Employer will apply a maximum **20% penalty of contract price** against the equivalent percentage of sites whereby this is identified. The Contractor shall pay the penalty to the Employer, or the Employer may deduct from final payments 'a retention based on its estimate of the fair value of its claims against the Contractor', for breach of environmental obligations or nonperforming of the mandatory as per the EARF (Environmental Assessment and Review Framework) requirements as follows:

If the subsequent audit finds that damage has in fact been misreported by the Contractor for particular works such as pile installation, debris removal, miss-management of waste and hazardous substances (fuels and lubricants, oil containment boom, sewage and grey waters; or

The NIC shall carry out a detailed environmental risk assessment which shall address the environmental aspects of the Works. The environmental risk assessment shall be submitted to the PIU or Employer's Representative together with the IEMP and the findings of the assessment shall have been incorporated into the IEMP; or

The NIC shall appoint an Environment Officer (EO) with a degree in Marine Science or Engineering having at least five (5) years of relevant experience to oversee timely and proper implementation of mitigation and monitoring measures as specified in the Installation Environmental Management Plan (IEMP). This could be the Marine Ecologist. The NIC shall ensure that their staff who are responsible for the Site environment are adequately trained regarding environmental management and have the necessary authority to suspend any activity where there is an imminent risk of negative environmental impact(s).

Contractor shall read carefully the EARF (Environmental Assessment and Review Framework) presented in the bidding document. The following table is also summarized description and reference for penalties to be applied:

An example of calculation of the breach of environmental obligations or nonperforming of the mandatory is as follows: i.e. 60 sites – 15% = 9 sites, say 2 sites audited are under reported (i.e. 2/9=22.22% of sites). Then penalty of 20% payment will apply to 22.22% of the 60 sites, on the basis of total cost rather than site by site.

The Table below summarizes the major issues/penalties.

Table Summary of major issues and penalties

SL No.	Clause Description	Reference for Validations	Penalties
1	<p>11. Causing Serious Environmental Harm</p> <p>(1) A person who unlawfully causes a serious environmental harm is guilty of an offence.</p> <p>(2) In proceedings for an offence against Subsection (1), there is no requirement to prove that the person intended to cause the serious environmental harm.</p>	PNG Environment Act, 2000 (Excerpts)	<p>Penalty: Where the person convicted of an offence is –</p> <p>(a) a Corporation - a fine not exceeding K250,000.00; and</p> <p>(b) Other than a Corporation - a fine not exceeding K125, 000.00 or imprisonment for a term not exceeding five years, or both.</p> <p>Default penalty: A fine not exceeding K15, 000.00.</p>
2	<p>12. Causing Material Environmental Harm</p> <p>(1) A person who unlawfully causes a material environmental harm is guilty of an offence.</p> <p>(2) In proceedings for an offence against Subsection (1), there is no requirement to prove that the person intended to cause the material environmental harm.</p>	PNG Environment Act, 2000 (Excerpts)	<p>Penalty: Where the person convicted of an offence is –</p> <p>(a) a Corporation – a fine not exceeding K100,000.00; and</p> <p>(b) other than a Corporation – a fine not exceeding K50,000.00 or imprisonment for a term not exceeding two years, or both</p> <p>Default penalty: A fine not exceeding K5, 000.00.</p>
3	<p>13. Causing Environmental Harm</p> <p>(1) A person who unlawfully causes an environmental harm by –</p> <p>(a) noise, dust, odour or electro-magnetism or litter; or</p> <p>(b) an unhealthy, offensive or unsightly condition because of a contaminant; or</p> <p>(c) Any other way prescribed by regulation, is guilty of an offence.</p> <p>(2) In proceedings for an offence against Subsection (1), there is no requirement to prove that the person intended to cause the unlawful environmental harm.”</p>	PNG Environment Act, 2000 (Excerpts)	<p>Penalty: A fine not exceeding K20,000.00</p> <p>Default penalty: A fine not exceeding K2, 000.00.</p>
4	<p>8. Duty to Notify Unlawful Environmental Harm</p> <p>(1) A person who becomes aware that unlawful serious environmental harm or unlawful material environmental harm is caused or threatened in the course of an activity carried out by that person, or over which that person has effective control, shall as soon as practicable give written</p>	PNG Environment Act, 2000 (Excerpts)	<p>Penalty: Where the person convicted of an offence is –</p> <p>(a) a Corporation - a fine not exceeding K100,000.00; and</p> <p>(b) Other than a Corporation - a fine not exceeding K50, 000.00 or imprisonment for a term not exceeding two years, or both.</p>

	<p>notice to the Director of the circumstances in which the harm or risk of harm arose.</p> <p>(2) A person who fails to comply with Subsection (1) is guilty of an offence.</p> <p>(3) It is not reasonable excuse for a person to fail to give notice to the Director of the circumstances involving the harm on the ground that the notice, or the giving of the notice, might tend to incriminate the person.</p> <p>(4) A notice given by a person under Subsection (1) is not admissible in evidence against that person, or any other person carrying out the relevant activity, in any legal proceedings.</p> <p>(5) Subsection (4) does not prevent other evidence obtained because of the notice, or the giving of the notice, being admitted in any legal proceeding against the person.</p>		
5	<p>Establishment of Contractor's facilities</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence: Avoids site damage/ pollution by assuring well planned and adequate facilities and equipment</p> <p>Assure appropriate anchoring capability, sewage and gray water containment, hazardous materials and waste handling, availability of spill control equipment, adequate bunding to contain spills aboard, appropriate personnel safety provision, etc.</p>	<p>(i) Approved EMP (ii) Papua New Guinea Law on the environment (Environment Act 2000), as well as further relevant Decrees and Circulars linked to the Environment Act 2000.</p>	Retention money as per the PCC Sub-Clause 56.4 above
6	<p>Storage and handling of fuel and lubricants</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence: Accidental spills resulting in water pollution or habitat damage</p> <p>Proposed Mitigation Measure: Fuel to be stored in properly sealed containers in adequately bunded area of minimum 110% capacity. Contractor to carry sufficient spill and emergency response equipment on board the barge. Contractor required to develop emergency response plan (as part of IEMP), and train all personnel in use of spill control equipment.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	Approved EMP incorporated in the bidding document	NIC shall be responsible for carrying out preventive action, and remediation at Contractor's expense. Applicable clauses of the PNG Environment Act apply to be determined by the Employer, its representatives or as maybe assisted by CEPA.

7	<p>Use of hazardous materials</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence: Health dangers to workers and the environment.</p> <p>Proposed Mitigation Measure: Contractor to provide list of all HAZCHEM products carried or planned for use on work vessels, if any. Contractor to display MSDS sheets in work areas.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	Approved EMP incorporated in the bidding document	NIC shall be responsible for carrying out preventive action including awareness raising and training at Contractor's expense. Applicable clauses of the PNG Environment Act apply to be determined by the Employer, its representatives or as maybe assisted by CEPA. Contractor shall provide for adequate medical care coverage at all times including repatriation of disabled workers occasioned by the improper use of hazardous materials at the work sites.
8	<p>Workplace health and safety</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence: Workplace accidents and health of workers; loss of productivity</p> <p>Proposed mitigation Measure: No drugs or alcohol allowed on-site. All workers to be provided with safety equipment appropriate for tasks in which they are employed, including personal floatation devices. Sufficient potable water and sanitary toilet facilities to be provided. Medical and first aid facilities to be provided together with a person qualified in first aid.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	Approved EMP incorporated in the bidding document	NIC shall be responsible for carrying out preventive action including awareness raising and training at Contractor's expense. Contractor shall provide for adequate medical care coverage at all times including repatriation of disabled workers occasioned by accidents at work sites.
9	<p>Sewage Management:</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence: Spillage resulting in water pollution</p> <p>Proposed Mitigation Measure: Sewage and gray waters shall be stored in on-board sullage tanks until they can be discharged either into land-based treatment facilities or as per specifications determined by a DEC permit, which must be applied for and obtained by the contractor if required.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	Approved EMP incorporated in the bidding document	NIC shall be responsible for carrying out preventive action including awareness raising and training at Contractor's expense. Applicable clauses of the PNG Environment Act apply to be determined by the Employer, its representatives or as maybe assisted by CEPA.
10	<p>Inorganic and solid waste disposal</p> <p>Work barge and associated vessels</p> <p>Potential Environmental Impact &/or Consequence:</p>	Approved EMP incorporated in the bidding document	NIC shall be responsible for carrying out preventive action including awareness raising and training at Contractor's expense. Applicable clauses of the PNG Environment Act

	<p>Prohibition of dumping to maintain environmental values</p> <p>Proposed Mitigation Measure: Inorganic and solid waste that will not degrade will be stored aboard work barge or other work vessel for later appropriate disposal at approved municipal facilities.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>		<p>apply to be determined by the Employer, its representatives or as maybe assisted by CEPA.</p>
11	<p>Pile Installation</p> <p>Navaid installation site</p> <p>Potential Environmental Impact &/or Consequence: Unnecessary bottom community disturbance or destruction</p> <p>Proposed Mitigation Measure: Noise and bottom disturbance should be minimized.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	<p>Approved EMP incorporated in the bidding document</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>
12	<p>Maneuvering and stabilizing work barge Work barge at navaid installation site</p> <p>Potential Environmental Impact &/or Consequence: Significant physical habitat damage possible if improperly conducted</p> <p>Proposed Mitigation Measure: Contractor must use great care in approaching each navaid installation site.</p> <p>Timing & How Reported: Site presence, Review of IEMRs, conducted at every installation location</p>	<p>Approved EMP incorporated in the bidding document</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>
13	<p>Debris Removal</p> <p>Navaid installation site and environs, including entire 400m2 lease area (underwater)</p> <p>Potential Environmental Impact &/or Consequence: Maintains or even improves environmental integrity of local habitats and ecosystems</p> <p>Proposed Mitigation Measure: Old navaid structures will be removed and transported to land for appropriate disposal or recycling.</p>	<p>Approved EMP incorporated in the bidding document</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>

	<p>All construction equipment and waste materials shall be removed from the site.</p> <p>A diver survey shall be made of each entire lease area to determine presence of debris, even if unrelated to navaid installation.</p> <p>If possible and reasonable, such debris will be removed. If amounts of debris are unreasonably extensive, as may be possible near populated areas, contractor will consult with PIU representatives to agree on a rational policy.</p> <p>Timing & How Reported: Site presence, Review of IEMRs conducted at every installation location</p>		
14	<p>4.5.Reporting of Environmental Incidents</p> <p>The NIC shall notify the Employer's Representative immediately of any environmental incident. Initial notification may be verbal but shall in any event, be followed by a preliminary written report, in a format that has been reviewed by the Employer's Representative, within 24 hours of the incident. A detailed written report shall be submitted within three (3) days.</p> <p>The NIC shall report all incidents to the Employer's Representative and Relevant Authorities.</p>	<p>PNG Environment Act, 2000 (Excerpts)</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>
15	<p>3.2.Environmental Risk Assessments</p> <p>The NIC shall carry out a detailed environmental risk assessment which shall address the environmental aspects of the Works.</p> <p>The environmental risk assessment shall be submitted to the Employer's Representative together with the IEMP and the findings of the assessment shall have been incorporated into the IEMP, relevant method statements, and other documents as required during the tender process.</p> <p>The nature of the Works environment dictates that assessment of risks to the environment requires regular review and update by the NIC.</p> <p>Environmental risk assessments shall be included as part of all method statements. The Employer's Representative reserves</p>	<p>PNG Environment Act, 2000 (Excerpts)</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>

	<p>the right to request the NIC to conduct an environmental risk assessment and document a method statement for hazardous Works as and when deemed necessary. Non-compliance with such a request from the Employer's Representative may result in suspension of the activities concerned.</p>		
16	<p>4.1. Environmental Inspections and Monitoring by the NIC</p> <p>The NIC's responsibilities with regards to the implementation of the EMP and environmental compliance monitoring are to:</p> <ul style="list-style-type: none"> • appoint an Environmental, Health and Safety Officer to oversee timely and proper implementation of mitigation and monitoring measures specified in the EMP and IEMP; • implement and provide sufficient funding and human resources for proper and timely implementation of required mitigation measures in the EMP and IEMP for pre-installation and installation phases; and • prepare the IEMP for the Employer's Representative's and ADB's assessment as necessary during the tender process. 	<p>PNG Environment Act, 2000 (Excerpts)</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>
17	<p>Management of Waste and Hazardous Substances</p> <p>Fuels and lubricants will be contained in spill-proof containers or tanks. All fuel storage and refueling areas aboard the work barge will be adequately banded to contain accidental spillage. Oil containment booms and skirts, absorbent pads, and other spill control equipment will be stored in easily accessible locations for rapid deployment and all crew shall be trained in their use prior to departing the barge's home docking facility.</p> <p>Oil containment boom shall be deployed around the navaid monopole prior to its being driven into the bottom substrate. It shall be deployed in such manner as to contain any hydraulic or lubricant materials discharged from the vibratory or impact hammer used to drive the pile. If such materials are collected with the boom during the installation procedure, they will be cleaned up and contained prior to removal and cleaning of the oil spill boom and skirt.</p>	<p>MARPOL and its Annexes as follows:</p> <p>(i) Annex I: Regulations for the Prevention of Pollution by Oil (October 1983).</p> <p>(ii) Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (April 1987).</p> <p>(iii) Annex III: Regulations for the Prevention of Pollution by Harmful</p>	<p>Retention money as per the PCC Sub-Clause 56.4 above</p>

	<p>Sewage and Grey Waters shall be stored in on-board sullage tanks until they can be discharged either into land-based treatment facilities or in accordance with MARPOL Annex IV – Regulations for the Prevention of Pollution by Sewage from ships.</p> <p>Inorganic and Solid Waste that will not degrade will be stored aboard the work barge or other work vessel for later appropriate disposal at approved municipal facilities. Specifically, the NIC shall conform with “The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 Relating Hereto”,</p>	<p>Substances Carried at Sea in Packaged Form (iv)Annex V: Regulations for the Control of Pollution by Garbage from Ships (December 1998).</p>	
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Source: CWP01 Works-Small (1S1E) Section 8_December2015 v2