ENVIRONMENTAL MANAGEMENT PLAN

(EMP)

TIMOR GAP Pualaca Block 2D Seismic Acquisition Project 2024

TG-CEO-QHSE-EMP-24-001

TIMOR GAP Pualaca Block Unipessoal, Lda.
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Approval Page

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27/09/24	01	Environmental Consultant	MD of TGPB/ QHSE General Manager	President & CEO

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ABBREVIATIONS

2D	2 Dimension
ADB	Asian Development Bank
ANP	*Autoridade Nacional do Petróleo/*The National Authority of Petroleum
DL	Decree Law
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERP	Emergency Responsibility Plan
ENSO	El-Niño Southern Oscillation
GoTL	Government of Timor-Leste
HSE	Health, Safety and Environment
IBA	Important Environment Areas
IFC	International Finance Corporation
IUCN	International Union for Conservation
MP	Ministerial Diploma
PSC	Production Sharing Contract
QHSE	Quality, Health, Safety and Environment
RDTL	*Republica Democratica de Timor-Leste*
SEIS	Simplified Environmental Impact Statement
TGPB	TIMOR GAP Pualaca Block
WHO	World Health Organization

CHAPTER 1 EXECUTIVE SUMMARY

1.1 Project Background

TIMORGAP PUALACA BLOCK (TGPB), a wholly owned subsidiary of TIMOR GAP E.P., was awarded the PSC TL-OT-21-17 on 7 December 2021. The block covers an area of 1,575 km2and is located on the south coast of Timor-Leste. In total, it accounts for territory in three Municipalities Manatuto, Manufahi, and Viqueque,

TIMORGAP and ANP negotiated a finalization, and minimum work program commitment plan, which was the focus of the Pualaca PSC application. This included incorporating desktopand geophysical studies such as seismic and non-seismic; full tensor gravity gradiometry and amplified geochemical imaging plans. The desktop study mainly covered onshore geological and geophysical data compilations of onshore geological and Geophysical data.

The subsidiary of TIMOR GAP, E.P. (TIMOR GAP) for the Pualaca block will hire a choice of several geophysical contractors from around the world for the proposed 2D SeismicAcquisition project for the Block in the municipalities of Manatuto, Viqueque, and Manufahi that cover contract area of PSC TL-OT-21-17.

The potential environmental impacts from the Lise Ot large, wheeled vibrator source machines consist of noise pollution, habitat disturbance; Soil compaction, and Water contamination, There Will be no cross-border and global impacts. The impact has been identified for any of the cultural sites present within -the block area, including traditional customs, historical, archaeological, and sacred sites as safe distances set out here in this document mitigate any damages, from the survey area, numerous public consultations the affected communities and regulatory bodies have been conducted. Based on the Decree-Law 39/2022 of 8 June (first amendment to Decree-Law 5/2011, of 9 February, Environmental Licensing law), The SeismicAcquisition project falls into Category B.

The consulting service that prepares EMP document for the TIMOR GAP Pualaca Block project is Halona Serena, Lda. This environmental consultant, category as a national consultant, was established in 2018 and base in Dili.

1.2 Objective of EMP

To identify the principles, approach, procedures and methods that will be used to control and reduce the environmental and social impacts of the Seismic Survey activities associated with the project, as identified in the Environmental Impact Assessment, in particular the identified Residual Risks. This project is to conduct Seismic survey activities located at Manatuto, Viqueque and Manufahi Municipalities.

The 2D seismic surveys are expected to take about three or four months by the contractor with their forty-one (41) personnel team were site in Chapter IV of table 2 and possible the unskilled and semi-skilled workers will be hired locally from towns and villages representative of the area and after consultation with the local authorities and communities. The aim will be to ensure a fair distribution of employment opportunities

1.3 Summary of Impact

Based on identification impact mentioning in SEIS document, there are server point or component that very important to summaries and provide the appropriated mitigation measures in the EMP in aim to avoid, minimize and compensated. The environmental component that need to provide appropriated mitigation such as Physiography and Geology, Soils, Air Quality, Surface and Groundwater Resources, Water Quality, Terrestrial Environment (Habitats, Flora and Fauna, Land Resources and National Parks, Archaeological, Historical and Cultural Sites, Visual Aesthetics, Noise and Vibrations, Solid and Liquid Wastes, Social Characteristics, Economic Characteristics, Occupational Health and Safety, Security and Public Safety, Camp Construction and Social and Economic.

1.4 Mitigation Measures

The following information of the mitigation measures proposed for the project activities will focus to **Physiography and Geology** :Use existing access roads to the extent possible, Minimize, to the extent possible, the use of bulldozers to open up cut lines and access roads to minimize landscape scarring; Avoid cut lines on slopes steeper than 40º to minimize risk of landslips and rock topples; **Soils** : Machinery and equipment should use existing routes as much as is practicable to avoid compaction of the surface soil, Construct drainage channels on cut lines where natural drainage may be affected, All fuels and other non-aqueous fluids to be stored in suitable bunded enclosures, Ensure that all drivers and technicians are familiar with drip-tray and spill-kit use through daily tool-box talks; and , Installation and proper management of camp sanitation facilities. **Air Quality:** Limit traffic speed and restrict movement of vehicles as is reasonable to minimize dust generation, Field vehicles, trucks and any other machinery should be switched off when not in use, Installation and proper management of camp sanitation facilities. **Surface and Ground Water Resources** : A water supply borehole should be drilled to provide the water required for the project; this could be donated to the community on completion of the seismic survey, It is recommended that an efficient water-use policy be adopted by the project proponent at the camp site and other work areas, Ensure that any in-field refueling or maintenance is performed while using a drip tray with a spill-kit available; **Water Quality** : Refueling areas must be underlain with spill-proof hard standing or bund, with spill kits readily available and operatives trained in their use, All fuels and other non-aqueous fluids to be stored in suitable bunded enclosures, All refueling operations to be carefully overseen and managed; **Construction of the Campsite** : Construction of the campsite shall be undertaken during daylight hours only, Mitigations in sections (Physiography and Geology), (Soils), (Surface and Groundwater) and (Terrestrial Environment), (Noise and Vibrations) (Occupational Health and Safety) and (Security and Public Safety) apply, Excavated soil should be used in landscape design of the campsite rather than stockpiling, Use of appropriate Personal Protective Equipment to be enforced and Company employees shall comply both with

the relevant national legislation, and its own in-house environmental health and safety (EHS) policies etc.

The EMP update will be prepared by TIMORGAP and Contractor related to the changing of methodology, equipment or location that will used for the seismic survey activities including responsible to prepare the decommissioning plan prior to the submission to ANP for approval before completing of the survey activities.

CHAPTER 2 DETAILS OF THE PROPONENT

2.1 Details of the Proponent

Company	TIMORGAP Pualaca Block, Unip. Lda.(TGPB)
Office Phone	+670 3310953
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First Contact Person	
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Title	Managing Director TIMORGAP Pualaca Block,Unip. Lda.
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Second Contact Person	
Name	Leonel Hornai da Cruz
Title	QHSE General Manager
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CHAPTER 3 DETAILS OF THE CONSULTANT

3.1 Introduction

The Consultant Established in 2018 in Dili, **Halona Serena, Lda.** is an innovative and dynamic consultancy firm specializing in environmental and engineering consulting. Founded with the mission to provide superior technical consulting services to both public and private sector clients, Halona Serena has quickly become a key player in addressing the growing demands for consultancy services in Timor-Leste, especially in the face of rapidly expanding infrastructure development.

At the core of Halona Serena's success is its team of professional staff, boasting both local and international expertise. Committed to meeting client expectations, the team comprises a diverse range of specialists including Senior Environmental Experts, Engineers, Health, Safety, and Environment (HSE) Specialists, Sociologists, Biologists, and more. This multidisciplinary approach ensures comprehensive solutions across various project aspects.

Halona Serena's portfolio includes a range of completed and ongoing projects, demonstrating its capability and versatility:

- Oil and Gas projects, including the Category A Project for Timor Resources in Betano.
- Infrastructure projects like the East to South Coast Road Connectivity Project for the Asian Development Bank.
- Baseline study for 72 MW solar panels to be installed in Laleia Manatuto, project for the Asian Development Bank.
- Environmental licensing for significant developments such as the Dili Central (Timor Plaza) project.
- Various environmental assessments and feasibility studies, particularly in water resources and management.

Driven by a vision to be a leading consultancy firm in Timor-Leste, Halona Serena is dedicated to delivering solutions that are environmentally sustainable, socially responsible, and economically

viable. The firm's mission focuses on protecting people, clients, and the environment, underpinned by a commitment to high-quality service and a pursuit of excellence.

Halona Serena offers a wide range of services, including Environmental Impact Assessment, Water and Waste Management, Air Pollution Management, Geotechnical Engineering, Social Studies and Resettlement, Various monitoring, and mapping services.

The firm is led by Maria do Ceu do Rosario Rosales, an experienced environmental scientist and business law expert, alongside a team of seasoned professionals like Lawrence Lazaro, Senior Environmental and Sanitary Engineer, Jacinto Soares, Senior Geologist, Januario da Costa, Senior Engineer in Water Treatment, Pedro Pinto, Senior Biologist, Charles Tan, Manager of Wastewater Treatment and Water Management, and others. Each member brings a wealth of experience and specialized knowledge, contributing to the firm's robust capability in handling complex environmental and engineering challenges.

3.2 Consultant who carried out the study and prepared EMP

3.2.1 Details of the consultant:

Company Name : Halona Serena Lda.
Director : Maria do Ceu do Rosario Rosales
Office Address : Level 4, Timor Plaza CBD 2, Room 402
Rua Presidente Nicolao Lobato, Comoro, Dili, Timor-Leste
Phone : (+670) 77114459/77724000
Email : halonaserena@gmail.com

CHAPTER 4 DESCRIPTION OF THE PROJECT

4.1 Description of the Project

TIMORGAP PUALACA BLOCK (TGPB), a wholly owned subsidiary of TIMOR GAP E.P., was awarded the PSC TL-OT-21-17 on 7 December 2021. The block covers an area of 1,575 km^2 and is located on the south coast of Timor-Leste. This Pualaca block accounts for territory in three Municipalities Manatuto, Manufahi, and Viqueque. TIMORGAP is committed to expand and improve its portfolio Exploration & Production.

There are a several geophysical contractors from around the world that have been considered to be hired by TGPB for 2D Seismic Acquisition project for the Block PSC TL-OT-21-17.

The seismic survey will deploy a broader grid of vibroseis seismic lines along roads and dry river valleys as shown in figure 1. The project acquisition design will be recorded using vibroseis source equipment the source interval will be 20m. The receiver equipment for recording will be a nodal system deployed with 20m intervals. A live recording spread is also to be provided to ensure noise thresholds are not exceeded during recording. 20 stations of "live receivers" will be deployed 100m away from the recording truck and spread out over 20m intervals to ensure clean recording. The sweep parameters will be finalized based on testing using one 12 second sweep with a 6 second listen time.

The targeted reservoir is sandstone of the Triassic Babulu Group and the length of the project will be approximately 266 linear kilometers. The estimated duration of this 2D seismic acquisition for the Pualaca Block is two and a half months. Details of the Municipalities, Post Administrative and Sucos, local receptors (existing building, schools, health facility, sacred sites, etc.) within the proposed seismic lines and any other project components as shown in Figure 1 and 2. The project is based entirely on roads and they are steep and quite densely overgrown in some areas so much effort will be needed in line clearance and preparation. Line clearance for the seismic survey points will be undertaken by the locals using machete, backhoe, and saw. The lines will be diverted to avoid important habitat, infrastructure and other significant features (e.g. sacred sites).

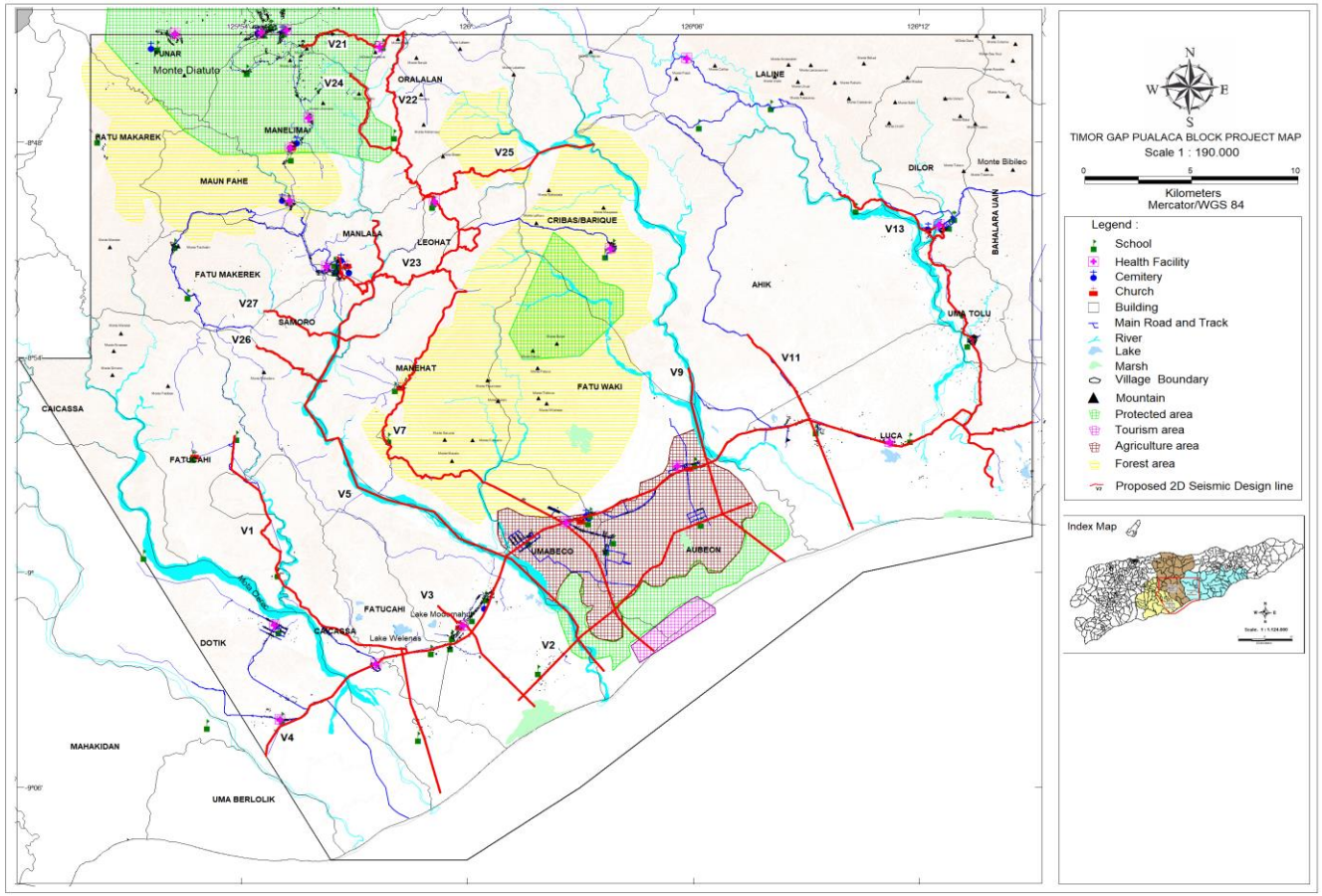


Figure 1. Detailed Map including effected community and proposed 2D seismic lines

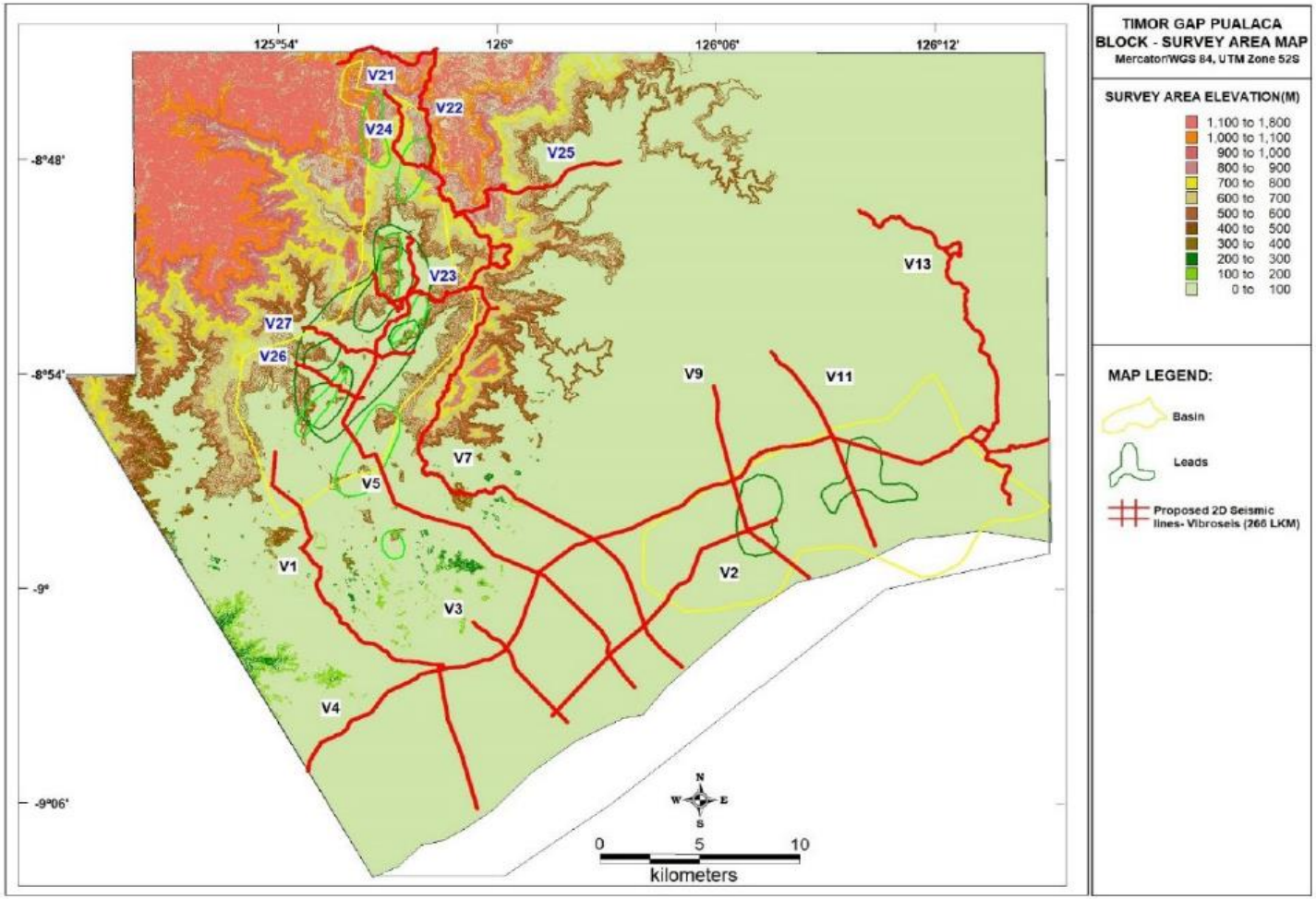


Figure 2. Proposed area for survey and Scouting 16 seismic lines.

The seismic line positions provided in Figure 4 are indicative of their final positions. The line positions will be finalized during survey operations after taking into account the geological and operational variations that will occur. A nominal corridor width of 100 m will be identified around the indicated lines and the most appropriate final route will be within this corridor. If any of the final seismic survey line falls outside of the identified 100-meter corridor the relevant government department and appropriate community leaders will be notified and a response time limit of <7 days to the company will be maintained to avoid costly delays.

Should TIMOR GAP Pualaca Block, Unip. Lda find that new lines different within this document, are required, then the proponent will undertake consultations with the relevant authority to determine the most appropriate process and timeline for inclusion of the new line/s.

4.2 Project Category

The IX Government Constitutional through the National Authority for Petroleum under the Ministry of Petroleum and Mineral Resources (MPMR), approval project document and classified this project as a category B project with reference number ANP/HSE/S/24/100, dated 05 July 2024 in accordance with Decree Law Nu. 39/2022 first amendment of Decree Law Nu. 5/2011of the Environmental Licensing.

As mentioned in Article 4 (Definition of Categories and Type of Environmental Assessment Procedure), the category B project is the projects that may cause environmental impacts and are subject to the procedure of Initial Environmental Examination (IEE), this based on the simplified Environmental Impact Statement (SEIS) and Environmental Management Plan (EMP) in accordance with the provisions of this law.

4.3 Project Nature, Size and Location

4.3.1 Nature of the project

Based on the surface geological mapping provisionally identified at least 6 exploration prospects and leads on the basis of field geology in combination with the Full Tensor Gravity (FTG) data.

The primary exploration lead identified is the Pualaca Anticline, which is interpreted as a simple anticlinal fold some 3.8 km long and 1.3 km wide developed immediately east of the Pualaca oil seeps. The reservoir target for this and other fold belt structures provisionally identified are sandstones of the Triassic Babulu Group.

The reconnaissance geological mapping of the block and supported by FTG data also formed the basis for the planning of a grid of vibroseis seismic lines.

Part of the primary justification for reconnaissance geological mapping of the entire Pualaca Block was the sensible location of a seismic grid. After initially (in 2023) considering a dynamite-sourced seismic grid focused on the Pualaca and Natarbora Basins (which proved prohibitively expensive because of logistical difficulties in acquiring seismic in the remote and high-topography Mutin-Sahem valley), it was decided instead to acquire a broader grid of vibroseis seismic lines acquired primarily along roads and along dry river valleys.

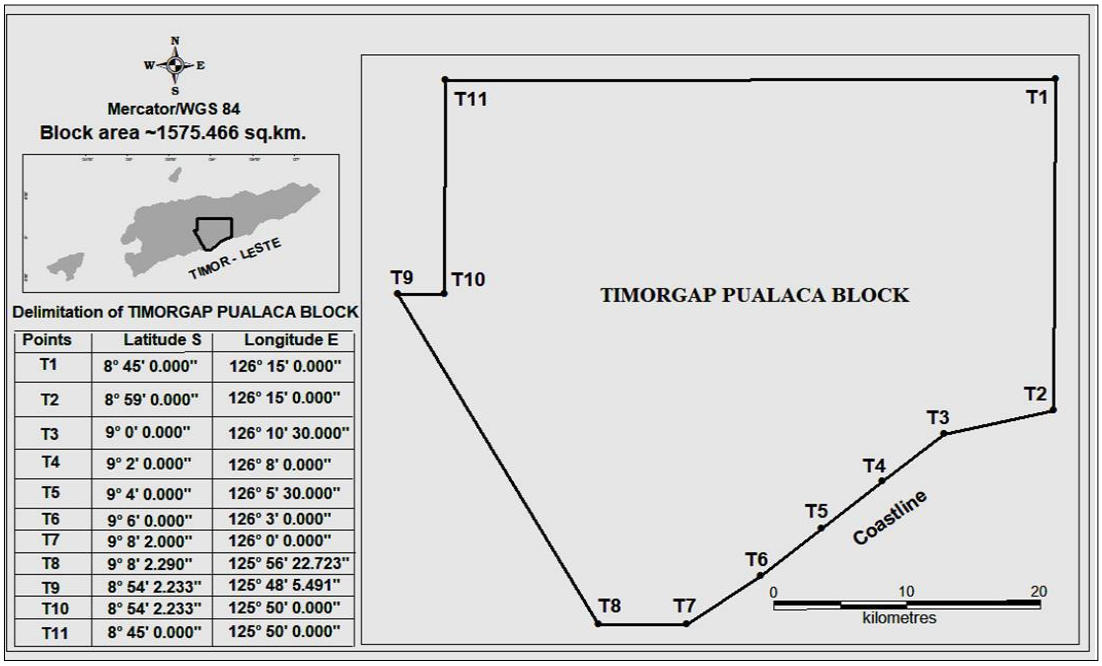
The acquisition portion of the geophysical survey as set out will follow the guidance as provided by the Autoridade Nacional do Petróleo (ANP) / the National Petroleum Authority wherever is possible. This project will be managed by strong HSE guidelines all will be based upon International Association Geophysical Contractors (IAGC) and Oil and Gas Producers (OGP) standards. Health, Safety and Environmental (HSE) documents and standards will be bridged between the contractor and TGPB's HSE before beginning the survey.

The length of the project will be approximately 266 linear kilometers. The first stage of interaction will be a detailed scout of the area hosted by TGPB with the awarded contractor.

4.3.2 Location

The project area lies in South Coast of Timor Leste, it is precisely located in the Manatutu Viqueque and Manufahi Municipalities with the coordinate point are mentioning in figure 4 bellow.

The following of the TGPB contract area and GPS coordinate point:



Points	Latitude S	Longitude E
T1	8° 45' 0.000"	126° 15' 0.000"
T2	8° 59' 0.000"	126° 15' 0.000"
T3	9° 0' 0.000"	126° 10' 30.000"
T4	9° 2' 0.000"	126° 8' 0.000"
T5	9° 4' 0.000"	126° 5' 30.000"
T6	9° 6' 0.000"	126° 3' 0.000"
T7	9° 8' 2.000"	126° 0' 0.000"
T8	9° 8' 2.290"	125° 56' 22.723"
T9	8° 54' 2.233"	125° 48' 5.491"
T10	8° 54' 2.233"	125° 50' 0.000"
T11	8° 45' 0.000"	125° 50' 0.000"

Figure 3. TGPB contract area and Coordinate Point

4.3.3 Size

The PUALACA BLOCK PSC TL-OT-21-17 covers an area of 1,575 km^2 and the project length approximately 266 linear kilometres.

4.3.4 The 2D Seismic Survey for TGPB Project

Seismic surveys are a primary tool utilized during the exploration of hydrocarbons on land. A seismic survey is conducted by creating an energy wave commonly referred to as a "seismic wave" on the surface of the ground along a predetermined line, using vibroseis acquisition equipment.

4.3.4.1 Seismic Survey Objectives

The aim of the 2D seismic program is to upgrade the existing mapping after 2D seismic acquisition. This seismic reflection survey will help to further delineate the structural configurations and shall be used:

- To enhance image on reservoir levels for better drilling locations and development of the field.
- To Identify and map major and minor faults at shallow / deep exploration targets.
- To seek reservoir characterization, Reservoir Monitoring

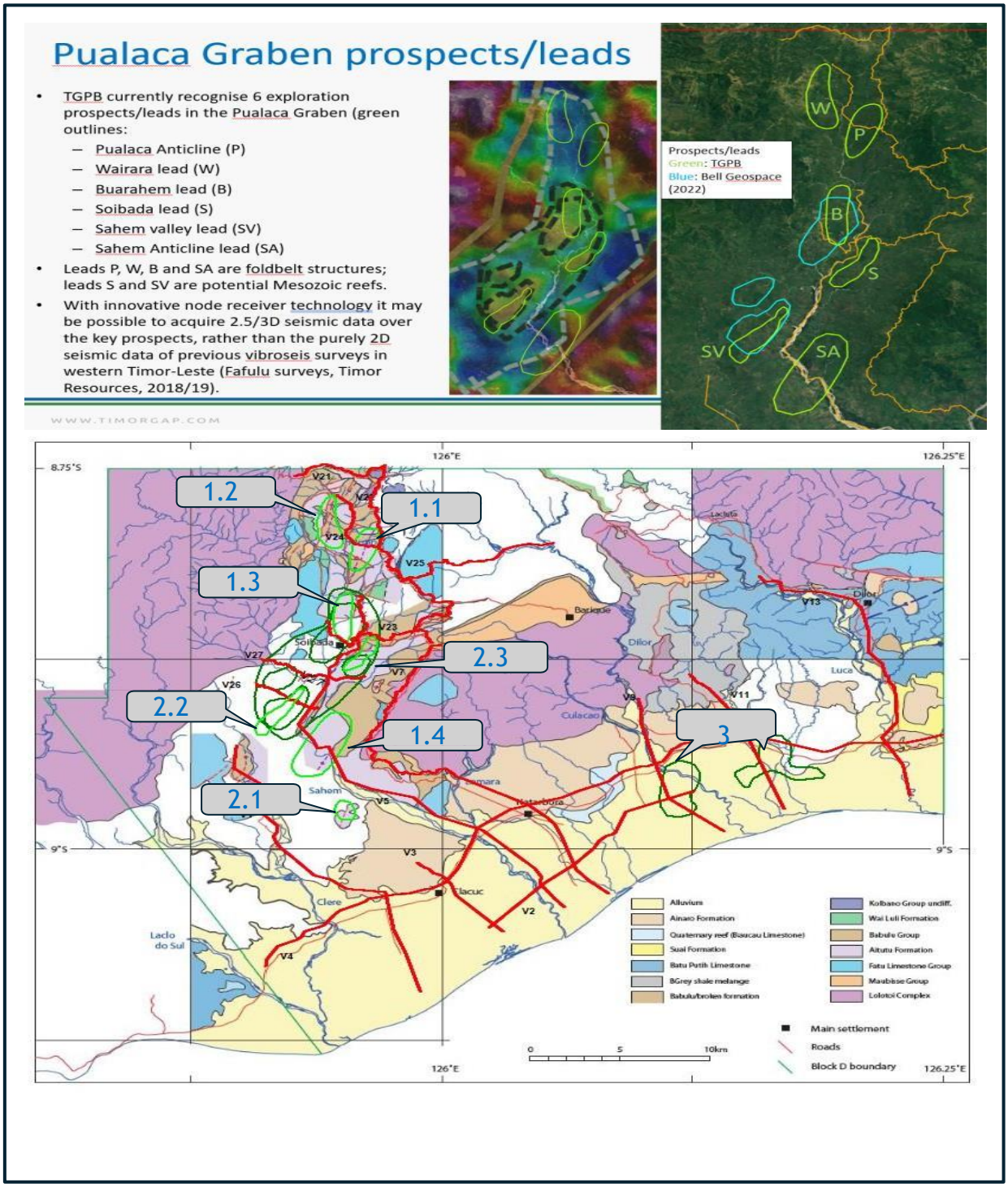


Figure 4. Pualaca Block Play and Leads Seismic Survey Scale and Extent

The contractor will conduct the seismic survey operation in 2024 with total length 226 km, total lines 16 lines, receiver point (RP) approximately 13,650 and vibrator point is similar with receiver point. This activity will take approximately three (3) months and expected to be kick of on October 2024. The seismic survey operation will be constrained along the seismic survey lines and to the base and fly camps, as well as to the access roads of these areas.

CONTRACTOR will provide: 2D acquisition operation design and furnish the necessary equipment and personnel to carry out the seismic acquisition.

Table 1. The total length with the total lines of seismic survey activity

No.	Line Number	Line lengh (KM)	Coordinate systems, degree(Longitude/Latitude,WGS 1G84,UTM Zone 52S			
			Beginning of line		End of line	
			Easting (x)	Northing(y)	Easting (x)	Northing(y)
1	V1	23.73	125° 59' 17.1168"	-9° 6' 9.1188"	125° 53' 49.416"	-8° 56' 11.9256"
2	V2	15.7	126° 7' 31.998"	-8° 58' 4.2168"	126° 1' 21.9072"	-9° 3' 34.3404"
3	V3	7.15	126° 1' 47.2944"	-9° 3' 44.6004"	125° 59' 13.4556"	-9° 0' 56.7972"
4	V4	45	125° 54' 39.3336"	-9° 5' 7.1052"	126° 15' 0.2376"	-8° 55' 48.414"
5	V5	33.2	126° 3' 37.8432"	-9° 2' 45.5712"	125° 57' 29.6928"	-8° 50' 11.3496"
6	V7	30.7	126° 4' 56.8956"	-9° 2' 11.8068"	125° 59' 55.6836"	-8° 52' 8.7888"
7	V9	11.6	126° 8' 25.296"	-8° 59' 41.442"	126° 5' 52.602"	-8° 54' 19.5192"
8	V11	11.5	126° 10' 14.106"	-8° 58' 48.0972"	126° 7' 25.9572"	-8° 53' 22.452"
9	V13	21.9	126° 14' 0.186"	-8° 58' 15.0816"	126° 9' 32.292"	-8° 49' 24.2868"
10	V21	6.51	125° 58' 20.5068"	-8° 44' 54.3912"	125° 55' 37.0812"	-8° 45' 20.1204"
11	V22	19.6	125° 59' 13.5096"	-8° 51' 36.54"	125° 58' 16.7736"	-8° 44' 56.8248"
12	V23	11.3	125° 59' 43.0692"	-8° 52' 5.214"	125° 56' 33.8244"	-8° 51' 12.2472"
13	V24	6.12	125° 58' 9.2856"	-8° 48' 10.8396"	125° 56' 54.5676"	-8° 46' 5.4048"
14	V25	10.9	125° 58' 48.9756"	-8° 49' 36.4116"	126° 3' 22.0104"	-8° 48' 3.456"
15	V26	4.36	125° 57' 39.4452"	-8° 53' 22.5024"	125° 54' 36.3924"	-8° 52' 43.3092"
16	V27	6.59	125° 56' 15.738"	-8° 54' 39.8196"	125° 54' 24.2316"	-8° 53' 41.1504"
Total line		266				

The 2D seismic surveys are expected to take about three months by the contractor with their personnel team were site in table 2. Where possible, unskilled and semi-skilled workers will be hired locally from towns and villages representative of the area and after consultation with the

local authorities and communities. The aim will be to ensure a fair distribution of employment opportunities.

Table 2. The Roles and Quantities for the seismic project

No	Roles	Quantities
1	Part Chief	1
2	Recording Observer (5 to 15 Year's Experience)	3
3	QC Geophysicists (5 to 15 year's experience)	2
4	On-site seismic data processor (5 to 15 year's experience)	2
5	HSE Advisor (one for base and one for fly camp)	2
6	Medical Doctor	2
7	Accounts /Admin Assistants	2
8	Surveyors	7
9	Radio Operator	2
10	Recording Field Assistant	2
11	Drilling Technicians	0
12	Vibrator Technicians & Shooting Supervisor	3
13	Vibrator Operators	6
14	Plant Attendant Electrician	2
15	Mechanics	5
16	Carpenter	1
17	Dozer Operator	As required
18	Line Crew / Line Boss	As required
19	Any other as per requirement (cook & bearer)	

4.3.4.2 Field Equipment

The contractor required to conduct 2D seismic survey activity using Vibroseis with the field equipment are mentioned bellow.

- **Recording Equipment**
  A. Recording / Instrument Type / Make / Model / Specification providing manufacturer details and capacity for all components (hardware / software), including node harvesting and charging.
  B. Number of available Geophone nodes. Contractor should be provide Technical Literature
  C. Detail of auxiliary / test equipment for geophone nodal system
  D. Encoder / Decoder (Shooting Equipment) Equipped with GPS.
- **Source Equipment**

  Vibrators (At least 05 Nos.), Peak force not less than 60000 lb equipped with DGPS System.
- **On-Site Seismic Data Processing Unit and 2D Planning and Designing Software Make / Model of Hardware / Plotter 2 Detail of 2D Processing Software**
  1) Make / Model of Hardware / Plotter
  2) Detail of 2D Processing Software
- **GPS and Survey Equipment**
  1) Make /Model of GPS and other equipment
  2) Version Number
  3) Survey Computation Software
- **Detail of vehicles and other machinery like dozers, tractors and Generators in the crew**
- **Radio and Communication equipment & facilities**
- **Experience of working**

Figure 5. Vibroseis and Wireless Nodes (Source: Dawson Geophysical Web site)

4.3.4.3 Seismic Acquisition "Source and Receiver Parameters

Source: vibroseis,

Source interval: 20m (single sweep)

The receiver: nodal system

Receiver interval: 20m intervals.

1. Receiver: appx. 13,650 receiver point (RP)
2. Source: appx. 13,650 source point (SP)

The sweep parameters will be finalized based on testing using two 12 second sweeps with a 6 second listen time.

The safe distances to be observed during the acquisition:

1. Houses - 50m
2. Grave sites - 100m
3. Water wells - 75m

4.4 Justification and need for the Project

The energy sector is one of the key pillars in the Timor-Leste 2011-2030 Strategic Development Plan. This sector is critical to young nation's economic growth and strength, and its prosperity for generations to come. TIMORGAP is well-positioned to turn some of the toughest challenges in sustainably developing hydrocarbon resources and turning them into new and exciting opportunities. In order to develop this sector, TIMORGAP have commitment to create, seize, develop and optimize the economic, commercial and strategic value of the upstream activities, starting from the exploration phase (studies and surveys), drilling, production to the decommissioning phase and carried out through several subsidiaries including one of the TGPB.

TGPB as a one of subsidiary of TIMORGAP, that takes an important role in exploration phase (studies and surveys) with using the seismic equipment to identify and describe potential of the hydrocarbon, if there are sufficient, it will be continuing to conducting the exploitation (Drilling).

Through the seismic survey activity will help us to identify the natural resources that exist in the country to make the exploitation with intention to contribute to the state deficit for savings and develop the country, provide extensive revenue for public services and company, create jobs opportunities and become important capital for other investments

4.5 The Proponent's Approval of the EIA

TIMORGAP PUALACA BLOCK endorses the contents of this report and will abide by all recommendations contained herein.

Name	**Position**	**Signature**
Eduardo Goncalves	Managing Director	
TITLE	MANAGING DIRECTOR TIMORGAP PUALACA BLOCK/ UNIP, IDA,	
MOBILE PHONE	75834612	

4.6 The Structure of the EMP

This EMP template is organized into 21 chapters in line with the Appendix 4 of the Diploma Ministerial No.46/2017 Regulation on the Detailed Requirements for Screening, Scoping and the Term of Reference, Environmental Impact Statement and Environmental Management Plan for Environmental Assessment. Hence, this EMP contents contain:

Table 3. EMP Structure

Chapter 1	Executive Summary
Chapter 2	Details of the Project Proponent
Chapter 3	Details of the Consultants Who Prepared the EMP
Chapter 4	Description of the Project
Chapter 5	Legal Requirements
Chapter 6	Institutional Roles and Responsibility

Chapter 7	Summary of Impacts
Chapter 8	Description of Proposed Mitigation Measures
Chapter 9	Governing Parameters
Chapter 10	Monitoring Program
Chapter 11	Reporting Requirements
Chapter 12	Responsibilities for Mitigation and Monitoring
Chapter 13	Emergency Plan
Chapter 14	Decommissioning Plan Chapter
Chapter 15	Capacity Development and Training
Chapter 16	Public Consultation and Information Disclosure
Chapter 17	Complaints and Grievances Mechanisms
Chapter 18	Work Plan and Implementation Schedule
Chapter 19	Cost Estimates
Chapter 20	Review of the EMP
Chapter 21	Non-Technical Summary

4.7 General Map and Plan of the project

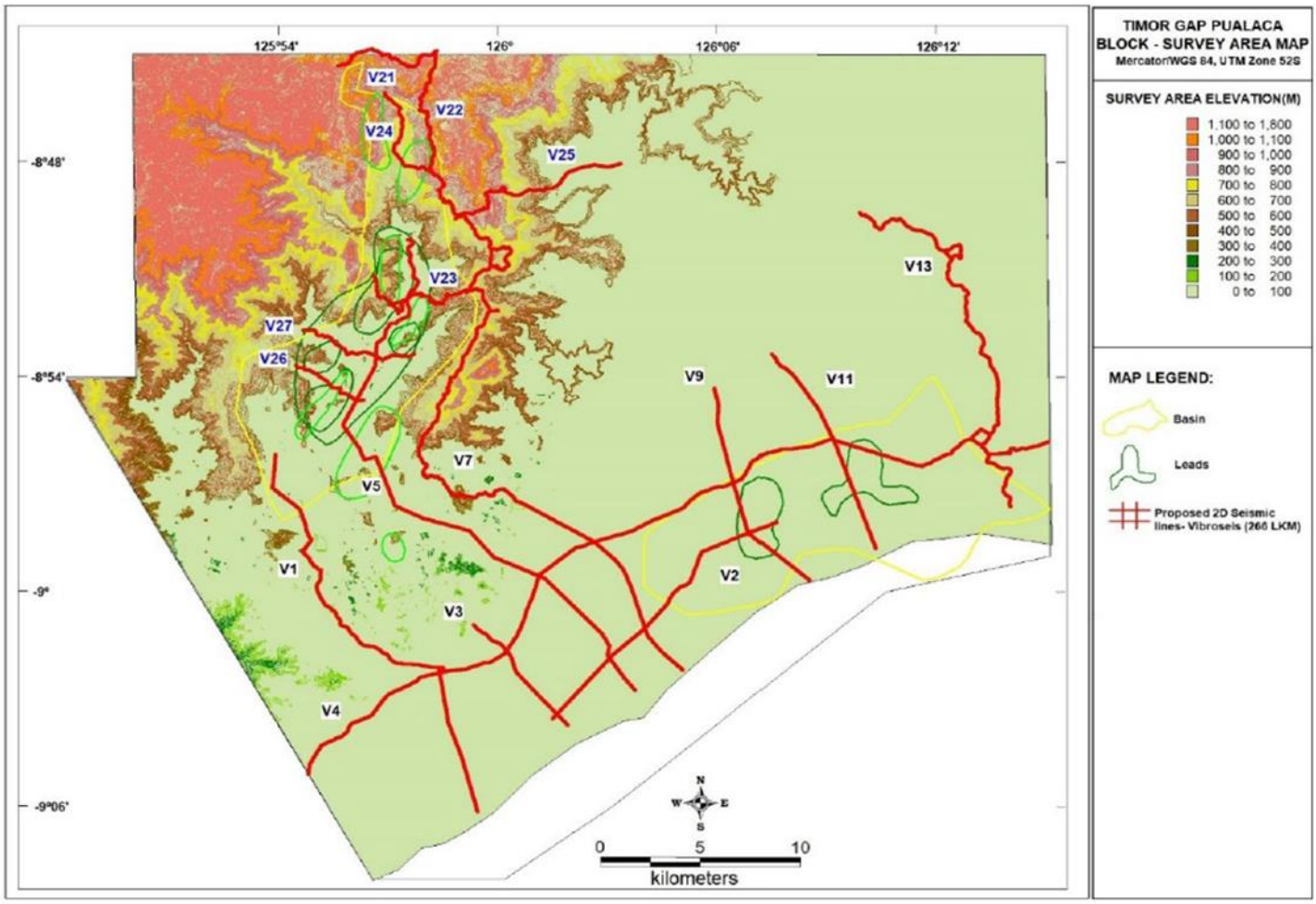


Figure 6. General map and Plan of the project

CHAPTER 5 LEGAL REQUIREMENTS

5.1 Introduction

The Timor-Leste Constitution provides the constitutional foundation for the protection of the environment and preservation of natural resources. Moreover, two other articles, i.e. Articles 61 and 139 stipulated conditions for the use and preservation of the environment and natural resources, respectively with the purpose of ensuring an ecologically balanced and sustainable development approach. Decree Law 39/2022 on Environmental Licensing (first amendment to the DL 5/2011 on Environmental Licensing) contains procedures and other requirements related to securing environmental permits prior to commencing development activities.

In supporting DL 39/2022, the Ministerial Diploma No. 46/2017 contains regulation on the detailed requirements for screening, scoping, preparation of a Project Document (PD), Terms of Reference (TOR), Environmental Impact Statement (EIS), and Environmental Management Plan (EMP) for category A. On the other hand, Simplified Environmental Impact Statement (SEIS) is required for Category B instead of EIS whilst another requirement remain the same for this category.

5.2 Constitution of the Democratic Republic of Timor – Leste, of 20 May 2002

The Constitution stipulates that a healthy environment is a constitutional right. Title III of the Constitution of the Democratic Republic of Timor-Leste stipulates the following provisions for Environmental Protection:

- Everyone has the right to a humane, healthy, and ecologically balanced environment and the duty to protect it and improve it for the benefit of future generations.
- The State shall recognize the need to preserve and rationalize natural resources.
- The State should promote actions aimed at protecting the environment and safeguarding the sustainable development of the economy.

5.3 Environmental Legislation

Table 4. Applicable Laws and Regulation in Timor-Leste for the Seismic Survey.

Tittle	Description	Relevance to the Project
Decree Law No. 26/2012 Basic Environmental Law	Sets the Environmental Framework in Timor-Leste; Defines Government, Proponent, and Civil Society responsibilities in the framework; Defines polluter requirements and obligations for several environmental components i.e. water, air, noise, solid waste, etc.; Defines the applicability of the World Health Organization (WHO) standards as established national standards. Defines the instruments for Environmental Assessment (EA).	Principles of Environmental Obligations (polluter/payer, etc) Environmental Assessment Study
Decree Law No. 39/2022 first amendment from Decree-Law No. 05/2011 - Environmental Licensing	Defines the Environmental Licensing procedure for public and private projects likely to produce environmental and social impacts. Defines the environmental classification (A = EIA; B = IEE) for said projects based on their nature, size, technical characteristics, location, and possible significant impacts, as in Annex I and II; Defines the requirements for the EIA process, and Public Consultation	Provides the environmental licensing procedure to regulate actions to encourage and protect the nature as an important instrument for sustainable development of Timor-Leste's economy.
Ministerial Diploma no. 44/2017	Defines the Impacts and Benefits agreed between the proponent and the communities or individuals affected by the Project, included in the EIS and/or	The SEIS/EMP guides the Inter-ministerial Group created by the

Tittle	Description	Relevance to the Project
Regulation on Impact and Benefits Agreement;	EMP and in the Resettlement Action Plan (RAP)	Government to handle the EIA process of the seismic survey activity
Ministerial Diploma No. 46/2017 – Detail requirements for Screening, Scoping, Project Document, Term of Reference, EIS, SEIS, and EMP for Environmental Assessment	This Article specifies the necessary of establishing a regulation for projects that may have significant impacts to the environment. Additionally, this article outlines minimum requirement contents for documents such as Project Document, TOR, EIS, SEIS, and EMP for category A, B, and C Projects.	Providing Minimum Requirement content for SEIS and EMP for this Category B Project.
Ministerial Diploma No. 47/2017 – Public Consultation Procedure and Requirement during Environmental Baseline Process	This Article specifies the procedure and requirement of involvement of public and communities into different stages of the environmental assessment process through public consultation.	Provides information and communicate to the affected communities, the positive and negative impact.
Biodiversity		
Decree-Law no. 05/2016 – National System of Protected Areas	This Article established the legal framework for the creation and management of the national system for protected areas, as well as identifies and classifies the existing protected Areas in the National Territory	Provides information in identifying protected areas in and/or perimeters of the project.

Tittle	Description	Relevance to the Project
Draft Decree Law on Biodiversity (version dated September 2012)	Promote the sustainable use of biological resources, conservation of biodiversity, and fair and equal division of the benefits generated from genetic resources, as well as the obligation for an impact assessment of biodiversity values regarding a policy, masterplan or implementation project	Current Biodiversity (Terrestrial and Marine) situation in AOI reviewed in SEIS & EMP.
Land and Property		
Law No. 13 /2017 – Special Regime for the definition of ownership and immovable assets	This Law describe the rules on land ownership, legal clarification of ownership, and promotion of distribution and access to land, as well as the figure of community property/land.	Provides information in defining land ownership and community properties
Law no. 08/2017 – Expropriation for Public Utility	This Article established the rules and regulations for expropriation for Public Use/utility reasons, with regard to fair indemnification Article no. 4 defines that *"3. For the reason of expropriation, the following are motives of public utility: […] d) reservoirs, dams, distribution structures, irrigation, and water or sanitation drainage"*.	Provides information in shaping Socio-economic analysis and Mitigation measures.
Labor		

Tittle	Description	Relevance to the Project
Decree Law No. 04/2012 – Labor Law	This law describes the duties and obligations of the private employer and employee while exercising their function within the scope of work, or the bounds of a work contract, to create good working conditions and a fair, safe, and healthy working environment.	SEIS - Chapter 6 presents the results of the Socio-economic study and its impacts regarding the description of the AOI's labor force, public health, and other sectors.
Cultural and Heritage		
Government Resolution No. 24/2009 – National Policy for Culture	Defines the concept of culture, heritage, and types of and how these should be identified, classified communicated to the public, and registered so as to make it a dynamic sector for the development of the identity and citizenship of Timor-Leste.	Provides information in identifying cultural and heritage in and/or around perimeter of the project.
Decree Law No. 33/2017 – Legal Framework for Cultural Heritage	Defines the concept of cultural heritage and the measures for its support, protection, preservation and conservation and the typology of cultural heritage in Timor-Lest and connects the population to the protection, conservation, and defense of cultural heritage, as well as its fruition.	Provides information in identifying cultural and heritage in and/or around perimeter of the project.
Waste Management		
Decree Law No. 3/2024 – First Alteration of DL No. 33/2008 - Hygiene and Public Order, Supported by DL No. 2/2007 –	These laws provide legal framework to manage the urban solid waste and to ensure promoting hygiene in the work place.	As the legal basis for the project proponent to manage solid waste produced during any project phase. This to be set as the minimum criteria for TGPB to

Tittle	Description	Relevance to the Project
Urban Residual Waste Management		establish its own waste management system.

Table 5. Applicable International Standards and Guidelines for the Seismic Survey

Tittle	Description	Relevance to the Project
WHO Guidelines for Community Noise (1999)	Compliance to the standards provisioned by WHO of acceptable sound pressure levels, relevant to project activities, for the prevention of critical health effects.	Guidelines used as reference for the Baseline evaluation for noise in SEIS.
WHO Air Quality Guidelines (2005)	Designed to offer guidance in reducing the health impacts of air pollution to protect public health in different contexts and countries where national targets are yet to be determined.	Guidelines used as reference for the Baseline evaluation for air quality in SEIS.
WHO Guidelines for Drinking-water Quality (2011)	Compliance to the standards provisioned by WHO for the quality of drinking water, especially groundwater quality.	List of water quality parameters relevant to perform references Baseline evaluation for groundwater water quality baseline reference.
IFC/WB EHS Guidelines: **Environmental, Health and** **Safety (2007)**	Contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs when host countries' national legislations are less stringent or non-existent.	The standards provisioned by IFC are also used when WHO standards are non-existent for specific components such as wastewater, contaminated land, biological hazards, etc.
United Nations Convention on Biological Diversity (UNCBD)	The Convention on Biological Diversity (CBD) has 3 main objectives: ➢ The conservation of biological diversity;	This project could have impacts on the flora and fauna or risk to the loss of the biodiversity. It is fundamental principle for

Tittle	Description	Relevance to the Project
	➢ The sustainable use of the component of biological diversity; and ➢ The fair and equitable sharing of the benefit arising out of the utilization of genetic resources.	TGPB to prevent or minimize the risk of biodiversity loss during the project implementation.
United Nation Framework for Climate Change Convention (UNFCCC) and Kyoto Protocols including Timor-Leste's National Action Plan for Climate Change	Provides a framework for intergovernmental effort to reduce greenhouse gas emissions and adapt to the expected impacts of climate change. It also provides guidance to member states on developing and implementing national climate change strategies, incorporating both adaptation and mitigation actions. Timor-Leste became a signatory to the UNFCCC in October 2006.	The project activities will release GHG emissions which would contribute to the country's climate change issue. The GHG emissions will be kept minimal when possible.
International Union for Convention of Nature (IUCN)	This international convention focuses on the nature conservation and sustainable of utilizing the natural resources. The IUCN works in the field to promote ecological conservation in order to ensure the sustainable development concept. Timor-Leste is a signatory member of IUCN.	This project will identify all species categories listed under the IUCN red list which can be impacted by the project activities.
UNESCO Convention on Natural and Cultural Heritage	This convention mandates each signatory member to identify, protect, conserve, transmit and present to the future generations of the cultural and natural heritage. Timor-Leste is a signatory member of this convention.	This project activities will ensure the protection and conservation of any cultural and natural heritage of the project location.

CHAPTER 6 INSTITUTIONAL ROLES AND RESPONSIBILITIES

TIMORGAP Pualaca Block (TGPB) as a proponent of the 2D Seismic Acquisition Project will be assigned responsibilities to several team leaders to plan and provide the actions for each stage of development. These personnel are responsible to implement this project in an environmentally sound whilst responsible to monitor and updates the EMP as the project progress. Once the information has been completed, the contractor and consultant are required to inform to TGPB for discussion prior to the submission of the final EMP to ANP for approval.

The seismic survey activity will be monitored directly by the project proponent during the implementation process with the aim of ensuring that the contractor follows the EMP requirement.

Table 6. The institution roles and responsibilities to implement the EMP for the project activities.

Position	General Responsibilities	Specific Site Responsibilities
Managing Director - TGPB	Overall supervision of project	Appoints a Project Manager Receives regular reports on progress, incidents, issues to be aware of Receives updates from HSE Officer as to compliance or non-compliance with legislation, and recommendations to rectify Assists in the resolution of environmental issues
TGPB Seismic Manager / Geophysical Consultant	Manages all works on-site Supervises all subcontractors on-site	Implements and updates the Project Environmental Management Plan Observes all environmental acts, rules and regulations Makes sure that work activities are carried out in a safe and environmentally sound manner Ensures sediment and erosion control measures are in place and functioning Provides advice and assistance on environmental matters to employees Actions Environmental reports & carries out workplace inspections

Position	General Responsibilities	Specific Site Responsibilities
		Investigates hazard reports and ensures they are completed and corrective actions undertaken Is part of environmental incident investigations Manages the resolution of project environmental issues Make sure records are kept and are up to date Ensures plant & equipment are weed free when entering/leaving site Monitors that vegetation is not disturbed except where necessary for development Ensures work is not conducted outside designated project boundary
TGPB Health Safety and Environment (HSE) Officer (Operator)	Site HSE Compliance	Support planning, coordinating and implementing of effective HSE policies, guidelines and procedures to ensure objective are met, and implementation of EMP Assists the Project Manager in the implementation of all aspects of the project EMP Monitors environmental legislative requirements. Controls all management system documentation Participates in project audits Communicates environmental requirements to the Project Manager Assists in investigation of any HSE incident and reports to relevant authorities and management providing a full report.
TGPB Environmental Consultant Operator	IEE Process, Formulating SEIS, and EMP	Tasked by the TGPB to seek Environmental Licensing by conducting IEE, formulating SEIS and EMP. Produce the Environmental Report (Six month and annual report) for the implementation project, if required by TGPB and ANP.

Position	General Responsibilities	Specific Site Responsibilities
Party Chief (Seismic Contractor)	Supervises all subcontractors on-site	He/she is based on the field operation and responsible for the overall compliance with project Environmental Management Plan, HSE standards and procedures, supervision of data quality and achievement of production goals. He/she communicates HSE information with senior staff and ensures follow-up where necessary. He/she is responsible to conduct emergency drills on the crew and ensures implementation. He/she is responsible for communications to the seismic contractor Country manager and TGPB Seismic Manager, both verbal and written, informing them of daily crew progress and any problems encountered that may require special attention. He/she is responsible for the effective supervision of subcontractors under his/her control. Furthermore : Ensure all instructions of the Party Chief concerning work methods and use of equipment are communicated and carried out properly and safely, with due regard for the environment; Initiate necessary actions in order to correct hazardous conditions; Check that protective and safety devices are in good condition and are used correctly when needed; Promptly follow up any reports of unsafe equipment that cannot be corrected on the crew; Promptly report any unsafe act that requires remedial action from the Party Chief; Encourage the participation of all crew members in the active improvement of the HSE Program during the operation; Identify HSE suggestions and recognizes crew members ability to contribute to accident prevention;

Position	General Responsibilities	Specific Site Responsibilities
		Assist in the investigation of all accidents; Orientate and briefs new crew members as to HSE awareness and responsibilities; Prepare regular HSE reports to seismic contractor country management and TGPB Seismic Manager; Ensure that all HSE information is disseminated to all personnel and is fully understood on the crew; Initiate the Hazard identification and assessment, design controls and recovery measures to combat any additional recognized hazards; Update Project HSE Plans; Carry out inspections of safety equipment. Check equipment, machinery, electric wiring, camp, water supply, food preparation, personnel, etc. Ensure that HSE procedures, safety stickers, warning signs, etc. are posted and all personnel are aware of these procedures; Visit work groups in the field to ensure compliance with safe working practices and use of safety equipment and use of PPE; Conduct regular documented training programs with the work force as per the training schedules. Follows all HSE guidelines at all times.
HR Manager Seismic Contractor	Manages recruitment and capacity building	Develop and implement HR strategies and initiative aligned with the overall business strategy. Manage the recruitment and selection process.

Position	General Responsibilities	Specific Site Responsibilities
		Support current and future business needs through the development, engagement, motivation and preservation of human capital. Develop and monitor overall HR strategies, systems, tactics and procedures across the company.
Health Safety and Environment (HSE) Manager (Seismic Contractor)	Site HSE Compliance	Outlines Project Management Plan, HSE objectives and goals for the program based on seismic contractor corporate policy, the contract, TGPB HSE policy and the bridged HSE plans; Monitors environmental legislative requirements. Controls all management system documentation Ensures that adequate HSE equipment is available for the survey; Manages and provides HSE training and inductions for all project employees. Audits the crew on a regular basis; Maintains contact with TGPB management, participates in HSE meetings; Sets a clear leadership example and promotes a high degree of HSE awareness, by participating in HSE activities and following all guidelines Setting objectives and targets and communicating these to all company personnel in the country and contractor staff. Implementation of the HSE Management System within Seismic Contractor Operations in Timor Leste. Draws up Emergency Response Plan, including medical contingency planning / evacuation procedures and emergency contacts etc.

Position	General Responsibilities	Specific Site Responsibilities
		Ensuring dissemination of HSE information to all crews, such as audit reports, incidents reports etc. Ensures proper training of all staff to necessary competence level; Coordinating the compilation and reporting of all accidents, audits and HSE statistics to Management. Ensuring that seismic contractor HSE standards and TGPB Requirements are applied equally throughout the operation. Keeping fully appraised of ongoing HSE concerns in both the office and field environments. Ensures that incident investigations are thoroughly carried out and actions followed up, participate in severe incident investigations. Liaison with seismic contractor Project management and TGPB HSE for HSE issues. Follows all HSE guidelines and provides a good example for all employees to follow.
Project Employees Seismic Contractor and TGPB	Seismic Contractor & TGPB Compliance	Work in a manner without risk to themselves, others or the environment Comply with the project EMP Report all environmental incidents to the seismic contractor HSE Manager Report all environmental hazards to the seismic contractor HSE Manager Seek assistance if unsure of HSE rules Comply with all project rules Comply with seismic contractor project management safe working procedures as well as local and national legal regulations.

Position	General Responsibilities	Specific Site Responsibilities
		Maintain personal health & safety at work and avoid endangering others. Develop personal awareness of complying with health, safety and environment protection rules. Ensure familiarity with standard emergency instructions such as fire safety, first aid and the emergency response plan. Wear his PPE properly, refrain from interfering with or misusing HSE material or equipment.
ANP (Environmental Authority and Superior Environmental Authority)	ANP (Environmental Authority and Superior Environmental Authority)	Assess the Project Document submitted by TIMOR GAP Pualaca Block, Unip. Lda. Initial Survey to the Project site Classify the project category Create the Environmental Impact Assessment Committee to assess the SEIS and EMP documents Issue IEE license
Project Sub-contractors	Site Contractor Camp & HSE Compliance	The sub-contractor with Municipality leader assures the process of waste handling (solid and liquids) and provide an option of an alternative for dump site location option during the project term in respect with industry best practice. All national sub-contractors to provide fuel supply for vibroseis truck (diesel) and refueling other transportation. All national sub-contractors provide food supplies seismic camps.

Position	General Responsibilities	Specific Site Responsibilities
		All national sub-contractors provide heavy equipment bulldozer and trucks. All national sub-contractors provide car rental 4x4 Vehicles (Hilux Pick up & station wagon). Where the subcontractor's manager is not physically undertaking work on the project they shall nominate a representative who will be responsible for attending to his employee's issues raised at the tool box meetings and the day to day safety practices of their employees. All subcontractors shall be required to attend an induction with seismic contractor & TGPB Project Management to discuss the specific elements of the TGPB Safety Management System. Develop personal awareness of complying with health, safety and environment protection rules and project EMP. Report all environmental incidents to the seismic contractor HSE Manager Report all environmental hazards to the seismic contractor HSE Manager
Local Authority Municipalities (Manatuto, Manufahi and Viqueque)		Coordinate with TGPB to assist project proponent to get workers for the project. Coordinate with project proponent to advice the option of an alternative dump site locally may evolve as a second option during the project term and approved by the municipalities authorities. Fairly resolve the issues between community and project proponent Coordinate with project proponent for supporting, implementing and monitoring vibroseis seismic survey

Position	General Responsibilities	Specific Site Responsibilities
		and assist TGPB in terms of any correspondence and liaison with community.
Community Municipality (Manatuto, Manufahi and Viqueque)		Provide skills and effort to support vibroseis seismic survey by applying the job that publish from project proponent. Participate in public consultation, rising concern on environmental issues Identify cultural site and coordinate with local authority and project proponent conducting the cultural ceremony Create a friendly environment with migrant workers

CHAPTER 7 SUMMARY OF IMPACTS

7.1 Introduction

Statement (SEIS), and the Environmental Management (EMP) document. These preliminary impacts have since been refined after a thorough environmental review of the site baseline conditions (Chapter 6: Description of the Environment - SEIS Document)) that established the scale and magnitude of the impacts in Chapter 9 of SEIS Document. This Chapter only focus to summaries those impacts that mentioning in several Chapter of SEIS and will propose to provide the mitigation measures with aim to avoid, reduce or minimized the negative impact and provided compensation.

Impact is any change to the existing of the environmental condition caused by human activity or an external influence. The impact may be positive (beneficial) or negative (adverse), and also be direct or indirect, long-term, medium or short-term, and temporary or to be a permanent.

7.2 Scope of the Assessment

- The scope of this summaries covers all seismic survey lines which located in Viqueque, Manatuto, and Manufahi.
- The assessment will be based on identification impact that already mentioned in SEIS document include public consultation
- The major of impacts have described in SEIS document with various of levels and continue to summaries in this chapter so that will provide the appropriated mitigation measures where the contractor should be implemented.
- The mitigation measures incorporated in the Environmental Management Plan (EMP) for Project implementation.

7.3 Methodology and Approach

The methods used to summaries the impact of the project meets with the laws and legislation establish in Timor-Leste, as defined under Decree Law number 39/2022 of the Environmental

Licensing, Ministerial Diploma 46, in particular, Annex V Environmental Impact Assessment process template include meets with the Risk and opportunity Management TG-IMS-P-003-Rev-03 for exploration activities in onshore areas.

7.4 Types of Impacts and Definitions

An impact is any change to a resource or receipt or brought about by the presence of a project component or by the execution of a project-related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the project could affect the biophysical and socio-economic environment.

This section only to provide the following activity and summary of impact that possible affected to social and environment as well.

Table 7. Proposed project activities

Activities	Pre-Seismic	Seismic	Post Seismic
	Scope of work	Renting Base Camps	Project reporting
	Procurement	Mobilization	verification and acceptance
	Project planning documents	System check	Certification of conformance
	Project instruction	Seismic Operation - Data acquisition (Processing)	Report transfer
	Equipment calibration	Data Processing	Dismantling of camp facilities;
	Software validation and report	Documentation	Cleaning all facilities and equipment including disposal all wastes
	Pre-work surveillance	Data Review	Reconditioning, rehabilitation and replanting areas
	Scouting, Permitting, Surveying.	In process surveillance	Audit and sign off.

	Land Clearance		Project closeout
	Line Preparation		
	Recruitment		
	Training		

The environmental risk matrix used for the assessment was based on the likelihood of occurrence and the severity of the consequence as shown in table 8. Each of the seismic lines within the block was assessed using this matrix in order to rank all environmental risks associated with the proposed project. Fifteen potential environmental risks were identified and assessed along each line using this method.

Table 8. The environmental criteria, rating scales risk matrix

CRITERIA	RATING SCALES
Intensity (expected size or magnitude of impact)	**Negligible** **Low -** where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected **Medium -** where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected **High -** where natural, cultural or social functions and processes are altered to the extent that it will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected
Extent (predicted scale of impact)	**Site-specific** **Local** (immediate surrounding areas) **Regional** **National**

CRITERIA	RATING SCALES
Duration (predicted lifetime of impact)	**Short-term** - 0 to 5 years **Medium term** -6 to 15 years **Long term** - 16 to 30 years - where the impact will cease after the operational life of the activity either because of natural processes or by human intervention **Permanent** - where mitigation either by natural process or human intervention will not occur in such a way or in such a time span that the impact can be considered transient
Probability (likelihood of impact occurring)	**Improbable** – where the possibility of the impact materializing is very low **Probable** – where there is a good possibility (90% chance of occurring) **Highly probable** – where it is most likely (50-90% chance) that the impact will occur **Definite** – where the impact will occur regardless of any prevention measures (>90% chance of occurring)
Status of impact	**Positive** - a "benefit" **Negative** - a "cost" **Neutral**
Degree of confidence (specialist's level of confidence in predictions +/or information on which it is based)	**Low** **Medium** **High**

Assigning significance ratings

The application of all the above criteria to determine the significance of potential impacts uses a balanced combination of duration, extent and intensity, modified by probability, cumulative effects and confidence.

Significance is described as follows:

Low: Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given programme description. This would be allocated to impacts of any severity/magnitude, if at a local scale and of temporary duration.

Medium: Where the impact could have an influence on the environment, which will require modification of the programme design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short-term.

High: Where the impact could have a significant influence on the environment and, in the event of a negative impact the activity causing it, should not be permitted (i.e. there could be a „no-go" implication for the programme, regardless of any possible mitigation). This would be allocated to impacts of high magnitude, locally for longer than a month, and/or of high magnitude regionally and beyond.

The relationship between the significance ratings and decision-making can be broadly defined as follows:

Low: Will not have an influence on the decision to proceed with the proposed programme, provided that recommended measures to mitigate impacts are implemented;

Medium: Should not influence the decision to proceed with the proposed programme, provided that recommended measures to mitigate impacts are implemented; and

High: Would strongly influence the decision to proceed with the proposed programme.

The 17 environmental risks identified were:

1. Physiography and Geology	7. Terrestrial Environment (Habitats, Flora and Fauna)	13. Social Characteristics
2. Air Quality	8. Land Resources and National Parks	14.Economic Characteristics
3. Soils	9. Archaeological, Historical and Cultural Sites	15.Occupational Health and Safety
4. Air Quality	10. Visual Aesthetics	16.Security and Public Safety
5. Surface and Groundwater Resources	11. Noise and Vibrations	17. Camp Construction
6. Water Quality	12. Solid and Liquid Wastes	

Table 9. Existing environmental pressures and potential impacts of seismic survey on environmental and social factors in the project area.

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Physiography and Geology	Baseline (Pre-project)	1. Delta growth due to land use changes in the catchment 2. Reduced river flows 3. Increased sedimentation in lake	Medium	Regional	Permanent	Definite	Negative	High	
	Project Operations	4. Cut lines leave long-lasting residual impacts (tracks, and/or scarring on surface landscape) 5. Vibrators/bulldozers and dynamite use near steep slopes may lead to	Low	Site specific	Long-term	Highly probable	Negative	High	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
		minor landslips and rock topples							
Soils	Baseline (Pre-project)	6. Livestock and wildlife grazing and soil compaction 7. Wind and water erosion	Medium	Regional	Long-term	Highly probable	Negative	High	

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
	Project Operations	8. Compaction of soft sediments in water-logged areas along cut lines 9. Disturbance of soil along cut lines 10. Cut lines, may enhance gulleying and erosion (wind and water) 11. Rutting in loose soils 12. Contamination of soils	Medium	Site specific	Long-term	Highly probable	Negative	High	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Air quality	Baseline (Pre-project)	13. Dust generated by wind and enhanced by low vegetation cover 14. Offensive odours from point sources e.g. pit latrines and garbage dumps	Low Low	Regional Site specific	Short-term Short-term	Definite Probable	Neutral Negative	High High	
	Project Operations	15. Pollution from exhaust emissions 16. Fugitive Dust generation from traffic 17. Offensive odours 18. Health risks	Low Low	Local Site-specific	Short-term Short-term	Definite Probable	Neutral Negative	High High	Low Low

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Surface and groundwater	Baseline (Pre-project)	19. Freshwater shortage 20. Damming of rivers 21. Uneven distribution of resource 22. High demand for water resources	High	Regional	Permanent	Highly probable	Negative	Medium	
	Project Operations	23. Conflict with neighboring communities if water source is shared 24. Compaction of near-surface aquifers such as springs, reducing yield 25. Downward draining of	Negligible Medium	Site-specific to local Site-specific to local	Short-term Permanent	Probable Probable	Neutral Negative	Medium High	Medium High

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
		groundwater through drill holes, reducing yield at springs							
Water Quality	Baseline (Pre-project)	26. High sediment loads in rivers 27. Point-source pollution of springs and wells	Low	Site specific to local	Permanent	Probable	Negative	Medium	
	Project Operations	28. Contamination of water supply source for the camp 29. Contamination of underlying aquifers	Low	Site specific to local	Short-term	Probable	Negative	Medium	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Terrestrial environment	Baseline (Pre-project)	30. Land degradation from overgrazing 31. Desertification 32. Frequent fires 33. Few wildlife in unprotected areas	Low	Regional	Permanent	Probable	Negative	High	
	Project Operations	34. Cutting of vegetation along cut lines 35. Disturbance of wildlife (physical presence and noise) 36. Introduced weeds and pests	Medium Low Low	Local Local Local	Medium-term Short-term Permanent	Probable Probable Probable	Negative Negative Negative	Medium Medium Medium	Medium Medium High

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Land resources and natural heritage sites	Baseline (Pre-project)	37. Overgrazing	Medium	Regional/ Local	Long-term	Probable	Negative	Medium	
	Project Operations	38. Cut lines affect pastoral resources 39. Disturbance of animals in National Parks	Negligible Low	Site specific Local	Long-term Short-term	Improbable Probable	Neutral Negative	High Medium	High Medium
Archaeological , Historical and Cultural Sites	Baseline (Pre-project)	40. Water erosion	Low	Local	Long-term	Probable	Negative	Medium	

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
	Project Operations	41. Compaction by heavy vehicles and machinery may damage fossils/artifacts buried in shallow soils 42. Vibrations and drilling of shot holes may disturb/break up near surface archaeological materials	Low	Site specific	Permanent	Probable	Negative	Medium	High
Visual aesthetic	Baseline (Pre-project)	43. Land degradation	Low	Local	Long-term	Probable	Negative	Medium	

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
	Project Operations	44. Poor campsite design does not blend in with the environment 45. Cutline footprints and vegetation cover removal lower aesthetic value of landscape 46. Landscape scarring on rocky surfaces	Low Low	Local Site specific	Short-term Long-term	Probable Probable	Negative Negative	High Medium	Low Medium
Noise and vibrations	Baseline (Pre-project)	47. Noise from strong winds 48. Not excessive noise localised in small towns and centers	Low	Local	Permanent	Definite	Neutral	High	

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
	Project Operations	49. Disturbance to humans, animals and livestock 50. Disturbance to workers 51. Health risks	Low	Local	Short-term	Definite	Negative	High	Medium
Liquid and Solid Wastes	Baseline (Pre-project)	52. Poor liquid and solid waste management in major centres, e.g. Lodwar	Low	Local	Short-term	Probable	Negative	High	
	Project Operations	53. Pollution of surface soils, waters and ground waters 54. Offensive odours 55. Health risks	Low	Local	Short-term	Probable	Negative	Medium	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
Social Characteristics	Baseline (Pre-project)	56. Low education levels 57. Low literacy levels 58. Few health facilities (inadequate, understaffed and under-equipped)	High	Regional	Long-term	Definite	Negative	High	
	Project Operations	59. Possible increase in crime rate and prostitution 60. Possible increase in school drop out by individuals searching for jobs 61. Erosion of culture and social values as a result	Low	Local	Short-term	Probable	Negative	Medium	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
		of intermingling with workers 62. May interfere with grazing lands and watering points 63. Spread of communicable diseases 64. Inter-community conflict 65. Conflict between community and operation worker force							
Economic factors	Baseline (Pre-project)	66. Few job opportunities 67. Poor access to markets	High	Regional	Long-term	Definite	Negative	High	Medium

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
		68. Slow economic growth rate							
	Project Operations	69. Improved livelihood 70. Improved short-term business opportunities for the locals 71. CSR project benefits	Medium	Regional	Short-term Long-term	Probable	Positive	High	Medium
Occupational Health and Safety	Baseline (Pre-project)	72. Low occupational health and safety issues	Low	Local	Short-term	Probable	Negative	High	

Parameter assessed	Baseline or Project	Pressures/Impacts	Intensity	Extent	Duration	Probability	Status	Degree of confidence	Significance of Potential Impacts
	Project Operations	73. Injuries to workers, visitors and area residents arising from project operations 74. Fire hazard 75. Other health risks	Low	Site specific	Short-term	Probable	Negative	High	Low
Security and public safety	Baseline (Pre-project)	76. Frequent cattle rustling 77. Illegal guns 78. Resource conflicts	High	Regional	Long-term	Highly probable	Negative	High	
	Project Operations	79. Improvement in security due to security enhancement for project activities	High	Local	Short-term	Probable	Positive	Medium	High

Table 10. Summarized the environmental aspects and potential impacts for the seismic acquisition

No	Parameter	Aspects	Potential Impact
1	Physiography and Geology	Vibroseis and associated equipment Bulldozer Dynamite shots	Cut lines leave long-lasting residual impacts (tracks, and/or scarring on surface landscapes) Vibrators/bulldozers and dynamite use near steep slopes may lead to minor landslips and rock topples
2	Soils	• Vibroseis and associated equipment • Bulldozer • Transport Vehicles • Oil or chemical leaks from vehicles and machinery, garage and storage areas	Compaction of soft sediments in waterlogged areas along cut lines Disturbance of soil along cut lines Cut lines may enhance gullying and erosion (wind and water) Rutting in loose soils Contamination of soils
3	Air Quality	• Vehicles and machinery • Sanitary systems • Waste disposal points	Pollution from exhaust emissions Fugitive dust generation from traffic Offensive odors Health risks
4	Surface and Groundwater Resources	• Water supply source for the camp • Heavy vehicles and machinery • Drilling of shot holes	Conflict with neighboring communities if water source is shared Compaction of near-surface aquifers such as springs, reducing yield

No	Parameter	Aspects	Potential Impact
			Downward draining of groundwater through drill holes, reducing yield at springs
5	Water Quality	• Liquid effluent discharges from sanitation systems at the campsite • Oil or chemical leaks from garage and storage areas, vehicles and machinery Subsurface detonation of dynamite charges	Contamination of water supply source for the camp Contamination of underlying aquifers
6	Terrestrial Environment (Habitats, Flora and Fauna)	• Vibroseis and associated equipment • Mulchers • Bulldozer • Transport vehicles	Cutting of vegetation along cut lines Disturbance of wildlife (physical presence and noise) Introduced weeds and pests
7	Land Resources and National Parks	• Vibroseis, mulchers and associated equipment • Dynamite shots • Vehicles Presence of humans	Disturbance of animals in National Parks
8	Archaeological, Historical and Cultural Sites	• Vibroseis and associated equipment • Vehicles • Dynamite shots	Compaction by heavy vehicles and machinery may damage fossils/artifacts buried in shallow soils Vibrations and drilling of shot holes may disturb/break up near-surface archaeological materials

No	Parameter	Aspects	Potential Impact
9	Visual Aesthetics	• Campsite design • Cut lines	Poor campsite design does not blend in with the environment Cutline footprints and vegetation cover removal lower aesthetic value of landscape
10	Noise and Vibrations	• Vibroseis and associated equipment • Dynamite charges and associated equipment Vehicles traversing the area	Disturbance to humans, animals and livestock Disturbance to workers Health risks
11	Solid and Liquid Wastes	• Campsite • Workplaces in the field	Pollution of surface soils, waters and ground waters Offensive odors Health risks
12	Social Characteristics	• Workforce influx • Activities along the seismic survey lines	• Possible increase in crime rate and prostitution • Possible increase in school drop out by individuals searching for jobs • Erosion of culture and social values as a result of intermingling with workers • May interfere with grazing lands and watering points
13	Economic Characteristics	• Employment opportunities • Tenders and supplies • Possibility of a successful exploration programme	• Improved livelihood • Improved short-term business opportunities for the locals • CSR project benefits • Social friction caused by sudden financial imbalances caused by introduction of cash via local workforce into local populace

No	Parameter	Aspects	Potential Impact
			• Long term economic benefits to local and national economy should the exploration programme be successful
14	Occupational Health and Safety	• Campsite and fieldwork environment	• Injuries to workers, visitors and area residents arising from project operations • Fire hazard • Other health risks
15	Security and Public Safety	• Workforce security needs	• Improvement in security due to security enhancement for project activities

CHAPTER 8 PROPOSED MITIGATION MEASURES

8.1 Introduction

This section will describe the appropriate mitigation measures with objective to avoid, reduce/mitigate or compensate the impacts were identified in the SEIS and the summary of impact which is mentioning in Chapter 7 of the EMP document. The mitigation measures listed in this EMP document will be implemented starting Pre-Seismic Survey, Seismic Survey, and Decommissioning).

The following information of the mitigation measures proposed for the project activities.

8.2 Physiography and Geology

The risk of subsidence due to passage of heavy vehicles is negligible due to the geology, but localized compaction of surface soils may occur in some places. There are few existing roads in the area and the hilly regions of the project area will pose a challenge in access and crossing over.

Mitigation:

- Use existing access roads to the extent possible;
- Pre-survey possible access routes, and use the selected routes rather than accessing work sites through free-ranging driving across the open country
- Explosives (dynamite) should be used as source instead of vibroseis in areas with highly dissected and incised surfaces
- When laying cut lines, use will be made of existing roads and tracks to avoid creating unnecessary tracks and trampling of pasture;
- Minimize, to the extent possible, the use of bulldozers to open up cut lines and access roads to minimize landscape scarring; Avoid cut lines on slopes steeper than 40º to minimize risk of landslips and rock topples;
- Optimize source energy to achieve the survey objectives to minimize risk of landslips and rock topples;
- Buffer zones of 50m should be maintained from areas posing landslip and topple hazards.

The potential residual impacts would be related to landscape scarring, and displaced sediments and boulders that may arise from landslips and rock topples related to use of the vibroseis and dynamite shots.

8.3 Soils

There are several different types of soils in the project area, each with its own peculiar geological, textural and weathering/erosion-driven properties, as well as anthropogenic footprints such as compaction by grazing animals, that are relevant to a number of issues that would need to be considered when executing the project. These issues include: ecosystem services e.g. the role of soil in support of vegetation and higher food chain members; erosion and ponding potential, as well as surface runoff and their resultant geomorphological features; rock weathering, transportation and deposition of soil-derived particulates; organic matter content, surface sealing and capping; agricultural potential.

Mitigation:

- Machinery and equipment should use existing routes as much as is practicable to avoid compaction of the surface soil
- Construct drainage channels on cut lines where natural drainage may be affected;
- Vehicles should steer away from natural drains and waterways wherever practicable, but a buffer zone of 20m should be maintained except at crossing points;
- Minimize vegetation and grassland clearance as much as possible when cutting the survey line transects
- Seismic survey should aim to be carried out as far as possible during the dry seasons;
- Use only essential vehicles and low pressure/low impact tires in areas with wet soils or that are susceptible to ponding or are prone to erosion;
- Ensure that all vehicles and machinery operating in the field and in the campsite are properly maintained so as not to have oil leaks that could contaminate the soils \
- Ensure that any in-field refueling or maintenance is performed while using a drip tray with a spill-kit available;

- All fuels and other non-aqueous fluids to be stored in suitable bunded enclosures;
- Ensure that all drivers and technicians are familiar with drip-tray and spill-kit use through daily tool-box talks; and
- Installation and proper management of camp sanitation facilities.

The potential residual impacts would be enhanced gulleying and erosion due to altered runoff and drainage patterns at local scales, necessitating the implementation of mitigation measures to eliminate any long-term negative impact.

8.4 Air Quality

Air quality variations are mainly related to changes in wind speed in the area are still normal, especially in some sparsely vegetated and dry places, and the associated particulate dust carried from one place to another. This wind can generate dust but in small quantities.

Dust raised by construction activities (e.g. preparation of seismic cut lines, and building of the base camp and access ways) as well as that raised by moving vehicles and equipment, will likely contribute to transient airborne dust. Further, the disturbed surface with fine textured soils as a result of site clearance for seismic survey transects would be susceptible to wind erosion. On a micro-scale, air quality may also be affected by exhaust emissions from vehicles and machinery, but this is also of a transient and insignificant nature. Sources of offensive but localised odours would include exhaust emissions from vehicles and other equipment, as well as poorly managed waste disposal and sanitary facilities at the camp site.

Mitigation:

- Limit traffic speed and restrict movement of vehicles as is reasonable to minimize dust generation;
- Field vehicles, trucks and any other machinery should be switched off when not in use;
- Regular servicing of all trucks, service vehicles, and any other machinery powered using fossil fuels to ensure efficient combustion and minimization of exhaust emissions
- Use low sulphur fuels if available and where suitable;
- Employees working in dusty conditions must use appropriate PPE;

- If litter is to be burned, it should be done at a time of low wind movement, and preferably in areas shielded from wind by vegetation;
- Installation and proper management of camp sanitation facilities.

There shall not be any residual impacts to air quality.

8.5 Surface and Ground Water Resources

The project area, being rural and undeveloped, lacks a main, quality assured, water supply network. Water is sourced from shallow wells, shallow to deep boreholes, springs, rivers and lakes. Its patchy distribution, and the low, erratic and unpredictable rainfall, means that water is generally scarce in most of the area. This scarcity has led to human-human and human-wildlife conflicts. The seismic crew will also need to access safe potable water. Effluents generated at the campsite(s) will also need to be managed so as not to contaminate any underlying shallow, unconfined aquifers or rivers and streams

Mitigation:

- A water supply borehole should be drilled to provide the water required for the project; this could be donated to the community on completion of the seismic survey;
- It is recommended that an efficient water-use policy be adopted by the project proponent at the camp site and other work areas
- An efficient sanitation system should be put in place in the campsite(s) to handle effluents
- Hazardous and toxic waste material should be managed according to international protocols and best practices
- Buffer zone distances between seismic lines and water sources will be established through extensive in-field ground vibration testing.
- Ensure that any in-field refueling, or maintenance is performed while using a drip tray with a spill-kit available;
- Ensure that all drivers and technicians are familiar with drip-tray and spill-kit use through daily tool-box talks

Residual impacts on surface and groundwater resources are not expected if the mitigations outlined above are effected.

8.6 Water Quality

Liquid effluent discharges and oil or chemical leaks at the campsite, if not properly managed, can potentially lead to pollution of an underlying shallow groundwater source. Along the cut lines, subsurface detonation of charges could leave localized small residuals of gases and solids (e.g. water/stream, carbon-dioxide gas, nitrogen gas, calcium carbonate solid, and sodium carbonate gas). The shot-hole method could also lead to clouding of spring waters for up to several weeks. Oil leaks from vehicles operating in the field and parked at the campsite can also potentially pollute underlying groundwater.

Mitigation:

- Refueling areas must be underlain with spill-proof hard standing or bund, with spill kits readily available and operatives trained in their use;
- All fuels and other non-aqueous fluids to be stored in suitable bunded enclosures;
- All refuelling operations to be carefully overseen and managed;
- Pits for disposal of domestic and sanitary effluents should be sited with knowledge of the geological and soil characteristics of the area;
- Buffer zone distances between seismic lines and water sources will be established through extensive in-field ground vibration testing.
- Spill kits to be carried with vibe truck service vehicle, refueling bowser vehicles, drill crews.
- All staff to be briefed on use of these; When water is encountered during shot hole drilling, betonies or a tapered concrete plug may be used to plug the hole up to 3m above the static water level or to a depth of 1m from the ground surface;
- Ensure that all vehicles and machinery operating in the field (and in the campsite) are properly maintained so as not to have any oil leaks that could contaminate the soils
- Ensure that any in-field refueling or maintenance is performed in a bunded area or while using a drip tray with a spill-kit available;

- Ensure that all drivers and technicians are familiar with drip-tray and spill-kit use through daily tool-box talks.

Residual impacts on water quality are not expected if the mitigations outlined above are effected

8.7 Terrestrial Environment (Habitats, Flora and Fauna)

The region, there is several vegetated, with a number of varied habitats and some protected areas that are, as a result of their harsh climatic setting (high temperatures and low rainfall), sensitive to disturbance. These habitats do, however, exhibit a good capacity for regeneration. Domesticated animals are numerous in the area, while wildlife (and birdlife) is found primarily on the eastern. With repeated vehicle passage and vibrator-pad compaction as would occur in this project, some damage would occur to the vegetation. The small-scale and spatial arrangement of the project operations is such that habitat is not likely to become fragmented or isolated from other areas of habitat. The vibroseis vehicles may destroy bird nests found on the ground and in low growing shrubs and trees, and the disturbance may cause some birds to abandon their nests. Burrows that serve as refuge for reptiles, amphibians, and small mammals may be compacted by the vehicles or the vibrating plate. While the seismic activities may result in some wildlife moving out of the area, the low percentage of land disturbed would affect only a small percentage of the population and their suitable habitat. The shot hole method would have little impact on the wildlife, except those individuals found within the immediate vicinity of the shot holes. Given the small percentage of land impacted (cut lines and access roads), the short duration of the project (three months maximum), its rolling-over nature (i.e. spending only a few hours at each survey locality), resulting in only localized and limited impact, any threats to endangered wildlife species are considered insignificant.

Mitigation:

- The mitigations related to soils (see above) apply;
- Trees with trunk diameter greater than 20cm should not be cut;
- Seismic survey activities to be undertaken during daylight hours only;

- Liaise with the forestry team at municipalities to ensure that wildlife disturbance and danger to the seismic team is mitigated. Any planned lines that are considered to be a threat will be relocated;
- Hunting, trapping and gathering of food resources by workers, when on and off duty should be strictly prohibited. All workers to be briefed regularly on this issue;
- The risk of introduction of weed and pests species to the region via contaminated vehicles and equipment will be mitigated by the wash-down of all vehicles and ancillary equipment at a designated location prior to the commencement of the survey.

The residual impact will be reduced vegetation cover along track lines; this will, however, regenerate in a few years. Given the small scale of the project, combined with implementation of the suggested mitigation measures, this impact is not considered significant.

8.8 Land Resources and National Parks

Plantations and rice fields are the main land resources in the area and support the local people's lifestyle, while fisheries are located a little further from the project site and there are no national parks.

Mitigation:

See the (Terrestrial Environment) above.

8.9 Archaeological, Historical and Cultural Sites

The project area has no known archaeological sites while cultural, sacral and historical sites are found in project location and residential neighborhoods. Impacts to such sites can occur because of vehicles driving over the surface, compression from the Vibroseis pad on the surface, vibrations resulting from the Vibroseis testing or dynamite charges in shot holes, and the drilling of shot holes. Vibrating pads would only compress the soils up to a few inches, so cultural, sacral and historical site not will be impact.

Mitigation:

- Consultations with the Secretary of State for Art, and Culture, local authority, Lia Nain, Veteranu to take place in the design and execution of the seismic survey in historical, sacred important areas;
- Close liaison should be maintained with stakeholders such as the Local Authorities, Lia Nain, local communities and veterans as they are custodians of some of the ancient, historical, sacral, cultural sites within the project area. Lines should be relocated if necessary after consultation with stakeholders;
- Use of shot points rather than vibration is recommended for such areas;
- Seismic survey lines will not be planned to go through Historical and cultural sites
- Consultations should be undertaken with local elders to help in identifying and avoiding any sensitive cultural sites during the survey in order to prevent conflict with the.

No residual impacts are expected if the mitigations outlined above are affected.

8.10 Visual Aesthetics

It is anticipated that there will be some minor impacts on the aesthetics of the pristine environment. Dust generated by wind erosion is not expected to affect air visibility in the project area due to the limited duration and extent of the activities.

Mitigation:

- Use of modern line cutting technology, preferably mulchers for clearing of the geophysical survey transects will ensure that minimal vegetation is removed, hence ensuring that re-vegetation will occur in a much shorter period since the rootstock, and seeds will be left along the traverses, and this will promote faster re-growth Campsite design should take into consideration the aesthetics of the selected area.

8.11 Noise and Vibrations

The use of heavy road construction equipment, vibroseis acoustic energy sources, dynamite charging, and power augers for shallow drilling are potential sources of environmental pollution in the form of noise generation and vibrations during the onshore survey that may affect the survey

crew, neighboring communities and their livestock, and wildlife. The base camp site can also be a source of noise pollution especially if generators are used for electricity generation.

Some noise sensitive areas (e.g. National Park, nesting sites along the shorelines, schools, hospitals and residences) are found in the project area. However, no significant impact is anticipated due to the localized and temporal nature of this project and its expected noise levels. The length of time the seismic crew spends in any one location is short, with up to 10 km per day of acquisition possible in good weather conditions. This will reduce the overall noise impacts on localized residential receptors to less than one day of actual disturbance

Mitigation:

- To reduce the expected transient impacts on wildlife, noise levels will need to be minimized to the extent possible, correct strength of dynamite charging and vibroseis use applied to achieve the survey objectives, and human contact with wildlife should also be minimized in line with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution (Control) Regulations, and the Wildlife Conservation and Management Act;
- All seismic operations should be carried out only during daylight hours;
- Ensure that vibroseis and other vehicles have working silencers to muffle noise;
- Provide full personal protective gear to workers as appropriate (e.g. helmets and ear muffs/plugs) and as specified in the Occupational Safety and Health Act;
- Workers should be sensitized on hazards likely to be encountered in such a work environment, and trained accordingly;
- Buffer zones distances between receptors and seismic sources/vehicles will be established through extensive in-field ground vibration and noise testing. Distances may vary between seismic source types, as per IAGC Guidelines. Liaison will be maintained with the relevant Kenyan government authority in deciding these distances;

- Engage local leaders in sensitizing the communities in the vicinity of the seismic operation areas about the project and its possible noise and vibration impacts;
- The communities should be informed in advance when a seismic survey operation is to be executed along a given seismic transect/location;
- Use generators with minimal noise production at camp sites and effect a noise mitigation policy for all operations in accordance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations

No residual impacts are expected if the mitigations outlined above are enforced.

8.12 Solid and Liquid Waste

As a result of the proposed project, it is expected that waste will be generated by the survey crew e.g. cans, wrappings, paper, plastics. Plastic waste is of particular concern especially if ingested by livestock, and for its environmental pollution effect. Waste oils and petroleum used in vehicles and exploration machinery may spill or leak on/into the ground, hence polluting the soil or water system within the project area. This may degrade water quality and affect livestock and domestic water users in the project area.

Mitigation:

- Waste materials (at the camp and in the field working areas) should be segregated into non-hazardous and hazardous waste, and consideration given to re-use, recycling, or disposal as appropriate;
- A waste management plan documenting the waste strategy, storage (including facilities and locations), handling procedures and means of disposal should be developed and should include a clear waste-tracking mechanism to track waste consignments from the originating location to the final waste treatment and disposal location in compliance with the Environmental Management and Coordination (Waste Management) Regulations;

- Hygienic sanitation and disposal of grey and black water will be covered in the waste management plan in order to protect the general health of the workers and the general public;
- Fuel and other non-aqueous liquid storage areas should be bunded;
- Servicing of equipment should be carried out in a designated garage area which has regularly maintained oil drainage traps and readily available spill kits. Workers in this area will be regularly briefed on spill prevention.

8.13 Social Characteristics

The local communities are conservative with respect to their culture. Due to the influx of people into the area, adherence to these cultures may be compromised. Owing to poverty levels in the area, school drop-out rates may also increase.

Mitigation:

- Employ Community Liaison Officers to keep communities informed prior to project mobilization and on an ongoing, continual basis to ensure sensitization of the community and stakeholders vis a vis the project objectives, activities and scheduling, potential impacts;
- The communities should be informed well in advance of the start of the seismic survey operation and prior to execution along a specific seismic transect/location using appropriate wide-penetration communication media;
- Awareness campaigns can be undertaken to inform/educate both the local communities and project employees;
- During the seismic operations, disruption of livelihood activities in the area should be avoided where possible otherwise minimized.
- Provision to be made to compensate local property and landowners for any loss or damage caused by seismic operations. Compensation rates to be agreed with Government dept before operations commence.

8.14 Economic Characteristics

The infrastructure, especially roads within the project area is poor; hence some cut lines may be useful to the local communities as access roads after seismic survey completion. The proposed project will offer limited, short-term, unskilled and semi-skilled employment opportunities to the locals. This may result in an influx of people from other areas, and could lead to recruitment-related conflicts if not properly handled.

Mitigation:

- Liaise with local community leaders during the recruitment process;
- Employment policies to be strategically managed to avoid inter-community conflict and similar problems caused by migrant labourers;
- Unskilled and semi-skilled manpower to be sourced locally as far as possible;
- Gender should be factored into the employment criteria;
- Sustained public awareness and sensitization about the proposed project should be continued throughout the project lifespan.

The residual impacts in this instance would mostly be positive, including short-term employment opportunities and infrastructure improvements if access roads are designed in such a manner that they would be useful to the community's post-project. Due to strong inter-tribal rivalries, great care will have to be taken to prevent conflict during hiring of local labour.

8.15 Occupational Health and Safety

During the seismic survey, the workers, visitors and the local community may be exposed to occupational and health hazards not normally encountered during day-to-day life or activity in the area. Accidents between vehicles or vehicles and humans or wildlife may occur. Workers could also be exposed to other risks in the field, such as landslips, rock falls, fires, and attacks from criminal elements.

On implementation of mitigations, no residual impacts are expected in this case.

Mitigation:

- All operations will be conducted in compliance with TGPB EHS, international best practices and Kenya Government requirements (as set out in the Occupational Health and Safety Act and the Public Health Act;
- Appropriate and well-stocked first aid kits and firefighting equipment should be available to all crew, and specific crew members should be trained on first aid administration and handling of firefighting equipment
- Job-specific personal protective equipment to be provided to the workers, training should be given, and their use made mandatory in designated areas
- Environmental safety and health regulations and policies/plans must be adhered to
- A Base Camp Clinic is to be provided, manned by suitably qualified field medical staff, licensed as appropriate to operate in-country, equipped with equipment and medication as appropriate, including ambulance vehicle(s);
- Adequate warning or cautionary signage will be posted as required;
- All electrical equipment shall be properly installed earthed and regularly inspected
- Only properly trained and authorized employees shall operate equipment or machinery.

8.16 Security and Public Safety

Security is a major concern, especially for people living in Manufahi dan Viqueque area, due to recurrent conflicts involving the individual, group, organization. During the project course, security issues may escalate due to free movement of people. The increase in human activity, including vehicle and seismic exploration activity, could increase the potential for human-related conflicts, including ignition of wildfires.

Mitigation:

- Ensure that all workers can be identified by staff uniform and badges where applicable;
- Adequate security measures should be provided, e.g. perimeter fencing, safe havens and security manning at the campsites
- The TGPB should liaise with the Provincial Administration, Local Authority, the Police (PNTL), Military force (FDTL) and other agencies to provide adequate security during the seismic survey operation;
- Barriers and guards will be installed as necessary to protect employees and visitors from physical hazards and criminal activity;
- Camp population will be forbidden from interacting with local populace;
- Journey management policy and monitoring to be enforced. A positive residual impact is the possibility that the involvement of government agencies during the project operations may enhance long term security initiatives from the concerned parties, hence improving the security situation in the area.

8.17 Construction of the Campsite

Contractors' staff will reside in a base camp. Minimal vegetation clearance is expected to give room to the camp construction. The camp will be located away from residential areas and trading centres. The camp will be constructed by a professional civil and building contractor with experience in setting up such camps. Issues such as sanitation, camp security, water provision and wastewater management, accommodation, material storage and parking lot among others shall be incorporated in the camp design.

Mitigation:

- Construction of the campsite shall be undertaken during daylight hours only;

- Mitigations in sections (Physiography and Geology), (Soils), (Surface and Groundwater) and (Terrestrial Environment), (Noise and Vibrations) (Occupational Health and Safety) and (Security and Public Safety) apply;
- Excavated soil should be used in landscape design of the campsite rather than stockpiling;
- Use of T-card system or similar for access control within the campsite shall be enforced
- Campsite will be erected by a qualified and licensed civil and building contractor with workers who are qualified to carry out assigned tasks;
- Use of appropriate Personal Protective Equipment to be enforced
- Adequate temporary housing and sanitation facilities shall be provided for the construction workers;
- Construction equipment and vehicles shall be well-maintained, checked and promptly repaired to ensure no spillage of oils and fuels and to minimize gaseous emissions;
- Company employees shall comply both with the relevant national legislation, and its own in-house environmental health and safety (EHS) policies; and,
- Adequate warning signs and fire extinguishing equipment will be visibly and appropriately posted.

CHAPTER 9 GOVERNING PARAMETERS

9.1 Introduction

TIMORGAP Pualaca Block, preference is to adopt and follow all applicable laws and onshore petroleum law, standards and regulations in order to ensure that the environmental impacts for the Pualaca Block are controlled and manageable. However, the application of parameters to use for the project needs to be considered because stock availability is very limited in this country.

The following environmental standards limits are utilized accordingly.

Table 11. WHO Air Quality Guidelines 2005

Table 11. WHO acceptable limits value for classical parameters

Parameter	Averaging Period	**Guideline Value ($\mu g/m^3$)**
Sulphur Dioxide (SO_2)	24-hour	20
	10 minutes	500
Nitrogen Dioxide (NO_2)	1-year	40
	1-hour	200
Particulate Matter PM_{10}	1-year	20
	24-hour	50
Particulate Matter $PM_{2.5}$	1-year	10
	24-hour	25
Ozone	8-hour	100

Table 12. WHO Drinking Water Quality Guidelines

Parameters	Unit	WHO/Timor-Leste Guidelines
Physical Test		
pH value	pH meter	6.5 - 8.5
E. Conductivity	us/cm	100 us - 1 ms
TSS	mg/L	
TDS	mg/L	1,000
Salinity	%	
Temperature	°C	
Turbidity	NTU	5 (NTU)
Chemical Test		
NH_3-N	mg/L	1.5
NO_3-N	mg/L	50
NO_2-N	mg/L	3
Iron (Fe)	mg/L	0.3
Manganese (Mn)	mg/L	0.5
Fluoride	mg/L	1.5
Chloride (Cl-)	mg/L	250
Free Chlorine	mg/L	0.5
Ca Hardness	mg/L	2.5
Hardness	mg/L	
Total Hardness	mg/L	200
Total Alkalinity	mg/L	
Sulphate (SO_42)	mg/L	250
Arsenic		0.1
Bacterial Test		

Parameters	Unit	WHO/Timor-Leste Guidelines
Total Coliform	CFU/100ml	0
E.Coli	CFU/100ml	0

A commitment is made to conduct monthly monitoring of noise against WHO Noise standards, see Table 13.

Note:

* Source: https://www.who.int/docstore/peh/noise/ComnoiseExec.htm #1: As low as possible. #2: Peak sound pressure (not LAF, max) measured 100 mm from the ear. #3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low. #4: Under headphones, adapted to free-field values.

Table 13. WHO Noise Limited Guidelines

SPECIFIC ENVIRONMENT	CRITICAL HEALTH EFFECT(S)	L_{Aeq} [dB(A)]	TIME BASE [HOURS]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors Inside bedrooms	Speech intelligibility & moderate annoyance, daytime & evening	35	16	-
	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	During Class	-
Pre-school bedrooms, indoors	Sleep disturbance	30	Sleeping Time	45

SPECIFIC ENVIRONMENT	CRITICAL HEALTH EFFECT(S)	L_{Aeq} [dB(A)]	TIME BASE [HOURS]	L_{Amax} fast [dB]
School, playground outdoor	Annoyance (external source)	55	During Play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time Sleep disturbance, daytime and evenings	30 30	8 16	40 -
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/ earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	-	-	140 #2 120 #2
Outdoors in parkland and conservations areas	Disruption of tranquility	#3		

Note:

* Source: https://www.who.int/docstore/peh/noise/ComnoiseExec.htm #1: As low as possible. #2: Peak sound pressure (not LAF, max) measured 100 mm from the ear. #3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low. #4: Under headphones, adapted to free-field values.

CHAPTER 10 MONITORING PROGRAM

To identify possible changes in the environment and follow up the effectiveness of the adopted environmental, social management measures and project progress, in the EMP was recommended the implementation of several monitoring activities for the environmental components which mentioned in table below:

Table 14. Project Monitoring Activities

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
Water Quality	• Physical parameter • Chemical parameter • Biological Parameter	• Physical water parameter such as Electrical conductivity, salinity, total dissolved solids, turbidity, temperature, color, and taste and odor. • Chemical water parameters such as pH, acidity, alkalinity, hardness, chlorine, and dissolved oxygen. • Biological water parameter such as bacteria, algae, nutrients, and viruses.	Site and Radios of Impact	Quarterly	Contractor & Heath, Safety, Environmental Officer

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
Air Quality	• Particulate matter ($PM_{2.5}$ & PM_{10}) • Carbon monoxide (CO), Ozone (O_3), • Nitrogen dioxide (NO_2), • Sulfur dioxide (SO_2)	• Population Air Quality Indicator • The Individual Air Quality Indicator.	Site and Radios of Impact	Daily	Contractor & Heath, Safety, Environmental Officer
Noise	Sound level meter	• Location of noise source • Location of noise source measurement • Location of noise receptor • Location of noise sample measurement at the receptor. • Topography between noise source and receptor	Site and Radios of Impact	Daily	Contractor & Heath, Safety, Environmental Officer
Traffic		• Adherence to Traffic Management Procedure: Accident and Incident Reports • Journey Management: Driver hours per day. Traffic routes	Site and Radios of Impact	Daily	Contractor & Heath, Safety, Environmental Officer

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
		• Speed Monitoring: Vehicle speed • Engine and generator service records: Vehicle maintenance records • Driver training: Driver licenses, Defensive driving Induction records			
Leaks and Spills		• Regular checking and cleaning of oil, fuel and waste spills • Inspection of perimeter drain and road culverts			Contractor & Heath, Safety, Environmental Officer
HSE – PPE for All Workers		• Introduce the all equipment • PPE check list • Training program	Site	Daily – weekly	
Land Use		• Grievance/ Complaints records: • Number of specific information notices and records of distribution to community. • Number of complaints and grievances received.	Site and radius of impact	Daily	Timor Gap, Contractor & Heath, Safety, Environmental Officer

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
Community Health		• Grievance/ Complaints records • Local Recruitment Program • New recruit Training and Induction • Local Community Education and Awareness Program	Radius of Impact	Monthly	Contractor & Heath, Safety, Environmental Officer
Solid and Liquid Waste		• Camp and warehouse wastes recorded, manifested, tracked • All wastes: Monthly Summary report • Inspection of sewage system	Site	Daily	Contractor & Heath, Safety, Environmental Officer
Tourism		• Communicate and Coordinate with local authorities, 'Lia-nain', Veteranus and communities • Grievance/ Complaints records	Site and Radios of Impact	Every Week	Contractor & Heath, Safety, Environmental Officer
Use of forest and other natural resources		• Grievance/ Complaints records	Radius of Impact	Quarterly	Contractor & Heath, Safety, Environmental Officer
Agriculture		• Grievance/ Complaints records	Radius of Impact	First Phase	Contractor &

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
					Heath, Safety, Environmental Officer
Cultural heritage, archaeological and scared sites		• Grievance/ Complaints records	Site and Radios of Impact	Monthly	Contractor & Heath, Safety, Environmental Officer
Land ownership and rights		• Grievance/ Complaints records	Site	First Phase	Contractor & Heath, Safety, Environmental Officer
Natural Resources rights		• Grievance/ Complaints records	Site	Monthly	Contractor & Heath, Safety, Environmental Officer
Unique Landscape		• Communicate and Coordinate with local authorities, Lia-nain, Veterans and communities • Grievance/ Complaints records	Radios of Impact	First Phase	Contractor & Heath, Safety, Environmental Officer

Environmental, Social Components & Project Progress	Specific Parameters	Indicator Principal	Sampling Location	Frequency	Responsibility
Project Progress		• Directly monitoring, • Contactor report	Site	Monthly	TGPB, Contractor & Heath, Safety, Environmental Officer

CHAPTER 11 REPORTING REQUIREMENTS

11.1 Introduction

During the project implementation phase, environmental reporting is an important tool to collect and record or documenting all progress and issued that arise during life time of the project activities. To find out those things, the Project Proponent Team will responsible to conduct the daily monitoring and recording closely the environmental mitigation measures are completely implemented to address the environmental impacts cause by the project activities.

In order to complete the reports requested by the section 11 of the EMP document, the project proponent and contractor have identified two types of reports that were very important to complete in this section itself. The following are two types of the reporting:

- Internal used: The reporting on environmental monitoring and site inspection for internal use in order to provide the feedback to the holder, contractor, environmental management team
- External used: The reporting on environmental monitoring and site inspection for external use to the National Authority for Petroleum and relevant institution for their information.

11.2 Project Phases

In all of project phases, the reported for the internal use will be cover all activities in all aspects such as planning, design, finance, employment, social, economic including environmental aspects or conducted the general control to the project activities and for the external used only cover the specific aspects such as health, safety, environment and social

- Internal and External Environmental Monitoring and Inspection for the all phases will cover the activities such as: Social issued likely communities and household affected, public facilities and infrastructure existing, Personal Protection Equipment that used by the workers, noise and water qualities, dust, Land acquisition process and presence of the construction workers.

- Incident, accident and emergency reporting will focus on the wounds, swelling and illness of the workers in the site of project, the proponent and contractor will communicated and transfer to the National hospital HNGV, Public health center (Centro Saude) and private Clinic in Dili
- Measuring performance indicators and interpreting and acting on the indicators, the proponent and contractor will provide the appropriate check list in order to facilities the identification, analysis and take actions in the reporting.
- Training programs will focus on the health, safety and environment, social training and driver training.

Internal monitoring and inspection will be carried out accordingly to control the general project activities. The daily monitoring will be recorded and will be used as the base information on compiling the Six-Monthly Environmental Report during the seismic survey activities as a required by the Decree law No. 39/2022 of Environmental License.

The Environmental Reports shall be submitted to ANP and relevant institution as the Government authority responsible for surveillance during the project implementation. Regulatory Authority may request for additional information to be reported for the purpose of monitoring of the Environmental requirements.

CHAPTER 12 RESPONSIBILITIES FOR MITIGATION & MONITORING

TIMORGAP Pualaca Block and contractor team will be responsible for supervising all environmental monitoring are identified in this Simplified Environmental Impact Assessment (SEIS). Therefore, the team will ensure all requirements under this EMP will be properly implemented and seeking for ongoing improvement in the future.

Details of the technical implementations will be under HSE Officers who are responsible for the HSE reports, training and other HSE related initiative programs. The HSE Department will ensure implementing the HSE Management System and providing necessary training or HSE awareness to all workers with full support from the management.

The ANP with relevant institutions based on their mandate under the law as the government regulatory are also have the right and responsibility to monitor and audit the project implementation activities in order to ensure it is in line with the legal requirements.

Table 15. Environmental Mitigation and Monitoring Responsibility.

Relevant Institution	Responsibility
TIMORGAP Pualaca Block, Unip. Lda	• Obtain necessary environmental license(s) from ANP • Ensure that the contractor carries out the stipulated work to protect the environment and/or any later amendments to the EMP due to a change in the design plans that may arise from time to time. This clause has to be incorporated into the contract documents.
Project Manager	• Conduct regular meetings (e.g. safety toolbox meetings) with the Main Contractor and Health, Safety and Environmental Manager to discuss day to day environmental issues related to the project • Ensure that the project complies with the environmental license and all other stipulated legal requirements and guidelines. • The Project Manager will also be the main person in charge of operation during emergency situations

Relevant Institution	Responsibility
	• Ensure that all workers, site agents, including site supervisors and management participate in Health and Safety training sessions. • Maintain a record of training and conduct of awareness sessions for staff to ensure compliance with Environmental Management Plan and conditions in the Environmental License. • Ensure compliance with environmental statutory and regulation of the Government of Timor-Leste. • Based on the results of the EMP monitoring, implement environmental corrective actions and corrective action plans, as necessary. • Respond promptly and efficiently to requests and instructions from ANP for environmental corrective actions and corrective actions and implement additional environmental mitigation measures, as necessary. • Provide sufficient funding and human resources for proper and timely implementation of required mitigation measures in the EMP
Contractor	• Prepare and implementing the EMP • Ensure that all implemented activities related to environmental matters do not conflict with standard practices and are conducted in accordance with contract specifications, statutory obligations and procedures as approved by the project owner • Promote a high degree of environmental awareness amongst all project construction personnel • Ensure all staff attends induction training on environmental aspects and awareness courses coordinated by the project manager • Ensure that the required reporting procedures on environmental matters are implemented property

Relevant Institution	Responsibility
	• Prepare the daily site diary of site progress
ANP **National Authority for Petroleum Under Ministry of Petroleum and Mineral Resources**	• Environmental Authority for Petroleum Sector • Internal assessment for Initial Environmental Examination (IEE) document which is cover Project Document, Simplified Environmental Impact Assessment (SEIS) and Environmental Management Plan (EMP), approval of environmental license and conducting the Monitoring activities • Issuing / granting and renewing the environmental license specifically for petroleum sector • Undertake monitoring of the project's environmental performance, health and safety and rehabilitation plan focus to the petroleum activities
SEFOPE	• Ensure the implementation of the work in line with the labour Law • Support government to enhance the labour policy and regulatory framework • Provide training to improve worker skill and capacity • Ensure the employers and employee rights and duty are not violated
DPA/MALFF **Ministry of Agriculture, Livestock, Fisheries and Forestry**	• Establish and maintain the national system of protected areas • Identify areas required protection on a basis of scientific data and prepare proposal to establish protected areas • Demarcate the Protected Areas and their zones and administrate the protected areas' operation • Protect the valuable ecosystem and other species declare in the law in consultation with other relevant institutions and suco councils
SSLP	• Guaranteed the land status

Relevant Institution	Responsibility
Secretary of State for Lands and Properties under Ministry of Justice	
Local Authority	• Monitor and control the project activity and implementation of EMP • Ensuring community well-being and hygiene living condition, controlling government utilities and preserving cultural heritage • Coordinate with community to provide workers for the project • Fairly resolve the issues between community and project proponent
NGOs	• Promote and involve in environmental protection and human right. • Creating awareness among the community on environmental issues • Monitoring the environmental quality • Transferring identified environmental information and afforting the solution
Communities	• Access to the result of the environmental assessment • Participate in public consultation, rising concern on environmental issues. • Monitor the implementation EMP. • Identify cultural site and coordinate with local authority and project proponent conducting the cultural ceremony if necessary. • Create a friendly environment with migrant workers

CHAPTER 13 EMERGENCY PLAN

13.1 Introduction

An Emergency Response Plan (ERP) is a comprehensive action plans to response all emergencies. This Chapter provides a framework of ERP for the Project, which serves as a guide for providing a response system to major emergencies that may occur during the construction and operation of the seismic activity.

The contractor should follow the IMS Procedure document **(Risk and Opportunity Management - TG-IMS-P-003-Rev-03** and relevant procedures were mentioning in Normative References bellow to provide a guided response to the emergency situations during the Project implementation.

13.2 Aim and Scope of ERP

The aim of the ERP is to provide procedures and action plans to promote an effective response when faced with an emergency situation. The major objectives of this ERP include:

- Identifying potential emergency situations, incidents that can cause illness or injury to human inddthe environment
- Provide a guide for the preparedness and response to handle emergency situations
- Propose mitigation for associated adverse environmental impacts or impact to human andprevention of accident
- Highlight the requirements for system review, revise and test emergency preparedness andresponse procedures where applicable

13.3 Emergency Concept

Emergency situation does occur. It is every employee's responsibility to be prepared for these events. Being prepared includes all of those activities that are done on a regular basis to ensure that:

- All emergency equipment are in place and is working;
- There is an effective Emergency Plan in place ; and
- All employees are aware of their role during an emergency.

13.4 Normative References

ISO 9001:2015 and ISO 14001:2015 Clause 4.1, 4.2	Context of organization and interested parties need and expectation
ISO 14001:2015 & 9001:2015 Clause 6.1	Action to address Risk and Opportunities
ISO 45001:2018 Clause 4.1, 4.2	Context of organization and need & expectation of workers and others interested party
ISO 45001:2018 Clause 6.1.1	Action to address Risk and Opportunity
TG-QHSE-G-001	Risk Management Guideline
ISO Guide 73	Risk management vocabulary

Table 16. Term & Definitions

TG	TIMORGAP
TIMOR GAP, E.P.	Timor Gás e Petróleo, Empresa Publica
IMS	Integrated Management System
Risk	Effect of uncertainty on objectives Note: Risk is often expressed in terms of a combination of the consequences of an event or a change in circumstances, and the associated likelihood of occurrence.
Risk and Opportunity	Potential adverse effects (threat) and potential beneficial effects (risk)
Likelihood	chance of something happening Note: This Guide uses the word "likelihood" to refer to the chance of something happening, whether defined, measured or determined objectively or subjectively, and described using general terms or mathematically (such as a probability or a frequency over a given time period).
Interested parties	person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity
Consequence	outcome of an event affecting objectives
HAZID	Hazard Identification
HAZOPS	Hazard Operability Study
JSA/JHA	Job Safety Analysis/Job Hazard Analysis
HIRAC	Hazard Identification, Risk Assessment and Control (HIRAC) process is the core process for occupational health and safety risk management
Hazard	source or situation with a potential to cause injury and ill health

Table 17. Roles, Responsibility & Authority

Role	Responsibilities	Authorities
Top Management	• Establish performance standard that all facilities will be designed based on Industry Standards and code of Practice • To review the effectiveness of the action taken of Risk and Opportunity, and changes in Risk and opportunity	• Approve and sign all IMS documents • To delegate task and resources needed for IMS implementation
IMR	Coordinate implementation and maintenance of the IMS on QHSE Risk Management procedure	
QHSE Team	Ensure all aspect of risk assessment from the project beginning until the facility is operational and undertaken as per Industry standard for the type of activity and/or facility	
Line Manager and Team Leader	1. Take lead as per of project management to ensure that risk assessment is carried out and is appropriate to the nature, scale, environmental aspects and impacts of its activity, products, services and QHSE requirements 2. Coordinate, support and participate in risk assessment process, monitor the recommendations and update management in management review follow up 3. Undertake Risk analysis, HAZID, HAZOP, JSA/JHA or similar appropriate Hazard Identification studies for all Installations and facilities	

13.5 Emergency Response Equipment

In line with the ERP, an emergency response set-up should be established. The emergency response set-up includes emergency reporting system, emergency response equipment and facilities.

Various emergency equipment should be made ready on-site and regular inspection on these equipment are necessary. These include:

- *Fire Fighting System*: portable fire extinguisher; portable foam gun, etc.
- *First aid*: first aid kit, stretcher, blankets
- *Spill kit*: absorbent, disposal bottles/bags, vacuum cleaner, broom, dust pan
- *Personal Protection Equipment (PPE)*: face masks/face shields, self-contained breathing apparatus (SCBA), goggles, safety helmet, safety boots, dust mask, earplugs and others as appropriate to the facility requirements
- *Emergency Communications*: telephone system, warlike talkie and intercom system
- *Material Safety Data Sheet (MSDS)*: MSDS of chemical usage onsite to be strategically displayed at the appropriate location to provide information for emergency response

The storage location of the emergency equipment should be well aware by all employees. Resources/ Medical Coordinator of ERT is responsible in conducting regular inspection on these equipment.

13.6 Emergency Response Procedures

This procedure must be read with TG-QHSE-G-001 Risk Management Guideline..

13.7 Emergency Contact Details

Contractor is solely responsible for all communications with TG and ANP include relevant institutions. HSE Officer will refer any matters requiring by TG and ANP involvement to Contractor Communications and Compliance. a list of institutions that to be contact by the contractor in cases of emergency.

TIMORGAP Pualaca Block Main Contact

MD Eduardo Goncalves +670 7538 4612

Project Manager Rob Kennedy +670 7595 4391 Local +66 87 127 0790

QHSE General Manager Leonel Hornai Da Cruz +670 75927376 / 77193315

COMMAND CENTERS/NOTIFICATION AND TELEPHONE NUMBERS

Table 18. National Emergency Contact Details

Ambulance	Police	Fire Brigades
110	112	115

1. HOSPITAL AND MEDICAL CENTRE

Table 19. Hospital and Medical Centre Contact Details

Hospital / Medical	Location	Phone
Hospital Nasional Guido Valadares (HNGV)	Bidau, Dili, Timor-Leste	3310141
Stamford Medical Emergency	Mandarin, Dili, Timor-Leste	77721111
Natabora local clinic	Natarbora, Manatuto, Timor-Leste	7673 5362

2. EMERGENCY TRANSPORTATION

Table 20. Emergency Transportation Contact Details

Transportation	Location	Phone
Aviation Transportation	Dili, Timor-Leste	33133821

Transportation	Location	Phone
Natabora local ambulance (Dr. Matias Leobato	Natarbora, Timor-Leste	7731 6688
HELIPAD	SPP, Natarbora, Timor-Leste	

3. In the event of an injury follow these steps to resolve the issue

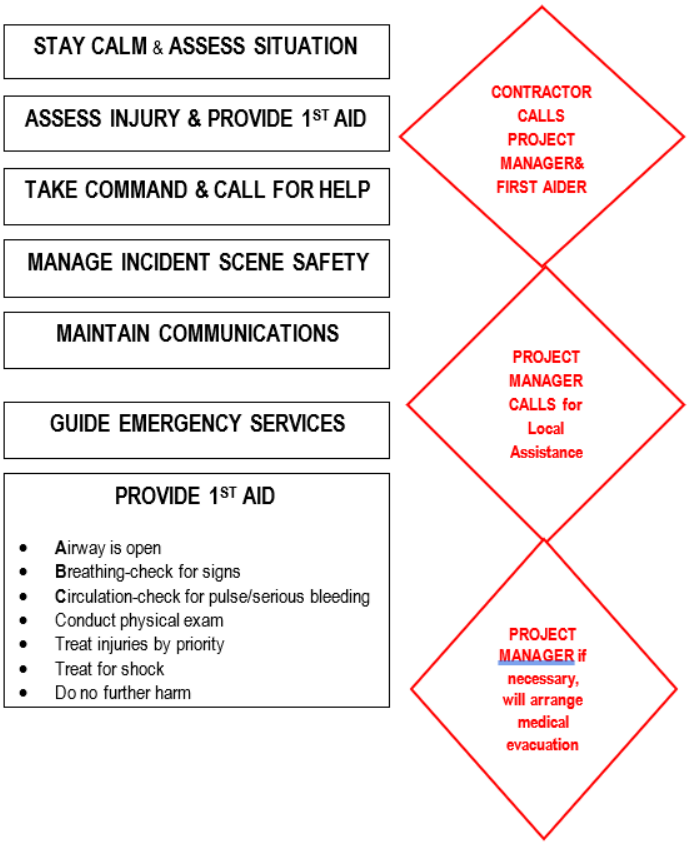


Figure 7. Procedure for Injury

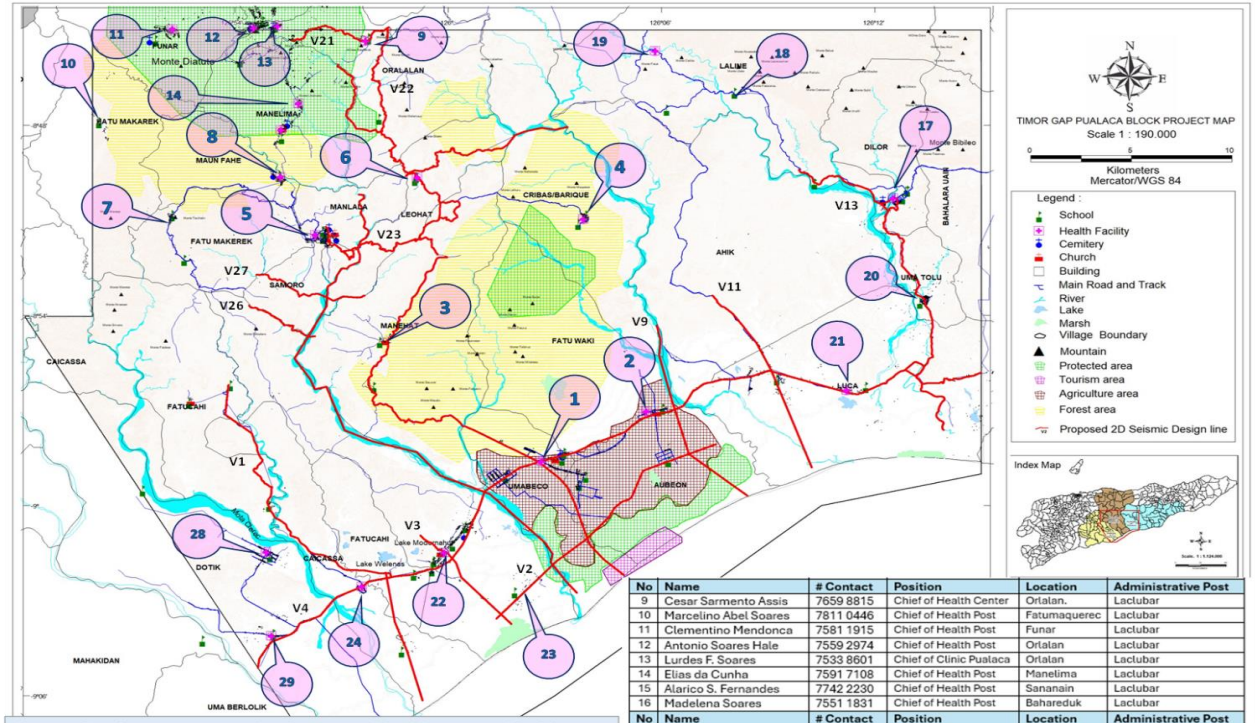
Contact list of Doctors, Nurses and Midwives in each health centers and health post in six Administrative Posts of Timor Gap Pualaca Block Coverage Area.

Table 21. Contact List Medical Services in the Project Area

No	Name	# Contact	Position	Location	Administrative Post
1.	Matias Lobato	7731 6688	Chief of Health Center	Uma Boco	BARIQUE/NATARBORA
	Francisca Nunes	7673 5362	Chief of Health Post	Sicone Diloli	BARIQUE/NATARBORA
	Josefina Alves	7780 6045	Chief of Health Post	Manehat	BARIQUE/NATARBORA
	Berta dos Anjos	7682 8583	Chief of Health Post	Barique	BARIQUE/NATARBORA
2.	Simplicio de Jesus Alves	7637 4472	Chief of Health Center	Manlala	SOIBADA
	Odete Soares Alves	7616 6363	Chief of Health Post	Leo-Hat	SOIBADA
	Andre de Sousa	7603 6442	Chief of Health Post	Fatu-Makerek	SOIBADA
	Josefina M. J. B da Costa	7548 7516	Chief of Health Post	Manufahi-kiik	SOIBADA
3.	Cesar Sarmento Assis	7659 8815	Chief of Health Center	Orlalan.	LACLUBAR
	Marcelino Abel Soares	7811 0446	Chief of Health Post	Fatumaquere	LACLUBAR
	Clementino Mendoça	7581 1915	Chief of Health Post	Funar	LACLUBAR
	Antonio Soares Hale	7559 2974	Chief of Health Post	Orlalan	LACLUBAR

No	Name	# Contact	Position	Location	Administrative Post
	Lurdes F. Soares	7533 8601	Chief of Clinic Pualaca	Orlalan	LACLUBAR
	Elias da Cunha	7591 7108	Chief of Health Post	Manelima	LACLUBAR
	Alarico S. Fernandes	7742 2230	Chief of Health Post	Sananain	LACLUBAR
	Madelena Soares	7551 1831	Chief of Health Post	Bahareduk	LACLUBAR
4.	Mariano Soares Xavier	7823 2383	Chief of Health Center	Dilor	LACLUTA
	Marcos de Oliveira	7600 6780	Chief of Health Post	Ahic	LACLUTA
	Agostinho dos Santos	7605 1335	Chief of Health Post	Laline	LACLUTA
	Antonina dos Santos	7743 2171	Chief of Health Post	Umatolu	LACLUTA
	Gabriel de B. Lopes	7608 0842	Chief of Health Post	Aitara-Dilor	LACLUTA
5.	Romualdo da Costa	7542 9817	Chief of Health Center	Clacuc	FATUBERLIU
	Flaviana Ornai	7687 2075	Chief of Health Post	Bitirai	FATUBERLIU
	Rosalina Barreto Ornai	7541 7005	Chief of Health Post	Caicasa	FATUBERLIU
	Roberto da Costa	7673 0058	Chief of Health Post	Bubususu	FATUBERLIU
	Manuela Fernandes	7601 1172	Chief of Health Post	Fahinehan	FATUBERLIU
6.	Rodrigues da Carvalho	7629 3969	Chief of Health Center	Mahakidan	ALAS

No	Name	# Contact	Position	Location	Administrative Post
	Diana da Silva da Costa	7598 0340	Chief of Health Post	Weberec	ALAS
	Luisa de Jesus Alves	7534 2578	Chief of Health Post	Dotik	ALAS



©Contact list of Doctors, Nurses and Midwives in each health centers and health post in six Administrative Posts of Timor Gap Pualaca Block Coverage Area.

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2	Francisca Nunes	7673 5362	Chief of Health Post	Sicone Diloli	Barique/Natarbora
3	Josefina Alves	7780 6045	Chief of Health Post	Manehat	Barique/Natarbora
4	Berta dos Anjos	7682 8583	Chief of Health Post	Barique	Barique/Natarbora
No	**Name**	**# Contact**	**Position**	**Location**	**Administrative Post**
5	Simplicio de Jesus Alves	7637 4472	Chief of Health Center	Manlala	Soibada
6	Odete Soares Alves	7616 6363	Chief of Health Post	Leo-Hat	Soibada
7	Andre de Sousa	7603 6442	Chief of Health Post	Fatu-Makerek	Soibada
8	Josefina M. J. B da Costa	7548 7516	Chief of Health Post	Manufahi-kiik	Soibada
9	Cesar Sarmento Assis	7659 8815	Chief of Health Center	Orlalan.	Laclubar
10	Marcelino Abel Soares	7811 0446	Chief of Health Post	Fatumaquerec	Laclubar
11	Clementino Mendonca	7581 1915	Chief of Health Post	Funar	Laclubar
12	Antonio Soares Hale	7559 2974	Chief of Health Post	Orlalan	Laclubar
13	Lurdes F. Soares	7533 8601	Chief of Clinic Pualaca	Orlalan	Laclubar
14	Elias da Cunha	7591 7108	Chief of Health Post	Manelima	Laclubar
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18	Marcos de Oliveira	7600 6780	Chief of Health Post	Ahic	Lacluta
19	Agostinho dos Santos	7605 1335	Chief of Health Post	Laline	Lacluta
20	Antonina dos Santos	7743 2171	Chief of Health Post	Umatolu	Lacluta
21	Gabriel de B. Lopes	7608 0842	Chief of Health Post	Aitara-Dilor	Lacluta
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25	Roberto da Costa	7673 0058	Chief of Health Post	Bubususu	Fatuberliu
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28	Diana da Silva da Costa	7598 0340	Chief of Health Post	Weberec	Alas
29	Luisa de Jesus Alves	7534 2578	Chief of Health Post	Dotik	Alas

Figure 8. Emergency Medical Centre and Location within Project Area

13.8 Incident Investigation and Reporting

Contractor should be established in a systematic manner inclusive of an investigation procedure so that appropriate response action can be provided and to avoid recurrence of similar accident. All incident reports and lesson learned are shared for continuously improvement.

13.9 Review and Update of ERP

The ERP should be reviewed and revised from time to time. On-going amendment is to ensure the ERP is effective and up-to-date with changing community standards and regulations. The Incident Managershould ensure that ERP is up to date. The ERP procedures should be reviewed and revised specifically upon occurrence of an incident and change in facility activity or process where potential emergency may arise.

13.10 Emergency Preparedness Trainings and Drills

Emergency training should be provided to all workers working within the Project site. For the ERT team, the training shall include fire control, the use of fire extinguisher, spill kit, first aid, etc. While for the general workers, awareness training should be provided on how to response to the emergency including general procedure when sighting of emergency, introduction of ERT team member, assembly area, awareness on alarm activation, etc. Training should be conducted periodically, and refresher should be given to ERT member whenever necessary

Periodical mock drill should be conducted to provide practical training to staff in dealing with emergency besides evaluating the effectiveness of emergency preparedness.

Apart from training and drills, all emergency response equipment including fire-fighting equipment, spill kit and first aids should be inspected periodically.

The detailed emergency plan will be bridging with potential bidder upon the awarding contract.

CHAPTER 14 DECOMMISSIONING PLAN

Decommissioning Plan presents the concept of the closure for site rehabilitation activities. Decommissioning will be accomplished in compliance with the requirements of the Government of Timor Leste (GoTL) and TGPB's future plan.

TGPB committed to decommission and rehabilitate project area and/or the Seismic lines and points that will be used during the 2D Seismic Acquisition project. In this step, the all-associated facilities that using or support to the seismic survey activity will be removed and the used land will be recovered to its original stated or better. The rehabilitation of the site can be done through trees planting activity as part of Corporate Social Responsibility (CSR).

The following is the summary of the key decommissioning processes to be implemented by the project Proponent with respect to the layover, fly-over or base sites and survey locations along each of the survey lines:

Step 1: Remove all layover, fly-over or base sites structures:

- Remove all the site supporting infrastructure such as housing container / tents.
- Disassemble all the structures and remove all materials from the layover, fly-over or base sites.
- Remove all machinery from the site and transport to a new site where it is to be used or stored or sold at an auction.
- Remove all signage and fences that have been constructed and either make the material available to the local persons/farmer, dispose at a suitable site or sell at an auction.
- Remove the generators from the sites and either transport to a new site for storage or sell it to the farmer or an auction.
- Seal all petrol, diesel, oil, and grease containers and remove from the site to a storage facility.
- Collect all scrap metal and dispose at a suitable site or sell at an auction.
- Break up all concrete slabs and structures on site and transport the fragments to a suitable municipal waste disposal or use a fill material along the sandy / slippery / muddy access road.

- The concrete reservoirs if created, can probably remain intact provided that the local people wish to utilize them at some stage - this will need to be negotiated.
- The future use of the water borehole/s and water pipelines as well as any additional infrastructures that has been added to the borehole shall be handed over to the Regional Council who will work with the local community on usage and maintenance of the infrastructure, and.
- Any unused pipes shall be removed, disassemble, and component parts transported to a storage site or sell at an auction

Step 2: Remove all waste and unwanted materials:

- All campsite materials shall be removed and entire site rehabilitated.
- Clean the site, collect all the waste materials and transport to a suitable municipal waste disposal site, and.
- Manually remove all weedy species that are present at the site (the entire plant can easily be removed because the plants tend not to root deeply).

Step 3: Rehabilitate surrounding impacted areas

- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.
- Selecting the several types of flora to replanting according to the existing flora were grows around the project location.

Step 4: Rehabilitate the affected tracks and roads

- All tracks impacted by the proposed 2D seismic survey operations shall be rehabilitated by smoothing the middle ridge between the tracks and raking the surface.

The details of the decommissioning Plan should be submitted to ANP for approval

NB: This chapter will be updated after completion of PC

CHAPTER 15 CAPACITY DEVELOPMENT

Ongoing capacity building and training is required for the project to be successful and prevent and mitigate any residual health, safety and environmental related risks. Therefore, the training programs are designed according with the national and international Guidelines. The ongoing training programs including HSE awareness will be introduced to all workers at various levels. TIMOR GAP Pualaca Block and Contractor will also ensure all contractor workers shall fulfil their training requirements as listed on their Training Matrixes.

The training is considered mandatory and covers all the health, safety and environmental aspects for workforce but not limited to:

- Safe system of work training,
- Traffic safety training
- Basic Hazard Identification and Training in hazardous materials handling and specialist machinery/equipment operation,
- Specific training on how to do assigned tasks includes training on grinding, cutting and welding, handling tools, spill management and defensive driving.
- Risk Assessment and Emergency Management,
- Waste management
- First aid, fire-fighting and emergency response, PPE, etc
- HIV Awareness.

The company board management will also taking part in the training session as well as the local authority presence for enforcement. The training will be developed and delivered by the experienced environmental practitioner within the project management or will invite the independent or governmental qualified environmental, health and safety persons. The emergency management are to be conducted twice a year or depend on the requirements. All workers must be familiar with the emergency management systems.

All new workers must complete facility safety induction before they are assigned to their jobs. TGPB will advise the contractor to provide training and capacity development to its workers according to the national and international Guidelines.

CHAPTER 16PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

16.1 Introduction

The Public Consultations is required by the ANP (Autoridade Nasional do Petróleo) under Decree Law number 39/2022 first amendment of DL no 5/2011 of Environmental License, for environmental assessment involving the preparation of the Simplify Environmental Impact Statement (SEIS) and Environmental Management Plan (EMP). This requirement is aimed at addressing the public's concern, understanding and acceptance of the project, especially on how the project may affect them positively or negatively.

Public consultation for project document (PD) with the communities in the project area has been underway since June 2022 and is a crucial component of work on the project to ensure that the proposed works are understood, and any concerns addressed.

TIMOR GAP Pualaca Block recognized that there was a need for more focused and direct consultation with community members whose farms or residences may be directly impacted by the transition lines in the seismic survey.

16.2 Purpose of the consultation during the preparation of SEIS

Public Consultation process for the environmental assessment is carried out in accordance the Ministerial Diploma for the "Regulation on the Public Consultation Procedures and Requirements during the environmental assessment process DM No 47/2017, de 2 de August with the objectives of disseminating the information on the Seismic Survey and its likely impacts on community, environment, and economy of Timor-Leste.

16.3 Methodology and Approach

The methodologies and approach used for the consultation of the Seismic survey for TGPB as mentioned below:

16.4 Methodology

- Preparation (Date, Presentation materials (Project Planning, Identification of Impact and Mitigation actions))

- Identification of Stakeholders (Public and Private institutions, Interesting Line, and Communities affected) in TGPB area.

16.5 Approach

- Formal Meeting such as public consultation which participating directly from communities, Local Authorities, NGOs, Interesting line, and relevant ministries

- Informal Meetings such as providing the questionnaire, door-to-door with individuals, groups, institutions and community meetings

- Social media through the Radio, TV, Phone, Website and Facebook page etc

16.6 Summary of main comments from participants

(Will be provided after the Public Consultation)

16.7 Comments taken for consideration

Provide the important point raise by the stakeholders, communities, NGOs Etc still ongoing consultation

16.8 Details of activities and participants

(dates, venues, attendance, topics discussed, minutes of meetings and figures etc) still ongoing consultation

16.9 Description of relevant activities and materials for consultations

(such as press releases, and notifications) still ongoing consultation

16.10 Recommendation for future consultations

The project proponent will continue to collaborate with ANP. or national and local Government Institutions to share a new regulation or any amendment of law including conducting the public consultation in order to inform a technology that will be used for the project with the intention to minimize the negative impact to the communities and environment.

NB: This Chapter will be updated by the Consultant after the completion of Public Consultation.

CHAPTER 17 COMPLAINTS AND GRIEVANCES MECHANISM

TIMORGAP Pualaca Block as the Project Proponent for the Pualaca Block will develop a Grievance Redress Mechanism (GRM) procedure to accommodate environmental and social related complaints from project affected communities or households. The GRM shall be designed to provide appropriate procedures on how the project affected communities or households can pass on their concerns and/or conflicts that may arise during the phases of the project. The GRM shall provide resolutions that are mutually beneficial and acceptable to all parties. The GRM shall also identify parties involve in the solution stage process, which include their roles and responsibilities.

The purpose of establishing GRM procedure is to ensure that concerns, conflicts and/or complaints raised by the project affected communities or households are accommodated, communicated and resolved amicably; this is in turn to create or establish and maintain a harmony relationship between the project and the communities living surrounding the project location.

Additionally, it shall also describe the structure on how a complaint is solved, and if there is no mutual agreement reached, the GRM shall provide the next level inline to be approached in order to obtain or reach an acceptable resolution between parties.

As specified in the GRM framework below, the GRM procedure shall have a complainant form and a register log, which has a monitoring and a performance indicator. Within the GRM procedure, an individual or group of community who submit their concerns through GRM complaint's form refers to as Complainants.

Further, it shall be noted that after the GRM is established within the project, it then needs to be socialized with the project affected communities or households. For their awareness and accessibility of procedure; and it shall be practical and transparent for all parties.

The GRM shall be developed in accordance with the IFC performance standard for grievance mechanism as shown in the diagrams below

The following is structure of GRM procedure shown in the Figuru 9 -11. The GRM shall be developed in accordance with the IFC performance standard for grievance mechanism. (https://www.ifc.org/content/dam/ifc/doc/mgrt/ifc-grievance-mechanisms.pdf)

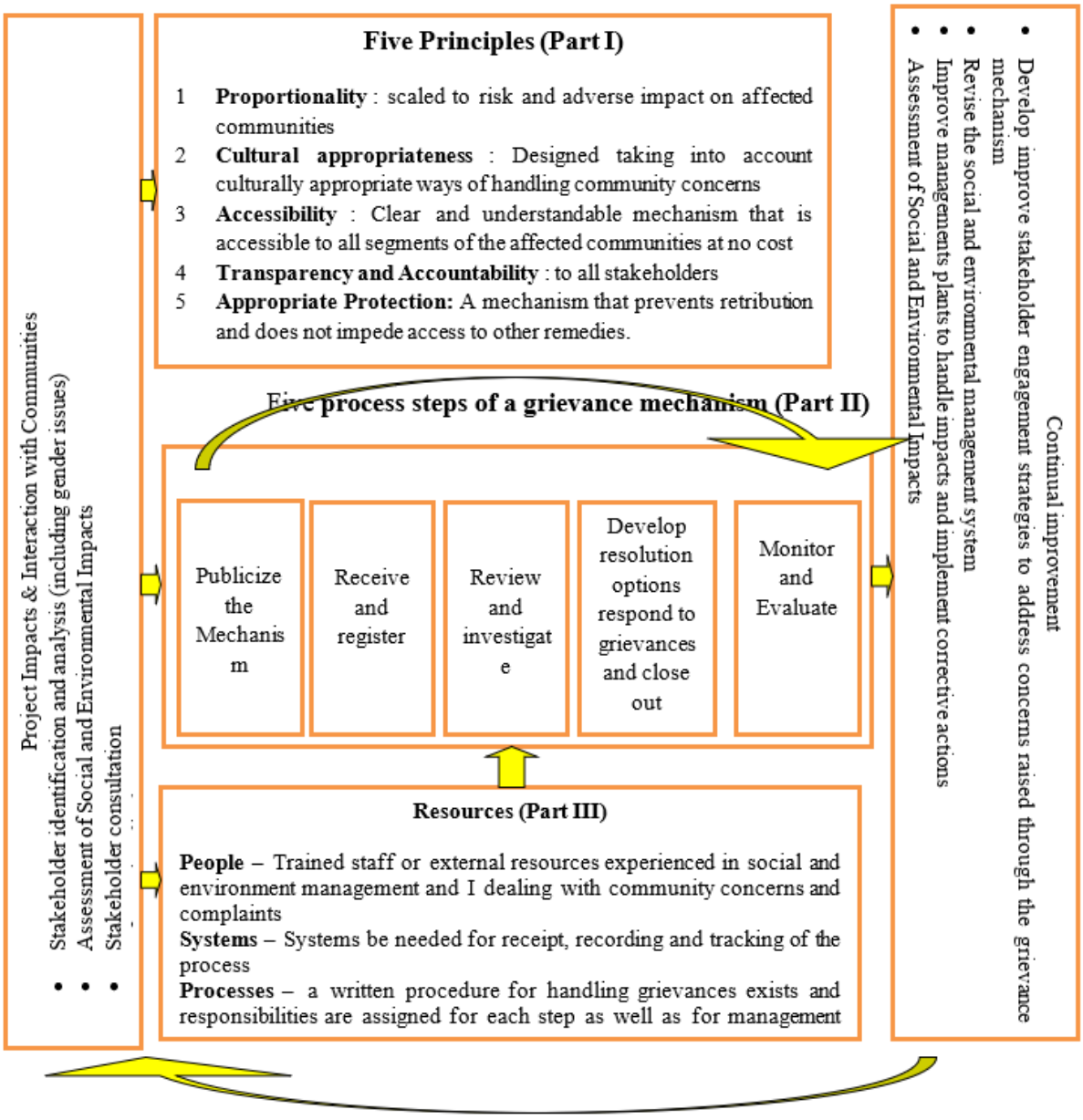

Figure 9. Basic Design Elements of a Project Level Grievance Mechanism.

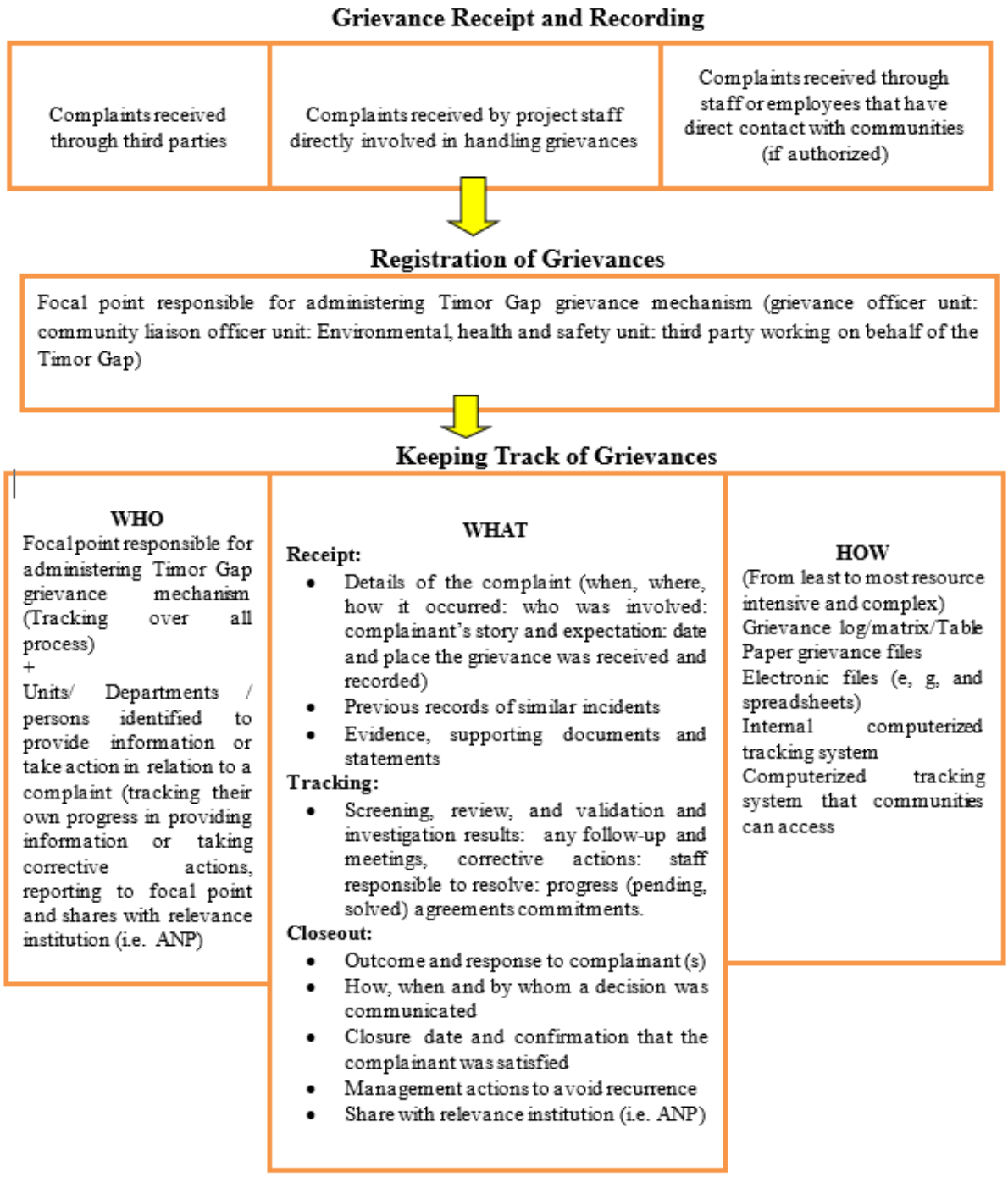

Figure 10. Receipt, Registration and Tracking of Grievances

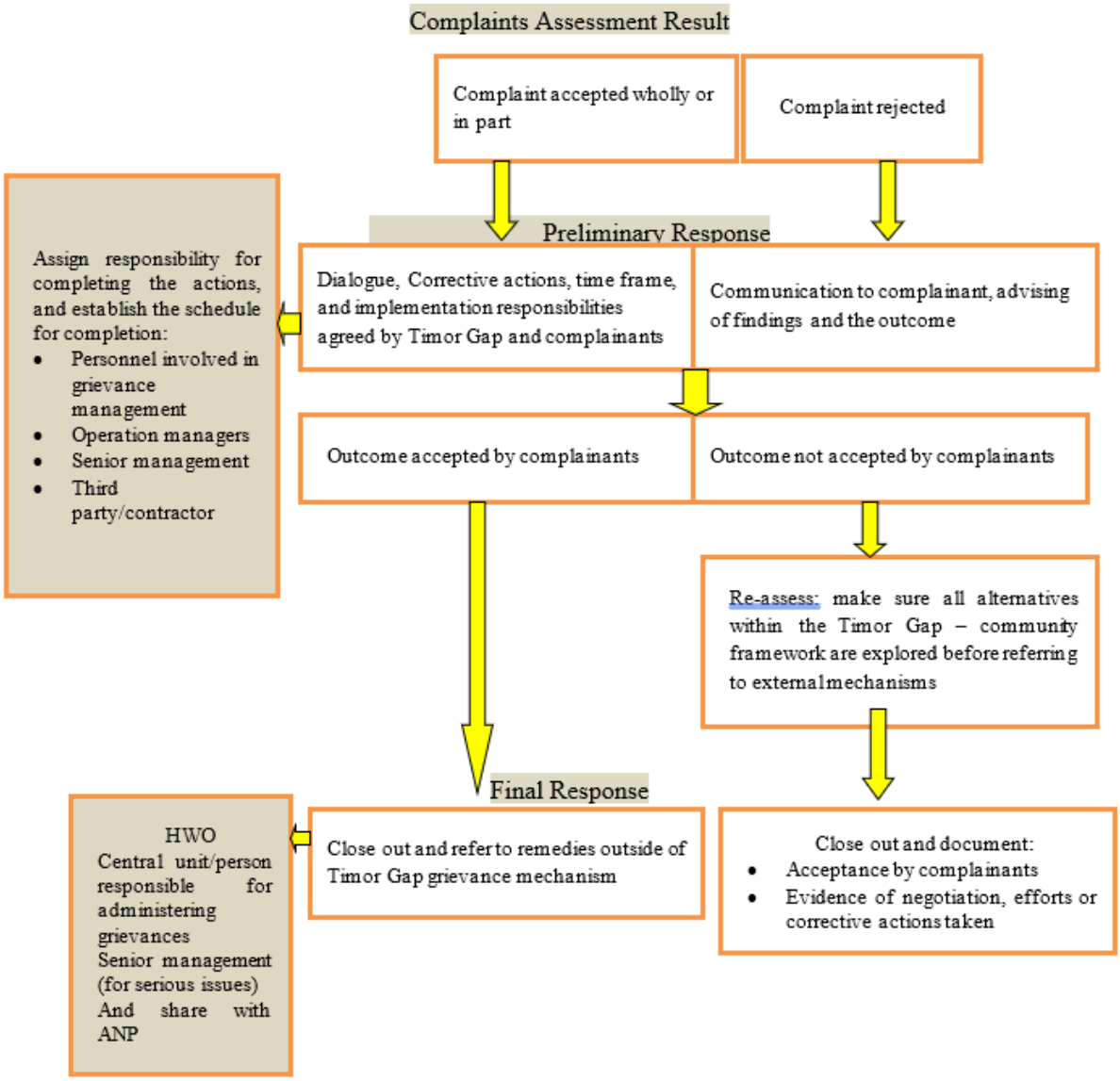

Figure 11. Developing Resolution Options, Preparing a Response and Closing out

CHAPTER 18 WORK PLAN AND IMPLEMENTATION SCHEDULE

Table 22. Work Plan and Implementation Schedule of the 2D Seismic project

Project Implementation Schedule			
Code	**Description of Task**	**Month**	**YEAR**
1	A. 2D Seismic Project		
2	A1. Procurement & Contract Process		
3	A1.1. Develop Tender Procurement Plan	March	2024
4	A1.2. Expression of Interest	May	2024
5	A1.3. Advertisement + Clarification	June	2024
6	A1.4. Group Scouting with Seismic Subcontractor	July	2024
7	A1.5. Technical and Financial Bid Opening + Evaluation	September	2024
8	A1.6. Due Diligence Evaluation	October	2024
9	A1.7. Contract Negotiation	October	2024
10	A1.8. Award + Contract Signature	October	2024
11	A1.9. Kick off Meeting	October	2024
12	A2. Environmental License Process		
13	A2.1. Project Screening - Project Document (PD)	May	2024
14	A2.2. Project Classification	July	2024
15	A2.3. Draft SEIS and EMP	September	2024
16	A2.4. Public Consultation	October	2024
17	A2.5. Final SEIS and EMP	October	2024
18	A2.6. Environmental License issue	October	2024
19	A3. Seismic Acquisition Operations		
20	A3.1. Recruitment	October	2024
21	A3.1. Camp Building and Equipment Mobilization	October	2024
21	A3.2. Personnel and Training	October	2024
23	A3.4. Line clearance operation	October	2024
24	A3.5. Survey Establish network and audit	November	2024
25	A3.6. Survey Operation	November - Dezember	2024
26	A3.7. Layout Nodes	Dezember	2024
27	A3.8. 2D Acquisition + parameter test	Dezember	2024
28	A3.9. Field Acquisition	Dezember	2024
29	A3.10. Field restoration	Dezember	2024
30	A3.11. Demobilization	Dezember	2024
31	A3.12. Camp Restoration	January	2025

32	A3.13 Acquisition Final Report	January	2025

CHAPTER 19 COST ESTIMATES

The capital cost is a cost that required for all project phases or Operational budget to support the implementation of EMP. The capital cost required to support the proposed project development in managing the environmental aspects. TGPB as a responsible project proponent in committed to carry out all pragmatic mitigation measures through the contractors to avert and minimize any potential environmental impacts. There shall be sufficient budgetary allocations for undertaking the environmental protection and monitoring works. The overall estimated environmental budgets for all phases of the project are summarized in table below.

Table 23. The estimation cost to cover the Environmental monitoring and mitigation

No.	Item	Pre-Seismic	Seismic	Post Seismic
1	Health, Safety and Environment include Training,	$ 50.000	$ 150.000	$ 10.000
2	Water Quality Monitoring	$, 15. 000	$ 30.000	$ 10.000
3	Air Quality Monitoring	$ 10,000	$ 20,000	$ 5.000
4	Noise mapping and measurement	$ 10,000	$ 20,000	$ 5.000
5	Soil Erosion and Sedimentation Control	$ 10,000	$ 20,000	-
6	Community, Cultural	$ 20.000	$ 10,000	$ 5,000
7	Planning, Survey, Equipment, Transport	$ 100.000	$ 200.000	$ 5.000
8	Decommissioning : Removal of camp, equipment, all wastes, Reforestation and re-condition	-	-	$ 200,000
9	Environmental Report	-	-	$ 20.000
	Sub-Total	**$ 215,000**	**$ 450,000**	**$ 260,000**
	Total (USD) = $ 925,000			

CHAPTER 20 REVIEW OF THE EMP

TIMORGAP Pualaca Block, Unip. Lda. will engage with Environmental Consultant to update the EMP. The EMP updating will prepare by the contractor and consultant and reviewed by the TGPB as a project proponent and submitted to ANP. Data collection should take place as part of the EMP update focusing on environmental aspects.

The project proponent will appoint an Environmental and Safety Officer (ESO) who will be responsible for site inspections on a daily and weekly basis to check compliance with the approved EMP and ensuring implementation of all health and safety requirements, these will be documented for the project progress report.

The mitigation measures presented in this EMP is considered as a living documents which subjected to be reviewed or updated as necessary based on the unidentified event happens during the project life time. If the mitigation measures in the EMP missed some important point which cause serious accident and accident to the people (workers and or general public, the EMP could subject to be reviewed.

The review procedures are:

- Establish accident investigation team which should compose of two persons with appropriate technical and investigation technique and experience;
- Investigate the root causes of accident;
- Proposing Corrective and Preventive Actions Required (CPAR) as necessary to prevent the reoccurrence of similar accident in the future; and
- Incorporate the CPAR in the revision of the EMP to be approved by relevant governmental authorities.

In the event that mitigation measures are insufficient to control impact to acceptable levels or if there is an alteration on the project condition such as enlarge the area for project site, changes to technologies used or changes in the local legislation, whenever adopting the new standards or guidelines as part of the development best practice, this EMP will be updated and amended to

cover unexpected impacts or changes and all matters to support application for the renewed environmental license as necessary.

ANP can review results from monitoring activities and compare them with baseline results collected during SEIS/EMP preparation and approval. Monitoring or data collection can also be taken on need basis when certain parameters have visually been observed to be elevated. Complains from community should also be taken into consideration and appropriate assessment and data collection take place to formulate proper ways to address the complaints

CHAPTER 21 NON-TECHNICAL SUMMARY

Non-technical Summary	Sumariu non tekniku
Introduction TIMOR GAP Pualaca Block, as a subsidiary of TIMOR GAP, was awarded with the PSC TL-OT-21-17 on 7 December 2021 by ANP.	**Introdusaun** TIMOR GAP Pualaca Block hanesan sanak ida husi TIMOR GAP neébe presta iha PSC TL-OT-21-17 loron 7 Dezembru 2021 husi ANP
Project description The Pualaca Block seismic survey activities are located in three municipalities such as Manatuto, Viqueque, Manufahi part of south coast of Timor Leste with the covers an area of 1,575 km^2. TIMOR GAP Pualaca Block, Unip. Lda.'s commitment to expanding and improving oil and gas Exploration & Production portfolio. This seismic survey or exploration activity is carried out to help and find out the existence of oil and gas resource that located in the three municipalities after that will continue to conduct with the exploitation activities. This activity is very important to increase state revenue and encourage the economic development in Timor-Leste Country.	**Deskrisaun ba Projeto** Atividade seismic survey Bloku Pualaca localiza iha munisipius tolu hanesan Manatuto, Viqueqeu no Manufahi parte husi kosta Sul ho area covetura hamutuk 1.575 Km^2. TIMOR GAP Pualaca Block, Unip. Lda. iha komunitmentu atu habelar no hasae portufoliu ba explorasaun produsaun mina no gas. Atividade seismic survei ka explorasaun neé halaó atu fasilita no idetifika rekursu mina no gas neébe mak lokaliza iha munisipius tolu refere hodi kontinua halaó atividade exploitasaun. Atividade neé importante tebes hodi ajuda hasae rendementu nasaun hodi dezenvolve ekonomia nasaun Timor-Leste.
Project justification Economic development, specifically of the petroleum industry, is identified as a target within the Strategic Development Plan (SDP) 2011-2030 (RDTL 2011d), with the aim of moving the country from a low income to a middle-income nation. The petroleum sector is	**Justifikasaun ba projeto** Dezenvolvimento ekonomia, espesifiku iha area industia Mina hanesan instrumentu inportante iha Planu Dezenvolvimento Estratejiku 2011 – 2030 ho objetivu atu dezenvolve nasaun neé husi rendementu nee'be kiík ba iha rendementu neébe as. Seitor mina hanesan komponente importante ba dezenlovimentu future nasaun ho

a key component of future development with revenue that can potentially be used to provide health care, education and security for the Timorese people. It will create opportunities for the people in Timor-Leste to improve their living standards through high level employment as well as the associated training opportunities.

Project Classification

TGPB project, has been classified as Category B project by the National Authority for Petroleum (ANP) under Ministry of Petroleum and Mineral Resources according with Decree Law No. 39/2022 first amendment of Decree Law No. 5/2011 of the Environmental Licensing.

Legal Requirement

The EMP has been prepared by the project proponent – TIMOR GAP Pualaca Block, Unip. Lda. to comply with the laws and regulatory requirements under the Decree Law no. 26/2012 on Environmental Basic Law, and the Decree Law no 39/2022 on the Environmental Licensing Law include several legal law and regulations that established in Timor – Leste

Environmental Management Plan (EMP)

The environmental impacts during the seismic survey activities will comply with all the relevant law and standards mentioned in section 5 and 9 of EMP. Based on the identification impact in SEIS document there are several

rendementu neébe atu fo asistensia ba saude, edukasaun no seguransa ba nasaun Timor – Leste.

Klasifikasaun Projectu

Projetu TGPB hetan ona kategorizasaun B husi Autoridade Nacional do Petroleo (ANP) tuteladu ba Ministerio do Petroleo e Rekursu Minerais baseia ba Dekretu Lei Nu 39/2022 amandamentu primeiru husi DL Nu. 5/201 konaba Lisensamentu Ambiental.

Rekerimentu Legal

Dokumentu DIAS prepara ona husi Proponente projetu – TIMOR GAP Pualaca Block, Unip. Lda. hodi banati tuir leis no regulamentu husi DL no 26/2012 Lei Baze Ambiental no DL 39/2022 konaba Lisensamentu Ambiental inklui leis no regulamentu relevante neébe estabelese iha Timor-Leste.

Planu Jestaun Ambiental (PJA)

Impaktu ba ambiente durante atividade seismic survei sei la'o tuir Lei no padraun ne'ebe mak mentiona ona iha seksaun 5 no 9 husi dokumentus Planu Jestaun Ambiental (PJA). Bazei ba identifikasaun impaktu iha dokumentu DIAS hatete katak komponenete ambiente neébe sei afeita husi atividade projetu mak

environmental component that will affected by the project activates likely human, plants, animals, water, soil. However, the impacts are considered as short-term and temporary with the risk levels from low to medium. To manage those impacts, the project proponent will follow the mitigation measures describe in section 8 of EMP that explain in details about the proposed mitigation measures and the ongoing training programs including HSE awareness will be introduced to all workers at various levels.	hanesan ema, plantasaun, animal, bee, rai. Maibe impaktu hirak ne'e konsideradu hanesan kurtu praju no temporati ho ninia level hahu husi ki'ik to klaran. Atu maneja impaktu hirak neé, proponente projetu sei hakruk no lao tuir mitigasaun adekuadu neébe sita ona iha seksaun 8 husi PJA neébe esplikasaun detailadamente no mos aplika treinamentu inklui intrudes konaba Saude, Siguransa no Ambiente ba trabalhadore sira hotu.
Grievance redress mechanism (GRM) TIMOR GAP Pualaca Block, Unip. Lda. will develop a Grievance Redress Mechanism (GRM) procedure to accommodate project environmental and social related complaints from project affected communities or households.	**Mekanismu de tratamento ba reklamasaun** TIMOR GAP Pualaca Block, Unip. Lda. mos sei desenvolve mekanismo de tratamento ba reklamasaun sira atu bele akomoda reklamasaun ne'ebe mak iha husi komunidade sira relasiona ho problema amibiente no mos social durante halaó atividade seismic survei

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