REPÚBLIC DEMOCRÁTICA DE TIMOR-LESTE

THE FINAL REPORT
(Volume II)

Environmental Management Plan

for the Condensate and Products Pipeline Route Project in Timor-Leste

Prepared by

TEAM Consulting Engineering and Management Co., Ltd.

June 2017

EMP FOR THE CONDENSATE AND PRODUCTS PIPELINE ROUTE PROJECT

FINAL REPORT

TABLE OF CONTENTS

PAGE

ABBREVIATION

CHAPTER 1 : EXECUTIVE SUMMARY

1.1 INTRODUCTION 1-1
1.2 DETAILS OF THE PROJECT PROPONENT 1-1
1.3 DETAILS OF THE EIA CONSULTANT 1-1
1.4 DESCRIPTION OF THE PROJECT 1-2
1.4.1 The Project Location 1-2
1.4.2 Nature and Size of the Project 1-2
1.4.3 Project Status and Schedule 1-4
1.5 LEGAL REQUIREMENTS 1-4
1.6 INSTITUTIONAL ROLES AND RESPONSIBILITIES 1-4
1.7 SUMMARY OF IMPACTS 1-5
1.8 DESCRIPTION OF PROPOSED MITIGATION MEASURES AND MONITORING PROGRAMS 1-5
1.9 GOVERNING PARAMETERS 1-21
1.10 MONITORING PROGRAM 1-22
1.11 REPORTING REQUIREMENTS 1-22
1.11.1 Internal Monitoring Reports 1-22
1.11.2 Monitoring Reports for Submission to NDPCEI 1-22
1.11.3 Reporting to Local Authority 1-23
1.12 RESPONSIBILITY FOR MITIGATION AND MONITORING 1-23
1.12.1 Pre-Construction and Construction Phases 1-23
1.12.2 Operation Phase 1-23
1.12.3 Deactivation Phase 1-24
1.13 EMERGENCY RESPONSE PLAN 1-24
1.13.1 Pre-Construction and Construction Phases 1-24
1.13.2 Operation Phase 1-24
1.13.3 Deactivation Phase 1-24

PAGE

CHAPTER 1 : EXECUTIVE SUMMARY (CONT'D)

1.14 DEACTIVATION EMP 1-25
1.15 CAPACITY DEVELOPMENT AND TRAINING 1-25
1.15.1 Pre-Construction and Construction Phases 1-25
1.15.2 Operation Phase 1-26
1.15.3 Capacity Development and Training during Deactivation Phase 1-26
1.16 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE 1-26
1.16.1 Public Consultation and Information Disclosure during EIA Preparation 1-26
1.16.2 Recommendations for Future Consultations 1-28
1.17 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS 1-29
1.17.1 Pre-Construction and Construction Phases 1-29
1.17.2 Operation Phase 1-29
1.17.3 Deactivation Phase 1-29
1.18 WORK PLAN AND IMPLEMENTATION SCHEDULE 1-29
1.19 COST ESTIMATES 1-29
1.20 REVIEW OF EMP 1-33
1.20.1 Review of the Contractor CEMP 1-33
1.20.2 Review of the OEMP 1-33
1.20.3 Review of the Contractor DEMP 1-33

CHAPTER 2 : DETAILS OF THE PROJECT PROPONENT 2-1

CHAPTER 3 : DETAILS OF THE CONSULTANTS

3.1 TEAM CONSULTING ENGINEERING AND MANAGEMENT (TEAM) 3-1
3.2 ATT 3-2
3.3 THE EMP TEAM 3-2

PAGE

CHAPTER 4 : DESCRIPTION OF THE PROJECT

4.1 IDENTIFICATION OF THE PROJECT 4-1
4.2 CATEGORY OF THE PROJECT 4-1
4.3 BRIEF DESCRIPTION OF THE NATURE, SIZE AND LOCATION OF THE PROJECT 4-1
4.3.1 Project Location 4-2
4.3.2 Nature and Size of the Project 4-2
4.4 PROJECT STATUS AND SCHEDULE 4-8
4.5 JUSTIFICATION AND NEED FOR THE PROJECT 4-9
4.6 THE PROPONENT'S ENDORSEMENT OF THE EMP 4-9
4.7 THE STRUCTURE OF THE EMP 4-9

CHAPTER 5 : LEGAL REQUIREMENTS

5.1 LEGAL REQUIREMENTS RELATED TO ENVIRONMENTAL AND SOCIAL ASPECTS 5-1

CHAPTER 6 : INSTITUTIONAL ROLES AND RESPONSIBILITIES

6.1 RELEVANT INSTITUTIONS AND/OR AGENCIES 6-1
6.2 THE ROLES OF INSTITUTIONS ON THE IMPLEMENTATION OF THE EMP 6-3

CHAPTER 7 : SUMMARY OF IMPACTS

7.1 ENVIRONMENTAL IMPACTS 7-1
7.1.1 Identified Environmental Issues and Impacts 7-1
7.1.1.1 Environmental Screening Matrix 7-1
7.1.1.2 Key Environmental Issues of the Project 7-5
7.2 SOCIAL IMPACTS 7-8
7.2.1 Social Impact Issues during Pre-construction and Construction 7-8
7.2.1.1 Land Acquisition 7-8
7.2.1.2 Workers' Camp 7-9
7.2.1.3 Influx of Worker 7-9
7.2.1.4 Community Health, Safety and Security 7-9
7.2.2 Social Impact Issues during Operation 7-10
7.2.3 Social Impact Issues during Deactivation Phase 7-10
7.2.4 Conclusion of Social Impacts 7-11

PAGE

CHAPTER 8 : DESCRIPTION OF PROPOSED MITIGATION MEASURES

8.1 PROPOSED MITIGATION MEASURES FOR ENVIRONMENTAL IMPACT 8-1
8.1.1 Mitigation Measures for Pre-Construction and Construction Phases.. 8-1
8.1.2 Mitigation Measures for Operation Phase 8-12
8.1.3 Mitigation Measures for Deactivation Phase..... 8-17

CHAPTER 9 : GOVERNING PARAMETERS

9.1 PROPOSED GOVERNING PARAMETERS FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES..... 9-1
9.2 PROPOSED GOVERNING PARAMETERS FOR OPERATION PHASE 9-6
9.3 PROPOSED GOVERNING PARAMETERS FOR DEACTIVATION PHASE 9-8
9.4 ENVIRONMENTAL, HEALTH, AND SAFETY GUIDELINES 9-11

CHAPTER 10 : MONITORING PROGRAM

10.1 MONITORING PROGRAM ON ENVIRONMENTAL IMPACTS 10-1
10.1.1 Monitoring Program during Pre-Construction and Construction Phases 10-1
10.1.1.1 Scheduled Environmental Monitoring and Evaluation 10-1
10.1.1.2 Site Inspections..... 10-2
10.1.2 Monitoring Program during Operation Phase (Operation EMP)..... 10-5
10.1.2.1 Scheduled Environmental Monitoring and Evaluation 10-5
10.1.2.2 Site Inspections..... 10-6
10.1.3 Monitoring Program during Deactivation Phase (Deactivation EMP) 10-9
10.1.3.1 Scheduled Environmental Monitoring and Evaluation 10-9
10.2 MONITORING PROGRAM ON SOCIAL IMPACTS 10-11

PAGE

CHAPTER 11 : REPORTING REQUIREMENTS

11.1 REPORTING REQUIREMENTS DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES 11-1
11.1.1 Environmental Incidents 11-1
11.1.1.1 Definition of an Environmental Incident 11-1
11.1.1.2 Environmental Incident Form 11-1
11.1.1.3 Environmental Incident Register 11-2
11.1.2 Internal Monitoring Reports 11-2
11.1.2.1 Site Inspection Reports 11-2
11.1.2.2 Environmental Monitoring Reports 11-2
11.1.3 Monitoring Reports for Submission to NDPCEI 11-3
11.1.4 Reporting to Local Authority 11-3
11.1.5 Corrective Actions 11-3
11.1.5.1 Categories of Non-Compliances 11-3
11.1.5.2 Levels of Non-Compliances 11-4
11.1.5.3 Responsibilities and Process 11-5
11.1.5.4 Corrective Action Request 11-6
11.1.5.5 Non-Compliance Report 11-6
11.2 REPORTING REQUIREMENTS DURING OPERATION PHASE 11-6
11.2.1 Environmental Incidents 11-7
11.2.1.1 Definition of an Environmental Incident 11-7
11.2.1.2 Environmental Incident Form 11-7
11.2.1.3 Environmental Incident Register 11-7
11.2.2 Internal Monitoring Reports 11-8
11.2.2.1 Site Inspection Reports 11-8
11.2.2.2 Environmental Monitoring Reports 11-8
11.2.3 Monitoring Reports for Submission to NDPCEI 11-8
11.2.4 Reporting to Local Authority 11-9
11.2.5 Corrective Actions 11-9
11.2.5.1 Categories of Non-Compliances 11-10
11.2.5.2 Levels of Non-Compliances 11-10
11.2.5.3 Responsibilities and Process 11-11
11.2.5.4 Corrective Action Request 11-12
11.2.5.5 Non-Compliance Report 11-12
11.3 REPORTING REQUIREMENTS DURING DEACTIVATION PHASE . 11-12

PAGE

CHAPTER 12 : RESPONSIBILITY FOR MITIGATION AND MONITORING

12.1 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES 12-1
12.1.1 Environmental Management System (EMS) 12-1
12.1.2 Arrangements for Operating the EMS 12-2
12.1.2.1 Responsibilities 12-2
12.1.2.2 Organizational Structure 12-3
12.1.2.3 Documentation 12-7
12.1.2.4 Communication Plan 12-7
12.2 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING OPERATION PHASE 12-11
12.2.1 Environmental Management System (EMS) 12-11
12.2.2 Arrangements for Operating the EMS 12-11
12.2.2.1 Responsibilities 12-11
12.2.2.2 Organizational Structure 12-12
12.2.2.3 Documentation 12-14
12.2.2.4 Communication Plan 12-14
12.3 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING DEACTIVATION PHASE 12-17

CHAPTER 13 : EMERGENCY RESPONSE PLAN

13.1 EMERGENCY RESPONSE PLAN FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES 13-1
13.2 EMERGENCY RESPONSE PLAN FOR OPERATION PHASE 13-2
13.3 EMERGENCY RESPONSE PLAN FOR DEACTIVATION PHASE 13-2

CHAPTER 14 : DECOMMISSIONING PLAN

14.1 OBJECTIVE OF DECOMMISSIONING PLAN 14-1
14.2 DESCRIPTION OF PROPOSED MITIGATION MEASURES 14-1
14.3 ENVIRONMENTAL MANAGEMENT PROCESS 14-2
14.4 EMERGENCY RESPONSE PLAN 14-3
14.5 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS 14-3
14.6 RESPONSIBILITY FOR MITIGATION AND MONITORING 14-3
14.7 REVIEW OF THE CONTRACTOR DEMP 14-4
14.8 WORK PLAN AND IMPLEMENTATION SCHEDULE 14-4
14.9 CAPACITY DEVELOPMENT AND TRAINING 14-4

PAGE

CHAPTER 15 : CAPACITY DEVELOPMENT AND TRAINING

15.1 CAPACITY DEVELOPMENT AND TRAINING FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES 15-1
15.1.1 Training 15-1
15.1.2 Site Induction 15-2
15.2 CAPACITY DEVELOPMENT AND TRAINING FOR OPERATION PHASE 15-2
15.3 CAPACITY DEVELOPMENT AND TRAINING DURING DEACTIVATION PHASE 15-4

CHAPTER 16 : PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

16.1 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING THE PREPARATION OF THE EIS AND EMP 16-1
16.1.1 Purpose of the Consultation 16-1
16.1.2 Methodology and Approach 16-1
16.1.3 Public Participation Activities 16-2
16.1.3.1 Meeting Organization 16-2
16.1.3.2 Issues Raised by Stakeholders 16-5
16.1.4 Public Acceptance on Proposed Project 16-6
16.1.5 How These Comments Were Taken into Account 16-6
16.1.6 Recommendations for Future Consultations 16-7
16.2 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES ... 16-7
16.2.1 Organization for Public Consultation 16-7
16.2.2 Information Disclosure 16-8
16.3 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING OPERATION PHASE 16-8
16.3.1 Organization for Public Consultation 16-8
16.3.2 Information Disclosure 16-9
16.4 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING DEACTIVATION PHASE 16-9
16.4.1 Organization for Public Consultation 16-9
16.4.2 Information Disclosure 16-9

PAGE

CHAPTER 17 : COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS

17.1 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES 17-1

17.2 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS FOR OPERATION PHASE 17-1

17.3 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS FOR DEACTIVATION PHASE 17-1

CHAPTER 18 : WORK PLAN AND IMPLEMENTATION SCHEDULE

18.1 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES 18-1

18.2 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR OPERATION PHASE 18-2

18.3 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR DEACTIVATION PHASE 18-5

CHAPTER 19 : COST ESTIMATES

19.1 COST ESTIMATES FOR MITIGATION MEASURES 19-1

19.1.1 Cost Estimates for Mitigation Measures during Pre-Construction and Construction Phases 19-1

19.1.2 Cost Estimates for Mitigation Measures during Operational Phase 19-1

19.1.3 Cost Estimates for Mitigation Measures during Deactivation Phase .. 19-1

19.2 COSTS ESTIMATES FOR MONITORING 19-2

19.2.1 Cost Estimates for Monitoring during Pre-Construction and Construction Phases 19-2

19.2.2 Cost Estimates for Monitoring during Operational Phase 19-4

19.2.3 Cost Estimates for Monitoring during Deactivation Phase 19-4

CHAPTER 20 : REVIEW OF THE EMP

20.1 REVIEW OF THE CONSTRUCTION EMP 20-1

20.2 REVIEW OF THE OPERATION EMP 20-2

20.3 REVIEW OF THE DEACTIVATION EMP 20-2

PAGE

CHAPTER 21 : NON-TECHNICAL SUMMARY

21.1 INTRODUCTION 21-1
21.2 DESCRIPTION OF THE PROJECT 21-1
21.2.1 The Project Location 21-1
21.3 SUMMARY OF IMPACTS 21-2
21.4 DESCRIPTION OF PROPOSED MITIGATION MEASURES AND MONITORING PROGRAMS 21-2
21.5 MONITORING PROGRAM 21-19
21.6 REPORTING REQUIREMENTS 21-19
21.7 EMERGENCY RESPONSE PLAN 21-19
21.7.1 Pre-Construction and Construction Phases 21-19
21.7.2 Operation Phase 21-19
21.7.3 Deactivation Phase 21-19
21.8 DEACTIVATION EMP 21-20
21.9 WORK PLAN AND IMPLEMENTATION SCHEDULE 21-20

REFERENCE

LIST OF FIGURES

FIGURE **PAGE**

1.4-1 The Condensate and Products Pipeline Route Project 1-3

3.3-1 Organization Chart for the EIS for the Condensate and Products Pipeline Route Project 3-3

4.3-1 The Project Affected Area along Proposed Highway, Pipeline Alignment 4-3

4.5-1 Tentative Construction Schedule 4-8

7.1-1 Pipeline Interruption 7-4

12.1-1 Organization for Project Construction 12-4

12.2-1 Provisional Organizational Structure for Betano Pipeline System Company 12-13

17.1-1 Complaints and Grievance Redress Process during Pre-construction and Construction Phase 17-2

17.1-2 Grievance Management Process during Operation Phase 17-3

18.1-1 Tentative Construction Schedule 18-2

21.4-1 The Condensate and Products Pipeline Route Project 21-3

LIST OF TABLES

TABLE **PAGE**

1.8-1 Mitigation Measures during the Pre-Construction and Construction Phases 1-6
1.8-2 Mitigation Measures during the Operation Phase 1-16
1.8-3 Mitigation Measures during the Deactivation Phase 1-20
1.18-1 Implementation of Mitigation Measures and Monitoring Program during Pre-Construction and Construction Phases 1-30
1.18-2 Implementation Schedule of Mitigation Measures and Monitoring Program for Operation Phase 1-31
1.18-3 Implementation Schedule of Mitigation Measures and Monitoring Program for Deactivation Phases 1-32
1.19-1 Preliminary Cost Estimates of Mitigation Measures and Monitoring Programs 1-33

4.3-1 Key Design and Operation Data of the Pipelines 4-2
4.3-2 Location Roads/Trails Crossing the Pipeline Crossing the Pipeline Alignment 4-6
4.3-3 Large Rivers Crossing the Pipeline Alignment 4-6

5.1-1 Summary of Legislation, International Policies, Standards, Acts, and Guidelines 5-3

6.1-1 Institutional Roles and Responsibilities 6-1

7.1-1 Environmental Screening Matrix 7-2
7.1-2 Identified Environmental Issues 7-6
7.2-1 Positive and Negative Impacts Arisen from Social Issues 7-12

8.1-1 Mitigation Measures during the Pre-Construction and Construction Phases 8-2
8.1-2 Mitigation Measures during the Operation Phase 8-13
8.1-3 Mitigation Measures during the Deactivation Phase 8-18

TABLE **PAGE**

9.1-1 Proposed Emission Standards 9-2
9.1-2 Proposed ambient environmental Standards 9-3
9.1-3 Soil Contaminant Standards 9-5
9.2-1 Proposed Ambient Environmental Standards 9-6
9.2-2 Soil Contaminant Standards 9-7
9.3-1 Proposed Emission Standards 9-8
9.3-2 Proposed Ambient Environmental Standards 9-9
9.3-3 Soil Contaminant Standards 9-10

10.1-1 Environmental and Social Monitoring program during Pre-construction and Construction Phases 10-3
10.1-2 Outline of Site Inspection Plan for Pre-construction and Construction 10-5
10.1-3 Environmental and Social Monitoring Program during Operation Phase 10-7
10.1-4 Outline of Site Inspection Plan for Operation Phase 10-8
10.1-5 Environmental and Social Monitoring Program during Deactivation Phase 10-10

12.1-1 Information Requirements for Internal and External Communications in Environmental Management during Construction 12-10
12.2-1 Information Requirements for Internal and External Communications in Environmental Management during Operation 12-16

15.2-1 Estimates of Personnel Requirements for EMS 15-3
15.2-2 Training Requirements 15-3

16.1-1 Consultation Meeting with Stakeholders 16-2

18.1-1 Implementation of Mitigation Measures and Monitoring Program during Pre-Construction and Construction Phases 18-3
18.2-1 Implementation of Mitigation Measures and Monitoring Program during Operation Phase 18-4
18.3-1 Implementation of Mitigation Measures and Monitoring Program during Deactivation Phase 18-6

TABLE **PAGE**

19.2-1 Preliminary Cost Estimates of Environmental Monitoring for Pre-Construction and Construction Phases 19-3

19.2-2 Preliminary Cost Estimates of Environmental Monitoring for Operation Phase 19-5

21.4-1 Mitigation Measures during the Pre-Construction and Construction Phases 21-3

21.4-2 Mitigation Measures during the Operation Phase 21-14

21.4-3 Mitigation Measures during the Deactivation Phase 21-18

21.9-1 Implementation of Mitigation Measures and Monitoring Program during Pre-Construction and Construction Phases 21-21

21.9-2 Implementation Schedule of Mitigation Measures and Monitoring Program for Operation Phase 21-22

21.9-3 Implementation Schedule of Mitigation Measures and Monitoring Program for Deactivation Phases 21-23

LIST OF PHOTOS

PHOTO **PAGE**

16.1-1 Consultation Meetings with Government Officials and the Locals 16-4

CHAPTER 1

EXECUTIVE SUMMARY

CHAPTER 1

EXECUTIVE SUMMARY

1.1 INTRODUCTION

An Environmental Management Plan (EMP) for the Project is prepared as part of the EIA study process. The Decree Law No. 5/2011 on Environmental Licensing requires an EMP for a proposed development project to be presented as a stand-alone document to be used in conjunction with the EIS. The objective of the EMP is to prescribe what will need to be done to: (i) minimize environmental (and social) impacts of the Project; and (ii) ensure that the environmental performance of the Project in all phases will comply with applicable laws and regulation and conditions of the environmental licensing.

1.2 DETAILS OF THE PROJECT PROPONENT

The Project Proponent is TIMOR GAP, E.P. which was established in 2011 under Decree Law No.31/2011. Being the national oil company. TIMOR GAP, E.P. conducts, on behalf of the State, oil and gas businesses covering onshore and offshore, and national to international operations. In addition to doing businesses in oil and gas to protect the interest of the country, TIMOR GAP, E.P. is also mandated to maintain energy security of the nation. In line with this mandate, TIMOR GAP, E.P. is embarking on a major investment in the Tasi Mane Project.

TIMOR GAP, E.P. has a mission to excel in providing services for the industry with *quality, health, safety and environment.* This mission is also extended to its support activities including the development of this Project.

1.3 DETAILS OF THE EIA CONSULTANT

The Consultant is TEAM Consulting Engineering and Management (TEAM) in association with ATT Consultants (ATT). TEAM is the lead firm.

TEAM Consulting Engineering and Management (TEAM)

TEAM is one of the key subsidiaries of TEAM Group of Companies (TGC). Through its subsidiaries, TGC provides comprehensive consulting services covering a complete project cycle from project conception through project planning and feasibility study, detailed design, construction supervision, and project management.

Environmental impact assessment is one of TEAM's key businesses. TEAM's experiences in EIA cover projects in various development sectors including transport, power, water resources, mass transit, mining, ports, and industry.

ATT Consultants (ATT)

ATT is one of the affiliated companies of TGC. It was established with the primary objective of providing engineering services for oil and gas related projects, petrochemical facilities, marine facilities, electrical power system, and industrial plants for both public and private sectors. ATT provides services in technical surveys and investigations, CADD drafting, technical due diligence, project preparation and feasibility study, detailed design, and construction supervision.

1.4 DESCRIPTION OF THE PROJECT

1.4.1 The Project Location

The proposed pipeline is to be laid along the highway being constructed (***Figure 1.4-1***). The pipeline's right-of-way (ROW) is set at 40 m on the south side of the highway. Including the highway width of 30 m, the pipeline's ROW and the highway will form a 90 m land corridor stretching from Betano to Suai Supply Base. Its total length will be about 60 km passing the administrative areas of Manufahi, Ainaro and Covalima districts.

1.4.2 Nature and Size of the Project

The Project will construct the following facilities:

(1) Pipeline

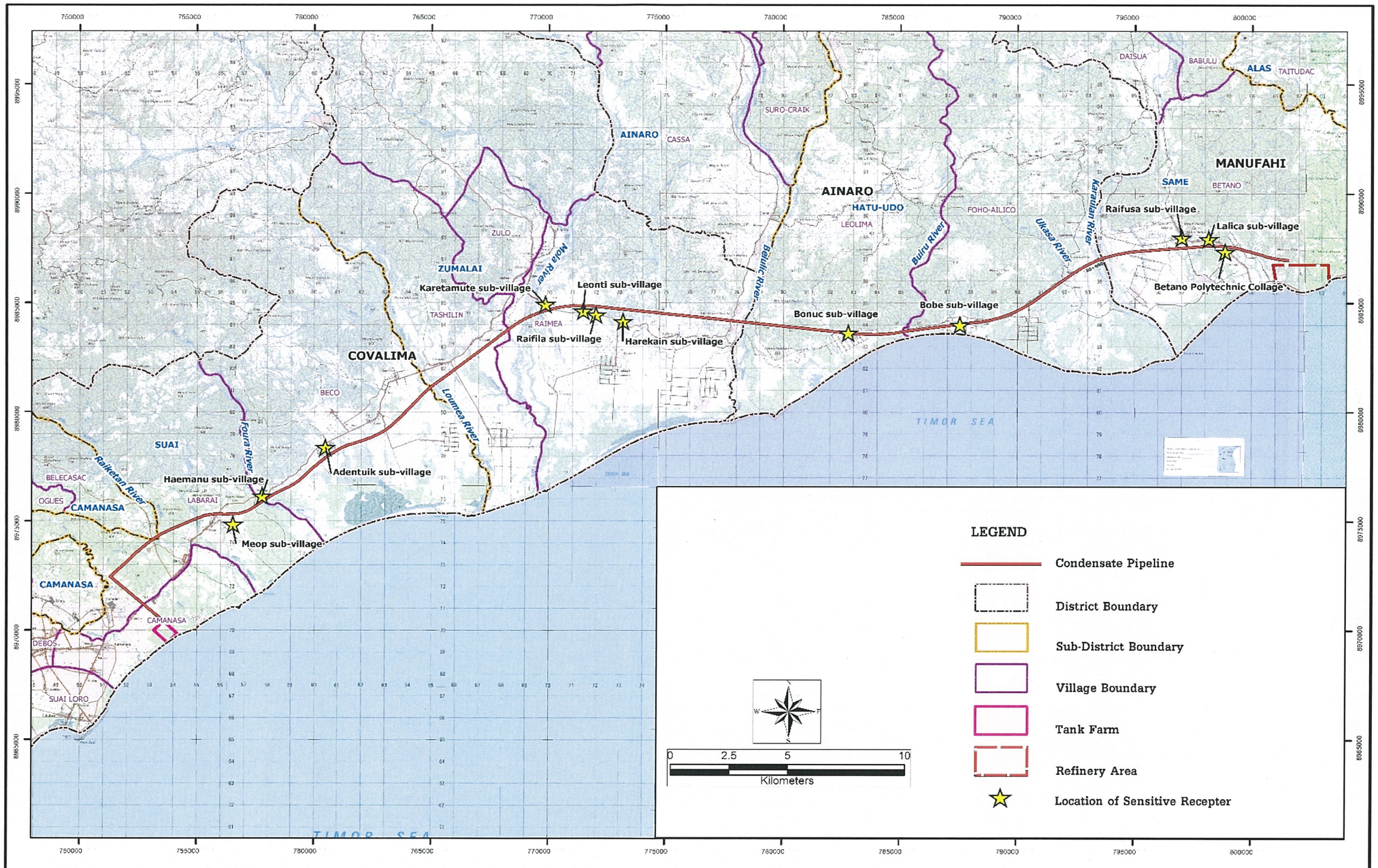
The pipeline will consist of 4 pipes (condensate, light naphtha, heavy naphtha, and diesel) designed for the refinery's future capacity of 40,000 barrels per day (BPD). The pipes will be laid at 1.0-1.5 m below ground measured from its crown to the ground surface. Pipe bridges will be used for river crossing.

(2) Instrumentation System

The pipeline will be equipped with appropriate instruments for monitoring and control of pressure, temperature and flow at both ends for the purposes of operational management and safety. The gathered information will be assessed and analyzed using a SCADA system to efficiently and effectively monitor and control the pipeline operation. In addition, the pipeline will be equipped with safety equipment as specified in the design standards.

(3) Pumping Stations

One pumping station will be constructed at Suai Supply Base for pumping the condensate. Another pumping station will be constructed at the refinery for pumping the three products.



Remark : Modified by TEAM Consulting Engineering and Management Co., Ltd., 2016.
Source : Department of Defense, Australia, 2005.

FIGURE 1.4-1 : THE CONDENSATE AND PRODUCTS PIPELINE ROUTE PROJECT

(4) Pigging Stations

Two pigging launching/receiving stations will be installed, one close to the pumping station at Suai Supply Base, and another close to the pumping station at the refinery.

(5) Control Buildings

One control building will be required at each end of the pipeline. The two buildings will be small and can be considered minor construction works.

1.4.3 Project Status and Schedule

Tentatively, TIMOR GAP, E.P. intends to commence the construction around 2017. The construction will take about 36 months to complete.

1.5 LEGAL REQUIREMENTS

Environmental management of this Project is directly governed by Environmental Licensing Law (Decree Law No.5/2011). Under the provisions of this Law, this Project is considered Category A – projects that may potentially cause significant environmental impacts. Consequently, the Project Proponent has to obtain an Environmental License for its construction and operation.

To apply for an Environmental License, the Project Proponent has to conduct an environmental impact assessment (EIA) of the Project to prepare two stand-alone documents-an environmental impact statement (EIS) and an environmental management plan (EMP). The two documents will be submitted to NDPCEI for its review and consideration according to the process prescribed in the Law. Approval of the EIS and the EMP is the condition for NDPCEI to issue an Environmental License to the Project Proponent.

1.6 INSTITUTIONAL ROLES AND RESPONSIBILITIES

The environmental processes involved in the management of two bodies: Responsible organization or implementation of the Environmental Management Plan, as well as relevant standards, laws and regulations, supervision and Environmental Management Plan in the project during the construction and operation phases.

There are 9 core institutions responsible for environmental management, namely The Ministry of Commerce, Industry and the Environment, The National Petroleum and Mineral Resources, Secretary of Statement for Employment Policy and Vocational Training, Ministry of Defence, Ministry of Agriculture and Fisheries, Ministry of Health, TIMOR GAP, E.P., and contractor and sub-contractor.

1.7 SUMMARY OF IMPACTS

Pre-construction and construction phases: the major activities during pre-construction phase will be land acquisition and the major activities during construction phase will be excavation, pipeline installation, pipeline inspection and testing, and construction of pumping station, pigging station, and control building. These two phases are considered together as one phase as they are closely connected and overlapped, the potentially affected environmental components to be considered are land acquisition, worker camp, influx of worker, conflict with the local, air quality, noise, surface water, wildlife, forest, cultural heritage, archeological site, historic site, and OHS.

Operation phase: the major activities during operation phase will be pigging for pipeline inspection, and inspection and maintenance of pipeline corridor. The impacts will be pigging waste and accident risks.

Deactivation phase: the major activities during deactivation phase will be the demolition of pipeline and associated buildings. The impacts will be similar to those occur during construction period.

Briefly information on these environmental and social impacts and their mitigation measures and monitoring programs for pre-construction, construction, operation and deactivation phases are presented in ***Table 1.8-1 to 1.8-3*** *of Section 1.8:Description of Proposed Mitigation Measures and Monitoring Programs.*

1.8 DESCRIPTION OF PROPOSED MITIGATION MEASURES AND MONITORING PROGRAMS

Mitigation measures and monitoring programs for the management of the potential project impacts both environmental and social issues during pre-construction, construction, operation and deactivation phases are presented in ***Table 1.8-1 to 1.8-3*** Each Mitigation measures and monitoring programs will be a working document and as such it will be reviewed and amended or updated as deemed necessary to reflect changes in construction schedule -and management review changes.

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES

<table>
<tr><th>Activities</th><th>Potential Impacts</th><th>Mitigation Measures</th><th>Mitigation Responsibilities</th><th>Mitigation Cost</th><th>Parameter to be Monitored</th><th>Targets and Quantitative Indicators of the Level of Mitigation</th><th>Monitoring Frequency</th></tr>
<tr>
<td><u>Land requirement</u> for establishment of base camp, office, corridor with space, pipe laydown area with materials and shed including satellite camp</td>
<td>Loss of about 255 ha of forest land and 205 ha of agricultural land in relation to land requirement.</td>
<td>• Compensation for forest and agricultural land
• Compensation and relocation for affected persons in Bobe and Bonuc sub-villages</td>
<td>• The Ministry of Public Works, Transport and Communication.
• The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.</td>
<td>Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.</td>
<td>To be managed and identified by the Ministry of Public Works, Transport and Communication.</td>
<td>Number of complaints related to land requirement for pipe laydown area and camp site.</td>
<td>To be managed by the Ministry of Public Works, Transport and Communication.</td>
</tr>
<tr>
<td><u>Fugitive dust</u> Site clearing, excavation work, move of heavy equipment and vehicles along the dirt road will generate fugitive dust</td>
<td>Fugitive dust includes:
• TSP about 411 µg/m^3 compared to standard of exceeding 230 µg/m^3.
• PM_{10} about 214 µg/m^3 compared to standard of not exceeding 150 µg/m^3</td>
<td>• Spray water at and around the construction areas and access roads during site preparation and grading.
• Limit speed for vehicles and trucks not to exceed 40 km/hr.
• Restore, resurface, and rehabilitate the disturbed areas as soon as practicable after completion of construction or disturbance.
• Prohibit the open burning of waste in the pre-construction area.
• Dust masks should be provided (where applicable) to all workers.
• For construction site including spoil placement sites:
– Use watering or other effective techniques on unsealed areas;
– Rehabilitate construction sites and spoil placement as soon as the land becomes available.
• Take measures (e.g. rumble bars and wheel wash bays) to ensure dust-creating material (earth or similar material) is not transported from the construction sites to roads or other areas in the public domain.
• Cover all trucks carrying spoil or other loose materials.
• Clear and remove all loose earth and similar material spilled or deposited within the construction sites and the transport routes from trafficked areas.
• Take measures to avoid impacts of dust on adjacent properties such as:
– Modify construction methods;
– Increase dust suppression measures; or
– Cessation of work when no other reasonable or practical measure is available.</td>
<td>• The Contractor under the supervision of the EHS Manager of the Project Proponent.</td>
<td>To be included in the total construction contract cost</td>
<td>• Total Suspended Particulate (TSP-24 hrs)
• Particulate Matter less than 10 micron (PM10-24 hrs) Nitrogen dioxide (NO_2)
• Wind speed and direction (WS/WD)</td>
<td>• Number of complaints filed through the complaint response channel.
• Number of times that the local ambient air quality is below the prescribed standards related to fugitive dust.
<table>
<tr><th>Pollutant</th><th>Not to be Exceeded</th></tr>
<tr><td>TSP 24- hour average</td><td>230 µg/m^3 [a/]</td></tr>
<tr><td>PM_{10}, 24-hour average</td><td>150 µg/m^3 (Interim target-1)[b/]</td></tr>
</table>
Remark:
[a/] WHO Pollution Prevention and Abatement Handbook , WHO, 1988
[b/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005</td>
<td>• Regular inspection (weekly minimum) by in-house staff.
• Twice a year monitoring over the construction period, by the third party.
• Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.</td>
</tr>
</table>

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Gaseous emissions Operations of diesel-powered heavy construction equipment, vehicles and generator sets will generate gaseous emissions during the construction.	• Gaseous emission will be mostly generated by typical pollutants such as NO_x, SO_x, CO, and particulate in the exhaust gases discharged from the engines. • Its effect would be on health of construction workers.	• Manage the movement of construction vehicles entering and leaving the construction sites to avoid the potential for vehicle emissions impacting on adjacent properties such as avoiding or minimizing queuing on streets approaching the worksites or adjacent to other sensitive activities; • Adopt procedures to avoid construction vehicles idling for excessive periods (e.g. more than 5 minutes) if required to queue to enter the construction sites; • For stationary plant and equipment powered by diesel motors, take measures to avoid or mitigate and manage the potential impacts of exhaust emissions on adjacent residential or other sensitive activities such as all equipment powered by diesel motors are fitted with emission control measures, and are regularly maintained to manufacturers' specifications. • Maintain all construction equipment in proper working conditions according to the manufacturer's specifications. • Provide adequate training to the equipment operators in the proper use of equipment. • Use the proper size of equipment for the job. • Use the equipment fitted engines with latest low emission technologies. • Perform on-site material hauling with trucks equipped with on-road engines • Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Nitrogen dioxide (NO_2) • Sulfur oxides (SOx) • Vehicle motors idling for periods exceeding 5 minutes while in queues to access construction sites (on-going). • Inspect the position of stationary plant and equipment powered by diesel engines to ensure exhaust emissions are directed away from sensitive activities and neighboring properties (initially on establishment).	• Number of complaints filed through the complaint response channel. • Number of times that the local ambient air quality is below the prescribed standards related to exhaust emission. **Pollutant** / **Not to be Exceeded** NO_2, 24-hour average: 200 µg/m³ (Interim target-1)[a/] SO_2, 24-hour average: 125 µg/m³ (Interim target-1)[a/] **Remark:** [a/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.
Noise level Operations of heavy construction equipment during land clearing, pipeline lowering, and backfilling, etc. would generate noise.	• Loud noise will disturb and cause annoyance to hearing capacity of the people in surrounding area. • Loud noise over long period will cause hearing impairment.	**Design** • Design to use construction equipment that generate low levels of noise with adoption of best available technologies to minimize noise. • Conduct a noise survey covering the identified sensitive receptors to update the existing baseline data in the Final EIA Report. • Demonstrate through predictive modeling of the proposed construction techniques and monitoring ambient noise readings prior to construction to establish pre-disturbance levels, the likely levels of noise due to construction works throughout the construction period.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Leq 1 hr • Leq 24 hrs • Lmax	• The incremental increases in noise level during the construction works compared to the targets. • Net ambient noise level compared to the applicable ambient noise standard. **Area** / **Not to be Exceeded** Industrial and Commercial area: Leq (24 hrs) - 70 dB(A)[1/,2/] - 70 dB(A)daytime [3/] - 70 dB(A) nighttime [3/] Residential areas: Leq (1 hr) - 55 dB(A)daytime [3/] - 45 dB(A) nighttime [3/] Lmax - 110 dB(A) [2/]	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 1.8-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Noise level Operations of heavy construction equipment during land clearing, pipeline lowering, and backfilling, etc. would generate noise. (cont'd)		**Pre-Construction and Construction Noise** • Construction works which generate excessive levels of noise must be carried out, only during the period between 6.30 am to 6.30 pm Mondays to Saturdays. Such construction works on Sundays or public holidays will need approval from the resident engineer of the Project Proponent. • Protect the affected sensitive receptors beyond standard construction hours such as installation of acoustic walls or noise barriers. • The noise reduction at the perimeter could be achieved using an acoustic wall or a sound barrier (Steel 18 ga with 1.27 mm. thickness which transmission loss of 25 dB(A) or equivalent) at least 3 m high with adequate length to block the noise emanating to the receptor. • Provide ear plugs or ear muffs to workers operating in the excessive noise areas. • Limit speeds of vehicles in the construction site, not exceed 40 km/hr. • Include measures to achieve the construction noise targets such as: – Commence advanced notification of works and undertake on-going consultation with potentially affected property owners and occupants. – Establishing temporary noise barriers between construction worksites and sensitive receptors. – Fitting noise-reduction measures to all equipment engaged in the construction works; • Designing worksites to minimize potential noise impacts on nearby sensitive places.				**Remark:** [1/] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974 [2/] Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 [3/] Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007	
Wastewater Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater.	Wastewater volume will be from: • about 15.3 m^3/day from base camp • about 1.9 m^3/day from each satellite camp.	**Design Concept** The Contractor will prepare detailed design of a wastewater management system for the worker camp, consisting of a collection system and a simple treatment system. Its proposed design concepts are: **For Domestic Wastewater** • Toilet wastes will be separated from grey water or sullage.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Total Nitrogen • Temperature • Total Suspended Solid • Oil and Grease • BOD_5 • COD • Total Phosphorus	• Qualities of the treated effluent compared with the applicable effluent quality standards. • The final effluents are expected to meet the following quality standard: - pH 6-9 - Total Nitrogen <10 mg/l [a] - Temperature increase ≤3 °C [b] - TSS <30 mg/l	Twice a year during construction

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Wastewater Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater. (Cont'd)		• Toilet wastes will be discharged into a septic tank(s) with a hydraulic retention time of about 5 days. The volume of toilet wastes is estimated at about 20% of the total volume of domestic wastewater. The septic tank effluent (septage) will be discharged into the retention pond. Alternatively, toilet wastes will be treated in a package treatment plant using an aerobic process. • The temporary retention pond within worker camp site areas will be designed as an oxidation pond. **During Construction** • Water in the retention pond will be used for dust suppression on unpaved areas in the construction site, and also for watering of the green area. • The remaining volume will be discharged into the water sources.			• Sulfides	- Oil and grease < 10 mg/l - BOD_5 < 30 mg/l - COD < 150 mg/l - Total Phosphorus <2 mg/l - Sulfides <1 mg/l **Remark:** [a] The effluent concentration of nitrogen (total) may be up to 40 mg/l in processes that include hydrogenation [b] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items.	An amount of waste is equivalent to: • About 237 tons of *construction waste* over the 60 km length of pipeline corridor, or about 0.2 tons/day over the period of 36 months. • About 0.8 m^3 / day of *waste from workers.* • About 0.25 tons/month of *hazardous waste*.	**Design and Planning before Commencing the Construction** • Design own disposal facility, preferably within the construction site. • Design the construction methods to generate the least amount of wastes. • Design methods of waste transport and disposal. • Prepare an action plan for waste management to reflect cumulative results of the previous quarters. • Consider using materials and products that have a recycled content. • Arrangements with suppliers to return any unused construction materials; • Where possible, goods to be ordered in bulk to minimize packaging waste and packaging material returned to the supplier wherever practicable; and **During Construction** **Waste Segregation** • Design and implement a waste segregation system. • Provide an appropriate number of containers with adequate volume and appropriate materials at strategic locations to support the segregation in terms of recycling, reuse and disposal sub-categories.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in total solid waste management cost of 25,820 USD.	• Efficiency of the collection, • Storage, and disposal volume, and • Record keeping	Number of complaints related to waste disposal.	• Daily site inspections, and • Detailed weekly site inspections.

TABLE 1.8-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items. (Cont'd)		**Waste Collection and Storage** • Collection and transport each sub-category of segregated wastes on daily basis. • Provide a roofed storage area with adequate space for storing the segregated wastes waiting for the on-site or off-site reuse or recycling. • Special design the storage area for hazardous waste to prevent spills or leaks onto the soil. **Waste Reuse and Recycling** • Chipping and mulching of vegetation and reuse for landscaping purposes; • Reuse of excavated material as fill at approved fill sites; • Topsoil free of weeds to be stockpiled and stored for re-use, if possible; • Collection and return of packaging materials (e.g. pallets) to suppliers wherever practicable; • Remove any contamination inadvertently deposited in recyclable waste material containers. Provide cleanup of excessive contamination at recycling vendor locations when such contamination is not controlled at the project site. • Collection and recycling of used oils by a licensed contractor; • Collection by a licensed contractor of empty oil and fuel drums and other containers for return to recycling facilities; **Waste Disposal** • Disposal of the remaining wastes that are unable to be reused or recycled in the approved landfill site. • Prohibit haphazard disposal of construction waste in or off the construction site. • Inert wastes such as broken tiles, bricks, plastics should be used for filling the site in areas planned to be vacant space. • No burning of wastes. • Decomposable wastes such as food wastes and vegetation may be disposed of by composting. • Hazardous wastes will be handled by a licensed hazardous waste contractor, otherwise finding for appropriate arrangements for incineration, safe permanent storage, or other appropriate methods of disposal.					

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		On-site Record Keeping Design and maintain record keeping procedures with provisions for: • Tracking collections of waste materials at the sites and deliveries to recycling, reuse, salvage, and landfill facilities. • Maintaining on-site logs that include for each load of materials removed from the site: type of material, load weight, recycling/hauling service, and date accepted by recycling service or landfill.					
Hydrostatic Test Water Hydrostatic test of all four installed pipes generate tested water.	Discharge of 9,900 m^3 tested water to natural receiving water.	• Formulate and submit a hydrostatic test plan for approval. The hydrostatic test plan will provide the following information: – Sections to be tested and testing schedule – Water volume required for the test – Sources and expected characteristics of the test water before discharge – Chemical to be used in the test, if there is any – Existing conditions-For each river, present information on existing water quality, physical conditions at the proposed section where the hydrostatic test water will be discharged, downstream water use, flow conditions. In addition to narrative information, photographs and drawings should also be included to support the information. – Expected rate and duration of the discharge of hydrostatic test water at each selected river. – Design of structure or facilities to be constructed at each discharge point to prevent damage to the embankment or bed of the river. – Water quality sampling plan before, during and after the discharge of hydrostatic test water to evaluate impacts on river water quality. • Conduct the hydrostatic test with specific practices as following practices: – Restrict water withdrawal for hydrostatic testing not to exceed 10% of the stream flow of the watercourse at the time of withdrawal or as	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Temperature • Suspended Solids	• Qualities of the treated test water compared with the applicable effluent quality standards. • The hydrostatic test water are expected to meet the following effluent quality standard: - pH 6-9 - Temperature increase ≤3 °C [a] - TSS <30 mg/l **Remark:** [a] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	Once after construction

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		required by permit / approval conditions. – Ensure that sufficient workers and equipment are available onsite to repair any rupture, leak or erosion problem that may arise during testing. – No chemicals, biocides or conditioners will be added to the pipeline test water unless otherwise approved by the Project Manager. – Use a diffuser to dissipate and reduce the rate of water as it is released and monitor dewater points for potential erosion problems. Use riprap, sheeting, tarpaulins or other comparable measures to protect the ground and vegetation from erosion at the discharge sites. – Monitor discharge locations to ensure that no erosion, flooding or detrimental ice build-up occurs. – Collect samples of source water and hydrostatic test water and analyze to demonstrate regulatory compliance. For this purpose, samples will be collected of hydrostatic test water at the beginning, middle and end of the release for testing for the project record. – In case of complaints about discharging of the test water from hydrostatic test, quick action of problem solving has to be conducted					
Water Turbidity In-river construction of pipe support columns will cause water turbidity.	A small turbidity plume would be observed in the river around the site, over a short distance before the turbidity returns to its normal level.	**Design and Planning** • Ensure the design of pipeline bridge for each river and the method of its construction will give due consideration on impacts on water quality, particularly turbidity or suspended solids. • For each river, the Contactor will: – Conduct a survey of downstream water user, river bed and embankment conditions at the proposed construction section. – Estimate the duration and magnitude of likely impacts of the in-river construction activities on river water quality. – Submit an action plan containing results of the surveys and impact assessment, and proposed methods of	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • DO • Suspended Solids • Turbidity	• Increase in river water turbidity before and during the construction. • The river water quality is expected to meet the following freshwater quality standard: - pH 6.5-9 [a] - Dissolved oxygen $\geq 3.5^{/}$ mg/l [a] - Turbidity crease ≤ 25 (Upstream) [b] ≤ 390 (Downstream) [b] - Suspended solids 80 mg/l [b] **Remark:** [a] National Recommended Water Quality Criteria, United States	2 times; before and during construction.

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		construction and mitigation measures to be implemented in each river. **Construction** • Undertaken in the low flow conditions, and should be completed with all temporary facilities in the river completely removed before the high flow season. • Minimize the areas that will be disturbed, including the river bed, bank, access to the construction site, and laydown area. • The on-land construction area near the river bank will have appropriate measures to minimize soil erosion during rainfalls. • The on-land construction area will be rehabilitated to its previous conditions as soon as the construction is completed.				Environmental Protection Agency (EPA), 2009 [b] Quality Criteria for Water, 1986	
Chance Finds for Archeological, Historic and Sacred Sites During site clearing and excavation of pipe trench, the Contractor may discover artifacts which potentially could have archeological, historic, religious, or cultural value.	Operational activities may possibly destroy some artifacts presented under the pipeline corridor.	• Site supervisor/foreman shall order construction workers to stop immediately the construction activities in the area of the chance find. • Inform concerned authority, including local leaders, for proper management if historic is found. • Delineate and mark clearly the discovered site or area and prohibit physical activities in the area without prior approval of the concerned authority. • Install temporary site protection measures (warning tape and stakes, avoiding signs). • Strictly enforce any no-go area needed to protect the site. • Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the responsible Ministry takes over. • If it is necessary to relocate a cemetery and grave yard, cultural ceremony should be arranged prior to the relocation.	• The contractor to inform the Project Proponent. • The Project Proponent to inform concerned authorities in case of chance finds archeological, historic, religious, or cultural value.	To be included in the total construction contract cost	Site inspection	Number of complaints filed through the complaint response channel.	During land clearance and site preparation
OSH of construction workers Activities related to pre-construction and construction may harm health of construction workers	There is a possibility that the workers/employees might be injured during working. Pre-construction.	Mitigation measures are identified in the worker camp management. (Under social issue)	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Accident • Record keeping	Number of accidents and injuries in the worker camps.	Daily and weekly inspection

TABLE 1.8-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Land acquisition Site preparation for establishment of base camp, office, corridor with space, pipe laydown etc will occupy some forest and agricultural areas.	Reduce of forest and agricultural areas which are economic resources of villagers who collect forest products and cultivate on these areas.	Compensation and relocation for affected persons in Bobe and Bonuc sub-villages	• The Ministry of Public Works, Transport and Communication. • The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.	Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.	To be identified and managed by the Ministry of Public Works, Transport and Communication.	Number of complaints related to land acquisition.	To be managed by the Ministry of Public Works, Transport and Communication.
Worker Camps Mismanagement of worker camps may harm workers' health and pollute surrounding environment.	• Unhygienic living conditions will affect health of workers; • Pollution of the natural environment outside the worker camp, such as fly infestation, water pollution, and odor; • Exposure of workers on accidental risks or worker safety.	Ensure the design, operation, and management of the worker camp are within specific requirements as follows: • The worker camps should be made of decent materials that could withstand heavy rains and storms, with adequately ventilated and lighted. • Provide a sleeping space of at least 4 m^2 per worker, with separate rooms for professional staff. • Number of toilets and baths should be 1 unit for 20 workers. • Plan for common canteen which can accommodate at least 150 persons. • Provide common areas for cloth washing and drying with adequate water supply and drainage. • Provide recreational facilities with sufficient accessories. • Set up one shop to sell sundry goods to the workers. • Strictly control fly, insect and rodent. • Provide medical services at a small clinic served by a doctor. • Prepare fire and safety plan for the camps. • Basic camp infrastructure with facilities of power supply, telecommunication, water supply, drinking water, drainage, sanitation and solid wastes management. • Establish and enforce codes of conduct within and outside the worker camps covering camp security, fire safety, drug using, drinking, smoking, and visiting guests. • Provide security guards to be in charge of the security of camp. • Provided transport services from the project site to nearby communities. • Environmental management of the demolition and dismantling of the worker camp and associated facilities after the construction is completed.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	• Worker Camp • Worker health and safety	• Number of complaints related to worker camps • Number of accidents and injuries in the worker camps.	Daily and weekly inspection.

TABLE 1.8-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Influx of Worker Employment of a large number of construction workers will create both of positive and negative impacts	*Positive impact* • Creation of demand for local goods and services; *Negative impact* • Competing use of local resources; • Health risks to the communities such as communicable diseases; • Conflicts with the locals due to differences in culture, value and ways of life.	• Ensure that local provision of goods and services to the workers will be orderly and clean, and will not create unsanitary conditions near the worker camp. • Avoid using local resources as much as possible, and should provide a medical clinic within the worker camp. • Provide communicable diseases control program related to the sanitation and hygiene program for the worker camp. • Provide brief information to non-local workers, to make them aware of cultural sensitivity of the locals.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	Feedback and complaints from affected households.	Number of complaints related to influx of worker	Daily and weekly inspection
Community health and safety Mismanagement or improper control of pre-construction and construction works may affect health and safety including security of the communities resided the pipeline corridor.	The locals and passers-by along the pipeline route might be injured or being insecure.	• Undertake a program of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto the construction corridor where the construction is ongoing. • Ensure that signs are put up around work fronts and construction sites advising people of the risks associated with trespass. • Ensure that there is adequate fencing around pipe lay down yards and other similar facilities to minimize the risk of trespass. • When work fronts are within 100 m of an inhabited building, all equipment will be parked overnight in a demarcated area • Select security personnel based on a careful background screening of the applicants and provide their training. • At the intersection of the construction corridor and local roads or trails, a diversion route must be provided during construction with warning signs to vehicles and pedestrians. • Truck drivers and operators of heavy construction equipment must receive training in public safety in their works.	• The Contractor under the supervision of the EHS Manager of the Project Proponent. • The EHS Manager to involve in CSR program.	To be included in the total construction contract cost	CSR program and its implementation	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Daily and weekly inspection

TABLE 1.8-2
MITIGATION MEASURES DURING THE OPERATION PHASE

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Environmental Issues							
Waste Cleaning of using pigs along the pipeline will generate waste.	Waste from pigging	**Pigging Waste Collection and Transportation** • The pigging wastes will be collected and transported to the waste oil treatment unit of the Betano Refinery's wastewater treatment plant. • The Operational Manager will supervise the collection, storage, and transport of the pigging wastes to the refinery's wastewater treatment plant. **On-site Record Keeping** • The ESH manager will design and maintain procedures for recording the volume of pigging wastes collected and sent for treatment at the refinery.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC.	Including in the operational cost of Betano Pipeline System Company	• Quality of oily sludge before and after the pigging waste is treated. • Volume and characteristics of pigging wastes	Number of complaints related to pigging waste disposal	Every time the pigging waste is sent to the refinery for treatment, about 2 times per month.
Operational risk Defective design, installation, and operation and management of operational work may cause accidental fires and explosions of pipelines	Damage of the pipeline due to risk of oil leak and explosion	Risk Management Program must be in place as a means to guarantee the safe start-up of the commercial operations with all risks fully under control as following : **1. Third Party Damage** **1.1 Excavation** (Ease to access by third party, No pipeline signal or marker) • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. • The minimum cover of buried pipeline shall be accordance with ASME/ANSI B31.4 standards. **1.2 Traffic Accident** (No pipeline signal or marker) • The pipeline signal or marker will be installed along the pipeline route. • The traffic signal shall be installed while pipeline laid above ground.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Monitoring emergency incidents situations such as accident, fire, oil spill, etc. including restrain and recovery the situations	• The likely of incident for each pipeline in case of pipe rapture is 3.94 times in 1,000 years (worst case scenario). • The operating procedure according to the standard of international standards of the American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI); ASME/ANSI B31.1, B31.4.	Daily and weekly site inspections

TABLE 1.8-2

MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		1.3 Vandalism • The project shall be educated the people who living in the vicinity area, in order to make the community understand and participate in the process of project development. • The project shall be built-up the relationship with the local communities. **1.4 Other damage, i.e., Fire/Explosion, arcing of Electronic from the other etc.** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. **2. Incorrect Operation** **2.1 Mechanical/Equipment Failure** • The pipeline operation shall be done in accordance with the international standards (ASME/ANSI B31.4, ASME/ANSI B31.1, etc.) • Regular maintenance and inspection the equipment, machines to be in good conditions. **2.2 Incorrect Installation** • Installation of machinery and equipment shall be in accordance with codes applicable to the specific type and their installation manual or guidelines. • After installation, machinery or equipment shall be tested under conditions approximating actual operations to assure their proper functioning.					

TABLE 1.8-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		2.3 Human Errors (No operation skill , Staff is not physically or mentally fit for duty, Negligence or inadequate attention to details of staff) • Staff training to be provided on a regular and continuing basis. • Physical check up programs for staff relevant to their tasks as required by regulations or safety standards • Random checks of drug use. • Instilling work safety discipline into staff **3. Natural Forced** **3.1 Earthquake** The pipeline is designed in accordance with the following criteria: • Design Code ASCE: 7-10 • Load Combination shall be as per ASCE 7-10 • Site Class: B • Risk Category: IV • Seismic Design Category: D • Design return period: 475-year **3.2 Storm** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way **3.3 Hit of Lightning** The pipeline shall be provided the lightning or fault currents prevention systems in accordance with NACE RP-O1-77 Guidelines. **3.4 Flood/Heavy Rain** The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route.					

TABLE 1.8-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		3.5 Volcano Eruption According to TIMOR LESTE: Natural Hazard Risks map provided by United Nation Office for the Coordination of Humanitarian Affairs (OCHA), there are no actives volcano within the project area and vicinity. **4. Corrosion** • The pipeline shall be used 3LPE for External Coating, that consist of a three layers coating system comprising: - First layer (inner): Fusion Bonded Epoxy (FBE). - Second layer (intermediate): Chemically Modified Polyethylene Copolymer - Third layer (outer): High-density high molecular weight UV stabilized Polyethylene (HDPE) • Three layers shall be used for Painting (External Coating for A/G) • The Cathodic Protection (CP) shall be provide to prevention the corrosion. • Pre-cast concrete sleeper shall be used for above-ground pipeline instead of steel structure in order to avoid corrosion problem.					
Social Issues							
Community Health and Safety Mismanagement or improper control of operational work may affect health and safety including security of the adjacent communities	• Risk of explosions; and • Pipeline ruptures and oil leaks	• Undertake stakeholder engagement regarding the pipeline operations to present and discuss safety features of the pipeline system. • Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns; and • Undertake a community education program on pipeline safety to alleviate concerns.	The General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Feedback and complaints from affected households.	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Throughout the entire operation period

TABLE 1.8-3
MITIGATION MEASURES DURING THE DEACTIVATION PHASE

Activities/Issues	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Demolition of structures and operation of heavy equipment and vehicles along the dirt road will generate: - *Fugitive dust* - *Loud noise* - *Solid waste* - *Hazardous wastes and oil products* from the storage tanks and pipelines - *Wastewater* from cleaning of storage tanks and pipeline	Fugitive dust will be generated and disturb health of workers and the locals adjacent to the demolition site.	• During the deactivation phase, the Project Proponent prepared at the EIA stage will not be applicable and will replaced by the new deactivation environmental management plan based on the new EIA. • The environmental issues, major sources, magnitude, receptor, predicted impact and mitigation measures in this phase will be similar to those occur during the construction phase. • However, activities of this phase will be demolition only then impacts from demolition activities will be controlled by the demolition contractor. • The contractor will be required to adopt the best practice to minimize impacts from : - Dust - Gas emission - Noise from heavy machinery and from demolition activities - Hazardous wastes and oil products - Wastewater and wastes	The demolition contractor and to be controlled by the project proponent.	• To be included in the demolition contract • To be included in the total solid waste management cost of 13,000 USD	*Fugitive dust* • Quantity of dust • Wind speed and direction • Complaints from the nearest communities *Noise level* • Complaints from the nearest communities *Solid waste* • Quantity • Its disposal *Hazardous wastes and oil products* • Quantity • Disposal management *Wastewater* • Volume and • Its discharge	• Number of complaints from affected local people along the pipeline route. • Number of complaints related to waste disposal and waste water discharging.	Regular site inspection (weekly minimum) by in-house staff.
Community Health and Safety Mismanagement or improper control of demolition work may affect health and safety including security of the workers adjacent communities	Demolition workers, the locals and passers-by along the pipeline route might be injured or being insecure.	Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns.	The Project proponent	To be included in the annual budget of the Project proponent	Complaints from local communities	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route	Regular inspection (weekly minimum) by in-house staff.

1.9 GOVERNING PARAMETERS

TIMOR GAP, E.P. has a mission to excel in providing services for the industry with quality, health, safety and environment. The concerned standards, guidelines and requirement will be prescribed in the contract for contractor to comply with and the Project Proponent will implement parts of the EMP for the operational and deactivation phases. As the national environmental standards are still incomplete, most governing parameters for environmental management of this Project are taken from generally accepted international standards. The governing parameters for environmental management are; proposed emission standards, proposed ambient environmental standards, and soil Contaminant standards as the following;

- Pollution Prevention and Abatement Handbook, WHO, 1998
- WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005
- Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974
- Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999
- Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: Environmental Noise Management of International Finance Corporation, 2007
- National Recommended Water Quality Criteria, United States Environmental Protection Agency (US EPA), 2009
- Quality Criteria for Water, 1986
- WHO's Guidelines for Drinking Water Quality, 2011
- National Recommended Water Quality Criteria, United States Environmental Protection Agency (US EPA), 2009
- Environmental Land Use Planning and Management, 2004
- International Association for Impact Assessment (IAIA) NOAA Screen Quick Reference Table, 2004

Moreover, the essential requirement in the Occupational Health and Safety Standards pertaining to this Project are;

- Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: Environmental Noise Management of International Finance Corporation, 2007
- Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007

1.10 MONITORING PROGRAM

Monitoring Program during pre-construction, construction, operation and deactivation phases are presented in ***Table 1.8-1 to 1.8-3***.

1.11 REPORTING REQUIREMENTS

Two types of monitoring reports will be generated in the environmental monitoring and site inspections. The first type is reports generated for internal use to provide feedback to the EMS. The second type is reports generated for submission to NDPCEI.

1.11.1 Internal Monitoring Reports

- **Site Inspection Reports**

The report will record results of the daily inspections in daily site inspection notes. This report will be reviewed on a weekly basis to confirm that the checks and subsequent required works are being carried out, and additional inspections are included.

For weekly inspections, the results of the inspections in weekly site inspection reports will present for discussion in the weekly project review meetings. Both the daily inspection notes and weekly inspection reports will highlight factors or events that could lead to non-compliance. Monthly site inspection reports are parts of the monthly environmental monitoring reports.

- **Environmental Monitoring Reports**

This report will prepare as monthly basis for submission to the Owner's Project Manager. The monthly environmental monitoring report will concisely present: (i) results of scheduled environmental monitoring and site inspections carried out during the month; (ii) identified non-compliance, if any, and causes of the non-compliance; (iii) complaints received; (iv) environmental incidents; (v) associated investigations and corrective actions taken; (vi) proposed changes to the monitoring plan, if any; and (vii) work program for the following month.

The monthly environmental performance reports will be discussed in the monthly project status review meetings or in separate monthly environmental performance meetings as appropriate.

1.11.2 Monitoring Reports for Submission to NDPCEI

Based on the monthly internal monitoring reports and results of the monthly review meetings, the project environmental monitoring report of the EMP implementation will prepare every six months for submission to NDPCEI as required by the Environmental Licensing Law and ANPM based on their relevant regulations throughout the pre-construction and construction, operation, and deactivation phases

1.11.3 Reporting to Local Authority

In case of environmental accidents occurrence, the Project will inform to the concerned local authorities (District Administrator (DA), Sub-District Administrator (SDA), and the Suco Chief and village leaders) and coordinate with related agencies and parties to take the proper action during the events, to ensure the presence of proper and adequate onsite emergency equipment and preparation of post-accident record and action.

1.12 RESPONSIBILITY FOR MITIGATION AND MONITORING

1.12.1 Pre-Construction and Construction Phases

The Project Proponent and the Contractor will have to establish and operate their own environmental management systems (EMS) for the Project construction. The Project Proponent's EMS will be focused on monitoring and reviewing environmental compliance at the Project level as part of the Project management. The Contractor's EMS will be focused on environmental management at the task level as part of the construction management. The two EMSs will therefore be complementary and will enable the Contractor and the Project Proponent to complete the Project construction with no significant environmental impacts.

There are three key groups with responsibility for environmental management of the Project:

(i) Project Proponent: Project proponent or project owner is legally responsible to NDPCEI and other line organizations responsible for specific environmental issues for environmental performance of the Project as prescribed as conditions in the Environmental License and other permits.

(ii) The Contractor: The Contractor, including its approved sub-contractors, is contractually responsible to the Project Proponent for environmental performance of the construction as prescribed in the construction contract.

(iii) NDPCEI: NDPCEI is the key agency to monitor and evaluate environmental performance of the Project construction and operation. Other agencies concerned will support NDPCEI in the monitoring and evaluation of environmental performance of the Project construction.

1.12.2 Operation Phase

Similarly to previous phase, responsibility for mitigation and monitoring would be planned within the context of EMS. At this phase, the pipeline EMP will be the core document of the EMS. Environmental management will be part of the pipeline management. The measures will be implemented by the pipeline O&M team.

1.15.2 Operation Phase

Assuming that all personnel to be recruited have no experience in environmental management of pipeline operations, they will need to undergo the training. The training will include theories and principles of each subject followed by on-the-job training in the selected pipeline company. The training period would be about 3 months.

1.15.3 Capacity Development and Training during Deactivation Phase

The Contractor will be required to conduct training of its key staff from the foreman level up to the General Manager, including key staff of the BPSC's Demolition Project Management Office. The objective of the training is to ensure that all concerned in the demolition works can efficiently and effectively perform their responsible tasks in environmental management.

1.16 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

1.16.1 Public Consultation and Information Disclosure during EIA preparation

Public Consultation was conducted during the period from 31 March to 8 April, 2016. The Project's stakeholders were classified into three categories of government authorities relevant to EIA considerations, NGO and local communities in eight villages along the 60 km of condensate pipeline alignment. They are Betano, Foho-Ailico, Leolima, Raimea, Tashilin, Zulo, Beco and Labarai Villages, located in four sub-districts of Same, Hatu-Udo, Zumalai and Suai, and three districts of Manufahi, Ainaro and Covalima.

The main method used in consultation was public meetings, complemented by disclosure of project information through presentation in the meetings and the interviews with key informants in the communities in order to collect socio-economic information of communities in the study area.

Concerns and comments from the nine government organizations were on several issues, including impacts from noise, environmental risk from oil transportation, alignment of pipeline route, and land release for pipeline alignment, integration of highway and pipeline project. Suggestions were on preservation of artifacts, sacred and cemeteries found.

Major concerns and comments from Lao Hamutuk NGO during public consultation meeting were on noise impact, realignment of highway and pipeline, EIA study, construction of pipeline and highway, impacts on groundwater, products transported by pipeline, risk of pipeline explosion and poor record of PTT.

The Lao Hamutuk NGO also provided their comments via open letter. Concerns were on:

1.14 DEACTIVATION EMP

Environmental management in the deactivation phase will be carried out by the BPSC. The objective is to ensure that the demolition works will not create significant impacts and will meet all applicable standards and guidelines and requirements at the time of demolition.

As the deactivation is the event in distant future, it would be adequate for the DEMP to provide only the conceptual framework. The demolition EIA would need to considerably update this DEMP to prepare a new DEMP. The new DEMP will reflect conditions related to technologies, laws and regulations, and land use along the pipeline corridor which would be much different from the present conditions.

The major activity during deactivation phase will be demolition, which will generate environmental problems similar to those of the construction phase but will be different in nature, scope and magnitude. The major environmental issues would be: (i) fugitive dust and noise; (ii) hazardous wastes and oil products from the storage tanks and pipeline; (iii) wastewater from cleaning of storage tanks and pipeline; and (iv) demolition wastes. Mitigation measures for these environmental problems will be similar to those normally used during the construction. The details of mitigation measures and monitoring program are summarized in ***Table 1.8-3***.

1.15 CAPACITY DEVELOPMENT AND TRAINING

1.15.1 Pre-Construction and Construction Phases

(1) Training

The Contractor is required to conduct training of its key staff from the foreman level up to the Project Manager, including key staff of the Owner's Project Management Office to ensure that all concerned in the Project construction can efficiently and effectively perform their responsible tasks in environmental management. The training scope should cover (i) environmental management of the project construction, (ii) construction environmental management plan, and (iii) specific training.

(2) Site Induction

The Contractor will ensure that all personnel working onsite have received an initial site induction. Under no circumstances can anyone enter or work onsite without having first attendance on a formal induction session. Induction will be provided by the Contractor to the Owners Project Management Team prior to each employee commencing work onsite.

Visitors must undergo a short induction which includes basic environmental, health and safety considerations/procedures. Visitors must be accompanied by a fully inducted employee or contractor at all times.

1.12.3 Deactivation Phase

The Demolition Contractor will be responsible for implementing the prescribed mitigation measures and undertaking monitoring under the supervision of the Owner EHS Manager and the Demolition Project Manager.

The BPSC will establish a Demolition Project Management Office. The Demolition Project Manager and the Demolition EHS Manager will be responsible for environmental management of the demolition works.

1.13 EMERGENCY RESPONSE PLAN

1.13.1 Pre-Construction and Construction Phases

The Contractor will be contractually binding to prepare and implement an emergency response plan to efficiently and effectively cope with accidents and emergencies which may occur during the pre-construction and construction periods. The emergency response plan would deal with work accidents, accidental fires, and oil spills. Natural emergency events such as earthquakes, land slide, and floods would be very unlikely. Consequently, the emergency response plan during the pre-construction and construction would focus on procedures and facilities to deal with work accidents, oil spills, and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay. The emergency response plan will be a part of the OHS system. Facilities to be provided on site will contain at minimum the following: fully equipped first aid station, fire-fighting equipment, arranged access to emergency services of the hospital in Manufahi, Ainaro and Covalima districts, and direct communication link with local fire brigades and other relevant government authorities such as the local police station.

1.13.2 Operation Phase

Despite rigorous implementation of the Risk Management Program, residual risks with significant consequence still remain in oil spill and leakage. Therefore, the EPC Contractor will be contractually binding to prepare an Operation Emergency Response Plan (OERP) for the Project Proponent and provide training to the designated staff to ensure they will be able to efficiently and effectively respond to occurring emergencies.

1.13.3 Deactivation Phase

The Demolition Contractor will be required to prepare an emergency response plan to efficiently and effectively cope with accidents and emergencies which may occur during the demolition works. The plan would deal mostly with work accidents and accidental fires with focusing on procedures and facilities to deal with work accidents and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay.

- The project did not take seriously on the EIA and EMP licensing process for Condensate Pipeline route due to large quantity of numerous toxic and explosive materials involved;
- Less attention about the significant impact of the environment and the community;
- Short preparation of 3 months for the EIA and EMP report;
- Possibility of leaks, spills, accident, fires and explosions;
- Effectiveness of emergency response.

The suggestions were on:

- Including additional assessment, planning, licensing and management which would be required for subsequent phases;
- Planning, design, preparation, implementation and operation for the potential risks and handle approach

Concerns/comments of villagers in **Betano Village** were on impacts related to leakage of the pipeline and suggestion on road upgrading.

Concerns of villagers in **Leolima and Foho-Ailico Villages** were on impacts on water and culture, explosion risk by the earthquake, distance to community. The suggestion was on arrangement of consultation meeting in Aldeia Ainaro Kiik.

Concerns of villagers in **Cassa Village** were on risk from pipe leakage, pipe destroyed by river flow, responsible agency for pipe maintenance. Their suggestions were on not to relocate sacred places and information disclosure about risk associated to pipe explosion.

There were no feedbacks/questions from two villages of **Beco and Labarai.**

Concerns of villagers in **Raimea, Tashilin and Zulo Villages** were on risk from pipeline explosion, opportunity of local employment, negative impact on soil and water, and distance of pipeline.

Clarifications were made by representatives of the Project's Proponent and Consultants accordingly. All are recorded in the Minutes of Meetings, and documented for reference.

Results from the interview of key informants showed that the majority of the people in eight villages have agreed with the project development by reasons of job opportunities and capacity building and development at the local and national levels.

Results of all the public consultation meetings will be utilized for implementation of environmental and social management plans of the Project as well as community support development programs to be provided by the Project Proponent in the Corporate Social Responsibility (CSR) context.

1.16.2 Recommendations for Future Consultations

Public consultation will be carried out during the pre-construction and construction, operational and deactivation phases as part of environmental management of the all project phases. Public consultation during the pre-construction and construction would mainly concern with measures to minimize various environmental disturbances which some communities may experience. Community development support would be a major issue for public consultation during operation and deactivation phases. Details are:

(1) Public Consultation and Information Disclosure during Pre-Construction and Construction Phases

Organization for Public Consultation

A tripartite committee is proposed to be set up by the Project in consultation with the community heads and representatives of the national, regional, and district administrations. The committee should be represented by: (i) the government sector, including NDPCEI; (ii) villages nearest to the Project site; and (iii) the Project Proponent. Tentatively, the committee should not have more than 15 members; of which 3 represent the government sector, 8 represent the villages such as Betano, Foho-Ailico, Leolima, Raimea, Tashilin, Zulo, Beco and Labarai Villages, and 3 represent the Project Proponent. The NDPCEI official should be the chairperson and the Project Manager of the Project Proponent should serve as secretariat of the committee. Representatives of the Contractor should participate in the committee meetings to support information.

Information Disclosure

Information to be disclosed during the Project construction phase will be monitoring reports.

The Owner Project Management Office will make arrangements for the disclosure of monitoring reports. It will be also disclosed to the proposed tripartite committee.

(2) Public Consultation and Information Disclosure during Operation Phase

Organization for Public Consultation

The tripartite committee set up during the construction phase will be maintained. Its composition will be reviewed to ensure that it is appropriate for environmental and risk management during the operation phase.

Information Disclosure

The information on risk management and monitoring should be made available to the public particularly to the communities along the pipeline corridor.

Information to be disclosed during the Project operation phase will be monitoring reports. The EHS Manager will make arrangements for the disclosure of monitoring reports in compliance with the above legal requirements. In addition, information on environmental management will be disclosed to the proposed tripartite committee.

1.17 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS

1.17.1 Pre-Construction and Construction Phases

A grievance redress process will be established and implemented as part of project management by the Project Management Office of the Project Proponent. The process will enable efficient management of grievance redress or response to complaints related to EHS of the Project construction.

1.17.2 Operation Phases

The Pipeline Management Entity will establish and operate a grievance redress mechanism and process as part of the environmental management system of the pipeline O&M.

1.17.3 Deactivation Phase

A grievance redress process will be established and implemented as part of demolition project management by the Demolition Project Manager of the BPSC. The process would be similar to that for the construction period.

1.18 WORK PLAN AND IMPLEMENTATION SCHEDULE

Table 1.18-1 to 1.18-3 present the implementation schedule of mitigation measures and monitoring program for pre-construction and construction, operation, and deactivation phases.

1.19 COST ESTIMATES

Cost estimates for mitigation measures and monitoring programs including emergency response plan, social support program and corporate social responsibility program during the pre-construction and construction, operation and deactivation phases are summarized in ***Table 1.19-1***.

TABLE 1.18-1

IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING PROGRAM DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

	Activity	Pre-Construction and Construction Phases																																				
		2017						2018												2019												2020								
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1.	**Mitigation Measures Implementation**																																						
1.1	Land requirement																																						
1.2	Fugitive dust and gaesous emissions																																						
1.3	Noise level																																						
1.4	Wastewater management																																						
1.5	Solid waste management																																						
1.6	Hydrostatic test																																						
1.7	Water Quality																																						
1.8	Chance finds for archeological , historic and scared sites																																						
1.9	OSH of construction workers																																						
1.10	Land acquisition																																						
1.11	Workers camps																																						
1.12	Influx of workers																																						
1.13	Community health and safety																																						
2.	**Monitoring Programs Implementation**																																						
2.1	Air quality (2 Stations @ 3 consecutive days)*																	△																					
2.2	Noise (2 Stations @ 3 consecutive days)*																	△																					
2.3	Wastewater measurement (3 Stations)						△						△						△						△						△						△		
2.4	River water measurement (24 Stations)							△		△		△		△		△		△		△		△		△		△		△		△									
2.5	Hydrostatic water test (2 samples at 1 station)																														△								
2.6	OSH of construction workers																																						
2.7	Land acquisition																																						
2.8	Conditions of worker camp																																						
2.9	Influx of workers																																						
2.10	Community health and safety																																						
3.	**Reporting**																																						
3.1	Submit monthly monitoring report to TIMOR GAP, E.P.	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆		
3.2	Submit semi-annual monitoring report to NDPCEI							◇						◇						◇						◇						◇						◇	

Remark: Implementation throughout pre-construction and construction periods, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the construction is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with construction Activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 1.18-2

IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES AND MONITORING PROGRAM FOR OPERATION PHASE

Activity	Operation Phase																	
	2020 (First Year)						2021 (Second Year)-End of Project Life											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Mitigation Measures Implementation																		
1.1 Pigging waste management																		
1.2 Operation risk																		
1.3 Community health and safety																		
2. Monitoring Programs Implementation																		
2.1 Pigging waste management (2 times/month)	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
2.2 Emergency response plan																		
2.3 Community health and safety																		
3. Reporting																		
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
3.2 Submit semi-annual monitoring report to NDPCEI						◆						◆						◆

Remark: Implementation throughout operation period, and recorded on weekly and monthly basis

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 1.18-3

IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES AND MONITORING PROGRAM FOR DEACTIVATION PHASES

Activity	Deactivation Phase												
	First Year												Second Year
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1. Mitigation Measures Implementation													
1.1 Air quality	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.2 Noise	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.3 Solid waste management	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.4 Wastewater management	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.5 Community health and safety	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
2. Monitoring Programs Implementation													
2.1 Air quality (2 Stations @ 3 consecutive days)*					▲								
2.2 Noise (2 Stations @ 3 consecutive days)*					▲								
2.3 Solid waste management					▲						▲		
2.4 Wastewater measurement					▲						▲		
2.5 Community health and safety	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
3. Reporting													
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	
3.2 Submit semi-annual monitoring report to NDPCEI						◆						◆	

Remark: Implementation throughout deactivation period, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the demolition is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with demolition activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 1.19-1

PRELIMINARY COST ESTIMATES OF MITIGATION MEASURES AND MONITORING PROGRAMS

Project Phase	Cost based on 2016 Price (USD)		
	Mitigation Measures	Monitoring Program	Total Cost/Year
Pre-construction/ Construction Phases	25,820	32,000	57,820
Operation Phase	-1/	25,000	25,000
Deactivation Phase	13,000	-	13,000

Remark: 1/= the cost of treating pigging wastes will be small compared to the Project's capital investment and operational expenses.

Source: TEAM Consulting Engineering and Management Co., Ltd., 2016

1.20 REVIEW OF EMP

1.20.1 Review of the Contractor CEMP

The Contractor CEMP will be consistently reviewed and updated or amended to ensure that it remains adequately responsive to the construction progress and changes in the construction schedule and methods, if any.

1.20.2 Review of the OEMP

The Operation EMP will be reviewed and updated by the EPC Contractor to become the Contractor OEMP. The Contractor OEMP should be completed during the commissioning of the Pipeline. The ESH Manager will review and update the Contractor OEMP during the initial months of the pipeline operations to become the Pipeline OEMP.

The Pipeline OEMP will be consistently reviewed and updated to ensure it remains effective and responsive to changes in operational requirements of the pipeline.

1.20.3 Review of the Contractor DEMP

The Contractor DEMP will be consistently reviewed and updated or amended to ensure that it remains adequately responsive to the demolition progress and changes in the demolition schedule and methods, if any.

CHAPTER 2

DETAILS OF THE PROJECT PROPONENT

CHAPTER 3

DETAILS OF THE CONSULTANTS

CHAPTER 3

DETAILS OF THE CONSULTANTS

The Consultant is TEAM Consulting Engineering and Management (TEAM) in association with ATT Consultants Co., Ltd. TEAM is the lead firm.

3.1 TEAM CONSULTING ENGINEERING AND MANAGEMENT (TEAM)

TEAM is one of the key subsidiaries of TEAM Group of Companies (TGC). Through its subsidiaries, TGC provides comprehensive consulting services covering a complete project cycle from project conception through project planning and feasibility study, detailed design, construction supervision, and project management. TGC's services cover various development sectors, including urban mass transit system, highways and expressways, water resources, water supply, wastewater, ports, power plants, housing, urban development, environmental management, and regional development. In addition, TGC also provides services in public event design and organizing, and management planning. TGC has completed assignments not only in Thailand but also in neighbouring countries, particularly Lao PDR, Viet Nam, Cambodia, and Myanmar.

Environmental impact assessment is one of TEAM's key businesses. TEAM's experiences in EIA cover projects in various development sectors including transport, power, water resources, mass transit, mining, ports, and industry. Some of these projects are in Lao PDR, Viet Nam, Cambodia, and Myanmar. Examples of completed EIA projects in Myanmar are: (i) The 400 MW Gas-Fired Combined Cycle Power Plant Project in Hlaing Thar Yar, Yangon, Myanmar; and (ii) Deedoke Hydropower Project in Mandalay, Myanmar.

TEAM's contact address is:

Dr. Sirinimit Boonyuen

Senior Executive Vice President-International

TEAM Building,

151 Nuan Chan Rd., Nuan Chan, Bueng Kum, Bangkok, Thailand 10230

Telephone: +66 2 509 9000 ext. 2304

Fax: +66 2 509 9047

Email: sirinw@team.co.th

3.2 ATT

ATT is one of the affiliated companies of TGC. It was established with the primary objective of providing engineering services for oil and gas related projects, petrochemical facilities, marine facilities, electrical power system, and industrial plants for both public and private sectors. ATT provides services in technical surveys and investigations, CADD drafting, technical due diligence, project preparation and feasibility study, detailed design, and construction supervision.

ATT's contact address is:

Dr. Werapol Thonguthai

Managing Director

TEAM Building,

151 Nuan Chan Rd., Nuan Chan, Bueng Kum, Bangkok, Thailand 10230

Telephone: +66 2 509 9050-6 ext. 117

Fax: +66 2 509 9057 and +66 2 509 9059

Email: werapt@attconsult.com

3.3 THE EMP TEAM

The EMP study for this Project is conducted by a multidisciplinary professional team consisting of a core study and planning group and a technical support group. The Team Leader manages technical aspect of the EMP study. The Environmental Planning Expert will assist the Team Leader in ensuring that the final EMP report will meet all requirements prescribed by NDPCEI, and that the proposed environmental management plans will be practical and implementable. The Team Coordinator assists the Team Leader in coordination among members of the EMP team, Project Proponent, NDPCEI, and other concerned government agencies.

The core study of the EMP study team consists of qualified and experienced professionals in various technical areas relevant to environmental and social impacts of the Project, including: environmental impact assessment, pipeline engineering, social impact assessment, and public consultation.

The core study and planning group will be supported by a technical support group consisting of professionals in various disciplines relevant to the environmental and social context of the Project, including: (a) civil engineering; (b) aquatic ecology; (c) water resource engineering; (d) public health; and (e) terrestrial ecology.

A simple organization structure for conducting and managing the EMP study is shown in ***Figure 3.3-1***.

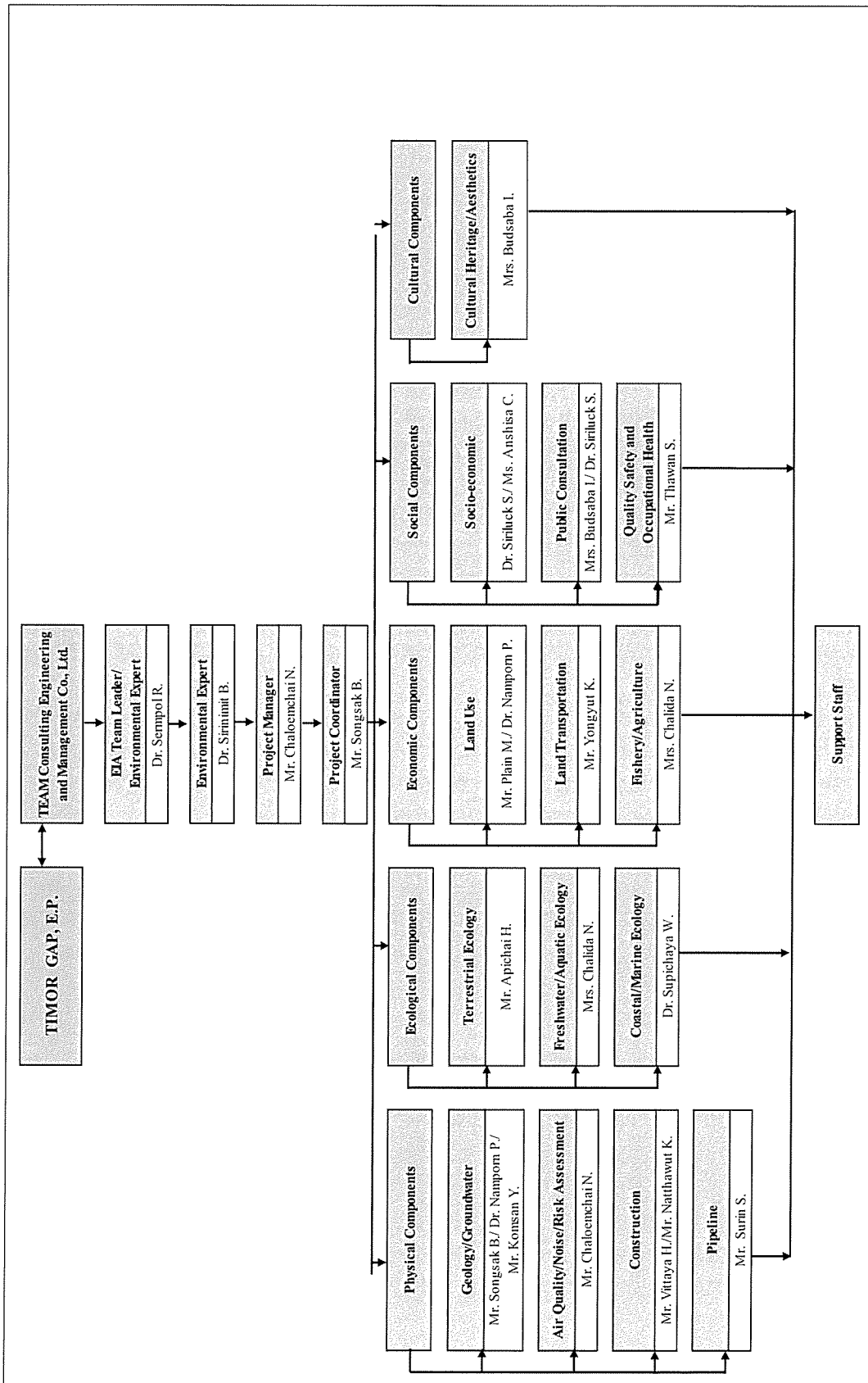


FIGURE 3.3-1: ORGANIZATION CHART FOR THE EIS FOR THE CONDENSATE AND PRODUCTS PIPELINE ROUTE PROJECT

CHAPTER 4

DESCRIPTION OF THE PROJECT

CHAPTER 4

DESCRIPTION OF THE PROJECT

4.1 IDENTIFICATION OF THE PROJECT

The Condensate and Products Pipeline Project is identified as a project to support the Betano Refinery Project-one of the three strategic projects for the development of oil and gas sector of the country. The Project will transport condensate from storage tanks at Suai Supply Base to Betano Refinery, and will transport light naphtha, heavy naphtha, and diesel fuel from storage tanks at the refinery to storage tanks at Suai Supply Base. Therefore, the proposed pipeline will essentially be an associated facility of the refinery as it will supply feed stock to the refinery and transport the three main products of the refinery to market.

4.2 CATEGORY OF THE PROJECT

The environmental category of the Project is category A as it will involve petroleum products. The Condensate and Products Pipeline Route Project will transport onshore oil with the size of 8 inch and 12 inch diameter and 60 km length. This requires the Environmental License as specified in article 4 of the Environmental Licensing Laws (Annexes 1, and 2) under Decree Law No. 5/2011.

4.3 BRIEF DESCRIPTION OF THE NATURE, SIZE AND LOCATION OF THE PROJECT

4.3.1 Project Location

The proposed pipeline is to be laid along the highway being constructed. ***Figure 2.4-1*** is an area map showing the proposed highway and the proposed pipeline alignment.

The pipeline's right-of-way (ROW) is set at 40 m on the south side of the highway. Including the highway width of 30 m, the pipeline's ROW and the highway will form a 90 m land corridor stretching from Betano to Suai Supply Base. Its total length will be about 60 km passing the administrative areas of Manufahi, Ainaro and Covalima districts.

With its length of 60 km and width of 90 m, the combined ROW of the pipeline and the highway will occupy 5.4 km^2 of area including water areas of rivers and streams that the corridor traverses.

4.3.2 Nature and Size of the Project

By its nature and length of the pipeline, the Project could be considered as a medium scale, civil works and mechanical works project. Its scope and technical features taken from the document on "Pipeline Study Design Basis" supplied by the Project Engineering Consultant (PEC) are summarized below:

The Project will construct the following facilities:

(1) Pipeline

The pipeline will consist of 4 pipes designed for the refinery's future capacity of 40,000 barrels per day (BPD). ***Table 4.3-1*** summarizes key design and operating data of the four pipes. The pipe will be carbon steel with adequate coating for corrosion protection. The pipeline designs follow international standards and codes presented in ***Appendix 4A***.

On the 60 km length of pipeline route, it is occupied by 12 sub-villages of Bematan, Lalica, Raifusa, Bobe, Bonuc, Haretain, Raifila, Leonti, Karetamute, Adentiuk, Haemanu, and Meop which are situated in 8 villages. The project affected area is indicated in the map as shown in ***Figure 4.3-1***. Consideration on the land required for the Highway implementation and construction. There were difficulties occurred regarding land title identification and negotiation. However the State shall pay for the land temporary ownership rights, land use and compensations for the existing trees and agricultural crops.

TABLE 4.3-1

KEY DESIGN AND OPERATING DATA OF THE PIPELINES

Fluid Name	Plant Design Flow(1) (m^3/hr)	Density(2) (kg/m^3)	Dp per 100 m (kg/cm^3)	Line Size (inch)	Velocity (m/s)	Pipe Size Selected (line)	Operating Pressure(3) (kg/cm^3)	Design Pressure(4) (kg/cm^3)
Condensate	417	711	0.044	12	1.6	12	55	83
Light Naphtha	156	625	0.043	8	1.3	8	62	93
Heavy Naphtha	106	730	0.026	8	0.9	8	41	62
Diesel	128	800	0.047	8	1.1	8	62	92

Source: TIMOR GAP, E.P., 2016
Remark: (1) Pipeline operating based on 45 hours transferring time, which design based on 10% margin
(2) Density is referred to UOP heat and Mass Balance @ 40°C
(3) 50% Safety Factor was added for pressure lose to represent pipe fitting auxiliary
(4) 50% Margin was added for pipe design pressure

The pipes will be laid at 1-1.5 m below ground measured from its crown to the ground surface.

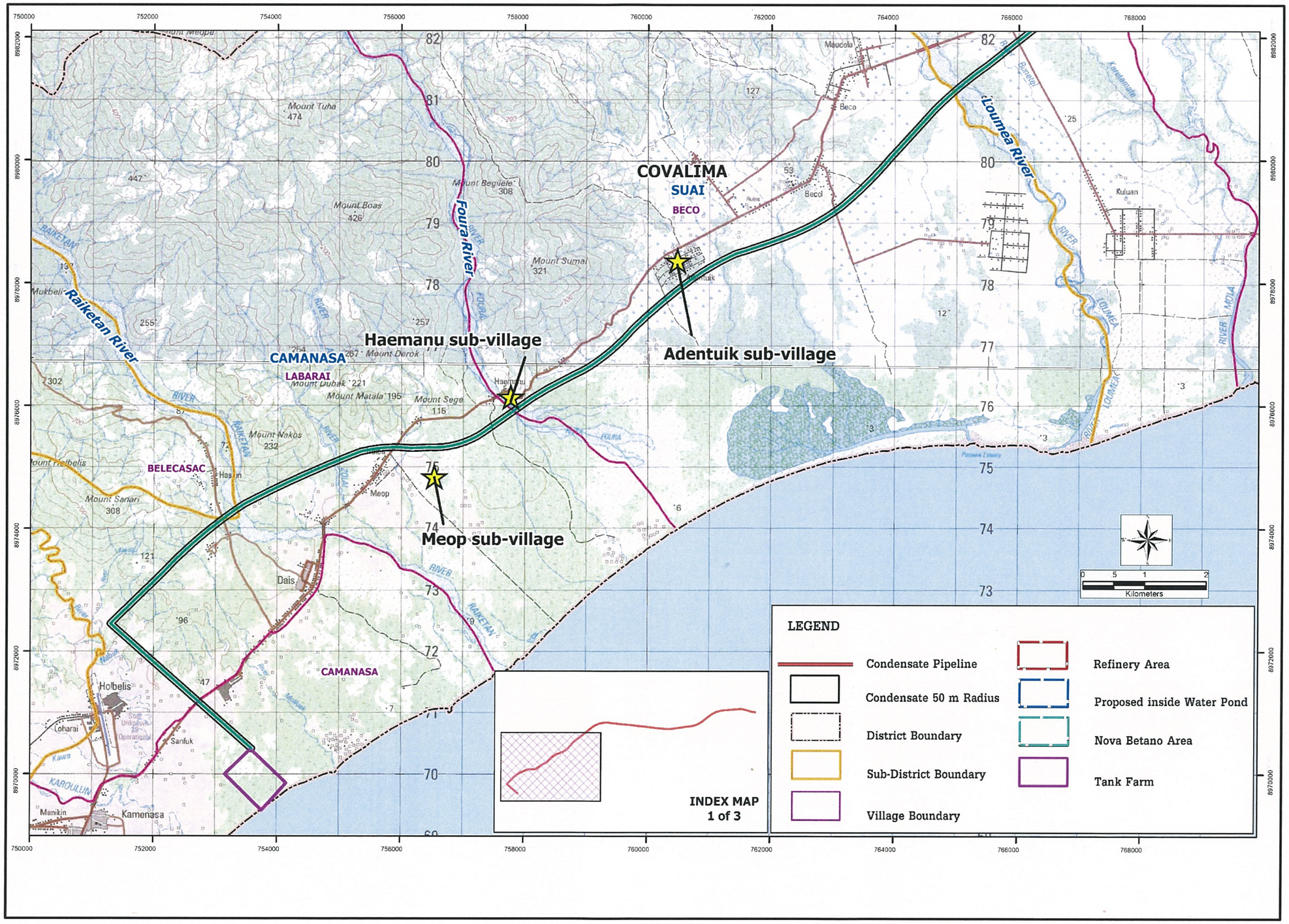


FIGURE 4.3-1 : THE PROJECT AFFECTED AREA ALONG PROPOSED HIGHWAY, PIPELINE ALIGNMENT

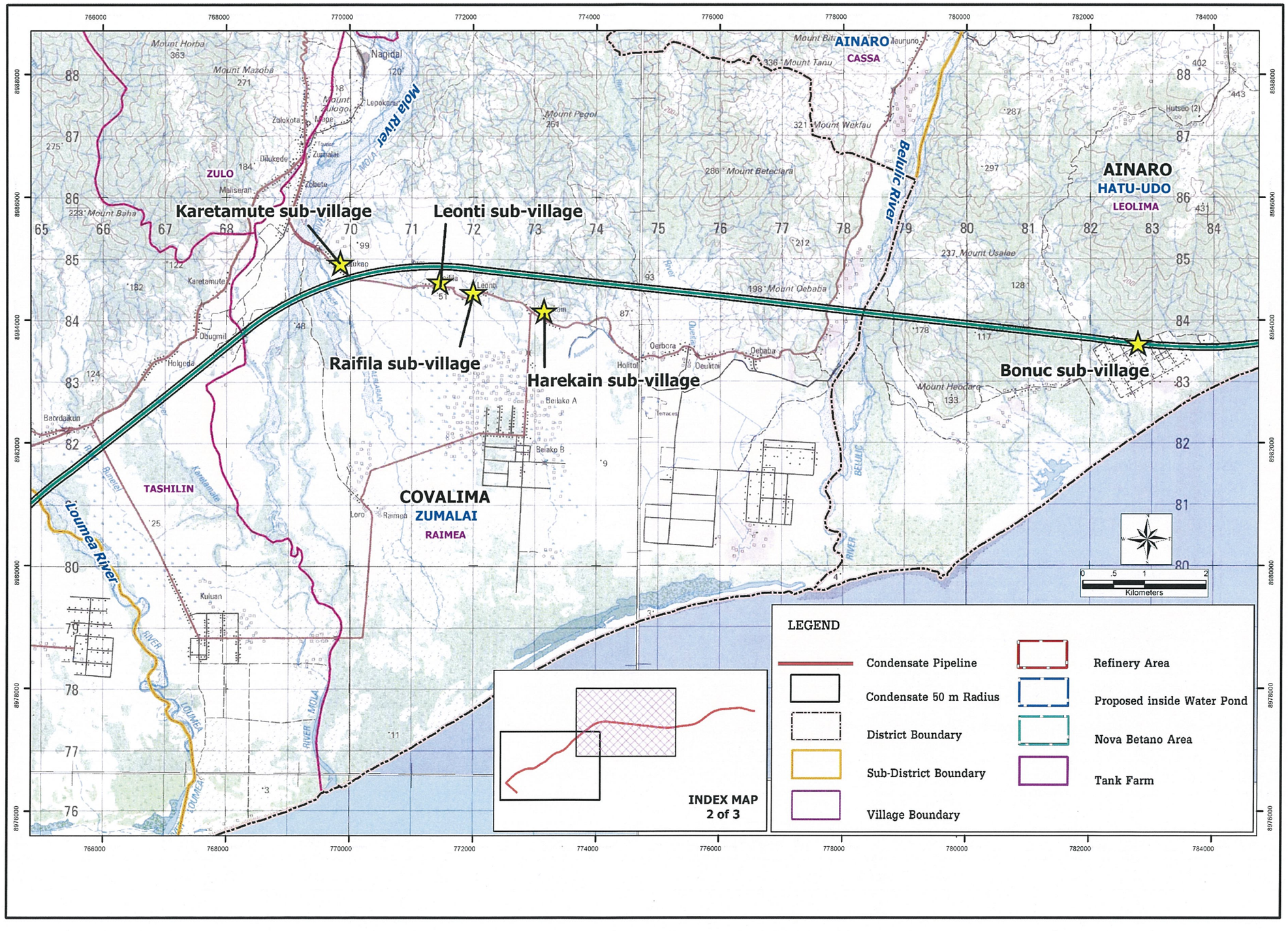


FIGURE 4.3-1 : THE PROJECT AFFECTED AREA ALONG PROPOSED HIGHWAY, PIPELINE ALIGNMENT (CONT'D)

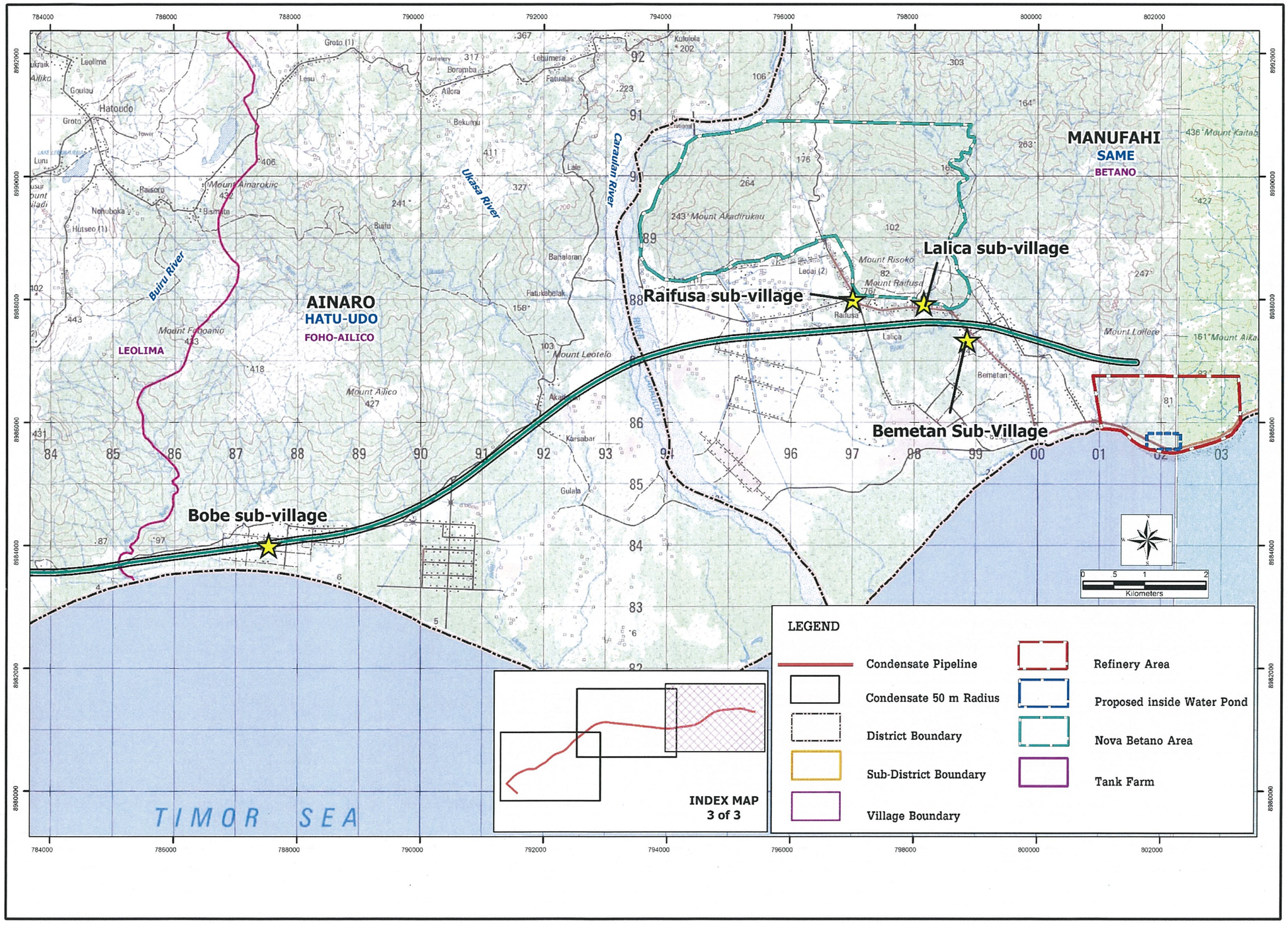


FIGURE 4.3-1 : THE PROJECT AFFECTED AREA ALONG PROPOSED HIGHWAY, PIPELINE ALIGNMENT (CONT'D)

Along its route, the pipeline will cross 25 local roads and trails. ***Table 4.3-2*** shows the positions of the local roads/trails crossing.

TABLE 4.3-2

LOCATION ROADS/TRAILS CROSSING THE PIPELINE CROSSING THE PIPELINE ALIGNMENT

Reference Sections		Reference Sections	
Highway	**Pipeline**	**Highway**	**Pipeline**
14+000	5+575	47+200	38+700
16+200	7+750	48+700	40+200
17+100	8+600	49+600	41+100
18+500	10+000	53+200	44+700
19+300	10+800	55+000	46+500
20+300	11+800	59+800	51+300
22+700	14+200	60+600	52+100
23+100	14+600	61+800	53+300
25+300	16+800	62+500	54+000
29+400	20+900	64+100	55+600
34+600	26+100	64+500	56+000
42+100	33+600	65+000	56+500
46+300	37+800		

Source: TIMOR GAP, E.P., 2016

The pipeline will cross four small rivers with widths less than 50 m and eight large rivers with widths more than 50 m and eight large rivers with widths more than 50 m (***Figure 4.3-1***). Pipe bridges will be used for river crossing. ***Table 4.3-3*** gives information on the large river crossing.

TABLE 4.3-3

LARGE RIVERS CROSSING THE PIPELINE ALIGNMENT

No.	River Name	Effective River Width (m.)
1	Raiketan River	190
2	Zolai River	110
3	Haimanu/Foura River	110
4	Loumea River	240
5	Mola River	400
6	Belulic River	240
7	Ukasa River	60
8	Karaulun River	800

Source: Terms of Reference for Condensate and Products Pipeline Route, p.13.

(2) Instrumentation System

The pipeline will be equipped with appropriate instruments for monitoring and control of pressure, temperature and flow at both ends for the purposes of operational management and safety. The gathered information will be assessed and analyzed using a SCADA system[1] to efficiently and effectively monitor and control the pipeline operation. In addition, the pipeline will be equipped with safety equipment as specified in the design standards, such as pressure reducing valves.

(3) Pumping Stations

One pumping station will be constructed at Suai Supply Base for pumping the condensate. Another pumping station will be constructed at the refinery for pumping the three products. Salient features of the two pumping stations are summarized as follows:

Pumping Station at Suai Supply Base

- Number of pumps
- Type of pumps
- Capacity of each pump
- Power

Pumping Station at Betano Refinery

- Number of pumps
- Type of pumps
- Capacity of each pump
- Power

The need for boosting pump stations will be determined in the detailed design.

(4) Pigging Stations

Pigging will be used for pipeline inspection to perform various maintenance operations without stopping the flow in pipelines.

Two pigging launching/receiving stations will be installed, one close to the pumping station at Suai Supply Base, and another close to the pumping station at the refinery.

(5) Control Buildings

One control building will be required at each end of the pipeline. The two buildings will be small and can be considered minor construction works.

[1] SCADA (Supervisory Control And Data Acquisition) is a system for remote monitoring and control that operates with coded signals over communication channels (using typically one communication channel per remote station)

(6) Block Valve Stations

The Project Proponent does not see the need for block value stations. However, the need of block value stations should be confirmed in the detailed design.

4.4 PROJECT STATUS AND SCHEDULE

Detailed engineering designs of the Project are being prepared by the EPC. The Project will be implemented on a single EPC contract by a qualified and experienced contractor. The contract scope would cover: (i) supply of all pipeline materials and equipment; (ii) construction of the pipeline, pumping stations, pigging stations, and control buildings; and (iii) testing and commissioning of the pipeline system.

The entire distance of 155.7 km had been cleared for highway construction. The area covers pipeline corridor. The required land has already been acquired by GoTL as part of the land acquisition for the highway project. TIMOR GAP, E.P. will coordinate the implementation of this Project with the highway project, the Betano Refinery Project, and the other two support projects of the Betano Refinery Project. Preferably, the pipeline construction will be carried out concurrently with the highway construction. As of the end of March 2016, the highway project has commenced the first phase of the highway from Suai to Zumalai about 31 km before reaching Betano.

Tentatively, TIMOR GAP, E.P. intends to commence the construction around 2017. The construction will take about 36 months to complete. ***Figure 4.5-1*** shows a tentative construction schedule.

No.	Activities	Duration	Construction Period (month)					
			2017		2018		2019	
			6	12	18	24	30	36
1	Site preparation	12						
2	Excavation works	21						
3	Pipeline installation	21						
4	Inspection and testing	21						
5	Earth backfilling works	20						
6	Commissioning	6						

Source: TIMOR GAP, E.P., 2016

FIGURE 4.5-1 : TENTATIVE CONSTRUCTION SCHEDULE

4.5 JUSTIFICATION AND NEED FOR THE PROJECT

Although this Project is not explicitly identified in the SDP, its need is evident as the refinery will need the condensate feedstock from Suai Supply Base and will have to deliver its products to Suai Base for further transport to buyers. Pipeline transport of petroleum product is commonly used as it is normally more economical than transport by tanker trucks. Therefore, the justification and need for this Project is solidly grounded on the justification and need for the Betano Refinery Project which is accorded high importance by GoTL. Without this Project, the Betano Refinery will have to transport its feed stock and products by trucks from and to Suai Supply Base. As the unit cost of transport by pipeline is lower than by tanker trucks, the Project could be justified on and economic ground.

In addition, the pipeline transport is normally more environmentally friendly than the truck transport. Therefore, the Project could also be justified on environmental ground. This subject is discussed in more detail in ***Chapter 8-Alternatives***.

4.6 THE PROPONENT'S ENDORSEMENT OF THE EMP

The Project Proponent's letter of endorsement is prepared to submit to NDPCEI.

4.7 THE STRUCTURE OF THE EMP

The EMP contains all elements prescribed in the Strengthening Country Safeguard Systems, Ta No. 7566 (Reg), Tl: Country Safeguards Review, 22 April 2014 on *"Minimum Requirements for an Environmental Management Plan"* (MREMP). The structure of this EMP follows as appropriate the sequence of various sections shown in MREMP. The EMP is structured as follows:

Chapter 1-Executive Summary:-This chapter corresponds to Section 1, MREMP, it summarizes the principles of environmental management. A summary of the key impacts identified for the different phases of the Project, and the mitigation measures will be put in place to manage and monitoring program.

Chapter 2-Details of the Project Proponent:-This chapter presents details of the Project Proponent (Section 2, MREMP).

Chapter 3-Details of the Consultants:-This chapter presents details of the Consultants or persons who prepared the EMP (Section 3, MREMP).

Chapter 4- Description of the Project:-This chapter corresponds to Section 3, MREMP. It presents brief description of the Project while details are presented in appendixes. The information in this chapter is the basis for identification of environmental and social changes that could have impacts on the environment during pre-construction and construction, operation, and deactivation of the Project. It also presents the proponent's endorsement of the EMP and the structure of the EMP.

Chapter 5- Legal Requirements: This chapter covers Section 4, MREMP. It presents national laws and regulations including environmental guidelines and standards applicable to this Project. International practices and standards relevant to this Project are also discussed and proposed, as appropriate, to fill gaps in the national laws and regulations, if any. It also presents corporate policies on environmental and social management that the Project Proponent is committed to implement during the construction and operation phases of the Project.

Chapter 6-Institutional Roles and Responsibilities: This chapter is prepared with reference to Section 6, MREMP. It presents roles and responsibilities of the developer and relevant institutions at the difference stages of the prescribed development. It also presents roles and responsibilities of the one who update the EMP based on detailed designs, who incorporates into the bid and contract documents, who prepare construction or site-specific EMP based on proponent's EMP.

Chapter 7-Summary of Impacts: This chapter corresponds to Section 7, MREMP. It summarizes the anticipated negative environmental and social impacts identified in EIS and addressed in this EMP.

Chapter 8-Description of Proposed Mitigation Measures: This chapter corresponds to Section 8, MREMP. This chapter presents the measures in accordance with the impacts during pre-construction, construction, operation and deactivation phases in environmental and social categories.

Chapter 9-Governing Parameter: This chapter corresponds to Section 9, MREMP. It presents the specific emission limit values and environmental quality standards. International practices and standards relevant to this Project are also discussed and proposed. The Project Proponent is committed to implement during pre-construction and construction, operation and deactivation phases of the Project.

Chapter 10-Monitoring Program: This chapter corresponds to Section 10, REMP. It presents environmental and social monitoring program, scheduled monitoring and evaluation, site inspections and audit for each phase.

Chapter 11-Reporting Requirements: This chapter corresponds to Section 11, MREMP. It presents the reporting frequencies and type of report to be prepared in each phase. It also presents environmental incidents, internal monitoring report, monitoring reports for submission to NDPCEI, and corrective actions.

Chapter 12-Responsibilities for Mitigation and Monitoring: This chapter corresponds to Section 12, MREMP. It presents the responsibilities for the various parties involved in implementing the management actions and mitigation measures and monitoring activities for each phase.

Chapter 13-Emergency Plan: This chapter corresponds to Section 13, MREMP. It presents an emergency plant to address risks associated with accidents and emergencies during pre-construction and construction, operation and deactivation phases.

Chapter 14-Decommissioning Plan: This chapter corresponds to Section 14, MREMP. It presents a clear conceptual framework for environmental management during the deactivation phase of the Project.

Chapter 15-Capacity Development and Training: This chapter corresponds to Section 15, MREMP. The training is identified based on the existing and available capacity of the site and Project personnel to undertake the required management actions and monitoring activities.

Chapter 16-Public Consultation and Information Disclosure: This chapter corresponds to Section 16, MREMP. It presents results of public consultation and disclosure conducted during the preparation of the EIS and EMP and the continued public consultation throughout the life-cycle of the Project.

Chapter 17-Complaints and Grievances Mechanisms: This chapter corresponds to Section 17, MREMP. It presents grievance redress process which will be established and implemented as part of project management during pre-construction and construction, operation and deactivation phases.

Chapter 18-Work Plan and Implementation Schedule: This chapter corresponds to Section 18, MREMP. It presents the timing of activities and operations, together with the related environmental works and inspection and monitoring schedule in each phase.

Chapter 19-Cost Estimates: This chapter corresponds to Section 19, MREMP. It presents cost estimates for mitigation and monitoring including emergency response plan, social support program and corporate social responsibility program for each phase.

Chapter 20-Review of the EMP: This chapter corresponds to Section 20, MREMP. It presents the procedures and mechanisms that will be used to revise the project or changes to the project.

Chapter 21-Non-technical Summary: This chapter corresponds to Section 21, MREMP. It presents a non-technical summary of the EMP to enable non-technical people to understand the Project and its environmental and social implications.

Appendices: All appendices referred to in the main text are presented at the end of main text.

CHAPTER 5

LEGAL REQUIREMENTS

CHAPTER 5

LEGAL REQUIREMENTS

5.1 LEGAL REQUIREMENTS RELATED TO ENVIRONMENTAL AND SOCIAL ASPECTS

Environmental management of this Project is directly governed by Environmental Licensing Law (Decree Law No.5/2011). Under the provisions of this Law, this Project is considered Category A – projects that may potentially cause significant environmental impacts. Consequently, the Project Proponent has to obtain an Environmental License for its construction and operation.

To apply for an Environmental License, the Project Proponent has to:

- Conduct an environmental impact assessment (EIA) of the Project to prepare two stand-alone documents-an environmental impact statement (EIS) and an environmental management plan (EMP). The two documents will be submitted to NDPCEI for its review and consideration according to the process prescribed in the Law. Approval of the EIS and the EMP is the condition for NDPCEI to issue an Environmental License to the Project Proponent;

- The Environmental License has to be renewed every two years, its renewal will depend on environmental performance of the Project[1]; and

- The environmental management will conform with national environmental standards and guidelines. However, in the absence of relevant national environmental standards, acceptable international standards may be adopted[2].

- The proponent will conform to Impacts and Benefits Agreement (IBA) which defines the rights and obligations between the proponent and the legal representative of the community protection, respect for traditional land use, customs that community rights and due compensation to the scale of potential environmental impacts identified in the EIS for the Project[3].

[1] Article 24: Duration and Renewal of Environmental License, CHAPTER VII-ENVIRONMENTAL LICENSE in ENVIRONMENTAL LICENSING Decree-Law No. 5 / 2011 of 9 February.
[2] Article 9: Reception of International Law, Timor-Leste's Constitution of 2002
[3] Article 15: Impacts and Benefits Agreement (IBA), CHAPTER V-PROTECTION OF TRADITIONAL CUSTOMS AND DUTIES in ENVIRONMENTAL LICENSING Decree-Law No. 5 / 2011 of 9 February.

- The Project Proponent will submit monitoring report to NDPCEI[4] as follows:

  - Semiannual environmental report, during construction phase;
  - Annual environmental report, during operation phase; and
  - Semiannual environmental, during deactivation phase.

Relevant legislation, international policies, standards, acts, and guidelines are summarized in ***Table 5.1-1***.

[4] Article 33: Duty Holder's Monitoring and Reporting, CHAPTER X-SURVEILLANCE AND MONITORING in ENVIRONMENTAL LICENSING Decree-Law No. 5 / 2011 of 9 February

TABLE 5.1-1
SUMMARY OF LEGISLATION, INTERNATIONAL POLICIES, STANDARDS, ACTS, AND GUIDELINES

Issues	Aspects	Legislation/International Policies/ Standards/Acts/Guidelines
Laws and regulations	1. Social Impact Management	1. Government Resolution No. 20/2014 6th August 2014 on Maximum value for payment on land in Tasi Mane Project in Suai 2. Land Acquisition and Resettlement – Constitution, Article 54 – Decree Law No. 6/2011 of 9 February on Compensations for Evacuating Stage Real Property 3. Occupational Health and Safety – Draft Occupational Health and Safety Law (2004) – The United Nations Transitional Administration in East Timor (UNTAET) Regulation 2002/08, the Labor Code for Timor-Leste
	2. Petroleum Activities	Law No. 13/2005 on Petroleum Activities – Article 23 (Working Practices requires operation safety and environmental protection)
	3. Ecological Protection	1. The World Database on Protected Area (WDPA) January 2015 2. Decree Law No. 6/2004 of 21 April 2004 on General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture
	4. Cultural Protection	The Government Resolution No. 25/2011, 14 Sep Protection of Cultural Heritage
Guidelines and standards	1. IFC's Standards and Guidelines	1. Performance Standards on Environmental and Social Sustainability, January 1, 2012; 2. Environmental, Health, and Safety-General Guidelines, April 30, 2007; and 3. Workers' accommodation: processes and standards, August 2009

TABLE 5.1-1

SUMMARY OF LEGISLATION, INTERNATIONAL POLICIES, STANDARDS, ACTS, AND GUIDELINES (CONT'D)

Issues	Aspects	Legislation/International Policies/ Standards/Acts/Guidelines
Guidelines and standards (Cont'd)	2. Emission Standards	
	2.1 Air Emission Levels	Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007
	2.2 Effluent Levels	Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007
	2.3 Resource and Energy Consumption	Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007
	3. Ambient environmental Standards	
	3.1 Ambient Air Quality	WHO Ambient Air Quality Guidelines stated on Environmental, Health, and Safety Guidelines: Environment Air Emissions and Ambient Air Quality of International Finance Corporation, 2007
	3.2 Ambient Noise Levels	1. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, U.S. EPA (U.S. Environmental Protection Agency), 1974 2. Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 3. Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007
	3.3 Coastal and Marine Water Quality	ASEAN MARINE WATER QUALITY Management Guidelines and Monitoring Manual, 2008
	3.4 Freshwater Quality	National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009
	3.5 Groundwater Quality	WHO's Guidelines for Drinking Water Quality, 2011
	3.6 Soil Contaminant	US EPA Region 9 Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations. Direct exposure pathways
	3.7 Land Stability	Environmental Land Use Planning and Management, 2004

CHAPTER 6

INSTITUTIONAL ROLES AND RESPONSIBILITIES

CHAPTER 6

INSTITUTIONAL ROLES AND RESPONSIBILITIES

Implementation of the Environmental Management Plan requires the participation of multiple agencies and departments including the Project Proponent and contractor. Each institution plays important roles to ensure effective environmental management of the project.

Basically, the environmental processes involved in the management of two bodies: Responsible organization or implementation of the Environmental Management Plan, as well as relevant standards, laws and regulations, supervision and Environmental Management Plan in the project during the construction and operation phases.

6.1 RELEVANT INSTITUTIONS AND/OR AGENCIES

There are 10 core institutions responsible for environmental management, namely The Ministry of Commerce, Industry and the Environment-NDPCEI, The National Petroleum and Mineral Resources-ANPM, Secretary of Statement for Employment Policy and Vocational Training, Ministry of Defence, Ministry of Agriculture and Fisheries, Ministry of Health, Ministry of Justice, Minister of Public Works, Transports and Communications, TIMOR GAP, E.P., and contractor and sub-contractor. Their roles and responsibilities are described in ***Table 6.1-1***.

TABLE 6.1-1

INSTITUTIONAL ROLES AND RESPONSIBILITIES

Relevant Institutions and/or Agencies	Roles and Responsibilities
Ministry of Commerce, Industry and the Environment-NDPCEI	Ministry of Commerce, Industry and the Environment is the key agency to monitor and evaluate environmental performance of the Project and responsible for the design, execution, coordination and assessment of the policy for the areas of commercial and industrial economic activities and the cooperative sector.
The National Petroleum and Mineral Resources-ANPM	The National Petroleum and Mineral Resources is responsible for the design and execution of the energy policy and of the management of mineral resources, including petroleum and other strategic minerals as well as the licensing and regulation of the extraction activity, and industrial activity of improvement of oil and minerals, including petrochemical and refining.

TABLE 6.1-1

INSTITUTIONAL ROLES AND RESPONSIBILITIES (CONT'D)

Relevant Institutions and/or Agencies	Roles and Responsibilities
Secretary of Statement for Employment Policy and Vocational Training	The Secretary of State for Vocational Training, Employment and Policy is the main national counterpart for the implementation of the Training and Employment Support Project. The Secretary of Statement for Employment Policy and Vocational Training has the mandate for designing, executing, and coordinating policies related to professional training and employment.
Ministry of Defence	Ministry of Defence is responsible for the design, execution, coordination and assessment of the policy for the areas of national defence and military cooperation.
Ministry of Agriculture and Fisheries	The Ministry of Agriculture and Fisheries is responsible for the protection and conservation of nature and biodiversity, supervising the implementation of the policy and supervising activities detrimental to the integrity of the national fauna and flora, in collaboration with the Ministry of Commerce, Industry and Environment the forest resources and watersheds.
Ministry of Health	Ministry of Health is responsible for the design, execution coordination and assessment of the policy for the areas of health and pharmaceutical activities.
Ministry of Justice (Land properties)	Ministry of Justice is responsible for design, execution, coordination and assessment of the policy for the areas of justice, land and property, law and human rights. The ministry also defines the laws of the criteria for calculation the compensation and requests the granting of compensation based on fair compensation to land owners.
Minister of Public Works, Transports and Communications	Ministry of Public Works, Transports and Communications is responsible for supporting the coordination and promotion of management, maintenance and modernization systems of motorways, roads, and related services.
Project Proponent-TIMOR GAP, E.P.	TIMOR GAP is a Project Proponent that is responsible to follow the guidelines that has been stipulated in the EMP and relevant applicable rules and regulation which will enhance the sustainability of the environmental as well social enrichment.
Contractor and Sub-contractor	The Contractor including its approved sub-contractors, is contractually responsible to the Project Proponent for environmental performance. The Contractor will implement the mitigation measures, conduct periodic monitoring and reporting of its compliance with the environmental and social performance and work instruction in strict conformance with environmental conducts prescribed in the contract.

6.2 THE ROLES OF INSTITUTIONS ON THE IMPLEMENTATION OF THE EMP

There are three key groups with responsibility for environmental management of the Project:

- Project Proponent who manages the Project through the Project Management Team
- The Contractor and sub-contractor
- The Construction Safety Officer
- The Project Safety Officer
- Independent Consultant

Responsibilities of each party in environmental management are as follows:

1. The Project Management Team will:

- Be aware of the conditions stated within the EIA license issued by the NDPCEI.
- Ensure that the Contractor/s is aware of all specifications and legal constraints pertaining to the project specifically with regards to the environment.
- Assist contractor (subcontractor) in the implementation of the EMP
- Ensure that all stipulations within the EMP are communicated and adhered to by Contractor(s).
- Monitor the implementation of the EMP throughout the project by means of site inspections, assessments and meetings. This will be documented as part of the site meeting minutes.
- Be fully conversant with the Environmental Impact Assessment and the EMP for the project, the conditions of the Environmental Authorization (once issued), and all relevant environmental legislation.
- Make the decision on the changes made to the EMP.

2. Project HSE Officer

- Be aware of the conditions stated within the EIA license issued by the NDPCEI.
- Be fully conversant with the Environmental Impact Assessment and the EMP for the project, the conditions of the Environmental Authorization (once issued), and all relevant environmental legislation.
- Conduct regular audits/inspection at the construction site as stated in the EMP.
- Coordinate with the Contractor and the project management.
- Keep record of non-compliance including compliance with the EMP.

3. The Contractor (including sub-contractors) will be responsible for:

- Be aware of the conditions stated within the EIA license issued by the NDPCEI
- Ensure all construction and subcontractor personnel are informed of the objective of the EMP for compliance assurance
- Complying with the environmental management specifications and other applicable legislation.
- Adhering to any instructions issued by the Project Manager.
- Keep record of all incidents that have occurred during construction period. This should be available during audits.
- Maintaining a public complaints register.
- Conduct environmental training and awareness to employees.
- Arrange for all employees and those of subcontractors to receive training before the commencement of construction in order that they are aware of the conditions of the environmental authorization and the EMP.

4. The Construction HSE Officer will:

- Be aware of the conditions stated within the EIA license issued by the NDPCEI
- Be fully familiar with the content of both the Environmental Impact Assessment study and Environmental Management Program.
- Be fully conversant with all relevant environmental legislation and ensure compliance with them.
- Convey the contents of this document to the Contractor site staff and discuss the contents in detail with the Project Manager and Contractor. Training will be required to ensure all staff understands the process.
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP and Environmental Authorization.
- Take appropriate action if the specifications contained in the EMP are not followed.
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible.
- Review and approve construction methods (where it could result in environmental impacts), with input from the Project Manager where necessary.
- Ensure that activities on site comply with all relevant environmental legislation.
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMP.
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the Environmental Authorization.

5. Independent Consultant will:

- Ensure to cover the EHS policy and procedures, EMS including procedures for monitoring and review of EHS performance of its business units, EHS performance standards adopted by the corporate, and corporate support to its business units in EHS management.
- Conduct independent environmental audits.
- Ensure to cover the same areas covered by the internal audit, and verify results of the internal audit.
- Identify additional gaps in environmental management if any, and recommend improvements.
- Submit audit reports to the Project HSE Officer and if required, relevant authority.
- Engage specialist sub-consultants when required.

CHAPTER 7

SUMMARY OF IMPACTS

CHAPTER 7

SUMMARY OF IMPACTS

Impacts arisen from the Project activities during pre-construction, construction, operation and deactivation phases are summarized in both of environmental and social categories, as shown below:

7.1 ENVIRONMENTAL IMPACTS

7.1.1 Identified Environmental Issues and Impacts

Environmental issues and impacts are identified into three phases of pre-construction and construction, operation, and deactivation.

7.1.1.1 Environmental Screening Matrix

The screening process was conducted to review project activities with systematic analysis by using all environmental components in MREIS plus OHS issue. The screening process is the very first important step for environmental impact assessment to provide detail information for the assessment of main issues related to human and environmental impact.

Screening process for this project uses matrix analysis to screen environmental impact causing by the project for each phase of development ***(Table 6.1-1)*** which are "Activity or event of the project as shown in matrix rows" and Environmental components as shown in matrix columns". The significant of environmental components are represented by symbol scale; it is described by the assignment of a symbol scale as follows:

○ = Not relevant

● = Insignificant

▲ = Significant

The analysis of the significant of impacts from the activities of each environmental components plus OHS issue is shown in ***Table 7.1-1*** and summarized as follows:

TABLE 7.1-1
ENVIRONMENTAL SCREENING MATRIX

Potentially Affected Environmental Components	Pre-construction and Construction Phase										Operation Phase		Deactivation Phase			
	*Land Acquisition**	*Land clearing*	*Transport of pipe and other materials*	*Trench excavation*	*Pipe welding, and laying*	*Back filling*	*In-river construction of pipe supports*	*Hydrostatic testing*	*Worker camps*	*Construction Waste Management*	*Pigging for Pipeline Inspection*	*Inspection and Maintenance of Pipeline Corridor*	*Removing any cathodic protection and oil products*	*Cleaning the line by flushing it with fresh water, air, or inert gas.*	*Cutting up the pipeline and remove cut sections from the ground*	*Demolish pipeline crossing structures, pumping stations, and pigging stations*
Physical components																
Climate	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Topography	○	●	○	●	○	●	○	○	○	○	○	○	○	○	●	○
Geology	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Air	○	●	●	▲	●	▲	●	●	○	●	○	○	▲	○	▲	▲
Noise	○	▲	●	▲	●	▲	●	●	●	○	○	○	▲	▲	▲	▲
Surface waters	○	●	○	●	○	○	▲	▲	▲	▲	▲	●	▲	▲	●	▲
Groundwater	○	○	○	○	○	○	○	○	▲	▲	▲	○	▲	▲	○	○
Coastal waters	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Marine waters	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Soil	○	●	○	●	●	●	●	●	▲	▲	▲	○	▲	▲	●	●
Ecological Components																
Wetlands	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Mangroves	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Corals	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Fisheries	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Protected areas and national parks	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Wildlife	○	▲	●	●	●	●	●	●	●	○	○	○	●	●	●	●
Forests	○	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Coastal resources	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Economic Components																
Employment sectors	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Infrastructure facilities	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Land use	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Use of forests and other natural resources	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Fishing	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Agriculture	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Tourism	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Other industries	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Social Components																
Population and communities	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Health profiles of communities	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Institutions, schools and health facilities	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Community structures, family structures	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Land ownership	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Any types of common or individual rights on natural resources	▲	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Cultural components																
Cultural heritage	○	▲	○	▲	○	○	○	○	○	○	○	○	○	○	○	○
Archeological sites	○	▲	○	▲	○	○	○	○	○	○	○	○	○	○	○	○
Historic sites	○	▲	○	▲	○	○	○	○	○	○	○	○	○	○	○	○
Sacred sites	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Unique landscape	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
OHS																
Occupational health and safety of personnel	○	▲	▲	▲	▲	▲	▲	●	▲	●	▲	▲	▲	▲	▲	▲

Remark: * Land Acquisition is obvious shown in the pre-construction phase.
○ Negligible/Not relevant ● Insignificant Impact ▲ Significant Impact

Source: TEAM Consulting Engineering and Management Co., Ltd, 2016 has applied from USAID Environmental Procedures Training Manual for USAID Environmental Offices and USAID Mission Partners AFR Edition : March 2002.

(1) Pre-construction phase

Major activities during pre-construction phase will be land acquisition. This activity is to prepare the site ready for construction of the pipeline project. The main environmental issues is loss of economic crops and natural vegetation, and wildlife habitats. Therefore, the potentially affected environmental components in to be considered are land use, use of forests and other natural resources, agriculture, community and family structures, land ownership and, any types of common or individual rights on natural resources. The screening matrix is shown in ***Table 7.1-1***.

(2) Construction phase

Major activities during construction phase will be land clearing, transport of pipe and other materials, trench excavation, pipe welding and laying, back filling, in-river construction of pipe supports, hydrostatic testing, worker camps, and construction waste management. The main environmental issues are loss of natural vegetation and wildlife habitats, increase of noise, fugitive dust and emissions from vehicles and machines, waste disposal, increasing water turbidity from foundation construction, contamination of surface water from hydrostatic test water discharge, contamination of groundwater and soil from worker camps, and chance find or damaging cultural heritage, archeological site and historic site. For groundwater and soil pollution from disposal of construction waste from worker camp and pipe laying, the Consultant would evaluate impact and propose mitigation measures in worker camp and construction wastes.

Therefore, the potentially affected environmental components to be considered are air, noise, surface water, wildlife, forest, cultural heritage, archeological site, historic site and OHS. The screening matrix is shown in ***Table 7.1-1***.

(3) Operation phase

Major activities during operation phase will be pigging for pipeline inspection, and inspection and maintenance of pipeline corridor. However, there is a probability of other major and unexpected risks such as natural force/events (e.g. earthquake, landslide, flooding etc.), corrosion, third party damage (e.g. excavation, traffic accident, vandalism, fire/explosion), incorrect design & operation (e.g. equipment/mechanic failure and human errors) as shown in ***Figure 7.1-1***.

The main environmental issues are pigging waste, accident, pipe leakage and explosion. For impact on soil or water around disposal sites of the pigging wastes, the Consultant would evaluate impact and propose mitigation measures in pigging wastes. Therefore, the potentially affected environmental components to be considered is OHS. The screening matrix is shown in ***Table 7.1-1***.

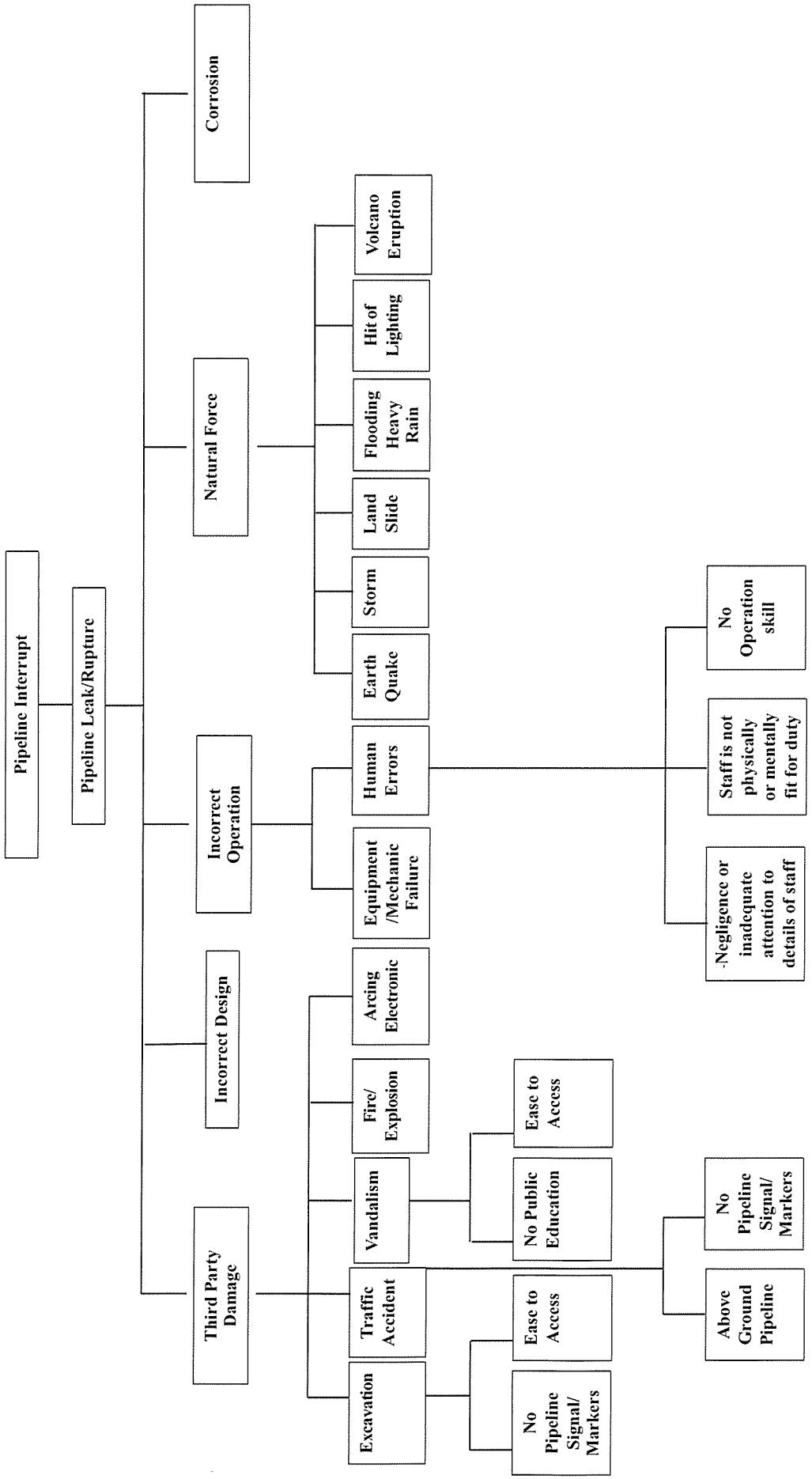


FIGURE 7.1-1 : PIPELINE INTERRUPTION

(4) Deactivation phase

Major activities during deactivation phase will be removing cathodic protection and oil products from the pipeline, cleaning the pipeline by flushing it with fresh water, air, or inert gas, cutting up the pipeline and removing cut sections from the ground, demolishing pipeline crossing structures, and demolishing the pumping stations, pigging stations, and block valve stations. The main environmental issues are fugitive dust and noise caused by heavy machines and equipment, disposal of waste, hazardous waste, and oil products and wastewater from cleaning of storage tanks and pipeline. The impacts will be similar to those occur during construction period. The screening matrix is shown in ***Table 7.1-1***.

Remark: For this Project, the time for deactivation of the pipeline system would come in the distant future when a decision is made by the Pipeline Company to cease permanently the operations of pipeline systems. As the deactivation is the event in distant future, the demolition EIA would need to considerably update the Deactivate Environmental Plan (DEMP) to prepare a new DEMP. The new DEMP will reflect conditions related to technologies, laws and regulations, and land use along the pipeline corridor which would be much different from the present conditions.

7.1.1.2 Key Environmental Issues of the Project

Based on the screening matrix, key environmental issues during pre-construction and construction, operation and deactivation, could be identified as shown in ***Table 7.1-2***.

Due to the closely related activities of the pre-construction and construction which most of them are integrated and cannot be distinguished, the Consultant, therefore, combine environmental issues of these two phases into one.

Based on the information on the Project construction, operation and decommissioning, environmental issues and impacts of the Project could be identified as shown in ***Table 7.1-2***.

During the pre-construction and construction phases, only the impacts of land clearing are permanent while the impacts of other environmental issues are transient and occur at one location in the pipeline corridor over a short duration as the construction moves along the corridor.

During the operational phase, the impacts will be pigging waste and accident risks. Pigging of the pipeline will be generated occasionally, and will give a small volume of petroleum wastes.

During the deactivation phase, the impacts are similar to those of the construction and will occur during the demolition period.

TABLE 7.1-2
IDENTIFIED ENVIRONMENTAL ISSUES

Project Activities	Environmental Issues	Generic Impacts on Receptors	Nature of Impacts
Pre-construction and Construction Phases			
1. Land Acquisition	Conversion of land from its existing conditions to the pipeline corridor	Loss of land ownership and livelihoods, terrestrial ecosystem	Significant social impacts, insignificant ecological impacts
2. Land clearing	Loss of economic crops and natural vegetation, and wildlife habitats	Impacts on terrestrial ecosystems, agro-ecosystem, and livelihood.	Permanent, occurred along the entire length of the pipeline corridor
3. Transport of pipe and other materials	Noise, fugitive dust, emissions, and vibration from vehicles	Discomfort and health risks to communities along the route	Reversible, occurred only during the construction period
4. Trench excavation	Noise, fugitive dust and emissions from excavating machines	Discomfort and health and safety risks to communities along the route	Reversible, occurred only during the construction period
	Archeological chance finds	Damaged artifacts	
5. Pipe welding, and laying	Waste materials disposal	Discomfort and health risks to communities along the route	Reversible, occurred only during the construction period
6. Back filling	Noise, fugitive dust, and emissions from machines	Discomfort and health risks to communities along the route	Reversible, occurred only during the construction period
7. In-river construction of pipe supports	Water turbidity	Impacts on aquatic ecosystem	Reversible, occurred only during the construction period
8. Hydrostatic testing	Disposal of water after the testing	Impacts on the receiving waters	Reversible, occurred only during the construction period
9. Worker camps	Waste disposal	Water and soil pollution	Reversible, occurred only during the construction period

TABLE 7.1-2

IDENTIFIED ENVIRONMENTAL ISSUES (CONT'D)

Project Activities	Environmental Issues	Generic Impacts on Receptors	Nature of Impacts
Operation phase			
1. Pigging for pipeline inspection	Pigging wastes	Impacts on soil or water environment around the disposal sites of the pigging wastes	Occasionally occurred during pigging operations
2. Operating the pipeline and pumping stations	Accidental risks (spill, fire, and explosions)	Fire , soil and ground/surface water contamination	Risks, low likelihood of occurrence
Deactivation or decommissioning of the pipeline system			
1. Removing any cathodic protection and oil products 2. Cleaning the line by flushing it with fresh water, air, or inert gas. 3. Cutting up the pipeline and removing cut sections from the ground 4. Demolish pipeline crossing structures , pumping stations, pigging stations, and block valve stations	Fugitive dust and noise caused by heavy machines and equipment	Discomfort, health risk and safety to worker and communities the deactivation site	Reversible, occurred only during the deactivation period
	Disposal of waste, hazardous waste, and oil products	Potential contamination of soil and groundwater	Occurred during the deactivation period
	Wastewater from cleaning of storage tanks and pipeline	Water and soil pollution	Occurred during the deactivation period

Source: TEAM Consulting Engineering and Management Co., Ltd., 2016

7.2 SOCIAL IMPACTS

Social Impact Assessment establishes that social impacts will require attention in the construction phase and operation phase. In the construction phase the number of workers on site would be about 150 persons.

During operation period, the Betano Pineline System Company (BPSC) would require about 30 persons for operations and maintenance. Therefore, social impact issues related to workers will not be as significant as the impacts during construction. Furthermore, the pipeline workers will consist mostly of skilled technicians and professionals. Hence, their impacts on the nearby communities would be minimal and insignificant.

For deactivation of the BPSC, its activities will be carried out at the end of the project life. The timing and activities undertaken during this phase will not be planned until closer to end of field life.

Then, four key social impact issues in the pre-construction and construction phases will need to be adequately addressed as part of the environmental and social management of the Project: (i) land acquisition and resettlement; (ii) conditions of worker camp (iii) influx of workers; and (iv) community health, safety and security. The pipeline safety is the only social impact issue during the operation phase.

Summary of social impacts during pre-construction, construction, operation and deactivation phases are described as follows:

7.2.1 Social Impact Issues during Pre-construction and Construction

7.2.1.1 Land Acquisition

The social management should focus on the relocation and livelihood restoration of about 10 affected households in each of Bobe and Bonuc sub-villages after resettlement in a new site to be provided in the Nova Betano new town to be developed.

At this stage, there is no detailed information on the affected households. It is proposed that a detailed physical and socio-economic surveys of the affected households be carried out for preparing a Resettlement Action Plan (RAP). The RAP will establish information on the affected people's present socio-economic conditions, their needs related to the relocation and livelihood restoration, and their views and suggestions on how should their needs be responded to by TIMOR GAP, E.P. and other concerned government agencies. Based on the information obtained from the household surveys, a practical relocation plan and livelihood restoration program can be designed.

7.2.1.2 Workers' Camp

The construction at its peak would require about 150 workers. Considering the international status of this Project, the design and operation of the worker camp should follow international guidelines as much as possible. Inadequate space and facilities and inadequate management of the worker camp could have such impacts as: (i) unhygienic living conditions with implications on health of workers; (ii) pollution or contamination of the natural environment outside the worker camp, such as fly infestation, water pollution, and odor; and (iii) exposure of workers on accidental risks or worker safety.

7.2.1.3 Influx of Worker

The influx of hundreds of workers during the three-year construction period could have both positive and negative impacts on the local communities as follows:

Creation of Demand for Local Goods and Services: The influx of workers will create demands for local goods and services, such as foods, handicrafts, and personal services such as hair cutting. These demands would be met locally and would create business opportunities to local people. This impact is therefore positive in nature.

Competing Use of Local Resources: The influx of workers could compete with the locals for limited local resources such as foods, water, health service, and infrastructure services. This completion could have impacts on the locals such as increased food prices, and inconveniences in using infrastructure.

Health Risks: Without proper management, the influx of workers could pose health risks to the communities. Communicable diseases such as sexually transmitted diseases, TB and hepatitis could be areas of concern.

Conflicts with Locals: Workers from other areas, including foreign workers, could have conflicts with locals due to differences in culture, value and ways of life.

7.2.1.4 Community Health, Safety and Security

This issue will be of concern to the communities near the construction corridor. The issue will be most significant in Karetamute sub-village (150 m from the corridor) and Bemetan sub-village which is only 20 m from the corridor. The other two sub-villages of Bobe sub-village and Bonuc sub-village will be traversed by pipeline.

IFC's Performance Standard 4-Community Health, Safety and Security prescribes in details its requirements related to community health, safety and security. The requirements are divided into two problem areas: (i) community health and safety; and (ii) security personnel.

The areas of concern under the two problem areas are reflected in the two objectives of PS4 as follows:

- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

The first objective is relevant to Community Health and Safety. The areas of concerns are indicated in PS4:

(1) Infrastructure and Equipment Design and Safety

(2) Hazardous Materials Management and Safety

(3) Ecosystem Services

(4) Community Exposure to Disease

(5) Emergency Preparedness and Response

The first four areas of concern require impact identification, assessment, and formulate mitigation measures. The last area of concern requires a design of an emergency preparedness and response plan.

The second objective is relevant to Security Personnel. The main area of concern is on the conduct of security personnel to be employed during the project construction, which may affect security of the communities.

7.2.2 Social Impact Issues during Operation

Communities along the pipeline corridor would naturally have concerns over safety associated with the pipeline once it is operational. Particular concerns included; risk of explosions, pipeline ruptures and oil leaks. While such concerns are generally unfounded due to the design of the pipeline (i.e. buried underground, restrictions along the pipeline corridor, and various safety measures), these concerns could affect community wellbeing and their perception of the safety of the area. The pipeline safety issue is considered significant and needs to be adequately addressed to alleviate concern of the communities.

7.2.3 Social Impact Issues during Deactivation Phase

Community health, safety and security will be an issue of concern to the two nearest communities of the construction corridor, namely Karetamute and Bemetan sub-villages. The areas of concern will be under the two problem areas of (i) community health and safety and (ii) security personnel, the same as those in construction phase.

7.2.4 Conclusion of Social Impacts

Both positive and negative impacts arisen during the pre-construction, construction and operation phases are generated by:

- Land acquisition
- Condition of worker camp
- Influx of workers
- Community health, safety and security
- Pipeline safety

The positive impact of economic benefits will also contribute up to regional and national levels as well. Its summary is shown in ***Table 7.2-1***.

TABLE 7.2-1

POSITIVE AND NEGATIVE IMPACTS ARISEN FROM SOCIAL ISSUES

Period	Issues	Positive Impact	Negative Impact
1. Construction	Land acquisition	-	- Impacts on livelihood of the land owners
	Worker camp	-	- The effects will be mainly on construction workers. Inadequate space and facilities and inadequate management of the worker camp could have such impacts as: (i) unhygienic living conditions with implications on health of workers; (ii) pollution or contamination of the natural environment outside the worker camp, such as fly infestation, water pollution, and odor; and (iii) exposure of workers on accidental risks or worker safety.
	Influx of workers	- Create demands for local goods and services	- Compete with the locals for limited local resources such as foods, water, health service, and infrastructure services
		- Create business opportunities to local people	- Increase food prices and inconvenience in using infrastructure
		- Local employment and cash flow in the local economy	- Pose health risks to the communities such as sexually transmitted disease, TB, hepatitis, etc.
			- Conflicts with locals due to differences in culture, value and way of life
	Community health, safety and security	-	- Personnel and property of Affected Community
			- Health and safety of Affected Community
2. Operation	- Pipeline safety	- Community wellbeing - Perception of the safety of the area	- Concern about risk of explosions, pipeline ruptures and oil leaks by communities
3. Implementation	- Socio-economic benefits	- Generate tax revenue to the local government	-
		- Increase regional revenue to improve health and educational services and including basic infrastructure	

CHAPTER 8

DESCRIPTION OF PROPOSED MITIGATION MEASURES

CHAPTER 8

DESCRIPTION OF PROPOSED MITIGATION MEASURES

Mitigation measures addressed the Project impacts during pre-construction, construction, operation and deactivation phases are described in two separates of environmental and social categories, as shown below:

8.1 PROPOSED MITIGATION MEASURES FOR ENVIRONMENTAL IMPACT

8.1.1 Mitigation Measures for Pre-Construction and Construction Phases

The summary of impacts as outlined in Chapter 6 of this EMP, environmental and social issues to be managed include: (i) land requirement; (ii) fugitive dust from construction activities; (iii) gaseous emissions within the construction site; (iv) noise within the construction site; (v) wastewater and solid waste from worker camp; (vi) construction waste; (vii) hydrostatic test water; (viii) water turbidity during in-river construction; (ix) chance finds for archeological , historical and sacred sites; (x) OSH of construction; (xi) land acquisition; (xii) condition of worker camp; (xiii) influx of worker; and (xvi) community health, safety and security. Mitigation measures and monitoring programs for the management of these issues are presented in ***Table 8.1-1***. Each mitigation measures and monitoring programs will be a working document and as such it will be reviewed and amended or updated as deemed necessary to reflect changes in construction schedule and management review changes.

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Land requirement for establishment of base camp, office, corridor with space, pipe laydown area with materials and shed including satellite camp	Loss of about 255 ha of forest land and 205 ha of agricultural land in relation to land requirement.	• Compensation for forest and agricultural land • Compensation and relocation for affected persons in Bobe and Bonuc sub-villages	• The Ministry of Public Works, Transport and Communication. • The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.	Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.	To be managed and identified by the Ministry of Public Works, Transport and Communication.	Number of complaints related to land requirement for pipe laydown area and camp site.	To be managed by the Ministry of Public Works, Transport and Communication.
Fugitive dust Site clearing, excavation work, move of heavy equipment and vehicles along the dirt road will generate fugitive dust	Fugitive dust includes: • TSP about 411 $\mu g/m^3$ compared to standard of exceeding 230 $\mu g/m^3$. • PM_{10} about 214 $\mu g/m^3$ compared to standard of not exceeding 150 $\mu g/m^3$	• Spray water at and around the construction areas and access roads during site preparation and grading. • Limit speed for vehicles and trucks not to exceed 40 km/hr. • Restore, resurface, and rehabilitate the disturbed areas as soon as practicable after completion of construction or disturbance. • Prohibit the open burning of waste in the pre-construction area. • Dust masks should be provided (where applicable) to all workers. • For construction site including spoil placement sites: – Use watering or other effective techniques on unsealed areas; – Rehabilitate construction sites and spoil placement as soon as the land becomes available. • Take measures (e.g. rumble bars and wheel wash bays) to ensure dust-creating material (earth or similar material) is not transported from the construction sites to roads or other areas in the public domain. • Cover all trucks carrying spoil or other loose materials. • Clear and remove all loose earth and similar material spilled or deposited within the construction sites and the transport routes from trafficked areas. • Take measures to avoid impacts of dust on adjacent properties such as: – Modify construction methods; – Increase dust suppression measures; or – Cessation of work when no other reasonable or practical measure is available.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Total Suspended Particulate (TSP-24 hrs) • Particulate Matter less than 10 micron (PM10-24 hrs) Nitrogen dioxide (NO_2) • Wind speed and direction (WS/WD)	• Number of complaints filed through the complaint response channel. • Number of times that the local ambient air quality is below the prescribed standards related to fugitive dust. **Pollutant** / **Not to be Exceeded** TSP 24- hour average: 230 $\mu g/m^3$ [a/] PM_{10}, 24-hour average: 150 $\mu g/m^3$ (Interim target-1)[b/] **Remark:** [a/] WHO Pollution Prevention and Abatement Handbook , WHO, 1988 [b/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Gaseous emissions Operations of diesel-powered heavy construction equipment, vehicles and generator sets will generate gaseous emissions during the construction.	• Gaseous emission will be mostly generated by typical pollutants such as NO_x, SO_x, CO, and particulate in the exhaust gases discharged from the engines. • Its effect would be on health of construction workers.	• Manage the movement of construction vehicles entering and leaving the construction sites to avoid the potential for vehicle emissions impacting on adjacent properties such as avoiding or minimizing queuing on streets approaching the worksites or adjacent to other sensitive activities; • Adopt procedures to avoid construction vehicles idling for excessive periods (e.g. more than 5 minutes) if required to queue to enter the construction sites; • For stationary plant and equipment powered by diesel motors, take measures to avoid or mitigate and manage the potential impacts of exhaust emissions on adjacent residential or other sensitive activities such as all equipment powered by diesel motors are fitted with emission control measures, and are regularly maintained to manufacturers' specifications. • Maintain all construction equipment in proper working conditions according to the manufacturer's specifications. • Provide adequate training to the equipment operators in the proper use of equipment. • Use the proper size of equipment for the job. • Use the equipment fitted engines with latest low emission technologies. • Perform on-site material hauling with trucks equipped with on-road engines • Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Nitrogen dioxide (NO_2) • Sulfur oxides (SOx) • Vehicle motors idling for periods exceeding 5 minutes while in queues to access construction sites (on-going). • Inspect the position of stationary plant and equipment powered by diesel engines to ensure exhaust emissions are directed away from sensitive activities and neighboring properties (initially on establishment).	• Number of complaints filed through the complaint response channel. • Number of times that the local ambient air quality is below the prescribed standards related to exhaust emission. **Pollutant** / **Not to be Exceeded** NO_2, 24-hour average: 200 µg/m³ (Interim target-1)[a/] SO_2, 24-hour average: 125 µg/m³ (Interim target-1)[a/] **Remark:** [a/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.
Noise level Operations of heavy construction equipment during land clearing, pipeline lowering, and backfilling, etc. would generate noise.	• Loud noise will disturb and cause annoyance to hearing capacity of the people in surrounding area. • Loud noise over long period will cause hearing impairment.	**Design** • Design to use construction equipment that generate low levels of noise with adoption of best available technologies to minimize noise. • Conduct a noise survey covering the identified sensitive receptors to update the existing baseline data in the Final EIA Report. • Demonstrate through predictive modeling of the proposed construction techniques and monitoring ambient noise readings prior to construction to establish pre-disturbance levels, the likely levels of noise due to construction works throughout the construction period.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Leq 1 hr • Leq 24 hrs • Lmax	• The incremental increases in noise level during the construction works compared to the targets. • Net ambient noise level compared to the applicable ambient noise standard. **Area** / **Not to be Exceeded** Industrial and Commercial area: Leq (24 hrs) - 70 dB(A)[1/,2/] - 70 dB(A)daytime [3/] - 70 dB(A) nighttime [3/] Residential areas: Leq (1 hr) - 55 dB(A)daytime [3/] - 45 dB(A) nighttime [3/] Lmax - 110 dB(A) [2/]	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 8.1-1
MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Noise level Operations of heavy construction equipment during land clearing, pipeline lowering, and backfilling, etc. would generate noise. (cont'd)		**Pre-Construction and Construction Noise** • Construction works which generate excessive levels of noise must be carried out, only during the period between 6.30 am to 6.30 pm Mondays to Saturdays. Such construction works on Sundays or public holidays will need approval from the resident engineer of the Project Proponent. • Protect the affected sensitive receptors beyond standard construction hours such as installation of acoustic walls or noise barriers. • The noise reduction at the perimeter could be achieved using an acoustic wall or a sound barrier (Steel 18 ga with 1.27 mm. thickness which transmission loss of 25 dB(A) or equivalent) at least 3 m high with adequate length to block the noise emanating to the receptor. • Provide ear plugs or ear muffs to workers operating in the excessive noise areas. • Limit speeds of vehicles in the construction site, not exceed 40 km/hr. • Include measures to achieve the construction noise targets such as: – Commence advanced notification of works and undertake on-going consultation with potentially affected property owners and occupants. – Establishing temporary noise barriers between construction worksites and sensitive receptors. – Fitting noise-reduction measures to all equipment engaged in the construction works; • Designing worksites to minimize potential noise impacts on nearby sensitive places.				**Remark:** [1/] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974 [2/] Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 [3/] Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007	
Wastewater Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater.	Wastewater volume will be from: • about 15.3 m^3/day from base camp • about 1.9 m^3/day from each satellite camp.	**Design Concept** The Contractor will prepare detailed design of a wastewater management system for the worker camp, consisting of a collection system and a simple treatment system. Its proposed design concepts are: **For Domestic Wastewater** • Toilet wastes will be separated from grey water or sullage.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Total Nitrogen • Temperature • Total Suspended Solid • Oil and Grease • BOD_5 • COD • Total Phosphorus	• Qualities of the treated effluent compared with the applicable effluent quality standards. • The final effluents are expected to meet the following quality standard: - pH 6-9 - Total Nitrogen <10 mg/l [a] - Temperature increase ≤3 °C [b] - TSS <30 mg/l	Twice a year during construction

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Wastewater Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater. (Cont'd)		• Toilet wastes will be discharged into a septic tank(s) with a hydraulic retention time of about 5 days. The volume of toilet wastes is estimated at about 20% of the total volume of domestic wastewater. The septic tank effluent (septage) will be discharged into the retention pond. Alternatively, toilet wastes will be treated in a package treatment plant using an aerobic process. • The temporary retention pond within worker camp site areas will be designed as an oxidation pond. **During Construction** • Water in the retention pond will be used for dust suppression on unpaved areas in the construction site, and also for watering of the green area. • The remaining volume will be discharged into the water sources.			• Sulfides	- Oil and grease < 10 mg/l - BOD_5 < 30 mg/l - COD < 150 mg/l - Total Phosphorus <2 mg/l - Sulfides <1 mg/l **Remark:** [a] The effluent concentration of nitrogen (total) may be up to 40 mg/l in processes that include hydrogenation [b] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items.	An amount of waste is equivalent to: • About 237 tons of *construction waste* over the 60 km length of pipeline corridor, or about 0.2 tons/day over the period of 36 months. • About 0.8 m^3 / day of *waste from workers.* • About 0.25 tons/month of *hazardous waste*.	**Design and Planning before Commencing the Construction** • Design own disposal facility, preferably within the construction site. • Design the construction methods to generate the least amount of wastes. • Design methods of waste transport and disposal. • Prepare an action plan for waste management to reflect cumulative results of the previous quarters. • Consider using materials and products that have a recycled content. • Arrangements with suppliers to return any unused construction materials; • Where possible, goods to be ordered in bulk to minimize packaging waste and packaging material returned to the supplier wherever practicable; and **During Construction** **Waste Segregation** • Design and implement a waste segregation system. • Provide an appropriate number of containers with adequate volume and appropriate materials at strategic locations to support the segregation in terms of recycling, reuse and disposal sub-categories.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in total solid waste management cost of 25,820 USD.	• Efficiency of the collection, • Storage, and disposal volume, and • Record keeping	Number of complaints related to waste disposal.	• Daily site inspections, and • Detailed weekly site inspections.

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items. (Cont'd)		**Waste Collection and Storage** • Collection and transport each sub-category of segregated wastes on daily basis. • Provide a roofed storage area with adequate space for storing the segregated wastes waiting for the on-site or off-site reuse or recycling. • Special design the storage area for hazardous waste to prevent spills or leaks onto the soil. **Waste Reuse and Recycling** • Chipping and mulching of vegetation and reuse for landscaping purposes; • Reuse of excavated material as fill at approved fill sites; • Topsoil free of weeds to be stockpiled and stored for re-use, if possible; • Collection and return of packaging materials (e.g. pallets) to suppliers wherever practicable; • Remove any contamination inadvertently deposited in recyclable waste material containers. Provide cleanup of excessive contamination at recycling vendor locations when such contamination is not controlled at the project site. • Collection and recycling of used oils by a licensed contractor; • Collection by a licensed contractor of empty oil and fuel drums and other containers for return to recycling facilities; **Waste Disposal** • Disposal of the remaining wastes that are unable to be reused or recycled in the approved landfill site. • Prohibit haphazard disposal of construction waste in or off the construction site. • Inert wastes such as broken tiles, bricks, plastics should be used for filling the site in areas planned to be vacant space. • No burning of wastes. • Decomposable wastes such as food wastes and vegetation may be disposed of by composting. • Hazardous wastes will be handled by a licensed hazardous waste contractor, otherwise finding for appropriate arrangements for incineration, safe permanent storage, or other appropriate methods of disposal.					

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		On-site Record Keeping Design and maintain record keeping procedures with provisions for: • Tracking collections of waste materials at the sites and deliveries to recycling, reuse, salvage, and landfill facilities. • Maintaining on-site logs that include for each load of materials removed from the site: type of material, load weight, recycling/hauling service, and date accepted by recycling service or landfill.					
Hydrostatic Test Water Hydrostatic test of all four installed pipes generate tested water.	Discharge of 9,900 m^3 tested water to natural receiving water.	• Formulate and submit a hydrostatic test plan for approval. The hydrostatic test plan will provide the following information: – Sections to be tested and testing schedule – Water volume required for the test – Sources and expected characteristics of the test water before discharge – Chemical to be used in the test, if there is any – Existing conditions-For each river, present information on existing water quality, physical conditions at the proposed section where the hydrostatic test water will be discharged, downstream water use, flow conditions. In addition to narrative information, photographs and drawings should also be included to support the information. – Expected rate and duration of the discharge of hydrostatic test water at each selected river. – Design of structure or facilities to be constructed at each discharge point to prevent damage to the embankment or bed of the river. – Water quality sampling plan before, during and after the discharge of hydrostatic test water to evaluate impacts on river water quality. • Conduct the hydrostatic test with specific practices as following practices: – Restrict water withdrawal for hydrostatic testing not to exceed 10% of the stream flow of the watercourse at the time of withdrawal or as required by permit / approval conditions.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Temperature • Suspended Solids	• Qualities of the treated test water compared with the applicable effluent quality standards. • The hydrostatic test water are expected to meet the following effluent quality standard: - pH 6-9 - Temperature increase ≤3 °C [a] - TSS <30 mg/l **Remark:** [a] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	Once after construction

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		– Ensure that sufficient workers and equipment are available onsite to repair any rupture, leak or erosion problem that may arise during testing. – No chemicals, biocides or conditioners will be added to the pipeline test water unless otherwise approved by the Project Manager. – Use a diffuser to dissipate and reduce the rate of water as it is released and monitor dewater points for potential erosion problems. Use riprap, sheeting, tarpaulins or other comparable measures to protect the ground and vegetation from erosion at the discharge sites. – Monitor discharge locations to ensure that no erosion, flooding or detrimental ice build-up occurs. – Collect samples of source water and hydrostatic test water and analyze to demonstrate regulatory compliance. For this purpose, samples will be collected of hydrostatic test water at the beginning, middle and end of the release for testing for the project record. – In case of complaints about discharging of the test water from hydrostatic test, quick action of problem solving has to be conducted					
Water Turbidity In-river construction of pipe support columns will cause water turbidity.	A small turbidity plume would be observed in the river around the site, over a short distance before the turbidity returns to its normal level.	**Design and Planning** • Ensure the design of pipeline bridge for each river and the method of its construction will give due consideration on impacts on water quality, particularly turbidity or suspended solids. • For each river, the Contactor will: – Conduct a survey of downstream water user, river bed and embankment conditions at the proposed construction section. – Estimate the duration and magnitude of likely impacts of the in-river construction activities on river water quality. – Submit an action plan containing results of the surveys and impact assessment, and proposed methods of construction and mitigation measures to be implemented in each river.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • DO • Suspended Solids • Turbidity	• Increase in river water turbidity before and during the construction. • The river water quality is expected to meet the following freshwater quality standard: - pH 6.5-9 [a] - Dissolved oxygen ≥ 3.5[/] mg/l [a] - Turbidity crease ≤ 25 (Upstream) [b] ≤ 390 (Downstream) [b] - Suspended solids 80 mg/l [b] **Remark:** [a] National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009 [b] Quality Criteria for Water, 1986	2 times; before and during construction.

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		Construction • Undertaken in the low flow conditions, and should be completed with all temporary facilities in the river completely removed before the high flow season. • Minimize the areas that will be disturbed, including the river bed, bank, access to the construction site, and laydown area. • The on-land construction area near the river bank will have appropriate measures to minimize soil erosion during rainfalls. • The on-land construction area will be rehabilitated to its previous conditions as soon as the construction is completed.					
Chance Finds for Archeological, Historic and Sacred Sites During site clearing and excavation of pipe trench, the Contractor may discover artifacts which potentially could have archeological, historic, religious, or cultural value.	Operational activities may possibly destroy some artifacts presented under the pipeline corridor.	• Site supervisor/foreman shall order construction workers to stop immediately the construction activities in the area of the chance find. • Inform concerned authority, including local leaders, for proper management if historic is found. • Delineate and mark clearly the discovered site or area and prohibit physical activities in the area without prior approval of the concerned authority. • Install temporary site protection measures (warning tape and stakes, avoiding signs). • Strictly enforce any no-go area needed to protect the site. • Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the responsible Ministry takes over. • If it is necessary to relocate a cemetery and grave yard, cultural ceremony should be arranged prior to the relocation.	• The contractor to inform the Project Proponent. • The Project Proponent to inform concerned authorities in case of chance finds archeological, historic, religious, or cultural value.	To be included in the total construction contract cost	Site inspection	Number of complaints filed through the complaint response channel.	During land clearance and site preparation
OSH of construction workers Activities related to pre-construction and construction may harm health of construction workers	There is a possibility that the workers/employees might be injured during working. Pre-construction.	Mitigation measures are identified in the worker camp management. (Under social issue)	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Accident • Record keeping	Number of accidents and injuries in the worker camps.	Daily and weekly inspection

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Land acquisition Site preparation for establishment of base camp, office, corridor with space, pipe laydown etc will occupy some forest and agricultural areas.	Reduce of forest and agricultural areas which are economic resources of villagers who collect forest products and cultivate on these areas.	Compensation and relocation for affected persons in Bobe and Bonuc sub-villages	• The Ministry of Public Works, Transport and Communication. • The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.	Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.	To be identified and managed by the Ministry of Public Works, Transport and Communication.	Number of complaints related to land acquisition.	To be managed by the Ministry of Public Works, Transport and Communication.
Worker Camps Mismanagement of worker camps may harm workers' health and pollute surrounding environment.	• Unhygienic living conditions will affect health of workers; • Pollution of the natural environment outside the worker camp, such as fly infestation, water pollution, and odor; • Exposure of workers on accidental risks or worker safety.	Ensure the design, operation, and management of the worker camp are within specific requirements as follows: • The worker camps should be made of decent materials that could withstand heavy rains and storms, with adequately ventilated and lighted. • Provide a sleeping space of at least 4 m^2 per worker, with separate rooms for professional staff. • Number of toilets and baths should be 1 unit for 20 workers. • Plan for common canteen which can accommodate at least 150 persons. • Provide common areas for cloth washing and drying with adequate water supply and drainage. • Provide recreational facilities with sufficient accessories. • Set up one shop to sell sundry goods to the workers. • Strictly control fly, insect and rodent. • Provide medical services at a small clinic served by a doctor. • Prepare fire and safety plan for the camps. • Basic camp infrastructure with facilities of power supply, telecommunication, water supply, drinking water, drainage, sanitation and solid wastes management. • Establish and enforce codes of conduct within and outside the worker camps covering camp security, fire safety, drug using, drinking, smoking, and visiting guests. • Provide security guards to be in charge of the security of camp. • Provided transport services from the project site to nearby communities. • Environmental management of the demolition and dismantling of the worker camp and associated facilities after the construction is completed.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	• Worker Camp • Worker health and safety	• Number of complaints related to worker camps • Number of accidents and injuries in the worker camps.	Daily and weekly inspection.

TABLE 8.1-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Influx of Worker Employment of a large number of construction workers will create both of positive and negative impacts	*Positive impact* • Creation of demand for local goods and services; *Negative impact* • Competing use of local resources; • Health risks to the communities such as communicable diseases; • Conflicts with the locals due to differences in culture, value and ways of life.	• Ensure that local provision of goods and services to the workers will be orderly and clean, and will not create unsanitary conditions near the worker camp. • Avoid using local resources as much as possible, and should provide a medical clinic within the worker camp. • Provide communicable diseases control program related to the sanitation and hygiene program for the worker camp. • Provide brief information to non-local workers, to make them aware of cultural sensitivity of the locals.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	Feedback and complaints from affected households.	Number of complaints related to influx of worker	Daily and weekly inspection
Community health and safety Mismanagement or improper control of pre-construction and construction works may affect health and safety including security of the communities resided the pipeline corridor.	The locals and passers-by along the pipeline route might be injured or being insecure.	• Undertake a program of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto the construction corridor where the construction is ongoing. • Ensure that signs are put up around work fronts and construction sites advising people of the risks associated with trespass. • Ensure that there is adequate fencing around pipe lay down yards and other similar facilities to minimize the risk of trespass. • When work fronts are within 100 m of an inhabited building, all equipment will be parked overnight in a demarcated area • Select security personnel based on a careful background screening of the applicants and provide their training. • At the intersection of the construction corridor and local roads or trails, a diversion route must be provided during construction with warning signs to vehicles and pedestrians. • Truck drivers and operators of heavy construction equipment must receive training in public safety in their works.	• The Contractor under the supervision of the EHS Manager of the Project Proponent. • The EHS Manager to involve in CSR program.	To be included in the total construction contract cost	CSR program and its implementation	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Daily and weekly inspection

8.1.2 Mitigation Measures for Operation Phase

The summary of impacts as outlined in Chapter 6 of this EMP, environmental issues in the O&M of the pipeline and its associated facilities could be controlled and will not create any significant environmental impacts. Environmental and social issues to be controlled include: (i) pigging waste; and (ii) operation risk and (iii) community health, safety and security from accidental risks of the pipeline operation. Mitigation measures and monitoring programs for the management of these issues are presented in ***Table 8.1-2***.

Each mitigation measures and monitoring programs will be a working document and as such it will be constantly reviewed and amended or updated as deemed necessary to reflect changes.

TABLE 8.1-2
MITIGATION MEASURES DURING THE OPERATION PHASE

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitoring	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Environmental Issues							
Waste Cleaning of using pigs along the pipeline will generate waste.	Waste from pigging	**Pigging Waste Collection and Transportation** • The pigging wastes will be collected and transported to the waste oil treatment unit of the Betano Refinery's wastewater treatment plant. • The Operational Manager will supervise the collection, storage, and transport of the pigging wastes to the refinery's wastewater treatment plant. **On-site Record Keeping** • The ESH manager will design and maintain procedures for recording the volume of pigging wastes collected and sent for treatment at the refinery.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC.	Including in the operational cost of Betano Pipeline System Company	• Quality of oily sludge before and after the pigging waste is treated. • Volume and characteristics of pigging wastes	Number of complaints related to pigging waste disposal	Every time the pigging waste is sent to the refinery for treatment, about 2 times per month.
Operational risk Defective design, installation, and operation and management of operational work may cause accidental fires and explosions of pipelines	Damage of the pipeline due to risk of oil leak and explosion	Risk Management Program must be in place as a means to guarantee the safe start-up of the commercial operations with all risks fully under control as following : **1. Third Party Damage** **1.1 Excavation** (Ease to access by third party, No pipeline signal or marker) • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. • The minimum cover of buried pipeline shall be accordance with ASME/ANSI B31.4 standards. **1.2 Traffic Accident** (No pipeline signal or marker) • The pipeline signal or marker will be installed along the pipeline route. • The traffic signal shall be installed while pipeline laid above ground.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Monitoring emergency incidents situations such as accident, fire, oil spill, etc. including restrain and recovery the situations	• The likely of incident for each pipeline in case of pipe rapture is 3.94 times in 1,000 years (worst case scenario). • The operating procedure according to the standard of international standards of the American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI); ASME/ANSI B31.1, B31.4.	Daily and weekly site inspections

TABLE 8.1-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitoring	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		1.3 Vandalism • The project shall be educated the people who living in the vicinity area, in order to make the community understand and participate in the process of project development. • The project shall be built-up the relationship with the local communities. **1.4 Other damage, i.e., Fire/Explosion, arcing of Electronic from the other etc.** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. **2. Incorrect Operation** **2.1 Mechanical/Equipment Failure** • The pipeline operation shall be done in accordance with the international standards (ASME/ANSI B31.4, ASME/ANSI B31.1, etc.) • Regular maintenance and inspection the equipment, machines to be in good conditions. **2.2 Incorrect Installation** • Installation of machinery and equipment shall be in accordance with codes applicable to the specific type and their installation manual or guidelines. • After installation, machinery or equipment shall be tested under conditions approximating actual operations to assure their proper functioning.					

TABLE 8.1-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitoring	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		2.3 Human Errors (No operation skill , Staff is not physically or mentally fit for duty, Negligence or inadequate attention to details of staff) • Staff training to be provided on a regular and continuing basis. • Physical check up programs for staff relevant to their tasks as required by regulations or safety standards • Random checks of drug use. • Instilling work safety discipline into staff **3. Natural Forced** **3.1 Earthquake** The pipeline is designed in accordance with the following criteria: • Design Code ASCE: 7-10 • Load Combination shall be as per ASCE 7-10 • Site Class: B • Risk Category: IV • Seismic Design Category: D • Design return period: 475-year **3.2 Storm** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way **3.3 Hit of Lightning** The pipeline shall be provided the lightning or fault currents prevention systems in accordance with NACE RP-O1-77 Guidelines. **3.4 Flood/Heavy Rain** The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route.					

TABLE 8.1-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitoring	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		3.5 Volcano Eruption According to TIMOR LESTE: Natural Hazard Risks map provided by United Nation Office for the Coordination of Humanitarian Affairs (OCHA), there are no actives volcano within the project area and vicinity. **4. Corrosion** • The pipeline shall be used 3LPE for External Coating, that consist of a three layers coating system comprising: - First layer (inner): Fusion Bonded Epoxy (FBE). - Second layer (intermediate): Chemically Modified Polyethylene Copolymer - Third layer (outer): High-density high molecular weight UV stabilized Polyethylene (HDPE) • Three layers shall be used for Painting (External Coating for A/G) • The Cathodic Protection (CP) shall be provide to prevention the corrosion. • Pre-cast concrete sleeper shall be used for above-ground pipeline instead of steel structure in order to avoid corrosion problem.					
Social Issues							
Community Health and Safety Mismanagement or improper control of operational work may affect health and safety including security of the adjacent communities	• Risk of explosions; and • Pipeline ruptures and oil leaks	• Undertake stakeholder engagement regarding the pipeline operations to present and discuss safety features of the pipeline system. • Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns; and • Undertake a community education program on pipeline safety to alleviate concerns.	The General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Feedback and complaints from affected households.	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Throughout the entire operation period

8.1.3 Mitigation Measures for Deactivation Phase

The summary of impacts as outlined in Chapter 6 of this EMP, the demolition is the reverse of construction. The demolition is the reverse of construction. For this Project, the demolition would involve the following tasks:

- Removing any cathodic protection from the pipeline.
- Physically disconnecting the pipeline from the storage tanks at its two ends.
- Removing the oil products from the pipeline.
- Cleaning the pipeline by flushing it with fresh water, air, or inert gas.
- Capping the pipe at all open ends by welding on steel caps.
- Hardening foam is injected at certain locations along the pipe to prevent water and contamination migration through the pipeline.
- Cutting up the pipeline and remove cut sections from the ground.
- Demolish pipeline crossing structures
- Demolish the pumping stations, pigging stations, and block valve stations.

The demolition will generate environmental problems similar to those of the construction phase but will be different in nature, scope and magnitude. The major environmental issues would be: (i) fugitive dust and noise; (ii) hazardous wastes and oil products from the storage tanks and pipeline; (iii) wastewater from cleaning of storage tanks and pipeline; and (iv) community health, safety and security from deactivation activities. Mitigation measures for these environmental and social problems will be similar to those normally used during the construction. The mitigation measures are presented in ***Table 8.1-3***.

TABLE 8.1-3

MITIGATION MEASURES DURING THE DEACTIVATION PHASE

Activities/Issues	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Demolition of structures and operation of heavy equipment and vehicles along the dirt road will generate: - *Fugitive dust* - *Loud noise* - *Solid waste* - *Hazardous wastes and oil products* from the storage tanks and pipelines - *Wastewater* from cleaning of storage tanks and pipeline	Fugitive dust will be generated and disturb health of workers and the locals adjacent to the demolition site.	• During the deactivation phase, the Project Proponent prepared at the EIA stage will not be applicable and will replaced by the new deactivation environmental management plan based on the new EIA. • The environmental issues, major sources, magnitude, receptor, predicted impact and mitigation measures in this phase will be similar to those occur during the construction phase. • However, activities of this phase will be demolition only then impacts from demolition activities will be controlled by the demolition contractor. • The contractor will be required to adopt the best practice to minimize impacts from : - Dust - Gas emission - Noise from heavy machinery and from demolition activities - Hazardous wastes and oil products - Wastewater and wastes	The demolition contractor and to be controlled by the project proponent.	• To be included in the demolition contract • To be included in the total solid waste management cost of 13,000 USD	*Fugitive dust* • Quantity of dust • Wind speed and direction • Complaints from the nearest communities *Noise level* • Complaints from the nearest communities *Solid waste* • Quantity • Its disposal *Hazardous wastes and oil products* • Quantity • Disposal management *Wastewater* • Volume and • Its discharge	• Number of complaints from affected local people along the pipeline route. • Number of complaints related to waste disposal and waste water discharging.	Regular site inspection (weekly minimum) by in-house staff.
Community Health and Safety Mismanagement or improper control of demolition work may affect health and safety including security of the workers adjacent communities	Demolition workers, the locals and passers-by along the pipeline route might be injured or being insecure.	Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns.	The Project proponent	To be included in the annual budget of the Project proponent	Complaints from local communities	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route	Regular inspection (weekly minimum) by in-house staff.

CHAPTER 9

GOVERNING PARAMETERS

CHAPTER 9

GOVERNING PARAMETERS

TIMOR GAP, E.P. has a mission to excel in providing services for the industry with quality, health, safety and environment. The concerned standards, guidelines and requirement will be prescribed in the contract for contractor to comply with and the Project Proponent will implement parts of the EMP for the operational and deactivation phases. As the national environmental standards are still incomplete, most governing parameters for environmental management of this Project are taken from generally accepted international standards.

The concerned natural standards are described in ***Section 9.1-9.3***. The Environmental Health, and Safety-General Guidelines are extracted from the IFC standards and guidelines and presented in ***Section 9.4***.

9.1 PROPOSED GOVERNING PARAMETERS FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

The governing parameters for this phase are presented in ***Table 9.1-1*** to ***Table 9.1-3***.

TABLE 9.1-1
PROPOSED EMISSION STANDARDS

Subjects	Parameters	Values	References
Effluent Levels		Maximum value	Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007
	pH	6-9 S.U.	
	BOD_5	30 mg/L	
	COD	150 mg/L	
	TSS	30 mg/L	
	Oil and Grease	10 mg/L	
	Chromium (total)	0.5 mg/L	
	Chromium (Hexavalent)	0.05 mg/L	
	Copper	0.5 mg/L	
	Iron	3 mg/L	
	Cyanide (total)	1 mg/L	
	Cyanide (free)	0.1 mg/L	
	Lead	0.1 mg/L	
	Nickel	0.5 mg/L	
	Mercury	0.02 mg/L	
	Vanadium	1 mg/L	
	Phenol	0.2 mg/L	
	Benzene	0.05 mg/L	
	Benzo (a) pyrene	0.05 mg/L	
	Sulfides	1 mg/L	
	Total Nitrogen	10 mg/L [a.]	
	Total Phosphorus	2 mg/L	
	Temperature increase	$\leq 3^{o}C$ [b]	

Note :
a. The effluent concentration of nitrogen (total) may be up to 40 mg/l in processes that include hydrogenation
b. At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.

TABLE 9.1-2
PROPOSED AMBIENT ENVIRONMENTAL STANDARDS

Subjects	Parameters	Values	References
Ambient Air Quality	TSP 24-hour average[1/] PM_{10} 24-hour average[2/] PM_{10} annual[2/] NO_2 1-hour average[2/] NO_2 annual[2/] SO_2 24-hour average[2/] $SO_2$10-minute average[2/]	230 µg/m^3 150 µg/m^3 (Interim target-1) 70 µg/m^3 (Interim target-1) 200 µg/m^3 40 µg/m^3 125 µg/m^3 (Interim target-1) 500 µg/m^3	[1/] Pollution Prevention and Abatement Handbook, WHO, 1998 [2/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005
Ambient Noise Levels - Industrial and commercial area - Residential areas	Leq (24 hrs) Leq (1 hr) Lmax	70 dB(A)[1/,2/] 70 dB(A)daytime [3/] 70 dB(A) nighttime [3/] 55 dB(A)daytime [3/] 45 dB(A) nighttime [3/] 110 dB(A) [2/]	[1/] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974 [2/] Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 [3/] Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007
Freshwater Quality	Dissolved oxygen pH Turbidity Suspended solids	≥ 3.5 mg/L 6.5-9 ≤ 25 ppm (Upstream) ≤ 390 ppm (Downstream) 80 mg/L	National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009 Quality Criteria for Water, 1986

TABLE 9.1-2

PROPOSED AMBIENT ENVIRONMENTAL STANDARDS (CONT'D)

Subjects	Parameters	Values	References
Land Stability	Industrial, Commercial and residential areas		Environmental Land Use Planning and Management, 2004
	Stable:	Areas of 0-5% slope that are not underlain by land slide deposits	
	Generally stable:	Areas of 5-15% slope that are not underlain by landslide deposits	
	Generally stable to marginally stable:	Areas of greater than 15% slope that are not underlain by landslide deposits or bedrock units susceptible to landsliding	
	Moderately unstable:	Areas of greater than 15% slope that are underlain by bedrock units susceptible to landsliding but not underlain by landslide deposits	
	Unstable:	Areas of any slope that are underlain by or immediately adjacent to landslide deposits	

TABLE 9.1-3

SOIL CONTAMINANT STANDARDS

Scenario	Unit	Arsenic	Benzo(a) pyrene	Cadmium	Boron	Chromium III	Chromium VI	Copper	DDT	Dieldrin	Dioxines	Inorganic Mercury	PCB[3]	PCP[4]
Standard residential 10% produce[1]	mg/kg dry weight	0.39	0.062	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Residential 0% produce-High density residential[2]	mg/kg dry weight	0.39	-	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Agriculture (no residence)	mg/kg dry weight	-	0.15	-	-	-	-	-	-	-	-	-	-	-
Nature	mg/kg dry weight	-	-	-	-	-	-	-	-	-	-	-	-	-
Other green, berms, industry, infrastructure	mg/kg dry weight	1.6	0.21	800	200,000	1,500,000	5.6	41,000	0.25	0.11	0.018	310	0.018	9

Remark: [1] standard residential lot, for single dwelling site with gardens, including home grown produce consumption (10%)

[2] Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.

[3] Polychlorinated biphenyls

[4] Pentachlorophenol

Source: US EPA Region 9 Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations. Direct exposure pathways. General information and background, http://www.epa.gov/region09/waste/sfund/prg/index.html

9.2 PROPOSED GOVERNING PARAMETERS FOR OPERATION PHASE

The governing parameters for this phase are presented in ***Table 9.2-1*** to ***Table 9.2-2***.

TABLE 9.2-1

PROPOSED AMBIENT ENVIRONMENTAL STANDARDS

Subjects	Parameters	Values	References
Freshwater Quality	Dissolved oxygen	≥ 3.5 mg/L	National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009
	pH	6.5-9	
	Turbidity	≤ 25 ppm (Upstream)	Quality Criteria for Water, 1986
		≤ 390 ppm (Downstream)	
	Suspended solids	80 mg/L	
Sediment Quality		Maximum limits	International Association for Impact Assessment (IAIA) NOAA Screen Quick Reference Table, 2004
	Total Chromium	81 mg/kg	
	Total Arsenic	8.2 mg/kg	
	Total Lead	46.7 mg/kg	
	Total Cadmium	1.2 mg/kg	
	Total Nickel	20.9 mg/kg	
	Total Zinc	150 mg/kg	
	Total Copper	34 mg/kg	
	Total Mercury	0.15 mg/kg	
Groundwater Quality	pH at 25° C	6.5-8.5	WHO's Guidelines for Drinking Water Quality, 2011
	Nitrate	50 mg/L	
	Nitrite	3 mg/L	
	Cadmium	0.003 mg/L	
	Lead	0.01 mg/L	
	Arsenic	0.01 mg/L	
	Copper	2 mg/L	
	Mercury	0.006 mg/L	
	Cyanide	0.17 mg/L	
	Chloride	250 mg/L	

TABLE 9.2-2

SOIL CONTAMINANT STANDARDS

Scenario	Unit	Arsenic	Benzo(a) pyrene	Cadmium	Boron	Chromium III	Chromium VI	Copper	DDT	Dieldrin	Dioxines	Inorganic Mercury	PCB[3]	PCP[4]
Standard residential 10% produce[1]	mg/kg dry weight	0.39	0.062	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Residential 0% produce-High density residential[2]	mg/kg dry weight	0.39	-	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Agriculture (no residence)	mg/kg dry weight	-	0.15	-	-	-	-	-	-	-	-	-	-	-
Nature	mg/kg dry weight	-	-	-	-	-	-	-	-	-	-	-	-	-
Other green, berms, industry, infrastructure	mg/kg dry weight	1.6	0.21	800	200,000	1,500,000	5.6	41,000	0.25	0.11	0.018	310	0.018	9

Remark: [1] standard residential lot, for single dwelling site with gardens, including home grown produce consumption (10%)

[2] Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.

[3] Polychlorinated biphenyls

[4] Pentachlorophenol

Source: US EPA Region 9 Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations. Direct exposure pathways. General information and background, http://www.epa.gov/region09/waste/sfund/prg/index.html

9.3 PROPOSED GOVERNING PARAMETERS FOR DEACTIVATION PHASE

The governing parameters for this phase are presented in ***Table 89.3-1*** to ***Table 9.3-3***.

TABLE 9.3-1
PROPOSED EMISSION STANDARDS

Subjects	Parameters	Values	References
Effluent Levels		Maximum value	Environmental, Health, and Safety Guidelines for Petroleum Refining of International Finance Corporation, 2007
	pH	6-9 S.U.	
	BOD_5	30 mg/L	
	COD	150 mg/L	
	TSS	30 mg/L	
	Oil and Grease	10 mg/L	
	Chromium (total)	0.5 mg/L	
	Chromium (Hexavalent)	0.05 mg/L	
	Copper	0.5 mg/L	
	Iron	3 mg/L	
	Cyanide (total)	1 mg/L	
	Cyanide (free)	0.1 mg/L	
	Lead	0.1 mg/L	
	Nickel	0.5 mg/L	
	Mercury	0.02 mg/L	
	Vanadium	1 mg/L	
	Phenol	0.2 mg/L	
	Benzene	0.05 mg/L	
	Benzo (a) pyrene	0.05 mg/L	
	Sulfides	1 mg/L	
	Total Nitrogen	10 mg/L [a.]	
	Total Phosphorus	2 mg/L	
	Temperature increase	$\leq 3^{o}C$ [b]	

Note :
a. The effluent concentration of nitrogen (total) may be up to 40 mg/l in processes that include hydrogenation
b. At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.

TABLE 9.3-2

PROPOSED AMBIENT ENVIRONMENTAL STANDARDS

Subjects	Parameters	Values	References
Ambient Air Quality	TSP 24-hour average[1/] PM_{10} 24-hour average[2/] PM_{10} annual[2/] NO_2 1-hour average[2/] NO_2 annual[2/] SO_2 24-hour average[2/] $SO_2$10-minute average[2/]	230 µg/m^3 150 µg/m^3 (Interim target-1) 70 µg/m^3 (Interim target-1) 200 µg/m^3 40 µg/m^3 125 µg/m^3 (Interim target-1) 500 µg/m^3	[1/] Pollution Prevention and Abatement Handbook, WHO, 1998 [2/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005
Ambient Noise Levels - Industrial and commercial area - Residential areas	Leq (24 hrs) Leq (1 hr) Lmax	70 dB(A)[1/,2/] 70 dB(A)daytime [3/] 70 dB(A) nighttime [3/] 55 dB(A)daytime [3/] 45 dB(A) nighttime [3/] 110 dB(A) [2/]	[1/] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974 [2/] Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 [3/] Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007
Freshwater Quality	Dissolved oxygen pH Turbidity Suspended solids	≥ 3.5 mg/L 6.5-9 ≤ 25 ppm (Upstream) ≤ 390 ppm (Downstream) 80 mg/L	National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009 Quality Criteria for Water, 1986

TABLE 9.3-3
SOIL CONTAMINANT STANDARDS

Scenario	Unit	Arsenic	Benzo(a) pyrene	Cadmium	Boron	Chromium III	Chromium VI	Copper	DDT	Dieldrin	Dioxines	Inorganic Mercury	PCB[3]	PCP[4]
Standard residential 10% produce[1]	mg/kg dry weight	0.39	0.062	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Residential 0% produce-High density residential[2]	mg/kg dry weight	0.39	-	70	16,000	120,000	0.29	3,100	0.062	0.03	0.0045	23	0.094	3
Agriculture (no residence)	mg/kg dry weight	-	0.15	-	-	-	-	-	-	-	-	-	-	-
Nature	mg/kg dry weight	-	-	-	-	-	-	-	-	-	-	-	-	-
Other green, berms, industry, infrastructure	mg/kg dry weight	1.6	0.21	800	200,000	1,500,000	5.6	41,000	0.25	0.11	0.018	310	0.018	9

Remark: [1] standard residential lot, for single dwelling site with gardens, including home grown produce consumption (10%)

[2] Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.

[3] Polychlorinated biphenyls

[4] Pentachlorophenol

Source: US EPA Region 9 Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations. Direct exposure pathways. General information and background, http://www.epa.gov/region09/waste/sfund/prg/index.html

9.4 ENVIRONMENTAL, HEALTH, AND SAFETY GUIDELINES

The essential requirement in the Occupational Health and Safety Standards pertaining to this Project is **Environmental, Health, and Safety-General Guidelines, April 30, 2007.**[1]

General EHS guidelines are covering the following subjects:

Environment: (i) air emissions and ambient air quality; (ii) energy conservation; (iii) wastewater and ambient water quality; (iv) water conservation; (v) hazardous materials management; (vi) waste management; (vii) noise; and (viii) contaminated land.

Occupational Health and Safety: (i) general facility design and operation; (ii) communication and training; (iii) physical hazards; (iv) chemical hazards; (v) biological hazards; (vi) radiological hazards; (vii) personal protective equipment; (viii) special hazard environments; and (ix) monitoring.

Community Health and Safety: (i) water quality and availability; (ii) structural safety of project infrastructure; (iii) life and fire safety (L&FS); (iv) traffic safety; (v) transport of hazardous materials; (vi) disease prevention; and (vii) emergency preparedness and response.

Construction and Decommissioning: (i) environment; (ii) occupational health and safety; and (iii) community health and safety.

The Guidelines present best practices in the management of the four subjects and recommend environmental standards. As there are no national environmental standards, the standards in this EHS Guidelines should be adopted for this Project as appropriate.

[1] IFC's standards and guidelines

CHAPTER 10

MONITORING PROGRAM

CHAPTER 10

MONITORING PROGRAM

Monitoring and evaluation of environmental performance during pre-construction, construction, operation and deactivation phases are presented in two separates of environmental and social categories, as described below:

10.1 MONITORING PROGRAM ON ENVIRONMENTAL IMPACTS

Summary of monitoring program on environmental impacts during pre-construction, construction, operation and deactivation phases are described as follows:

10.1.1 Monitoring Program during Pre-Construction and Construction Phases

10.1.1.1 Scheduled Environmental Monitoring and Evaluation

Before commencing the construction, the Contractor will review and update existing data on relevant baseline environmental condition, particularly at locations expected to be affected by the construction.

Scheduled monitoring of environmental performance is required throughout the pre-construction and construction phases of the Project to evaluate compliance with legal requirements, the environmental management objectives, and relevant policies, standards and guidelines. The monitoring and evaluation will enable the overall effectiveness of the environmental controls to be determined and allow areas of non-compliance to be identified so corrective actions can be taken. The environmental monitoring plan for each issue to be managed is also presented in each sub-plan.

Environmental monitoring will be undertaken according to the following:

- The Contractor's Environmental, Health and Safety (EHS) Manager is responsible for implementing the monitoring plans, and arranging training and specialist consultants for the monitoring as required.
- The monitoring will be conducted by the Contractor using the approved methods stated in the Contract.
- Environmental results not meeting the required standards will be managed as per the corrective action process and issued with a non-compliance report.
- The EHS Manager will advise the Contractor Project Manager of any non-compliance from monitoring and will report these to the Owner's EHS Manager as required.

In general an impact monitoring program is a measure to demonstrate the accuracy of impact assessment and the effectiveness of mitigation measures. Monitoring program and mitigation measures compliance reporting is an important channel for providing results of the implementation according to regulations and measures as indicated in the Environmental Impact Statement (EIS) report. The results will also be used in undertaking project improvements and increasing the effectiveness of control measures. This section presents details of the environmental monitoring program.

In developing the monitoring programs, the following considerations and strategies have been applied:

- Consistency with internationally acceptable practices;
- Ability to detect environmental changes/trends; and
- Practicality

The environmental monitoring programs presented in this section are proposed to monitor the residual impacts from the activities of construction works.

The monitoring results will later be submitted to the NDPCEI for pre-construction and construction phases. They will be used to determine for monitoring the efficiency of project construction (see ***Table 10.1-1***).

10.1.1.2 Site Inspections

In addition to scheduled environmental monitoring, the Contractor's EHS Manager will conduct daily, weekly, and monthly general inspections of the main pipeline construction site and construction sites of support facilities. The objectives are to early identify or detect factors which, if unattended to, could result in major environmental events and/or non-compliance. A general scope of inspections is outlined below in ***Table 10.1.2*** and it will need to be updated when the detailed pre-construction and construction plan are prepared.

The daily inspections will be informal visual inspections to observe conditions of the construction sites. The focus will be on the main pipeline construction site where construction activities are concentrated.

The weekly inspections will be formal visual inspections in more details than the daily inspections.

The Contractor's EHS Manager will be responsible for the daily and weekly site inspections. The Owner's EHS Manager will participate in the weekly site inspections, and occasionally in the daily site inspections.

The monthly inspections will be conducted in more detail than the weekly inspections and will be conducted jointly by personnel from both sides, including the Project Managers, the Construction Manager and the EHS Managers.

TABLE 10.1-1

ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Issues	Potential Impacts	Parameter to Monitored	Frequency of Monitoring	Sampling Location	Responsibility
1. Environmental Issues					
Fugitive dust	• The amount of fugitive dust (TSP and PM10) is generated from excavated works, excavated materials transportation, movement of heavy vehicles and haulage trucks. • They will harm worker's health and annoying nearby communities.	• Total Suspended Particulate (TSP-24 hrs) • Particulate Matter less than 10 micron (PM10-24 hrs) • Nitrogen dioxide (NO_2) • Sulfur oxides (SOx) • Wind speed and direction (WS/WD)	Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.	Two nearest communities comprising : • Bobe village • Bonuc village	The Contractor under the supervision of the EHS Manager of the Project Proponent
Noise	• Noise is generated from construction activities will affect construction workers and would also affect the nearby receptors.	• Leq 1 hr • Leq 24 hrs • Lmax	Once for 3 consecutive days in the period that construction is passing the two nearest communities.	Two nearest communities comprising : • Bobe village • Bonuc village	The Contractor under the supervision of the EHS Manager of the Project Proponent
Wastewater from worker camp	• Wastewater from worker camp would have significant impacts on the receiving environment such as soil, groundwater, and natural water body.	• pH • Total Nitrogen • Temperature • Total Suspended Solid • Oil and Grease • BOD5 • COD • Total Phosphorus • Sulfides	Twice a year during construction	At the out let of retention pond at the 3 worker camps.	The Contractor under the supervision of the EHS Manager of the Project Proponent

TABLE 10.1-1

ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Issues	Potential Impacts	Parameter to Monitored	Frequency of Monitoring	Sampling Location	Responsibility
River water quality	• A small turbidity plume would be observed in the river around the site, over a short distance before the turbidity returns to its normal level.	• pH • DO • Suspended Solids • Turbidity	2 times; before and during construction across 12 rivers	At 100 m and 200 m downstream of the 12 river construction sites	The Contractor under the supervision of the EHS Manager of the Project Proponent
Hydrostatic water test	• Discharge 9,900 m^3 of tested water to natural receiving water.	• pH • Temperature • Suspended Solids	At once after hydrostatic testing	Receiving water at Suai Supply Base	The Contractor under the supervision of the EHS Manager of the Project Proponent
2. Social support program including CSR	• Project activities during pre-construction and construction may impact on the social environment.	• CSR • Feedback from stakeholders	Throughout construction period	8 villages along the pipeline route	The Project Proponent
3. Emergency Response Plan	• Work accidents and natural disaster may occur during these periods, if occurred, it would not be safe to the nearest communities including project workers.	• Emergency incidents such as accident, fire, oil spill, etc.	Throughout construction period	• Along the pipeline route • Worker camps	The Contractor under the supervision of the EHS Manager of the Project Proponent

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

TABLE 10.1-2

OUTLINE OF SITE INSPECTION PLAN FOR PRE-CONSTRUCTION AND CONSTRUCTION

Inspection Focuses	Daily Inspections	Weekly Inspections	Monthly Inspections	Remark
Cleanliness	√	√	√	
Tidiness	√	√	√	
Sanitation conditions of worker camps, canteen, kitchen		√	√	
Storage of hazardous materials		√	√	
Fugitive dust	√	√	√	
Ambient noise level	√	√	√	
Safety in work places	√	√	√	
Refuse disposal	√	√	√	
Drainage	√	√	√	
Wastewater disposal	√	√	√	
Discharge of hydrostatic test water				At the beginning , middle and end of the discharge of hydrostatic test water
River water turbidity	√			In -river construction

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

10.1.2 Monitoring Program during Operation Phase (Operation EMP)

10.1.2.1 Scheduled Environmental Monitoring and Evaluation

Before commencing the commissioning of pipeline system, the Contractor will review and update existing data on relevant baseline environmental condition, particularly at locations expected to be affected by the pipeline operation and decommissioning.

Scheduled monitoring of environmental performance is required throughout the operational phase of the Project, including during commissioning, to evaluate compliance with legal requirements, the environmental management objectives, an relevant policies, standards and guidelines. The monitoring and evaluation will enable the overall effectiveness of the environmental controls to be determined and allow areas of non-compliance to be identified so corrective actions can be taken. The environmental monitoring plan for each issue to be managed is also presented in each sub-plan.

Environmental monitoring will be undertaken mainly by the Environmental, Health and Safety (EHS) Manager and supported by Operational Manager and Maintenance Manager according to the following:

- The EHS Manager is responsible for implementing the monitoring plans, and arranging training and specialist consultants for the monitoring as required.
- The monitoring will be conducted by EHS Manager using the approved methods stated in the Contract.
- Environmental results not meeting the required standards will be managed as per the corrective action process and issued with a non-compliance report.
- The EHS Manager will report the non-compliances to the General Manager and work together on corrective actions to eliminate the non-compliances.

In general an impact monitoring program is a measure to demonstrate the accuracy of impact assessment and the effectiveness of mitigation measures. Monitoring program and mitigation measures compliance reporting is an important channel for providing results of the implementation according to regulations and measures as indicated in the Environmental Impact Statement (EIS) report. The results will also be used in undertaking project improvements and increasing the effectiveness of control measures. This section presents details of the environmental monitoring program.

In developing the monitoring programs, the following considerations and strategies have been applied:

- Consistency with internationally acceptable practices;
- Ability to detect environmental changes/trends; and
- Practicality operation

The environmental monitoring programs presented in this section are proposed to monitor the residual impacts from the activities of operational works (see ***Table 10.1-3***). The monitoring results will later be submitted to the NDPCEI.

10.1.2.2 Site Inspections

In addition to scheduled environmental monitoring, the Contractor's EHS Manager will conduct daily, weekly, and monthly general inspections of the pipeline corridor which is 60 km long and 40 m. wide and facilities. The objectives are to early identify or detect factors which, if unattended to, could result in major environmental events and/or non-compliance. A general scope of inspections is outlined below in ***Table 10.1-4*** and it will need to be updated by the EHS Manager before commencing the commercial operation.

The inspections will be informal visual inspections focusing on the aspects of the pipeline such as condition of pipeline lying area, leakage, leak detection system, conditions of fire and safety equipment, and storage of pigging waste etc.

TABLE 10.1-3

ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM DURING OPERATION PHASE

Issues	Potential Impacts	Parameter to be monitored	Frequency of Monitoring	Sampling Location	Responsibility
1. Environmental Issues					
Pigging waste	Waste from pigging	• Quality of oily sludge before and after the pigging waste is treated. • Volume and characteristics of pigging wastes	Every time the pigging waste is sent to the refinery for treatment.	• The pigging station at Suai Supply Base • The Betano Refinery's wastewater treatment system	The Operational Manager , the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC
Operational Risk	Damage of the pipeline due to risk of oil leak and explosion	• Occurrences of accident, gas leakage and emergency incidents • Causes and rectification methods of impact on operators/workers and nearby communities	Throughout the entire operation period	Along the pipeline route	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC
2. Social Issues					
Community health and safety	• Risk of explosions • Pipeline rapture and oil leaks	Complaints and feedback from stakeholders	Throughout the entire operation period	8 villages along the pipeline route	The General Manager of the BPSC
Social support program including CSR	The implementation during operation period may impact on the social environment.	• CSR • Feedback from stakeholders	Throughout the entire operation period	8 villages along the pipeline route	The General Manager of the BPSC
3. Emergency Response Plan	• Risk of explosions • Pipeline rapture and oil leaks	Emergency incidents such as accident, fire, oil spill, etc.	Throughout the entire operation period	• Along the pipeline route • Pumping stations/ Block valve stations	The General Manager of the BPSC

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

TABLE 10.1-4

OUTLINE OF SITE INSPECTION PLAN FOR OPERATION PHASE

Inspection Focuses	Daily Inspections	Weekly Inspections	Monthly Inspections	Remark
Cleanliness	√	√	√	
Tidiness	√	√	√	
Storage of pigging waste at pigging station			√	2 times/month in the pipeline operation
Safety for transportation of the pigging waste to the refinery's wastewater treatment plant			√	
Condition of pipeline lying area and section above ground	√	√	√	
Condition of warning signs		√	√	
Condition of pipeline subsidence and soil erosion at backfilling area with the soft soil, waterways or slope			√	
Condition of condensate leak detection system	√	√	√	
Operator's use of protective equipment	√	√	√	
Conditions of emergency response equipment	√	√	√	
Compliance with OHS requirements			√	
Risk Triggers	√	√	√	

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

The daily inspections will be informal visual inspections to observe conditions of the pipeline corridor. The focus will be on the pipeline section above ground which third parties could lead to leakage and consequential fires.

The weekly inspections will be formal visual inspections in more details than the daily inspections.

The EHS Manager will be responsible for the daily and weekly site inspections. The General Manager will participate in the weekly site inspections, and occasionally in the daily site inspections.

The monthly inspections will be conducted in more detail than the weekly inspections. The monthly inspections will also include storage of pigging waste at pigging station, safety for transportation of the pigging waste to the refinery's wastewater treatment plant, condition of pipeline subsidence and soil erosion at backfilling area with the soft soil, waterways or slope, and risk triggers identified in the environmental risk management plan. The monthly inspections will be conducted jointly by the EHS Manager and the General Manager.

10.1.3 Monitoring Program during Deactivation Phase (Deactivation EMP)

10.1.3.1 Scheduled Environmental Monitoring and Evaluation

Monitoring of the environmental performance of the Demolition Contractor will consist of scheduled environmental monitoring and site inspections to take note of Environmental Incidents in Environmental Incident Forms, and record them in an Environmental Incidents Register. The Environmental Incident Register is the tool for environmental management. It will be discussed regularly at the monthly environmental performance review meetings. The meeting will discuss the corrective actions taken and the preventative measures that have been put in place.

Results of the monitoring and site inspection will be used to prepare environmental monitoring and evaluation reports for internal use and for submitting to NDPCEI.

The environmental programs presented in this section are proposed to monitor the residual impacts from the activities of demolition works. The monitoring results will later be submitted to the NDPCEI for deactivation phase. They will be used to determine for monitoring the efficiency of project construction (see ***Table 10.1-5***).

TABLE 10.1-5

ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM DURING DEACTIVATION PHASE

Issues	Potential Impacts	Parameter to be monitored	Frequency of Monitoring	Sampling Location	Responsibility
1. Environmental Issues					
Air quality and noise	Fugitive dust and noise caused by heavy machines and equipment will be disturb health of workers and the locals adjacent to the demolition site.	• Quantity of dust • Wind speed and direction • Complains form the nearest communities	Regular site inspection (weekly minimum) by in-house staff	• Demolition site • Two nearest communities, comprising: - Karetamute - Bemetan	• The demolition contractor • The controlled by the Project Proponent
Hazardous wastes	Hazardous wastes and oil products from the storage tanks and pipelines would be dump on the ground.	Complains form the nearest communities			
Wastewater	Wastewater would be from cleaning the storage tanks and pipelines. They would be dump on the ground.	• Volume • Its discharge			
Solid waste	Solid waste would be from demolition activities. They would be dump on the ground.	• Quantity • Disposal management			
2. Social Issues					
Community health and safety	Demolition workers, the locals and passers-by along the pipeline route might be injured or being insecure.	Complaints and feedback from stakeholders	Regular site inspection (weekly minimum) by in-house staff	• Demolition site • Two nearest communities, comprising: - Karetamute - Bemetan	The Project Proponent

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

10.2 MONITORING PROGRAM ON SOCIAL IMPACTS

Monitoring program on social impacts during pre-construction, construction, operation and deactivation phases will be evidenced via the function of "*Public Consultation and Information Disclosure*" together with "*Complaints through Grievance Redress Mechanisms*" which are elaborated in ***Chapter 16*** and ***Chapter 17*** of this EMP volume. Monitoring mitigation addressed to social impacts is included in CSR and social support program as shown in ***Table 10.1-1***, ***Table 10.1-3*** and ***Table 10.1-5***.

In addition, the Project Proponent should set up a liaison forum or committee for promoting good relation between the workers and the communities. The Communities-Workers Relation Committee should monitor the worker integration, identify any potential or emerging issues or conflicts, promote good practices, and act as a formal channel of communication between the local communities and the worker camp. The Committee should have not more than 15 members representing the Contractor, the Project Proponent, the workers, and the local communities.

The Committee should meet as regularly as necessary and at least once a month for the first 6 months. It should continue throughout the life of the worker camp.

CHAPTER 11

REPORTING REQUIREMENTS

CHAPTER 11

REPORTING REQUIREMENTS

Reporting requirements during pre-construction and construction, operation and deactivation phases of the Project implementation can be described as follows:

11.1 REPORTING REQUIREMENTS DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Two types of monitoring reports will be generated in the environmental monitoring and site inspections. The first type is reports generated for internal use to provide feedback to the EMS. The second type is report generated for submission to National Directorate for Pollution Control and Environment Impact (NDPCEI).

These reports will describe about environmental incidents, form to be used and registration.

11.1.1 Environmental Incidents

11.1.1.1 Definition of an Environmental Incident

In addition to scheduled environmental monitoring, the monitoring will also cover environmental incidents. An environmental incident during the Project pre-construction and construction phases is an occurrence which has (or potentially could have had) a negative or adverse effect on the environment. An adverse effect is something that causes (or could have caused) environmental harm. An environmental incident can also be a deviation from a requirement or practice prescribed in this CEMP and the Contractor CEMP. This means there has been a failure to follow the established process or procedures that help the Project achieve best practice (e.g. failure to report a spill). Some environmental incident could create an emergency, i.e. its impact is so serious that it has to be promptly dealt with.

11.1.1.2 Environmental Incident Form

An environmental incident, once noted, has to be recorded in an Environmental Incident Form (EIF). A standard Environmental Incident Form (EIF) template will be used for all site specific activities throughout the construction of the Project. An Environmental Incident Form is proposed in ***Appendix 11A***.

11.1.1.3 Environmental Incident Register

The Contractor's EHS Manager will input all data from completed EIFs as soon as possible to generate an Environmental Incident Register (EIR). A standard EIR will be controlled by the Contractor's EHS Manager. It will contain all environmental incidents occurring on all construction sites of the Project. The EIR will be discussed regularly at the Project environmental performance review meetings. These meetings will discuss the corrective action taken, and the preventative measures that have been put in place.

According to minimum requirements for an Environmental Management Plan of NDPCEI, the EIR from will be included in internal monitoring report and monitoring report to NDPCEI. Environmental incident register and form are management tool will be attached in ***Appendix 11A***.

11.1.2 Internal Monitoring Reports

11.1.2.1 Site Inspection Reports

The contractor's EHS Manager will record results of the daily inspections in daily site inspection notes. The Contractor's EHS Manager and Construction Manager will review the daily site inspection notes on a weekly basis to confirm that the checks and subsequent required works are being carried out, and additional inspections are included as per construction progress.

For weekly inspections, the Contractor's EHS Manager will present results of the inspections in weekly site inspection reports for discussion in the weekly project review meetings. Both the daily inspection notes and weekly inspection reports will highlight factors or events that could lead to non-compliance and will need attention of the Contractor's Project Manager.

The Contractor's EHS Manager will prepare monthly site inspection reports as part of the monthly environmental monitoring reports.

11.1.2.2 Environmental Monitoring Reports

The Contractor's EHS Manager will prepare monthly environmental performance reports for submission to the Owner's Project Manager. The monthly environmental monitoring report will concisely present: (i) results of scheduled environmental monitoring and site inspections carried out during the month; (ii) identified non-compliance, if any, and causes of the non-compliance; (iii) complaints received; (iv) environmental incidents (in form of Environmental Incident Register (EIR); (v) associated investigations and corrective action taken; (vi) proposed changes to the monitoring plan, if any; and (vii) work program for the following month.

The monthly environmental performance reports will be discussed in the monthly project status review meetings or in separate monthly environmental performance meetings as appropriate.

11.1.3 Monitoring Reports for submission to NDPCEI

Based on the monthly internal monitoring reports and results of the monthly review meetings, the Owner's EHS Manager will prepare a project environmental monitoring report of the CEMP every six months for submission to NDPCEI as required by the Environmental Licensing Law. Based on good practices, the Environmental Monitoring Report will contain the following.

11.1.4 Reporting to Local Authority

In case of environmental accidents occurrence, the Contractor will be instructed by the Owner Project Manager to coordinate and inform the concerned local authorities (District Administrator (DA), Sub-District Administrator (SDA), and the Chief and village leaders), including the related agencies and parties along its 60 km length of pipeline traverses. These include administrative area of 8 villages in Covalima, Anairo, and Manufahi districts, comprising: (i) Raimea, Tashilin, and Zulo villages in Covalima district; (ii) Beco village and Labarai village of Suai sub-disteict in Covalima district, (iii) Leolima village and Foho-Ailico village of Hatu-Udo sub-district in Covalima district, and (iv) Betano village of Same sub-district in Manufahi district. Proper action will be performed to ensure the presence of appropriate and adequate onsite emergency equipment and preparation of post-accident record and action. Based on good practices, the accidents should be informed to the local authorities as soon as possible. Required information is specified in ***Appendix 11B: Construction Emergency Response Plan Condensate and Products Pipeline Route Project.***

11.1.5 Corrective Actions

The Contractor will be instructed by the Owner Project Manager to take corrective actions for any identified non-compliance. Taking corrective actions in managing EHS aspect of the Project will have to be a part of project management and use the same procedure proposed in this CEMP will therefore have to be reviewed and revised as necessary to make it in line with the procedure for other aspects of the Project. A single procedure for taking corrective actions should be used in project management.

The Contractor is required to establish own procedure for corrective actions related to EHS non-compliances.

11.1.5.1 Categories of Non-Compliances

Non-compliances cover non-compliance with legal requirements, non-conformance with internal requirements of the Project, inadequate environmental performance, environmental incident, and complaints or grievance received from the public. Non-compliances could be identified from the following:

- External EHS audits;
- Internal EHS audits;
- Site inspection notes and reports;
- Schedule environmental monitoring;
- Complaints, grievance or inquiries registers;
- Environmental incident registers;
- Specific environmental studies and reports;
- Directive from NDPCEI or other government authorities;
- Review meetings;
- Recommendations from any project staff member, Contractor or visitors, which are considered by the EHS Manager and the Project Manager to warrant investigation.

11.1.5.2 Levels of Non-Compliances

EHS non-compliances can be identified, ranked and recorded at three levels. Once the level of a non-compliance has been established the appropriate tool shall automatically be selected for closing out the non-compliance. The actions required for each are detailed below; as a temporary work suspension for cause may be enforced in case of Level A or B or C non-compliances.

Level A: A critical non-compliance situation, typically including material damage to or a reasonable expectation of impending material damage to an ecologically or socially sensitive resource or has the potential for an extreme health and safety incident. Intentional disregard of project which may lead to a serious EHS incident is also classified as Level A.

Level B: A non-compliance situation that has not yet resulted in clearly identified damage or irrelevant impacts to sensitive important resources, or has the potential for a serious health and safety incident. It requires expeditious corrective action and site specific attention to prevent such effects. Repeated Level B non-compliance may become Level A non-compliance if left unattended or are continuously recurring.

Level C: A non-compliance situation not consistent with the original requirements but not believed to present an immediate threat to an identified important resource, community or employee health and safety. Repeated Level C non-compliance may become Level B non-compliance if left unattended.

The non-compliance may also be of a procedural nature where the Contractor has failed to implement specified requirements and actions. In this case, the Contractor may need to take actions to ensure the procedural requirements are effectively implemented.

11.1.5.3 Responsibilities and Process

The Owner's EHS Manager will be responsible for identifying and ranking EHS non-compliances. However, all Project management personnel are encouraged to help identify EHS non-conformance.

The Owner's EHS Manager will take actions according to the category of non-compliances.

For Level A Non-Compliances: The Owner's EHS Manager will report the identified non-conformances to the Project Manager with recommendation on corrective actions and instructions for the Contractor.

For Level B Non-Compliances: The Owner's EHS Manager will issue instructions to the Contractor in consultation with the Project Manager and the Resident Engineer as necessary.

For Level C Non-Compliances: The Owner's EHS Manager will instruct the Contractor to take appropriate corrective actions.

The Project Manager will be responsible for:

- Issuing instructions to the Contractor to take corrective actions within a given timeframe;
- Follow up on corrective actions taken by the Contractor;
- Evaluate the results of taking corrective actions;
- Prepare a non-compliance report to close the case.

The Contractor will be required to conduct an investigation of the non-compliance to determine its root causes and formulate effective actions to correct the root causes.

For Level B and C non-compliances, the Contractor will submit a brief note on corrective actions to be taken to the EHS Manager and the Resident Engineer, if the corrective actions are related to change in construction practices.

For Level A non-compliances, the Contractor will submit a brief report on the results of investigation and proposed corrective actions to the Project Manager through the EHS Manager and the Resident Engineer, if the corrective actions are related to change in construction method.

11.1.5.4 Corrective Action Request

Instructions to the Contractor will be in the form of Corrective Action Request. The CAR will contain: (i) information sources of non-compliance; (ii) description of non-compliance; (iii) category of non-compliance; (iv) originator; and (v) time frame for corrective actions.

The corrective action requirements will be included in the requirement tracking system of the project management information system.

11.1.5.5 Non-Compliance Report

The Owner EHS Manager will prepare a brief non-compliance report based on the CAR and reports from the Contractor. The non-compliance report will contain: (i) information in the CAR; (ii) corrective actions taken by the Contractor; (iii) implementation period; (iv) results; and (v) recommendation for further actions, if any. The non-compliance report should be in one or two pages in a Form to be designed.

Each and every non-compliance report will be closed out on a progressive basis, until construction is completed.

Non Compliance Report Form will be verified and closed out by the originator or his designee. Correspondence referring to a proposed course of action shall be referenced and attached to the Non Compliance Report Form as appropriate and stored within the Project Documentation System.

11.2 REPORITNG REQUIREMENTS DURING OPERATION PHASE

Two types of monitoring reports will be generated in the environmental and risk management of the pipeline O&M. The first type is reports generated for internal use as part of the environmental and risk management. The second type is reports generated for submission to NDPCEI.

These reports will describe about environmental incidents, form to be used and registration.

11.2.1 Environmental Incidents

11.2.1.1 Definition of an Environmental Incident

In addition to scheduled environmental monitoring, the monitoring will also need to include environmental incidents. An environmental incident during the pipeline operation is an occurrence which has (or potentially could have had) a negative or adverse effect on the environment. An adverse effect is something that causes (or could have caused) environmental harm. An environmental incident can also be a deviation from a requirement or practice prescribed in the operation manual or the detailed OEMP. The occurrence of an environmental incident indicates a failure to follow the established process or procedures that help the Project achieve best practice (e.g. failure to report a spill). Some environmental incident could create an emergency, i.e. its impact is so serious that it has to be promptly dealt with.

11.2.1.2 Environmental Incident Form

An environmental incident, once noted, has to be recorded in an Environmental Incident Form (EIF). A standard EIF template will be used for all site specific activities throughout the operation of the Project. An Environmental Incident Form is proposed in ***Appendix 11C***.

11.2.1.3 Environmental Incident Register

The EHS Manager will input all data from completed EIFs as soon as possible to generate an Environmental Incident Register (EIR). A standard Environmental Incident Register (EIR) will be controlled by the EHS Manager. It will contain all environmental incidents occurring during the operations of the pipeline. The EIR will be discussed regularly at the monthly environmental performance review meetings. The meetings will discuss the corrective actions taken and the preventive measures that have been put in place.

According to minimum requirements for an Environmental Management Plan of NDPCEI, the EIR form will be included in internal monitoring report and monitoring report to NDPCEI. Environmental incident register and form are management tool will be attached in ***Appendix 11C***.

11.2.2 Internal Monitoring Reports

11.2.2.1 Site Inspection Reports

The EHS Manager will record results of the daily inspections in daily site inspection notes. The EHS Manager, the Operation Manager, and the Maintenance Manager will review the daily site inspection notes on a weekly basis to confirm that the checks and subsequent required works are being carried out, and additional inspections are included as per construction progress.

For weekly inspections, the EHS Manager will present results of the inspections in weekly site inspection reports for discussion in the weekly project review meetings. Both the daily inspection notes and weekly inspection reports will highlight factors or events that could lead to non-compliance and will need attention of the GM.

The EHS Manager will prepare monthly site inspection reports as part of the monthly environmental monitoring reports

11.2.2.2 Environmental Monitoring Reports

The EHS Manger will prepare monthly environmental performance reports for submission to the GM. The monthly environmental monitoring report will concisely present: (i) results of scheduled environmental monitoring and site inspections carried out during the month; (ii) identified non-compliance, if any, and causes of the non-compliance; (iii) complaints received; (iv) environmental incidents (in form of Environmental Incident Register (EIR)); (v) associated investigations and corrective action taken; (vi) proposed changes to the monitoring plan, if any; and (vii) work program for the following month.

The monthly environmental performance reports will be discussed in the monthly project status review meetings or in separate monthly environmental performance meeting as appropriate.

11.2.3 Monitoring Reports for Submission to NDPCEI

Based on the environmental monitoring reports and the site inspection reports, the EHS Manage will prepare a project environmental and risk monitoring report every six months for submission to NDPCEI as required by the Environmental Licensing Law. The Environmental Licensing Law does not prescribe the content of the required semi-annual report. Based on good practices, the Environmental and Risk Monitoring Report should contain the following:

- Documentation of compliance with all conditions;
- Progress made to date on implementation of the OEMP against the submitted implementation schedule, if applicable;
- Difficulties encountered in implementing the OEMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties;
- Number and type of non-compliance with the OEMP and proposed remedial measures and timelines for completion of remediation;
- Accidents or incidents (in form of Environmental Incident Register (EIR)); relating to the occupational and community health and safety, and the environment; and
- Monitoring data of environmental parameters and conditions as committed in the OEMP or otherwise required.

11.2.4 Reporting to Local Authority

In case of environmental accidents occurred, the EHS will be instructed by the general manager to coordinate and inform the concerned local authorities (District Administrator (DA), Sub-District Administrator (SDA), and the Chief and village leaders), including the related agencies and parties along its 60 km length of pipeline traverses. These include administrative area of 8 villages in Covalima, Anairo, and Manufahi districts, comprising: (i) Raimea, Tashilin, and Zulo villages in Covalima district; (ii) Beco village and Labarai village of Suai sub-disteict in Covalima district, (iii) Leolima village and Foho-Ailico village of Hatu-Udo sub-district in Covalima district, and (iv) Betano village of Same sub-district in Manufahi district. Proper action will be performed to ensure the presence of appropriate and adequate onsite emergency equipment and preparation of post-accident record and action. Based on good practices, the accidents should be informed to the local authorities as soon as possible. Required information is specified in ***Appendix 11D: Emergency Response Plan for Condensate and Products Pipeline Route Operation***.

11.2.5 Corrective Actions

The EHS Manager, the Operation Manager, and the Maintenance Manager will be instructed by the general manager to take corrective actions if non-compliances are identified. Taking corrective actions in managing the environmental and risk aspects of the pipeline operation will be a part of pipeline operation management and use the same procedure for taking corrective actions in managing other aspects of the pipeline operation. The procedure for taking corrective actions related to risk management will need to be prescribed as part of the risk management program. It will therefore have to be reviewed and revised as necessary to make it similar to the procedure for other aspects of the pipeline management.

11.2.5.1 Categories of Non-Compliances

Non-compliances cover non-compliance with legal requirements, non-conformance with internal requirements of the pipeline O&M, inadequate environmental performance, environmental incident, and complaints or grievances received from the public. Non-compliances could be identified from the following:

- External EHS audits;
- Internal EHS audits;
- Site inspection notes and reports;
- Scheduled environmental monitoring;
- Complaints, grievance or inquiries registers;
- Environmental incident registers;
- Specific environmental studies and reports
- Directives from NDPCEI or other government authorities;
- Review meetings;
- Recommendations from any personnel and stakeholders, which are considered by the EHS Manager, the Operation Manager, the Maintenance Manager, and the General Manager to warrant investigation.

11.2.5.2 Levels of Non-Compliances

EHS non-compliances can be identified, ranked and recorded at three levels. Once the level of a non-compliance has been established the appropriate tool shall automatically be selected for closing out the non-compliance. The actions required for each are detailed below; also a temporary work suspension for cause may be enforced in case of Level A or B non-compliances.

Level A: A critical non-compliance situation which has the potential for an extreme health and safety incident, significant impacts on soil and water quality, and disregard of conditions attached to the operation permit. Intentional disregard of pipeline operation and maintenance procedures and standards which may lead to a serious ESHS incident is also classified as Level A.

Level B: A non-compliance situation which less potential than Level A. It requires expeditious corrective action and site specific attention to prevent such effects. Repeated Level B non-compliance may become Level A non-compliance if left unattended or are continuously recurring.

Level C: A non-compliance situation not consistent with the original requirements but not believed to present an immediate threat to an identified important resource, community or employee health and safety. Repeated Level C non-compliance may become Level B non-compliance if left unattended.

The non-compliance may also be of a procedural nature where the operational personnel have failed to implement specified requirements and actions. In this case, the General Manager, or the EHS Manager, the Operation Manager, and the Maintenance Manager depending on the nature of non-compliance, may need to take action to ensure the procedural requirements are effectively implemented.

11.2.5.3 Responsibilities and Process

The EHS Manager will be a major party to response for identifying and ranking EHS non-compliances. However, all personnel are encouraged to help identify EHS non-conformance.

The EHS Manager will take actions according to the category of non-compliances.

For Level A Non-Compliances: The EHS Manager will report the identified non-conformances to the General Manager with recommendations on corrective actions and instructions for taking the corrective actions.

For Level B Non-Compliances: The EHS Manager, the Operation Manager, the Maintenance Manager, and the General Manager will jointly take corrective actions. The lead person is determined by the nature of non-compliance.

For Level C Non-Compliances: The EHS Manager, the Operation Manager, the Maintenance Manager, and the General Manger will take appropriate corrective actions.

The General Manager will be responsible for:

- Issuing instructions to the EHS Manager, or the Operation Manager, or the Maintenance Manager to take corrective actions within a given timeframe;
- Follow up on the progress of corrective actions; and
- Evaluate the results of corrective actions

The EHS Manager incorporate with the Maintenance Manager and the Operation Manager will conduct an investigation of the non-compliance under their responsibility to determine its root causes and formulate effective actions to correct the root causes.

For Level C non-compliances, the EHS Manager, or the Operation Manager, or the Maintenance Manager will submit a brief note on corrective actions to be taken to the General Manager.

For Level B non-compliances, the EHS Manager incorporate with the Operation Manager and the Maintenance Manager will jointly prepare and submit a brief note on corrective actions to be taken to the General Manager.

For Level A non-compliances, the EHS Manager incorporate with the Operation Manager and the Maintenance Manager will submit a brief report on the results of investigation and proposed corrective actions to the General Manager.

The EHS Manager will prepare a non-compliance report to close the case.

11.2.5.4 Corrective Action Request

Instructions to the EMS Manager, or the Operation Manager, or the Maintenance Manager will be in the form of Corrective Action Request (CAR). The CAR will contain: (i) information sources on non-compliance; (ii) description of non-compliance; (iii) category of non-compliance; (iv) originator; and (v) time frame for corrective actions.

11.2.5.5 Non-Compliance Report

The EHS Manager will prepare a brief non-compliance report based on the CAR and results of taking corrective actions. The non-compliance report will contain: (i) information in the CAR; (ii) corrective actions taken; (iii) implementation period; (iv) results; and (v) recommendation for further actions, if any. The non-compliance report should be in one or two pages in a Form to be designed.

Each and every non-compliance report will be closed out on a case by case basis.

Non Compliance Report Forms will be verified and closed out by the EHS Manager or his designee. Correspondence referring to a proposed course of action shall be referenced and attached to the Non Compliance Report Form as appropriate and stored within the refinery documentation system.

11.3 REPORTING REQUIREMENTS DURING DEACTIVATION PHASE

Results of the monitoring and site inspections will be used to prepare environmental monitoring and evaluation reports for internal use and for submitting to NDPCEI.

Corrective actions will be taken by the Demolition Project Manager of the BPSC to close the found gaps in environmental performance. The Demolition Contractor will be instructed to take corrective actions prescribed by the Demolition Project Manager.

CHAPTER 12

RESPONSIBILITY FOR MITIGATION AND MONITORING

CHAPTER 12

RESPONSIBILITY FOR MITIGATION AND MONITORING

Responsibility for mitigation and monitoring during three phases of the Project implementation is described as follows:

12.1 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Implementing impact mitigation measures and implementing environmental monitoring and evaluation program are two elements of the environmental management system (EMS). Therefore, responsibility for mitigation and monitoring has to be planned within the context of EMS.

12.1.1 Environmental Management System (EMS)

The Project Proponent and the Contractor will both be involved in environmental management of the Project construction. The Contractor will select construction methods or practices that have least environmental impacts, thus meeting environmental performance targets prescribed in the Contract. During the construction, the Contractor will implement, under supervision of the Project Proponent, impact mitigation measures prescribed in the Contract.

The Project Proponent and the Contractor will have to establish and operate their own environmental management systems (EMS) for the Project construction. The two EMSs will be related and based on the same information base. The Project Proponent's EMS will be focused on monitoring and reviewing environmental compliance at the Project level as part of the Project management. The Contractor's EMS will be focused on environmental management at the task level as part of the construction management. The two EMSs will therefore be complementary and will enable the Contractor and the Project Proponent to complete the Project construction with no significant environmental impacts.

12.1.2 Arrangements for Operating the EMS

12.1.2.1 Responsibilities

There are three key groups with responsibility for environmental management of the Project:

- Project Proponent or Project Owner who manages the Project through a Project Manager;
- Contractor as the party undertaking the construction; and
- NDPCEI and other government agencies at the regional, district and community levels.

Responsibilities of each party in environmental management are as follows:

Project Proponent

The Project Proponent is legally responsible to NDPCEI and other line organizations responsible for specific environmental issues for environmental performance of the Project as prescribed as conditions in the Environmental License and other permits.

Specifically, the Project Proponent will have the following responsibilities:

- Supervise closely the Contractor in implementing the Contractor CEMP as an integral part of its project implementation management and construction supervision.
- Submit every six months monitoring reports to NDPCEI as required in the Environmental Licensing Law.
- Notwithstanding the biannual monitoring reports to be submitted to NDPCEI, keep NDPCEI and other concerned authorities informed of any serious environmental events and responses to the events.
- Conducting periodic audit of environmental and social performances of the Contractor.

Contractor

The Contractor, including its approved sub-contractors, is contractually responsible to the Project Proponent for environmental performance of the construction as prescribed in the construction contract.

Specifically, the Contractor will have the following responsibilities:

- Prepare a detailed Contractor CEMP for review and approval by the Project Proponent. The Contractor CEMP should follow the outline prescribed by the Project Proponent as proposed in ***Appendix 12A***.
- Implement the mitigation measures during the construction through construction method statements and work instructions in strict conformance with environmental conducts prescribed in the Contract.

- Ensure that all process and environmental control equipment meet all technical specifications related to their environmental performance.
- Conduct periodic monitoring and reporting of its compliance with the environmental and social performance prescribed in the Contract.
- Ensure that its sub-contractors shall comply with the Contractor CEMP.
- Consistently update the Contractor CEMP and submit the updated version to the Project Proponent for approval.

NDPCEI

NDPCEI is the key agency to monitor and evaluate environmental performance of the Project construction and operation. Other agencies concerned will support NDPCEI in the monitoring and evaluation of environmental performance of the Project construction.

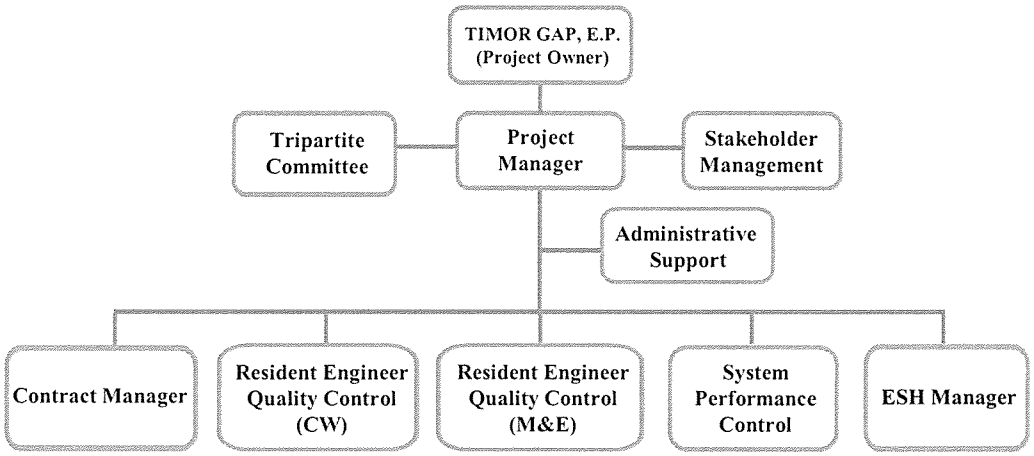
12.1.2.2 Organizational Structure

As environmental management will be carried out as part of the Project management, it will be a functional unit in the project management organization. ***Figure 12.1-1*** shows a tentative organizational structure for Project construction consisting of an organizational structure of the Project Proponent and an organizational structure of the Contractor. The two organizational structures will need to be revised as appropriate as the Project moves from the planning stage to the design stage.

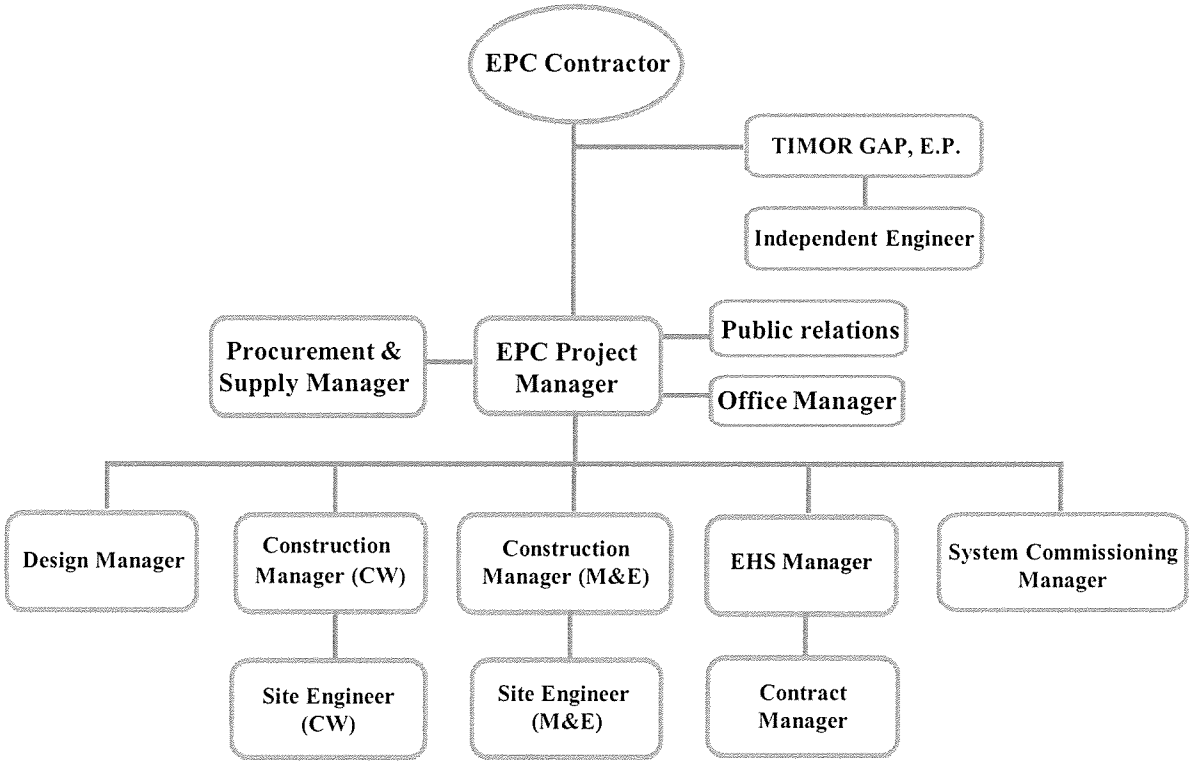
(1) Organizational Structure of the Project Proponent

The Project Proponent will establish a Project Management Office (PMO), headed by a Project Manager. The Project Manager will be responsible for the overall Project management to ensure that the Project construction will be completed on time and fully meet the requirements on scope, quality, budget and environmental performance of the Project construction. The PMO will have seven functional units: (i) Contract management and administration; (ii) construction quality control (civil works); (iii) quality control (mechanical and electrical works); (iv) system performance control; (v) environmental, health and safety management; (vi) stakeholder management; and (vii) administrative support.

The EHS management and the stakeholder management functions are directly related to the implementation of the Contractor CEMP. The two functions cover the following tasks or activities:



ORGANIZATIONAL STRUCTURE OF PROJECT MANAGEMENT OFFICE OF TIMOR GAP, E.P.



EPC CONTRACTOR'S PROJECT MANAGEMENT STRUCTURE

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

FIGURE 12.1-1 : ORGANIZATION FOR PROJECT CONSTRUCTION

EHS Management Function:

- Review the Contractor CEMP and environmentally-related construction method statements and work instructions prepared by the Contractor;
- Ensure that environmental monitoring activities of the Contractor are properly carried out and will generate reliable data;
- Inspect sites where environmental mitigation measures are implemented;
- Review periodic EHS reports submitted by the Contractor;
- Evaluate the Contractor's environmental performance;
- Prepare Project EHS performance reports;
- In consultation with the relevant quality control functional unit, prepare recommendations to the Project Manager on corrective actions related to environmental performance;
- Coordinating with NDPCEI and other government agencies concerned regarding monitoring environmental compliance of the Project; and
- Make arrangements to facilitate site inspection by NDPCEI and other agencies concerned.

Stakeholder Management Function:

- Design and implement an appropriate CSR program for the Project;
- Process public complaints in accordance with the public grievance redress process;
- Carry out community and public relation activities to ensure acceptance of the Project by all key stakeholders of the Project; and
- Coordinate with the EHS Manager in making arrangements for site visit or inspection by the Project stakeholders.

(2) Organizational Structure of the Contractor

The Contractor will establish a Contractor Project Management Office (CPMO), headed by a Contractor Project Manager. The Contractor Project Manager will be responsible for the overall management of Project construction, testing and commissioning of the pipeline and associated facilities to ensure that the Project construction will be completed on time and fully meet the requirements on scope, quality, budget and environmental performance. The CPMO will also have seven functional units: (i) design management; (ii) construction management; (iii) Contract management and administration, including Contracts with sub-contractors; (iv) procurement and supply management; (v) system commissioning; (vi) environmental, health and safety management; and (vii) office management, including all management and administrative supports. The Contractor may have a different organizational structure but the EHS function is required.

The construction management and the EHS management functions are directly related to the implementation of the Contract-specific or Contractor CEMP. The two functions cover the following tasks or activities:

(a) Construction Management Function

- Translate environmental mitigation measures into construction method statements and work instructions for engineers and foremen to carry out;
- Closely supervise construction activities with environmental impacts and implementation of mitigation measures to ensure residual environmental impacts will be within permissible limits;
- Ensure full compliance with all environmental management covenants in the Contract; and
- Coordinate and facilitate environmental monitoring activities of the EHS personnel.

(b) EHS Management Function:

- Review the Project CEMP and prepare a Contract specific CEMP;
- Update the Contractor-specific CEMP as needed to reflect the latest changes in construction plan or schedules;
- Prepare environmentally-related construction method statements and work instructions in consultation with the construction management functional unit;
- Carry out environmental monitoring of construction activities as prescribed in the monitoring schedules in the Contract-specific CEMP;
- Closely supervise the implementation of environmental mitigation measures in collaboration with the construction management functional unit;
- Prepare periodic EHS performance reports for submitting to the Project Proponent;
- Coordinate with the EHS management functional unit of the Project Proponent to facilitate site inspection or visits of officials from NDPCEI, other government agencies, and representatives of communities in the vicinities;
- Cooperate with the Project Proponent in investigations related to public complaints;
- In consultation with the construction management functional unit, prepare recommendations to the Contractor Project Manager on corrective actions related to environmental performance; and
- Carry out environmental monitoring during the commissioning of pipeline system and prepare an environmental performance report of the pipeline.

It should be noted that environmental management during the pipeline commissioning will be included in the OEMP. The pipeline operation and maintenance team will participate in the commissioning and will take over the pipeline and associated facilities once the technical and environmental performance of the pipeline is accepted.

The Project Management team will support the pipeline O&M team during the transition phase between construction and operational phases. In particular, the Project Management team is responsible for the sign off construction and post construction resource consent and designation conditions, handover of environmental monitoring data and reports and compliance and audit reports before the Project is handed to the O&M team.

12.1.2.3 Documentation

All documents generated in environmental management and references used will be systematically filed and maintained as part of the Project documentation system. The Contractor is required to design and establish an appropriate documentation system for environmental management as an element of its project documentation system which is an integral element of its project management information system. The documentation system will include an appropriate document control procedure.

The Contractor will ensure that the Project Proponent will have a convenient access to its documentation system for environmental management. The documentation system will provide information for environmental audit of the Contractor. Details on the access to the documentation system and documentation control related to the Project Proponent will be worked out by the Contractor and presented in its CEMP.

12.1.2.4 Communication Plan

Environmental management of the Project construction will involve communication, both internally and externally. Clear, concise and timely communications are important to the achievement of the objectives of environmental management.

Internal communication will involve: (i) communications within PMO; and (ii) communications within CPMO; and (iii) communications between PMO and CPMO. External communication will involve communications between PMO and stakeholders and the public. Communications between CPMO and stakeholders will need to receive prior concurrence of PMO.

Communications relevant to environmental management of the Project construction will clearly be a part of the project communication.

A. Objectives of Communication

Internal Communication

The objective of internal communication within PMO and CPMO is to ensure efficiency of environmental management of the Project construction.

The objective of internal communication between PMO and CPMO is to ensure efficiency in monitoring and control environmental management performance of the Contractor, which leads to efficient environmental management of the Project construction.

External Communication

The objective of external communication between PMO and NDPCEI and other concerned government authorities is to comply with the reporting requirements prescribed in the EIA Procedure.

The objectives of external communication between PMO and communities around the Project site as well as mass media and NGOs, if any, are to: (i) ensure adequate and correct understanding of environmental impacts of the Project; and (ii) keep the stakeholders closely informed of the Project's efforts in environmental management and environmental performance of the Project construction. The bottom line is to create trust among the stakeholders in the Project's determination and commitment to environmental management to enable the Project to exist in harmony with the environment and communities.

B. Topics of Communication

Major topics of communication include:

- Scope of construction;
- Construction schedule;
- Environmental impacts and mitigation measures;
- Environmental policy, objectives, and targets;
- Environmental management roles and responsibilities;
- Legal requirements and environmental quality standards;
- Contractor CEMP;
- Results of environmental monitoring and performance evaluation;
- Hazards and emergency situation; and
- Mechanisms for grievance redress, queries, comments, or complaints from stakeholders

As communication involves providing information, information requirements related to the above communication topics for various communicating parties will need to be identified. Internal and external communications will have different information requirements as they have different objectives. ***Table 12.1-1*** presents a tentative information requirements for the internal and external communications.

C. Methods of Communication

The internal communication will use informal communication, formal communication through meetings, and formal correspondence in writing through e-mail or letters, notice boards, and formal notifications or instructions. The methods of communication will follow the methods of project communication.

The external communication will use a variety of methods depending on the purpose of communication and the stakeholders. The methods of communication will follow the methods of project communication.

D. Responsibilities

Project Proponent

The EMS Manager of the Project Proponent is responsible for:

- Communicating the Project's environmental policy, commitments and procedures to all project management staff;
- Communicating roles and responsibilities for environmental management and the results of monitoring activities carried out by the Contractor;
- External communications with stakeholders under the supervision of the Project Manager;
- Preparing a list of information to be provided in external communication and persons with authority to release the information;
- Recording the external communication on an External Communication Log and tracking any pending matters; and
- Supporting the Project's public relation activities through providing environmentally related information.

The Contractor

The EMS Manager of the Contractor has the following responsibilities:

- Communicating the Project's environmental policy, commitments and procedures to all project management and construction personnel;
- Communicating roles and responsibilities for environmental management and the results of monitoring activities to all personnel;
- Providing information support to the Project Proponent's EMS Manager for use in external communication with stakeholders as well as in internal communication.

TABLE 12.1-1

INFORMATION REQUIREMENTS FOR INTERNAL AND EXTERNAL COMMUNICATIONS IN ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION

Information	Communications	
	Internal	External
Basic Information		
Corporate's environmental policy on project construction	√	√
EIA Report	√	√
EIA-level CEMP	√	√
NDPCEI's EHS requirements or conditions attached to the issuance of environmental license	√	√
Contractor-CEMP	√	√
EHS's specification and clauses in the EPC contract	√	√
Construction schedule	√	√
Project EMS	√	√
Project management organization-Owner	√	√
Construction management organization-Contractor	√	√
Information Generated in EHS Management		
Daily, weekly and monthly site inspection reports	√	
Environmental monitoring results	√	√
Minutes of project review meetings-EHS	√	
Monthly monitoring reports	√	
Minutes of Tripartite Committee's meetings	√	√
Complaints register and response	√	√
Reports on visits by media and stakeholders for environmental purposes	√	
Environmental incident reports	√	√
Corrective action reports	√	√
Biannual monitoring reports submitted to NDPCEI	√	√

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

12.2 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING OPERATION PHASE

Implementing impact mitigation measures and implementing environmental monitoring and evaluation program are two elements of the environmental management system (EMS). Therefore, responsibility for mitigation and monitoring has to be planned within the context of EMS.

12.2.1 Environmental Management System (EMS)

The Project Proponent, TIMOR GAP, E.P., is certified ISO 14001. Therefore, it already has an EMS in place for environmental management at the corporate level. For this Project, the Project Proponent intends to ensure that the pipeline will be accredited ISO14001 as well. Consequently, the Pipeline Management will set up an EMS for environmental management of the pipeline O&M. The pipeline OEMP will therefore be the core document of the EMS. The pipeline O&M team will implement the OEMP. During the operational phase, environmental management activities will become routine and the Project Proponent, as owner of the pipeline, will be responsible for environmental performance of the pipeline.

12.2.2 Arrangements for Operating the EMS

12.2.2.1 Responsibilities

Environmental management will be part of the pipeline management. Environmental management measures will be implemented by the pipeline O&M team.

The Operation Manager will be primarily responsible for operation of environmental management facilities and implementing mitigation measures. He will therefore be responsible for environmental, health, and safety (EHS) performance of the pipeline operation.

The Maintenance Manager will be responsible for maintenance of the pipeline and its corridor.

The EHS Manager will be responsible for monitoring, evaluating, and reporting EHS performance of the pipeline operation. He will work closely with the Operation and the Maintenance Managers in formulating corrective actions to resolve non-compliance issues.

The General Manager will supervise the Operation Manager, the Maintenance Manager, and the EHS Manager in environmental management of the pipeline operation.

Ministry of Commerce, Industry and Environment through NDPCEI and other government agencies at the regional, district and community levels will monitor and evaluate compliance of the pipeline operation with legal requirements and prescribed conditions in the Environmental License or the permit for operation.

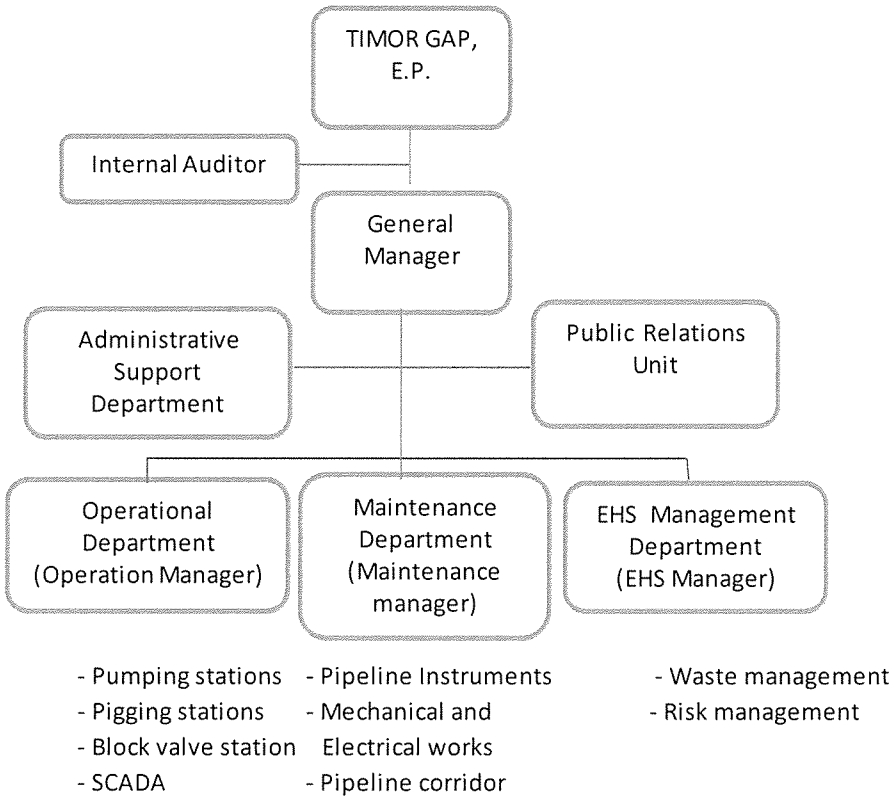
12.2.2.2 Organizational Structure

The Project Proponent will need to establish an organization for O&M and management of the pipeline system. The pipeline organization could be a business unit of TIMOR GAP, E.P. or it could be incorporated as a subsidiary company of TIMOR GAP, E.P. The Consultant assumes that the pipeline organization will be set up as a subsidiary company of TIMOR GAP, E.P. for the purpose of this EIA. This company is referred to in this document as "Betano Pipeline System Company" (BPSC) for the purpose of this EMP.

Figure 12.2-1 presents a provisional organizational structure for BPSC prepared by the Consultant for the purpose of this EIA. The main point in the provisional structure is the environmental management function. The organization will be led by a chief executive officer which may be entitled "General Manager" (GM). The implementing of environmental impact, mitigation measures and risk management measures will be under taken by managers of the three departments-operational, maintenance and ESH Management.

The environmental management function will involve the following activities:

- Prepare the operation manuals for the wastewater management covering pigging wastes, the risk management program and the emergency response plan;
- Ensure efficient implementation of the risk management program and the emergency response plan, if an emergency occurs;
- Prepare periodic EHS performance reports for submitting to the GM;
- Facilitate site inspection or visits of officials from NDPCEI, other government agencies, and representatives of communities in the vicinities;
- Investigate issues related to public complaints;
- Prepare recommendations to the GM on corrective actions related to environmental and risk performance, and state of preparedness for implementing the emergency response plan;
- Prepare monthly monitoring reports for internal use as feedback to the EMS;
- Prepare bi-annual monitoring reports for submitting to NDPCEI; and
- Supervise risk management during the commissioning period



Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

FIGURE 12.2-1 : PROVISIONAL ORGANIZATIONAL STRUCTURE FOR BETANO PIPELINE SYSTEM COMPANY

12.2.2.3 Documentation

All documents generated in environmental management and references used will be systematically filed and maintained as part of the pipeline documentation system. The environmental management documentation system will provide information for environmental audit of the pipeline operation.

The General Manager will design and establish an appropriate documentation system for environmental management as an element of the documentation system for the pipeline operation. The documented information on environmental management should be included in or linked with the pipeline information system. The documentation system will include an appropriate document control procedure.

12.2.2.4 Communication Plan

Environmental management of the pipeline operation will involve communication, both internally and externally. Clear, concise and timely communications are important to the achievement of the objectives of environmental management.

Internal communication will involve: (i) communications within the EMS unit; and (ii) communications within the BPSC organization. External communication will involve communications between the BPSC and NDPCEI as well as other stakeholders. Public communications between the EMS unit and stakeholders will need to receive prior concurrence of the General Manager.

(1) Objectives of Communication

Internal Communication: The objective of internal communication is to ensure efficient environmental management of the pipeline operation.

External Communication: The objective of external communication between the BPSC organization and NDPCEI and other concerned government authorities is to comply with the reporting requirements prescribed in the Environmental Licensing Law. The objectives of external communication with other stakeholders, especially communities near the pipeline route as well as mass media and NGOs, if any, are to: (i) ensure adequate and correct understanding of environmental aspect of the pipeline operation; and (ii) keep the stakeholders closely informed of the pipeline's efforts in environmental management and environmental performance. The bottom line is to create trust among the stakeholders in the pipeline's determination and commitment to environmental management to enable the pipeline to exist in harmony with the environment and communities.

(2) Topics of Communication

Major topics of communication include:

- Pipeline operation;
- Environmental impacts and mitigation measures;

- Environmental policy, objectives, and targets;
- Environmental management roles and responsibilities;
- Legal requirements and environmental quality standards;
- OEMP and EMS;
- Results of environmental monitoring and performance evaluation;
- Hazards and emergency situation; and
- Mechanisms for grievance redress, queries, comments, or complaints from stakeholders.

As communication involves providing information, information requirements related to the above communication topics for various communicating parties will need to be identified. Internal and external communications will have different information requirements as they have different objectives. ***Table 12.2-1*** presents a tentative information requirements for the internal and external communications.

(3) Methods of Communication

The internal communication will use informal communication, formal communication through meetings, and formal correspondence in writing through e-mail or letters, notice boards, and formal notifications or instructions. The methods of communication will follow the methods used in communication in the BPSC organization.

The external communication will use a variety of methods depending on the purpose of communication and the stakeholders. The methods of communication will follow the methods of project communication.

(4) Responsibilities

The General Manager is responsible for:

- Communicating the environmental policy, commitments and procedures to all operational personnel including NDPCEI and other government agencies;
- Communicating results of monitoring activities;
- External communications with stakeholders;
- Preparing a list of information to be provided in external communication and persons with authority to release the information;
- Recording the external communication on an External Communication Log and tracking any pending matters; and
- Supporting the public relation activities through providing environmentally related information.

TABLE 12.2-1

INFORMATION REQUIREMENTS FOR INTERNAL AND EXTERNAL COMMUNICATIONS IN ENVIRONMENTAL MANAGEMENT DURING OPERATION

Information	Communications	
	Internal	External
Basic Information		
Corporate EHS policy on pipeline operation	√	√
EIS Report	√	√
NDPCEI's EHS requirements or conditions attached to the Issuance of Environmental License	√	√
Operation manuals	√	
EMS	√	√
Pipeline management organization	√	√
Various operational procedures related to EHS/OHS	√	
Information Generated in EHS Management		
Daily, weekly and monthly site inspection reports	√	
Environmental monitoring results	√	√
Minutes of EHS review meetings	√	
Monthly monitoring reports	√	
Minutes of Tripartite Committee's meetings	√	√
Complaints register and response	√	√
Reports on visits by media and stakeholders for environmental purposes	√	√
Environmental incident reports	√	√
Corrective action reports	√	√
Annual monitoring reports submitted to NDPCEI	√	√

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

12.3 RESPONSIBILITY FOR MITIGATION AND MONITORING DURING DEACTIVATION PHASE

The Demolition Contractor will be responsible for implementing the prescribed mitigation measures and undertaking monitoring under the supervision of the Owner EHS Manager and the Demolition Project Manager.

The Demolition Contractor will establish an environmental management system (EIS) for the demolition works. The EIS will be supported by a documentation system to support decision making for corrective actions. The Demolition Contractor will organize his demolition team which will include an EHS Manager.

The BPSC will implement the demolition works as a project and will establish a Demolition Project Management Office. The Demolition Project Manager and the Demolition EHS Manager will be responsible for environmental management of the demolition works.

CHAPTER 13

EMERGENCY RESPONSE PLAN

CHAPTER 13

EMERGENCY RESPONSE PLAN

Emergency response plans during pre-construction, construction, operation and deactivation phases should be prepared. They are proposed as follows:

13.1 EMERGENCY RESPONSE PLAN FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

The Contractor will be contractually binding to prepare and implement an emergency response plan to efficiently and effectively cope with accidents and emergencies which may occur during the pre-construction and construction period. Considering the nature and magnitude of the construction and the construction site, the emergency response plan would deal with work accidents, accidental fires, and oil spills. Natural emergency events such as earthquakes, land slide, and floods would be very unlikely. Consequently, the emergency response plan during the pre-construction and construction would focus on procedures and facilities to deal with work accidents, oil spills, and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay. The emergency response plan will be a part of the OHS system. Facilities to be provided on site will contain at minimum the following: fully equipped first aid station, fire-fighting equipment, arranged access to emergency services of the hospital in Manufahi, Ainaro and Covalima districts, and direct communication link with local fire brigades and other relevant government authorities such as the local police station.

Appendix 13 A presents a Construction Emergency Response Plan (CERP) for the Project prepared by the Consultant at the request of the Project Proponent. It should be noted that the CERP must be based on the detailed design and construction plan, schedule, and methods prepared by the EPC Contractor and approved by the Project Proponent to be part of the contract. Therefore, this CERP prepared as part of the EIA study can only be considered as an initial CERP with substance at the conceptual level. The Project Proponent should use this initial CERP to prescribe minimum requirements for the CERP to be prepared by the EPC Contractor before commencing the construction. The EPC Contractor will further develop this initial ERP to become the final CERP which will have to be ready for implementation in due course before the construction.

13.2 EMERGENCY RESPONSE PLAN FOR OPERATION PHASE

Despite rigorous implementation of the Risk Management Program, residual risks with significant consequence still remain in oil spill and leakage. Therefore, the EPC Contractor, who designs and construct the pipeline route and its associated facilities, will be contractually binding to prepare an operation emergency response plan (OERP) for the Project Proponent and provide training to the designated staff to ensure they will be able to efficiently and effectively respond to occurring emergencies. It is clear that the OERP has to be based on the details of constructed facilities and the organizational structure for the management of pipeline operation established by the Project Proponent.

Appendix 13B presents an OERP for pipeline prepared by the Consultant to comply with the requirement in MREMP. At this EIA stage, the OERP can only be an initial OERP with substance at the conceptual level as it is based on information in the Front End Engineering Design of the Project and the organizational structure of the pipeline system and its associated facilities suggested by the Consultant. Therefore, the OERP presented in ***Appendix 13B*** will have to be later elaborated by the EPC Contractor to turn it into the final OERP which reflects the constructed facilities and the BPSC. Subsequently, the Project Proponent will need to review the final ERP submitted by the EPC Contractor and revise it as appropriate to ensure its readiness for implementation. The BPSC organization will maintain its response capability based on the most probable emergencies that may occur.

13.3 EMERGENCY RESPONSE PLAN FOR DEACTIVATION PHASE

The Demolition Contractor will be required to prepare an emergency response plan to efficiently and effectively cope with accidents and emergencies which may occur during the demolition works. Considering the nature and magnitude of the demolition works, the emergency response plan would deal with work accidents and accidental fires. Consequently, the emergency response plan during the demolition works would focus on procedures and facilities to deal with work accidents and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay. The emergency response plan will be a part of the OHS system. Facilities to be provided on site will contain at minimum the following: fully equipped first aid station, fire-fighting equipment, arranged access to emergency services of the hospital in Manufahi, Ainaro, and Covalima districts, and direct communication link with local fire brigades and other relevant government authorities such as the local police station.

CHAPTER 14

DECOMMISSIONING PLAN

CHAPTER 14

DECOMMISSIONING PLAN

14.1 OBJECTIVE OF DECOMMISSIONING PLAN

The economic lifetime of a pipeline (the time necessary for depreciation of the initial investment) is typically around 50 years.[1] However, with a sufficient commitment to maintenance and upgrading, pipeline systems can remain functional for much longer periods of time.

For this Project, the time for deactivation of the pipeline system would come in the distant future when the a decision is made by the Betano Pipeline System Company (BPSC) to cease permanently the operations of pipeline systems. Therefore, the deactivation phase of the Project will involve demolition of the pipeline and its associated facilities, and return the pipeline corridor to the Government.

Environmental management in the deactivation phase will be carried out by the BPSC. The objective is to ensure that the demolition works will not create significant impacts and will meet all applicable standards and guidelines and requirements at the time of demolition, not at present. In most countries, the decommissioning of oil pipeline will require an EIA as a condition of issuing a demolition permit.

The key objective of the Deactivation EMP (DEMP) presented in this chapter is to establish a clear conceptual framework for environmental management during the deactivation phase of the Project. As the deactivation is the event in distant future, it would be adequate for the DEMP to provide only the conceptual framework. The demolition EIA would need to considerably update this DEMP to prepare a new DEMP. The new DEMP will reflect conditions related to technologies, laws and regulations, and land use along the pipeline corridor which would be much different from the present conditions.

14.2 DESCRIPTION OF PROPOSED MITIGATION MEASURES

The demolition is the reverse of construction. For this Project, the demolition would involve the following tasks:

- Removing any cathodic protection from the pipeline.
- Physically disconnecting the pipeline from the storage tanks at its two ends.
- Removing the oil products from the pipeline.
- Cleaning the pipeline by flushing it with fresh water, air, or inert gas.
- Capping the pipe at all open ends by welding on steel caps.

[1] The timeframe is associated with the lifespan of Betano Refinery, which is identified as 40 years.

- Hardening foam is injected at certain locations along the pipe to prevent water and contamination migration through the pipeline.
- Cutting up the pipeline and remove cut sections from the ground.
- Demolish pipeline crossing structures
- Demolish the pumping stations, pigging stations, and block valve stations.

It should be noted that the pipes are normally left in the trench to reduce demolition cost and minimize environmental impacts.

The demolition will generate environmental problems similar to those of the construction phase but will be different in nature, scope and magnitude. The major environmental issues would be: (i) fugitive dust and noise; (ii) hazardous wastes and oil products from the storage tanks and pipeline; (iii) wastewater from cleaning of storage tanks and pipeline; and (iv) demolition wastes. Mitigation measures for these environmental problems will be similar to those normally used during the construction.

14.3 ENVIRONMENTAL MANAGEMENT PROCESS

Environmental management of the demolition works will follow the principle, process, and procedures to be used in the construction phase. All prescribed mitigation measures will be implemented by the Demolition Contractor.

Monitoring of the environmental performance of the Demolition Contractor will consist of scheduled environmental monitoring and site inspections to take note of Environmental Incidents in Environmental Incident Forms, and record them in an Environmental Incident Register. The Environmental Incident Register is the tool for environmental management. It will be discussed regularly at the monthly environmental performance review meetings. The meetings will discuss the corrective actions taken and the preventative measures that have been put in place.

Results of the monitoring and site inspections will be used to prepare environmental monitoring and evaluation reports for internal use and for submitting to NDPCEI.

Corrective actions will be taken by the Demolition Project Manager of the BPSC to close the found gaps in environmental performance. The Demolition Contractor will be instructed to take corrective actions prescribed by the Demolition Project Manager.

14.4 EMERGENCY RESPONSE PLAN

The Demolition Contractor will be required to prepare an emergency response plan to efficiently and effectively cope with accidents and emergencies which may occur during the demolition works. Considering the nature and magnitude of the demolition works, the emergency response plan would deal with work accidents and accidental fires. Consequently, the emergency response plan during the demolition works would focus on procedures and facilities to deal with work accidents and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay. The emergency response plan will be a part of the OHS system. Facilities to be provided on site will contain at minimum the following: fully equipped first aid station, fire-fighting equipment, arranged access to emergency services of the hospital in Manufahi, Ainaro, and Covalima districts, and direct communication link with local fire brigades and other relevant government authorities such as the local police station.

14.5 COMPLAINTS AND GRIEVANCE REDRESS MECHANISMS

A grievance redress process will be established and implemented as part of demolition project management by the Demolition Project Manager of the BPSC. The process would be similar to that for the construction period.

14.6 RESPONSIBILITY FOR MITIGATION AND MONITORING

The Demolition Contractor will be responsible for implementing the prescribed mitigation measures and undertaking monitoring under the supervision of the Owner EHS Manager and the Demolition Project Manager.

The Demolition Contractor will establish an environmental management system (EMS) for the demolition works. The EMS will be supported by a documentation system to support decision making for corrective actions. The Demolition Contractor will organize his demolition team which will include an EHS Manager.

The BPSC will implement the demolition works as a project and will establish a Demolition Project Management Office. The Demolition Project Manager and the Demolition EHS Manager will be responsible for environmental management of the demolition works.

14.7 REVIEW OF THE CONTRACTOR DEMP

The Contractor DEMP will be consistently reviewed and updated or amended to ensure that it remains adequately responsive to the demolition progress and changes in the demolition schedule and methods, if any.

The amendment of the Contractor DEMP could be initiated by the Contractor EHS Manager or General Manager, or could be requested by the Demolition Project Manager. The process for amendment of the Contractor DEMP should be similar to that of the construction phase.

14.8 WORK PLAN AND IMPLEMENTATION SCHEDULE

Before commencing the construction, the Contractor will need to carry out and complete the following tasks:

(1) Training of personnel in environmental management of the demolition works.

(2) Preparing the Contractor DEMP which will be based on the DEMP prepared as part of the demolition EIA, the methods of demolition and dismantling, and the demolition schedule.

(3) Setting up the EMS including documentation system, organization, monitoring and evaluation plans and procedures, and formats of various reports.

These three tasks will have to be completed to the satisfaction of the Pipeline Company not later than two weeks before commencing the demolition.

14.9 CAPACITY DEVELOPMENT AND TRAINING

The Contractor will be required to conduct training of its key staff from the foreman level up to the General Manager. Key staff of the BPSC's Demolition Project Management Office will also attend the training. The objective of the training is to ensure that all concerned in the demolition works can efficiently and effectively perform their responsible tasks in environmental management. Similar to the training for the construction, the training for the demolition works scope should cover the following subjects: (i) Environmental Management of the Demolition Project; (ii) Demolition Environmental Management Plan; and (iii) Specific Training. The last training course will be important as the demolition of pipeline would require some special skills to minimize risks related to hazardous wastes and accidental fires.

The Contractor will also be required to ensure that all personnel working onsite have received an initial site induction.

CHAPTER 15

CAPACITY DEVELOPMENT AND TRAINING

CHAPTER 15

CAPACITY DEVELOPMENT AND TRAINING

Capacity development and training will be carried out during the operation of three phases of the Project, as described below:

15.1 CAPACITY DEVELOPMENT AND TRAINING FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

15.1.1 Training

The Contractor is required to conduct training of its key staff from the foreman level up to the Project Manager. Key staff of the Owner's Project Management Office will also attend the training. The objective of the training is to ensure that all concerned in the Project construction can efficiently and effectively perform their responsible tasks in environmental management. To achieve this objective, the training scope should cover the following subjects:

ENV1-Environmental Management of the Project Construction

All trainees are required to attend this introductory subject. It will cover: (i) scope of the Project; (ii) existing characteristics and conditions of the Project site; (iii) the nature and scope of construction- civil works and mechanical and electrical works; (iii) construction plan and schedule; (iv) laws and regulations relevant to construction environmental management; (v) environmental issues that need to be addressed during construction; (vi) environmental performance targets; (vii) impact mitigation measures; (viii) EMS-monitoring and evaluation program, documentation, reporting requirements, and corrective actions; (ix) roles and responsibility of the Contractor and the Contractor; and (x) mechanisms for coordinating between the Contractor and the Owner in environmental management of the Project construction.

ENV2-Construction Environmental Management plan

The key staff of the two parties will jointly review the CEMP to ensure the two parties have a common understanding of the Owner's requirements of environmental performance of the Contractor. The two parties will collaborate to identify areas in the CEMP that could be improved. The Contractor's key staff will prepare the Contractor CEMP for use in the construction environmental management.

ENV3-Specific Training

Specific training will be organized specifically for each sub-plan and each environmental management task. The objective is to ensure that key staff of the Contractor responsible for each sub-plan and each environmental management task have adequate competency to carrying out tasks under their responsibilities. The training should cover such subjects as: (i) construction waste and hazardous waste management; (ii) environmental quality control of the work sites; (iii) environmental management of the worker camp; (iv) resettlement and livelihood development; (v) management of social impacts from the influx of workers; and (vi) monitoring of hydrostatic test water and river water quality.

The Contractor will be required to submit a detailed plan for conducting the three training modules. The detailed training plan will include at least the following subjects: (i) detailed scope of each module and each subject within Course ENV3; (ii) methods of training of each subject; (iii) training duration; (iv) names and positions of staff to receive training for each course and subjects in Course ENV3; (v) names and CV of the trainers; (vi) training schedule; (vii) management of the training program; and (viii) assessment of the results of training.

15.1.2 Site Induction

The Contractor will ensure that all personnel working onsite have received an initial site induction. Under no circumstances can anyone enter or work onsite without having first attended a formal induction session. Induction will be provided by the Contractor to the Owners Project Management Team prior to each employee commencing work onsite.

Visitors must undergo a short induction which includes basic environmental, health and safety considerations/procedures. Visitors must be accompanied by a fully inducted employee or contractor at all times.

The induction of personnel living on site should cover such topics as: (i) sensitive local cultures and customs; (ii) sensitive environmental spots; (iii) health and safety requirements and standards; (iv) personal hygiene and sanitation of the worker camp; (v) forbidden behaviors unfriendly to the environment; and (vi) conflict resolution procedures. Information on these matters should be provided on billboards or public relation bulletins.

15.2 CAPACITY DEVELOPMENT AND TRAINING FOR OPERATION PHASE

Personnel requirements for the EHS operations and management are estimated as shown in ***Table 15.2-1***. The total number is about 4.

TABLE 15.2-1
ESTIMATES OF PERSONNEL REQUIREMENTS FOR EMS

Position	Number	Function	Qualification
EHS Manager	1	Overall management of the EHS operations and management	Graduate in environmental, chemical or mechanical engineering, with post graduate training in environmental management
EHS Engineer	1	Supervision and control of waste management	Graduate in environmental, chemical, or mechanical engineering
EHS Technicians	2	Collection and disposal of pigging wastes and other wastes, if any	High school or technical school graduates

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

Assuming that all personnel to be recruited have no experience in environmental management of pipeline operations, they will need to undergo the training as shown in ***Table 15.2-2***. The training will be provided by the EPC Contractor at a selected pipeline company, if possible. The training will include theories and principles of each subject followed by on-the-job training in the selected pipeline company. The training period would be about 3 months.

TABLE 15.2-2
TRAINING REQUIREMENTS

Subject	Personnel	Duration
Environmental management of a multiple oil pipeline system	EHS Manager, Operational Manager, Maintenance Manager	15 days
Pigging waste management	EHS Manager and staff	7 days
Risk management of the pipeline	EHS Manager, Operational Manager, Maintenance Manager	15 days
Leak detection methods and use of special equipment.	Operational Manager and staff, Maintenance Manager and staff	15 days
Control of pipeline leak and fire	Operational Manager and staff, Maintenance Manager and staff	15 days
Control of oil spills in rivers	EHS Manager and staff, Maintenance Manager and staff	15 days

Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

15.3 CAPACITY DEVELOPMENT AND TRAINING DURING DEACTIVATION PHASE

The Contractor will be required to conduct training of its key staff from the foreman level up to the General Manager. Key staff of the BPSC's Demolition Project Management Office will also attend the training. The objective of the training is to ensure that all concerned in the demolition works can efficiently and effectively perform their responsible tasks in environmental management. Similar to the training for the construction, the training for the demolition works scope should cover the following subjects: (i) Environmental Management of the Demolition Project; (ii) Demolition Environmental Management Plan; and (iii) Specific Training. The last training course will be important as the demolition of pipeline would require some special skills to minimize risks related to hazardous wastes and accidental fires.

The Contractor will also be required to ensure that all personnel working onsite have received an initial site induction.

CHAPTER 16

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

CHAPTER 16

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Public consultation and information disclosure carried out during the preparation of the EIS and EMP and will be carried out throughout the project life are described as follows:

16.1 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING THE PREPARATION OF THE EIS AND EMP

16.1.1 Purpose of the Consultation

Public consultation conducted during the preparation of the EIS and EMP has three purposes:

(1) Informing the stakeholders about the Project, environmental and social issues related to the Project pre-construction, construction, operation, and deactivation including mitigation measures to minimize environmental and social impacts;

(2) Seeking views of the stakeholders on the Project and mitigation measures; and

(3) Participation and partnership where issues and needs are jointly discussed and assessed.

Results of the public consultation are useful to the formulation and implementation of environmental and social management plans, purposing on alleviating the adverse impacts while promoting positive impacts of the Project, including being guidance for improving the living conditions of communities around the Project site.

16.1.2 Methodology and Approach

Public Consultation was conducted during the period from 31 March to 8 April, 2016. The Project's stakeholders were classified into three categories of government authorities relevant to EIA considerations, NGO and local communities in eight villages along the 60 km of condensate pipeline alignment. They are Betano, Foho-Ailico, Leolima, Raimea, Tashilin, Zulo, Beco and Labarai Villages, located in four sub-districts of Same, Hatu-Udo, Zumalai and Suai, and three districts of Manufahi, Ainaro and Covalima.

The main method used in consultation was public meetings, complemented by disclosure of project information through presentation in the meetings and the interviews with key informants in the communities in order to collect socio-economic information of communities in the study area.

16.1.3 Public Participation Activities

16.1.3.1 Meeting Organization

The public meetings were organized at both of national and local levels. The Project proponent had invited relevant government authorities and NGO for consultation meeting on 31 March 2016 and the locals on 4 to 8 April 2016. The meeting dates, names of persons met, the agencies they represented, and venues are given in ***Table 16.1-1*** and ***Appendix 16A***.

TABLE 16.1-1

CONSULTATION MEETING WITH STAKEHOLDERS

Meeting Dates/time	Name	Position	Organization	Venue
31 March 2016	**Government Officer (total of 10 persons)**			Conference Room, Timor Plaza
10.00-14.00 hrs.	1. Mr. Francisco Poto	Head of EIA Department	National Directorate for Pollution Control and Environment Impact (NDPCEI)	
	Mr. Sabino L.A.	Chief of Department	Ministry of Agriculture, Forestry and Fisheries (MAFF)	
	Ms. Filomena Oliveira Ms. Elsa C. Viegas	Chief Cabinet Officer	Ministry of Public Works, Transport and Communications	
	Mr. Eugenio Sarmento	Chief of the Art and Culture Department	Ministry of Tourism	
	Mr. Paul Alves Mr. Jacinto Gusmão	Director General Director	Secretariat of State of Professional Training and Employment (SEFOPE)	
	Mr. Antonio Freitas	Director General of Statistics	Ministry of Finance	
	Mr. Ismenio da Silva	Executive Secretary of Development Fund Human Capital	Ministry of Planning and Strategic Investment	
	Mrs. Juvencia da Costa	Health Safety Inspector Officer	National Petroleum of Authority and Mineral (ANPM)	
	Mr. Paulino da Cruz	Representative	Department of Land and Property, Ministry of Justice	

TABLE 16.1-1

CONSULTATION MEETING WITH STAKEHOLDERS (CONT' D)

Meeting Dates/time	Name	Position	Organization	Venue
	NGO (total of 3 persons)			
	Mr. Charles Scheiner Mr. Paulino de Almeido Mrs. Martinha Fernandes	Representatives	Lao Hamutuk	
4-8 April 2016	**Local Community Groups**			
4 April 2016 (09.30-12.00 hrs.)	**Total 93 prs.** Local people: 67 prs. NDPCEI: 2 prs. Project proponent: 17 prs. Consultant: 7 prs.	Chief of Manufahi District, chief of Betano village, Chief of Bemetan sub-village, community leaders, representative of sensitive areas		Betano village
5 April 2016 (9.30-12.00 hrs.)	**Total 73 prs.** Local people: 47 prs. NDPCEI: 2 prs. Project proponent: 17 prs. Consultant: 7 prs.	Ainaro officials, chiefs of Leolima and Foho-Ailico villages, chief of Bobe and Bonuc sub-villages, community leaders, representative of sensitive areas		Hatu-Udo sub-district
6 April 2016 (10.00-12.00 hrs.)	**Total 78 prs.** Local people: 52 prs. NDPCEI: 2 prs. Project proponent: 17 prs. Consultant: 7 prs.	Officials and residents of Ainaro, chief of Cassa village, community leaders, representative of sensitive areas		Cassa village
7 April 2016 (15.00-18.00 hrs.)	Chief of Beco and Labarai villages	Chief of Beco and Labarai villages, villagers of Labarai		Beco and Labarai villages
8 April 2016 (9.00-12.00 hrs.)	**Total 49 prs.** Local people: 23 prs. NDPCEI: 2 prs. Project proponent: 17 prs. Consultant: 7 prs.	Chief of Zumalai sub-district, chief of Raimea, Tashilin and Zulo sub-villages, community leaders, representative of sensitive areas.		Zumalai sub-district

Photo 16.1-1 shows some pictures of the meetings.

The Project information was disclosed through slides in English language with Tatum translation, and brief information was posted at the meeting place. Questions and answers were in both of English and Tetum Languages. Translation was made back and forth. Open discussion was undertaken after information disclosure.

Meeting with Government Officials and NGO

Consultation Meeting at Betano Village

Consultation Meeting at Hatu-Udo Sub-District

Consultation Meeting at Cassa Village

Consultation Meeting with Chief of Beco Village

Consultation Meeting with Chief of Labarai Village

Consultation Meeting at Zumalai Sub-District

PHOTO 16.1-1 : CONSULTATION MEETINGS WITH GOVERNMENT OFFICIALS AND THE LOCALS

16.1.3.2 Issues Raised by Stakeholders

There were comments and feedbacks from each group of stakeholders during the meeting. Clarifications were made by representatives of the Project's Proponent and Consultants accordingly. Its summary is shown in below:

(1) Government Authorities

Concerns and comments from the nine government organizations were on were on several issues, including impacts from noise, environmental risk from oil transportation, alignment of pipeline route, land release for pipeline alignment, integration of highway and pipeline project. Suggestion was on preservation of artifacts, sacred and cemeteries found.

(2) NGOs

The Lao Hamutuk expressed the concerns and comments in two occasions: (i) the consultation meeting on 31 March 2016; and (ii) open letter. Major concerns and comments from Lao Hamutuk NGO during public consultation meeting were on noise impact, realignment of highway and pipeline, EIA study, construction of pipeline and highway, impacts on groundwater, products transported by pipeline, risk of pipeline explosion and poor record of PTT.

The Lao Hamutuk NGO also provided their comments via open letter. Concerns were on:

- The project did not taking seriously on the EIA and EMP licensing process for Condensate Pipeline route due to large quantity of numerous toxic and explosive materials involved;
- Less attention about the significant impact of the environment and the community;
- Short preparation of 3 months for the EIA and EMP report;
- Possibility of leaks, spills, accident, fires and explosions;
- Effectiveness of emergency response.

The suggestions were on:

- Including additional assessment, planning, licensing and management which would be required for subsequent phases;
- Planning, design, preparation, implementation and operation for the potential risks and handle approach.

(3) Local Communities Groups

Concerns/comments from villagers in **Betano Village** were on impacts related to leakage of the pipeline and suggestion on road upgrading.

Villagers in **Leolima and Foho-Ailico Villages** of Hatu-Udo Sub-district concerned on impacts on water and culture, explosion risk by the earthquake, distance to community. Their suggestion was on arrangement of consultation meeting in Aldeia Ainaro Kiik.

The meeting at **Cassa Village** was arranged according the request of villagers here. Their concerns were on risk from pipe leakage, pipe destroyed by river flow, responsible agency for pipe maintenance. Their suggestions were on not to relocate sacred places and information disclosure about risk associated to pipe explosion.

Consultation meetings in the two villages of **Beco and Labarai** were arranged at Suai Sub-district. However villagers attended the meeting with Minister of Petroleum Authority which was arranged there on the same day instead. Therefore the Project had the meetings with chief of Beco and Labarai Villages only. They were no feedbacks/questions from chiefs of these two villages.

Consultation meeting with **Raimea, Tashilin and Zulo Villages** was arranged at Zumalai Sub-district. Their concerns were on risk from pipeline explosion, opportunity of local employment, negative impact on soil and water, and distance of pipeline.

Clarifications were made by representatives of the Project's Proponent and Consultants accordingly. All are recorded in the Minutes of Meetings, and documented for reference as shown in ***Appendix 16B***.

16.1.4 Public Acceptance on Proposed Project

Results from the interview of key informants[1] showed that the majority of the people in eight villages have agreed with the project development. Their reasons were: the Project would offer job opportunities, capacity building and development at the local and national levels.

16.1.5 How These Comments Were Taken into Account

Results of all the public consultation meetings will be utilized for implementation of environmental and social management plans of the Project as well as community support development programs to be provided by the Project Proponent in the Corporate Social Responsibility (CSR) context.

[1] These comprise chief of village, chief of sub-village, mediator, teachers, elderly, and youth. They are knowledgeable about the community circumstances.

16.1.6 Recommendations for Future Consultations

Public consultation will be carried out during the construction and operational phases as part of environmental management of the two project phases. Public consultation during the construction would mainly concern with measures to minimize various environmental disturbances which some communities may experience. Community development support would be a major issue for public consultation during operation phase.

16.2 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

16.2.1 Organization for Public Consultation

A tripartite committee is proposed to be set up by the Project in consultation with the community heads and representatives of the national, regional, and district administrations. The committee should be represented by: (i) the government sector, including NDPCEI; (ii) villages nearest to the Project site; and (iii) the Project Proponent. Tentatively, the committee should not have more than 15 members; of which 3 represent the government sector, 8 represent the villages such as Betano, Foho-Ailico, Leolima, Raimea, Tashilin, Zulo, Beco and Labarai Villages, and 3 represent the Project Proponent. The NDPCEI official should be the chairperson and the Project Manager of the Project Proponent should serve as secretariat of the committee. The secretariat will be assisted by the EHS Manager of the Project Proponent as assistant secretariat of the committee. Representatives of the Contractor should participate in the committee meetings to support information.

The tripartite committee should have the following responsibilities:

- Convene emergency meetings to deal with urgent complain case submitted by Project Manager
- Review and comment on the Contractor CEMP submitted by the Contractor to ensure the Contractor CEMP will adequately address key concerns or issues raised by the stakeholders;
- Review the periodic monitoring and evaluation reports and, if there are performance gaps, give advices on the most appropriate course of action to fill the gaps;
- Review the periodic reports on issue and grievance management;
- Appoint additional committee members as deemed appropriate;
- Organize public discussion forum for promoting understanding of the Project and the communities' needs, and cooperation among the three parties for mutual benefits; and
- Review and comments on community assistance initiatives of the Project as part of its CSR.

The tripartite committee may appoint two working groups, one on environmental management, and another on social management, to provide technical supports to the committee.

16.2.2 Information Disclosure

Information to be disclosed during the Project construction phase will be monitoring reports.

The Owner Project Management Office will make arrangements for the disclosure of monitoring reports. In addition, information on environmental management will be disclosed to the proposed tripartite committee.

16.3 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING OPERATION PHASE

16.3.1 Organization for Public Consultation

The tripartite committee set up during the construction phase will be maintained. Its composition will be reviewed to ensure that it is appropriate for environmental and risk management during the operation phase.

The responsibilities of the tripartite committee will be slightly changed in line with the nature of environmental and risk management during the operational phase. The responsibilities will include:

(1) Review and comment on the Pipeline Risk Management Plan and the Emergency Response Plan to ensure the Pipeline OEMP will adequately address key concerns or issues related to the pipeline operation raised by the stakeholders.

(2) Review the periodic monitoring and evaluation reports and, if there are performance gaps, give advices on the most appropriate course of action to fill the gaps.

(3) Review the periodic reports on issue and grievance management.

(4) Appoint additional committee members as deemed appropriate.

(5) Organize public discussion forum for promoting understanding of the environmental and risk management of the pipeline system and the communities' needs, and cooperation among the three parties for mutual benefits.

(6) Review and comments on community assistance initiatives of the pipeline system as part of its CSR.

The tripartite committee may appoint two working groups, one on environmental management, and another on social management, to provide technical supports to the committee.

16.3.2 Information Disclosure

The information on risk management and monitoring should be made available to the public particularly to the communities along the pipeline corridor.

Information to be disclosed during the Project operation phase will be monitoring reports. The EHS Manager will make arrangements for the disclosure of monitoring reports in compliance with the above legal requirements. In addition, information on environmental management will be disclosed to the proposed tripartite committee.

16.4 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE DURING DEACTIVATION PHASE

16.4.1 Organization for Public Consultation

The tripartite committee set up during the construction phase will be maintained. Its composition will be similar to those in construction phase as operations during these two phases are similar. However the timeframe will be shorter.

16.4.2 Information Disclosure

Information to be disclosed during the Project deactivation phase will be monitoring reports.

Demolition Project Manager of the Betano Pipeline System Company (BPSC) will make arrangements for the disclosure of monitoring reports. In addition, information on environmental management will be disclosed to the proposed tripartite committee.

CHAPTER 17

COMPLAINTS AND GRIEVANCES MECHANISMS

CHAPTER 17

COMPLAINTS AND GRIEVANCES MECHANISMS

Complaints and grievances mechanisms are proposed to be carried out during pre-construction and construction, operation, and deactivation phases. Elaboration is as follows:

17.1 COMPLAINTS AND GRIEVANCES MECHANISMS FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

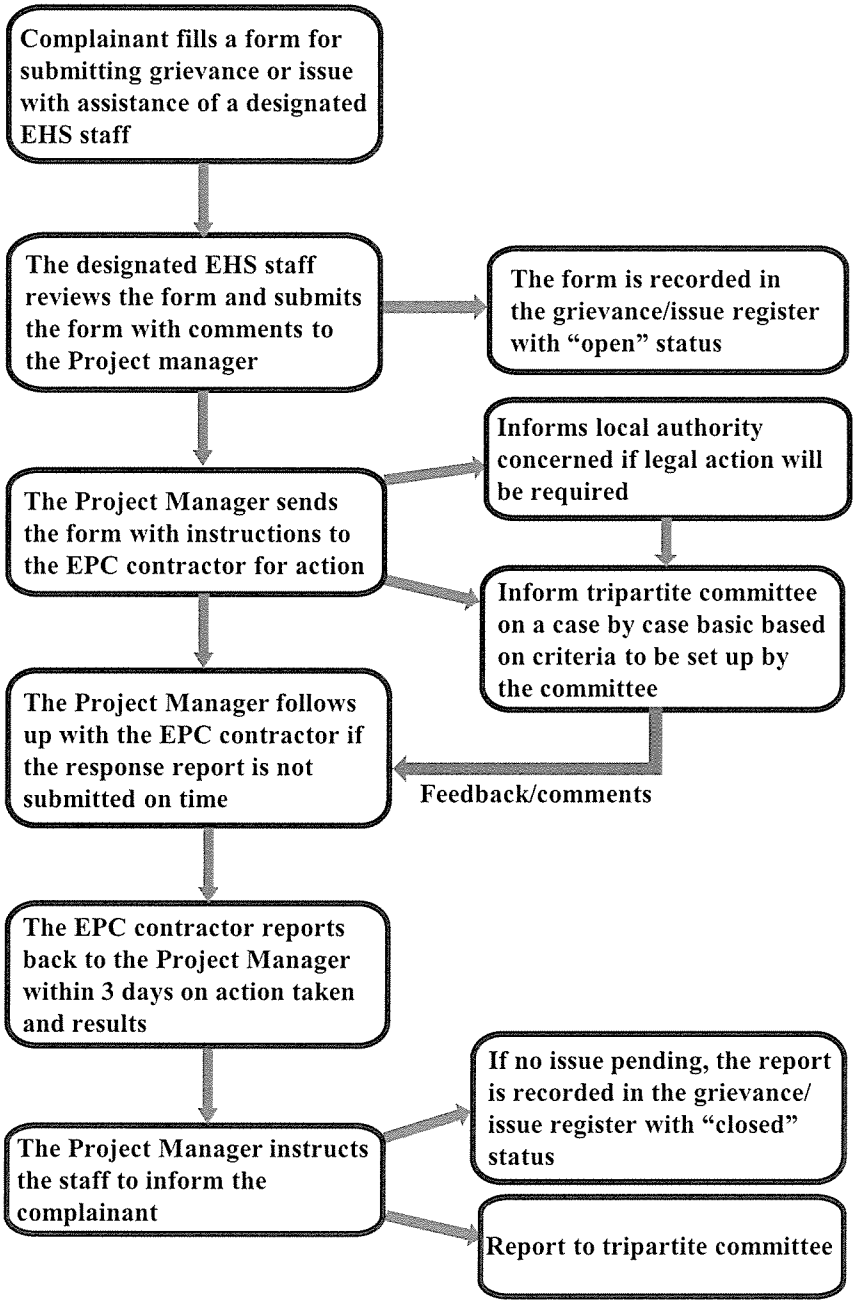
A grievance redress process will be established and implemented as part of project management by the Project Management Office of the Project Proponent. The process is shown in a diagram in ***Figure 17.1-1***. Each step of the process is clearly explained in the diagram. The process will enable efficient management of grievance redress or response to complaints related to EHS of the Project construction.

17.2 COMPLAINTS AND GRIEVANCES MECHANISMS FOR OPERATION PHASE

The Pipeline Management Entity will establish and operate a grievance redress mechanism and process as part of the environmental management system of the pipeline O&M. The process is shown in a diagram in ***Figure 17.1-2***. Each step of the process is clearly explained in the diagram. The process will enable efficient management of grievance redress or response to complaints related to EHS of the pipeline O&M.

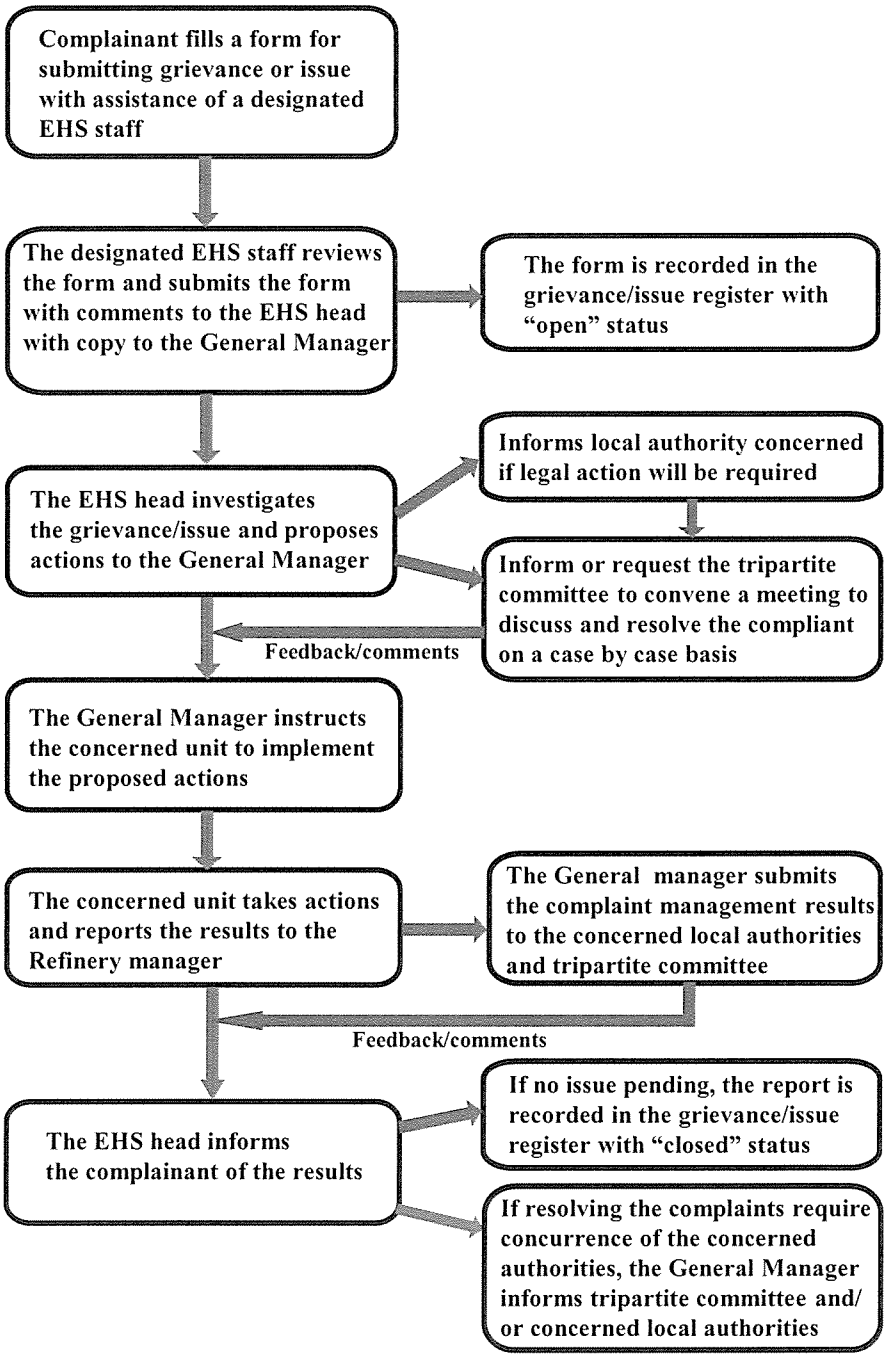
17.3 COMPLAINTS AND GRIEVANCES MECHANISMS FOR DEACTIVATION PHASE

A grievance redress process will be established and implemented as part of demolition project management by the Demolition Project Manager of the BPSC. The process would be similar to that for the construction period.



Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

FIGURE 17.1-1 : COMPLAINTS AND GRIEVANCE REDRESS PROCESS DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASE



Source : TEAM Consulting Engineering and Management Co., Ltd., 2016

FIGURE 17.1-2 : GRIEVANCE MANAGEMENT PROCESS DURING OPERATION PHASE

CHAPTER 18

WORK PLAN AND IMPLEMENTATION SCHEDULE

CHAPTER 18

WORK PLAN AND IMPLEMENTATION SCHEDULE

Work plan and implementation schedule for pre-construction and construction, operation, and deactivation phases of the Project implementation are described as follows:

18.1 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Activities related to preparation for pre-construction and construction will be carried out in about 3 years, tentatively starting of 2017 until of 2020.

Before commencing the construction, the Contractor will need to carry out and complete the following tasks:

(1) Training of personnel in environmental management in construction works relevant to the detailed designs, the nature and scope of construction works in this Project, and existing environmental and social conditions of the Project site.

(2) Preparing the Contractor CEMP which will be based on this CEMP, the detailed designs, the methods of construction, and the construction schedule. The Contractor CEMP will retain all requirements in the CEMP and will have more specific details than the CEMP. All sub-plans in the CEMP will be elaborated as appropriate.

(3) Setting up the EMS including documentation system, organization, monitoring and evaluation plans and procedures, and formats of various reports.

These three tasks will have to be completed to the satisfaction of the Project Proponent not later than two weeks before commencing the construction.

Figure 18.1-1 shows tentative working schedule during pre-construction and construction periods.

Table 18.1-1 presents implementation schedule of mitigation measures and monitoring program during pre-construction and construction phases.

Brief description on monitoring and inspection program is attached in ***Appendix 18A***. Its should be noted that those forms in ***Appendix 18A*** are examples of each issue. It can be adjusted to the work details.

No.	Activities	Duration (months)	Construction period (month)					
			Year 1		Year 2		Year 3	
			6	12	18	24	30	36
1.	Site preparation	12						
2.	Excavation works	21						
3.	Pipeline installation	21						
4.	Inspection and testing	21						
5.	Earth backfilling works	20						
6.	Commissioning	6						

Remark : Tentatively, TIMOR GAP, E.P. intends to commence the construction around 2017

Source : TIMOR GAP, E.P., 2016.

FIGURE 18.1-1 : TENTATIVE CONSTRUCTION SCHEDULE

18.2 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR OPERATION PHASE

The design consultant or the Contractor should submit a detailed Risk Management Program and the Emergency Response Plan not later than 2 months before commissioning the pipeline.

Training of personnel for risk management will be completed before the testing and commissioning of the pipeline system. The Risk Management System will be set up, used and adjusted as issues arise until it can efficiently function.

Tentative, TIMOR GAP, E.P. intends to commence the operation, starting of the third quarter of 2020 throughout the whole project of life of 50 years.

Table 18.2-1 presents implementation schedule of mitigation measures and monitoring programs during operation period.

Brief description on monitoring and inspection program is attached in ***Appendix 18B***. Its should be noted that those forms in ***Appendix 18B*** are examples of each issue. It can be adjusted to the work details.

TABLE 18.1-1

IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING PROGRAM DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

	Activity	Pre-Construction and Construction Phases																																							
		2017						2018												2019												2020									
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1.	**Mitigation Measures Implementation**																																						
1.1	Land requirement																																						
1.2	Fugitive dust and gaesous emissions																																						
1.3	Noise level																																						
1.4	Wastewater management																																						
1.5	Solid waste management																																						
1.6	Hydrostatic test																																						
1.7	Water Quality																																						
1.8	Chance finds for archeological , historic and scared sites																																						
1.9	OSH of construction workers																																						
1.10	Land acquisition																																						
1.11	Workers camps																																						
1.12	Influx of workers																																						
1.13	Community health and safety																																						
2.	**Monitoring Programs Implementation**																																						
2.1	Air quality (2 Stations @ 3 consecutive days)*																	△																						
2.2	Noise (2 Stations @ 3 consecutive days)*																	△																						
2.3	Wastewater measurement (3 Stations)						△						△						△						△						△						△			
2.4	River water measurement (24 Stations)							△		△		△		△		△		△		△		△		△		△		△		△										
2.5	Hydrostatic water test (2 samples at 1 station)																														△								
2.6	OSH of construction workers																																						
2.7	Land acquisition																																						
2.8	Conditions of worker camp																																						
2.9	Influx of workers																																						
2.10	Community health and safety																																						
3.	**Reporting**																																						
3.1	Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★		
3.2	Submit semi-annual monitoring report to NDPCEI							◆						◆						◆						◆						◆						◆	

Remark: Implementation throughout pre-construction and construction periods, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the construction is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with construction Activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 18.2-1

IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING PROGRAM DURING OPERATION PHASE

Activity	Operation Phase																	
	2020 (First Year)						2021 (Second Year)-End of Project Life											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Mitigation Measures Implementation																		
1.1 Pigging waste management																		
1.2 Operation risk																		
1.3 Community health and safety																		
2. Monitoring Programs Implementation																		
2.1 Pigging waste management (2 times/month)	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
2.2 Emergency response plan																		
2.3 Community health and safety																		
3. Reporting																		
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
3.2 Submit semi-annual monitoring report to NDPCEI						◇						◇						◇

Remark: Implementation throughout operation period, and recorded on weekly and monthly basis

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

18.3 WORK PLAN AND IMPLEMENTATION SCHEDULE FOR DEACTIVATION PHASE

Deactivation related to deactivation will be carried out in maximum 1 year duration.

Before commencing the construction, the Contractor will need to carry out and complete the following tasks:

(1) Training of personnel in environmental management of the demolition works.

(2) Preparing the Contractor DEMP which will be based on the DEMP prepared as part of the demolition EIA, the methods of demolition and dismantling, and the demolition schedule.

(3) Setting up the EMS including documentation system, organization, monitoring and evaluation plans and procedures, and formats of various reports.

These three tasks will have to be completed to the satisfaction of the Pipeline Company not later than two weeks before commencing the demolition.

Table 18.3-1 presents implementation schedule of mitigation measures and monitoring programs during deactivation period.

TABLE 18.3-1
IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING PROGRAM DURING DEACTIVATION PHASE

Activity	Deactivation Phase												
	First Year												Second Year
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1. Mitigation Measures Implementation													
1.1 Air quality	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.2 Noise	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.3 Solid waste management	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.4 Wastewater management	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
1.5 Community health and safety	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
2. Monitoring Programs Implementation													
2.1 Air quality (2 Stations @ 3 consecutive days)*					△								
2.2 Noise (2 Stations @ 3 consecutive days)*					△								
2.3 Solid waste management					△						△		
2.4 Wastewater measurement					△						△		
2.5 Community health and safety	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	
3. Reporting													
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	
3.2 Submit semi-annual monitoring report to NDPCEI						◆						◆	

Remark: Implementation throughout deactivation period, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the demolition is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with demolition activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

CHAPTER 19

COST ESTIMATES

CHAPTER 19

COST ESTIMATES

Cost estimates for mitigation and monitoring including emergency plan and social support program during pre-construction, construction, operation and deactivation phases are described as follows:

19.1 COST ESTIMATES FOR MITIGATION MEASURES

19.1.1 Cost Estimates for Mitigation Measures during Pre-Construction and Construction Phases

All mitigation measures to be implemented in the construction will be included in the contract cost. The total cost of mitigation measures is provisionally estimated at approximately 25,820 US$ (2016 prices). The cost estimates involve mainly waste management and social issues including emergency response plan.

For capacity development and training, the Contractor will present the cost of training in his cost proposal which would be a very small fraction of the contract cost.

19.1.2 Cost Estimates for Mitigation Measures during Operational Phase

All mitigation measures to be implemented in the operation will be included in the contract cost.

The total cost of the project is estimated at US$ 522 million. The cost of treating pigging wastes will be small compared to the Project's capital investment and operational expenses.

For capacity development and training, the cost will be included in annual operation budget of Betano Pipeline System Company.

19.1.3 Cost Estimates for Mitigation Measures during Deactivation Phase

All mitigation measures to be implemented in the operation will be included in the demolition contract cost.

Assumed the cost of mitigation measures is about 50% of pre-construction and construction phases and duration of deactivation phase is also about 50% of pre-construction and construction phases. Hence its cost would be about 13,000 US$ (2016 prices).

For capacity development and training, the cost will be included in annual operation budget of demolition contract.

19.2 COST ESTIMATES FOR MONITORING

19.2.1 Cost Estimates for Monitoring during Pre-Construction and Construction Phases

During the construction phase, a budget will be allocated for monitoring and evaluation of the Project's environmental and social performance. At present, it is estimated that a budget of approximately 32,000 US$ per year should be adequate. Exact amount of budget will be determined each year in order to fulfill an actual annual implementation program.

Scheduled monitoring of environmental performance is required throughout the construction phase of the Project to evaluate compliance with legal requirements, the environmental management objectives, and relevant policies, standards and guidelines. The monitoring and evaluation will enable the overall effectiveness of the environmental controls to be determined and allow areas of non-compliance to be identified so corrective actions can be taken.

Therefore, the monitoring will be linked to the work schedule. The Contractor will be required to prepare environmental monitoring program based on the latest construction schedule before commencing the construction.

Monitoring by the third party will be officially carried out for air quality, noise measurement, wastewater measurement twice a year in general. River water quality will be measured at 100 m and 200 m downstream of the 12 river construction sites before and during construction period. Monitoring on hydrostatic water test will be carried out once at completion of construction.

This aims to check correctness of mitigation measures compliance and impacts which might be occurred.

Table 19.2-1 presents details of the cost estimates. The actual amount of budget will have to be determined each year in line with the actual annual monitoring program to be implemented in that year.

TABLE 19.2-1

PRELIMINARY COST ESTIMATES OF ENVIRONMENTAL MONITORING FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES

No.	COST ITEMS	Monitoring Activities	Unit Cost		Annual Budget
			US$	Units	US$
1	**Environmental monitoring during the construciton period**				
	air quality (2 stations)	Ambient air quality will be carried out at the sensitive area of the two nearest communities to the pipeline corridor, namely Bobe and Bonuc villages, to check PM10, TSP, NO_X and SO_X.	650	Station	2,600
	noise measurement (2 stations)	Monitoring will be carried out at the sensitive area of the two nearest communities to the pipeline corridor, namely Bobe and Bonuc villages, to check Leq 1 hr, Leq 24 hr and Lmax	150	Station	600
	wastewater measurement (3 stations)	Twice a year collection of two grab water samples, at outlet of retention pond, at 3 woker camps to analyzed magnitudes of various quality parameters, as prescribed in effluent standards.	250	Station	1,500
	river water measurement (24 stations)	Collection of two grab water samples, at 100 m and 200 m downstream of the 12 river construction sites before and during construction period, to analyzed pH, DO, Turbidity and Suspened Solids.	150	Station	7,200
	Hydrostatic water test	Collection of two grab hydrostatic test water samples at once after construction to analyzed pH, temperature and Suspened Solids.	100	Station	100
2	**Social support program including CSR**	Disclosure the project information to the public, public relations To be communication channel, including receiving complaints and settling the solutions	10,000	Lumpsum	10,000
3	**Enmergency Response Plan**	Monitoring emergency situations such as accident, fire, etc. including restrain and and recovery the situations	10,000	Lumpsum	10,000
TOTAL ANNUAL BUDGET					32,000
TOTAL BUDGET FOR CONSTRUCTION PERIOD *			**95,800**		

Note: * Hydrostatic water test will be carried out only once in three years.

19.2.2 Cost Estimates for Monitoring during Operation Phases

During operation phase, monitoring of environmental performance will be on recording the volume of pigging wastes which will be sent for treatment at the refinery plant only. This internal monitoring, therefore, will be no cost involved.

Table 19.2-2 presents details of the cost estimates. The actual amount of budget will have to be determined each year in line with the actual annual monitoring program to be implemented in that year.

19.2.3 Cost Estimates for Monitoring during Deactivation Phases

The demolition works will be implemented in a short period of time with similar activities to those in the construction phase. Therefore, monitoring will be carried out based on former experiences, by The Demolition Contractor. Its cost will be included in Demolition Project Management.

TABLE 19.2-2
PRELIMINARY COST ESTIMATES OF ENVIRONMENTAL MONITORING FOR OPERATION PHASE

No.	COST ITEMS	Monitoring Activities	Unit Cost		Annual Budget
			US$	Units	US$
1	Social support program including CSR	Disclosure the project information to the public, public relations To be communication channel, including receiving complaints and settling the solutions	10,000	Lumpsum	10,000
2	Enmergency Response Plan	Monitoring emergency situations such as accident, fire, etc. including restrain and and recovery the situations	15,000	Lumpsum	15,000
TOTAL ANNUAL BUDGET					25,000
TOTAL OF ANNUAL BUDGET FOR OPERATION PERIOD					**1,250,000**

CHAPTER 20

REVIEW OF THE EMP

CHAPTER 20

REVIEW OF THE EMP

Review of the EMP during three phases of the Project implementation is described as follows:

20.1 REVIEW OF THE CONSTRUCTION EMP

The Contractor CEMP will be consistently reviewed and updated or amended to ensure that it remains adequately responsive to the construction progress and changes in the construction schedule and methods, if any.

The amendment of the Contractor CEMP could be initiated by the Contractor EHS Manager or Project Manager, or could be requested by the Owner Project Manager. The need for amending the Contractor CEMP will be triggered by the following:

- Environmental performance falls much below the benchmarks
- Construction methods will be changed.
- Environmental quality standards and requirements have been upgraded by NDPCEI.
- There will be changes in the scope of construction, design, or site.

The review and updating or amendment of the Contractor CEMP will follow the following procedure:

A. The amendment is initiated by the Contractor

1) The Contractor will submit the proposed changes to the Owner Project Manager for review and approval. The Owner EHS Manager will support the Owner Project Manager in reviewing the proposed changes and their implications on environmental performance of the construction.

2) The proposed amendments will be recorded in accordance with the established document control system. The Owner Project Manager will undergo the contract variation procedure to effect the changes in the Contractor CEMP.

B. The amendment is initiated by the Owner

1) The Owner ESH Manger or the Owner Project Manager could see the need for amending the Contractor CEMP. The EHS Manager will recommend the needed changes to the Project Manager.

2) The Pipeline Manager will review the recommendations and assess their implications on environmental performance of the construction. The Pipeline Manager will make a decision on the recommended revisions.

3) If the proposed amendment is approved, the Owner Project Manager will request the Contractor to amend the Contractor CEMP. The changes will be recorded in accordance with the document control system.

4) A contract variation will be issued, if necessary. For minor changes, contract variation would not be necessary. An addendum signed by the Owner and the Contractor Project Managers will be added to the amended Contractor CEMP.

20.2 REVIEW OF THE OPERATION EMP

This Operation EMP will be reviewed and updated by the EPC Contractor to become the Contractor OEMP. The Contractor OEMP should be completed during the commissioning of the Pipeline. The ESH Manager will review and update the Contractor OEMP during the initial months of the pipeline operations to become the Pipeline OEMP.

The Pipeline OEMP will be consistently reviewed and updated to ensure it remains effective and responsive to changes in operational requirements of the pipeline. The review of OEMP will be triggered by the following:

- Risk management performance falls much below the benchmarks
- Pipeline capacity will be increased.

The review and updating of the Pipeline OEMP will follow the following procedure:

(1) The ESH Manager will review the Pipeline OEMP and submit recommendations to the GM for revising the Pipeline OEMP in accordance with the document control system.

(2) The GM in consultation with the Maintenance Manager, the Operation Manager, and the ESH Manager will review the recommendations and assess their implications on the pipeline operation, budget and training requirements. The GM will make a decision on the recommended revisions.

(3) For minor revision of the OEMP, the GM will authorize the ESH Manager to make the revisions in accordance with the documentation control system.

(4) For major revisions of the Pipeline OEMP, the GM will seek approval at the corporate level.

20.3 REVIEW OF THE DEACTIVATION EMP

The Contractor DEMP will be consistently reviewed and updated or amended to ensure that it remains adequately responsive to the demolition progress and changes in the demolition schedule and methods, if any.

The amendment of the Contractor DEMP could be initiated by the Contractor EHS Manager or General Manager, or could be requested by the Demolition Project Manager. The process for amendment of the Contractor DEMP should be similar to that of the construction phase.

CHAPTER 21

NON-TECHNICAL SUMMARY

CHAPTER 21

NON-TECHNICAL SUMMARY

21.1 INTRODUCTION

An Environmental Management Plan (EMP) for the Project is prepared as part of the Environment Impact Assessment EIA study process in the Decree Law No. 5/2011 on Environmental Licensing. The objective of the EMP is to prescribe what will need to be done to: (i) minimize environmental (and social) impacts of the Project; and (ii) ensure that the environmental performance of the Project in all phases will comply with applicable laws and regulation and conditions of the environmental licensing.

21.2 DESCRIPTION OF THE PROJECT

21.2.1 The Project Location

The proposed pipeline is to be laid along the highway being constructed of about 60 km passing the administrative areas of Manufahi, Ainaro and Covalima districts.

The Project will construct the following facilities:

(1) Pipeline

The pipeline will consist of 4 pipes (condensate, light naphtha, heavy naphtha, and diesel) designed for the refinery's future capacity of 40,000 barrels per day (BPD).

(2) Instrumentation System

The pipeline will be equipped with appropriate instruments for monitoring and control of pressure, temperature and flow at both ends for the purposes of operational management and safety

(3) Pumping Stations

One pumping station will be constructed at Suai Supply Base for pumping the condensate. Another pumping station will be constructed at the refinery for pumping the three products.

(4) Pigging Stations

Two pigging launching/receiving stations will be installed, one close to the pumping station at Suai Supply Base, and another close to the pumping station at the refinery.

(5) Control Buildings

One control building will be required at each end of the pipeline. The two buildings will be small and can be considered minor construction works.

21.3 SUMMARY OF IMPACTS

Briefly information on these environmental and social impacts and their mitigation measures and monitoring programs for pre-construction, construction, operation and deactivation phases are presented in ***Table 1.8-1 to 1.8-3*** *of Section 1.8:Description of Proposed Mitigation Measures and Monitoring Programs.*

21.4 DESCRIPTION OF PROPOSED MITIGATION MEASURES AND MONITORING PROGRAMS

Mitigation measures and monitoring programs for the management of the potential project impacts both environmental and social issues during pre-construction, construction, operation and deactivation phases are presented in ***Table 21.4-1 to 21.4-3*** Each Mitigation measures and monitoring programs will be a working document and as such it will be reviewed and amended or updated as deemed necessary to reflect changes in construction schedule -and management review changes.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Land requirement for establishment of base camp, office, corridor with space, pipe laydown area with materials and shed including satellite camp	Loss of about 255 ha of forest land and 205 ha of agricultural land in relation to land requirement.	• Compensation for forest and agricultural land • Compensation and relocation for affected persons in Bobe and Bonuc sub-villages	• The Ministry of Public Works, Transport and Communication. • The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.	Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.	To be managed and identified by the Ministry of Public Works, Transport and Communication.	Number of complaints related to land requirement for pipe laydown area and camp site.	To be managed by the Ministry of Public Works, Transport and Communication.
Fugitive dust Site clearing, excavation work, move of heavy equipment and vehicles along the dirt road will generate fugitive dust	Fugitive dust includes: • TSP about 411 $\mu g/m^3$ compared to standard of exceeding 230 $\mu g/m^3$. • PM_{10} about 214 $\mu g/m^3$ compared to standard of not exceeding 150 $\mu g/m^3$	• Spray water at and around the construction areas and access roads during site preparation and grading. • Limit speed for vehicles and trucks not to exceed 40 km/hr. • Restore, resurface, and rehabilitate the disturbed areas as soon as practicable after completion of construction or disturbance. • Prohibit the open burning of waste in the pre-construction area. • Dust masks should be provided (where applicable) to all workers. • For construction site including spoil placement sites: – Use watering or other effective techniques on unsealed areas; – Rehabilitate construction sites and spoil placement as soon as the land becomes available. • Take measures (e.g. rumble bars and wheel wash bays) to ensure dust-creating material (earth or similar material) is not transported from the construction sites to roads or other areas in the public domain. • Cover all trucks carrying spoil or other loose materials. • Clear and remove all loose earth and similar material spilled or deposited within the construction sites and the transport routes from trafficked areas. • Take measures to avoid impacts of dust on adjacent properties such as: – Modify construction methods; – Increase dust suppression measures; or – Cessation of work when no other reasonable or practical measure is available.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Total Suspended Particulate (TSP-24 hrs) • Particulate Matter less than 10 micron (PM10-24 hrs) Nitrogen dioxide (NO_2) • Wind speed and direction (WS/WD)	• Number of complaints filed through the complaint response channel. • Number of times that the local ambient air quality is below the prescribed standards related to fugitive dust. **Pollutant** / **Not to be Exceeded** TSP 24- hour average: 230 $\mu g/m^3$ [a] PM_{10}, 24-hour average: 150 $\mu g/m^3$ (Interim target-1)[b] **Remark:** [a] WHO Pollution Prevention and Abatement Handbook , WHO, 1988 [b] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Gaseous emissions Operations of diesel-powered heavy construction equipment, vehicles and generator sets will generate gaseous emissions during the construction.	• Gaseous emission will be mostly generated by typical pollutants such as NO_x, SO_x, CO, and particulate in the exhaust gases discharged from the engines. • Its effect would be on health of construction workers.	• Manage the movement of construction vehicles entering and leaving the construction sites to avoid the potential for vehicle emissions impacting on adjacent properties such as avoiding or minimizing queuing on streets approaching the worksites or adjacent to other sensitive activities; • Adopt procedures to avoid construction vehicles idling for excessive periods (e.g. more than 5 minutes) if required to queue to enter the construction sites; • For stationary plant and equipment powered by diesel motors, take measures to avoid or mitigate and manage the potential impacts of exhaust emissions on adjacent residential or other sensitive activities such as all equipment powered by diesel motors are fitted with emission control measures, and are regularly maintained to manufacturers' specifications. • Maintain all construction equipment in proper working conditions according to the manufacturer's specifications. • Provide adequate training to the equipment operators in the proper use of equipment. • Use the proper size of equipment for the job. • Use the equipment fitted engines with latest low emission technologies. • Perform on-site material hauling with trucks equipped with on-road engines • Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Nitrogen dioxide (NO_2) • Sulfur oxides (SOx) • Vehicle motors idling for periods exceeding 5 minutes while in queues to access construction sites (on-going). • Inspect the position of stationary plant and equipment powered by diesel engines to ensure exhaust emissions are directed away from sensitive activities and neighboring properties (initially on establishment).	• Number of complaints filed through the complaint response channel. • Number of times that the local ambient air quality is below the prescribed standards related to exhaust emission. **Pollutant** / **Not to be Exceeded** NO_2, 24-hour average: 200 µg/m³ (Interim target-1)[a/] SO_2, 24-hour average: 125 µg/m³ (Interim target-1)[a/] **Remark:** [a/] WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, 2005	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Noise level Operations of heavy construction equipment during land clearing, pipeline lowering, and backfilling, etc. would generate noise.	• Loud noise will disturb and cause annoyance to hearing capacity of the people in surrounding area. • Loud noise over long period will cause hearing impairment.	**Design** • Design to use construction equipment that generate low levels of noise with adoption of best available technologies to minimize noise. • Conduct a noise survey covering the identified sensitive receptors to update the existing baseline data in the Final EIA Report. • Demonstrate through predictive modeling of the proposed construction techniques and monitoring ambient noise readings prior to construction to establish pre-disturbance levels, the likely levels of noise due to construction works throughout the construction period. **Pre-Construction and Construction Noise** • Construction works which generate excessive levels of noise must be carried out, only during the period between 6.30 am to 6.30 pm Mondays to Saturdays. Such construction works on Sundays or public holidays will need approval from the resident engineer of the Project Proponent. • Protect the affected sensitive receptors beyond standard construction hours such as installation of acoustic walls or noise barriers. • The noise reduction at the perimeter could be achieved using an acoustic wall or a sound barrier (Steel 18 ga with 1.27 mm. thickness which transmission loss of 25 dB(A) or equivalent) at least 3 m high with adequate length to block the noise emanating to the receptor. • Provide ear plugs or ear muffs to workers operating in the excessive noise areas. • Limit speeds of vehicles in the construction site, not exceed 40 km/hr. • Include measures to achieve the construction noise targets such as: – Commence advanced notification of works and undertake on-going consultation with potentially affected property owners and occupants. – Establishing temporary noise barriers between construction worksites and sensitive receptors. – Fitting noise-reduction measures to all equipment engaged in the construction works; • Designing worksites to minimize potential noise impacts on nearby sensitive places.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Leq 1 hr • Leq 24 hrs • Lmax	• The incremental increases in noise level during the construction works compared to the targets. • Net ambient noise level compared to the applicable ambient noise standard. **Area** / **Not to be Exceeded** Industrial and Commercial area: Leq (24 hrs) - 70 dB(A)[1,2] - 70 dB(A)daytime [3] - 70 dB(A) nighttime [3] Residential areas: Leq (1 hr) - 55 dB(A)daytime [3] - 45 dB(A) nighttime [3] Lmax - 110 dB(A) [2] **Remark:** [1] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, US EPA (United States Environmental Protection Agency), 1974 [2] Notification of Guidelines for Community Noise, World Health Organization (WHO), 1999 [3] Environmental, Health, and Safety (EHS) Guidelines: General EHS GUIDELINES: ENVIRONMENTAL NOISE MANAGEMENT of International Finance Corporation, 2007	• Regular inspection (weekly minimum) by in-house staff. • Twice a year monitoring over the construction period, by the third party. • Once for 3 consecutive days cover in the period that construction is passing the two nearest communities.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Wastewater Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater. *Wastewater* Daily activities of the workers/employees in relation to kitchen, canteen, toilets, bath rooms, and wash water in the base camp and satellite camp will generate wastewater. (Cont'd)	Wastewater volume will be from: • about 15.3 m^3/day from base camp • about 1.9 m^3/day from each satellite camp.	**Design Concept** The Contractor will prepare detailed design of a wastewater management system for the worker camp, consisting of a collection system and a simple treatment system. Its proposed design concepts are: **For Domestic Wastewater** • Toilet wastes will be separated from grey water or sullage. • Toilet wastes will be discharged into a septic tank(s) with a hydraulic retention time of about 5 days. The volume of toilet wastes is estimated at about 20% of the total volume of domestic wastewater. The septic tank effluent (septage) will be discharged into the retention pond. Alternatively, toilet wastes will be treated in a package treatment plant using an aerobic process. • The temporary retention pond within worker camp site areas will be designed as an oxidation pond. **During Construction** • Water in the retention pond will be used for dust suppression on unpaved areas in the construction site, and also for watering of the green area. • The remaining volume will be discharged into the water sources.	• The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Total Nitrogen • Temperature • Total Suspended Solid • Oil and Grease • BOD_5 • COD • Total Phosphorus • Sulfides	• Qualities of the treated effluent compared with the applicable effluent quality standards. • The final effluents are expected to meet the following quality standard: - pH 6-9 - Total Nitrogen <10 mg/l [a] - Temperature increase ≤3 °C [b] - TSS <30 mg/l - Oil and grease < 10 mg/l - BOD_5 < 30 mg/l - COD < 150 mg/l - Total Phosphorus <2 mg/l - Sulfides <1 mg/l **Remark:** [a] The effluent concentration of nitrogen (total) may be up to 40 mg/l in processes that include hydrogenation [b] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	Twice a year during construction
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items.	An amount of waste is equivalent to: • About 237 tons of *construction waste* over the 60 km length of pipeline corridor, or about 0.2 tons/day over the period of 36 months. • About 0.8 m^3 / day of *waste from workers.* • About 0.25 tons/month of *hazardous waste*.	**Design and Planning before Commencing the Construction** • Design own disposal facility, preferably within the construction site. • Design the construction methods to generate the least amount of wastes. • Design methods of waste transport and disposal. • Prepare an action plan for waste management to reflect cumulative results of the previous quarters. • Consider using materials and products that have a recycled content. • Arrangements with suppliers to return any unused construction materials; • Where possible, goods to be ordered in bulk to minimize packaging waste and packaging material returned to the supplier wherever practicable; and	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in total solid waste management cost of 25,820 USD.	• Efficiency of the collection, • Storage, and disposal volume, and • Record keeping	Number of complaints related to waste disposal.	• Daily site inspections, and • Detailed weekly site inspections.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items. (Cont'd)		**During Construction** **Waste Segregation** • Design and implement a waste segregation system. • Provide an appropriate number of containers with adequate volume and appropriate materials at strategic locations to support the segregation in terms of recycling, reuse and disposal sub-categories. **Waste Collection and Storage** • Collection and transport each sub-category of segregated wastes on daily basis. • Provide a roofed storage area with adequate space for storing the segregated wastes waiting for the on-site or off-site reuse or recycling. • Special design the storage area for hazardous waste to prevent spills or leaks onto the soil. **Waste Reuse and Recycling** • Chipping and mulching of vegetation and reuse for landscaping purposes; • Reuse of excavated material as fill at approved fill sites; • Topsoil free of weeds to be stockpiled and stored for re-use, if possible; • Collection and return of packaging materials (e.g. pallets) to suppliers wherever practicable; • Remove any contamination inadvertently deposited in recyclable waste material containers. Provide cleanup of excessive contamination at recycling vendor locations when such contamination is not controlled at the project site. • Collection and recycling of used oils by a licensed contractor; • Collection by a licensed contractor of empty oil and fuel drums and other containers for return to recycling facilities; **Waste Disposal** • Disposal of the remaining wastes that are unable to be reused or recycled in the approved landfill site. • Prohibit haphazard disposal of construction waste in or off the construction site.					

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Construction Waste • Activities related to site clearing, excavation, concrete works, steel works, piping works, installation of equipment, and construction of buildings will generate wastes. • Daily activities of the workers will generate non-construction wastes, including wastes from canteens and offices such as paper, food and beverage containers, food wastes, and other domestic items. (Cont'd)		• Inert wastes such as broken tiles, bricks, plastics should be used for filling the site in areas planned to be vacant space. • No burning of wastes. • Decomposable wastes such as food wastes and vegetation may be disposed of by composting. • Hazardous wastes will be handled by a licensed hazardous waste contractor, otherwise finding for appropriate arrangements for incineration, safe permanent storage, or other appropriate methods of disposal. **On-site Record Keeping** Design and maintain record keeping procedures with provisions for: • Tracking collections of waste materials at the sites and deliveries to recycling, reuse, salvage, and landfill facilities. • Maintaining on-site logs that include for each load of materials removed from the site: type of material, load weight, recycling/hauling service, and date accepted by recycling service or landfill.					
Hydrostatic Test Water Hydrostatic test of all four installed pipes generate tested water.	Discharge of 9,900 m^3 tested water to natural receiving water.	• Formulate and submit a hydrostatic test plan for approval. The hydrostatic test plan will provide the following information: – Sections to be tested and testing schedule – Water volume required for the test – Sources and expected characteristics of the test water before discharge – Chemical to be used in the test, if there is any – Existing conditions-For each river, present information on existing water quality, physical conditions at the proposed section where the hydrostatic test water will be discharged, downstream water use, flow conditions. In addition to narrative information, photographs and drawings should also be included to support the information. – Expected rate and duration of the discharge of hydrostatic test water at each selected river.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • Temperature • Suspended Solids	• Qualities of the treated test water compared with the applicable effluent quality standards. • The hydrostatic test water are expected to meet the following effluent quality standard: - pH 6-9 - Temperature increase ≤3 °C [a] - TSS <30 mg/l **Remark:** [a] At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.	Once after construction

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Hydrostatic Test Water Hydrostatic test of all four installed pipes generate tested water. (Cont'd)		– Design of structure or facilities to be constructed at each discharge point to prevent damage to the embankment or bed of the river. – Water quality sampling plan before, during and after the discharge of hydrostatic test water to evaluate impacts on river water quality. • Conduct the hydrostatic test with specific practices as following practices: – Restrict water withdrawal for hydrostatic testing not to exceed 10% of the stream flow of the watercourse at the time of withdrawal or as required by permit / approval conditions. – Ensure that sufficient workers and equipment are available onsite to repair any rupture, leak or erosion problem that may arise during testing. – No chemicals, biocides or conditioners will be added to the pipeline test water unless otherwise approved by the Project Manager. – Use a diffuser to dissipate and reduce the rate of water as it is released and monitor dewater points for potential erosion problems. Use riprap, sheeting, tarpaulins or other comparable measures to protect the ground and vegetation from erosion at the discharge sites. – Monitor discharge locations to ensure that no erosion, flooding or detrimental ice build-up occurs. – Collect samples of source water and hydrostatic test water and analyze to demonstrate regulatory compliance. For this purpose, samples will be collected of hydrostatic test water at the beginning, middle and end of the release for testing for the project record. – In case of complaints about discharging of the test water from hydrostatic test, quick action of problem solving has to be conducted					

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Water Turbidity In-river construction of pipe support columns will cause water turbidity.	A small turbidity plume would be observed in the river around the site, over a short distance before the turbidity returns to its normal level.	**Design and Planning** • Ensure the design of pipeline bridge for each river and the method of its construction will give due consideration on impacts on water quality, particularly turbidity or suspended solids. • For each river, the Contactor will: – Conduct a survey of downstream water user, river bed and embankment conditions at the proposed construction section. – Estimate the duration and magnitude of likely impacts of the in-river construction activities on river water quality. – Submit an action plan containing results of the surveys and impact assessment, and proposed methods of construction and mitigation measures to be implemented in each river. **Construction** • Undertaken in the low flow conditions, and should be completed with all temporary facilities in the river completely removed before the high flow season. • Minimize the areas that will be disturbed, including the river bed, bank, access to the construction site, and laydown area. • The on-land construction area near the river bank will have appropriate measures to minimize soil erosion during rainfalls. • The on-land construction area will be rehabilitated to its previous conditions as soon as the construction is completed.	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• pH • DO • Suspended Solids • Turbidity	• Increase in river water turbidity before and during the construction. • The river water quality is expected to meet the following freshwater quality standard: - pH 6.5-9 [a] - Dissolved oxygen $\geq 3.5'$ mg/l [a] - Turbidity crease ≤ 25 (Upstream) [b] ≤ 390 (Downstream) [b] - Suspended solids 80 mg/l [b] **Remark:** [a] National Recommended Water Quality Criteria, United States Environmental Protection Agency (EPA), 2009 [b] Quality Criteria for Water, 1986	2 times; before and during construction.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Chance Finds for Archeological, Historic and Sacred Sites During site clearing and excavation of pipe trench, the Contractor may discover artifacts which potentially could have archeological, historic, religious, or cultural value.	Operational activities may possibly destroy some artifacts presented under the pipeline corridor.	• Site supervisor/foreman shall order construction workers to stop immediately the construction activities in the area of the chance find. • Inform concerned authority, including local leaders, for proper management if historic is found. • Delineate and mark clearly the discovered site or area and prohibit physical activities in the area without prior approval of the concerned authority. • Install temporary site protection measures (warning tape and stakes, avoiding signs). • Strictly enforce any no-go area needed to protect the site. • Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the responsible Ministry takes over. • If it is necessary to relocate a cemetery and grave yard, cultural ceremony should be arranged prior to the relocation.	• The contractor to inform the Project Proponent. • The Project Proponent to inform concerned authorities in case of chance finds archeological, historic, religious, or cultural value.	To be included in the total construction contract cost	Site inspection	Number of complaints filed through the complaint response channel.	During land clearance and site preparation
OSH of construction workers Activities related to pre-construction and construction may harm health of construction workers	There is a possibility that the workers/employees might be injured during working. Pre-construction.	Mitigation measures are identified in the worker camp management. (Under social issue)	The Contractor under the supervision of the EHS Manager of the Project Proponent.	To be included in the total construction contract cost	• Accident • Record keeping	Number of accidents and injuries in the worker camps.	Daily and weekly inspection
Land acquisition Site preparation for establishment of base camp, office, corridor with space, pipe laydown etc will occupy some forest and agricultural areas.	Reduce of forest and agricultural areas which are economic resources of villagers who collect forest products and cultivate on these areas.	Compensation and relocation for affected persons in Bobe and Bonuc sub-villages	• The Ministry of Public Works, Transport and Communication. • The Project Proponent to coordinate with the Ministry of Public Works, Transport and Communication.	Compensation cost will be covered by the Ministry of Public Works, Transport and Communication.	To be identified and managed by the Ministry of Public Works, Transport and Communication.	Number of complaints related to land acquisition.	To be managed by the Ministry of Public Works, Transport and Communication.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Worker Camps Mismanagement of worker camps may harm workers' health and pollute surrounding environment.	• Unhygienic living conditions will affect health of workers; • Pollution of the natural environment outside the worker camp, such as fly infestation, water pollution, and odor; • Exposure of workers on accidental risks or worker safety.	Ensure the design, operation, and management of the worker camp are within specific requirements as follows: • The worker camps should be made of decent materials that could withstand heavy rains and storms, with adequately ventilated and lighted. • Provide a sleeping space of at least 4 m^2 per worker, with separate rooms for professional staff. • Number of toilets and baths should be 1 unit for 20 workers. • Plan for common canteen which can accommodate at least 150 persons. • Provide common areas for cloth washing and drying with adequate water supply and drainage. • Provide recreational facilities with sufficient accessories. • Set up one shop to sell sundry goods to the workers. • Strictly control fly, insect and rodent. • Provide medical services at a small clinic served by a doctor. • Prepare fire and safety plan for the camps. • Basic camp infrastructure with facilities of power supply, telecommunication, water supply, drinking water, drainage, sanitation and solid wastes management. • Establish and enforce codes of conduct within and outside the worker camps covering camp security, fire safety, drug using, drinking, smoking, and visiting guests. • Provide security guards to be in charge of the security of camp. • Provided transport services from the project site to nearby communities. • Environmental management of the demolition and dismantling of the worker camp and associated facilities after the construction is completed.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	• Worker Camp • Worker health and safety	• Number of complaints related to worker camps • Number of accidents and injuries in the worker camps.	Daily and weekly inspection.

TABLE 21.4-1

MITIGATION MEASURES DURING THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Influx of Worker Employment of a large number of construction workers will create both of positive and negative impacts	*Positive impact* • Creation of demand for local goods and services; *Negative impact* • Competing use of local resources; • Health risks to the communities such as communicable diseases; • Conflicts with the locals due to differences in culture, value and ways of life.	• Ensure that local provision of goods and services to the workers will be orderly and clean, and will not create unsanitary conditions near the worker camp. • Avoid using local resources as much as possible, and should provide a medical clinic within the worker camp. • Provide communicable diseases control program related to the sanitation and hygiene program for the worker camp. • Provide brief information to non-local workers, to make them aware of cultural sensitivity of the locals.	The Contractor under the supervision of the EHS Manager of the Project Proponent	To be included in the total construction contract cost	Feedback and complaints from affected households.	Number of complaints related to influx of worker	Daily and weekly inspection
Community health and safety Mismanagement or improper control of pre-construction and construction works may affect health and safety including security of the communities resided the pipeline corridor.	The locals and passers-by along the pipeline route might be injured or being insecure.	• Undertake a program of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto the construction corridor where the construction is ongoing. • Ensure that signs are put up around work fronts and construction sites advising people of the risks associated with trespass. • Ensure that there is adequate fencing around pipe lay down yards and other similar facilities to minimize the risk of trespass. • When work fronts are within 100 m of an inhabited building, all equipment will be parked overnight in a demarcated area • Select security personnel based on a careful background screening of the applicants and provide their training. • At the intersection of the construction corridor and local roads or trails, a diversion route must be provided during construction with warning signs to vehicles and pedestrians. • Truck drivers and operators of heavy construction equipment must receive training in public safety in their works.	• The Contractor under the supervision of the EHS Manager of the Project Proponent. • The EHS Manager to involve in CSR program.	To be included in the total construction contract cost	CSR program and its implementation	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Daily and weekly inspection

TABLE 21.4-2

MITIGATION MEASURES DURING THE OPERATION PHASE

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Environmental Issues							
Waste Cleaning of using pigs along the pipeline will generate waste.	Waste from pigging	**Pigging Waste Collection and Transportation** • The pigging wastes will be collected and transported to the waste oil treatment unit of the Betano Refinery's wastewater treatment plant. • The Operational Manager will supervise the collection, storage, and transport of the pigging wastes to the refinery's wastewater treatment plant. **On-site Record Keeping** • The ESH manager will design and maintain procedures for recording the volume of pigging wastes collected and sent for treatment at the refinery.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC.	Including in the operational cost of Betano Pipeline System Company	• Quality of oily sludge before and after the pigging waste is treated. • Volume and characteristics of pigging wastes	Number of complaints related to pigging waste disposal	Every time the pigging waste is sent to the refinery for treatment, about 2 times per month.
Operational risk Defective design, installation, and operation and management of operational work may cause accidental fires and explosions of pipelines	Damage of the pipeline due to risk of oil leak and explosion	Risk Management Program must be in place as a means to guarantee the safe start-up of the commercial operations with all risks fully under control as following : **1. Third Party Damage** **1.1 Excavation** (Ease to access by third party, No pipeline signal or marker) • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. • The minimum cover of buried pipeline shall be accordance with ASME/ANSI B31.4 standards. **1.2 Traffic Accident** (No pipeline signal or marker) • The pipeline signal or marker will be installed along the pipeline route. • The traffic signal shall be installed while pipeline laid above ground.	The Operational Manager, the Maintenance Manager and the EHS Manager under supervision of the General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Monitoring emergency incidents situations such as accident, fire, oil spill, etc. including restrain and recovery the situations	• The likely of incident for each pipeline in case of pipe rapture is 3.94 times in 1,000 years (worst case scenario). • The operating procedure according to the standard of international standards of the American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI); ASME/ANSI B31.1, B31.4.	Daily and weekly site inspections

TABLE 21.4-2

MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		1.3 Vandalism • The project shall be educated the people who living in the vicinity area, in order to make the community understand and participate in the process of project development. • The project shall be built-up the relationship with the local communities. **1.4 Other damage, i.e., Fire/Explosion, arcing of Electronic from the other etc.** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way. **2. Incorrect Operation** **2.1 Mechanical/Equipment Failure** • The pipeline operation shall be done in accordance with the international standards (ASME/ANSI B31.4, ASME/ANSI B31.1, etc.) • Regular maintenance and inspection the equipment, machines to be in good conditions. **2.2 Incorrect Installation** • Installation of machinery and equipment shall be in accordance with codes applicable to the specific type and their installation manual or guidelines. • After installation, machinery or equipment shall be tested under conditions approximating actual operations to assure their proper functioning.					

TABLE 21.4-2

MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		2.3 Human Errors (No operation skill , Staff is not physically or mentally fit for duty, Negligence or inadequate attention to details of staff) • Staff training to be provided on a regular and continuing basis. • Physical check up programs for staff relevant to their tasks as required by regulations or safety standards • Random checks of drug use. • Instilling work safety discipline into staff **3. Natural Forced** **3.1 Earthquake** The pipeline is designed in accordance with the following criteria: • Design Code ASCE: 7-10 • Load Combination shall be as per ASCE 7-10 • Site Class: B • Risk Category: IV • Seismic Design Category: D • Design return period: 475-year **3.2 Storm** • The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route. • The pipeline signal or marker will be installed along the pipeline route. • Regular survey patrol driving along the pipeline right of way **3.3 Hit of Lightning** The pipeline shall be provided the lightning or fault currents prevention systems in accordance with NACE RP-O1-77 Guidelines. **3.4 Flood/Heavy Rain** The pipeline will be laid in the right of way of the highway and the fences will be installed along the highway and pipeline route.					

TABLE 21.4-2
MITIGATION MEASURES DURING THE OPERATION PHASE (CONT'D)

Activities	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
		3.5 Volcano Eruption According to TIMOR LESTE: Natural Hazard Risks map provided by United Nation Office for the Coordination of Humanitarian Affairs (OCHA), there are no actives volcano within the project area and vicinity. **4. Corrosion** • The pipeline shall be used 3LPE for External Coating, that consist of a three layers coating system comprising: - First layer (inner): Fusion Bonded Epoxy (FBE). - Second layer (intermediate): Chemically Modified Polyethylene Copolymer - Third layer (outer): High-density high molecular weight UV stabilized Polyethylene (HDPE) • Three layers shall be used for Painting (External Coating for A/G) • The Cathodic Protection (CP) shall be provide to prevention the corrosion. • Pre-cast concrete sleeper shall be used for above-ground pipeline instead of steel structure in order to avoid corrosion problem.					
Social Issues							
Community Health and Safety Mismanagement or improper control of operational work may affect health and safety including security of the adjacent communities	• Risk of explosions; and • Pipeline ruptures and oil leaks	• Undertake stakeholder engagement regarding the pipeline operations to present and discuss safety features of the pipeline system. • Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns; and • Undertake a community education program on pipeline safety to alleviate concerns.	The General Manager of the BPSC	Including in the operational cost of Betano Pipeline System Company	Feedback and complaints from affected households.	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route.	Throughout the entire operation period

TABLE 21.4-3
MITIGATION MEASURES DURING THE DEACTIVATION PHASE

Activities/Issues	Potential Impacts	Mitigation Measures	Mitigation Responsibilities	Mitigation Cost	Parameter to be Monitored	Targets and Quantitative Indicators of the Level of Mitigation	Monitoring Frequency
Demolition of structures and operation of heavy equipment and vehicles along the dirt road will generate: - *Fugitive dust* - *Loud noise* - *Solid waste* - *Hazardous wastes and oil products* from the storage tanks and pipelines - *Wastewater* from cleaning of storage tanks and pipeline	Fugitive dust will be generated and disturb health of workers and the locals adjacent to the demolition site.	• During the deactivation phase, the Project Proponent prepared at the EIA stage will not be applicable and will replaced by the new deactivation environmental management plan based on the new EIA. • The environmental issues, major sources, magnitude, receptor, predicted impact and mitigation measures in this phase will be similar to those occur during the construction phase. • However, activities of this phase will be demolition only then impacts from demolition activities will be controlled by the demolition contractor. • The contractor will be required to adopt the best practice to minimize impacts from : - Dust - Gas emission - Noise from heavy machinery and from demolition activities - Hazardous wastes and oil products - Wastewater and wastes	The demolition contractor and to be controlled by the project proponent.	• To be included in the demolition contract • To be included in the total solid waste management cost of 13,000 USD	*Fugitive dust* • Quantity of dust • Wind speed and direction • Complaints from the nearest communities *Noise level* • Complaints from the nearest communities *Solid waste* • Quantity • Its disposal *Hazardous wastes and oil products* • Quantity • Disposal management *Wastewater* • Volume and • Its discharge	• Number of complaints from affected local people along the pipeline route. • Number of complaints related to waste disposal and waste water discharging.	Regular site inspection (weekly minimum) by in-house staff.
Community Health and Safety Mismanagement or improper control of demolition work may affect health and safety including security of the workers adjacent communities	Demolition workers, the locals and passers-by along the pipeline route might be injured or being insecure.	Maintain the Grievance Mechanism throughout the operation of the pipeline so the communities can report their specific concerns.	The Project proponent	To be included in the annual budget of the Project proponent	Complaints from local communities	• Number of complaints from affected local people along the pipeline route. • Number of accidents and injuries at the local communities along the pipeline route	Regular inspection (weekly minimum) by in-house staff.

21.5 MONITORING PROGRAM

Monitoring Program during pre-construction, construction, operation and deactivation phases are presented in ***Table 21.4-1 to 21.4-3***.

21.6 REPORTING REQUIREMENTS

Two types of monitoring reports will be generated in the environmental monitoring and site inspections. The first type is reports generated for internal use to provide feedback to the EMS. The second type is reports generated for submission to NDPCEI.

21.7 EMERGENCY RESPONSE PLAN

21.7.1 Pre-Construction and Construction Phases

The Contractor will be contractually binding to prepare and implement an emergency response plan to deal with work accidents, accidental fires, and oil spills and natural emergency events (e.g. earthquakes, land slide, and floods). Consequently, the emergency response plan during the pre-construction and construction would focus on procedures and facilities to deal with work accidents, oil spills, and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay as part of the OHS system. Facilities to be provided on site will contain at minimum the following: fully equipped first aid station, fire-fighting equipment, arranged access to emergency services of the hospital in Manufahi, Ainaro and Covalima districts, and direct communication link with local fire brigades and other relevant government authorities such as the local police station.

21.7.2 Operation Phase

The EPC Contractor will be contractually binding to prepare an Operation Emergency Response Plan (OERP) for the Project Proponent and provide training to the designated staff to ensure they will be able to efficiently and effectively respond to occurring emergencies.

21.7.3 Deactivation Phase

The Demolition Contractor will be required to prepare an emergency response plan to deal mostly with work accidents and accidental fires with focusing on procedures and facilities to deal with work accidents and accidental fires to minimize injuries and loss of lives, damage to properties, and construction delay.

21.8 DEACTIVATION EMP

Environmental management in the deactivation phase will be carried out by the BPSC. The objective is to ensure that the demolition works will not create significant impacts and will meet all applicable standards and guidelines and requirements at the time of demolition.

The details of mitigation measures and monitoring program are summarized in *Table 21.4-3*.

21.9 WORK PLAN AND IMPLEMENTATION SCHEDULE

Table 21.9-1 to 21.9-3 present the implementation schedule of mitigation measures and monitoring program for pre-construction and construction, operation, and deactivation phases.

TABLE 21.9-1

IMPLEMENTATION OF MITIGATION MEASURES AND MONITORING PROGRAM DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASES

Activity	Pre-Construction and Construction Phases																																					
	2017						2018												2019												2020									
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1. Mitigation Measures Implementation																																						
1.1 Land requirement																																						
1.2 Fugitive dust and gaesous emissions																																						
1.3 Noise level																																						
1.4 Wastewater management																																						
1.5 Solid waste management																																						
1.6 Hydrostatic test																																						
1.7 Water Quality																																						
1.8 Chance finds for archeological , historic and scared sites																																						
1.9 OSH of construction workers																																						
1.10 Land acquisition																																						
1.11 Workers camps																																						
1.12 Influx of workers																																						
1.13 Community health and safety																																						
2. Monitoring Programs Implementation																																						
2.1 Air quality (2 Stations @ 3 consecutive days)*																	△																					
2.2 Noise (2 Stations @ 3 consecutive days)*																	△																					
2.3 Wastewater measurement (3 Stations)						△						△						△						△						△						△		
2.4 River water measurement (24 Stations)							△		△		△		△		△		△		△		△		△		△		△		△									
2.5 Hydrostatic water test (2 samples at 1 station)																														△								
2.6 OSH of construction workers																																						
2.7 Land acquisition																																						
2.8 Conditions of worker camp																																						
2.9 Influx of workers																																						
2.10 Community health and safety																																						
3. Reporting																																						
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★		
3.2 Submit semi-annual monitoring report to NDPCEI							◇						◇					◇							◇						◇							◇

Remark: Implementation throughout pre-construction and construction periods, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the construction is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with construction Activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 21.9-2

IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES AND MONITORING PROGRAM FOR OPERATION PHASE

Activity	Operation Phase																	
	2020 (First Year)						2021 (Second Year)-End of Project Life											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Mitigation Measures Implementation																		
1.1 Pigging waste management																		
1.2 Operation risk																		
1.3 Community health and safety																		
2. Monitoring Programs Implementation																		
2.1 Pigging waste management (2 times/month)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
2.2 Emergency response plan																		
2.3 Community health and safety																		
3. Reporting																		
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
3.2 Submit semi-annual monitoring report to NDPCEI						◆						◆						◆

Remark: Implementation throughout operation period, and recorded on weekly and monthly basis

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

TABLE 21.9-3

IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES AND MONITORING PROGRAM FOR DEACTIVATION PHASES

Activity	Deactivation Phase												
	First Year												Second Year
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1. Mitigation Measures Implementation													
1.1 Air quality	—	—	—	—	—	—	—	—	—	—	—	—	
1.2 Noise	—	—	—	—	—	—	—	—	—	—	—	—	
1.3 Solid waste management	—	—	—	—	—	—	—	—	—	—	—	—	
1.4 Wastewater management	—	—	—	—	—	—	—	—	—	—	—	—	
1.5 Community health and safety	—	—	—	—	—	—	—	—	—	—	—	—	
2. Monitoring Programs Implementation													
2.1 Air quality (2 Stations @ 3 consecutive days)*					△								
2.2 Noise (2 Stations @ 3 consecutive days)*					△								
2.3 Solid waste management					△						△		
2.4 Wastewater measurement					△						△		
2.5 Community health and safety	—	—	—	—	—	—	—	—	—	—	—	—	
3. Reporting													
3.1 Submit monthly monitoring report to TIMOR GAP, E.P.	★	★	★	★	★	★	★	★	★	★	★	★	
3.2 Submit semi-annual monitoring report to NDPCEI							◆					◆	

Remark: Implementation throughout deactivation period, and recorded on weekly and monthly basis

* Measurement of air quality and noise level will be conducted at Bobe and Bonuc sub –villages whenever the demolition is taken place. It should be that measurement schedule will be adjusted as appropriate in accordance with demolition activities.

Source: TEAM Consulting Engineering and Management Co., Ltd. (2016)

LIST OF REFERENCE

LIST OF REFERENCES

An American National Standards. Process Piping. ASME Code for Pressure Piping, B31 ASME B31.3-2002. The American Society of Mechanical Engineers. 316 pages.

An American Society of Mechanical Engineers (ASME) and American National Standards Institute (ANSI). ASME/ANSI B31.1, B31.4. https://www.asme.org/and https://www.ansi.org/

ASEAN Secretariat. 2008. ASEAN Marine Water Quality Management Guidelines and Monitoring Manual. 1st Edition. New Millennium Pty Ltd. 432 pages.

DIN 4150, Part 1 - 3: Vibrations in Buildings, 1999-2001.

Environmental Protection Agency. 2009. National Recommended Water Quality Criteria. United States Environmental Protection Agency. 21 pages.

International Finance Corporation. 2007. Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines: Introduction. International Finance Corporation and World Bank Group. 99 pages.

International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 2009. Worker's accommodation: processes and standards. A guidance note by IFC and the EBRD. International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD). 34 pages.

John Randolph, 2004. Environmental Land Use Planning and Management. ISLAND PRESS. 704 pages MetOcean Engineers. 2004. Preliminary Metocean Conditions for Prospective Pipeline Routes from Sunrise to East Timor. WEL.

The World Bank. 1989. Techniques for assessing industrial hazards: a manual. Technica, Ltd.

TIMOR GAP, E.P. 2012. Tasi Mane Project – Betano Petroleum Refinery and Beaço LNG Plant Strategic Environmental Impact Statement. Volume 1-4. Worley Parsons.

TIMOR GAP, E.P. 2015. Report on Identification of Environmental Sensitive Areas along Highway Project, Phase I – Suai to Zumalai (30.355 Km). 13 pages.

TIMOR GAP, E.P. 2014. Engineering Specification for Pipeline Pig Launcher and Receiver. Project Document NO. F040-PP-011. Feed for Betano Refinery Project. 16 pages.

United States Environmental Protection Agency. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. US EPA Environmental Protection Agency. Washington, D.C. 33 pages.

United States Environmental Protection Agency. 1986. Quality Criteria for Water. EPA: 440/5-86-001.United States Environmental Protection Agency. 450 pages.

United States Environmental Protection Agency (US EPA) Region 9 Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations. Direct exposure pathways.

World Health Organization. 1999. Guidelines for Community Noise. World Health Organization, Geneva. 141 pages.

World Health Organization. 2006. WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Global update 2005, Summary of risk assessment. 20 pages.

World Health Organization. 2011. Guidelines for drinking-water quality, 4th Edition. WHO Press, World Health Organization. 541 pages.

APPENDIX 11A

TENTATIVE ENVIRONMENTAL INCIDENT REPORT FROM CONSTRUCTION PHASE

APPENDIX 11A
TENTATIVE ENVIRONMENTAL INCIDENT REPORT FORM
CONSTRUCTION PHASE

Date of Incident	
Time of Incident	
Construction Site	

TYPE OF INCIDENT

On-sites	Off-sites		
❒ Fugitive dust ❒ Noise and vibration ❒ Exhaust emissions ❒ Wastewater ❒ Construction wastes ❒ Hazardous waste storage ❒ Non-compliance with complaint redress requirements	❒ Work related accidents ❒ Fire ❒ Explosion ❒ Non-compliance with safety regulations ❒ Non-compliance with monitoring requirements	❒ Transport accident ❒ Transport noise ❒ Transport vibration ❒ Community's conflicts with construction workers ❒ Noise and vibration ❒ Waste disposal	❒ ❒ ❒ ❒

TYPE OF IMPACT

❒ General environmental and social effects (to be used where other categories do not apply)
❒ Local air pollution
❒ Land contamination
❒ Excessive noise and vibration at sensitive receptors
❒ Pollution of the receiving waters
❒ Local insanitary condition
❒ Disturbances and discomforts to the communities
❒ Public safety risk
❒ Health and safety of construction workers
❒ Breach of conditions in the ECC
❒ Project's image
❒ Legal liabilities
❒ Financial-fine, liabilities, legal cost, construction cost

NUMBER OF PEOPLE AFECTED BY THE INCIDENT

DETAILS OF THE INCIDENT
Person who reported the incident

Place of incident and related construction activity

Area affected by the incident

Actual or Suspected Cause

Estimated cost incurred by the incident

CLASSIFICATION OF THE INCIDENT

❒ High severity level ❒ Medium severity level ❒ Low severity level			
INCIDENT INVESTIGATION DETAILS Incident investigation undertaken	❒ Yes		❒ No
Detail of actions taken			
COMPLETED BY			
Name	signature	Position	Date

APPENDIX 11B

TENTATIVE ENVIRONMENTAL INCIDENT REPORT FORM OPERATION PHASE

APPENDIX 11B
TENTATIVE ENVIRONMENTAL INCIDENT REPORT FORM
OPERATION PHASE

Date of Incident
Time of Incident

☐ ☐

TYPE OF INCIDENT

In-Plant OHS		Environment	
☐ Oil spill ☐ Fire ☐ Explosion ☐ Condensate leaks	☐ Work related accidents ☐ Non-compliance with safety regulations ☐ Accident by transportation	☐ Pigging waste management ☐ Non-compliance with monitoring requirements ☐ Non-compliance with complaint redress requirements	☐ ☐ ☐ ☐

TYPE OF IMPACT

☐ General environmental and social effects (to be used where other categories do not apply)
☐ Local air pollution
☐ Land contamination
☐ Excessive noise and vibration at sensitive receptors
☐ Pollution of the receiving waters
☐ Disturbances and discomforts to the communities
☐ Public safety risk
☐ Health and safety of operational staff
☐ Legal liabilities
☐ Financial fine, liabilities, legal cost

NUMBER OF PEOPLE AFECTED BY THE INCIDENT

DETAILS OF THE INCIDENT
Person who reported the incident

Place of incident and related operational activity

Area affected by the incident

Actual or Suspected Cause

Estimated cost incurred by the incident

CLASSIFICATION OF THE INCIDENT
☐ High severity level
☐ Medium severity level
☐ Low severity level

INCIDENT INVESTIGATION DETAILS
Incident investigation undertaken ☐ Yes ☐ No

Details of actions taken

COMPLETED BY

Name	Signature	Position	Date

APPENDIX 12A

OUTLINE OF CONTRACTOR'S ENVIRONMENTAL MANAGEMENT PLAN (FOR GUIDANCE ONLY)

APPENDIX 12A
OUTLINE OF CONTRACTOR'S ENVIRONMENTAL MANAGEMENT PLAN[1]
(for guidance only)

1. INTRODUCTION

The introduction of the Contractor's EMP should include:

- A brief description of the project and the contract
- The contractor's environmental objectives
- An explanation of the role of the Contractor's EMP and how it will be used during construction to achieve the project's environmental and social (ES) objectives.

2. ENVIRONMENTAL MANAGEMENT SYSTEM

The contractor shall provide details of the ES management system (ESMS) to apply during the contract.

The basic elements of the contractor's ESMS to be detailed are likely to include:

2.1 Contractor's ES policy

Include a copy of the policy document and an explanation of how the policy will apply to the project.

2.2 Project organisation chart

An organisational chart showing the reporting/responsibility relationships, position titles and personnel, including subcontractors, should be included. The personnel with specific site ES management responsibility should be highlighted.

[1] Modified from Appendix A, Contractor's Environmental Management Plan Guidelines for Construction-Road, Rail and Marine Facilities, Government of South Australia Government, Revision 2 February 2009

2.3 Training, awareness and competence

Describe how the organisation training policy will apply to this contract to ensure that all employees and subcontractors are aware of and adequately trained to discharge their environmental responsibilities. A specific site briefing prior to commencement of works shall occur.

2.4 ESMS documentation

Provide documented details of the system, if available, including any manuals, standard report sheets, checklists, etc.

2.5 Document control

Describe the document control system to apply to the contract.

2.6 Checking and corrective action

Describe the procedures to apply to inspection, monitoring and auditing including non-conformance and corrective action.

Procedures applicable for these basic elements should be documented. Existing quality assurance procedures may already respond to issues such as document control and corrective action.

3. CONTRACTOR'S EMP SCHEDULE

Schedules may be presented under two categories, namely:

- Specific response to the Project EMP
- Best practice response.

Best practice responses should be detailed, particularly when a project-specific Project EMP is not developed.

Plans can either be issue based or activity based. The Project ESMP is issue based with headings such as construction wastes, labour and working condition, and fugitive dust.

An activity based plan would be likely to have headings such as vegetation clearance, excavation, topsoil removal, demolition, dredging and drainage works, etc.

The contractor shall include an inspection, monitoring and audit plan based on the Contractor's EMP Schedules. These are essential in order to establish if the contractor's performance has achieved the project objectives. The Contractor's EMP must be relevant to the site activities and effectively implemented and managed. Inspections, monitoring and auditing will provide the basis to implement corrective action and to ensure the environmental outcomes are achieved. Resultant action may involve upgrading the Contractor's EMP, changing procedures, training staff or providing additional or repositioning controls.

APPENDIX 13A

CONSTRUCTION EMERGENCY RESPONSE PLAN CONDENSATE AND PRODUCTS PIPELINE ROUTE PROJECT

APPENDIX 13A
CONSTRUCTION EMERGENCY RESPONSE PLAN
CONDENSATE AND PRODUCTS PIPELINE ROUTE PROJECT

I. APPLICATION OF THIS CERP

At the request of the Project Proponent, the EIS Consultant prepares this Emergency Response Plan (CERP) for the construction of Condensate and Products Pipeline Route Project as part of the EIS study and present as part of the CEMP. It should be noted that the EPC Contractor will have to be contractually binding to prepare and implement an ERP for review and approval by the Project Proponent. The CERP must be based on the detailed design and construction plan, schedule, and methods prepared by the EPC Contractor and approved by the Project Proponent to be part of the contract. Therefore, this CERP prepared as part of the EIS study can only be considered as an initial ERP with substance at the conceptual level. The Project Proponent should use this initial CERP to prescribe minimum requirements for the CERP to be prepared by the EPC Contractor before commencing the construction.

The EPC Contractor will further develop this initial CERP to become the final CERP which will have to be ready for implementation in due course before the construction. To facilitate its further development by the EPC Contractor, this initial ERP adopts the structure of the final CERP. The EPC Contractor will have to fill identified information gaps and add more details as appropriate.

II. THE INITIAL ERP

1. PURPOSE AND SCOPE

This Emergency Response Plan for Construction (CERP) is prepared by (Name of the EPC Contractor). The CERP covers emergency incidents that may occur in the construction sites during the construction of the Condensate and Products Pipeline Route Project. The emergency incidents could have adverse impacts on the environment, and on health and safety of construction workers and nearby communities.

The purposes of the CERP are:

- To ensure that all concerned personnel of the EPC Contractor will efficiently and effectively discharge their assigned responsibilities in handling emergency situations occurring in the construction of the pipelines and its associated facilities to minimize adverse impacts on the environment and health and safety of the construction workers and the nearby communities; and
- To ensure public confidence in the readiness of the Contractor to efficiently and effectively respond to emergency situations occurring in the construction.

In line with the above purpose, the CERP presents key emergency incidents, procedures for responding to the emergency incidents, organization for the management of CERP implementation, responsibilities of concerned units and persons in the Contractor's construction management organization in emergency response, training requirements, and guidelines for review and updating of the CERP.

2. IMPLEMENTORS OF THE CERP

The CERP is applied to all personnel of the Contractor and Subcontractors. The CERP should be studied by staff of the Project Management Office of the Project Owner and concerned staff of the local authorities.

The CERP is made available to the Tripartite Committee. The CERP is also disclosed to the public through the web site of the Project Owner: http:www._____

Questions regarding the CERP can be directed to:

Mr. _____

Construction Manager

Name of the Contractor

Tel. _____

E-mail: _____

3. SCOPE OF CONSTRUCTION

The construction of Condensate and Products Pipeline Route Project consisting of 4 pipelines with the total length of 60 km. The details of each pipeline and associates facilities are:

- A condensate pipeline with 12 inches diameter and flow capacity of 417 m^3/hr.
- A light Naphtha pipeline with 8 inches diameter and flow capacity of 156 m^3/hr.
- A heavy Naphtha pipeline with 8 inches diameter and flow capacity of 106 m^3/hr.
- A diesel pipeline with 8 inches diameter, and flow capacity of 128 m3/hr.
- An associate facilities such as pumping station, block value station, pigging station, and control building.

Appendix 3.1 gives more information on the facilities to be constructed. The construction will be completed in 36 months based on the construction schedule in ***Figure 3.1***. It should be noted that the construction schedule may be revised from time to time as appropriate.

(Note: This section is to be prepared by the EPC Contractor based on the detailed design and detailed construction plan.)

4. INCIDENTS CONSIDERED EMERGENCIES

Emergency incidents are:

- Risk events or incidents that still occur despite the implementation of risk mitigation measures
- Risk events that cannot be managed such as natural calamities.

Incidents that are considered emergencies are those that demand quick response as they are causing serious consequences or are certain to escalate and cause serious consequences.

In the construction of this Project, the following incidents are considered emergencies:

- Accidents resulting in serious injuries or fatalities of construction personnel
- Fire and explosion, including fires at the worker camp
- Hazardous chemical/oil spill on water or land
- Vehicle/equipment accident

5. ORGANIZATION FOR EMERGENCY RESPONSE

The EPC Contractor has set up an Emergency Response Team (ERT) led by the EPC Project Manager. The ERT is not a regular functional unit. It is a standby unit and will be activated and function only when there is an emergency incident that triggers the CERP implementation. The ERT structure is shown in ***Figure 5.1***.

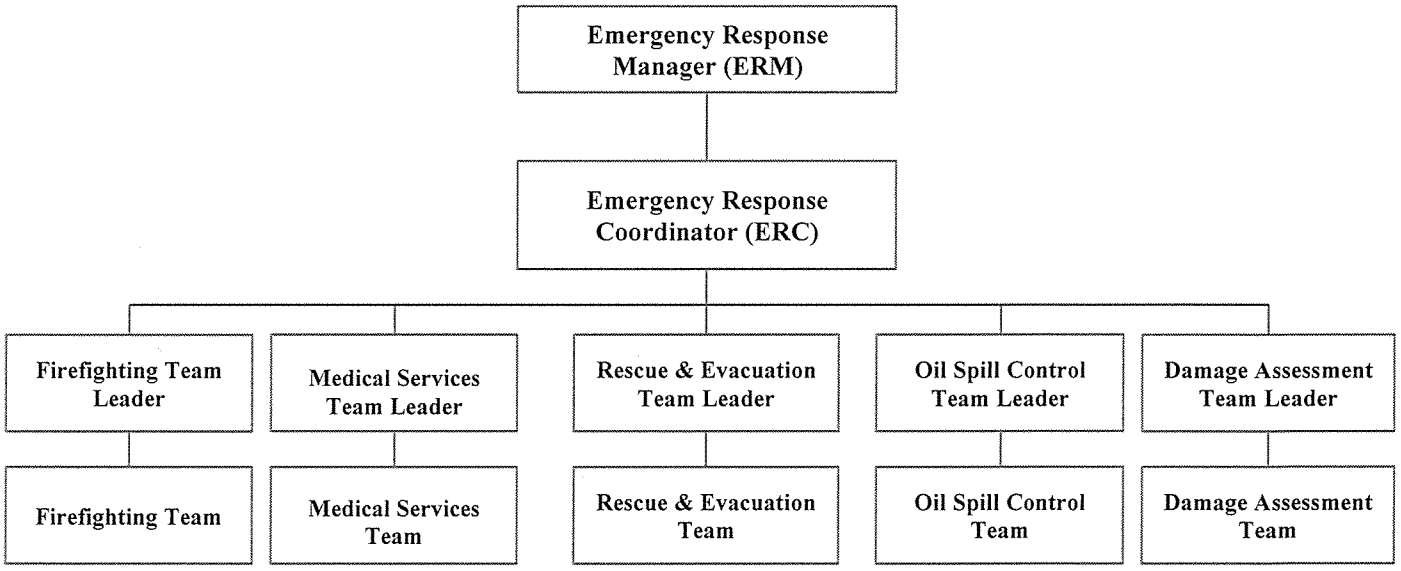


FIGURE 5.1 : STRUCTURE OF EMERGENCY RESPONSE TEAM (ERT)

(To be finalized by the Contractor and approved by the Project Proponent)

The ERT consists of 5 teams. Functions of key personnel and leader are as summarized in ***Table 5.1***.

TABLE 5.1
FUNCTIONS OF KEY PERSONNEL AND TEAM LEADER IN THE ERT

Position	ERT Position	Responsibilities
EPC Project Manager	Emergency Response Manager (ERM)	• Be the issuing authority for this CERP • Ensure effective implementation of this Plan, including provision of adequate resources • Scheduled review and updating the CERP
Office Manager	Emergency Response Coordinator (ERC)	• Ensure sufficiently trained resources are available onsite to deal with potential and actual emergency situations • Communicate with ERT member and/or Site member • Implement the CERP and capture all information relating to the situation • Undertake and/or manage investigations into emergency situations or remedial works • Provide training to ERT members • Provide summary of incidents, actions and responses to the ERM • Scheduled review and updating the CERP
Construction Manager (CW)	Firefighting Team Leader	• Be the leader of firefighting team • Communicate with ERC • Scheduled review and updating the CERP
Site Engineer (CW)	Rescue & Evacuation Team Leader	• Be the leader of rescue & evacuation team • Communicate with ERC • Scheduled review and updating the CERP
EHS Officer	Medical Services Team Leader	• Be the leader of first-aid team • Ensuring sufficiently first aid services are available to treat injuries/illnesses • Communicate with ERC • Scheduled review and updating the CERP
EHS Officer	Oil Spill Control Team Leader	• Be the leader of first-aid team • Ensuring sufficiently first aid services are available to treat injuries/illnesses • Communicate with ERC • Scheduled review and updating the CERP
Procurement& Supply Manager	Damage Assessment Team Leader	• Be the leader of damage assessment team • Communicate with ERC • Scheduled review and updating the CERP
	Firefighting Team	• First response coordinator to capture emergency and/or commence response
	Medical Services Team	• Provide immediate first aid and medical assistance to injured or ill personnel • Provide information to local emergency services as required

TABLE 5.1
FUNCTIONS OF KEY PERSONNEL AND TEAM LEADER IN THE ERT
(Cont'd)

Position	ERT Position	Responsibilities
	Rescue & Evacuation Team	• Responsible for all personnel's safety during rescue & evacuation • Keep an updated list of employees and visitors on site and carry the name list with them during evacuation • Ensure all personnel have evacuated to the Muster point
	Oil Spill Control Team	• Responsible for oil spill control
	Damage Assessment Team	• Responsible for assessments of the extent of damage, estimation of its cost.

6. PROCEDURES

6.1 Emergency Communications

Emergency communication will generally be through Ultra High Frequency (UHF) radio using a dedicated emergency channel as nominated by the Project Owner. However, manually activated alarm systems will be installed at various high risk areas in the construction site.

6.2 Notification Procedure

In case of Emergency incidents, the person discovered the incident must promptly activate the manual alarm system, and notify the Area Supervisors or raise alarm on emergency UHF channel.

For Employee Notification, the alarm warning to evacuate the location and assemble at Muster Point or safe location will be delivered through an audible, intermittent sound signal alarm. When the evacuation signal is given, all personnel will evacuate the location and proceed to the designated assembly areas. An internal network of communications has been developed to alert workers to danger, convey safety information, and maintain site control. Any effective system or combination of systems is to be employed.

During emergency action and response training, employees are made aware of the various types of notification systems.

After the emergency incident is verified and its nature is defined, the EHS Manager will immediately inform the Emergency Response Manager (ERM). The ERM will activate the ERT for implementation of the CERP. All teams under the ERT will be immediately deployed to take appropriate actions as prescribed in the Response Procedures.

6.3 Emergency Response Actions

Emergency response actions have been predetermined to facilitate the management of incidents at the Project. Incidents may include one or more response plans and they should be used in unison as required. The responses covered include:

- Incident resulting in injuries
- Incident resulting in fatality
- Fire and explosion
- Hazardous chemical/oil spill on water or land
- Vehicle/equipment accident

The procedure of each Emergency response actions are shown in ***Figure 6.1 to Figure 6.5***.

6.4 Emergency Evacuation

In the event of an emergency and evacuation is determined necessary, all personnel are to be evacuated to the muster point. The evacuation procedures are as follows:

- Should close doors behind, but do not lock unless otherwise instructed.
- Should switch off or unplug the electrically operated machines or equipment prior to leaving the work area.
- Leave lights on for Emergency personnel.
- Should walk, remain quiet, and follow all other emergency instructions.
- All personnel will assemble at the muster point.
- The evacuation team will account for all personnel at the muster point.
- The evacuation will follow the incident reporting procedures.

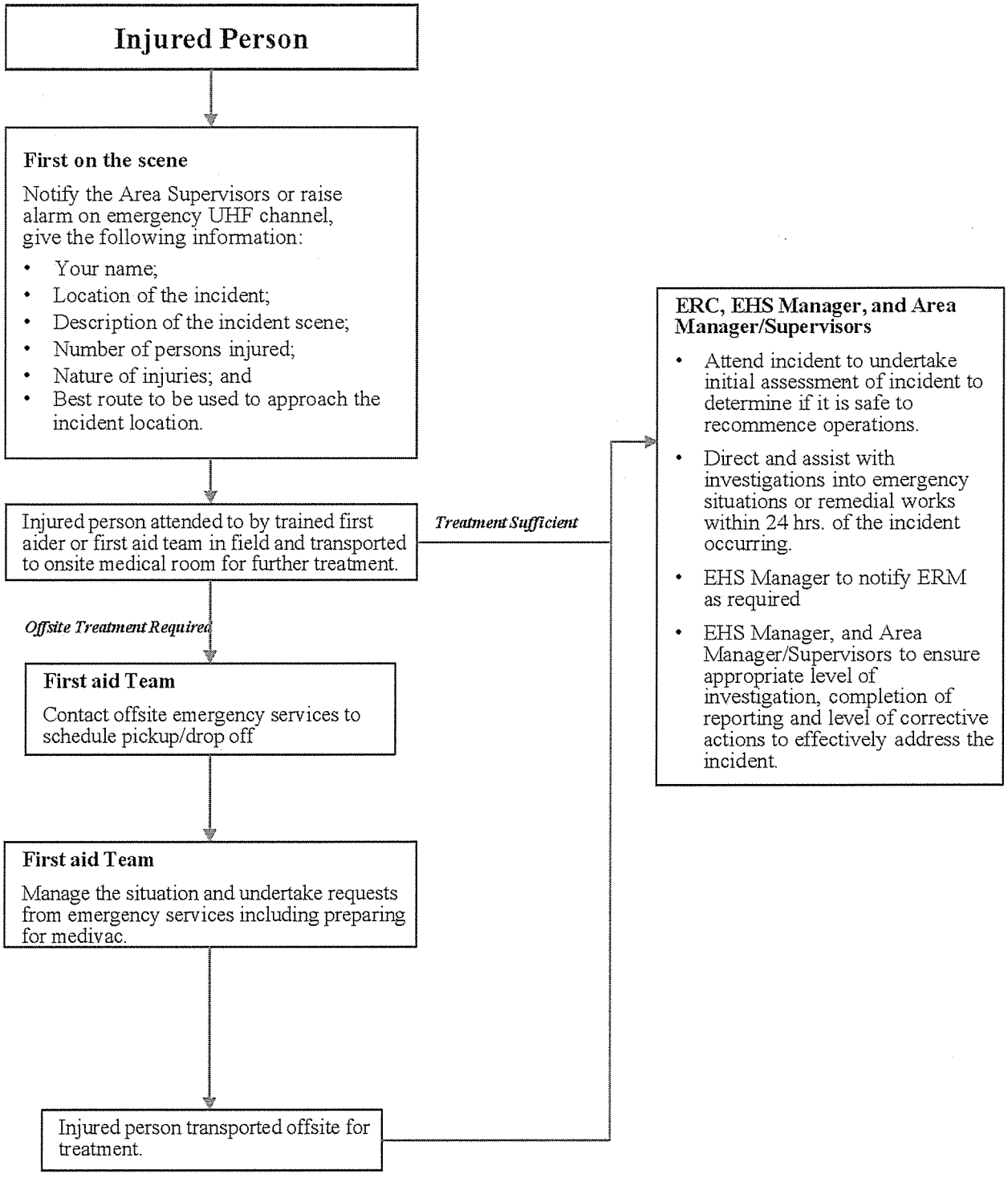


FIGURE 6.1 : INCIDENT RESULTING IN INJURIES

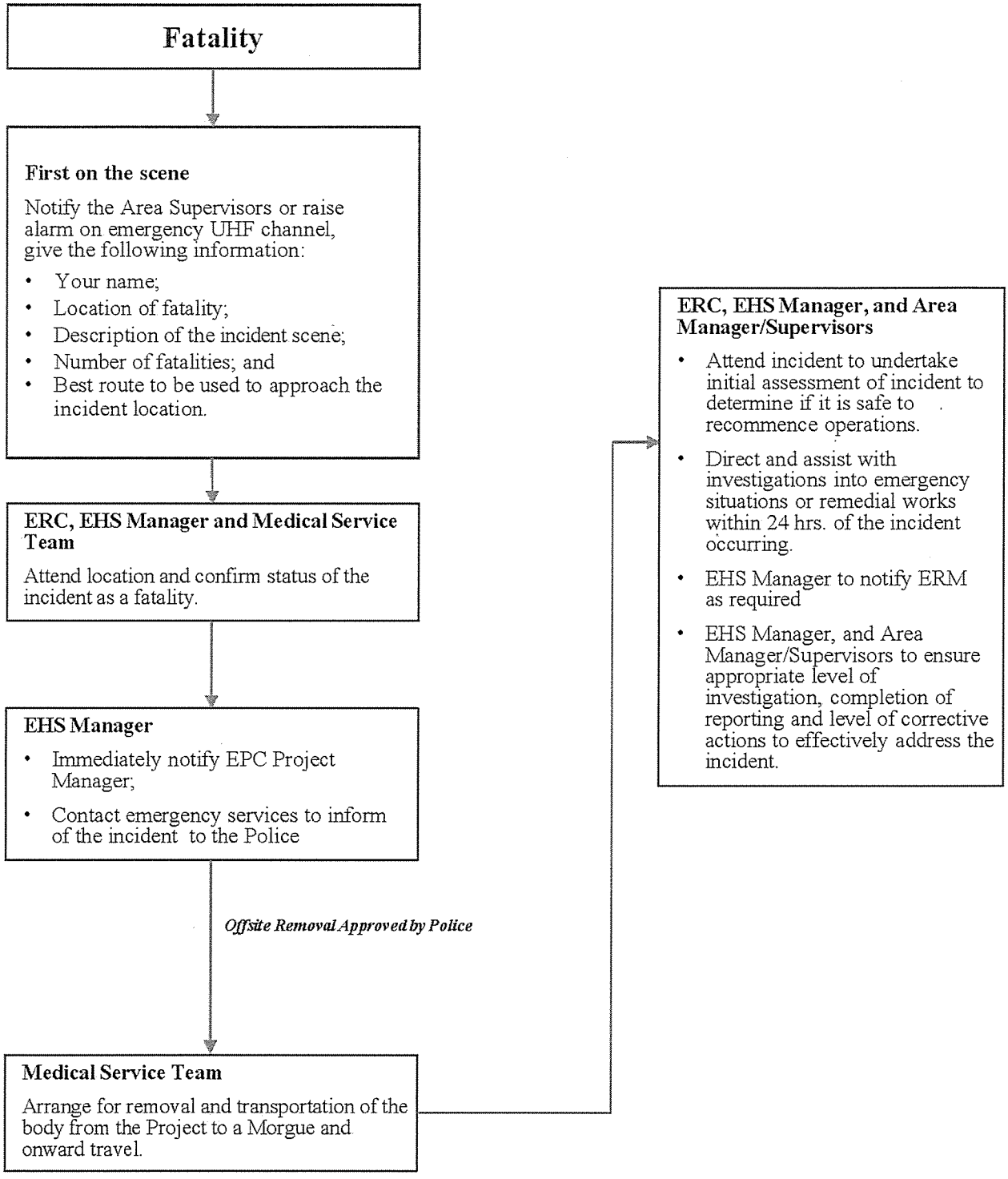


FIGURE 6.2 : INCIDENT RESULTING IN FATALITY

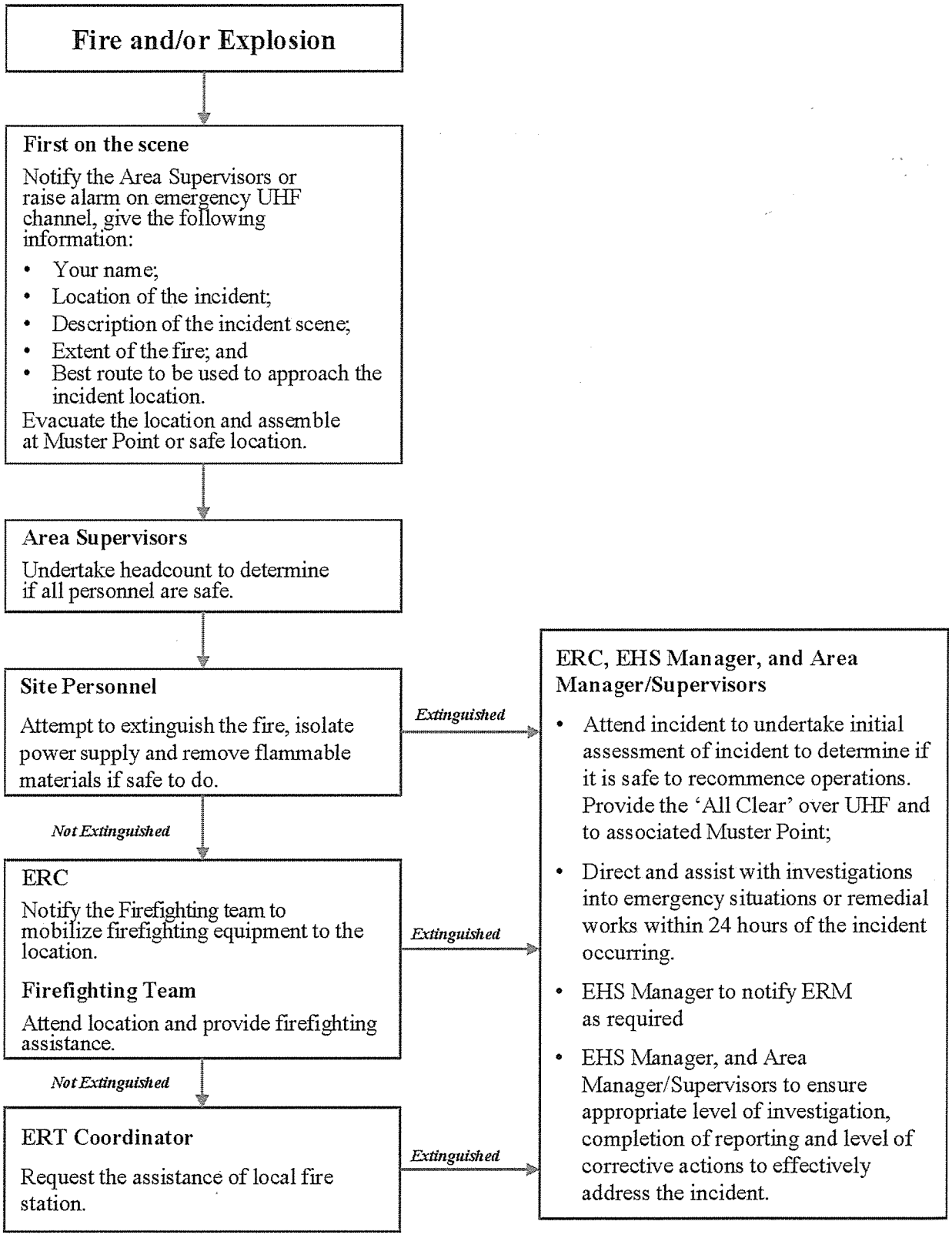


FIGURE 6.3: FIRE AND EXPLOSION

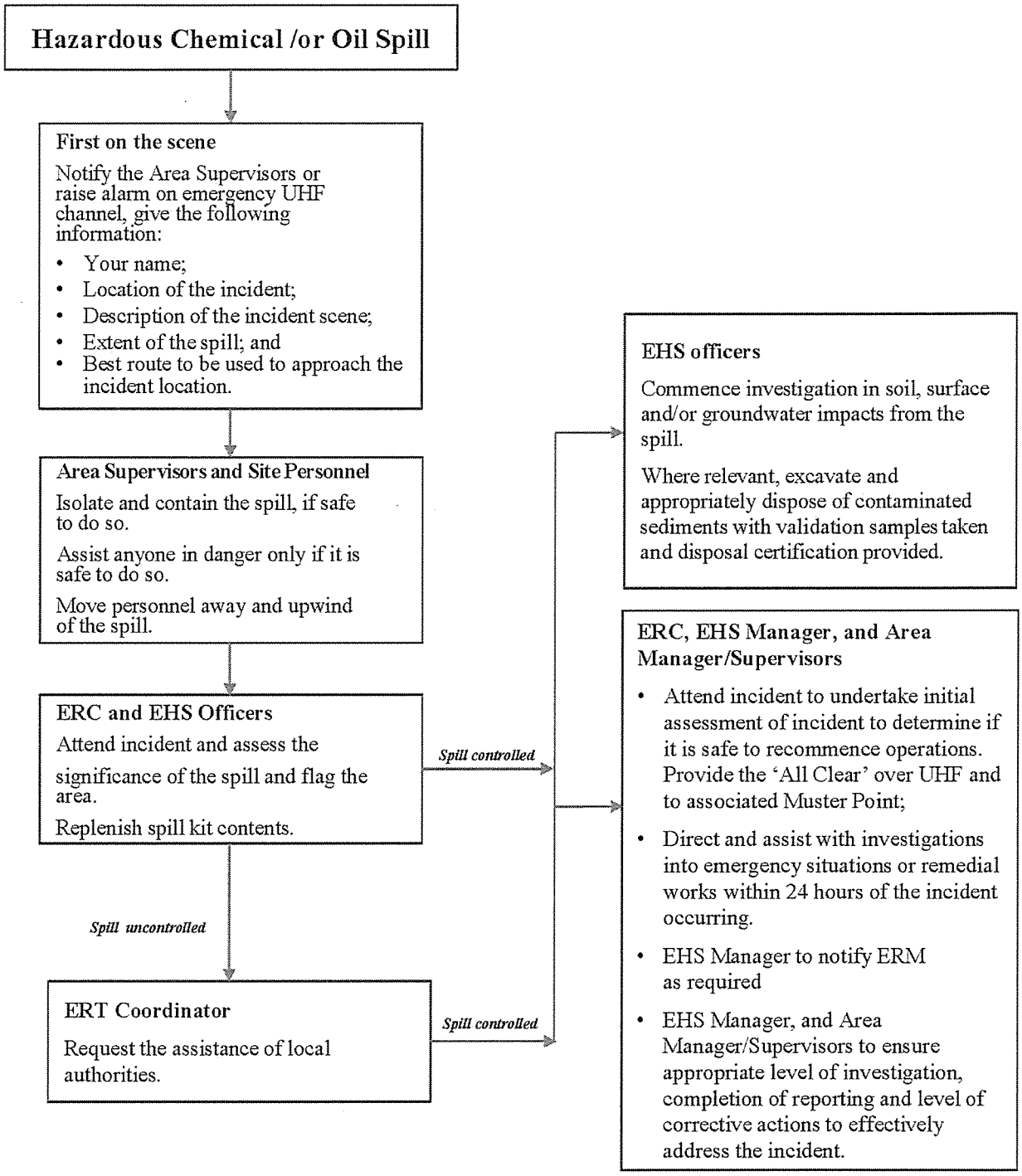


FIGURE 6.4 : HAZARDOUS CHEMICAL/OIL SPILL ON WATER OR LAND

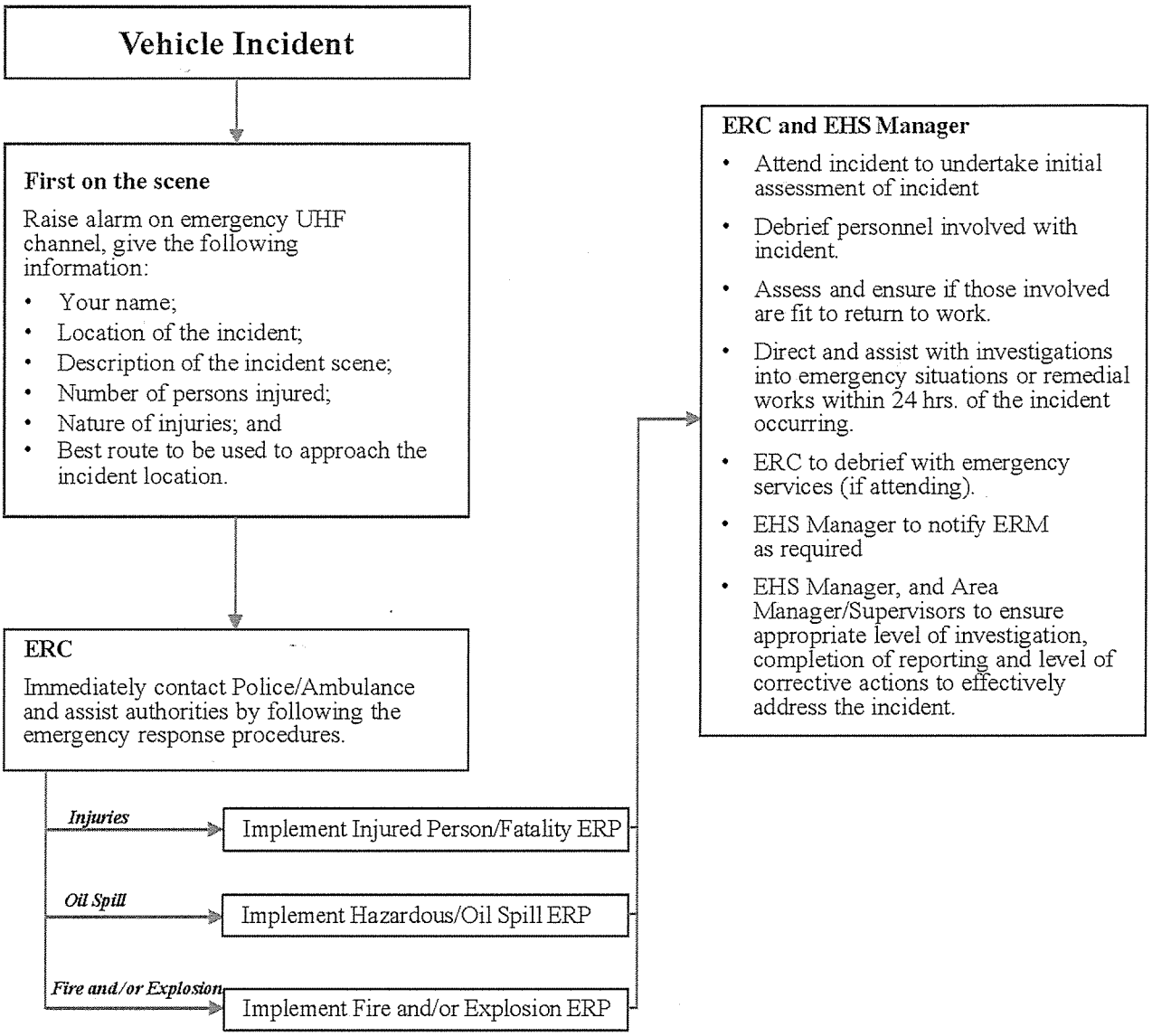


FIGURE 6.5 : VEHICLE/EQUIPMENT ACCIDENT

6.5 Documentation Procedure

The emergency response team dispatched to the site shall record necessary information which will be later used for preparing documentation and an Emergency Response Report (ERR). The required information includes but is not limited to:

Rescue and Medical Response (Accidents resulting in serious injuries / fatality / Vehicle/equipment accident)

a. Date and time of being notified of the incident
b. Date and time of arrival at the site
c. Exact location of the incident (including GPS coordinates)
d. Description of the incident scene
e. Number of person injuries/fatality or illness
f. Nature of injuries/fatality or illness
g. Description of the medial action taken/intended
h. Cause of the incident

Fire Response

a. Date and time of being notified of the incident
b. Date and time of arrival at the site
c. Exact location of the incident (including GPS coordinates)
d. Magnitude and Location of the fire
e. The extent of smoke observed and direction
f. Activities taken to control the fire
g. Time that the fire is successfully put under control
h. Time cleanup completed and description of cleanup activities
i. Time the team left site
j. Time, name, and nature of other regulatory agencies that have been notified by the fire response team or that have participated in the fire control
k. The area impacted by the smoke
l. Cause of the fire
m. Interviews with residents or businesses in the area impacted by the smoke.
n. Impact on the pipeline operation

Hazardous Chemical/Oil Spill Response

a. Date and time of being notified of the incident
b. Date and time of arrival at the site
c. Exact location of the incident (including GPS coordinates)
d. Location of the leakage
e. Estimated rate of the leakage
f. Activities taken to contain and fix the leakage
g. Time that the leakage is successfully put under control
h. Time cleanup completed and description of cleanup activities
i. Time the team left site
j. Time, name, and nature of other regulatory agencies that have been notified by the Oil Spill Containment Team or that have participated in the oil spill control
k. Cause of the leakage

7. RESOURCES

The Contractor has procured or leased all equipment and materials deemed adequate for effective emergency response during the construction. The ERM shall ensure orderly and systematically storage or installation of the provided resources ready for immediate use in time of emergency. Emergency equipment must be maintained through preventive maintenance procedures (inspection and testing) in accordance with the manufacturer's recommendations to ensure that equipment is in ready condition for use. The inspection shall be documented in a field logbook or similar means to be kept in the project files. Emergency equipment is to include, but not limited to the following:

- Class A,B,C fire extinguisher based on construction site and construction activities
- First aid kit
- Eye wash
- Emergency shower
- Potable water
- Appropriate vehicles for transporting injured person

It is recognized that emergency response resources, such as fire control resources, of local authorities are very limited. Therefore, the EPC Contractor has a fire-truck on a 24-hour standby basis to effectively respond to emergency situations. In addition, a clinic with a medical officer and two nurses is established to provide initial medical treatment to construction workers as well as to respond to medical aid needs during emergencies.

8. TRAINING PROGRAM

Effective training is essential for members of the ERT to enable them to efficiently and effectively respond to emergency incidents. The EPC Contractor will identify key personnel to receive training which will be conducted annually focusing on new members of the ERT. The training is to include, but not limited to the following:

- Firefighting;
- First Aid;
- Emergency Evacuation;
- Medical and Environmental Emergencies; and
- Other subjects as required.

9. DRILLING

The ERM will ensure that the emergency operations must be rehearsed once every six months.

10. REVIEW AND UPDATING THE CERP

The CERP shall be reviewed and amended annually or any time to:

- Correct deficiencies or inadequacies that are found
- Reflect changes in the organizational structure of the ERT, contact lists, telephone numbers, and e-mail addresses. The ERM and ERT members will be responsible for the review and amendment process.

11. OPERATIONAL MANUALS

Members of the ERT will refer to the relevant operational manuals in their implementation of the response procedures in this CERP. The reference operational manuals include, but not limited to, the following:

- Operational Manual on Safety in Pipeline Construction
- Operational Manual on Specific Works (work in places exposed to heat, etc.)
- Operational Manual on Firefighting and Evacuation at Construction Sites
- Operational Manual on First-aid and Initial Medical Treatment in Construction Site
- Operational Manual on Hazardous and Oil Spills Management

APPENDIX 13B

EMERGENCY RESPONSE PLAN FOR CONDENSATE AND PRODUCTS PIPELINE ROUTE OPERATIONS

APPENDIX 13B

EMERGENCY RESPONSE PLAN FOR CONDENSATE AND PRODUCTS PIPELINE ROUTE OPERATIONS

I. APPLICATION OF THIS ERP

This Emergency Response Plan (ERP) for the operational phase of the Condensate and Products Pipeline Route Project is prepared by the EIA Consultant as part of the EIA study and presented as part of the OEMP. It should be noted that the ERP to be used during the operations of the pipeline system has to be related to the constructed facilities and the organizational structure of the Betano Pipeline System Company (the BPSC/ the Company). This ERP, prepared at the EIA stage of the Project, is based on: (i) the proposed organizational structure by the EIA Consultant; (ii) results of the Front End Engineering Design (FEED) of the Pipeline System; (iii) established practices in emergency response planning of oil pipelines; and (iv) conditions of the pipeline corridor and its surrounding areas. Therefore, this ERP is considered as an initial ERP with substance at the conceptual level. The EPC Contractor and the Project Proponent will have to develop this initial ERP further before commissioning of the Pipeline System when the organizational structure of the BPSC is final and all technical details of the Pipeline System are also final.

To facilitate its further development to be the final ERP, this initial ERP is prepared as final ERP with some gaps that cannot be filled at this EIA stage. The EPC Contractor and the Project Proponent will have to fill these gaps, add more details, and may changes some of the text as appropriate.

II. INITIAL ERP

1. PURPOSE AND SCOPE

This Emergency Response Plan (ERP) for the operations of the Pipeline System is prepared by the *Betano Pipeline System Company* (the Company).

The ERP covers only emergency incidents along the pipeline corridor. Emergency incidents at the tank farms of the Betano Refinery and Suai Supply Base are included in emergency response plans of the two installations.

The purposes of the ERP are:

- To ensure that all concerned personnel will efficiently and effectively discharge their assigned responsibilities in handling emergency situations occurring in the operations of the petroleum product pipeline system to minimize adverse impacts on the environment and the public, and

- To ensure public confidence in the readiness of the Company to efficiently and effectively respond to emergency situations occurring in the operations of the pipeline system.

In line with the above purpose, the ERP presents key emergency incidents, procedures for responding to the emergency incidents, organization for the management of ERP implementation, responsibilities of concerned units and persons in the Company in emergency response, training requirements, and guidelines for review and updating of the ERP.

2. IMPLEMENTORS OF THE ERP

The ERP is applied to all personnel of the Company particularly operational staff of the following organizational units:

- Operational Department
- EHS Management Department
- Maintenance Department
- Public Relations Unit

Staff who concurrently serve as members of the Emergency Response Task Force (see ***Section 5***) are required to study and understand clearly this ERP and the reference operational manuals relevant to their assigned tasks.

The ERP is made available to the Tri-partite Committee. The ERP is also disclosed to the public through the web site of the Company: http:www._____

Questions regarding the ERP should be directed to:

Mr. _____

Manager

Environmental Management Department

Nova Betano Town Administration

Tel._____

e-mail: ____

3. EXISTING FACILITIES

The constructed pipeline system is designed to transport condensate from Suai Supply Base to Betano Refinery, and light naphtha, heavy naphtha, and diesel from Betano Refinery to Suai Supply Base. The constructed facilities consist of: (i) four pipelines; (ii) one pumping station at Suai Supply Base; (iii) one pumping station at Betano Refinery; (iv) two pig launching/receiving stations; and one block valve station.

(***Note: The EPC Contractor will prepare Salient technical information on the constructed pipeline system based on as-built drawings.***)

4. INCIDENTS CONSIDERED EMERGENCIES

Emergency incidents are:

- Risk events or incidents that still occur despite the implementation of risk mitigation measures
- Risk events that cannot be managed such as natural calamities.

Incidents that are considered emergencies are those that demand quick response as they are causing serious consequences or are certain to escalate and cause serious consequences.

Based on the design, lay out, and nature of the operations of the Pipeline System, emergency incidents could be

- Oil spills on the rivers from leaks of the crossing pipeline
- Oil spills at the pumping stations, pigging stations, and block valve stations
- Oil pools visibly seen on ground along the pipeline corridor
- Fire or explosion as the consequence of oil spill
- Fire close enough to the pipeline that could lead to pipeline explosion

These emergency conditions may be caused by natural forces, equipment malfunctions, or operator error, including breakdown in communications and deviation from standard operating procedures. Oil spills could be caused by pipe leaks and accidental discharge of products in the pipeline into the environment. Pipe leaks could be caused by accidental or intentional damage to the pipes, pipe corrosion, and malfunctions of pipe joints.

5. ORGANIZATION FOR EMERGENCY RESPONSE

The Company has set up an Emergency Response Task Force (ERTF). The ERTF is not a regular functional unit. It is a standby unit which will be activated and operate only when there is an emergency incident that triggers the ERP implementation. All personnel of the ERTF are always on standby duty and are ready to perform promptly upon being called out.

The ERTF is organized as shown in ***Figure 5.1.*** The ERTF consists of two groups of operational teams.

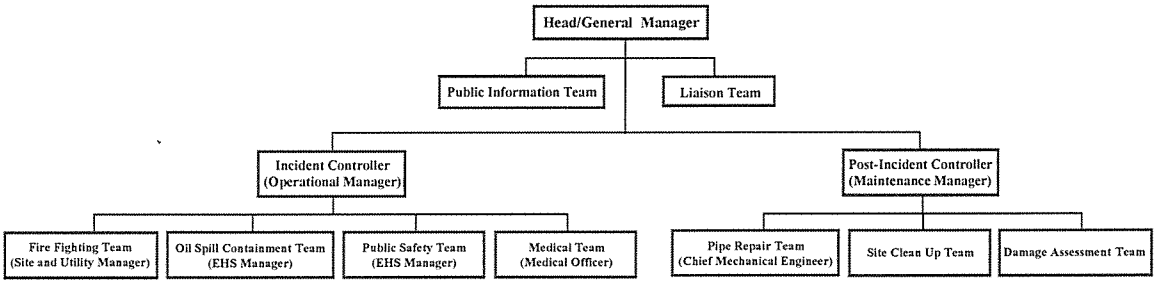


FIGURE 5.1 : ORGANIZATIONAL STRUCTURE OF THE EMERGENCY RESPONSE TASK FORCE

The first group is the *Incident Control Group* which consists of four teams: (i) fire fighting team; (ii) oil spill containment team; (iii) public safety team; and (iv) medical team. These four teams will be the first to arrive at the incident site to take over the initial response from the operational staff. They will take immediate actions to control the situation as quick as possible to minimize impacts on personnel in the area. Each team is led by a Team Leader appointed from the Pipeline System personnel with responsibilities and skills required for efficient functioning of the team.

The second group is the Post- Incident Control Group which consists of: (i) pipe repair team; (ii) site clean up team; and (iii) damage assessment team. The Post Incident Control Group has the responsibility to get the Pipeline System back into operations as soon as possible.

The Head of ERTF is supported by the Liaison Team and the Public Information Team.

Table 5.1 summarizes responsibilities of all response team. Details on responsibilities of each key personnel are presented in ***Attachment 1*** (*to be prepared by the EPC Contractor*).

Key personnel of the ERTF are:

(1) Head: The General Manager serves as Head of the ERTF. The ERTF Head has an overall responsibility for efficient and effective performance of the ERTF in handling the emergencies with minimum damage to the Pipeline

System's assets and staff and minimum stoppage of the Pipeline System's operations.

(2) The Incident Controller: The Operational Manager serves as the Incident Controller. He/she has an overall responsibility to put an end to the emergency incidents as soon as possible.

(3) The Post-Incident Controller: The Maintenance Manager serves as the Post-Incident Controller. He/she has an overall responsibility to bring the Pipeline System back to operations as soon as possible and resolve all matters related to insurance claims and compensation to injured and fatal cases of affected personnel.

TABLE 5.1
RESPONSIBILITIES OF THE RESPONSE TEAMS

Incumbent or Team	Functions
1 Head	Overall responsibility for efficient and effective performance of all teams.
2 Fire Fighting Team	Contain and extinguish the fire as quick as possible.
3 Oil Spill Containment Team	Contain and remove or disperse the oil spills as quick as possible.
4 Public Safety Team	Secure the incident area and evacuate affected people as quick as possible, if necessary.
5 Medical Team	Provide first aid and primary treatment of injured personnel at the safety area before transferring to hospital for furter treatment
6 Pipe Repair Team	Fix the pipe leaks or leaking pipe fittings or leaking appurtenances as quick as possible
7 Site Clean Up Team	Clean up and reinstate the inciden site as quick as possible to resume the pipeline operations.
8 Damange Assessment Team	Assess the extent of damage, estimate its cost, and propose a compensation plan to affectd properties or people
9 Liaison Team	Liaise with local communities and local authorities to ensure their collaboration in responding to the emergenc incidents
10 Public Information Team	Provide information on behalf of the ERTF and the Company to ensure correct understanding of the situations and the efforts of the Company

(Note: This section needs to be revised by the Project Proponent in finalizing the ERP.)

6. EMERGENCY RESPONSE ZONE

The Emergency Response Zone covers the 60 km pipeline corridor between the tank farms at Suai Supply Base and at Betano Refinery. The corridor is about 90 m wide and is the area on which development activities are prohibited. Most length of the corridor is adjacent to the existing road from Suai to Zumalai. The corridor crosses 12 rivers and 25 trails and roads. Communities located within 100 m from the corridor are 8 villages. There are no commercial and industrial activities along the pipeline corridor.[1]

7. PROCEDURES

The following procedures are to be adhered to in responding to the emergency situations.

7.1 Incident Notification

As the pipeline is about 60 km long, pipeline emergency incidents may be reported by citizen or found by operational personnel from routine pipeline inspections and pipeline control system. The public could report pipe leak or oil spills incidents to an assigned Emergency Incident Handler (EIH) through the Company's dedicated phone numbers made known to the public. This phone number is the center for receiving reports on all types of emergency incidents on a 24-hour basis.

In addition to the reported oil spills or pipe leaks, other types of emergency situations can affect the buried pipelines. These include: floods, earthquakes, forest fires, structure collapses, and other similar events where earth has been disturbed or will be moved as part of the response efforts. In addition, to routine inspections along the pipeline corridor, the Company will be alert to developments along or near the pipeline corridor which could have negative impacts on the pipeline integrity. The Company has an agreement with the local highway authority that the Company will be immediately notified of any road accidents that could adversely affect the pipeline. The same telephone number will be used for this type of incident.

Upon being notified, the EIH will immediately inform Head of the ERTF and promptly inspect the reported incident site for verification. As the pipeline is 60 km long, the Company has appointed two emergency incident reporters located at about km 30 and 50 of the pipeline length. Together with the EIH of the Company, each of the three persons could cover incidents over 20 km of the pipeline section. Verification could be done within a short period.

---

[1] **Source :** Data derived from field survey by TEAM Consulting Engineering and Management Co., Ltd., February 2016. The map is to be prepared by the EPC Contractor after the corridor is final.)

After the emergency incident is verified and its nature is defined, the EIH will immediately inform Head of the ERTF. Head of the ERTF will activate the ERTF for implementation of the ERP. All teams under the ERTF will be immediately deployed to take appropriate actions as prescribed in the Response Procedures. The Liaison Team will immediately inform Betano Refinery and other organizations in the area to mobilize their resources to assist the BPSC, if necessary (see ***Section 8 Resources***). The Liaison Team will also inform potentially affected communities, and concerned local authorities and concerned national authorities, if legally required.

The ERTF Head as the Company Manager could command all resources in the Company to respond to the emergency incident. Additional resources of Betano Refinery could also be mobilized if necessary.

7.2 Public Safety Protection

Public safety is an issue of concern during the spills or fire control operations. In a fire incident, the Fire Fighting Team (FFT) will take the following measures:

Secure the Incident Area

The FFT will take appropriate measures to secure and isolate the incident area using traffic cones, barricades or warning tapes as appropriate to detour vehicle and pedestrian traffic safely around the operation area. Entry will be denied to unauthorized persons and vehicles. The size of the containment area will be dictated by the location and size of the incident and the magnitude of its impacts such as heat level.

Respond to Protect People, Property and the Environment

The FFT will take protective actions to preserve the health and safety of its team members and the public during a pipeline incident. While the pipeline operator concentrates on the pipeline, the FFT should concentrate on isolating and removing ignition sources and moving the public out of harm way. Several response procedures can and should be pursued simultaneously.

It may be necessary to evacuate everyone in the danger area to a safe location distant from the incident area. The evacuation procedure will be followed.

7.3 Work Safety Procedure

All personnel of the FFT will strictly wear protective clothing, masks, and eye glass. Oxygen tanks should be made ready for use.

7.4 Pipeline Shutdown

The first task that the ERTF shall undertake is to instruct the Operational Department to take the appropriate actions to ensure that a release does not occur. If a discharge has occurred, the Pipeline Control Unit will take actions to limit the magnitude but not be limited to the following:

- Shut down the affected line segment if there is an indication of a leak
- Isolate the line segment
- Depressurize the line
- Start internal and external notifications
- Mobilize additional personnel as required

7.5 Spill Response Procedures

Each spill mitigation situation is unique and must be treated according to the circumstance present. In every situation, however, personnel safety must be assessed as the first priority. The potential for ignition and/or toxic exposure must be promptly evaluated. An example of spill mitigation procedures is presented below in ***Table 7.1.***

TABLE 7.1
SPILL MITIGATION PROCEDURES

Type	Mitigation Procedure
Failure of Transfer Equipment	1. Personnel and public safety are the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Terminate transfer operations and close block valves. 3. Drain product into containment areas if possible. 4. Eliminate sources of vapor cloud ignition by shutting down all engines and motors.
Tank Overfill/Failure	1. Personnel and public safety are the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Shut down or divert source of incoming flow to tank. 3. Transfer fluid to another tank with adequate storage capacity (if possible). 4. Shut down source of vapor cloud ignition by shutting down all engines and motors. 5. Ensure that dike discharge valves are closed. 6. Monitor diked containment area for leaks and potential capacity limitations. 7. Begin transferring spilled product to another tank as soon as possible.

TABLE 7.1
SPILL MITIGATION PROCEDURES (Cont'd)

Type	Mitigation Procedure
Piping Rupture/Leak (under pressure and no pressure)	1. Personnel and public safety are the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Shut down pumps. Close the closest block valves on each side of the rupture. 3. Drain the line back into contained areas (if possible). Alert nearby personnel of potential safety hazards. 4. Shut down source of vapor cloud ignition by shutting down all engines and motors. 5. If piping is leaking and under pressure, then relieve pressure by draining into a containment area or back to a tank (if possible). Then repair line according to established procedures.
Fire/Explosion	1. Personnel and public safety are the first priority Evacuate nonessential personnel or personnel at risk of injury. 2. Notify local fire and police departments. 3. Attempt to extinguish fire if it is in incipient (early) stage and if it can be done safely. 4. Shut down transfer or pumping operation. Attempt to divert or stop flow of product to the hazardous area (if it can be done safely). 5. Eliminate sources of vapor cloud ignition shutting down all engines and motors. 6. Control fire before taking steps to contain spill.
Manifold Failure	1. Personnel and public safety are the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Terminate transfer operations immediately. 3. Isolate the damaged area by closing block valves on both sides of the leak/rupture. 4. Shut down source of vapor cloud ignition by shutting down all engines and motors. 5. Drain fluids back into containment areas (if possible).

7.6 Fire and Explosions Response Procedure

7.6.1 Fire Response

Each fire incident is unique and it often causes confused situation. Because of the individual character of each fire emergency it is not possible to develop procedures for every possible event. Common actions for fire response are as follows:

- The Incident Controller will oversee the response actions of the FCT.
- The FTT personnel must be properly equipped for fire fighting. They must wear protective suit and must be equipped with masks, breathing apparatus and other relevant protective equipment.
- Upon arriving at the fire scene, the FTT will immediately take the following actions:
  - The Incident Controller will assess if the pipeline fire will pose a threat to safety of the nearby communities. In consultation with the ERTF Head, the Incident Controller may start the evacuation process according to the evacuation plan prepared for the communities along the pipeline corridor.
  - The Incident Controller will instruct the operational staff to implement the emergency shut off procedures of the pipeline system.
  - Control the pipeline fire following the operational manual for pipeline fire control.
  - Apply cooling to adjacent equipment to prevent aggravation of the situation (cooling with water may not be acceptable).
  - Prevent flow of combustibles on surface water drain systems (fire traps).
  - Stop flow of combustibles to other undesirable directions (e.g. use sand, sandbags).
  - Attempt to blanket burning liquids in open spaces with foam.

7.6.2 Actions of the Medical Team

- The notification of the pipeline fire will also activate the Medical Team to rush to the incident site with prepared equipment.
- The Medical Team will set up a medical assistance center in a safe area to provide first-aid and primary medical treatment to injured persons.
- Communicate with the designated hospital in Dilli and transfer seriously injured patients to the hospital for further treatment.
- Transfer all patients after providing on-site initial treatment to the Refinery clinics or the designated nearby hospital.

- Document all cases with information on diagnosis, conditions at admission, and required further treatment.

7.6.3 Termination of the Emergency

After regaining control and extinguishing the fire, the FTT will immediately take the following actions to prevent recurrence of the fire:

- Secure the affected areas, spray with water to disperse possible vapor clouds, and continue to cool down to ensure there is no chance of re-ignition.
- Check and confirm that no flammable/combustible fluids are continuing to be released;
- Maintain standby of fire and emergency equipment and services ;
- Continue "cool down", if necessary;
- Check for toxic vapors;

The Post-Incident Control Group will take over the site from the FTT. Its three operational teams will immediately take the following actions:

- Restrict entry into the affected areas/sites;
- Check for structural integrity of the damaged facilities;
- Safe guard surrounding area as necessary;
- Assess the damage and prepare an action plan for rehabilitation of the damaged facilities for submission to the ERTF Head. The rehabilitation could involve repair and replacement of the damaged facilities, as appropriate.
- Implement the action plan in collaboration with the Operational Manager under the supervision of the ERTF Head.
- Testing and evaluating the rehabilitated facilities.
- Submit the "all clear" signal to the ERFT Head for approval to resume the operations of the Pipeline System.

7.7 Oil Spills

7.7.1 Response by the Oil Spill Containment Team

Oil leak from the pipeline system could cause oil spills on land or in the rivers where the pipeline cross. The Oil Spill Containment Team will be responsible for responding to the oil spills incidents.

Oil spills on land is not difficult to handle. The leak location has to be identified and excavated to take out oil pools and contaminated soil. The oily mud has to be cleaned up (e. g. centrifuging or settling and draining followed by land farming or incinerating). Therefore, spills on land is not considered emergency incident. The incidents will not normally trigger the activation of the ERTF unless they are certain to enter the water bodies.

Oil spills in flowing rivers are more difficult to handle. Promptly after the incident is notified, the Incident Controller will immediately take the following actions:

- Order the mobilization of the Oil Spill Containment Team with its equipment, boats, and materials for oil spill control.
- Investigate the spill incident to identify the leak pipet and take measures to terminate the operation of the leaking pipe.
- Assess safety, including probability of fire.
- Make decision whether it will be necessary to warn local communities on fishing activities.
- Arrange for fire- fighting boat to stand by.

The Oil Spill Containment Team will implement the following measures to contain the spilled oil in the river:

- Deploy booms to contain the spills.
- Skim for oil recovery;
- Install back-up boom if necessary;
- Use absorbent materials to remove final traces of oil;
- Disperse any oil which cannot be contained and recovered (subject to local legislation or approval).

The Incident Controller will supervise the oil spill control operations and will terminate the operations when he/she decides that the residual spills will no longer cause significant impacts.

The Leader of the Oil Spill Containment Team and the Incident Controller will document the incident and prepare an Emergency Response Report for submitting to the ERTF Head.

7.7.2 Termination of the Emergency

After regaining control and eliminating the spills, the Incident Controller could declare the end of the oil spills emergency. The Post-Incident Control Group will then take over the site from the Oil Spills Containment Team. Its three operational teams will immediately take the following actions:

- Restrict entry into the affected areas/sites;
- Check for structural integrity of the leaked pipe;
- Safe guard surrounding area as necessary;
- Assess the damage and prepare an action plan for rehabilitation of the leaked pipe for submission to the ERTF Head. The rehabilitation could involve repair and replacement of the leaked pipe, as appropriate.
- Implement the action plan in collaboration with the Operational Manager under the supervision of the ERTF Head.
- Testing and evaluating the rehabilitated facilities.
- Submit the "all clear" signal to the ERFT Head for approval to resume the operations of the Pipeline System.

7.8 Documentation Procedure

The emergency response team dispatched to the site shall record necessary information which will be later used for preparing documentation and an Emergency Response Report (ERR). The required information includes but is not limited to:

Fire Response

a) Date and time of being notified of the incident
b) Date and time of arrival at the site
c) Exact location of the incident (including GPS coordinates)
d) Magnitude and location of the fire along the pipeline corridor
e) The extent of smoke observed and direction
f) Activities taken to control the fire
g) Time that the fire is successfully put under control
h) Time cleanup completed and description of cleanup activities
i) Time the team left site
j) Time, name, and nature of other regulatory agencies that have been notified by the fire response team or that have participated in the fire control
k) The area impacted by the smoke
l) Cause of the fire
m) Interviews with residents or businesses in the area impacted by the smoke.
n) Impact on the pipeline operation

The Support Teams (Liaison and Public Information Teams) will collect information relevant to its responsibilities including item j), k), m) and n).

Spills and Leakage Response

a) Date and time of being notified of the incident

b) Date and time of arrival at the site

c) Exact location of the incident (including GPS coordinates)

d) Location of the leakage in the pipeline

e) Estimated rate of the leakage

f) Activities taken to contain and fix the leakage

g) Time that the leakage is successfully put under control

h) Time cleanup completed and description of cleanup activities

i) Time the team left site

j) Time, name, and nature of other regulatory agencies that have been notified by the Oil Spill Containment Team or that have participated in the oil spill control

k) Extent of pollution caused by the spills

l) Cause of the leakage

m) Interviews with residents or businesses in the area impacted by the leakage

n) Impact on pipeline system operations

The Support Team will collect information relevant to its responsibilities including item j), k), m) and n).

7.9 Post- Incident Reporting

Within 15 days after the end of the emergency incident, the Incident Controller will submit an Emergency Response Report to the ERTF Head. The ERR will present results of the investigation of the incident to establish the causes, evaluate the performance of the incident response, identify deficiencies that will need to be rectified for improving the future performance, and recommend actions that need to be taken to prevent future fire incidents.

Within 15 days after the Pipeline System is back to operations, the Post-Incident Controller will submit a Post- Incident Response Report (PIRR) to the ERTF Head. The PIRR will present information on the damages caused by the incident to persons, facilities, and operations, total cost incurred by the incident, post-incident actions taken and the time taken to bring the Pipeline System back to operations, status of insurance claims, if any; any legal cases related to the incident, and recommendations on improvement of the post-incident response.

The General Manager will convene a senior staff meeting to review the two reports and agree on improvements to be made to prevent the recurrence of incident and improve the incident and post-incident response actions.

The reports will be registered and maintained in the Incident Response Data Base.

7.10 Post-Incident Review

Head of the ERTF, as the Company Manager, will convene a review meeting with all concerned staff to review the ERR and PIRR and discuss recommendations in the two reports. The review meeting will help identifying deficiencies in the ERP that will need to be rectified.

8. RESOURCES

It is recognized that emergency response resources, such as fire control resources, of local authorities are very limited. Therefore, the BPSC has entered into an agreement with the Betano Refinery, Betano Power Plant Company, Suai Supply Base, and Nova Betano Town to pool emergency response resources of these four organizations. In an emergency situation of one organization, the other three organizations will send their resources to assist under the command of the affected organization.

9. TRAINING PROGRAM

Effective training is essential for members of the ERTF to enable them to efficiently and effectively respond to emergency incidents. The Company will identify key personnel to receive training which will be conducted annually focusing on new members of the ERTF. The training to be provided by external consultants will cover the following subjects:

- Measures and equipment for effective response to emergency leakage of the pipelines, pumping stations, and pigging stations;
- Measures for effective containment and recovery of oil spills in flowing rivers and on ground;
- Assessment of the emergency incidents and effective planning for field response actions;
- Environmental and site clean up;
- Protection of health and safety of personnel and the general public;
- Preparation of quality ERR for improving the performance of ERTF; and
- Other subjects as required.

10. REVIEW AND UPDATING THE ERP

The ERP shall be reviewed and amended as appropriate. Head of the EHS Management Department of the Company will be responsible for coordinating the review and amendment process. The distribution of the recommended changes to the ERP holders will be delegated to support staff. The EHS Management Department will:

- Conduct five-year review of the ERP and update it with the issuance of a revised or new ERP.
- Conduct annual training on the use of the ERP with new personnel designated to be a member of the response teams of the ERTF.
- Review and update annually the various contact lists and telephone and e-mail addresses included in the ERP for response personnel, regulatory agencies, and public media.

11. OPERATIONAL MANUALS

Members of the ERTF will refer to the relevant operational manuals prepared by the EPC Contractor in their implementation of the response procedures in this ERP. The reference operational manuals include:

- Operational Manual on Pipeline Fire Control
- Operational Manual on Oil Spills Management in Flowing Water
- Operational Manual on Environmental and Site Clean Up after the Incident
- Operational Manual on Public Safety Management During the Fire Incidents

In addition, the reference will also include an evacuation plan for communities with high risks from pipeline fires.

APPENDIX 16A

LIST OF STAKEHOLDERS ATTENDED CONSULTATION MEETING BETWEEN 31 MARCH – 8 APRIL 2016

Stakeholders & NGOs @TIMOR GAP, E.P.

31 March 2016: 10.00 a.m. - 2.00 p.m.

Total 26 People

-Project owner: 6

-Consultant: 7

-Stakeholders & NGOs: 13

PUBLIC CONSULTATION MEETING REGISTRATION FORM

ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date 31 **Month** March **2016 Time** 10.00 a.m - 2 p.m **at** Conference Room, TIMOR GAP, E.P.

Sub-Village........................ **Village**........................ **Sub-District**........................ **District** DILI

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	Paulo Alvz	DG	M	44	Taicoli	77304070	[signature]
2	Charles Scheiner	Researcher	M	65	Dili / Bebonuk	7734 0965	[signature]
3	Ismenio M. da Silva	Secretário Executivo do FDCH-MPIE			Matadouro - Dili	7736374[illegible]	[signature]
4	Jerenito Guzmão	DGGP	M	44	Comoro	7732663[illegible]	[signature]
5	Eugenio Lemos	Cultura	M	55	Becora	77012039	[signature]
6	Juvencia M.J.D.D. Costa	HSE Insp. Officer	F	30	ANPM	77505064	[signature]
7	Paulino da Cruz	Rep. Direc. [illegible]	M	[illegible]	Bebora / Dili.	77305733	[signature]
8	Sabino L.A	MAP - Pescas	M	37	Fatu metan	77705861	[signature]
9	Paulino de Almeida	La'o Hamutuk	M	26	Surikmas	77156951	[signature]
10	Martinha A. Fernandes	La'o Hamutuk	F	27	Taibessi	77240906	[signature]

PUBLIC CONSULTATION MEETING REGISTRATION FORM

ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date..31.....**Month**.March..... **2016 Time**.10.00 a.m-2 p.m..**at**Conference Room, TIMOR GAP, E.P.....

Sub-Village.....**Village**.....**Sub-District**.....**District**....Dili.....

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	Francisco Pinto	Head of EIA Dep	M	40	Motael / Dom Aleixo	77327064	
2	Roberto Belo	P.E (TG)	M	32	Comoro / Bidau	77518661	
3	Quirnado Pinto	Env. Eng. (TG)	M	26	Bairo-Pite	77091166	
4	CHALIDA NIROBUPPA	Env Scientist	F	49	TEAM	089-0195099	CHALIDA N.
5	Anshisa Chansila	Socio-Economist & public consultation	F	29	TEAM	088-003-8822	Anshisa C.
6	Budsaba Israngura Na Ayudya	Public Consultation Specialist	F.	59	TEAM	+66 81 907 6522	Budsaba Israngura Na Ayudya
7	Supichaya Nagchiangmai	Environmental Scientist	F.	38	TEAM	+66 89 487 5619	Supichaya N.
8	Chaloemchai Nakkhwan	Project Manager	M	36	TEAM	+66 828891199	Chaloemchai
9	SONGSAK BHADDEE	Project Co-ord	M	59	AFT	+66 818251921	
10	Vicente Pinto	TG-Dire	M	45	TL	-	

PUBLIC CONSULTATION MEETING REGISTRATION FORM

ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date..31.....**Month**..March..... **2016** **Time**.10.00a.m.-2.p.m..**at**.Conference..Room,..T.I.M.O.R..G.A.P.,..E.P.....

Sub-Village.....**Village**.....**Sub-District**.....**District**..Dili.....

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	Filomena Oliveira	chefe Gab. DGTC	F	43	Rai-para-B-Dili	73393381	
2	Elsa C Viegas	Sof Gab DGTC	F			7731287	
3	Joao dos Reis	Project. Controller	M		TimorGAP	7736587	
4	Nolkia Pereira	Env. Engineer	F	—	Timor GAP	78495186	
5	Elvina da silva	process Eng	F	—	—	77520316	
6	Komsan Vonchai	Geotechnical Eng.	M	26	ATT	+66840108763	
7							
8							
9							
10							

Betano village

4 April 2016: 9.30-12.00 a.m.

Total 93 People

-Local people: 67

-NDE: 2

-Project owner: 17

-Consultant: 7

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..09.....**Fulan**..Abril..... **2016 Oras**..9.30-12.00 a.m..**iha**..Sede Suco.....

Aldeia..Bemetan.....**Suku**..Betano.....**Sub-Distritu**...Same.....**Distritu**.....Manufahi.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Tomas Cabral	Agricultur	M	60	Bemetan	—	
2	Raimundu T.	A — 11 —	— 11 —	35	— 11 —	—	
3	Domingos Vaptista	— 11 —	— 11 —	34	— 11 —	77310451	
4	Henrique Pereira	Chefe Aldeia	m	34	— 11 —	77711523	
5	Francisco Sarmento	agricultor	m	63	— 11 —	—	
6	Acacio de Jesus	motorista	M	52	Same / Aldeia	77262653	
7	Moises Alves	Agricultura	m	1022	— 11 —	75279917	
8	Francisco magno	Agricultura	m		—		
9	Tito GONZAGA	AGRICULTURA	m	37	— 11 —	75401173	
10	Domingos Baptista	Agricultura	m	10	Bemetan	—	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..04.......**Fulan**..Abril........ **2016 Oras**..9.-30-12.00 A.M. **iha**....Sede suco....

Aldeia..Bemetan..........**Suku**...Betano...............**Sub-Distritu**..Same..............**Distritu**...Manu Fahi......

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Marcel dc.B	Staf Ambiental	M	31	Same vila	77377134	[illegible]
2	Fransisco da A.	agricultor	M	40	Same vila	-	[illegible]
3	Alegria da Costa J.	agricultor	M	60	Same vila	75187169	[illegible]
4	Lourenso	-"-	M	89	Same vila	-	[illegible]
5	Henrique da S.	"	M	40	Same vila	"	[illegible]
6	Horgacio J.	62 Tah	M	43	BEMETAN	"	[illegible]
7	Bisanti Tilmon	Liurai	M	62	BEMETAN	—	[illegible]
8	IZOK.A.Miranda	Agricultor	M	61	— " —	—	[illegible]
9	JON Pereira	— " —	— " —	60	— " —	—	[illegible]
10	Adolvo Tilmon	— " —	— " —	54	— " —	—	[illegible]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..09.....**Fulan**..Abril..... **2016** **Oras**9.30-12.00 A.M**iha**..Sede...Suco.....

Aldeia..Bemetan.....**Suku**...Betano.....**Sub-Distritu**....Same.....**Distritu**...Manufahi.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Mario Pereira	Agricultora	M.	60.	Betano	—11—	
2	Domingos C. Hornai	Agricultura	M	69	Bemetan	—	
3	Francisco da Costa	Agricultura	M	68	Bemetan	—	
4	Elias Tilman	Reg. Veterano	M	78	Betano	76475899	
5	Mario Noronha	—/—	[illegible]	52	[illegible]		
6	Jacob Pereira	—"—	M	52	Bemetan		
7	Luis de Araujo	—"—	—	40	—"—	—	
8	Vicente Leal	—"—	—	62	—"—		
9.	Jose Pereira	Jovem	M	28	—"—	77306383	
10	Joaquim Noronha	Agricultor	M.	62	—"—	—"—	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 04 **Fulan** Abril **2016 Oras** 9.30-12.00 a.m. **iha** Sede Suco

Aldeia Bemetan **Suku** Betano **Sub-Distritu** Same **Distritu** Manufahi

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Tomas Da costa.	Agrikultura	m.	35.	Betano/Bemetan	–	
2	Florindo da vicente	Adjunto Saude	m	41	Betano/Bemetan	78258652	
3	Armando de Fatima	Comunidade	M	42	Betano/Selitrahun	77266986.	
4	Belarmino T. Mendes	Comunidade	M	43	Bemetan/Betano	77664645	
5	Marcelino J.C.	Comunidade	M	36	Bemetan/Betano	75899301	
6	Florindo Pereira	Comunidade	M	54	BEMETAN	-	
7	Francisco Amaral	Comunidade	M	55	—"—	-	
8	BERE	COMUNIDADE	M	31	—"—	-	
9	PEDRO DE ARAUJO	—"—	M	60	—"—	-	
10	Jose M. Dias	PD.	M.	50	Bemetan		

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 04 **Fulan** Abril **2016 Oras** 9.30 - 12.00 a.m. **iha** sede suco

Aldeia Bemetan **Suku** Betano **Sub-Distritu** Same **Distritu** Manufahi

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	[illegible] X d	[illegible]	M	65	Betano / [illegible]	–	[illegible]
2	Juliano d. C	[illegible]	M	45	Betano / Bemetan	–	[illegible]
3	Roztori N.	Agrikoltor	M	31	Betano	–	[illegible]
4	Juliaõ pereira	agrikultura	M	35	Betano	–	[illegible]
5	Rojerio DC	Agrikultura	M	20	Betano	–	[illegible]
6	~~Agôs~~ [illegible]	Ap. Same	M	50	Same		[illegible]
7	Daniel Da Costa		M	30	Betano / Bemetan		[illegible]
8	Moses pereira		M	50	Betano / Bemetan		[illegible]
9	~~pedro de Ara~~						
10	Evangelino da Costa	Joventude	M	27	Betano / loro	–	[illegible]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 04 **Fulan** Abril **2016 Oras** 9.30-12.00 A.M. **iha** Sede Suco

Aldeia Bemetan **Suku** Betano **Sub-Distritu** Same **Distritu** Manufahi

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Mateus Miranda	Agrikultur	M.	50	Betano / Bemeta	—	[signature]
2	Julião N. Da Costa	Sekretariu Kpl.	M.	26	Betano / Raifuza.	75765299	[signature]
3	Moises Pereira			53	Betano Bemetan		[signature]
4	Andre Tilman	Agrikultor	M.	34	— " — " — " —		[signature]
5	Silvino Pereira	— " —	M	40	— " — " —		[signature]
6	Engki	" = —	M	35	— " — " —		[signature]
7	Martinho Loureiro	— " —	M	32	— " —		[signature]
8	Felipe Neri Tilman	Grupo Afetadu	M	50	Betano - Selihasan	77331693	[signature]
9	Carinho da Costa	Funsionariu	F.	50	Betano - Selihasan	78141981	[signature]
10	Julito da Costa	— " —		35	Betano. Bemetan	76043281	[signature]

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..4.....**Fulan**..Abril..... **2016 Oras**..9.30-12.00 a.m.**iha**....sede suco.....

Aldeia...Bemetan.....**Suku**....Betano.....**Sub-Distritu**.....Same.....**Distritu**....Manufahi.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Benedito Omai	Studante, Arch.	M	28	Betano, Bemetan	77053252	
2	Bosco P. Noronha	Agricultor, Asst	M	25	Betano, Bemetan	76860603	
3	Domingos de jesus	— 〃 —	— 〃 —	46	Betano / LURO	—	
4	NASIMENTU DOS REIS	— 〃 —	— 〃 —	28	— 〃 — RAITUSA	—	
5	IDELFONSO M	— 〃 —		27	— 〃 —	— 〃 —	
6	Marciano	— 〃 —	M	29	Betano / Bemetan	7783320	
7	Martinho	— 〃 —	M.	49	Betano / Bemeta		
8	João baptista	— 〃 —	M	39	Betano bemetan		
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data...4.....**Fulan** April........ **2016 Oras** 9.30-12.00a.m. **iha** Sede suco...

Aldeia Bemetan.........**Suku**....Betano...........**Sub-Distritu**...Same...........**Distritu** Manutahi.....

NDE

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	FRANCISCO POTO	HEAD OF EIA DEP	M	40	ANCPM - ACIA	77327064	[signature]
2	FRANCESKOG CARDO	STAFF	M	49	—— // ——	73522582	[signature]
3							
4							
5							
6							
7							
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 4 **Fulan** April **2016 Oras** 9.30-12.00a.m. **iha** Sede suco

Aldeia Bemetan **Suku** Betano **Sub-Distritu** Same **Distritu** Manufahi

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Vicente Pinto	TG - Dir	M	45	Dili	77147086	[signature]
2	Romy José B.P.	— 11 —	M	34	— 11	77280879	[signature]
3	Joao dos Reis	TG - Project Controller	M	33	Dili	77386507	[signature]
4	Carmelita Baptista	TG -	F	31	Dili	77963525	[signature]
5	Madalena Viana	Env. Engineer	F	26	Dili	77995210	[signature]
6	Quinmado Pinto	Env. Sup.	F	26	Dili	77041166	[signature]
7	Domingos Elcito	Proc.	M	33	Dili	7723-2694	[signature]
8	Tito FRAGA	land Surveyor	M	30	Dili	77235050	[signature]
9	ADILIO XIMENES	CIVIL ENGINEER	M	31	Dili	7771367	[signature]
10	Manuel Boavida	- 1	M	[illegible]	Bucai		[signature]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 4 **Fulan** April **2016 Oras** 9.30 - 12.00 a.m. **iha** Sede suco

Aldeia Bemetan **Suku** Betano **Sub-Distritu** Same **Distritu** Manufahi

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Alberto Da Silva	Comuni Pode	M	33	Tashilin	-	[signature]
2	Manuel Martines	Communitde	M	32	Raimea	-	[signature]
3	Jose Conceicao	Com	M	50	Zulo	-	[signature]
4	Magdalena Viana	Env. Engineer	F	26	Dili / Aimutin		[signature]
5	Carmelita M. Baptista	Tecnico	F	31	Dili		[signature]
6	Domingos Elisito	Proc.	M	35	Dili		[signature]
7	Francisco Carlos	Staf Meio	M	44	Dili		[signature]
8							
9							
10							

VPK/ENV/GT5701/10P2934/GT14215

PUBLIC CONSULTATION MEETING REGISTRATION FORM
ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date 4 **Month** April **2016 Time** 9.30-12.00 a.m. **at** Sede suco

Sub-Village Bemetan **Village** Betano **Sub-District** Same **District** Manufahi

Consultant

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	chaloemchai Nakkhwon	Project Manager	Male	35	TEAM	+66 2889 1178	Chaloemchai
2	Supichaya Wongchinavit	Environmental Scientist	F	38	TEAM	+66 894765619	Supichaya W.
3	Budsaba Issangura Na Ayudhya	Public Participation Specialist	F	59	TEAM	+66 81 909 6522	Budsaba Issangura Na Ayudhya
4	Komsain Yonchai	Geotechnical Eng.	M	26	ATT	+66 84 910 9763	
5	SONGSAK BAADDEE	Phys. Cord	M	59	ATT	+66 81 825 1921	
6	CHALIDA NIEOBURA	Senior Env. Scientist	F	49	TEAM.	+66 89 019 5099	CHALIDA N.
7	Anshisa Chansila	Socio-Economist & Public Consultation	F	29	TEAM	+668800 38822	Anshisa C.
8							
9							
10							

Meeting at Hatu-udo, Ainaro

5 April 2016: 9.30-12.00 a.m.

Total 73 People

-Local people: 47

-NDE: 2

-Project owner: 17

-Consultant: 7

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016 Oras** 9:30 - 12:00 A.M **iha** Hatu-udo

Aldeia bdoc & bonuc **Suku** Foho Ailico & Leolima **Sub-Distritu** Hatu-udo **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Albertino de Araujo	Administrador	M.	36	Ainaro / Nuno-Mogue	77869064	
2	FRANCISCO BARROS	Adjunto	M	51	Ainaro Villa	77304100	
3	ELDA F. DE ARAUJO	DIRECTORA	F	30	AINARO VILLA	78443929	
4	Zeferino G. M.	Rep. Director	M	52	Ainaro Vila	77287589	
5	Lucio R. Ribeiro	Director MAP.	M	40	Ainaro	78592729	
6	Rosivo B. Magno	STAFF ADM	M	34	Ainaro	77441058	
7	Alcina O. J. da Cruz	Estudante	F	20	Ainaro	78527303	
8	Anabela B. Mara	Studante	F	28	Ainaro	77652541	
9	Júlia da Cunha Marques	Studante	F	22	Ainaro	78080926	
10	Cepris Jelino	OPC Hatu-udo	M.	40.	Leo-Lima, Nuno Bere	77347945	

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016** **Oras** 9.30 - 12.00 a.m. **iha** Hatu - udo

Aldeia Bobe & Bonuc **Suku** Foho Ailico & Leolima **Sub-Distritu** Hatu - udo **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Tomas Salvador	Xefe Aldeia	M	38	leo-lima / Hut-sco	-	
2	Bartolomeu de A.	komunidade	M	37	leo-lima - ainaro leo		
3	Delfim Maia de Araujo	Asst. Operador/MAE	M	36	Ainaro	77282432	
4	Clarimundo de Araujo	Staff MES	M	47	leo-lima, Hatu-udo	77430132	
5	Domingos de Araujo	komunidade	M	29	Luro, leo-lima		
6	Daniel Gomes	-	M	59	Dan-Luro, leo-lima		
7	Zeferino de Oliveira	Aff. MAP	M	46	Beikala / Foho-ailico	77416686	
8	Miguel Maia Pereira	Comunidade	M	40	Ainaro leo-lima	76238121	
9	Elias de Jesus	Chefe Of. Hu.	M	45	Ailoo Foho Ailico	77320995	
10	Paulo Soares	DNSPP	M	35	Ainaro	78335235	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..5..... **Fulan**.April..... **2016 Oras**9:30-12.00 a.m **iha**..Hatu-udo.....

Aldeia..Bobe & Bonuc..**Suku**.Foho Ailico & Leolima.....**Sub-Distritu**..Hatu-udo.....**Distritu**..Ainaro.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Fidelino Serrano	chefe Aldeia	M	44	Foho Ailico	76491988	
2	EDUARDO SOARES	PNTL SIP	M	44	Foho Ailico/Ailoro	755641286	
3	Estevino J. de Araujo	Sec. Dez. Comunitario	M	30	Hato-udo, Leo-Lima	77348469	
4	Mariano de Alm	Chefe Suco Leo-Lima	M	50	Hut-seo, Leo-Lima	78442912	
5	Almerindo Canuas	Kom. Bomule	M	62	Hut-seo	—	
6	Daniel Salvador	Xefe Aldeia	M	43	Lesse Leo-Lima	75518782	
7	Ldefonso Alves	Dansur	M	67	Dansur Leo-Lima		
8	Inacio H. G. Alves	AIMER/GU	M	39	AIMER/GU	75481242	
9	Joaninho Da C. Araujo	AP. Hato udo	M	50	Hato-udo	77304112	
10	MARTINHO B. D	Xefe OPS	M	36	Ainaro	77525965	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data..5.....**Fulan**..April..... **2016 Oras**9.30-12.00a.m.**iha**..Hatu-udo.....

Aldeia.Bobe & Bonuc...**Suku**.Fohe..Ailico & Leolima.....**Sub-Distritu**.Hatu-udo.....**Distritu**..Ainaro.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Crispin Pe loiola	com ES7	M	37anos	Hato-udo	77367591	
2	BERNARDINO X.	M. VETERANOS	M.	41 ANOS	HATO-UDO	7777965	
3	Aniceto Jaques	Motorista.	M	38 Anos	Hato-udo	77563083	
4	Silvano de F	RTK	M	42	AINARO	77263753	
5	Valdemiro Vicente	PNTL	M	34	Hato-UDU	77775635	
6	Carolino da M. Pereira	comunidade	m		Ainaro		
7	Moises da Silva magno	Jornalista	M	24	Ainaro	7094577	
8	Mario da Costa	staf Statistik	M	25	Hato-udo	7735565	
9	Silveiro Pereira	Segurança sivil	m	25	Ainaro		
10	João Amaral	Juventude	M	23	Ainaro	77356814	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016** **Oras** 9.30 - 12.00 a.m **iha** Hatu-udo

Aldeia Bobe & Bonuc **Suku** Foho Ailico & Leolima **Sub-Distritu** Hatu-udo **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	TOMAS AQUINO DA S. DEO	CONDUTOR ADM	M	26	AINARO	76220143	
2	SABINO PEREIRA	COMUNIDADE	M	57	HATO-UDO		
3	FRANSISCO VICENTE	COMUNIDADE	M	60	HATO-UDO		
4	VALENTINO ALVES	COMUNIDADE	M	61	HATO-UDO		
5	Tomas Alves	Comunidade	M	32	Bobe		
6	Manuel Pereira	Comunidade	M	30	BONUC		
7	Lucas Tilman	Comunidade	M	35	Bobe		
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016 Oras** 9.30 - 12.00 a.m. **iha** Hatu-udo

Aldeia Bobe & Bonuc NDE **Suku** FohoAilico & Leolima **Sub-Distritu** Hatu-udo **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	FRANCISCO POTO	HEAD OF EIA DEP	M	40	ANCPIA - ACIA	77327069	[signature]
2	FRANCEGIXOG CARDOSO	STAFF	M	44	— // —	73522832	[signature]
3							
4							
5							
6							
7							
8							
9							
10							

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016 Oras** 9.30-12.00 a.m. **iha** Hatu-udo

Aldeia Bobe & Bonuc **Suku** Foho Ailico & Leolima **Sub-Distritu** Hatu-udo **Distritu** Ainaro

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Vicente Pinto	TG - Dir	M	45	Dili	77147086	
2	Romy Jose B.P	—"—	M	34	—"—	77280809	
3	Joao dos Reis	TG - Project Controller	M	33	Dili	77386507	
4	Carmelita Baptista	TG -	F	31	Dili	77963525	
5	Madalena Viana	Env. Engineer	F	26	Dili	77995210	
6	Quirinado Pinto	Env. Sup.	F	26	Dili	77041166	
7	Domingos Elesito	Proc.	M	33	Dili	7723-2694	
8	Tito Fraga	Land Surveyor	M	30	Dili	77235850	
9	Adilio Ximenes	Civil Engineer	M	31	Dili	7779367	
10	Manuel Boavida	"	M	[illegible]	Betai		

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU

EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 5 **Fulan** April **2016 Oras** 9.30-12.00 a.m. **iha** Hatu-udo

Aldeia Bobe & Bonuc **Suku** Foho Ailico & Leolima **Sub-Distritu** Hatu-udo **Distritu** Ainaro

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Alberto da Silva	Comunidade	M	33	Tashilin	-	[signature]
2	Manuel Martinez	Comunidade	M	32	Raimea	-	[signature]
3	José Conceição	Com	M	50	Zulo	-	[signature]
4	Magdalena Viana	Env Engineer	F	26	Dili / Aimutin		[signature]
5	Carmelita M. Baptista	Técnico	F	31	Dili		[signature]
6	Domingos Eliseto	Proc.	M	35	Dili		[signature]
7	Franklino Cardoso	Staf Meia	M	44	Dili		[signature]
8							
9							
10							

VPK/ENV/GT5701/10P2934/GT14215

PUBLIC CONSULTATION MEETING REGISTRATION FORM

ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date 5 **Month** April **2016 Time** 9.30-12.00 a.m. **at** Hatu-udo

Sub-Village Bobe & Bonuc **Village** Foho Ailico & Leolima **Sub-District** Hatu-udo **District** Ainaro

Consultant

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	chaloemchai Nakkhwon	Project Manager	Male	35	TEAM	+66 28891194	Chaloemchai
2	Supichaya Wongchinawit	Environmental Scientist	F	38	TEAM	+66 874765619	Supichaya W.
3	Budsaba Israngura Na Ayudhya	Public Participation Specialist	F	59	TEAM	+66 819096522	Budsaba Israngura Na Ayudhya
4	Komsan Yonchai	Geotechnical Eng.	M	26	ATT	+66 849109763	[signature]
5	SONGSAK BUADDEE	Proj. Cord	M	59	ATT	+66818251921	[signature]
6	CHALIDA NIBOBUKA	Senior Env. Scientist	F	49	TEAM.	+66890195099	CHALIDA N.
7	Anshisa Chansila	Socio-Economist & Public Consultation	F	29	TEAM	+66880038822	Anshisa C.
8							
9							
10							

VPK/ENV/GT5701/10P2934/GT14215

Cassa village

6 April 2016: 10.00-12.00 a.m.

Total 78 People

-Local people: 52

-NDE: 2

-Project owner: 17

-Consultant: 7

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 6 **Fulan** April **2016 Oras** 9:30 – 12.00am **iha** sede suco Cassa

Aldeia Mausuka **Suku** Cassa **Sub-Distritu** Ainaro **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Cesaltino de Amaral	Chefe Aldeia	M	60	Suco Cassa, Mausuka	75804751	[signature]
2	Saturnino Castro	Comunidade	M	75	— 〃 —		[signature]
3	Aleixo de Carvalho B.	chefe de suco	M	45	Lailima, Cassa	77054628	[signature]
4	Ostalina da Silva	PAAS	F	32	Qussamau, Cassa	77342218	[signature]
5	Venancio Martins	Comunidad	M	45	Cassa, Cual	—	[signature]
6	Orlando Barreto	Comunidad	M	53	Cassa, Lai-lima	—	[signature]
7	Moisés da Silva Magno	Jornalista	M	29	Ainaro	77099577	[signature]
8	Laurentino de Araujo	Comunidad	M	60	Cassa, Mausuka	—	[signature]
9	Gilberto Lopes	— —	M	60	Cassa, Bolhemia	—	[signature]
10	Alipio Amaral	— —	M	42	Cassa, Lailima	—	[signature]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data....6......**Fulan**..April........**2016 Oras**.9.30-12.00 a.m..**iha**..Sede suco cassa..........................

Aldeia..Mausuka..........**Suku**..Cassa.................**Sub-Distritu**..Ainaro............**Distritu**..Ainaro.........

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Antonio Da Costa	comunidade	m	62	cassa, Beltama	—~	[signature]
2	Regino Lopes	comunidade	m	60	Cassa, Mausuca	~	[signature]
3	João Branco	—~—	m	35	cassa, Mausuka	—~	[signature]
4	Marcelino Lopes	—~—	m	66	cassa, Beltama	~	[signature]
5	Agostinho Da Silva	~	m	45	cassa, Lor-Lima	—~	[signature]
6	Paulino O.	—"—	m	26	cassa, Lor-Lima	—"—	[signature]
7	Floreno X. L	—"—	m	45	Cassa, Lor-Lima	—"—	[signature]
8	ELDA F. DE ARAUJO	DIRECTORA	F	30	AINARO VILLA	78443929	[signature]
9	Aleina C. J. da Cruz	Estudante	F	20	Ainaro Villa	78527303	[signature]
10	Zélia da Cunha M	Estudante	F	25	Ainaro	78080926	[signature]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data...6.....**Fulan** April..... **2016 Oras** 9.30-12.00 a.m. **iha** Sede suco cassa.....

Aldeia Mausuka.....**Suku**..Cassa.....**Sub-Distritu**..Ainaro.....**Distritu**..Ainaro.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Belina Xavier	— // —	f	24	Ainaro Vila.	78080783	
2	Marcelina M.S DeAraujo	— // —	f	23	Ainaro Vila	78121102	
3	Natanzel M.M. Aleixo	— // —	M	23	Ainaro Vila	78416092	
4	Sidalia M.M. de Orleans	— // —	F	20	Ainaro vila	78555126	
5	Lucio R. Ribeiro	diretor	M	40	Ainaro	73727207	
6	Umardi Magno	De do posto	M	29	Ainaro	78409713	
7	Joserino de Braco	komunidade	M	68	Cassa	—	
8	Miguel Ximenes	komunidade	M	60	Cassa	—	
9	Justino de Araujo	komunidade	M	69	Cassa	—	
10	Agostinho Lopes	Comunidade	M	64	Cassa	—	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 6 **Fulan** April **2016 Oras** 9.30-12.00 a.m. **iha** Sede suco cassa

Aldeia Mausuka **Suku** cassa **Sub-Distritu** Ainaro **Distritu** Ainaro

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Jose Corte Real	OPS. Suco	M.	45	Cassa/Faulata	77390874	
2	Filomeno	Comunidade	M	46	Cassa		
3	Rogerio Bimeo	— " —	M	44	Cassa		
4	Elias Pereira		M	47	— " —	77258169	
5	EVANGELINO GOMES	AGRICULTURA	M	50	CASSA		
6	SANCHO LOPES	— " —	M	~~40~~	— " —		
7	ALARICO MARIO	— " —	M	30	— " —	—	
8	LAURENTINO BARROS	— " —	M	38	— " —	—	
9	MAS OAMEN	— " —	M	40	— " —	—	
10	Luis Da Silva	PNTL	M.	45	— " —	76749861	

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data...6......**Fulan** April......... **2016 Oras** 9.30-12.00 a.m. **iha** Sede suco Cassa..............................

Aldeia Mausuka..........**Suku** Cassa...............**Sub-Distritu** Ainaro..........**Distritu** Ainaro..........

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Carlos C- do Rego	Ex-[illegible]	M	42	Cassa	76368400	[signature]
2	[illegible] Lopes	Agricultor	M	38	Cassa		[signature]
3	Mario Magno	Agricultor	M	36	Cassa.	77447219	[signature]
4	Sebastião Gomes	— II —	M	42	Cassa	78240287	[signature]
5	Abelino de Araujo	— II —	M	64	Cassa		[signature]
6	JOSE MAGNO PEREIRA	AGRICULTURA	M	48	Cassa	77286415	[signature]
7	MONICA LOPES.	AGRICOTOR	F	41	Casa.		[signature]
8	Luis Da Silva	PNTL	M.	45	Cassa	76749861	[signature]
9	Albino de Araujo	chefi Aldeia	M	68.	Cassa	78254547	[signature]
10	Linu de Araujo	— II —	M	46	Cassa	[illegible]	[signature]

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data...6.....**Fulan**...April..... **2016** **Oras**9.30-12.00 a.m..**iha**...SEDE..Suco...CASSA.....

Aldeia..MAUSUKA...**Suku**.....Cassa.....**Sub-Distritu**..AUBARO.....**Distritu**..Ainaro.....

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Alicia Caldas	comunidade	F	27	Suku cassa Aldeia		
2	Jose Soares da Cruz	- " -	M	38	- " -		
3							
4							
5							
6							
7							
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 6 **Fulan** April **2016 Oras** 9.30-12.00 A.M. **iha** Sede suco Cassa

Aldeia Mausuka **Suku** Cassa **Sub-Distritu** Ainaro **Distritu** Ainaro

NDE

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Francisco Potu	Head of EIA Dep	M	40	ANCPM - MCIA	77327069	[signature]
2	Francisco Cardo[illegible]	Staff	M	44	—— // ——	7352258[illegible]	[signature]
3							
4							
5							
6							
7							
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU

EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 6 **Fulan** April **2016 Oras** 9.30-12.00 a.m. **iha** Sede suco Cassa

Aldeia Mausuka **Suku** Cassa **Sub-Distritu** Ainaro **Distritu** Ainaro

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Vicente Pinto	TG - DIV	M	45	Dili	77147086	[signature]
2	Romy Jose B.P	— " —	M	34	— "	77258089	[signature]
3	Joao Jos Reis	TG - Project Controller	M	33	Dili	77386504	[signature]
4	Carmelita Baptista	TG -	F	31	Dili	77963525	[signature]
5	Madalena Viana	Env. Engineer	F	26	Dili	77995210	[signature]
6	Quinmado Pinto	Env. Sup.	F	26	Dili	77041166	[signature]
7	Domingos Elisito	Proc. "	M	33	Dili	7723-2694	[signature]
8	Tito FRAGA	land Surveyor	M	30	Dili	77245850	[signature]
9	ADILIO XIMENES	CIVIL ENGINEER	M	31	Dili	7779367	[signature]
10	Manuel Boavida	- "	M	55	Buai		[signature]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 6 **Fulan** April **2016 Oras** 9.30-12.00a.m. **iha** Sede suco Cassa

Aldeia Mausuka **Suku** Cassa **Sub-Distritu** Ainaro **Distritu** Ainaro

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Alberto Da Silva	Comunidade	M	33	Taslulin	-	[signature]
2	Manuel Martines	Comunidade	M	32	Raimea	-	[signature]
3	João Conceiçao	Comu	M	50	Zulo	-	[signature]
4	Madalena Viana	Env Engineer	F	26	Dili / Aimutin		[signature]
5	Carmelita M. Baptista	Tehnik	F	31	Dili		[signature]
6	Domingos Elisito	Proc.	M	33	Dili		[signature]
7	Francelino Cardoso	SHE Mein	M	44	Dili		[signature]
8							
9							
10							

VPK/ENV/GT5701/10P2934/GT14215

PUBLIC CONSULTATION MEETING REGISTRATION FORM
ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date 6 Month April 2016 Time 9.30-12.00 a.m. at Sede suco cassa

Sub-Village Mausuka Village Cassa Sub-District Ainaro District Ainaro

Consultant

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	chaloemchai Nakkhwon	Project Manager	Male	35	TEAM	+66 2889 1178	Chaloemchai
2	Supichaya Wongchimwit	Environmental Scientist	F	38	TEAM	+66 874765619	Supichaya W.
3	Budsaba Issarangura Na Ayudhya	Public Participation Specialist	F	59	TEAM	+66 819096522	Budsaba Issarangura Na Ayudhya
4	Komsan Yonchai	Geotechnical Eng.	M	26	ATT	+66 849109763	[signature]
5	SONGSAK BAADDEE	Proj. Coro	M	59	ATT	+66 818251921	[signature]
6	CHALIDA NIROBUBPA	Senior Env. Scientist	F	49	TEAM.	+66 890195099	CHALIDA N.
7	Anshisa Chansila	Socio-Economist & Public Consultation	F	29	TEAM	+66 880038822	Anshisa C.
8							
9							
10							

Suai sub-district

7 April 2016: 9.30 a.m.

No attendance

Remark:

-Informed project details, impact & mitigation measures to chief of villages 3.00-5.00 p.m. at their villages

-Informed way to contact & send feedback from villagers to TIMOR GAP, E.P.

Zumalai sub-district

8 April 2016: 9.00-12.00 a.m.

Total 49 People

-Local people: 23

-NDE: 2

-Project owner: 17

-Consultant: 7

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 8 **Fulan** April **2016 Oras** 9.30 - 12.00 a.m. **iha** SALÃO NOBEL DA PAZ

Aldeia Leogol **Suku** ZULO **Sub-Distritu** ZUMALAI **Distritu** COVALIMA

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Rosita de Jesus	membrus	F		Zulo / obucmil	78634477	
2	Miguel dos santos	membrus	M		Zulo / obugmil		
3	Alipio Noronha	membrus	M		Zulo/obugmil		
4	Jaime Barreto	— " —	M		Zulo Lale		
5	Felisiano Borges	— " —	M		Zulo Llale		
6	Estagnio Bovera	— " —	M		Zulo leogol	75552242	
7	Abrão Tilman	— " —	m		Zulo Lale		
8	Gregorio S. Kchi	— " —	m	1995	Zulo obugmil		
9	Selia monis	— " —	F		Zulo obugmil		
10	Kalistro Tilman	— " —	m		Zulo TPZ		

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 8 **Fulan** April **2016 Oras** 9.30-12.00 a.m **iha** Salão Nobel Da Paz

Aldeia Leogol **Suku** Zulo **Sub-Distritu** Zumalai **Distritu** Covalima

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Ficomino do santos	membros	m	68	Zulo Taz		[signature]
2	Romeo Magno	membros	m	55	Lour		[signature]
3	David do santos	membros	m	1996	Zulo Obugmil		[signature]
4	Francisca M	membros	F		Zulo Zoz		[signature]
5	Virgilio Ferreira	Chefe Aldeia	M	1963	Zulo Obugmil		[signature]
6	Femenia Soares	membros	F		Zulo Leogol		[signature]
7	Jorge ferreira	Chefe suco	M		Raimea		[signature]
8	Alexandre Pereira	Chefe Suco	M	1964	Taz-Hilin	77344528	[signature]
9	FLAVA. S	komunidade	F		Zulo		[signature]
10	Matias Sequeira	Membro	M.	70	Zulo	—	[signature]

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 8 **Fulan** April **2016 Oras** 9.30-12.00am **iha** Salão Nobel Da Paz

Aldeia Leogol **Suku** Zulo **Sub-Distritu** Zumalai **Distritu** Covalima

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Carolino Do Nascimento	Membro	M.	40	Galetas / Tashilin		[signature]
2	Carlos Fereira	Chefi Aldeia	M	35	Zulo		[signature]
3	Alberto Do Nascimento	Seguranza PNTL	M	33	Zulo		[signature]
4							
5							
6							
7							
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 8 **Fulan** April **2016 Oras** 9.30 - 12.00 a.m. **iha** Salão Nobel Da Paz

Aldeia Leogol **Suku** Zulo **Sub-Distritu** Zumalai **Distritu** Covalima

NDE

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Francisco POTU	HEAD of EIA DEP	M	40	ANCPA - ACIA	77327069	[signature]
2	FRANCEGIXOL CARDO	STAF	M	44	— // —	73528582	[signature]
3							
4							
5							
6							
7							
8							
9							
10							

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data 8 **Fulan** April **2016 Oras** 9.30-12.00 a.m. **iha** Salão Nobel Da Paz

Aldeia Leogol **Suku** Zulo **Sub-Distritu** Zumalai **Distritu** Covalima

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Vicente Pinto	TG - DIR	M	55	Dili	77147086	[signature]
2	Romy jose B.C	— " —	M	34	— "	77280829	[signature]
3	Joao Jos Reis	TG - Project Controller	M	33	Dili	77386507	[signature]
4	Carmelita Baptista	TG -	F	31	DILI	77963525	[signature]
5	Madalena Viana	Env. Engineer	F	26	Dili	77095210	[signature]
6	Quinmado Pinto	Env. Sup.	F	26	Dili	77041166	[signature]
7	Domingos Elisito	Proc.	M	33	Dili	7723-2694	[signature]
8	TITO FRAGA	land Surveyor	M	30	Dili	77235850	[signature]
9	ADILIO XIMENES	CIVIL ENGINEER	M	31	DILI	7779 367	[signature]
10	Manuel Boavida	- "	M	[illegible]	Bobai		[signature]

VPK/ENV/GT5701/10P2934/GT14215

FORMULARIU REJISTRASAUN BA SORUMUTU KONSULTASAUN PUBLIKU
EVALUASAUN IMPAKTU AMBIENTAL BA PROJEITU REFINARIA BETANO

Data....8......**Fulan** April........ **2016 Oras** 9.30-12.00 a.m. **iha** Salão Nobel Da Paz..............................

Aldeia Leogol..............**Suku** Zulo...............**Sub-Distritu** Zumalai.........**Distritu** Covalima........

Project owner

No.	Naran	Pozisaun	Sexu	Tinan	Hela Fatin (Suku / Aldeia)	Numeru Telefone	Asinatura
1	Alberto Da Silva	Comandante	M	33	Tashilin	-	
2	Manuel Martinez	Comandante	M	32	Raimea	-	
3	Jose Conceicao	Com	M	50	Zulo	-	
4	Magalena Viana	Env. Engineer	F	26	Dili / Aimutin		
5	Carmelia M. Baptista	Timitu	F	31	Dili		
6	Domingos Elisito	Proc.	M	33	Dili		
7	Franklino Cordeiro	Staf Ncia	M	44	Dili		
8							
9							
10							

PUBLIC CONSULTATION MEETING REGISTRATION FORM

ENVIRONMENTAL IMPACT STATEMENT (EIS) STUDY FOR BETANO REFINERY PROJECT

Date 8 **Month** April **2016 Time** 9.30-12.00 a.m. **at** Salão Nobel Da Paz

Sub-Village Leogol **Village** Zulo **Sub-District** Zumalai **District** Covalima

Consultant

No.	Name	Position	Sex	Age	Address (Village / Sub-village)	Telephone Number	Signature
1	chaloemchai Nakkhwon	Project Manager	Male	35	TEAM	+66 2889 1198	Chaloemchai
2	Supichaya Hongchinarit	Environmental Scientist	F	38	TEAM	+66 894765619	Supichaya H.
3	Budsaba Isarangura Na Ayudhya	Public Participation Specialist	F	59	TEAM	+66 819096522	Budsaba Isarangura Na Ayudhya
4	Komsan Yonchai	Geotechnical Eng.	M	26	ATT	+66 849109763	[signature]
5	SONGSAK BUADDEE	Proj. Coord	M	59	ATT	+66818251921	[signature]
6	CHALIDA NIBOBUBPA	Senior Env. Scientist	F	49	TEAM	+66890195099	CHALIDA N.
7	Anshisa Chansila	Socio-Economist & Public Consultation	F	29	TEAM	+66880038822	Anshisa C.
8							
9							
10							

APPENDIX 16B

MINUTES OF CONSULTATION MEETING

31 March 2016

Government Officer and NGO

TIMORGAP	MINUTES of MEETING (MoM) Public Consultation on EIA study for Betano Refinery project with Government Institutions and Stakeholders in TIMOR GAP, E.P office – Dili	REFINERY & PETROLEUM SERVICES UNIT

RECORD OF MEETING

No	Participant Name & Organization	
1	*List Attached (see attachment 10A)*	
2		
3		
4		
5		
6		
7		
8		

Date	31st March 2016
Time Start	10.00 am
Time finish	2.45 pm
Location	TG Conference Room, Timor Plaza
Recorder	Elvina da Silva & Noelia Pereira
Doc No	
Date Signed	

- Safety Briefing from by Mr. Samuely de Araujo - Quality, Health, Safety & Environment (QHSE) Unit Staff
- Opening Remarks from Mr. Francisco Monteiro - TIMOR GAP, E.P. President & CEO
- Presentation on General Perspective on the Refinery Project, the Context of the Refinery Project & Previous Refinery Project Related Studies by Mr. Roberto Belo, Refinery & Petroleum Service Unit (RPSU)Staff
- Presentation on the EIA Requirements for the Refinery Project (Based on the Decree Law 5/2011 on Environmental Licensing Law) by Mr. Quirmado Pinto (QHSE Staff)
- Presentation on the EIA Study for Betano Refinery Project by Mrs. Budsaba Israng kura Na Ayudhaya and Mr. Songsak Bhaddee, TEAM Consulting

No.	Questions	Answers
1	Mr. Charles Scheiner, Lao Hamutuk: • In relation to the impact to Betano Polytechnic, Bobe sub-village and resettlement area; are you proposing to realign both the pipeline and the highway or just the pipeline?	Mr. Songsak Bhaddee, TEAM Consulting: • Alignment of condensate pipeline has to be beside the highway.
2	• Mrs. Filomena Oliveira, Ministry of Public Works, Transport & Communications: what is the reason for the pipeline to be constructed underground instead of above ground?	• Final design will be based on the result of detailed investigation that will be performed at further stage.
3	• Mr. Antonio Freitas, Director General of Statistics (Ministry of Finance): What is the distance to move the pipeline route up to the north to avoid impact on the Betano Polytechnic, Bobe sub-village and resettlement area?	• TEAM Consulting: Mitigation measures will be formulated to address the impacts, especially from noise.
4	• Mr. Charles Scheiner, Lao Hamutuk: Is the EIA Study for both the pipeline and the highway?	• Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: Only Pipeline, the highway will be the responsibility of the Ministry of Public Works, Transport & Communications
5	• Mr. Antonio Freitas, Director General of Statistics (Ministry of Finance): Is there any implication on the financial aspect?	• Mr. Songsak Bhaddee, TEAM Consulting: The budgeting and responsibilities will be included as part of the mitigation measures in the EMP which the draft will be submitted to TG next week.
6	• Mr. Charles Scheiner, Lao Hamutuk: Will the construction of the pipeline take place after the highway?	• Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: Ideally the pipeline and highway should be built simultaneously. If for some reason the highway is not fully constructed, the right of way (row) of the highway has already been reserved for the construction of the pipeline.
7	• Mr. Ismenio da Silva, Development Fund Human Capital (Ministry of Planning and Strategic Investment)): Has the land been released from the community?	• Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: As previously mentioned that the construction of both highway and refinery should be done at the same time. However if there are delays in the construction of the highway, the land of right of way (row) of the highway for the pipeline will be secured. At the moment the land has already been released for the highway route from Suai to Zumalai. The land to be released from Zumalai to Betano would depend on availability of the budget and resources.

No.	Questions	Answers
8	Mr. Charles Scheiner, Lao Hamutuk: • Since there is no deactivation phase for condensate pipeline, does that mean the pipeline will be left underground? • If the pipeline is left underground then it will rust and leak into the ground water.	• Mr. Songsak Bhaddee, TEAM Consulting: The appropriate mitigation measures for impact during deactivation phase of the pipeline would be recommended in the EIS report. • Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO – This question is best to be addressed in the future.
9	Mr. Ismenio da Silva, Development Fund Human Capital (Ministry of Planning and Strategic Investment)): • Who is going to protect the pipeline underground?	• Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: To secure the pipeline, both the highway and the right way for the pipeline will be secured using signs to designate the No Go zone. If possible with sufficient budget, then fences will be built to keep people from entering both the highway and pipeline areas. Also there will be a need for socialization to inform the nearby communities not to disturb the properties of both the highway and the pipeline.
10	Mr. Paulino da Cruz, Ministry of Justice (Department of Land and Property) – suggestions: • During the relocation process, it is highly recommended not to only relocate the people but also their animals. It would surely create negative impacts, such as health issues, if those animals were to be situated closely to the community housings. • Both the pipeline and highway should be managed as an integrated project	Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO : • If possible, TG would like to manage all the Tasi Mane Projects, however that is not possible. Some of the projects are managed by relevant ministries. TG hopes that all projects will run smoothly and continues to work closely with the relevant ministries on the management of these projects.
11	Mr. Eugenio Sarmento – Ministry of Tourism (Secretariat of State for Art and Culture) - suggestion: • Ensure that any artifacts found during the construction to be preserved. Sacred and cemeteries should also be considered when it comes to land preparation for the construction.	Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: • It would be recommended in the EIA report that in case of "Chance fine" during construction the relevant agencies would be promptly informed for proper management.
12	Mr. Charles Scheiner, Lao Hamutuk: • Will there be any impacts from using one pipeline to transport multiple products (gasoline, diesel, naphtha, etc.)? • What happen if there are spills, accidents and explosions? What are the impacts to the community, water, sea and groundwater?	• Mr. Roberto Belo, Refinery & Petroleum Service Unit (RPSU) Staff: According to the design, different product will be transported via different pipelines. • Mr. Songsak Bhaddee, TEAM Consulting: The control system will monitor if there is leaking in pipeline. The system will measure the difference in the pressure in the pipeline. If there are changes then the people will be notified. If there is a leakage the people will

No.	Questions	Answers
	• PTT has the history with environmental problems, how does TG ensure that those things do not happen in TL?	inspect and take samples of the soil and water. • Mr. Francisco Monteiro, TIMOR GAP, E.P. President & CEO: TG feels comfortable working with ATT. It is very hard to judge just because of what has happened in the pasts. TG will focus on the positive as focusing on negative will make it harder to work with any other companies.
15	Mr. Paul Alves – Secretariat of State of Professional Training and Employment - suggestions: • The priority of the employment should be given to the local community.	Noted

END OF RECORD

Note: This Minutes of Meeting (MoM) is provided by TIMOR GAP, E.P office –Dili.

4 April 2016

Betano Village

TIMORGAP	MINUTES of MEETING (MoM) **Public Consultation on EIA study for Betano Refinery project with local communities in Bemetan sub-village, Betano village, Same sub-district, Manufahi district**	REFINERY & PETROLEUM SERVICES UNIT

RECORD OF MEETING

No	Participant Name & Organization			Date	April 04, 2016
1.	Mr. Vicente da Costa Pinto (VP)	TIMOR GAP, E.P.		Time Start	09.00 am
2.	Mr. Rony Joel da Costa Barreto (RJB)	TIMOR GAP, E.P.			
3.	Mr. Quirmado Pinto (QP)	TIMOR GAP, E.P.		Time finish	12:30 pm
4.	Mr. Roberto Belo (RB)	TIMOR GAP, E.P.		Location	Betano Village
5.	Mr. Edmundo Soares (ES)	TIMOR GAP, E.P.			
6.	Ms. Madalena Viana (MV)	TIMOR GAP, E.P.		Recorder & Editor	DES
7.	Ms. Carmelita Baptista (CB)	TIMOR GAP, E.P.		Doc.No	
8.	Mr. Domingos Elisito do E. Santos (DES)	TIMOR GAP, E.P.		Data Sign	
9.	Mr. Lucas Faria (LF)	TIMOR GAP, E.P.			
10.	Mr. Songsak Badee (SBa)	TEAM Consulting			
11.	Mrs. Chalida Nieobubpa (CN)	TEAM Consulting			
12.	Mrs. Budsaba I. Na Ayudhaya (BA)	TEAM Consulting			
13.	Mr. Chaloemchai Nakkhwan (CN)	TEAM Consulting			
14.	Ms. Supichaya Wongchinawit (SW)	TEAM Consulting			
15.	Ms. Anshisa Chansila (AC)	TEAM Consulting			
16.	Mr.Komsan Yontchai (KY)	TEAM Consulting			
17.	Mr. Francisco Poto (FP)	NDPCEI			
18.	Mr. Francelino Cardoso (FC)	NDPCEI			
19.	***Please See the Attachment List (see attachment 10A)***	Local Leaders & Communities			

1. Opening Remarks by Master of Ceremony, Mr Joao dos Reis -Refinery Project Controller
2. Short Speech by Chief of Betano Village, Mr. Saturnino Tilman
3. Short Speech by Director of Refinery and Petroleum Services Unit , Mr. Vicente Pinto, TIMOR GAP, E.P
4. Short Speech by NDPCEI (National Directorate Pollution Control and Environmental Impact), Mr. Francisco Poto
5. Presentation on EIA study for Betano Refinery Project Mr.Songsak Bhaddee and Mrs. Budsaba Ayudhaya, TEAM Consulting
6. Closing Ceremony by Director of QHSE (Quality, Healthy, Safety and Environmental), Mr, Rony da Costa, TIMOR GAP,E.P

No	Question	Answer
1.	Tito conzaga community be metan sub-village • According to the slide presentation by TEAM Consultant from Thailand that to mitigate the negative impact on pipeline route, so, what is the mitigation procedure? • How impact to the water, because all of us here consumed ground water?	• SBa- The Mitigation risk for pipeline route has to do measurement for pipeline construction will do the test to insure that there is no leakage and use systems that we called hydro static test. Normally maintenance once a year and can do leakage test according to the standards that we called ASME standard. And then the control system will automatically will detected if there any leakage. • Answered by SBa-In case of leakage that would be remediation programs such as soil sample and water will be taken to the laboratories test and then there will be monitoring of surface water and groundwater quality.
	Suggestions: • Mr. Elias Tilman suggested to TG that, during construction period there will be impact from dust so I suggested that road should be given asphalt so that can be minimize dust. • Request to technical Engineers to do details study so that can be reduce the negative impact and increase the income to this country of Timor-Leste.	NOTED

END OF RECORD

Note: This Minutes of Meeting (MoM) is provided by TIMOR GAP, E.P office –Dili.

5 April 2016

Hatu-Udo Sub-district

TIMORGAP	MINUTES of MEETING (MoM) **Public Consultation on EIA study for Betano Refinery project with local communities in Hatu-Udo sub-district, Ainaro district**	REFINERY & PETROLEUM SERVICES UNIT

RECORD OF MEETING

No	Participant Name & Organization			Date	April 05, 2016
1.	Mr. Vicente da Costa Pinto (VP)	TIMOR GAP, E.P.		Time Start	09:00 am
2.	Mr. Rony Joel da Costa Barreto (RJB)	TIMOR GAP, E.P.			
3.	Mr. Quirmado Pinto (QP)	TIMOR GAP, E.P.		Time finish	12:00 pm
4.	Mr. Roberto Belo (RB)	TIMOR GAP, E.P.		Location	Hatu-udo Sub-District Ainaro
5.	Mr. Edmundo Soares (ES)	TIMOR GAP, E.P.			
6.	Ms. Madalena Viana (MV)	TIMOR GAP, E.P.		Recorder & Editor	DES
7.	Ms. Carmelita Baptista (CB)	TIMOR GAP, E.P.		Doc.No	
8.	Mr. Domingos Elisito do E. Santos (DES)	TIMOR GAP, E.P.		Data Sign	
9.	Mr. Lucas Faria (LF)	TIMOR GAP, E.P.			
10.	Mr. Songsak Badee (SBa)	TEAM Consulting			
11.	Mrs. Chalida Nieobubpa (CN)	TEAM Consulting			
12.	Mrs. Budsaba I. Na Ayudhaya (BA)	TEAM Consulting			
13.	Mr. Chaloemchai Nakkhwan (CN)	TEAM Consulting			
14.	Ms. Supichaya Wongchinawit (SW)	TEAM Consulting			
15.	Ms. Anshisa Chansila (AC)	TEAM Consulting			
16.	Mr.Komsan Yontchai (KY)	TEAM Consulting			
17.	Mr. Francisco Poto (FP)	NDPCEI			
18.	Mr. Francelino Cardoso (FC)	NDPCEI			
19.	***Please See the Attachment List (see attachment 10A)***	Local Leaders & Communities			

1. Opening Remarks by Master of Ceremony, Mr Joao dos Reis -Refinery Project Controller
2. Short Speech by Head of Municipal Ainaro Mr. Albertino de Araujo
3. Short Speech by Director of Refinery and Petroleum Services Unit , Mr. Vicente Pinto, TIMOR GAP, E.P
4. Short Speech by NDPCEI (National Directorate Pollution Control and Environmental Impact), Mr. Francisco Poto
5. Presentation on EIA study for Betano Refinery Project Mr.Songsak Bhaddee and Mrs. Budsaba Ayudhaya, TEAM Consulting
6. Closing Ceremony by Director of QHSE (Quality, Healthy, Safety and Environmental), Mr, Rony da Costa, TIMOR GAP,E.P

No	Question	Answers
1	Chief of Hatu-Udo Administrator • If the pipes cross the river and the depth of pipe only 1 ½ meter, can you guarantee that the river will not damage the pipe?	SBa- The study for this project already done by consultant from Thailand, they have compared two types of structure, the first one will be on rack crossing the big river and the other one is underground pipe. According to the Detailed Design the pipeline the pipeline would be on rack in parallel with existing bridge across the river.
2	Mr. Mariano de Almeida, Chief of Leo-lima Village • If the project affected to cultural places, it will be considered by the project owner?	• VP- Yes, consideration to sacred places will be taken before commencement of the project
3	Administrator of Ainaro District • Is there any possibility to do another public consultation regarding the project to the affected people in Aldeia Ainaro Kiik? (suggestion)	• VP- TIMOR GAP as mandated to administer and manage the project will always be ready to conduct a public consultation in order to disseminate the benefit of the project to the affected people if require.
4	Lucio Ribeiro, Agriculture staff • If the pipeline explosive or damage because of the earthquake automatically have impact to the community • Distance of the pipe to the community	• VP- the pipeline has been design based on the Timor Leste earthquake historical data. Thus, the risk of earthquake has been well calculated. • VP- the distance from pipeline route to the community around 50 – 60 M (buffer zone)

END OF RECORD

This Minutes of Meeting (MoM) is provided by TIMOR GAP, E.P office –Dili.

6 April 2016

Cassa Village

TIMORGAP	MINUTES of MEETING (MoM) Public Consultation on EIA study for Betano Refinery project with local communities in Cassa village, Ainaro sub-district	REFINERY & PETROLEUM SERVICES UNIT

RECORD OF MEETING

No	Participant Name & Organization			Date	April 06, 2016
1.	Mr. Vicente da Costa Pinto (VP)	TIMOR GAP, E.P.		Time Start	09:00 am
2.	Mr. Rony Joel da Costa Barreto (RJB)	TIMOR GAP, E.P.			
3.	Mr. Quirmado Pinto (QP)	TIMOR GAP, E.P.		Time finish	12:00 pm
4.	Mr. Roberto Belo (RB)	TIMOR GAP, E.P.		Location	Cassa Village
5.	Mr. Edmundo Soares (ES)	TIMOR GAP, E.P.			
6.	Ms. Madalena Viana (MV)	TIMOR GAP, E.P.		Recorder & Editor	DES
7.	Ms. Carmelita Baptista (CB)	TIMOR GAP, E.P.		Doc.No	
8.	Mr. Domingos Elisito do E. Santos (DES)	TIMOR GAP, E.P.		Data Sign	
9.	Mr. Lucas Faria (LF)	TIMOR GAP, E.P.			
10.	Mr. Songsak Badee (SBa)	TEAM Consulting			
11.	Mrs. Chalida Nieobubpa (CN)	TEAM Consulting			
12.	Mrs. Budsaba I. Na Ayudhaya (BA)	TEAM Consulting			
13.	Mr. Chaloemchai Nakkhwan (CN)	TEAM Consulting			
14.	Ms. Supichaya Wongchinawit (SW)	TEAM Consulting			
15.	Ms. Anshisa Chansila (AC)	TEAM Consulting			
16.	Mr.Komsan Yontchai (KY)	TEAM Consulting			
17.	Mr. Francisco Poto (FP)	NDPCEI			
18.	Mr. Francelino Cardoso (FC)	NDPCEI			
19.	***Please See the Attachment List (see attachment 10A)***	Local Leaders & Communities			

1. Opening Remarks by Master of Ceremony, Mr Joao dos Reis -Refinery Project Controller
2. Short Speech by Deputy of Municipal Ainaro Mr. Alcino Barros
3. Short Speech by Director of Refinery and Petroleum Services Unit , Mr. Vicente Pinto, TIMOR GAP,E.P
4. Short Speech by NDPCEI (National Directorate Pollution Control and Environmental Impact), Mr. Francisco Poto
5. Presentation on EIA study for Betano Refinery Project Mr.Songsak Bhaddee and Mrs. Budsaba Ayudhaya, TEAM Consulting
6. Closing Ceremony by Director of QHSE (Quality, Healthy, Safety and Environmental), Mr, Rony da Costa, TIMOR GAP,E.P

No	Question	Answers
1.	Mr. Carlos Cardoso do Rego, (Casa Community) - • What would be the mitigation plan if there is any leakage?	• SBa - The consultant would provide emergency plan to mitigate the impact as well as monitoring program. Aside from that, we have to install safety system e.g. SCADA system to control the pressure and monitoring any potential impact during the operation phase; we also have daily inspection and annual inspection to the pipe.
2.	Marcelino de Araujo, (Casa Community) • I am worried about the depth of buried pipe only 1–1, 5 m, in case of heavy rain the pipe will be destroyed by river flow.	• SBa – on river crossing section the pipeline would be put on rack in parallel with existing bridge at the same height of the bridge, thus, it would be safe from river flow.
3.	Mr. Veriato Amaral, (Casa Community) • Who are going to do the pipe maintenance?	• SBa – TG as project owner will be responsible for conducting regular maintenance and monitoring
4.	Village chief suggested that: • For the cultural cases; I would suggest the existing cemeteries we can relocate, however to the sacred places we cannot relocate , it should be considered by the project proponent • Moreover the communities have lack of	• VP- Culture ceremony is "the Must" to be considers prior the project construction is kicked off. • Noted

No	Question	Answers
	awareness; the proponent must socialize the risk associated with pipe explosion	

END OF RECORD

Note: This Minutes of Meeting (MoM) is provided by TIMOR GAP, E.P office –Dili.

8 April 2016

Zumalai Sub-district

TIMORGAP	MINUTES of MEETING (MoM) Public Consultation on EIA study for Betano Refinery project with local communities in Zumalai sub-district, Covalima district	REFINERY & PETROLEUM SERVICES UNIT

RECORD OF MEETING

No	Participant Name & Organization			Date	April 08, 2016
1.	Mr. Vicente da Costa Pinto (VP)	TIMOR GAP, E.P.		Time Start	09:00 am
2.	Mr. Rony Joel da Costa Barreto (RJB)	TIMOR GAP, E.P.			
3.	Mr. Quirmado Pinto (QP)	TIMOR GAP, E.P.		Time finish	12: 00 pm
4.	Mr. Roberto Belo (RB)	TIMOR GAP, E.P.		Location	Zumalai Sub-District Ainaro
5.	Mr. Edmundo Soares (ES)	TIMOR GAP, E.P.			
6.	Ms. Madalena Viana (MV)	TIMOR GAP, E.P.		Recorder & Editor	DES
7.	Ms. Carmelita Baptista (CB)	TIMOR GAP, E.P.		Doc.No	
8.	Mr. Domingos Elisito do E. Santos (DES)	TIMOR GAP, E.P.		Data Sign	
9.	Mr. Lucas Faria (LF)	TIMOR GAP, E.P.			
10.	Mr. Songsak Badee (SBa)	TEAM Consulting			
11.	Mrs. Chalida Nieobubpa (CN)	TEAM Consulting			
12.	Mrs. Budsaba I. Na Ayudhaya (BA)	TEAM Consulting			
13.	Mr. Chaloemchai Nakkhwan (CN)	TEAM Consulting			
14.	Ms. Supichaya Wongchinawit (SW)	TEAM Consulting			
15.	Ms. Anshisa Chansila (AC)	TEAM Consulting			
16.	Mr.Komsan Yontchai (KY)	TEAM Consulting			
17.	Mr. Francisco Poto (FP)	NDPCEI			
18.	Mr. Francelino Cardoso (FC)	NDPCEI			
19.	***Please See the Attachment List (see attachment 10A)***	Local Leaders & Communities			

1. Opening Remarks by Master of Ceremony, Mr Joao dos Reis -Refinery Project Controller
2. Short Speech by Head of Sub-District Administrator Zumalai Mr.Manuel Freitas
3. Short Speech by Director of Refinery and Petroleum Services Unit, Mr. Vicente Pinto, TIMOR GAP, E.P
4. Short Speech by NDPCEI (National Directorate Pollution Control and Environmental Impact), Mr. Francisco Poto
5. Presentation on EIA study for Betano Refinery Project Mr.Songsak Bhaddee and Mrs. Budsaba Ayudhaya, TEAM Consulting
6. Closing Ceremony by Director of QHSE (Quality, Healthy, Safety and Environmental), Mr, Rony da Costa, TIMOR GAP, E.P

No	Question	Answer
1	Jaime Barreto, Zulo community Village • If the pipeline pass through our garden and damaged or explosive how to solve?	• SBa- during the operation phase will install SCADA system in Betano and Suai. The system will automatically detect if there any leakage along the pipeline. • TIMOR GAP: as pipeline operator would have the emergency team to promptly solve the problem if there is something wrong with the pipeline.
2	Afonso dos Santos, Zulo village chief • Maximum involving of Local people, so that we are not only watching? • If there is negative impact on water or contamination to the water and Soil how to mitigate the risk?	• VP- the contractor is required to employee local people based on Timor Leste Local Content regulation. The work opportunity will provide based on the skill available locally. • SBa- soil around the area will be tested in laboratories if it is contaminated. There would be remediation programs for example, water and soil will be taken for treatment and clean soil will put in place to replace contaminated soil. • During pipeline construction, there will be a test to insure that there is no leakage by using system that we call hydro static test. • RdC-EIA study team will Identify and quantify the potential negative impacts and positive impact from the proposed project with respect to the environment (physical, biological, economic, social, and cultural) and propose prevention, mitigation, and monitoring measures in the future.
	• How much is the distance from pipeline to the farms and community stay by?	• VP- that distance from pipeline to the community around 50 – 60 m (buffer zone)

END OF RECORD

Note: This Minutes of Meeting (MoM) is provided by TIMOR GAP, E.P office –Dili.

APPENDIX 18A[1]

TEMPLATE TO BE USED FOR MONITORING AND INSPECTION PROGRAMS DURING PRE-CONSTRUCTION AND CONSTRUCTION PHASE

[1] Modified from the template of ONEP, Thailand

Summary Table:
Results from Performing Mitigation Measures and Monitoring Plans

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Environmental Impact	Mitigation Measures	Detail of the Compliance with the Mitigation Measures	Problem/ Obstacles Correction (See NB.)	Reference

Ambient Air Quality Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Location/ coordinate of the monitoring site: ..... Station No.: .....

UTM Coordinate of the monitoring station: ..... Site Operator: .....

Analyzer Model and Serial No.: .....

Calibrator Model and Serial No. : .....

Calibration Gas Cylinder I.D. : .....

Certified Date: .....Concentration <ppm> : .....

Expire Date: .....

Time*	Results (specify the ambient air parameters)						
	Date	Date	Date	Date	Date	Date	Date
00.00 – 01.00 am 01.00 – 02.00 am 02.00 – 03.00 am . . . 9.00 – 10.00 pm 10.00 – 11.00 pm 11.00 – 12.00 pm							
Maximum 24-hour average Maximum 1-hour average Minimum 1-hour average							
Standard 1-hour Standard 24-hour							

*Hourly monitoring, for 24 hours: 0.00 am. – 12.00 pm.

Name of the person responsible for sampling: .....

Name of the person responsible for data collection/recording: .....

Name of the auditor/ inspector: .....

Name of the analytical laboratory responsible for sample analysis: .....

Name of the analyst: ..... the analyst's registration ID. : .....

Contact phone number: .....

Wind Direction and Hourly Average Wind Speed Monitoring Results and Wind Rose

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Location/ coordinate of the monitoring site .....Station No. : .....

UTM Coordinate of the monitoring station: ..... Site Operator .....

Time*	Date		Date		Date		Date	
	Wind speed (m/ s)	Direction	Wind speed (m/ s)	Direction	Wind speed (m/ s)	Direction	Wind speed (m/ s)	Direction

* Hourly monitor, for 24 hours

Name of the person responsible for sampling: .....

Name of the person responsible for data collection/recording: .....

Name of the auditor/ inspector: .....

Name of the analytical laboratory responsible for sample analysis: .....

Name of the analyst: ..... the analyst's registration ID. : .....

Contact phone number: .....

Summary: Majority of the wind direction originated from .....

Majority of the wind speed is in the range of .....m/s

Show graphic illustration of **wind rose**: .....

Waste Water Quality Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Location/ coordinate of the monitoring site: .....

UTM Coordinate of the monitoring station: .....

Parameters	Units	Results (1)						Range of the Maximum and Minimum Values	Standard(2)	Level granted in EIA(3)
		Date	Date	Date	Date	Date	Date			

Notes: (1) indicates the detection limit of the analytical method used, especially for the "not-detectable" case.

(2) specify relevant standard and reference

(3) specify the concentration or loading granted in EIA

Name of the person responsible for sampling: .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor/ inspector: .....

Name of the analytical laboratory responsible for sample analysis: .....

Name of the analyst: .....the analyst's registration ID. : .....

Contact phone number: .....

Surface Water Quality Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Monitoring Stations and their UTM Coordinates	Parameters	Units	Result (1)						Range of the Maximum and Minimum Values	Standard (2)
			Date	Date	Date	Date	Date	Date		

Notes: (1) indicates the detection limit of the analytical method used, especially for the "not-detectable" case.

(2) specify relevant standard (varies with types of the surface water) and reference

Name of the person responsible for sampling: .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor/ inspector: .....

Name of the analytical laboratory responsible for sample analysis: .....

Name of the analyst: .....the analyst's registration ID. : .....

Contact phone number: .....

Community Noise Levels Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Location/ coordinate of the monitoring site: .....

UTM Coordinate of the monitoring station: .....

Sound Level Meter's Model and Serial No.: .....

Calibrator Model and Serial No.: .....

Calibration Ref. dB (A): .....

SLM Reading dB (A) and SLM Adjust dB (A): .....

Certified Date: .....

Calibration Sheet No.: .....

Time	Equivalent Sound Pressure Level (dB(A))	
	Date	Date
00.00 – 01.00 am 01.00 – 02.00 am 02.00 – 03.00 am . . . 9.00 – 10.00 pm 10.00 – 11.00 pm 11.00 – 12.00 pm		
Leq<24>* Ldn Lmax **		
Standard: 24 hours Standard: Maximum		

Notes: * 24-hour average

** Maximum Sound Pressure Level in 24 hours

Name of the person responsible for the monitoring/ analyzing (and registration ID) .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor: .....

Contact phone number: .....

Summary Table of Workers' Medical Examinations

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Date of the check-ups: .....

Name of the hospital or nursing-home .....

Total numbers of workers in the plant .....

Numbers of workers received the check-ups .....

Total numbers of workers required further medical treatment or consultation .....

Medical Examination List (1)	Numbers of workers received the check-ups (2)	Normal	Abnormal (3)

Notes: (1) for examples, annual check-ups—lung, liver, kidney, blood, including special/ extra check-ups for chemicals in blood, etc.

(2) also specify the workers' job descriptions or types of plant's area of responsible

(3) specify relevant criteria for determination and reference

Name of the person responsible for data collection/ recording: .....

Name of the auditor or data controller .....

If an abnormality was found, specify further action(s) .....

.....

Summary Table of Accidents

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: ..... month/year to ..... month/year

Types of Accidents[1]	Frequency [2]	Location	Target for Accident Reduction [3]

Notes: (1) specify the definition of the accident or near miss, e.g., severity and/or numbers of days leave

(2) rate of accidents per period of time

(3) target set to cutback the rate of accidents

Name of the person responsible for data collection/ recording: .....

Name of the auditor or data controller .....

If an accident was occurred, specify further action(s) .....

.....

APPENDIX 18B[1]

TEMPLATE TO BE USED FOR MONITORING AND INSPECTION PROGRAMS DURING OPERATION PHASE

[1] Modified from the template of ONEP, Thailand

Summary Table:

Results from Performing Mitigation Measures and Monitoring Plans

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Environmental Impact	Mitigation Measures	Detail of the Compliance with the Mitigation Measures	Problem/ Obstacles Correction	Reference

Noise Levels in Work Place Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Location/ coordinate of the monitoring site: .....

UTM Coordinate of the monitoring station: .....

Sound Level Meter's Model and Serial No. : .....

Calibrator Model and Serial No. : .....

Calibration Ref. dB (A): .....

SLM Reading dB (A) and SLM Adjust dB (A): .....

Certified Date : .....

Calibration Sheet No. : .....

.....

Time	Equivalent Sound Pressure Level (dB(A))	
	Date	Date
08.00 – 09.00 09.00 – 10.00 10.00 – 11.00 11.00 - 12.00 12.00 – 13.00 13.00 – 14.00 14.00 – 15.00 15.00 – 16.00		
Leq<8>* Lmax **		
Standard: 8 hours Standard: Maximum		

Notes: * 8-hour average

** Maximum Sound Pressure Level in 8 hours

Show a **noise contour** with detail description, if it is required in EIA .....

Name of the person responsible for the monitoring/ analyzing (and registration ID) .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor: .....

Contact phone number: .....

Air Quality in Work Place Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Date	Stations	Parameters	Unit	Results	Standard (1)

Note: (1) specify relevant standard and reference

Name of the person responsible for monitoring/ sampling: .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor/ inspector: .....

Name of the analytical laboratory responsible for sample analysis: .....

Name of the analyst: .....the analyst's registration ID. : .....

Contact phone number: .....

Light Intensity in Work Place Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Date	Location	Types of Work[1]	Results (Lux)	Standards [2]

Notes: (1) indicates types of work carried out at the monitoring location, e.g., maintenance work etc.

(2) specify relevant standard and reference

Name of the person responsible for the monitoring/ analyzing (and registration ID) .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor/ inspector: .....

Contact phone number: .....

Heat in Work Place Monitoring Results

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Date	Location	Types of Work (1)	Results (Degree)	Standard (2)

Notes: (1) indicates types of work carried out at the monitoring location, e.g., maintenance work etc.

(2) specify relevant standard, such as WBGT (Wet Bulb Globe Temperature) proposed by ACGIH (American Conference of the Governmental Industrial Hygienists)

Name of the person responsible for the monitoring/ analyzing (and registration ID) .....

Name of the person responsible for data collection/ recording: .....

Name of the auditor/ inspector: .....

Contact phone number: .....

Summary Table of Workers' Medical Examinations

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Date of the check-ups:. .....

Name of the hospital or nursing-home.....

Total numbers of workers in the plant .....

Numbers of workers received the check-ups .....

Total numbers of workers required further medical treatment or consultation .....

Medical Examination List (1)	Numbers of workers received the check-ups (2)	Normal	Abnormal (3)

Notes: (1) for examples, annual check-ups—lung, liver, kidney, blood, including special/ extra check-ups for chemicals in blood, etc.also specify the workers' job descriptions or types of plant's area of responsible specify relevant criteria for determination and reference

Name of the person responsible for data collection/ recording: .....

Name of the auditor or data controller .....

If an abnormality was found, specify further action(s).....

.....

Summary Table of Accidents

Project: ..... Owner company: .....

Monitoring report prepared by: .....

Period of reporting: .....month/year to ..... month/year

Types of Accidents[1]	Frequency [2]	Location	Target for Accident Reduction [3]

Notes: (1) specify the definition of the accident or near miss, e.g., severity and/or numbers of days leave rate of accidents per period of time target set to cutback the rate of accidents

Name of the person responsible for data collection/ recording: .....

Name of the auditor or data controller .....

If an accident was occurred, specify further action(s) .....

.....