Environmental Management Plan (EMP) Report

For

Pre-construction Phase of Oils, Fuels and LPG Terminal, General Cargo Terminal with Bonded Warehouses and Industrial Estate

Proposed by

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Prepared by

E Guard Environmental Services

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LIST OF ABBREVIATIONS

BANCA	Biodiversity and Nature Conservation Association
BOD	Biochemical Oxygen Demand
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CSR	Corporate Social Responsibility
dB	Decibels
DD	Data Deficient
DO	Dissolved Oxygen
ECD	Environmental Conservation Department
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EN	Endangered
GPS	Global Positioning System
GW	Ground Water
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
LC	Least Concern
m^2	square meter
m^3	cubic meter
mg /l	milligram per liter
MIC	Myanmar Investment Commission
MMK	Myanmar Kyat
MONREC	Ministry of Natural Resources and Environmental Conservation
NAAQS	National Ambient Air Quality Standard
ND	Non Detectable
NE	Not Evaluated
NO_2	Nitrogen Dioxide
O_3	Ozone
PM_{10}	particulate matters equal to or less than 10µm
$PM_{2.5}$	particulate matters equal to or less than 2.5µm
PPE	Personal Protective Equipment
ppm	part per million
SO_2	Sulfur Dioxide
SW	Surface Water
TSP	Total suspended particulates, particulate matters equal to or less than 50µm
VOCs	Volatile Organic Compounds
VU	Vulnerable
WHO	World Health Organization
µm	micrometer

၁။ အကျဉ်းချုပ်အစီရင်ခံစာ

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အစီရင်ခံစာသည် မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာအနီးတွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ (မြေနေရာရှင်းလင်းခြင်း၊ ရုံးခန်းအဆောက်အဦး ဆောက်လုပ်ခြင်းနှင့် လမ်းဖောက်လုပ်ခြင်း)အတွက် မွန်ပက်ထရို ကုမ္ပဏီလီမိတက်မှ အဆိုပြုတင်ပြသောအစီရင်ခံစာ ဖြစ်ပါသည်။ အဆိုပါ စီမံကိန်း၏ စုစုပေါင်း မြေကွက်ဧရိယာသည် (၆၁၁.၁၃) ဧက ကျယ်ဝန်းပါသည်။ စီမံကိန်း အဆိုပြုသူ မွန်ပက်ထရို ကုမ္ပဏီ လီမိတက်သည် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် အစီရင်ခံစာလေ့လာမှုအား E Guard Environmental Services နှင့် လေ့လာမှုများ လုပ်ဆောင်ခဲ့ပါသည်။

အဆိုပါ စီမံကိန်း၏ အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ ဆောင်ရွက်မည့်ကာလသည် ၆လခန့် ကြာမြင့်မည် ဖြစ်ပါသည်။ စီမံကိန်း၏ အကြိုတည်ဆောက်ခြင်း လုပ်ငန်းများ လုပ်ဆောင်သည့် ကာလတွင် မြေနေရာ ရှင်းလင်းခြင်း၊ ရုံးခန်း အဆောက်အဦး ဆောက်လုပ်ခြင်းနှင့် လမ်း ဖောက်လုပ်ခြင်း လုပ်ငန်းများ ပါဝင်ပါသည်။ ထို့အပြင် စီမံကိန်း၏ အဆောက်အဦးများ နေရာချထားပုံနှင့် တည်နေရာအား ဝေဟင်မှ ခြုံငုံမြင်ရသည့် မြေပုံတို့ကို အသေးစိတ် ဖော်ပြထားပါသည်။ (အခန်း(၂)တွင် အသေးစိတ် ကြည့်ရှုရန်)

အခန်း(၃)တွင် စီမံကိန်းအကြောင်းအရာများနှင့် စီမံကိန်းအဆိုပြုသူ၏ အသေးစိတ် သတင်းအချက်အလက်များ၊ ဖွဲ့စည်းပုံနှင့် ရင်းနှီးမြှုပ်နှံမှုပုံစံတို့ကို အသေးစိတ် ရေးသားဖော်ပြထားပါသည်။ (အခန်း(၃) တွင် အသေးစိတ်ကြည့်ရှုရန်)

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စီမံကိန်းနေရာ၏ လက်ရှိသဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များဖြစ်သည့် ဆူညံမှု တိုင်းတာခြင်း၊ လေထုအရည်အသွေးတိုင်းတာခြင်းတို့ကို ကွင်းဆင်းတိုင်းတာခဲ့ပါသည်။ မြေအောက်ရေနှင့် မြေသားများကိုလည်း နမူနာကောက်ယူပြီး သက်ဆိုင်ရာဓာတ်ခွဲခန်းများသို့ပို့ကာ စစ်ဆေးမှုများပြုလုပ်ပြီး ရလဒ်များအား နောက်ဆက်တွဲ(ခ)တွင် ဖော်ပြထားပါသည်။ ထို့အပြင် အဆိုပြု စီမံကိန်း တည်နေရာနှင့် သက်ဆိုင်သည့် အခြေခံအချက်အလက်များဖြစ်သည့် လူမှုစီးပွားအခြေအနေ၊ ရူပဆိုင်ရာအချက်အလက်၊ ဇီဝပတ်ဝန်းကျင်ဆိုင်ရာအချက်အလက်၊ ရာသီဥတုဆိုင်ရာ သတင်းအချက်အလက်များ စသည်တို့ကို မွန်ပြည်နယ်၊ မုဒုံမြို့နယ် အတွက် အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာနမှ ပြဋ္ဌာန်းထားသော မြို့နယ်ဆိုင်ရာ အချက်အလက်များမှ စုဆောင်းထားပါသည်။ ပတ်ဝန်းကျင်အရည်အသွေးဆိုင်ရာအချက်အလက်များ ကွင်းဆင်းတိုင်းတာမှုအား ၂၀၁၉ခုနှစ်၊ စက်တင်ဘာလ (၁) ရက်မှ (၃) ရက်နေ့များတွင် လုပ်ဆောင်ခဲ့ပြီး ရရှိလာသော လေအရည်အသွေး ရလဒ်၊ ဆူညံသံတိုင်းတာမှုရလဒ်၊ မြေအောက်ရေနှင့် မြေသားတို့၏ ဆန်းစစ်ခြင်း ရလဒ်များကို အခန်း(၆)တွင် ဖော်ပြထားပါသည်။ ထို့ကြောင့် ဤပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် လေ့လာမှုတွင် အဆိုပြု စီမံကိန်း၏ လုပ်ဆောင်မှုများကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်နိုင်မှုများကို ကွင်းဆင်းလေ့လာခြင်း၊ စီမံကိန်းမှ တာဝန်ရှိသူများနှင့် တွေ့ဆုံ မေးမြန်းခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များအား အသုံးပြုပြီး စီမံကိန်းအကြိုတည်ဆောက်ခြင်းကာလတွင် ဖြစ်နိုင်ခြေရှိသော ထိခိုက်နိုင်မှုများကို ဖြေလျှော့ရေးနည်းလမ်းများဖြင့် ရှောင်လွှဲရန် နည်းလမ်းတို့ကို ဖော်ပြထားပါသည်။ (အခန်း(၆) တွင် အသေးစိတ်ကြည့်ရှုရန်)

အဆိုပါစီမံကိန်းကြောင့် ဖြစ်နိုင်ခြေရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်နိုင်မှု ဆန်းစစ်ချက်များအရ အကြို တည်ဆောက်ခြင်းလုပ်ငန်းများ လုပ်ဆောင်နေစဉ်ကာလတွင် သိသာထင်ရှားမှု အဆင့်အနည်း ရှိသည့် ထိခိုက်နိုင်မှု (၁၁)ခု၊ အသင့်အတင့်အဆင့်ရှိသည့် ထိခိုက်နိုင်မှု (၇)ခုနှင့် ကောင်းကျိုးဖြစ်စေသော သိသာထင်ရှားမှုအဆင့် (၁)ခု ရှိသည်ကို တွေ့ရှိရပါသည်။ ထို့ကြောင့် အဆိုပါ လုပ်ငန်းစီမံကိန်း ၏ ဖြစ်နိုင်ချေရှိသည့် ဆိုးကျိုးများနှင့် ဖြေလျှော့ရေးနည်းလမ်းများကို ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် လေ့လာမှု ပြုလုပ်နေစဉ်အတွင်း ထည့်သွင်းစဉ်းစားထားခဲ့ပါသည်။
(အခန်း(၇) တွင် အသေး စိတ်ကြည့်ရှုရန်)

အဆိုပါစီမံကိန်း၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ကို အကြိုတည်ဆောက်ခြင်း လုပ်ငန်းများ လုပ်ဆောင်သည့် ကာလအတွင်း တွေ့ရှိလာသော ဖြစ်နိုင်ချေရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်နိုင်မှု အချက်အလက်များကို အသုံးပြုခြင်း၊ လက်ရှိစီမံကိန်း၏ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ ဖြစ်သည့် လေထုအရည်အသွေး၊ အသံဆူညံမှုအခြေအနေ၊ ရေနှင့် မြေသား၊ စီမံကိန်း

တည်နေရာအနီး ပတ်ဝန်းကျင်၏ လက်ရှိအခြေအနေနှင့် စီမံကိန်းတည်နေရာသို့ ကွင်းဆင်းလေ့လာခြင်း၊ စီမံကိန်းအကြောင်း အရာများကို စီမံကိန်းအဆိုပြုသူတို့နှင့် ဆွေးနွေးခြင်းတို့ဖြင့် ပြင်ဆင်ရေးသားခဲ့ပါသည်။ ထို့အပြင် အဆိုပါစီမံကိန်း၏ ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှု အစီအစဉ်အား ရေရှည်ဖွံ့ဖြိုးတိုးတက် ကောင်းမွန်သော ပတ်ဝန်းကျင်အဖြစ် အကောင်အထည်ဖော်ဆောင်ရွက်ရန် ရည်ရွယ်ဆောင်ရွက်ခြင်းဖြစ်သည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ ဆိုးကျိုးသက်ရောက်မှု လျော့နည်းစေရန် သင့်တော်သော ဖြေလျော့ရေး နည်းလမ်းများကို လုပ်ဆောင်ခြင်းအားဖြင့် စီမံကိန်း အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်းကို အကျိုးရလဒ် ဖြစ်ထွန်းစေပါသည်။ အဆိုပါ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တွင် ပတ်ဝန်းကျင်ထိခိုက်မှု ဖြေလျော့ရေးအစီအစဉ်၊ စံချိန်စံညွှန်းလမ်းညွှန်ချက်များပါဝင်သည့် ပတ်ဝန်းကျင် အရည်အသွေး စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်တို့ ပါဝင်ပါသည်။ ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တွင် တွေ့ကြုံနိုင်သည့် အဆိုပြုစီမံကိန်း၏ ဖြစ်နိုင်ချေ ရှိသော ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု ကောင်းကျိုး၊ ဆိုးကျိုးများကို တွက်ချက်ခန့်မှန်းခြင်း၊ သတ်မှတ်ထားသည့် သိသာသော ထိခိုက်မှုများကို ရှောင်ရှားနိုင်သော ဖြေလျော့ရေး နည်းလမ်းများ အသုံးပြုရန် သတ်မှတ်ခြင်းနှင့် စောင့်ကြပ်ကြည့်ရှုခြင်း နည်းလမ်းများကို ခွဲခြားဖော်ပြထားပြီး စနစ်တကျ ရေးသားဖော်ပြထားပါသည်။ (အခန်း(၈)တွင် အသေးစိတ်ကြည့်ရှုရန်)

အကျဉ်းချုပ်အားဖြင့် ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံ၏လမ်းညွှန်မှုများ၊ ပတ်ဝန်းကျင်ဆိုင်ရာဥပဒေ၊ နည်းဥပဒေ စည်းမျဉ်းစည်းကမ်းများနှင့် ချမှတ်ထားသော မူဝါဒ လမ်းညွှန်ချက်များ အတိုင်း ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှု အလေ့အကျင့်များ၊ လုပ်ငန်းစဉ်များနှင့် လိုက်နာဆောင်ရွက်ကျင့်သုံးရန် တာဝန်များကို ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ဖော်ပြတင်ပြထားပါသည်။ စီမံကိန်းနှင့် သက်ဆိုင်သူများအား စီမံကိန်းဆိုင်ရာ အကြောင်းအရာများ ရှင်းလင်းတင်ပြခြင်း၊ အကြံပြုချက်များနှင့် ဆွေးနွေး တင်ပြလာသော သဘောထားအကြံပြုချက်များကို ရယူပြီး အဆိုပါ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် အစီရင်ခံစာ၏ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ထည့်သွင်းရေးသား ခဲ့ပါသည်။

1. EXECUTIVE SUMMARY

Mon Petrol Co., Ltd. (as investor) proposed to conduct the Environmental Management Plan (EMP) report for Pre-construction (site clearance, construction of site office and access road). The proposed project is located near Kadone Paw Village, Mudon Township, Mon State. The proposed total land area is 611.13 acres. Since the said project requires an EMP to meet the environmental assessment requirements of Myanmar Environmental Conservation Law, Mon Petrol Co., Ltd. commissioned E Guard Environmental Services for EMP report study.

Pre-construction period of this proposed project will be 6 months. In the Pre-construction phase of proposed project, the designed area includes site clearance, construction of site office and access road. Moreover, layout plan and overview map are also mentioned. (See details in Chapter 2)

In the next chapter, detail information of project proponent and organization chart of project are mentioned in chapter 3.
(See details in chapter 3)

In chapter 4, include EMP study objectives and responsibilities of EMP expert team of E Guard Environmental Services Co., Ltd.
(See details in chapter 4)

In Chapter 5, provides the brief summary of relevant national laws and environmental legislations including Environmental Impact Assessment Procedure (2015) and National Environmental Quality (emission) Guidelines, established by the Ministry of Natural Resources and Environmental Conservation (MONREC) and overview of current local and international environmental guidelines for the proposed project. (See details in Chapter 5)

Environmental baseline data were collected by onsite measurements analysis for air quality and noise level at proposed project site. Ground water and soil samples were also collected and sent them to respective laboratories and then the analyzed lab results can be seen in Appendix C. Moreover, secondary data collection of proposed project site area such as socio-economic condition, physical/biological environment, and weather data were collected from official township data of Mudon Township, Mon State. Environmental quality baseline data collection was conducted on 1st to 3rd September, 2019 and detail analysis results of air quality, noise level, ground water and soil are seen in chapter 6. So, in this EMP study, the potential environmental impacts brought by various activities of proposed project were identified and judged by site surveying with checklist, meeting with client team, and assessing the environmental baseline information for pre-construction phase along with its mitigation measure. (See details in Chapter 6)

According to the potential environmental impact assessment, in pre-construction phase, there are 11 numbers of low, 7 numbers of moderate and 1 number of beneficial significant impacts. Potential negative impacts and mitigation measures of the proposed project were taken into consideration during the study. (See detail in chapter 7)

The Environmental Management Plan (EMP) of proposed project was prepared by using the finding of potential environmental impacts during pre-construction phase, the current condition of environmental baseline data of air quality, noise level, ground water quality , soil quality results and surround area of project site, site visit activities at project site and discussion of project status with the proponent. Moreover, environmental management plan is a site specific plan development to ensure that the project is implemented in an environmental sustainable manner. And also the project implementation is carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts. Environmental management plan includes Environmental Impact Mitigation Plan, Environmental Quality Monitoring plan with related standard guidelines. This EMP has, in brief, systematically explored all possible positive and negative environmental impacts of the proposed project and identified mitigation and monitoring measures on negative impacts which can be occurred in three phases. (See details in Chapter 8)

In conclusion, the environmental management practices, procedures and responsibilities are defined here in to get full compliance with the existing environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar. All the feedbacks, desires and needs of local public recorded in public consultation meetings are well addressed and incorporated in formulation of EMP.

This EMP Report can be studied and downloaded on the following website link.
https://www.mediafire.com/folder/kx66xzzjj1fto/Mon_Petrol_Project_EMP

2. PROJECT DESCRIPTION

This report describes the findings of the Environmental Management Plan (EMP) for Pre-construction (site clearance, construction of site office and access road) from Mon Petrol Co., Ltd. The main objective of this report is to identify the major environmental impacts due to implementation of the project along with the effective measures to mitigate the potential adverse impacts.

2.1 Project Information

The proposed project is the 100% local investment by Mon Petrol Co., Ltd. with an estimated authorized capital of MMK (52500.00) million. This whole project aims to establish oils, fuels and LPG terminal, general cargo terminal with bonded warehouses and industrial estate which includes many development projects although this report is only for Pre-construction phase. The proposed project is located near Kadone Paw village, Mudon Township, Mon state (Lat 16º 13' 21.98" and long 97º 38' 32.54"). The total land area is 611.13 acres. Those lands were originally farm lands, and the project proponent bought those from related farm owners with legal documents in accordance with the related laws and regulations.

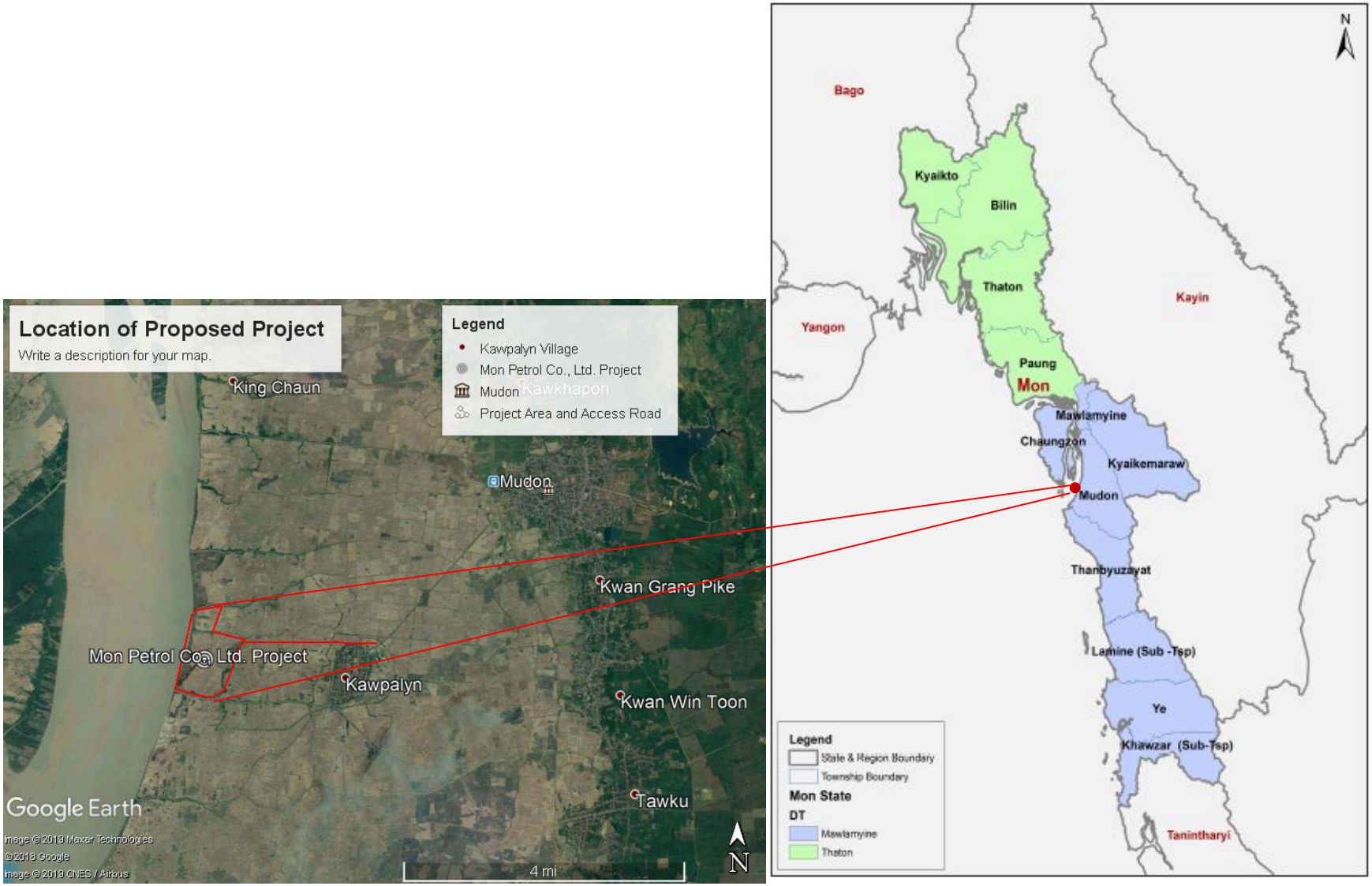


Figure 2. 1 Location Map of Proposed Project

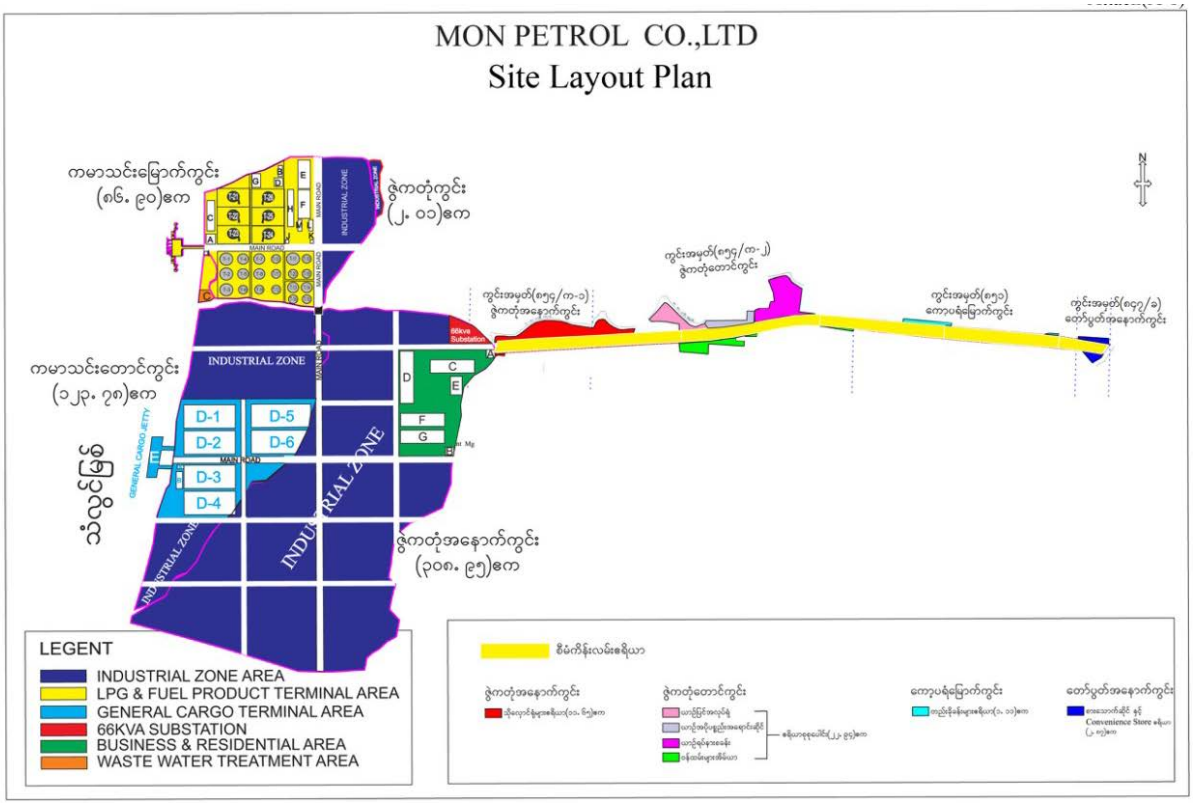


Figure 2. 2 Tentative design of Whole Project

2.2 Project Operation Processes (Pre-construction process)

Since this proposed project is still on pre-construction stage, there includes site clearance, construction of site office and construction of access road. The Pre-construction phase duration will be about six months.

(i) Site Clearance

The clearance of the whole site area involves clearing away vegetation and surface soil, and levelling and preparing the ground. Also, it involves clearing a site of any machinery or equipment, unwanted surplus materials, rubbish, and so on.

(ii) Construction of site office

Site office is one storey warehouse design which is constructed by local sub-contractor. The design can be seen below figure.

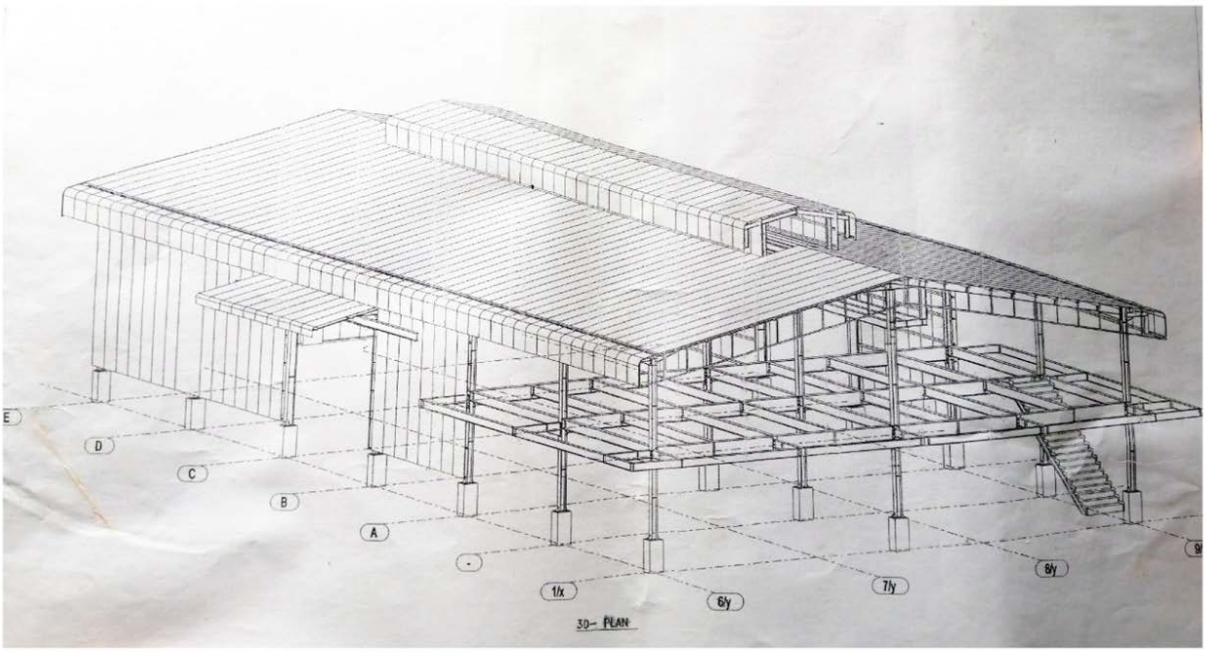


Figure 2. 3 Site office design

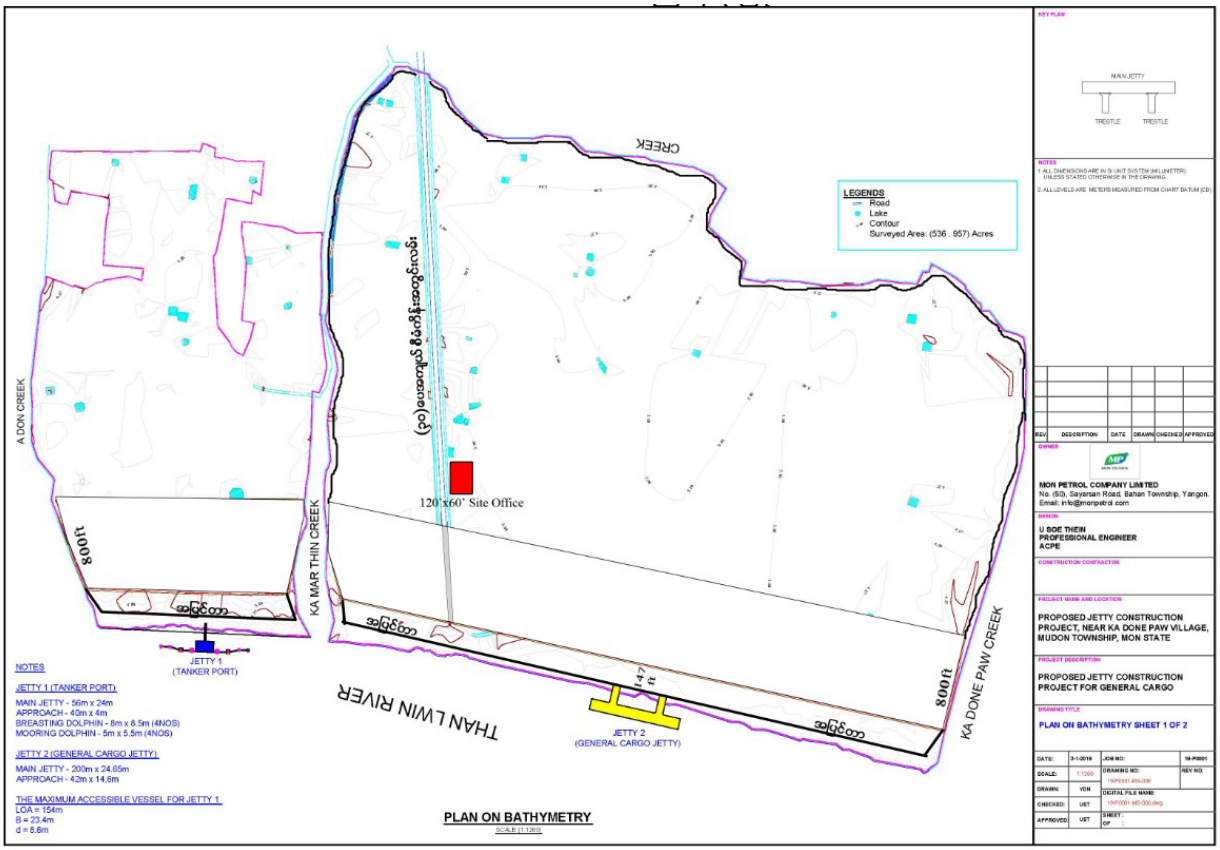


Figure 2. 4 Site Office Location

(iii) Construction of access road

Access road construction includes clearance of vegetation, excavation, mounting, fine grading and aggregate base which use lateritic soil and crushed granite stones. The road length is 2.85 miles and it starts from the site area to the existing rural road.

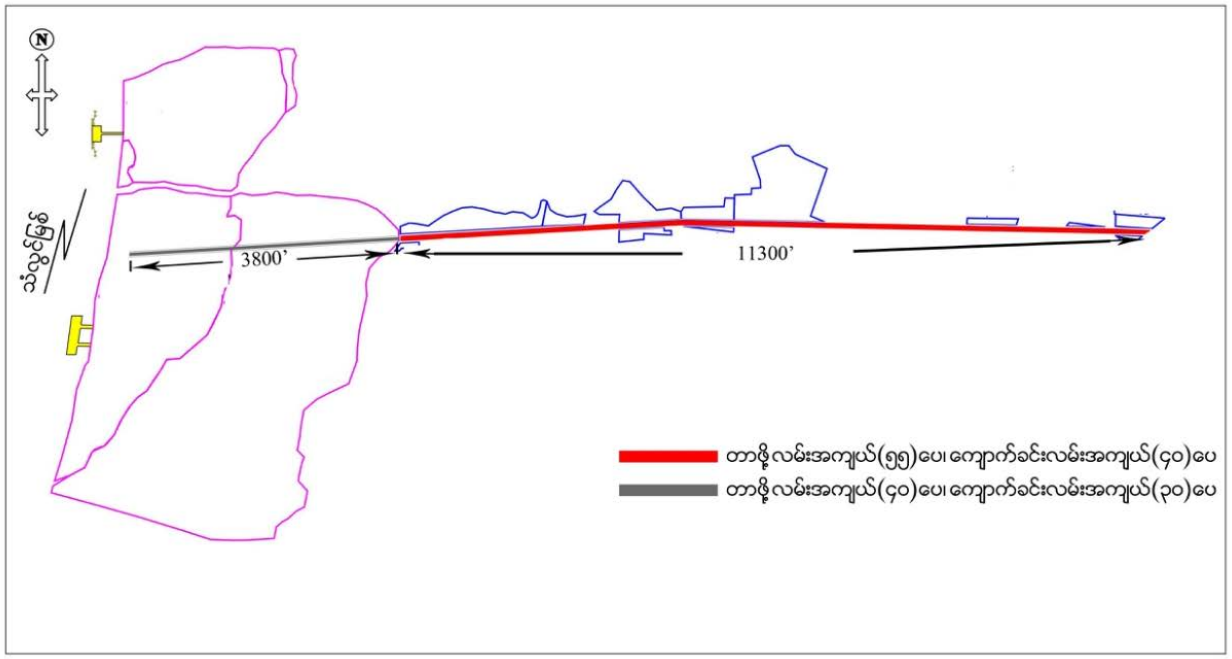


Figure 2. 5 Access Road Construction

2.3 Use of Materials and Resources and Generation of Waste

2.3.1 Human Resources Requirement

	Site Office Construction	**Access Road Construction**
Number of Labors	10	100

2.3.2 Types of Machineries and Vehicles for Pre-construction Phase

No.	**List of Items**			
	Site Office Construction	**Quantity**	**Access Road Construction**	**Quantity**
1	Excavator	1	Excavator	4
2	Generator	1	Compactor	4
3	Welding Machines	2	Grader	1
4	Cutter Machine	1	Dozer	2
5	4” Water Pump	2	Water Bowser	1
6			Dump Truck	15
7			Water Pump with Engine	3

2.3.3 Utilities

The Utilities for this proposed project include fuel oil for backup generators and water for operation and general purpose. Electric power will not be used for this Pre-construction phase.

i. Fuel Requirement

For this proposed project, types of fuel used are premium high speed diesel. For site office construction, fuel usage is about 10 gallons per day and about 70 gallons per day for access road construction.

ii. Water Requirement

The main source of water supply for construction of site office and access road is from Kawpalyn village carried with drums. The water consumption is about 800 gallons per day for site office construction, and 10000 gallons per day for access road construction. But, those usages will be temporary.

2.3.4 Generation and Control of Wastes

Approximately, the solid wastes from site office construction and access road construction are produced 0.5 ton per day while domestic wastes from worker camps 0.05 ton per day that are kept with plastic garbage. The sewage waste from temporary toilets is produced about 100 gallons per day stored in underground storage tank. Those are disposed in cooperation with Mudon township municipality.

i. Fire Security Plan

1. **Aim and Objection**
   Pre-construction Phase of Oils, Fuels, and LPG Terminal, General Cargo Terminal with bonded warehouses and Industrial Estate
2. **Location**
   Near Kadone Paw Village, Mudon Township, Mon State, Myanmar
3. **Work Duties**
   Must to be abided to overcome implement the aim and objection
   (a) Fire Hazard Prevention
   (b) Fire Die Out Works
   (c) Resettlement and Reestablishment Works
4. **Fire Hazard Prevention**
   Prevention works are the most of base and most of yield result, must be accurately abided the following instructions and to be abided the added instructions under time and conditions.
   (1) Conditions on fire to be removed and prohibited.
   (2) Within project, must always be cleaned a throw away materials, dustbin weed grass on fire.
   (3) The fuel oil must be stored systematically, supplying, using, and throwing away under fixed controlled method.

(4) Within project, must be written dangerous noticed letter and hanged up “No Smoking”, “Be Careful” “Use Electricity Systematically”, etc. Must be done special notice on oil storage tank and other easy on fire storage place.
(5) Electricity must be used and fixed under directions and methods of Myanmar Electrical Enterprise.
(6) Must be fixed underground rings and diverted thunder bolt at buildings.
(7) Must be written and fixed the office used materials in priority marks.
(8) Form the fire prevention, fire extinguish association and will be taught training for fire emergency.
(9) Have fire extinguishers, fire extinguish pipe tabs and water tank.

5. Advance Works for Fire Extinguish

Prevention for fire control and if fire, must be abided the works systematically as follows;

(1) Have fire extinguish boxes, water baskets, sand baskets, fire hang and flat at every building and required place.
(2) Must be fixed automatic fire alarm system and warning iron roads.
(3) Must be fixed fire warning system.
(4) If fire, must be fixed priority extinguish.
(5) Must be assigned the daily duty the fire security team or staff.
(6) If fire, must be done urgent the followings,
  (a) Ring the warning bell
  (b) Inform to Myanmar Fire Services Department that the Fire Extinguishing Motored Vehicles come and fight quickly
  (c) Transfer the priority property to fire free space
  (d) Fire Extinguishing

6. Resettlement and Reestablishment Works

If on fire, made the emergency transfer the person and materials, if injury and lost, report to duty supervisors and will be done, placing, carry to clinic, hospital and medical take care, help and support.

3. IDENTIFICATION OF THE PROJECT PROPONENT

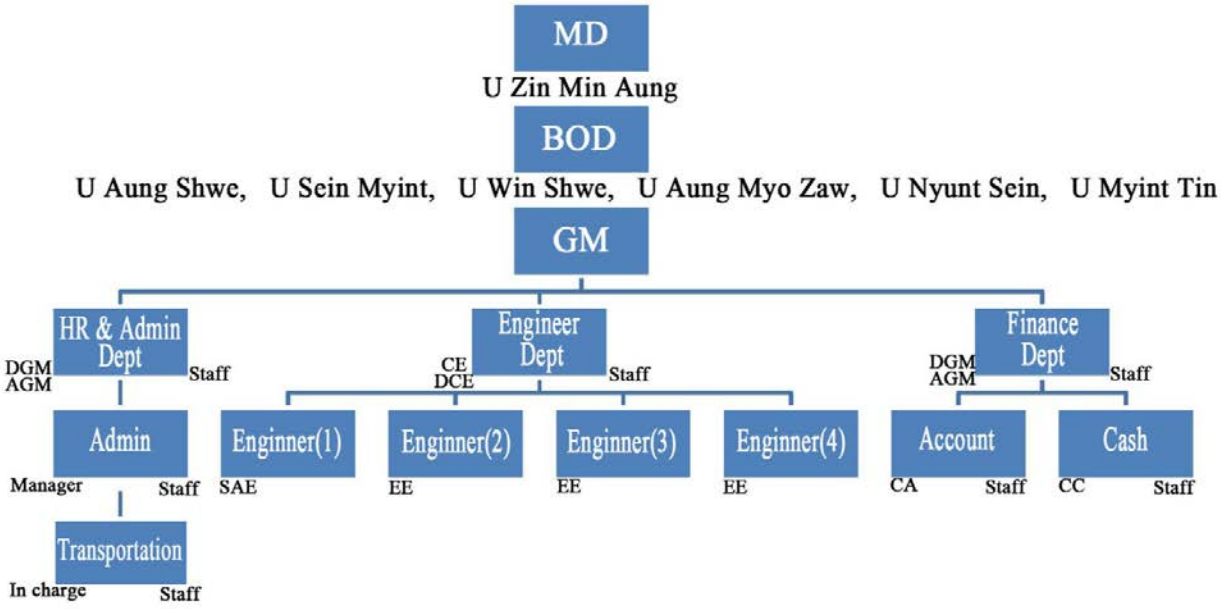
3.1 Proponent Information

Project	Pre-construction phase of oils, fuels and LPG terminal, general cargo terminal with bonded warehouses and industrial estate
Proponent's name	Mon Petrol Co., Ltd.
Citizenship	Myanmar
Office Address	No.(50), Sayar San Road, Bahan Township, Yangon
Place of Project	Near Kadone Paw Village, Mudon Township, Mon State, Myanmar
Contact Person	U Myint Tin 09976404410

3.2 Director List of the Project

No.	Name	Designation	Address
1	U Myint Tin	Director	Lower main road, No.80, Mupon quarter, Mawlamyine township, Mon state, Myanmar.
2	U Sein Myint	Director	
3	U Aung Myo Zaw	Director	
4	U Nyunt Sein @ Houng Tin Chein	Director	
5	U Aung Shwe @ Long Min Taik	Director	
6	U Win Swe	Director	
7	U Zin Min Aung	Director	

3.3 Organization Chart of the Project



4. IDENTIFICATION OF ORGANIZATION AND THE EMP EXPERTS

4.1 Identification of Organization and Experts for Environmental Management Plan (EMP) Study

E Guard Environmental Services prepares this Environmental Management Plan (EMP) Report in line with related Myanmar Environmental Conservation Laws and Regulations. The study for the EMP Report is carried out by the following study team. A summary of team member's responsibilities during the study period is described below. The members of the EMP team are listed in Table 4.1 indicating their ECD Registration number, roles in preparing this report.

The contact address and EIA study team members are described as follows.

E Guard Environmental Services Co., Ltd.
No.11, Airport Avenue, 10 Miles, Insein P.O 11011, Yangon, Myanmar.
Tel: +95-1-9667757, +95-1-9653332
Fax: +95-1-666512
info@eguardservices.com
http://www.eguardservices.com

Table 4. 1 EIA Study Team Members

No.	Name	Position	Transitional Consultant Registration Numbers	Roles
	E Guard Environmental Services Co., Ltd.	EIA Organization	00028	
1.	U Aye Thiha	Managing Director, Team Leader	00106	Project Overall Supervision
2.	Daw Khine Mar Kyaw	Consultant	Applied	Project Supervision, Report Preparation, Client Negotiation, Stakeholders Meeting Arrangement, Focus Group Discussion, Site Visit
3.	U Si Thu Aung	Environmental Specialist	-	Data Collection, Report Preparation, Client Negotiation, Focus Group Discussions, Site

				Visit
4.	Daw Htet Shwe Sin Aung	Environmental Specialist	Applied	Zoology, Ecology, Site Visit
5.	Daw Hay Marn Hnin	Environmental Specialist	Applied	Botany, Ecology, Site Visit
6.	U Kaung Khant Kyaw	Project Assistant	-	Site Visit, Focus Group Discussion
7.	U Myo Thuya	Project Assistant	-	Site Visit, Focus Group Discussion
8.	U Aung Moe Oo	Project Associate, EQ Team Leader	-	Environmental Quality Survey and Analysis
9.	U Wunna Zaw	Surveyor	-	Environmental Quality Survey and Sampling

U Aye Thiha (Managing Director, Team Leader)

Since E Guard was established, U Aye Thiha is working as Managing Director. He got his Bachelor Degree from University of Forestry, Yezin since 1995. Furthermore, he got his Master Degree in Natural Resources Management from Asian Institute of Technology. He also received Master of Business Administration from Yangon University of Economics in 2018. He also got Diploma in Computer Science from Yangon University. He has managed and implemented numerous projects (including local and foreign funded development as well as investment projects. At E Guard Environmental Services, he is responsible for management of ESIA projects, cost estimation, contracting, staff recruitment, etc.

Daw Khine Mar Kyaw (Consultant)

Daw Khine Mar Kyaw completed Master Degree with specializing in Environmental Engineering and Management from Asian Institute of Technology in Thailand and Bachelor of Pharmacy from University of Pharmacy, Mandalay. Moreover, she got many trainings related with environmental and social studies such as Health Impact Assessment, Social Impact Assessment, Resettlement Action Plan, ISO 9001:2015 and ISO 14001:2015. She has two years experiences in environmental consultancy, which include the conducting of Environmental Impact Assessment, Initial Environmental Examination and Environmental Management Plan. Furthermore, she has experience in carrying out ISO 9001:2015 Internal Auditor, also in dealing with external auditor.

U Si Thu Aung (Environmental Specialist)

U Si Thu Aung is an Environmental Specialist at E Guard Environmental Services Co. Ltd. He received his Bachelor Degree of Civil Engineering from Thanlyin Technological University in 2015. Then he worked as a freelance Civil Engineer in some private Civil Engineering works. He also received Post Graduate Diploma in Environmental Engineering from Yangon Technological University in 2017. He finished the course work for his Master Degree in Environmental Engineering from YTU in 2018 and has got his Master Thesis Paper Confirmation at July, 2019. He has started his career at E Guard Environmental Services since August, 2018 and now he has more than one year experiences in ESIA Report

Preparation, Stakeholders Meeting Arrangement, Background Data Collection, Site Visiting and Client Cooperating.

Daw Htet Shwe Sin Aung (Environmental Specialist)

Daw Htet Shwe Sin Aung is an Environmental Specialist at E Guard Environmental Services. She graduated since 2017 with the Master of Science specialized in Zoology from Yangon University. She has over one year experience in surveying the fauna, writing report and good experience in lab works. She is responsible for gathering information for the environmental reports, conducting socioeconomic surveys, cooperating with clients including NGOs, Local and Governmental agencies for the projects, assisting and cooperating in writing of environmental reports.

Daw Hay Marn Hnin (Environmental Specialist)

Daw Hay Marn Hnin is an Environmental Specialist, who received her Bachelor of Science and Master of Science Degree in Botany from the Pathein University at 2014 and 2017. She has almost two-year experiences on environmental site surveys, socio-economic surveys and biodiversity assessment. She is also familiar with conducting stakeholder's engagement and public consultations.

U Myo Thura (Project Assistant)

U Myo Thu Ya is a Project assistant at E Guard Environmental Services. He graduated on January 2019 with the Bachelor of Business Science (Applied Statistics) at the Co-Operative University in Thanlyin Township, Yangon. He is responsible for gathering information, conducting socioeconomic surveys, data entry and analyzing, assisting and cooperating for the ESIA projects.

U Kaung Khant Kyaw (Project Assistant)

U Kaung Khant Kyaw is a Project Assistant at E Guard Environmental Services Co., Ltd. He received his Bachelor of Science in Forestry from University of Forestry and Environmental Science (Yezin) in 2016. He worked as an Intern at HRD Environmental Training and Services Co., Ltd., Yangon from November 2017 to May 2018, a Health, Safety and Environmental (HSE) Assistant Officer at Eindu to Kawkareik Road Improvement Project (China Road and Bridge Corporation), Hpa-an, Kayin State from June 2018 to July 2018 and an Environmental Assistant Consultant at Myanwei Consulting Group, Yangon in March 2019. He is currently responsible in collecting information, conducting socioeconomic surveys, data entry and analyzing, assisting and cooperating for Environmental Impact Assessment (EIA) Report and Resettlement Action Plan (RAP).

U Aung Moe Oo (Project Associate)

U Aung Moe Oo is a Project Associate, who received his Bachelor Degree in Chemical Engineering from Thanlyin Technological University in 2016. He has more than two years of experience in Environmental Quality Analysis. He specializes in Environmental Quality such as air quality, water quality, soil quality, noise level, vibration intensity, and more. He is also responsible for data analysis and interpretation of environmental baseline data of this project.

U Wunna Zaw (Surveyor)

U Wunna Zaw is a matriculate. He has almost two year experience in Environmental Quality Sampling and Surveying tasks. He also specialized in on-site air and noise quality measurements, vibration measurement, water and wastewater sampling, sample preservation and logistics management works in assessing the environmental baseline data.

5. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

A brief summary of relevant national environmental legislations established by the Ministry of Natural Resources and Environmental Conservation and overview of current local and international laws and policies including related international or regional convention for the proposed project is provided in this section.

Constitution of the Republic of the Union of Myanmar (2008)	
section 45	The Union shall protect and conserve natural environment.
sub –section (b) of section 390	Every citizen has the duty to assist the Union carrying out the environmental conservation.
Myanmar National Environmental Policy (2019)	
Mission	To achieve a clean environment, with healthy and functioning ecosystems, that ensures inclusive development and wellbeing for all people in Myanmar.
Vision	To establish national environmental policy principles for guiding environmental protection and sustainable development and for mainstreaming environmental considerations into all policies, laws, regulations, plans, strategies, programmes and projects in Myanmar.
The Environmental Conservation Law (2012)	
Objectives	To construct a healthy and clean environment and to conserve natural and cultural heritage for the benefit of present and future generations; to maintain the sustainable development through effective management of natural resources and to enable to promote international, regional and bilateral cooperation in the matters of environmental conservation.
sub-section (o) of section 7	The project proponent has to pay the compensation for damages if the project will causes injuries to environment.
section 14	The project proponent has to purify, emit, dispose and keep the polluted materials in line with the stipulated standards.
section 15	The project proponent has to install or use the apparatus which can control or help to reduce, manage, control or monitor the impacts on the environment.
section 24	The project proponent has to allow relevant governmental organization or department to inspect whether performing is conformity with the terms and condition included in prior permission, stipulated by the ministry, or not.
section25	The project proponent has to comply with the terms and conditions included in prior permission.
section29.	The project proponent has to abide by the stipulations included in the rules, regulation, by-law, order, notification and procedure.
The Environmental Conservation Rule (2014)	
sub- rule (a) of rule 69	The project proponent has to avoid emit, discharge or dispose the materials which can pollute to environment, or hazardous waste or hazardous material prescribed by notification in the place where

	directly or indirectly injure to public.
sub-rule (b) of rule 69	The project proponent has to avoid performing to damage to ecosystem and the environment generated by said ecosystem.
The Environmental Impact Assessment Procedure (2015)	
sub-paragraph (a) of paragraph 102	The project proponent has to be liable for all adverse impacts caused by doing or omitting of project owner or contractor, sub-contractor, officer, employee, representative or consultant who is appointed or hired to perform on behalf of project owner.
sub-paragraph (b) of paragraph 102	The project proponent has to support, after consultation with effected persons by project, relevant government organization, government department and other related persons, to resettlement and rehabilitation for livelihood until the effected persons by the project receiving the stable socio-economy which is not lower than the status in pre-project.
paragraph 103	The project proponent has to fully implement all commitments of project and conditions included in EMP. Moreover the project proponent has to be liable for contractor and sub-contractor who perform on behalf of him/her have to fully abide by the relevant laws, rules, this procedure, EMP and all conditions.
rule 104	The project proponent has to be liable and fully & effectively implement all requirements included in ECC, relevant laws and rules, this procedure and standards.
paragraph 105	The project proponent has to inform the completed information, after specifying the adverse impacts caused by the project, from time to time.
paragraph 106	The project proponent has to continuously monitor all adverse impacts in the pre-construction phrase, construction phrase, operation phrase, suspension phrase, closure phrase and post-closure phrase, moreover has to implement the EMP with abiding the all conditions included in ECC, relevant laws & rules and this procedure.
paragraph 107	The project proponent has to submit, as soon as possible, the failures of his or her responsibility, other implementation, ECC or EMP. If dangerous impact caused by this failure or failure should be known by the Ministry the project proponent has to submit within 24 hours and other than this situation has to submit within 7 days from knowing it.
paragraph 108	The project proponent has to submit the monitoring report dually or prescribed time by Ministry in line with the schedule of EMP.
rule 109	The project proponent has to prepare the monitoring report.
paragraph 110	The project proponent has to show this monitoring report in public place such as library, hall and website and office of project for the purpose to know this report by public within 10 days from the date

	which the report is submitted to the Ministry. Moreover has to give the copy of this report, by email or other way which way agreed with the asked person, to any asked person or organization.
paragraph 113	The project proponent has to allow inspector to enter and inspect in working time and if it is needed by Ministry has to allow inspector to enter and inspect in the office and work-place of project and other work-place related to this project in any time.
paragraph 115	The project proponent has to allow inspector to immediately enter and inspect in any time if it is emergency or failure to implement the requirements related to social or environment or caused to it.
paragraph 117	The project proponent has to allow inspector to inspect the contractor and sub-contractor who implement on behalf of project.
National Environmental Quality (Emission) Guidelines (2015)	
Objectives	The project proponent has to emit, discharge or dispose in line with the standards stipulated in said guideline.
The Myanmar Investment Law (2016)	
Objectives	To ensure the appointing of employees, fulfilling the rights of employees, avoiding any injury to environment, social and cultural heritage, insure the prescribed insurance in line with the above law.
sub-section (d) of section 50	The project proponent has to register the land lease contract at Registration of Deeds Office in accordance with the Registration of Deeds Law.
sub-section (b) of section51	The project proponent has to appoint the nationalities in the various levels of administrative, technical and expert work by the arrangement to develop their expertise.
sub-section (c) of section51	The project proponent has to appoint the nationalities only in normal work without expertise.
sub-section (d) of section51	The project proponent has to appoint either foreigner or nationality with the appointment agreement in accord with the law.
sub-section (g) of section65	The project proponent has to comply with the international best practices, existing laws, rules and procedures to not damage, pollute, and injure to environment, cultural heritage and social.
sub-section (i) of section65	The project proponent has to close the project after paying the compensation to the employees in accord with the existing laws if violates the appointment agreement or terminate, transfer or suspend the investment or reduce the number of employees.
sub-section (j) of section65	The project proponent has to pay the wages or salary to the employees in accord with the laws, rules, order and procedures in the suspension period.
sub-section (k) of section65	The project proponent has to pay the compensation or injured fees to the respected employees or their inheritors if injury in or loss of part of body or death caused by work.
sub-section (l) of	The project proponent has to stipulate the foreign employees to

section65	respect the culture and custom and abide by the existing laws, rules, orders, and directives.
sub-section (m) of section65	The project proponent has to abide by labor laws.
sub-section (o) of section65	The project proponent has to pay the compensation, to the injured person for damages if damage to environment or socio-economy is occurred by misuse of project.
sub-section (p) of section65	The project proponent has to allow to inspect in anywhere of project if Myanmar Investment Commission inform to inspect the project.
sub-section (q) of section 65	The project proponent has to obtain the permission of MIC before EIA process and report back this process to Myanmar Investment Commission.
section 73	The project proponent has to insure the prescribed insurance by rules.
The Myanmar Investment Rules (2016)	
rule 202	The project proponent has to comply with the conditions of the permit issued by MIC and applicable laws when making the investment.
rule 206	The project proponent has to fully assist while negotiating with the authority for settling the grievance of the local community which has been affected due to investment.
rule 206	The project proponent has to submit the passport, expertise evidence or document of degree and profile to the MIC office for approval if decide to appoint a foreigner as a senior management, technician expert or consultant according to sub-section (a) of section 51 of Myanmar Investment Law.
Foreign Investment Rules (2013)	
Rule 54	The promoter or investor shall: (a) comply with Environmental Protection Law in dealing with environmental protection matters related to the business; (b) shall carry out socially responsible investment in the interest of the Union and its people; (c) shall co-operate with authorities for occasional or mandatory inspection; (d) shall exercise due diligence to be in conformity and harmony with norms and standards prescribed by relevant Union Ministry in conducting construction of factories, workshops, buildings, and other activities; (e) shall enforce Safety and Health
The Myanmar Insurance Law (1993)	
Objectives	The project can cause the damages to the environment and injuries to public so to ensure the needed insurances are insured at Myanmar Insurance.
section 15	If the project proponent uses the owned vehicles the project owner

	has to insure the insurance for injured person.
section 16	The project proponent has to insure the insurance to compensate for general damages because the project may cause the damages to the environment and injury to public.
Prevention of Hazard from Chemical and Related Substances Law (2013)	
Objectives	To ensure to use the hazardous chemical and related substances safely and safety for the employees. Moreover safety in carrying the hazardous chemical and related substances and storage place of it. If it is needed to train how to use the safety dresses which provided to the employees with free of charges. Insure to compensate for injury to person or damage to environment. The project has to be inspected for safety use of hazardous chemical and related substances before starting the project.
sub-section(a) of section 15	The project owner will be inspected for the safety and resistance of the machinery and equipment by the respective Supervisory Board and Board of Inspection before starting the business.
sub-section(b) of section 15	The project owner will assign the employees, who will serve with the hazardous chemical and substances, to attend the trainings on prevention of hazardous chemical and substances in local or abroad.
sub-section(a) of section 16	The project owner will abide by the conditions included in the license.
	The project owner will abide by and assign to the employees who serve in this work to abide by the instructions for safety in using the hazardous chemical and related substances.
sub-section(c)of section 16	The project owner will arrange the enough safety equipment in the work-place and provide the safety dresses to the employees who serve in this work with free of charge.
sub-section(d) of section 16	The project owner will train, in work-place my arrangement, the know-how to use the occupational safety equipment, personal protection equipment and safety dresses systemically in the work-place.
sub-section(e) of section 16	The project owner will allow the receptive Supervisory Board and Board of Inspection to inspect whether the hazard may be injured to health of human or animal or damaged to environment.
sub-section (f) of section 16	The project owner will assign the healthy employees who have obtained the recommendation that is fit for this work after taken medical check- up and keep systematically the medical records of employees.
sub-section (g) of section 16	The project owner will inform the copy of storage permission for hazardous chemical and related substances to the relevant township administrative office.
sub-section (h) of section 16	The project owner will obtain the approval with instructions of relevant fire force before starting the work if the project will use the

	fire hazard substances or explosive substances.
sub-section (i) of section 16	The project owner will transport only the limited amount of the chemical and related substance in accord with the prescribed stipulations in local transportation.
section 17	The project owner will insure, in accord with the stipulations, to pay the compensation if the project cause injury to person or animals or damage to environment.
section 22	The project owner will abide by the conditions included in the registration certificate. Moreover will abide by the orders and directives issued by the Central Supervisory Board from time to time.
sub-section (a) of section 27	The project owner will classify the level of hazard to protect it in advance according to the properties of chemical and related substances.
sub-section (c) of section 27	The project owner will provide the safety equipment, personal protection equipment to protect and reduce the accident and assign to attend the training to use the equipment systematically.
The Public Health Law (1972)	
Objectives	To ensure the public health include not only employees but also resident people and cooperation with the authorized person or organization of health department.
section 3	The project proponent has to abide by any instruction or stipulation for public health.
section 5	The project proponent has to allow any inspection, anytime, anywhere if necessary.
The Prevention and Control of Communicable Diseases Law (1995)	
Objectives	To ensure the healthy work environment and prevention the communicable diseases by the cooperation with the relevant health department.
clause (9) of sub-section (a) of section 3	The project proponent has to build the housing in line with the health standards, distribute the healthful drinking water & using water and arrange to systematically discharge the garbage & sewage.
section 4	The project proponent has to abide by any instruction or stipulation by Department of health and Ministry of Health.
section 9	The project proponent has to inform promptly to the nearest health department or hospital if the following are occurred: (a) Mass death of animals included in birds or chicken; (b) Mass death of mouse; (c) Suspense of occurring of communicable disease or occurring of communicable disease; (d) Occurring of communicable disease which must be informed.
section 11	The project proponent has to allow any inspection, anytime, anywhere if it is need to inspect by health officer.

The Control of Smoking and Consumption of Tobacco Product Law (2006)	
Objectives	To ensure the creation of smoking area and non-smoking area in the power plant area for health and control of smoking.
sub-section (a) of section 9	The project proponent has to keep the caption and mark referring that is non- smoking area in the project area.
sub-section (b) of section 9	The project proponent has to arrange the specific place for smoking in the project area and keep the caption and mark in accordance with the stipulations.
sub-section (c) of section 9	The project proponent has to supervise and carry out the measures so that no one shall smoke at the non-smoking area.
sub-section (d) of section 9	The project proponent has to allow the inspection of supervisory body in the power plant area.
Occupational Safety and Health Law (2019)	
Objectives	To effectively implement measures related to safety and health in every industry and to set occupational safety and health standards.
sub-section (e) of section-26	The project proponent has to provide adequate and relevant personal protective equipment to workers free of charge and make them wear it during work so as not to expose workers to any serious occupational diseases or hazards.
sub-section (l) of section-26	The project proponent has to arrange and display occupational safety and health instructions, warning signs, notices, posters, and signboards.
sub-section (a) of section 30	The worker shall wear or use at all times any protective clothes, equipment and tools provided by the employer for the purpose of safety and health.
sub-section (d) of section 30	The worker shall proper and systematic use any equipment and tools, machines, any parts of the machines, vehicles, electricity and other substances being used at the workplace.
sub-section (e) of section 30	The worker shall take reasonable care for the safety and health of himself/ herself and of other persons who may be affected by his/ her acts or omissions at work
The Myanmar Motor Vehicle Law (2015) and Rules (1987)	
Objectives	When the construction period and if necessary in operation and production period for the all vehicles.
	The project proponent has to promise to abide by the nearly all provisions of said law and rules, especially the provisions related to air pollution, noise pollution and life safety.
The Myanmar Fire Brigade Law (2015)	
Objectives	To ensure to prevent the fire, to provide the precautionary material and apparatuses, if the fire caused in the project area to be defeated because the project is business in which electricity and any inflammable materials such as petroleum are used. So, the project owner has to institute the specific fire service in line with the above

	law.
sub-section (a) of section 25	The project proponent has to institute the specific fire services.
sub-section (b) of section 25	The project owner has to provide materials and apparatuses for fire precaution and prevention.
The Labor Organization Law (2011)	
Objectives	To ensure protection the rights of the employees, having the good relationships between the employees and employer and enabling to form and carry out the labor organizations systematically and independently.
section 17	The project owner has to allow the labor organization to negotiate and settle with the employer if the workers are unable to obtain and enjoy the rights of the workers contained in the labor laws and to summit demands to the employer and claim in accord with the relevant law if the agreement cannot be reached.
section 18	The project proponent has to allow the demand for the re-appointment of worker who is dismissed by the employer without the conformity with the labor laws.
section 19	The project proponent has to send the representatives to the Conciliation Body in settling a dispute between the employer and the worker.
section 20	The project proponent has to allow the labor organization to participate and discuss in discussing with the government, the employer and the complaining employees in respect of employee's rights or interest contained in the labor laws.
section 21	The project proponent has to allow the labor organization to participate in solving the collective bargains of the employees in accord with the labor laws.
section 22	The project proponent has to allow the labor organization to carry out the holding the meetings, going on strike and other collective activities in line with the procedure, regulation ,by-law and directive of relevant Chief Labor Organization .
The Settlement of Labor Dispute Law (2012)	
Objectives	To ensure negotiation and discussion between employees and project proponent, abiding the decision of Tribunal.
section 38	The project proponent has to not absent to negotiation within the stipulated time for complaint
section 39	The project proponent has to not change the existing stipulations for employees within conducting period before tribunal.
section 40	The project proponent has to not close the work without negotiation, discussion on dispute in accord with this law, decision by tribunal.
section 51	The project proponent has to pay the compensation decided by Tribunal if violates any act or any omission to damage the interest of labor by reducing of product without efficient cause.

The Employment and Skill Development Law (2013)	
Objectives	To ensure the job security and to develop the employee's skill with the fund of project owner.
section 5	The project proponent has to appoint employees with the contract
section 14	The project proponent has to carry out the training programs with the policy of Skill Development Body to develop the employment skill of employees who is appointed or will be appointed.
sub-section (a) of section 30	The project proponent has to monthly pay to the fund, which is fund for development of skill of employees, not less below 0.5 percentage of the total payment to the level of worker supervisor and the workers below such level.
sub-section (b) of section 30	The project proponent has to promise not to deduct from the payment of employees for above mentioned fund.
The Minimum Wages Law (2013)	
Objectives	To ensure the project owner pay the wages not less than prescribed wages and notify obviously this wages in work place, moreover to be inspected.
sub-section (a) of section 13	The project proponent has to notify the prescribed wages obviously in work place.
sub-section (b)(c)(d) of section13	The project proponent has to correctly record the lists, schedules, documents and wages and report these to the relevant department and give if these are asked while inspecting, in accord with the stipulations.
sub-section (d) and (e) of section 13 and section 18	The project proponent has to allow to be inspected by the inspector.
sub-section (f) of section 13	The project proponent has to allow holiday for medical treatment if the employee' health is not fit to work.
sub-section (g) of section 13	The project proponent has to allow holidays without deducting from the wages if one of parents or one of family dies.
The Payment of Wages Law (2016)	
Objectives	To ensure the way of payment and avoiding delay payment to the employees.
section 3 & 4	The project proponent has to pay the wages.
section 5	The project proponent has to submit with the agreements of employees & reasonable ground to department if it is difficult to pay because of force majeure included in natural disaster.
section 7 to 13 in chapter (3)	The project proponent has to abide by the provisions of section 7 to 13 in chapter (3) in respect of deduction from wages.
section 14	The project proponent has to pay the overtime fees, prescribed by law, to the employees who work over working hours.
Workmen's Compensation Act (1923)	
Objectives	To ensure the compensations to injured employee while implementing in line with the above law and to pay the prescribed

	compensations in various kinds of injury.
section 13	The project proponent has to pay the compensation in line with the provisions of said law base on kind of injury and case by case.
The Leaves and Holiday Act (1951)	
Objectives	The employees can take the leaves and get the holidays legally and to ensure the right to get the holidays and leaves.
	The project proponent has to allow the leaves and holidays in line with the law.
Social Security Law (2012)	
Objectives	The project proponent has to create the social security for the employees because the project is the business under the Myanmar Citizen Investment Law. To ensure the social security for employees of the project, the project owner has to register to the social security offices and to pay the prescribed fund.
sub-section (a) of section 11	The project proponent has to register to the respected social security office.
section 15	The project proponent has to pay the social security fund for at least four types of social security included in sub-section (a) of section 15.
sub-section (b) of section 18	The project proponent has to pay the fund which has to be paid myself and together with the fund which has to be paid from their salary by the employees .Moreover the project owner will pay the cost for paying the above mentioned fund only myself.
sub-section (b) of section 48	The project proponent has to pay the fund for accidence.
section 75	The project proponent has to make correctly and submit the list and record provided in section 75 to respected social security office.
The Protection and Preservation of Antique Objects Law (2015)	
Objectives	To ensure the protection of ancient monument, to inform about it if it was in the project area.
section 12	The project proponent has to inform to the village-tract or ward administrator if any antique objective is found in project area.
The Protection and Preservation of Ancient Monument Law (2015)	
Objectives	To ensure the protection of ancient monument and information about it if it was in the project area.
section 12	The project proponent has to report to the village-tract or ward administrators if the project proponent will find any ancient monument under the ground or on the ground or under the water.
section 15	The project proponent has to obtain the prior permission of Department of Archaeology and National Museum if the project area is in the prescribed area of Ancient monument.
sub-section (f) of section 20	The project proponent has to obtain the prior permission, by written, of Department of Ancient Research and National Museum if the project proponent disposes the chemical and solid waste in the

	Ancient Monument.
The Protection and Preservation of Cultural Heritage Regions Law (2019)	
Objectives	To ensure the protection of cultural heritage and the cultural heritage area from the damage by the natural disaster or man-made.
section 21	The project proponent has to apply to get the prior permissions of the Regional or State Conservation Committee if the project has in the boundary of world cultural heritage region or national cultural heritage region.
section 36	The project proponent promises not to plough and cultivate or carry out any activity which may cause damage to the cultural heritage within the boundary notified by the Regional or State Conservation Committee or the Regional Conservation Committee.
The Ethnic Rights Protection Law (2015)	
Objectives	To ensure to disclose to residents ethnic nationalities about the project fully, moreover to ensure to cooperate with them.
section 5	The project proponent has to disclose to the residents national races all about the project fully.
	The project proponent has to cooperate with the residents national races.
Forest Law (2018)	
Objectives	to ensure in carrying out the project with the permission of Ministry of Natural Resources and Environmental Conservation if the project land is forest land or forest covered land.
sub- section (a) of section 12	The project proponent has to obtain the permission of Ministry of Natural Resources and Environmental Conservation before starting the work if the project land is forest land or forest covered.
The Protection of Biodiversity and Protected Area Law (2018)	
Objectives	to ensure abiding by the prohibitions and stipulations to protect biodiversity and protected area
sub-section (a) of section35	The project proponent has to avoid entering the prohibited area located in protected area without permission.
sub-section (c) of section35	The project proponent has to avoid digging on the land or carrying out any activity in protected area.
sub-section (d) of section35	The project proponent has to avoid extracting, collecting or destroying in any manner, any kind of wild or cultivated plant in protected area.
sub-section (a) of section39	The project proponent has to avoid polluting soil, water and air, damaging a water-course or poisoning water, electrification, using chemical or explosive materials in protected area.
sub-section (b) of section39	The project proponent has to avoid possessing or disposing of toxic objectives or mineral wastes in protected area.
The Conservation of Water Resources and Rivers Law (2006)	
Objectives	The project proponent will avoid the disposal of stipulated materials

	into river-creek.
sub-section (a) of section 8	The project proponent has to avoid any act to damage to the Hlaing river, any creek and water resource.
sub-section (a) of section 11	The project proponent has to avoid disposing the fuel, chemicals, toxic substances, other substances and explosive substances from the bank to the Hlaing river.
section 19	The project proponent has to avoid disposing any material, which may damage or change the water way, from the bank to the Hlaing river.
sub-section (a) of section 21	The project proponent has to avoid constructing the toilets, which are not suitable, at the bank.
sub-section (b) of section 21	The project proponent has to avoid digging the well or lake and digging the soil without permission of the Directorate.
section 22	The project proponent has to avoid putting the heavy materials in the bank without permission of the Directorate.
sub-section (b) of section 24	The project proponent has to avoid the violation of conditions stipulated by the Directorate for prevention of water pollution
Underground Water Act (1930)	
Objectives	to ensure to obtain the license before sinking the underground water and to abide by the conditions in license.
section 3	The project owner will obtain the license granted by the water officer for sinking the underground water before sinking water.
sub-section (a) of section 6	The project proponent has to abide by the conditions prescribed by rules.
The Petroleum and Product of Petroleum Law (2016)	
Objectives	The project will transport and store the fuel in any phrase. To ensure to take the license for importation and storage and abide by the stipulations in the license
sub-section (a) of section 9	The project proponent has to transport the fuel by the vehicle or vessel which is licensed by the Ministry of Transportation and Communication
sub-section (e) of section 9	The project proponent has to abide by the procedures and conditions specified by the Ministry of Transportation and Communication
sub-section (b) of section 10	The project proponent has to transport after obtaining the transportation license issued by the Ministry of Natural Resource and Environmental Conservation
sub-section (d) of section 10	The project proponent has to store the fuel in the tank which is licensed by the Ministry of Natural Resource and Environmental Conservation under sub-section (a) of section 10 of said law.
sub-section (a) of section 10	The project proponent has to store the fuel in the tank which is licensed by the Ministry of Natural Resource and Environmental Conservation
section 11	The project proponent has to show the notice of danger on the tank

	or container of fuel
Natural Disaster Management Law (2013)	
Objectives	to implement natural disaster management programs and to coordinate with national and international organizations in carrying out natural disaster management activities; to conserve and restore the environment affected by natural disaster and to provide health, education, social and livelihood programmes in order to bring about better living conditions for victims.
sub-section (a)(i) of section-13	The project proponent has to perform preparatory and preventive measures for natural disaster risks reduction before the natural disaster strikes
sub-section (a)(iii) of section-13	The project proponent has to undertake rehabilitation and reconstruction activities for improving better living standard after the natural disaster strikes and conservation of the environment that has been affected by natural disaster
sub-section (b) of section-14	The project proponent has to carry out better improvement on early warning system of natural disaster
sub-section (d) of section-14	The project proponent has to carry out together with the measures of natural disaster risk reduction in development plans of the State
section-25	Whoever if the natural disaster causes or is likely to be caused by any negligent act without examination or by willful action which is known that a disaster is likely to strike, shall be punished with imprisonment for a term not exceeding three years and may also be liable to fine
section-26	Whoever interferes, prevents, prohibits, assaults or coerces the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding two years or with fine or with both
section-29	Whoever violates any prohibition contained in rules, notifications and orders issued under this law shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both
sub-section (a) of section-30	Whoever willful failure to comply with any of the directives of the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both
The Farm Land Law (2012)	
Objectives	To ensure the right to use the farm land and sufficient compensation for acquisition of the farm land. This law focuses the following matters;
section 26	The project owner has to abide by the decision of relevant Ministry

	with the coordination with the Central Administrative Body of the Farmland for paying the compensation if it is needed acquisition farm land
sub-section (a) of section 30	The project proponent has to obtain the permission of the Central Administrative Body of Farmland for the land use change from paddy field land to other land use
sub-section (b) of section 30	The project proponent has to obtain the permission of the Yangon Region Government with the recommendation of Yangon Region Administrative Body of Farmland for the land use change from farm land other than paddy field land to other land use
Myanmar Port Authority Law (2015)	
Objectives	To ensure that any natural resources within a port are free and safe from all dangerous and toxic materials and so far from any unsafe activities.
sub-section (b) of section 80	The project proponent shall not discharge, dispose or cause to fall dangerous materials, toxic materials, garbage, sludge and waste from the vessels, above and underwater natural resource exploration rigs and structures within a port limit
sub-section (c) of section 80	The project proponent shall not discharge, dispose or cause to fall other materials which cause obstacle to the navigation, from the vessels, into a port
sub-section (d) of section 80	The project proponent shall not dispose or drop the materials that may slide into the port because of tide, storm or flood on land
sub-section (b) of section 81	The project proponent shall not, without permission of the Myanmar Port Authority, wield or heat pitch, tar, resin, dammar, turpentine, oil or other flammable materials on board a vessel or at the restricted area within a port

6. DESCRIPTION OF THE SURROUNDING ENVIRONMENTAL AND SOCIAL CONDITIONS

6.1 Methodology for Data Collection and Analysis

This section presents the general description of the status of the existing environment in the project area. It also allows for identification of sensitive environmental features and possible receptors of the effects of the proposed project. In the EMP study, it is necessary to establish baseline information on the environmental and socio-economic setting of a project area that could receive impacts from the project.

For preparation purposes of this EMP Report, the following two methodologies have been used for baseline data collection and analysis.

(a) Secondary Data Collection and Analysis

Some data such as socioeconomic conditions, physical/biological environment and weather data are collected from official Township Data and analyzed by the study team. The baseline data of the Mudon Township was collected from the Township Data published by General Administration Department in 1st March, 2019.

(b) Onsite Measurement and Analysis

Baseline parameters such as air quality, odor, noise, vibration and water quality of the existing project site during the Pre-construction are measured on site and some water quality parameters are measured at respective laboratories and results are mentioned in this Chapter. The laboratory results of some water quality parameters are attached in Appendix C.

The objective of the EMP baseline data collection is to present the general description of the environmental as primary data collection. The methodology is designed to assess the baseline data of the environmental quality factors for Mon Petrol Project. Baseline environmental parameters are defined according to the guideline which applies to projects dedicate to Mon Petrol Project. All necessary criteria such as site selections for sampling and analysis of ambient air quality, water quality, noise level and vibration assessment of the project site were identified by E Guard.

6.2 Physical

6.2.1 Study Area

The proposed project (study area) which is located in Mudon Township has already mentioned in project description in details. Mudon Township is located in Mawlamyaing District, Mon State of Southern Myanmar. Mudon Township is situated at coordinate points of North Latitude between 15º 57' 0" and 16º 25' 0", East Longitude between 97º 35' 0" and 97º 53' 0". The township has total area of 314.69 square mile. Also the total area of Kamarwat Township is about 22.44 square miles. The township shares borders with Kyeik Ma Raw Township and Kyar Inn Seik Gyi Township in the East, Chaung Zone Township in the West, Than Byu Zayat Township in the South, and Mawlamyaing Township in the North.

6.2.2 Land Use

The land use of township is presented in this section. The net agricultural area of the Mudon Township is 114,945 acres. The pastureland is about 4067 acres. The industrial land use is

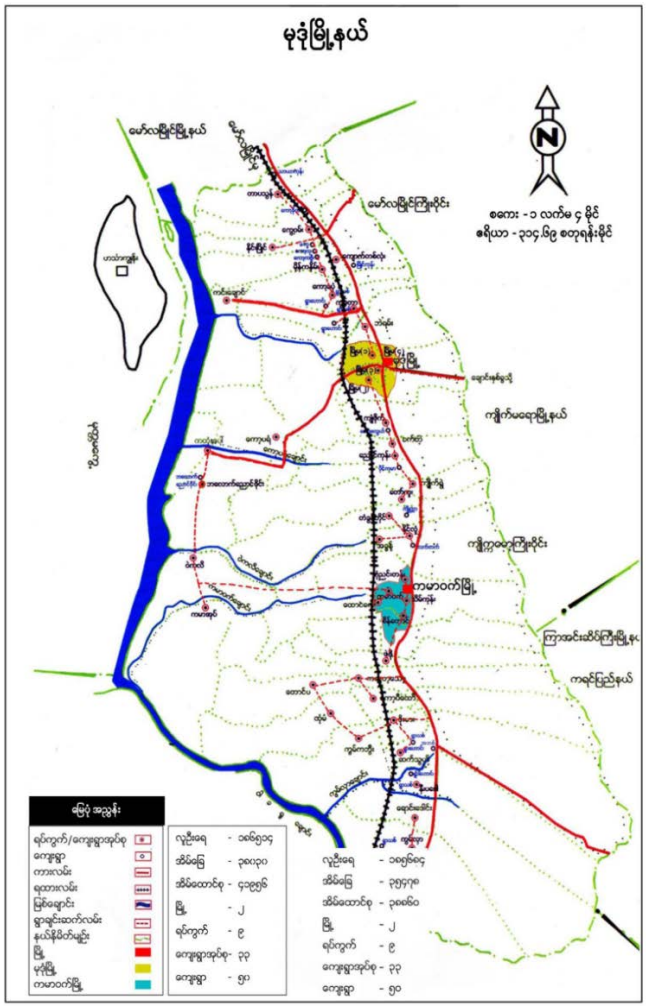
200 acres. The urban area is 1436 acres and the rural area, 4866 acres. The store land use is 3006 acres. The other land use is 8876 acres. The reserved forest area is 33507acres. The wild land is 31 acres and the area which cannot be used for agricultural purposes is about 30469 acres. Therefore, the total land use of the township is 201,403 acres.

6.2.3 Topography

The topography of Mudon Township is gradually lower from Eastern to Western parts. The wards and villages of the township are flat ground. The elevation of the township is about 31 feet above sea level. The highest mountain of the township is Kyeik Ka Mat Gyi Mountain with 1875 feet height. The highest part of the township is Myoma (4) Ward and the lowest part is Kin Chaung Village.

6.2.4 Geology

Information on geotechnical characteristics of study area is not available. In addition, there is no major earthquake recorded in the study area.



Source: Township Data (2019)

Figure 6. 1 Urban Map of Mudon Township

6.2.5 Climate

The study area has hot and wet climate characterized by three distinct seasons namely, summer, rainy and cool seasons. The mean monthly temperatures of Mudon Township are highest temperature of 37ºC and lowest temperature of 14.8ºC. In 2018, the highest temperature is 38ºC and the lowest is 14.2ºC. The township has total raining days of 114 days with rainfall intensity of 174.08 inches in this year.

6.2.6 Hydrology

The creeks of the township such as Welkhali Creek, Kamarpade Creek, Azin Creek, Kyone Fight Creek and Winphanom Creek, are flowing from East to West.

6.2.7 Environmental Quality Measuring for Physical Environment

Baseline environmental parameters and sampling locations for air, noise and water monitoring were defined according to the objectives of the environmental monitoring purposes. Locations for sampling and analysis of ambient air quality of the project site were identified by E Guard.

(i) Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites by using the Environmental Perimeter Air Station (EPAS), and EPAS provides direct readings in real time with data-logging capabilities. The monitoring results were compared with National Environmental Quality (Emission) Guidelines (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 6. 1 Ambient Air Quality Parameters

Ambient Air Quality	
Gas Emission	CO_2, CO, SO_2, NO_2, O_3
Dust Emission	PM_{10}, $PM_{2.5}$

(ii) Ambient Noise and Vibration

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Meter. The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument’s manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural Resources and Environment Conservation (MONREC). "National Environmental Quality (Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 6. 2 Noise level monitoring

Noise monitoring	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

Equipment used to measure ambient air and noise measurement are shown below.

Table 6. 3 Equipment used to measure ambient air and noise measurement

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	

Vibration Level Meter **VM-55**	
Aeroqual S 500	

(iii) Water Quality

Water Samples were collected on site with appropriate sampling equipment and procedures. Physical parameters such as pH, electrical conductivity, turbidity, salinity, DO, Temperature of surface and ground water were measured on site by portable multi parameter water quality meter. The sampling team has pre-arranged with the labs in Yangon for analysis and logistic arrangement made to reach the preserved samples to the designated labs within 48hrs.

The sampling and survey team has a list of local laboratories providing analytical services for water quality analysis. Up to this date, there is no laboratory having accredited certification for water quality testing (environmental analysis) in Myanmar.

The following laboratories were used for analysis of water and parameters shown in below table.

1. ISO Lab, No-18, Lanthit Road, Insein Township, Yangon. Tel; 01 540 955, 732251575
2. SGS Minerals and Environmental Services, No. 79D, Bo Chain Street, 6-1/2Miles, Hlaing Township, Yangon. Tel; 01 654 795, 654 796

Table 6. 4 Environmental Quality Parameters for Water quality

Water Quality Parameter	
Chemical Parameter	BOD, COD
Physical Parameter	pH, Total Suspended Solid
Nutrients	Total Nitrogen, Total Phosphorous
Compounds	Oils & grease
Biological	Total Coliform Bacteria

On-site water quality measurements, water samplings are conducted using the following equipment as shown in below table.

Table 6. 5 Equipment for water sampling

Water Sampling Bottle	

(iv) Soil Quality

Soil samples were collected on site with appropriate sampling equipment and procedures. The sampling team has pre-arranged with the labs in Yangon for analysis and logistic arrangement made to reach the preserved samples with unique IDs to the designated labs.

The sampling and survey team has a list of local laboratories providing analytical services for soil quality analysis. Up to this date, there is no laboratory having accredited certification for soil quality testing (environmental analysis) in Myanmar.

The following laboratories were used for analysis of soil parameters shown in Table.

1. REM-UAE Laboratory and Consultant Co.,Ltd B702 Delta Plaza, Shwegondaing Road, Bahan, Yangon,11201, Myanmar. Tel; 0973013448, 095144005, 095376382

Table 6. 6 Environmental Quality Parameters

Soil (2 locations)	
Soil Parameter	pH, Chromium, Lead, Nickel, Cadmium, Arsenic

On-site water quality measurements, water, soil and sediment samplings are conducted using the following equipment.

Soil Sampler (One Piece Auger) Augers are used for sampling to depths of 8'. These soil augers use snap pins to lock the cross handle, two concentric extendable extension pieces, and the bucket auger together. It is designed for easy transport and storage. Telescoping augers are just 5' 4" long and weigh between 5 to 8 lbs.	

6.2.8 Monitoring and Sampling Locations and Results

Locations of sampling sites were discussed briefly by E Guard. Air quality was monitored at the selected locations Mon Petrol Project Site (Source) and Kawpalyn Village (Receptor) that are within the ambient air quality monitoring. Water quality sampling locations consist of 3 surface water location (SW1 at Road Way of Kawpalyn Village, SW2 at Road Way of Mon Petrol Project and SW3 at Kadone Paw Village) and Ground water location (GW at Kawpalyn Village). Soil quality sampling location consist of 2 soil locations (Soil 1 at Kawpalyn village and Soil 2 at Mon Petrol Project Site).

Figure 6. 2 Air Quality Monitoring Locations

Figure 6. 3 Water Quality Monitoring Locations

Figure 6. 4 Soil Quality Sampling Locations

Table 6. 7 Location of sampling points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality Monitoring Locations			
1	Air 1	Lat- 16°13'22"N, Long- 97°38'34"E	Project Site
2	Air 2	Lat- 16° 13'0"N, Long- 97°40'39"E	Kawpalyn Village
Surface Water Quality Sampling Locations			
1	SW 1	Lat- 16°13'24"N, Long- 97°41'0"E	Road Way of Kawpalyn Village
2	SW 2	Lat- 16°13'24"N, Long- 97°39'7"E	Road Way of Mon Petrol Project Site
3	SW 3	Lat- 16°12'32"N, Long- 97°38'25"E	Kadone Paw Village
Ground Water Quality Sampling Locations			
1	GW	Lat- 16°13'0"N, Long- 97°40'40"E	Kawpalyn Village
Soil Quality Sampling Locations			
1	Soil 1	Lat- 16°13'23"N, Long- 97°41'1"E	Kawpalyn Village
2	Soil 2	Lat- 16°13'24"N, Long- 97°39'7"E	Project Site

(i) Ambient Air Quality

Air quality monitoring was done 24 hours at each selected location from 1 September 2019 to 3 September 2019. The measured results are compared with National Emission Guidelines.

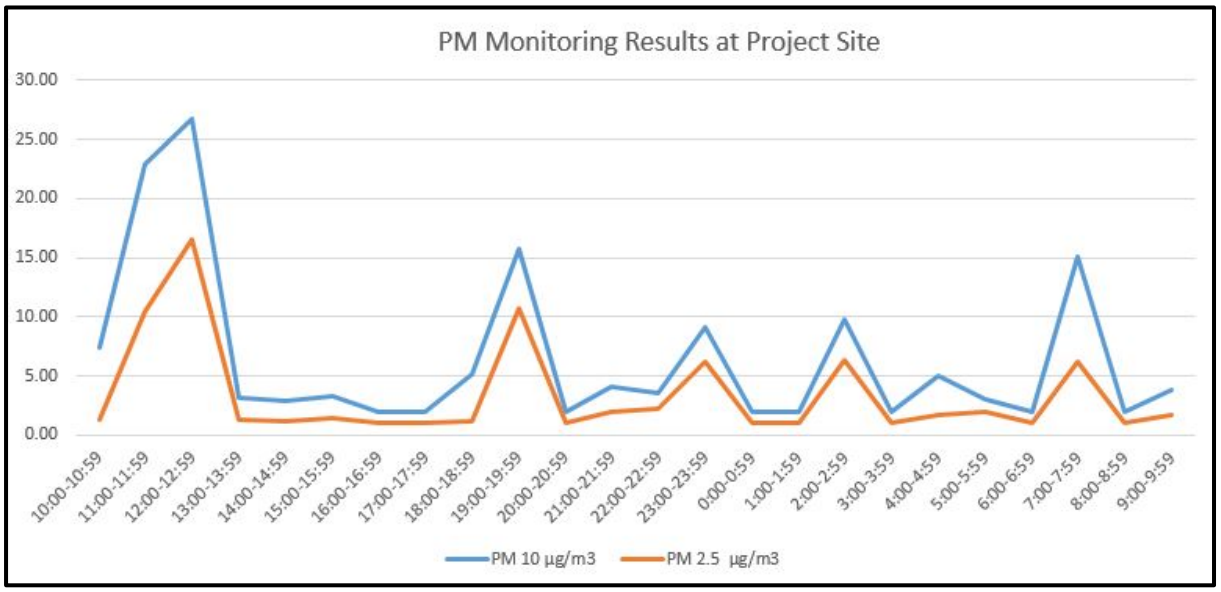


Figure 6. 5 PM Monitoring Results at Project Site

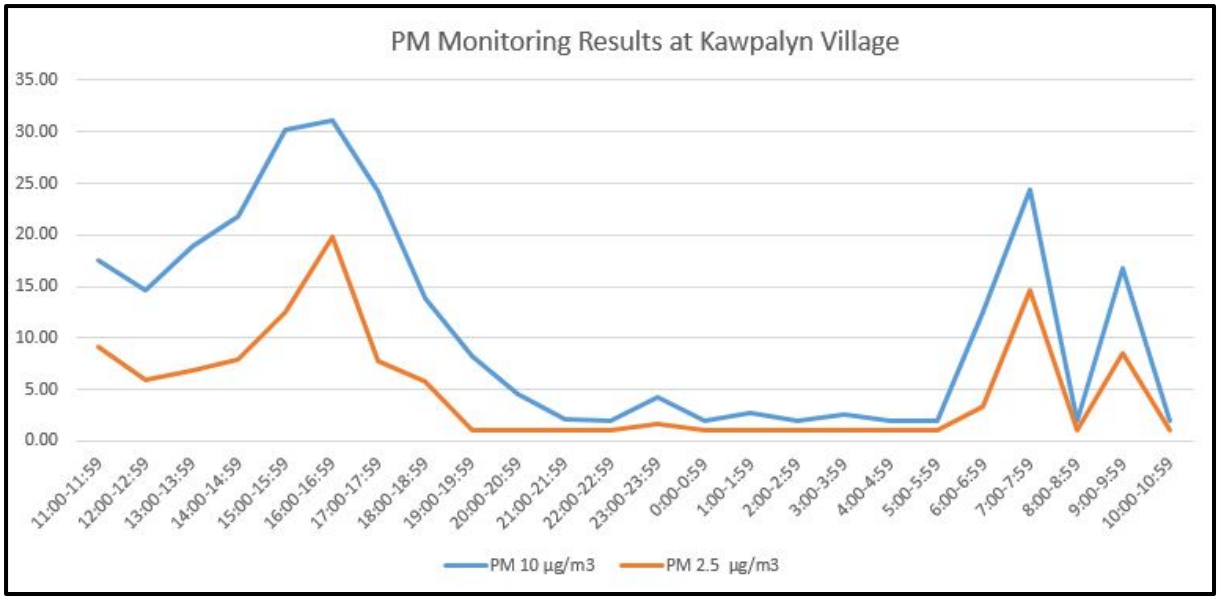


Figure 6. 6 PM Monitoring Results at Kawpalyn Village

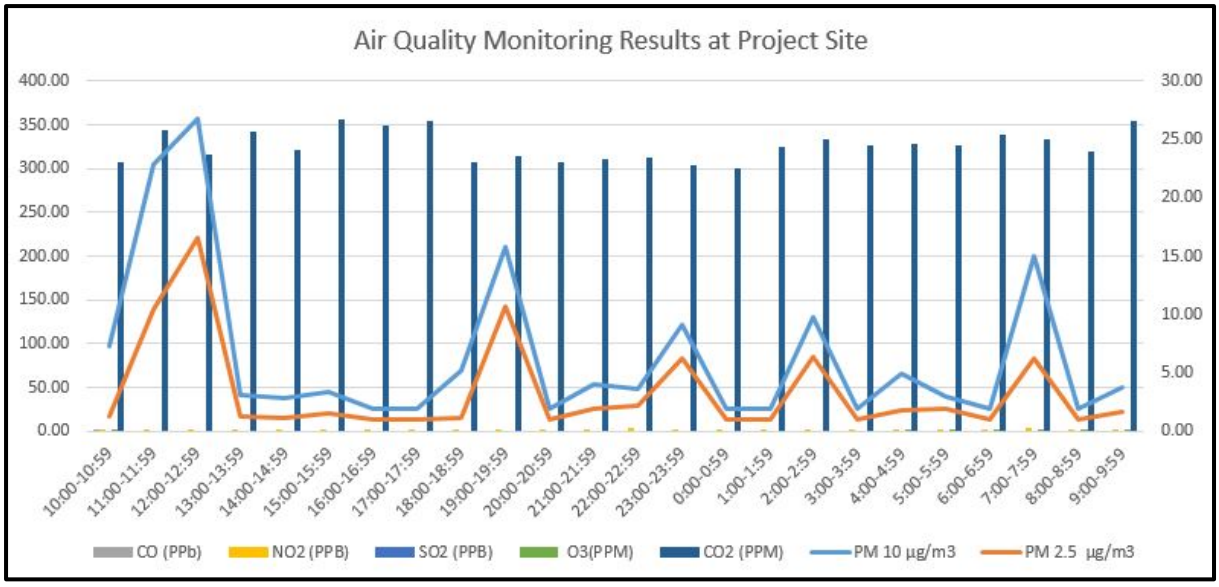


Figure 6. 7 Fluctuation of Air Pollutants during dial cycle (Project Site)

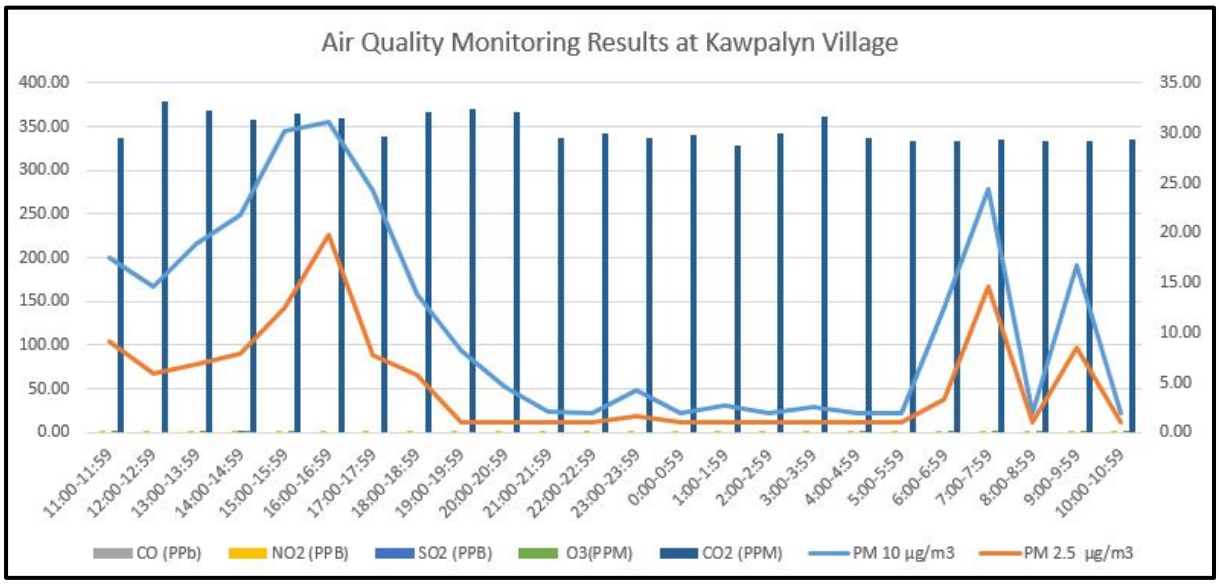


Figure 6. 8 Fluctuation of Air Pollutants during dial cycle (Kawpalyn Village)

Table 6. 8 Air Monitoring Results (Project Site)

Date	Time		PM 10 µg/m^3	PM 2.5 µg/m^3	CO (PPB)	NO_2 (PPB)	SO_2 (PPB)	O_3(PPM)	CO_2 (PPM)
1.9.2019	10:00-10:59	Average	7.33	1.25	0.18	2.92	0.00	0.0002	308.18
1.9.2019	11:00-11:59	Average	22.92	10.42	0.00	2.50	0.00	0.0000	344.68
1.9.2019	12:00-12:59	Average	26.75	16.58	0.00	2.00	0.00	0.0000	316.03
1.9.2019	13:00-13:59	Average	3.17	1.25	0.00	3.00	0.00	0.0000	343.07
1.9.2019	14:00-14:59	Average	2.83	1.17	0.00	2.33	0.00	0.0000	320.93
1.9.2019	15:00-15:59	Average	3.33	1.50	0.00	2.00	0.00	0.0000	355.45
1.9.2019	16:00-16:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	349.02
1.9.2019	17:00-17:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	354.63
1.9.2019	18:00-18:59	Average	5.17	1.17	0.00	3.08	0.00	0.0000	307.53
1.9.2019	19:00-19:59	Average	15.75	10.75	0.00	2.00	0.00	0.0000	313.83
1.9.2019	20:00-20:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	307.12
1.9.2019	21:00-21:59	Average	4.08	1.92	0.00	2.00	0.00	0.0000	310.22
1.9.2019	22:00-22:59	Average	3.58	2.17	0.00	3.33	0.00	0.0000	313.35
1.9.2019	23:00-23:59	Average	9.17	6.25	0.00	2.00	0.00	0.0000	304.03
2.9.2019	0:00-0:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	300.95
2.9.2019	1:00-1:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	324.32
2.9.2019	2:00-2:59	Average	9.75	6.33	0.00	2.00	0.00	0.0000	334.30
2.9.2019	3:00-3:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	325.97
2.9.2019	4:00-4:59	Average	5.00	1.75	0.00	2.42	0.00	0.0003	327.85
2.9.2019	5:00-5:59	Average	3.00	1.92	0.00	2.00	0.00	0.0003	325.83
2.9.2019	6:00-6:59	Average	2.00	1.00	0.00	2.00	0.00	0.0006	339.65
2.9.2019	7:00-7:59	Average	15.08	6.25	0.00	3.33	0.00	0.0095	334.13
2.9.2019	8:00-8:59	Average	2.00	1.00	0.00	2.00	0.00	0.0061	320.37
2.9.2019	9:00-9:59	Average	3.83	1.67	0.00	2.00	0.00	0.0014	355.10
Average			6.53	3.35	0.01	2.29	0.00	0.0008	326.52
1 hour Maximum			26.75	16.58	0.18	3.33	0.00	0.0095	355.45
1 hour Minimum			2.00	1.00	0.00	2.00	0.00	0.0000	300.95

Table 6. 9 Air Monitoring Results (Kawpalyn Village)

Date	Time		PM 10 µg/m^3	PM 2.5 µg/m^3	CO (PPB)	NO_2 (PPB)	SO_2 (PPB)	O_3(PPM)	CO_2 (PPM)
2.9.2019	11:00-11:59	Average	17.50	9.08	0.00	2.00	0.00	0.0003	336.83
2.9.2019	12:00-12:59	Average	14.58	6.00	0.00	3.08	0.00	0.0000	379.66
2.9.2019	13:00-13:59	Average	18.83	6.83	0.00	2.83	0.00	0.0065	368.33
2.9.2019	14:00-14:59	Average	21.83	7.92	0.00	2.00	0.25	0.0113	357.37
2.9.2019	15:00-15:59	Average	30.25	12.42	0.00	2.00	0.00	0.0051	364.77
2.9.2019	16:00-16:59	Average	31.17	19.83	0.00	2.00	0.00	0.0000	359.10
2.9.2019	17:00-17:59	Average	24.25	7.75	0.00	2.00	0.00	0.0000	338.97
2.9.2019	18:00-18:59	Average	13.92	5.75	0.00	2.67	0.00	0.0000	366.02
2.9.2019	19:00-19:59	Average	8.17	1.00	0.00	2.00	0.00	0.0000	370.12
2.9.2019	20:00-20:59	Average	4.58	1.00	0.00	2.00	0.00	0.0000	366.25
2.9.2019	21:00-21:59	Average	2.17	1.00	0.00	2.00	0.00	0.0000	337.85
2.9.2019	22:00-22:59	Average	2.00	1.00	0.00	2.50	0.00	0.0000	341.63
2.9.2019	23:00-23:59	Average	4.25	1.58	0.00	2.17	0.00	0.0000	336.87
3.9.2019	0:00-0:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	340.27
3.9.2019	1:00-1:59	Average	2.75	1.00	0.00	2.00	0.00	0.0000	328.93
3.9.2019	2:00-2:59	Average	2.00	1.00	0.00	2.00	0.00	0.0000	341.78
3.9.2019	3:00-3:59	Average	2.50	1.00	0.00	2.00	0.00	0.0000	361.20
3.9.2019	4:00-4:59	Average	2.00	1.00	0.00	2.00	0.00	0.0004	337.87
3.9.2019	5:00-5:59	Average	2.00	1.00	0.00	2.00	0.00	0.0001	334.37
3.9.2019	6:00-6:59	Average	12.42	3.33	0.00	2.00	0.00	0.0058	333.42
3.9.2019	7:00-7:59	Average	24.33	14.58	0.00	2.00	0.00	0.0066	335.57
3.9.2019	8:00-8:59	Average	2.00	1.00	0.00	2.00	0.00	0.0078	333.92
3.9.2019	9:00-9:59	Average	16.83	8.58	0.00	2.42	0.00	0.0188	333.53
3.9.2019	10:00-10:59	Average	2.00	1.00	0.00	2.00	0.00	0.0121	334.92
Average			11.01	4.82	0.00	2.15	0.01	0.0031	347.48
1 hour Maximum			31.17	19.83	0.00	3.08	0.25	0.0188	379.66
1 hour Minimum			2.00	1.00	0.00	2.00	0.00	0.0000	328.93

Table 6. 10 Air Emission Levels (Standard)

No.	Parameter	Unit	Maximum Concentration	
			National	Average Period
1	Sulfur dioxide	µg/m^3	20 500	24-hour 10-minute
2	Nitrogen dioxide	µg/m^3	40 200	1 year 1 hour
3	Particulate matter PM_{10}	µg/m^3	20 50	1-year 24-hour
4	Particulate matter $PM_{2.5}$	µg/m^3	10 25	1-year 24-hour
5	Ozone	µg/m^3	100	8-hour

As per above tables, it can be seen that All parameters measured are under the National Environmental Quality (Emission) Guideline (NEQG).

Table 6. 11 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Value		Guidelines Value	Unit	Averaging Period
	Project Site	Kawpalyn Village			
CO_2	336.50	358.88	5000	ppm	8hrs
CO	0.00002	0	9	ppm	8hrs
PM_{10}	6.53	11.01	50	µg/m^3	24hrs
$PM_{2.5}$	3.35	4.82	25	µg/m^3	24hrs
SO_2	0	0.027	20	µg/m^3	24hrs
NO_2	6.27	5.79	200	µg/m^3	1hrs
O_3	0.0044	0.0126	100	µg/m^3	8hrs

(ii) Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at two point: these points are project site (Source) and Kadone Paw village (Receptor) on 1 September to 2 September 2019. Measuring period is 24 hours continuously. The observed values are described in the following tables and the following figures are noise level measurement at the proposed project.

Table 6. 12 Observed Values of Noise Level Measurement at Project Site

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	2.9.2019	7:00:13-7:59:13	49.58	A	Day	49.10
2	2.9.2019	8:00:13-8:59:13	48.62	A	Day	

3	2.9.2019	9:00:13-9:59:13	49.91	A	Day	
4	1.9.2019	10:00:13-10:59:13	48.83	A	Day	
5	1.9.2019	11:00:13-11:59:13	51.08	A	Day	
6	1.9.2019	12:00:13-12:59:13	50.64	A	Day	
7	1.9.2019	13:00:13-13:59:13	53.54	A	Day	
8	1.9.2019	14:00:13-14:59:13	50.83	A	Day	
9	1.9.2019	15:00:13-15:59:13	49.80	A	Day	
10	1.9.2019	16:00:13-16:59:13	49.76	A	Day	
11	1.9.2019	17:00:13-17:59:13	45.96	A	Day	
12	1.9.2019	18:00:13-18:59:13	48.94	A	Day	
13	1.9.2019	19:00:13-19:59:13	46.97	A	Day	
14	1.9.2019	20:00:13-20:59:13	45.19	A	Day	
15	1.9.2019	21:00:13-21:59:13	46.86	A	Day	
16	1.9.2019	22:00:13-22:59:13	55.98	A	Night	
17	1.9.2019	23:00:13-23:59:13	42.62	A	Night	
18	2.9.2019	0:00:13-0:59:13	45.41	A	Night	
19	2.9.2019	1:00:13-1:59:13	54.70	A	Night	
20	2.9.2019	2:00:13-2:59:13	51.11	A	Night	50.95
21	2.9.2019	3:00:13-3:59:13	52.87	A	Night	
22	2.9.2019	4:00:13-4:59:13	50.58	A	Night	
23	2.9.2019	5:00:13-5:59:13	53.20	A	Night	
24	2.9.2019	6:00:13-6:59:13	52.10	A	Night	
Average			**49.79**			

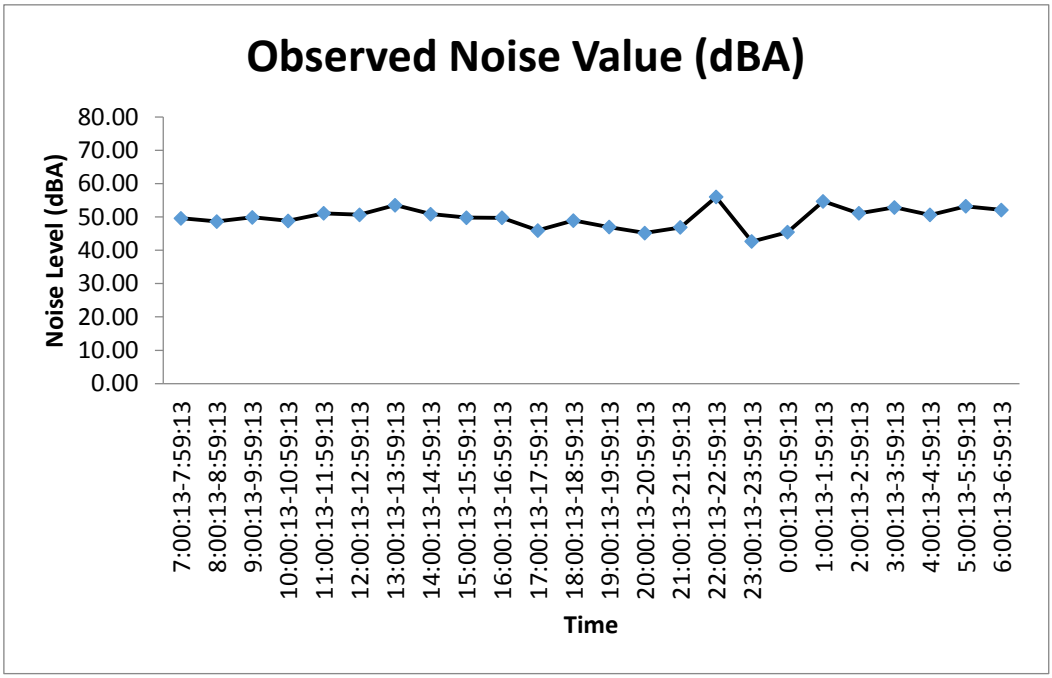


Figure 6. 9 Noise Level at Project Site

Table 6. 13 Observed Values of Noise Level Measurement at Kadone Paw Village

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	2.9.2019	7:00:13-7:59:13	61.04	A	Day	
2	2.9.2019	8:00:13-8:59:13	61.07	A	Day	
3	1.9.2019	9:00:13-9:59:13	63.84	A	Day	
4	1.9.2019	10:00:13-10:59:13	64.62	A	Day	
5	1.9.2019	11:00:13-11:59:13	65.38	A	Day	
6	1.9.2019	12:00:13-12:59:13	64.83	A	Day	
7	1.9.2019	13:00:13-13:59:13	64.66	A	Day	
8	1.9.2019	14:00:13-14:59:13	64.63	A	Day	64.28
9	1.9.2019	15:00:13-15:59:13	65.47	A	Day	
10	1.9.2019	16:00:13-16:59:13	64.69	A	Day	
11	1.9.2019	17:00:13-17:59:13	65.71	A	Day	
12	1.9.2019	18:00:13-18:59:13	65.62	A	Day	
13	1.9.2019	19:00:13-19:59:13	64.26	A	Day	
14	1.9.2019	20:00:13-20:59:13	64.13	A	Day	
15	1.9.2019	21:00:13-21:59:13	64.18	A	Day	
16	1.9.2019	22:00:13-22:59:13	64.09	A	Night	
17	1.9.2019	23:00:13-23:59:13	63.78	A	Night	
18	2.9.2019	0:00:13-0:59:13	64.28	A	Night	
19	2.9.2019	1:00:13-1:59:13	65.20	A	Night	
20	2.9.2019	2:00:13-2:59:13	65.63	A	Night	63.91
21	2.9.2019	3:00:13-3:59:13	63.61	A	Night	
22	2.9.2019	4:00:13-4:59:13	62.84	A	Night	
23	2.9.2019	5:00:13-5:59:13	63.45	A	Night	
24	2.9.2019	6:00:13-6:59:13	62.30	A	Night	
Average			**64.14**			

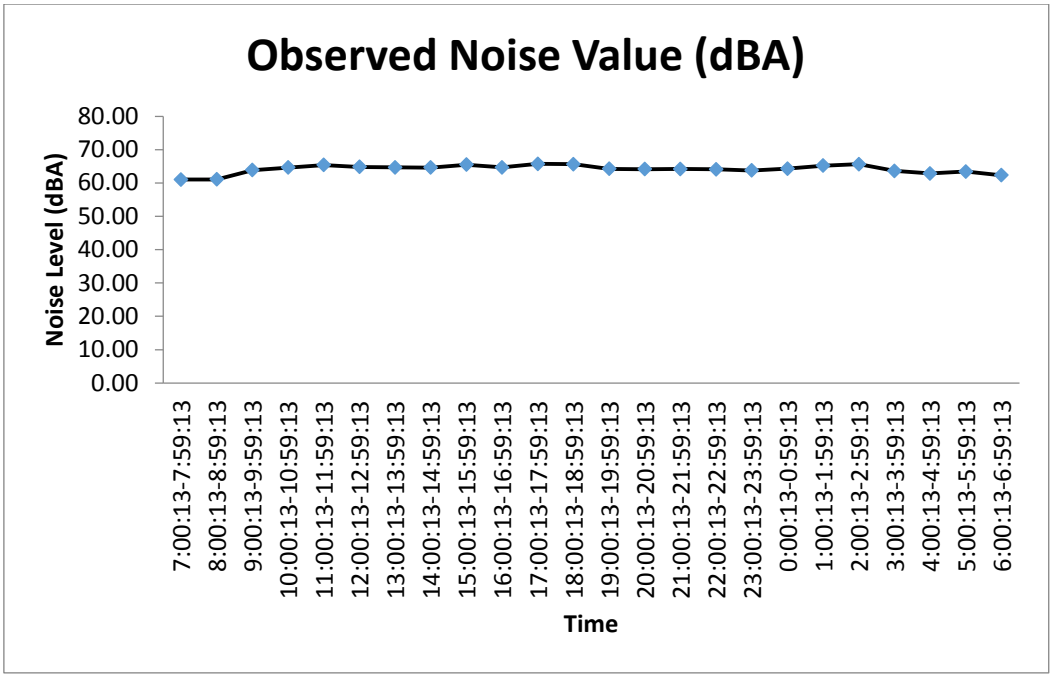


Figure 6. 10 Noise Level at Kadone Paw Village

Table 6. 14 Observed Ambient Noise level Results from Selected Points

Point	Project Site		Kadone Paw village	
	Day Time	Night Time	Day Time	Night Time
	49.10	50.95	64.28	63.91
Guideline Values	70	70	55	45

The observed values are compared with the National Environmental Quality (Emission) Guidelines which indicates the separate level for industrial points.

The proposed project is located adjacent to the industrial area. The observed daytime and night time values of Project Site are lower than the National Environmental Quality (Emission) Guidelines. The observed daytime and night time values of Kadone Paw Village are higher than the National Environmental Quality (Emission) Guidelines because this monitoring location is near Kadone Paw village. This is fishing village. So, this village is near Thanlyin River. This river is passing through more schooner at daytime and nighttime. So, the observed daytime and night time values of Kadone Paw Village are higher than the National Environmental Quality (Emission) Guidelines.

Table 6. 15 Summary of Vibration Survey

Location	**X-Lveq (dB)**		**Y-Lveq (dB)**		**Z-Lveq (dB)**	
	Day Time 7:00-22:00	**Night Time 22:00-7:00**	**Day Time 7:00-22:00**	**Night Time 22:00-7:00**	**Day Time 7:00-22:00**	**Night Time 22:00-7:00**
Project Site	29.53	28.28	28.38	28.61	26.21	28.20
Kawpalyn Village	45.93	39.10	32.71	33.21	25.98	24.45

Table 6. 16 Regulatory Standards for Vibration Emitted from Specified Factories (Summary)

Time Area	Day Time	Night Time	Applicable Areas
Ⅰ	60-65 dB	55-60 dB	Areas where maintenance of quiet is particularly needed to preserve a good living environment and where quiet is needed for as they are used for residential purposes.
Ⅱ	65-70 dB	60-65 dB	Areas used for commercial and industrial as well as residential purposes where there is a need to preserve the living environment of local residents and areas mainly serving industrial purposes which are in need of measures to prevent the living environment of local residents from deteriorating.

There is still no official released vibration guidelines in Myanmar. Therefore, Japan vibration guidelines are used to analyze the current vibration results of this project. These results are within the Japan vibration guidelines.

(iii) Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 1 September to 3 September 2019 respectively. According to the data, the wind direction is following the Figure.

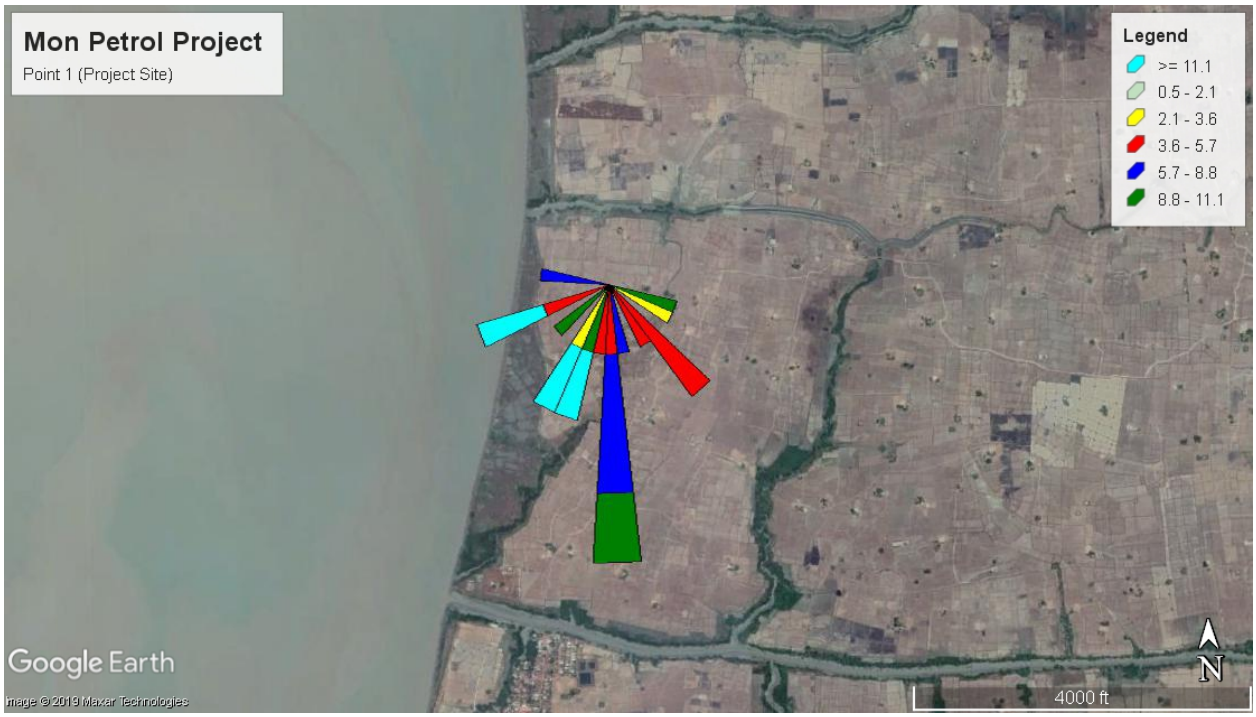


Figure 6. 11 Wind Speed and Wind Direction (Blowing From) at Project Site

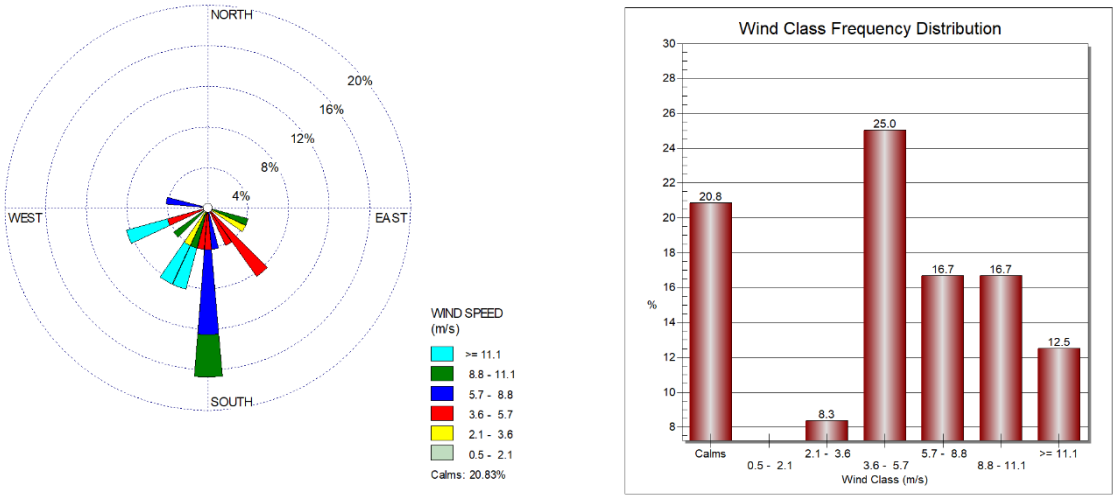


Figure 6. 12 Wind Class Frequency Distribution at Project Site

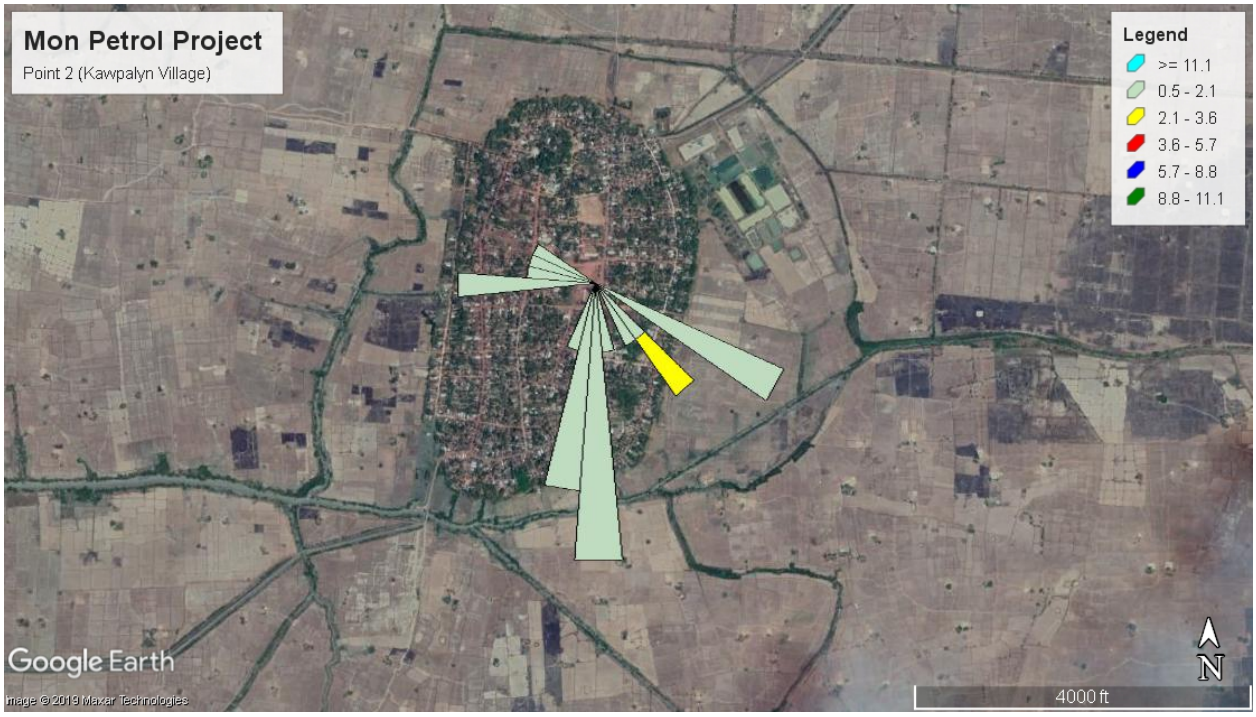


Figure 6. 13 Wind Speed and Wind Direction (Blowing From) at Kawpalyn Village

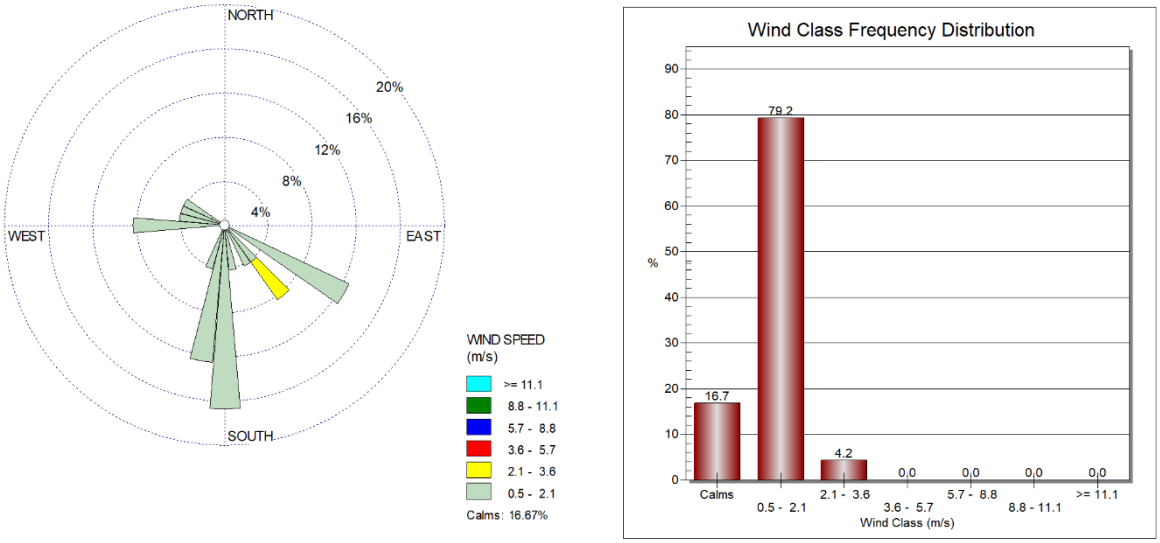


Figure 6. 14 Wind Class Frequency Distribution at Kawpalyn Village

(iv) Water Quality Standards

Currently, Myanmar does not have surface water quality standards for major rivers and its tributaries, natural and man-made streams or lakes, ground water, or reservoir water. Environmental conservation department is in the process of developing National Ambient Water Quality Standards based on the protection of aquatic life. It is recommended by the environmental specialist to compare the measured water quality results with the standards shown in below.

Groundwater Quality Standards

Ambient Water Quality Standards, shall apply to both surface and groundwater since the environmental values which they protect relate to the same above ground uses (e.g. drinking water, irrigation, and maintenance of aquatic ecosystems).

Table 6. 17 Ambient water quality standards for the protection of aquatic life

Parameter	Unit	Concentration	Reference
Aluminum	mg/l	0.005 (if pH < 6.5) 0.1 (if pH > 6.5)	Australian and New Zealand guidelines for fresh and marine water quality. 2000. Australian and New Zealand Environment Conservation Council. Water Quality Guidelines for the Protection of Aquatic Life. 2016. Canadian Council of Ministers

			of the Environment. Metal mining technical guidance for environmental effects monitoring. 2012. Environment Canada.
Ammonia	mg/l	0.02	As above
Arsenic	mg/l	0.05	As above
Boron	mg/l	0.5	As above
Cadmium	mg/l	0.0002	As above
Chloride	mg/l	0.86	As above
Chromium (hexavalent)	mg/l	0.01	As above
Chromium (trivalent)	mg/l	0.0089	As above
Coliforms (total)	MPN/100ml	5000	As above
Coliforms (faecal)	MPN/100ml	1000	As above
Color	mg/l	Not significantly higher that seasonally adjusted background value	As above
Copper	mg/l	0.002	As above
Cyanide (free)	mg/l	0.005	As above
Dissolved oxygen	mg/l	6	As above
Ethanol	mg/l	1.4	As above
Fluoride	mg/l	0.2	As above
Iron	mg/l	0.3	As above
Lead	mg/l	0.001	As above
Manganese	mg/l	0.05	As above
Mercury	mg/l	0.0001	As above
Molybdenum	mg/l	0.073	As above
Naphthalene	mg/l	0.016	As above
Nitrate	mg/l	5	As above
Nitrite	mg/l	0.06	As above
Oil & grease	-	Substantially absent, no iridescent sheen	As above
pH	-	6.5-9	As above
Phenols	mg/l	0.004	As above
Phosphorus	mg/l	0.15	As above
Selenium (total)	mg/l	0.005	As above
Silver	mg/l	0.0001	As above
Sulfide	mg/l	0.002	As above
Temperature	°C	< 2 increase	As above

Thallium	mg/l	0.004	As above
Total suspended solids	mg/l	10	As above
Tributyltin	mg/l	0.000008	As above
Turbidity	-	< 10% change	As above
Uranium	mg/l	0.015	As above
Zinc	mg/l	0.005	As above

(v) Water quality

The project proponent is responsible for ensuring the drainage or runoff from the project or its related activities do not deteriorate the existing water quality. Baseline quality of water quality was recorded by on site sampling and laboratory analysis at three selected locations systematically. The field surveys for environmental quality monitoring and sampling were done during 1 September 2019.

Objectives of the sampling and analysis of water quality is to understand the existing water quality at the selected locations and to monitor the impacts before the operation.

All locations water quality sampling results are shown in the following tables and compared with National Environmental Quality (Emission) Guidelines and ambient water quality standards for the protection of aquatic life. Analyzed water quality results were shown in the tables below comparing with the ambient water quality standards. Generally, Most of the lab results of parameters analyzed is within the national water quality standard.

Table 6. 18 Surface Water Quality of Mon petrol

Parameters	National Environmental Quality (Emission) Guidelines for Ports, Harbors and Terminals	Ambient water quality standards for the protection of aquatic life	SW 1	SW 2	SW 3
Biochemical Oxygen Demand (BOD) (5 days at 20 .C)	30 mg/l		12 mg/l	22 mg/l	12 mg/l
Chemical Oxygen Demand (COD)	125 mg/l		32 mg/l	64 mg/l	32 mg/l
Dissolved Oxygen (Onsite Results)		6 mg/l	3.45 mg/l	2.97 mg/l	4.17 mg/l
Electrical Conductivity (Onsite Results)			245 µS/cm	205 µS/cm	214 µS/cm
Oil & Grease	10 mg/l	Substantially absent, no iridescent sheen	< 5 mg/l	< 5 mg/l	< 5 mg/l
pH (Onsite Results)	6-9	6.5-9	6.3	6.4	6.2
Salinity (Onsite Results)			0.4 ppt	0.1 ppt	0.3 ppt
Temperature (Onsite Results)			29°C	29°C	29°C
Turbidity (Onsite Results)		< 10% change	33 NTU	430 NTU	39 NTU
Total Dissolved solids (Onsite Results)			103 mg/l	210 mg/l	145 mg/l
Total Suspended Solids	50 mg/l	10 mg/l	30 mg/l	388 mg/l	47 mg/l
Total Nitrogen	10 mg/l		<1 mg/l	<1 mg/l	<1 mg/l
Total Phosphorus	2 mg/l		0.036 mg/l	0.087 mg/l	0.083 mg/l
Total Coliform Bacteria	400 CFU/100ml		10 CFU/100ml	20 CFU/100ml	8 CFU/100ml

Table 6. 19 Ground Water Quality of Mon petrol

Parameters	National Environmental Quality (Emission) Guidelines for Ports, Harbors and Terminals	Ambient water quality standards for the protection of aquatic life	GW
Dissolved Oxygen (Onsite Results)		6 mg/l	8.72 mg/l
Electrical Conductivity (Onsite Results)			43 µS/cm
pH (Onsite Results)	6-9	6.5-9	7.69
Salinity (Onsite Results)			0.0 ppt
Temperature (Onsite Results)			29°C
Turbidity (Onsite Results)		< 10% change	0.0 NTU
Total Dissolved solids (Onsite Results)			28 mg/l

(vi) Soil

In Myanmar, there is still no government guideline for determination of background values of metals and metalloids in soil. Internationally, respective national guidelines use definition of natural background concentration in natural soil. The stepwise approach for deriving background values involves collection of data, statistical analysis of the data and determination of the background value. In this project, baseline soil and sediment contamination were collected to understand the soil quality of existing conditions Analyzed results are shown in following table.

Table 6. 20 Soil analyzed at Soil 1 and Soil 2

Sample Name	Unit	Soil 1	Soil 2
Arsenic	mg/kg	24.6	17
Cadmium	mg/kg	ND	ND
Chromium	mg/kg	64.1	46.6
Lead	mg/kg	25.8	26.1
Nickel	mg/kg	84.3	91.8

6.3 Ecological/Biological Environment

The current forest coverage area of Mudon Township is 16.62% of the township area. The township has Mawlamyaing (Htin) Reserved Forest of 4112.87 Acres and Kyeikkamot Reserved Forest of 29377.99 acres. Therefore the total reserved forest area of the township is 33490.86 Acres. Teak, Pyinkadoe, Inn Pin, Yarmanay, Thapyay, Kanyin, Thityar, Banbwe, Zinpyoune, Thitsay and Phankhar have grown in the township. (Source: Township Data 2019)

The biodiversity team observed fauna and flora species in and around the proposed project area from 31st August, 2019 to 3rd September, 2019. The project area is located near the bank

of Thanlwin River, Kadone Paw Village and Kawpalyn Village at Mudon Township. The survey aimed to find out the impacts by construction activities effected upon the fauna and flora species along the proposed project area and access road of the project. The points of biodiversity survey are describing the following figure.

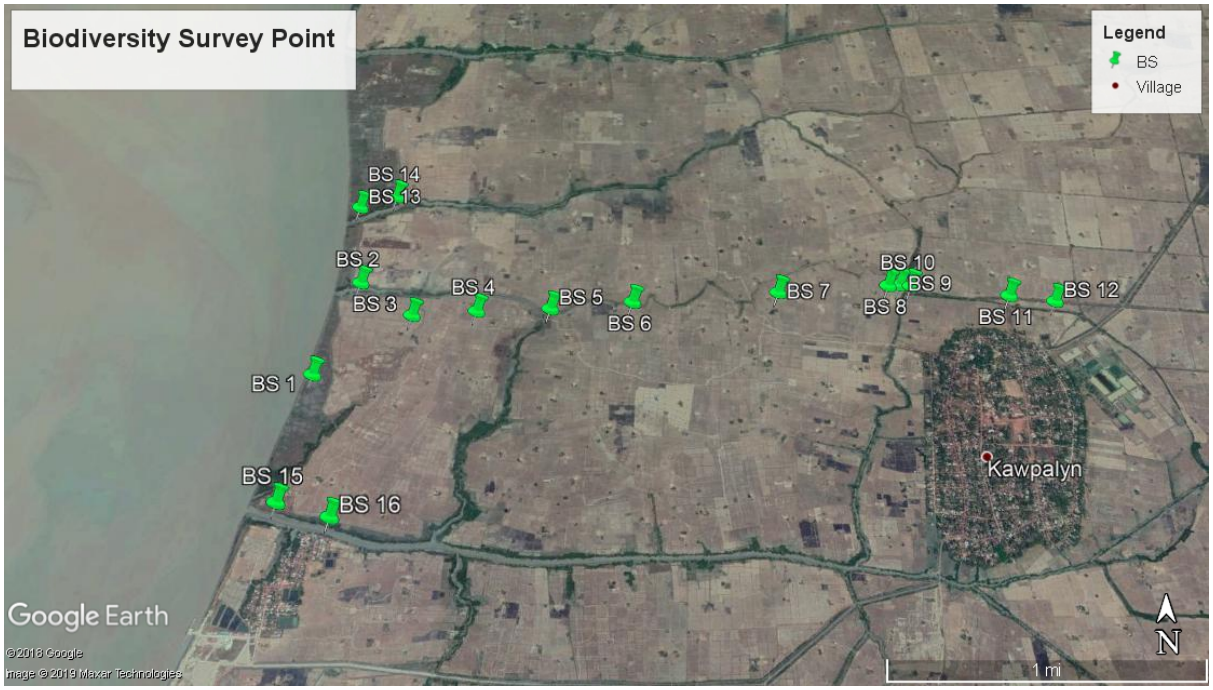


Figure 6. 15 Biodiversity Survey Points of the Proposed Project Area

Materials and Methods

The investigations were conducted in tend to observe primary data. The aids for field surveys are relevant topographic map, compass, and basic field survey equipment including the Global Positioning System (GPS) to assess the spatial location (latitude and longitude) of survey points, digital camera to take the photos of the specimens, diameter tape to measure the girths, binocular to clearly identify the avifauna, guide books, field notes and survey forms.

The point count method was used to record the fauna and flora data in and around the project site, along the access road and the bank of the Thanlwin River of the proposed project. Having interviewed with fishermen who live near the study site, the information of some flora and fauna were gathered and identified.

The recorded fauna was identified by following after by Kyaw Nyunt Lwin and Khin Ma Ma Thwin (2003) and BANCA (2014), Patrick Hook (2013), the Commercial Fishes of Myanmar (2008). Besides, the recorded species were categorized by IUCN red list. The listed and recorded plant species were identified from Checklists of the Trees, Shrubs, Herbs, and Climbers of Myanmar by W. John Kress, Daw Yin Yin Kyi, et al. (2003) and checked with the International Union for Conservation of Nature (IUCN) Red List of threatened species.

Observation

Fauna

The total 25 species of fauna were recorded during survey at the project area. There were 11 species of birds, 4 species of insects, 1 species of reptile, 5 species of fish and 3 species of crustaceans respectively. The IUCN status of recorded fauna was described. There was only one Vulnerable (VU) species and the latitude and longitude is also described.

Table 6. 21 Recorded Birds from the project area

No	Common Name	Scientific Name	IUCN Status
1	Pond heron	*Ardeola grayii*	LC
2	Little Cormorant	*Phalacrocorax niger*	LC
3	Indian Roller	*Coracias venghalensis*	LC
4	Little Egret	*Egretta garzetta*	LC
5	Asian Palm Swift	*Cypsiurus balasiensis*	LC
6	Green Bee-eater	*Merops orientails*	LC
7	Common Mina	*Acridothrers tristis*	LC
8	Spotted Dove	*Streptopelia chinensis*	LC
9	Marsh Sandpiper	*Tringa stagnatilis*	LC
10	Zitting Cisticola	*Cisticola juncidis*	LC
11	Olived-backed Sunbird	*Cinnyris jugularis*	LC

Ardeola grayii

Phalacrocorax niger

Coracias venghalensis

Egretta garzetta

Cypsiurus balasiensis

Merops orientails

Acridothrers tristis

Streptopelia chinensis

Tringa stagnatilis

Cisticola juncidis

Cinnyris jugularis

Figure 6. 16 Recorded Birds from the project area

Table 6. 22 Recorded Insects from the project area

No	Common Name	Scientific Name	IUCN Status
1	Ground Skimmer	*Brachythemis contaminata*	LC
2	Ground Skimmer	*Brachythemis contaminatea* (female)	LC
3	Scarlet skimmer	*Crocothemis servilia*	LC
4	Common chaser	*Potamarcha congener*	LC

Brachythemis contaminata

Brachythemis contaminatea (female)

Crocothemis servilia

Potamarcha congener

Figure 6. 17 Recorded Insects from the project area

Table 6. 23 Recorded Reptile from the project area

No	Common Name	Scientific Name	IUCN Status
1	Cobra	*Naja sp.*	VU

Species	Latitude	Longitude	IUCN Status
 *Naja sp.*	16°13'9.45"N	97°38'21.50"E	VU (Vulnerable)

Figure 6. 18 Recorded Reptile from the project area and its location

Table 6. 24 Recorded fishes from the project area

No	Common Name	Scientific Name	IUCN Status
1	Gangftic tank	*Glossogobius giuris*	LC
2	Snakehead Murrel	*Channa striata*	LC
3	Spiny Eel	*Mastacembelus sp.*	LC
4	Freshwater Garfish	*Xenetondon cancila*	LC
5	Mud skipper	*Boleophthalmus boddarti*	LC
6	Striped dwarf Catfish	*Myatus vittatus*	NE

Glossogobius giuris

Channa striata

Xenetondon cancila

Mastacembelus sp.

Boleophthalmus boddarti

Myatus vittatus

Figure 6. 19 Record Fish from the project area

Table 6. 25 Recorded crabs from the project area

No	Common Name	Scientific Name	IUCN Status
1	Shrimp	*Paelemonidae*	NE
2	Marsh crab	*Sesarma reticulatum*	NE
3	Fiddler Crab	*Uca sp.*	NE

Paelemonidae

Sesarma reticulatum

Uca sp.

Figure 6. 20 Recorded Crustacean from the project area

Flora

A total of (22) flora species belonging to (12) families were recorded by the Pre-construction period along the study area, comprising (13) trees, (1) small tree, (4) shrubs, (3) herbs, (1) climber. According to the results of flora survey, recorded plant species have been mentioned with the following table.

Table 6. 26 List of Recorded Plant Species from the Proposed Project Area

No.	Common Name	Scientific Name	Family	Habit
1	Acacia	*Acacia auriculiformis*	Fabaceae	Tree
2	Dani	*Nypa fruticans*	Arecaceae	Shurb
3	Htan	*Borassua flabellifer*	Arecaceae	Tree
4	Khayar	*Acanthus ilicifolius*	Acanthaceae	Shrub
5	Kokko	*Albizia lebbek*	Mimosaceae	Tree
6	Kyeik Mhan	*Eclipta prostrata*	Asteraceae	Herb
7	Lamu	*Sonneratia caseolaris*	Lythraceae	Tree
8	Ma Gyi	*Tamarindus indica*	Fabaceae	Tree
9	Maezali	*Senna siamea*	Fabaceae	Tree
10	Man Gan Shar	*Acacia mangium*	Fabaceae	Tree
11	New Nat	*Derris trifoliata*	Fabaceae	Climber
12	Nyan	*Sesbania bispinosa*	Fabaceae	Shurb
13	Ohn	*Cocos nucifera*	Arecaceae	Tree
14	Pan Padauk	*Pterocarpus indicus*	Fabaceae	Tree
15	Pha Lan Taung Whay	*Costus speciosus*	Costaceae	Herb

16	Taw Kyaung Pan	*Clerodendrum inerme*	Verbenaceae	Shrub
17	Tha Mae Gyi	*Avicennia officinalis*	Acanthaceae	Tree
18	Thayat	*Mangifera indica*	Anacardiaceae	Tree
19	Thinban Shaw	*Hibiscus tiliaceus*	Malvaceae	Small tree
20	Thit Phyu	Albizia procera	Mimosaceae	Tree
21	Wet Kyut	*Commelina maculata*	Commelinaceae	Herb
22	Zi	*Ziziphus jujuba*	Rhamnaceae	Tree

IUCN Red List Species of the Proposed Project Area

Species observed during the flora survey were referred to the IUCN Red List of threatened species. According to conservation status of IUCN, one Data Deficient (DD) species, one Endangered (EN) and eleven Least Concern (LC) species were existing in the project area. *Pterocarpus indicus*, Common name - (**Pan Padauk**) was observed as endangered species of the IUCN red list. It is endangered species according to the IUCN category but native species and widely distributed in Myanmar. Moreover, another important red list species in and around the proposed project area are mentioned as following table.

Table 6. 27 List of IUCN Red List Species of the Proposed Project Area

No.	Common Name	Scientific Name	IUCN red list category
1	Acacia	*Acacia auriculiformis*	LC
2	Dani	*Nypa fruticans*	LC
3	Khayar	*Acanthus ilicifolius*	LC
4	Kyeik Mhan	*Eclipta prostrata*	LC
5	Lamu	*Sonneratia caseolaris*	LC
6	Ma Gyi	*Tamarindus indica*	LC
7	Maezali	*Senna siamea*	LC
8	Nyan	*Sesbania bispinosa*	LC
9	Pan Padauk	*Pterocarpus indicus*	EN
10	Tha Mae Gyi	*Avicennia officinalis*	LC
11	Thayat	*Mangifera indica*	DD
12	Thit Phyu	Albizia procera	LC
13	Zi	*Ziziphus jujuba*	LC

Species	Latitude	Longitude
	**16°39'06" N**	**96°19'06" E**
	IUCN red list category	
Pterocarpus indicus	**Endangered (EN)**	

Acacia auriculiformis

Nypa fruticans

Acanthus ilicifolius

Borassua flabellifer

Albizia lebbek

Senna siamea

Tamarindus indica

Sesbania bispinosa

Avicennia officinalis

Acacia mangium

Albizia procera

Derris trifoliata

Ziziphus jujuba

Sonneratia caseolaris

Mangifera indica

Cocos nucifera

Costus speciosus

Clerodendrum inerme

Hibiscus tiliaceus

Commelina maculata

Eclipta prostrata

Pterocarpus indicus

Figure 6. 21 Recorded plant species in the proposed project area

6.4 Socio-economic Environment

This section describes the baseline data to define of socio-economic profile and cultural resources of the study area. Administrative structure of the study township has 2 towns, 9 wards, 33 village tracts and 50 villages.

6.4.1 Population and Communities

The demographic structure of study area including number of households, and population are shown in the following tables.

Table 6. 28 Population Data

		Above 18 years old			Below 18 years old			Total		
No.	Content	Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Urban	29737	32725	62462	7387	8209	15596	37124	41934	78058
2	Rural	42484	45971	88455	9947	10763	20710	52431	55734	109165
Total		72221	78696	150917	17334	18972	36306	89555	97668	187223

Source: Township Data (2019)

Table 6. 29 House and Household Status

No.	Content	Houses	Households	Wards	Village Tracts	Villages
1	Urban	15073	16196	9	-	-
2	Rural	23262	25765	-	33	50
Total		38335	41961	9	33	50

Source: Township Data (2019)

6.4.2 Occupation

Mudon Township is located in Mon State and is a township of fair economic status. The occupational status of workable personal and unemployment status is shown in below Tables.

Table 6. 30 Occupational Status

No.	Township	Number of Workable Persons	Current Employed Persons	Unemployment Persons	Percentage of Unemployment Persons
1	Mudon	155968	151133	4835	3.11%

Source: Township Data (2019)

Table 6. 31 Livelihood and Employment Status

No	Types of Employment	Mudon
1.	Government Staff	2528
2.	Services	1005
3.	Agriculture	10200
4.	Livestock	2888
5.	Trading	5965
6.	Industrial	4673
7.	Fishing	237
8.	Casual Labors	13327
9.	Others	110993
Total		150917

Source: Township Data (2019)

6.4.3 Education

In higher education sector, there is no institute, university or college in Mudon Township. In basic education sector, there are 8 high schools, 6 sub-high schools, 2 middle schools, 5 sub-middle schools, 17 post-primary schools, 64 primary schools, 56 pre-schools, and 3 monastery-based schools. And the township also has 13 libraries for public.

6.4.4 Health Facilities

In Mudon Township, there are one 25-Bedded Public Hospital and 16-Bedded Government Hospital of Kamarwat Town. In addition, there are 41 private clinics, 4 government clinics, 7 rural health care centers and 24 sub rural health care centers in the township.

6.5 Ethnic, Culture and Heritage

The ethnic composition of residing in the study area is also shown in table (6.30). Most of the people who lived in the township are Mon, followed by Burma people. Religious status can be seen in below table (6.31) according to the township data of Mudon Township.

Moreover, there are some cultural heritage buildings in Mudon Township. These are Kan Gyi Pagoda, Kyeik Ka Mot Gyi Pagoda and Kyeik Ka Mot Lay Pagoda in Myoma (4) Ward, Kan Ka Lay Pagoda in Kyone Fight Village and Bin Hlaing Pagoda in Kawkhapone Village.

Table 6. 32 Races of Mudon Township

No	Race	Number of Occupant	Township Population	Percentage of Township Population (%)
1	Kachin	8	187223	0.004
2	Kayah	-	187223	-
3	Kayin	895	187223	0.47
4	Chin	16	187223	0.008
5	Mon	164745	187223	87.99
6	Burma	18857	187223	10.07
7	Rakhine	79	187223	0.04
8	Shan	201	187223	0.1
9	Chinese (Half-Blooded)	49	187223	0.25
10	Indian (Half-Blooded)	1950	187223	1.04
Total		187220	187223	99.99

Source: Township Data (2019)

Table 6. 33 Religion Status

No.	Religion	Population
1	Buddhism	185586

2	Christianity	251
3	Hinduism	989
4	Islam	397
5	Others	-
Total		187223

Source: Township Data (2019)

6.6 Conditions of surroundings near Project Site

Near the project site, there are three villages that might be affected by the project construction activities. The focus group discussion was performed by the study team to know their opinions on this project implementation. Those villages are Kawpalan Village Kadone Paw Village and Balauk Nyaungwine Village. The highlights of these villages' profiles are describes below_

Table 6. 34 Socio-economic conditions of villages near Project site

Village	Area (Acre)	Population	Household	Clinic	Economic activates	Water supply	Transportation	Electricity
Kawpalan	220	5800	1180	2	Agriculture, Loom	Yes	Good	Yes
Kadone Paw	69	1832	355	2	Agriculture, fishery, dhani plantation, loom	Yes (from Kawpalan)	Good	Yes
Balauk Naungwine	37	2563	541	1	Agriculture, mason, dhani plantation, loom	Yes (from Kawpalan)	Good	Yes

According to FGD results, there will be better transportation for agriculture, development due to this project because the villager will have job opportunities.

7. IDENTIFICATION AND ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

7.1 Methodology for the Impact Assessments

The impact assessment is executed based on attention to the magnitude, duration, extent and frequency of activities which are going to be carried out and characteristics of the project site. This assessment is qualitative and the significance of each impact is classified into 5 categories in overall.

In order to assess the environmental impacts of the proposed project, the following methodology is applied. Each source of impact is assessed by four parameters, magnitude, duration, extent and probability and each assess point have 5 scales as mentioned below:

Table 7. 1 Impact Assessment Parameters and Its Scale

Assessment	Scale				
	1	2	3	4	5
Magnitude (M)	Insignificant	small and will have no effect on working environment	Moderate and will result in minor changes on working environment	High and will result in significant changes on working environment	Very high and will result in permanent changes on working environment
Duration (D)	0 -1 yea	2 -5 ye	6 -15	Life of operation	Post Closure
Extent (E)	Limited to the site	Limited to the local area	Limited to the region	National	International
Probability (P)	Very improbable	Improbable	Probable	Highly probable	Definite

Then, Significant Point (SP) = (Magnitude + Duration + Extent)* Probability

Impact Significance: Based on calculated significant point, impact significance can be categorized as follows:

Explanation

Significant Point (SP) = (Magnitude + Duration + Extent)* Probability

Impact Significance Significant Point (SP)	Impact Significance
<15	Very Low
15-29	Low
30-44	Moderate
45-59	High
60	Very high

7.2 Impact Identifications and Potential Impacts from proposed project

Every developed project can make changes in the local environment in terms of physical, biological and socio-economic aspects along with the perspective on both positive and negative impacts. In the EMP study for this proposed project, the anticipated environmental impacts will be identified and assessed based on the environmental baseline information along with its mitigation measures.

Potential Impacts

The potential impacts on the environment from various activities of the project can be categorized as follows;

(i) Impacts on Land: Land Acquisition, Land Use
(ii) Impacts on Environmental Resources: Air Quality, Noise, Water Quality, Soil Quality
(iii) Impacts on Ecological Resources: Flora and Fauna
(iv) Impacts on Human: Occupational Health and Safety, Socio-economics
(v) Waste Disposal: Solid, Liquid

7.3 Potential Environmental Impacts for Pre-construction Phase

Since this proposed project is in the first stage of project implementation including site clearance, site office construction and access road construction, this EMP report will access and analyses the impacts for Pre-construction phase.

The following are the anticipated impacts of proposed project;

i. Impacts on Land

   Since the proposed project has already clarified with the documentations with regards to land ownership as mentioned above, the land acquisition is not necessarily required to describe in this project document. Hence there shall be almost no impacts on the land. However, change in existing land use due to improvement of site clearance and road construction might happen because some works on removal of shrubs, trees and invasive vegetation are necessary for the implementation of the project.

ii. Impact on Soil Quality

   Site clearance, road construction and construction works related to the site office building will expose soils in the affected areas leading to soil contamination due to miscellaneous wastes from those activities. Also, accidental spillage of fuel such as diesel from construction vehicles can be another source.

iii. Impact on Air Quality

   Air quality impact is anticipated because a certain amount of air borne particulate matter (dust) will be generated by earth moving activities during road and building construction and during off-loading of marl. The occurrence of dusting is periodic and short-term, lasting for the duration of the construction activities. Some air pollution might be resulted from vehicles and generators.

iv. Impact of Noise and Vibration

Noise and Vibration will inevitably be generated from the use of heavy equipment, machineries and vehicles during site office and road construction works, also from generator which may create a nuisance for nearby residents. However, this negative impact will be short-term (limited to the duration of construction works) and is not considered to be a significant threat to the health or well-being of humans.

v. Impact on Water Quality

In the proposed project site, there are some water bodies_ the canal, also the stream. Since the proponent let those be within the existing formation, there will be no loss of water resource in the project. Moreover, there will be wastewater from construction period and washing from maintenance of vehicles which may affect to surface water quality in near water bodies, but, it may low, short term and mitigatable.

vi. Impact on Ecology Resources (Flora and Fauna)

Fauna: The noise and vibration produced from excavation activities by using machine such as excavator, bulldozer will destroy the insects and that make not only the rare food for birds also habitat lost. The fauna usually live in the barrows like reptiles and amphibians will lost their habitats and even die by crushing accidently. The proposed road construction area is crossing through the paddy field that is why the population of fish, crab and shrimp which live there will decrease and lost their habitats.

Flora: Ground clearance activities for access road and project site will have impacts on the habitat of shrub, herb, climber and creeper species. Construction activities such as transporting the construction vehicles, transitions the construction machinery will effect on the plant species. Cutting down the trees include access road construction area are the one of species loss.

vii. Impact on Solid Waste Disposal

The wastes generated from this proposed project are construction wastes from site office, roads and also debris for site clearance activities. Furthermore, there will be municipal solid wastes from construction worker camps. Some wastes which are scrap metals from construction, materials from maintenance of vehicles and so on can be hazardous.

viii. Occupational Health and Safety

Since many construction activities include steel erection and welding, fastening of roofing materials, metal grinding, cutting and concrete work, etc., the construction workers will be exposed to risks of accidents and injuries. Also, injuries can be occurred from accidental falls from high elevations, accidents by road construction heavy machineries, and hand tools, cuts from sharp edges from site clearance activities.

ix. Socio-economics

Most of the impacts of the proposed project on socio-economic environment may be positive due to the long term project. Implementation of proposed project may create temporary job opportunities and raw materials suppliers for site clearance and construction activities. Subsequently, socio-economic standards of local people will be increased and eventually it may lead to the economic growth at local and regional level.

7.4 Project Activities and its Impacts Significance for Pre-construction Phase

Table 7. 2 Project Activities and its Impacts Significance for Pre-construction Phase

Item	Impacts	Project Activities	Magnitude	Duration	Extent	Probability	Result Score	Significance
1	Land	• Site Clearance	4	5	1	4	40	Moderate
		• Road Construction	4	5	2	4	44	Moderate
2	Soil	• Site Office Construction	3	4	1	3	24	Low
		• Road Construction	3	4	2	3	27	Low
		• Accidental Spillage of Fuel from Vehicles	2	4	1	3	21	Low
3	Air	• Dust particles from earth moving	3	4	2	3	27	Low
		• Vehicles and Generators	3	4	2	3	27	Low
4	Noise and Vibration	• Using of Heavy machineries, Vehicles	3	4	1	3	24	Low
		• Construction Activities	3	4	2	3	27	Low
5	Water	• Wastewater from Construction Activities	2	4	2	3	24	Low
6	Flora	• Site Clearance	3	4	2	4	36	Moderate
7	Fauna	• Site Clearance	2	4	2	4	32	Moderate
		• Construction Activities	2	4	2	3	24	Low
8	Solid Waste Disposal	• Site Clearance	3	1	1	4	20	Low
		• Construction Activities	3	4	1	4	32	Moderate
		• Construction Worker Camps	3	4	1	4	32	Moderate

Item	Impacts	Project Activities	Magnitude	Duration	Extent	Probability	Result Score	Significance
9	Occupational Health and Safety	• Site Clearance	3	5	1	3	27	Low
		• Construction Activities	4	5	1	4	40	Moderate
10	Socio-economics	• Temporary Job Employment						

7.5 Anticipated Environmental Impacts Mitigation Measures for Pre-construction Phase

Table 7. 3 Anticipated Environmental Impacts Mitigation Measures for Pre-construction Phase

No.	Source	Mitigation Measures
Mitigation Measures for Soil Quality Impact		
1	Miscellaneous wastes from site clearance and construction activities	• Remove and clean those materials offsite and transport in appropriate vehicles to carry because some can be hazardous.
2	Accidental spillage of fuels from Vehicles	• Regular maintenance of vehicles, and use leak proof containers if there is storage for fuels.
Mitigation Measures for Air Quality Impact		
3	Earth moving	• Wet regularly access roads and exposed ground that effectively keeps down the dust.
4	Heavy machineries, vehicles and generators	• Do not idle the vehicles. • Transport and operate the vehicles in timely manner if possible. • Generators should be operated in enclosed area.
Mitigation Measures for Noise and Vibration Impact		
5	Building construction and other related activities	• Apply occupational preventive measures and temporary noise barriers for noise attenuation

6	Using of heavy machineries and vehicles	• Operation activities should be performed in working hours
Mitigation Measures for Water Quality Impact		
7	Wastewater from construction activities	• Discharge of wastewater should be avoided to water bodies. • Prohibit disposing of wastes from construction works to water bodies.
Mitigation Measures for Ecological Resources Impact		
8	Site clearance and construction of site office building and road	• Fauna: The habitat loss of the fauna is temporary during the construction period of the road. After the construction period finished, they can retain their habitat but the noise due to vehicles stay remain. • Flora: It may reduce the loss of flora species by avoid the cutting down the tree species as much as possible especially economic important species and endangered species according to IUCN red list category. If they cannot avoid the cutting down the tree species due to construction design, transplantation in another spacious areas, refrain the trees from road construction and relocating trees around the site are the best way.
Mitigation Measures for Solid Waste Disposal Impact		
9	Site clearance and construction activities	• Implement good solid waste disposal system and disposed in coordination with the municipality for regular collection • Do not allow burning of waste materials.
10	Municipal wastes from construction worker camps	• Implement good solid waste disposal system and disposed in coordination with the municipality for regular collection. • Provide temporary toilets for labor, also toilet waste should be cleaned regularly by waste collector.
Mitigation Measures for Occupational Health and Safety		
11	Site clearance and construction activities	• Provide personal protective equipment (PPE) such as safety gloves, helmet, goggles, earmuffs etc. as required. • Should have enforcement program for using PPEs to employees.

		• Be available adequate safety measures including first aid facilities on the project site. • Appropriate traffic warning signs, informing road users and construction workers, and instructing them to reduce speed, should be placed.

8. IMPLEMENTATION OF THE ENVIRONEMNTAL MANAGEMENT PLAN AND ENVIRONMENTAL MONITORING PLAN

8.1 Introduction

The Environment Management Plan (EMP) is required to ensure sustainable development in the area of the project site. Hence, an all-encompassing plan is envisaged in this Chapter, albeit the identification and quantification of impacts based on scientific matrix and professional judgement have been presented in Chapter 7.

Since all the data cannot bring out all variations induced by the natural or human activities, regular monitoring program of the environmental parameters is essential to take into account the changes in the environment.

The objective of monitoring is:

- To check or assess the efficacy of the controlling measures
- To detect deviations in order to initiate necessary measures
- To establish a database for Impact Assessment Studies for new projects.

Responsibilities for EMP

The responsibilities are required to identify to establish the development and effective implementation of the EMP. The environmental management practices, procedures, and responsibilities defined herein to get full compliance with the existing national environmental policy, laws, rules, and regulations. The following entities should be involved in the implementation of this EMP:

- Mon Petrol Co., Ltd.
- Environmental Conservation Department, ECD
- Third-Party Environmental Consultant

8.2 Environmental Impact Mitigation Plan

Table 8. 1 Environmental Impact Mitigation Plan for Pre-construction Phase

No.	Potential Environmental Impact	Project Activities	Mitigation & Enhancement	
			Measures	Responsible Party
1	Soil Pollution	• Site clearance • Construction of site office and road • Leakage of fuels from Vehicles	• Get rid of miscellaneous wastes offsite and transport to related municipal site • Regular maintenance of vehicles	Construction company
2	Air Pollution	• Earth moving in construction activities • Using heavy machineries, vehicles and generators	• Wet regularly access roads and exposed ground that effectively keeps down the dust. • Do not idle the vehicles. Transport and operate the vehicles in timely manner if possible. • Generators should be operated in enclosed area.	Construction company
3	Noise and Vibration Impact	• Construction and other related activities • Heavy machineries and transportation activities	• Perform operation activities during working hours • Use occupational preventive measures	Construction company Mon Petrol Co., Ltd
4	Water Pollution	• Construction activities	• Avoid discharge of wastewater to water bodies. • Prohibit disposing of wastes from construction works to water bodies.	Construction company Mon Petrol Co., Ltd
5	Ecological Resources (Flora	• Site clearance and	• Replant of trees to recreate some	Mon Petrol Co., Ltd

No.	Potential Environmental Impact	Project Activities	Mitigation & Enhancement	
			Measures	Responsible Party
	and Fauna) Impact	Construction activities	semblance of original appearance and condition of the site.	
6	Solid Waste Disposal Impact	• Site clearance and Construction activities • Municipal wastes from construction worker camps	• Implement good solid waste disposal system and disposed in coordination with the municipality for regular collection • Do not allow burning of waste materials. • Provide temporary toilets for labor, also toilet waste should be cleaned regularly by waste collector.	Mon Petrol Co., Ltd
7	Occupational Health and Safety	• Site clearance and Construction activities	• Provide personal protective equipment (PPE) such as safety gloves, helmet, goggles, earmuffs etc. as required. • Use appropriate traffic warning signs, informing road users and construction workers, and instructing them to reduce speed	Construction company Mon Petrol Co., Ltd

8.3 Environmental Monitoring Plan

Table 8. 2 Environmental Monitoring Plan for Pre-construction Phase

Item	Environmental Concerns	Parameters	Frequency	Locations	Estimated Cost (USD)	Responsible Party
1	Ambient air quality	PM_{10}, $PM_{2.5}$, CO, CO_2, NO_2, SO_2, O_3	End of construction	One point on site	1000	Mon Petrol Co., Ltd
2	Noise level	Equivalent noise level dB(A)	End of construction	At major construction area	500	Mon Petrol Co., Ltd
3	Water quality	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Suspended Solids, Total Nitrogen, Total Phosphorus (on site) pH, Temperature, EC, TDS, DO, Turbidity, Salinity	End of construction	One point at stream near construction area	500	Mon Petrol Co., Ltd
4	Soil quality	pH (on site), chromium, lead, nickel, cadmium, arsenic	End of construction	One point on site	1000	Mon Petrol Co., Ltd
5	Waste disposal		Weekly	Disposal point	1200	Mon Petrol Co., Ltd

9. PUBLIC CONSULTATION MEETING

9.1 Objectives of Public Consultation Meeting

a) to promote public understanding and acceptance of proposed project by project nature, summarizing potential positive and negative environmental and impacts, scoping of study area through open discussion
b) to use public feedback as constructive inputs for improvement of the project design
c) to avoid the conflicts about project implementation

With those purposes of disclosing the project information to the concerned parties and authorities, the public consultation meeting was held on 22th September 2019, at Ywar Lal Dhammaryone Taw Gyee, Kawpalyn Village, Mudon Township.

The stakeholders meeting was held in following agenda;

1. Opening Ceremony
2. Opening Remark and Presentation about Project Planning by U Myint Tin, Director of Mon Petrol Co., Ltd.
3. Presentation of Environmental Management Plan (EMP) by U Aye Thiha, Managing Director of E Guard Environmental Services Co., Ltd.
4. Recommendation and Suggestion by Attendees.
5. Closing Remark by U Myint Tin, Director of Mon Petrol Co., Ltd.
6. Closing Ceremony

9.2 Stakeholders/ Participants Lists

Category	No. of Participants Lists
Government Department	- 10
Local People	- 49
Private company	- 4
Total	- 63

9.3 Outcomes of Stakeholders Meeting

(1) Daw Nway Nway Htwe (Villager, Kawpalyn Village)

Question: As Mon Petrol company Limited, how many opportunities can create for villagers (e.g jobs, education, etc.) if the project is finished.

Answer: Company can give jobs opportunities for 75% of villagers according to their education level, their ages, and genders respectively. (Answered by U Myint Tin, Director of Mon Petrol Co., Ltd.)

(2) U Ban Chain (Villager, Kawpalyn Village)

Question: Is Mon Petrol Company local investment? How long does the project take?

Answer: Although Mon Petrol Co., Ltd was founded by only Myanmar Nationality owners. But, there should be no limit whether foreign investment or local as the company expands more and more in various fields which are beyond the limit of local

technologies. The project will take about between 5 and 10 years but Jetty project may take about 3 year. (Answered by U Myint Tin, Director of Mon Petrol Co., Ltd.)

(3) U Kyan Aung (Villager, Kawpalyn Village)

Question: If the project access road of the company is finished, whether the existing road of the village will be good or not. As company, can repair the existing road because all of the villagers want to get more convenient road than before.

Answer: As the company grows big and more, the socio-economic status also improves more and more like Myanmar Proverb "ကျွဲကူးရေပါ" (If buffalo move, the water soaked with their bodies go along with them). (Answered by U Myint Tin, Director of Mon Petrol Co., Ltd.)

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusion

This Environmental Management Plan (EMP) has been prepared for Mon Petrol Co., Ltd. The main objective of the study is to identify the major environmental impacts due to the implementation of the project activities in Pre-construction phase. Therefore, assessment of potential environmental impacts and preparing of environmental management plan with recommended impact mitigation measures were prepared according to the compliance with environmental impact assessment procedure (2015) and National Environmental (Emission) Guidelines.

In this study, baseline environmental data collection and site visit activities were conducted. According to the data interpretation for ambient air quality, noise level, ground water and soil quality results were compared with National and Environmental Quality (emission) Guidelines and international guideline standards. The assessment of each impact is based on consideration of the magnitude, duration, extent and probability of activities which are going to be carried out during that pre-construction phase.

All of the impacts can be minimized by using mitigation measures and implementing Environmental Management Plan. The effective implementation of the mitigation measures proposed will ensure towards good environmental management within the proposed project area. Furthermore, the environmental monitoring plan prepared as part of the EMP will provide adequate opportunities to address any residual impacts during the operation phase.

In conclusion, it has been figured out that, the proposed project is going to generate local employment opportunities and enhance capabilities and working skills of employees. Consequently, their socio-economic standard is expected to be improved.

10.2 Recommendations

The following recommendations have been made for efficient and effective implementation of environmental conservation, health and safety and social responsibilities through the lifespan of the proposed project.

- Follow the comments and suggestions made by ECD after reviewing this EMP report.
- Once EMP is approved by concerned authorities, strict implementation is essential.
- For full and proper implementation of EMP, well understanding and supports by proponent and authority is deem necessity.
- According to the study conducted, the proposed project will have the least impacts through successful implementation of Environmental Management Plan, Monitoring Plan as mentioned in this report.
- The environmental fund should be allocated in accordance with the management and monitoring plans.
- Finally, environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar should be abided.

APPENDIX A

Commitment Letters

Commitment to follow Legal Frameworks

Subject: Commitment to follow legal frameworks including Environmental Conservation Law, Rules, Procedures, Guidelines, and Standards stated in Environmental Management Plan (EMP) Report

With regard to the above matter, we, Mon Petrol Company Limited, strongly commit that all of our operations will be performed in an environmentally friendly manner by following existing laws and regulations, especially, Environmental Conservation Law 2012, Environmental Conservation Rules, 2014, Environmental Impact Assessment Procedures 2015, National Environmental Quality (Emission) Guidelines 2015, and other relevant environmental standards through successful implementation of mitigation measures stated in Environmental Management Plan (EMP) Report.

MON PETROL COMPANY LIMITED
No.80, Lower Main Road, MuPon Quarter, MawLaMyine, Myanmar **Phone: 09-798435040, 09-976404410.**

MON PETROL

Commitment for CSR Plan

Subject: Undertaking to Cooperate Social Responsibility (CSR)

With regard to the above matter, we, Mon Petrol Company Limited, will be incorporated in accordance with Myanmar Companies Act. For that case, we would like to provide 2% of Net Profit for Cooperate Social Responsibility (CSR). In which we have a plan to provide the following activities and expenditure ratio.

1. Education Sector – 0.4%
2. Health Sector – 0.4%
3. Social Development – 0.4%
4. Environmental Protection – 0.4%
5. Regional Development – 0.4%

Remarks: the expenditure ratio is variable depending on project implementation situation.

MON PETROL COMPANY LIMITED
No.80, Lower Main Road, MuPon Quarter, MawLaMyine, Myanmar **Phone: 09-798435040, 09-976404410.**

Commitment for EMP Report

Subject: Commitment for Environmental Management Plan (EMP)

With regard to the above matter, we, Mon Petrol Company Limited, strongly commit that Environmental Management Plan Report for our project is comprehensive and completed. We abide by Rules and Regulations of Myanmar, including Environmental Impact Assessment Procedures during the preparation of this Environmental Management Plan Report.

MON PETROL COMPANY LIMITED
No.80, Lower Main Road, MuPon Quarter, MawLaMyine, Myanmar **Phone: 09-798435040, 09-976404410.**

MON PETROL

Commitment for Environmental Protection

Subject: Presentation of Performance Conditions to protect Environmental Pollution

With regard to the above matter, we, Mon Petrol Company Limited, has carried on works associated with Pre-construction Phase of Oils, Fuels and LPG Terminal, General Cargo Terminal with bonded warehouses and Industrial Estate. For our project operation, we have strongly promised to carry out Environmental Management Plan to reduce environmental pollution by providing sufficient toilets in certain places, trash bags and cans in working areas, cleaning working areas every day, taking enough good drainage system for cleaning and avoid from clotting and bad smells, systematically discharging waste water from the project area. Solid waste from working areas has been controlled by systematic solid waste management system in collaborating with Township Development Committee. We are entirely responsible for the above plans.

We also have committed to reduce noise pollution from the project area for the peace of surrounding areas. Moreover, other pledges that provide of First Aid Kits, Personal Protective Equipment (PPEs), and good sanitary system for health of workers and staff and planting trees to reduce bad odors, are also included.

MON PETROL COMPANY LIMITED
No.80, Lower Main Road, MuPon Quarter, MawLaMyine, Myanmar **Phone: 09-798435040, 09-976404410.**

Good Workspace and Worker Welfare Program

Pre-Construction Phase of Oils, Fuels and LPG Terminal, General Cargo Terminal with bonded warehouses and Industrial Estate of Mon Petrol Company Limited will prepare the following works for better workspace and worker welfare program.

1. Ferry vehicles will be provided.
2. Dining room and space with required dining facilities will be provided.
3. Sufficient number of toilets and rest rooms for both male and female will be provided.
4. Good lighting service will be prepared.
5. Required Personal Protective Equipment (PPE) will be provided.
6. In order to prevent environment pollution, toilets, basins, personal cleaning materials, and good drainage system will be provided.

MON PETROL

Commitment for Income Tax

Subject: Undertaking to pay Tax

With regard to the above matter, we, Mon Petrol Company Limited, would like to admit that the income tax of the appointed staff with the net salary of above 4,800,000 Kyats per year, will be cut off from the staff's salary under fixed rate and will be paid to the state.

MON PETROL COMPANY LIMITED
No.80, Lower Main Road, MuPon Quarter, MawLaMyine, Myanmar **Phone: 09-798435040, 09-976404410.**

eguard
ENVIRONMENTAL SERVICES

No. (II), Airport Avenue Road, (လေဆိပ်ရိပ်သာလမ်း)
Yangon Airport Road, Saw Bwar Gyi Gone Quarter,
Insein Township, Yangon 11011, Myanmar.
Tel: (95) 1 666512 Fax: (95) 19667757
H.P (95) 9 44801676

Commitment to follow and compliance with Environmental Conservation Law, Rules, Environmental Impact Assessment Procedure, National Environmental (Quality) Emission Guidelines, Standard and Mitigation Measures stated in the Environmental Management Plan (EMP) Report

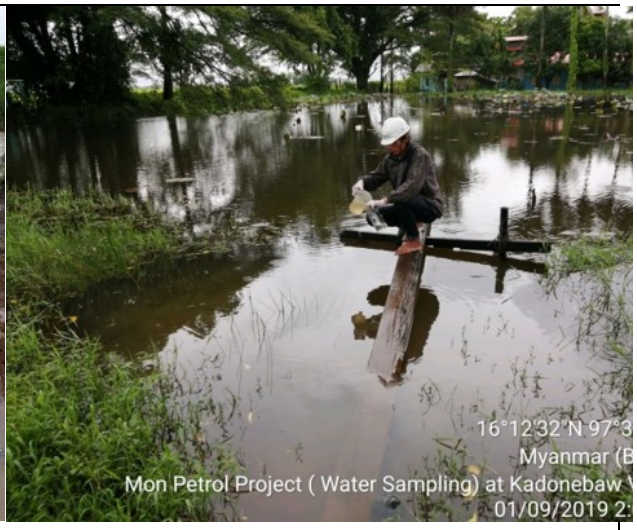
With regard to the above matter, we, E Guard Environmental Services have prepared the Environmental Management Plan (EMP) Report for Pre-Construction Phase of Oil, Fuel and LPG Terminal, General Cargo Terminal with Bonded Warehouses, and Industrial Estate of Mon Petrol Company Limited. Our company strongly commits that this EMP report has been prepared by following Environmental Conservation Law (2012), Environmental Conservation Rules (2014), Environmental Impact Assessment Procedure (2015), National Environmental Quality (Emission) Guidelines (2015) and other relevant environmental standards through successful implementation of mitigation measures stated in the Environmental Management Plan (EMP) Report.

Aye Thiha
Managing Director
E guard Environmental Services

Email: info@eguardservices.com URL: www.eguardservices.com

APPENDIX B

Site Visit


16°12'32"N 97°3
Myanmar (B
Mon Petrol Project (Water Sampling) at Kadonebaw V
01/09/2019 2: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oject (Focus Group Discussion) at Kadonebaw Village, Mudon Tow
02/09/2019 10:

APPENDIX C

Environmental Quality Results

SGS

ANALYSIS REPORT

ORIGINAL

Job Ref : 2000528/2019
Date : 06/09/2019
Page : 1 of 1

Sample Described as : **Surface Water**
Client Name : **Mon Petral Co.,Ltd**
Sample Received Date : 02.September.2019
Sample Brought By : Client
Sample Marking : 1
Sample Location : Point (1) Corpral
Analysed Date : 03.September.2019
Lab Code No. : 289/19

No.	Test Parameter	Method	LOQ	Unit	Result
1	Total Nitrogen (organic)	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012; 4500-N_{org} B.Macro Kjeldahl Method	1	mg/L	<1
2	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E Ascorbic Acid Method	0.01	mg/L	0.036
3	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;5520B	5	mg/L	<5

******************************** End of Report ********************************

SGS (Myanmar) Limited

(Nu Nu Yi)
Manager

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W0919 022

WATER QUALITY TEST RESULTS FORM

Client: Mon Petrol Co.,Ltd.

Nature of Water: Surface Water (Point - 1)

Location: [illegible]

Date and Time of collection: 1.9.2019

Date and Time of arrival at Laboratory: 2.9.2019

Date and Time of commencing examination: 3.9.2019

Date and Time of completing: 8.9.2019

Results of Water Analysis — **WHO Drinking Water Guideline (Geneva - 1993)**

pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness		mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron		mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium chloride (as NaCL)		mg/l	
Sulphate (as SO_4)		mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids	30	mg/l	
Total Dissolved Solids		mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature:
Name: Zaw Hein Oo, B.Sc (Chemistry), Sr. Chemist, ISO TECH Laboratory

Approved by
Signature:
Name: Soe Thit, B.E (Civil) 1986, Technical Officer, ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg. (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LMSE 001
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W0919 022

WATER QUALITY TEST RESULTS FORM

Client	Mon Petrol Co.,Ltd.
Nature of Water	Surface Water (Point - 1)
Location	ကော့သမို့ မုဒုံမြို့နယ်
Date and Time of collection	1.9.2019
Date and Time of arrival at Laboratory	2.9.2019
Date and Time of commencing examination	3.9.2019
Date and Time of completing	8.9.2019

Results of Water Analysis — **WHO Drinking Water Guideline (Geneva - 1993)**

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate ($N.NO_3$)		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	32	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	12	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (Si)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature:
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature:
Name: Soe Thu
B.E (Civil) 1980
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	Mon Petrol Co.,Ltd.
Nature of Water	Surface Water (Point - 1)
Location	[illegible] ပေါင်မြို့နယ်
Date and Time of collection	1.9.2019
Date and Time of arrival at Laboratory	2.9.2019
Date and Time of commencing examination	2.9.2019
Date and Time of completing	3.9.2019

Results of Water Analysis — **WHO Drinking Water Guideline (Geneva - 1993)**

Total Coliform Count	10	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	3	CFU/100ml	Not detected
pH	6.3		6.5 - 8.5
Turbidity	33	NTU	5 NTU
Colour (True)	20	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature: Hein

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature: Soe Thit

Name: Soe Thit
B.E (Civil) 1980
Technical Officer
ISO TECH Laboratory

SGS

ANALYSIS REPORT

ORIGINAL

Job Ref : 2000528/2019
Date : 06/09/2019
Page : 1 of 1

Sample Described as : **Surface Water**
Client Name : **Mon Petral Co.,Ltd**
Sample Received Date : 02.September.2019
Sample Brought By : Client
Sample Marking : 2
Sample Location : Point (2),No.(4)Bradge
Analysed Date : 03.September.2019
Lab Code No. : 300/19

No.	Test Parameter	Method	LOQ	Unit	Result
1	Total Nitrogen (organic)	Standard methods for the examination of water & waste water APHA ,AWWA & WEF.22nd ed. 2012: 4500-N_{org} B Macro Kjeldahl Method	1	mg/L	<1
2	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF.22nd ed. 2012.4500-P E Ascorbic Acid Method	0.01	mg/L	0.087
<	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF.22nd ed. 2012.5520B	5	mg/L	<5

************************************ End of Report ************************************

SGS (Myanmar) Limited

(Nu Nu Yi)
Manager

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), UNSE 001,
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W0919 023

WATER QUALITY TEST RESULTS FORM

Client: Mon Petrol Co.,Ltd.
Nature of Water: Surface Water (Point - 2)
Location: [illegible] မုဒုံမြို့နယ်
Date and Time of collection: 1.9.2019
Date and Time of arrival at Laboratory: 2.9.2019
Date and Time of commencing examination: 3.9.2019
Date and Time of completing: 8.9.2019

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness		mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron		mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium chloride (as NaCL)		mg/l	
Sulphate (as SO_4)		mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids	388	mg/l	
Total Dissolved Solids		mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature:
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature:
Name: Soe Thit
B.E (Civil) 1986
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthamone Quarter, Insein Township, Yangon, Myanmar

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W0919 023

WATER QUALITY TEST RESULTS FORM

Client: Mon Petrol Co.,Ltd.

Nature of Water: Surface Water (Point - 2)

Location: အမှတ်(၄)ဝင်တဘေး မုဒုံမြို့နယ်

Date and Time of collection: 1.9.2019

Date and Time of arrival at Laboratory: 2.9.2019

Date and Time of commencing examination: 3.9.2019

Date and Time of completing: 8.9.2019

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate (N.NO_3)		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	64	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	22	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (Si)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature:

Name: Ser Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

M0919 002

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	Mon Petrol Co.,Ltd.
Nature of Water	Surface Water (Point - 2)
Location	အမှတ်(၄)တံတား မုဒုံမြို့နယ်
Date and Time of collection	1.9.2019
Date and Time of arrival at Laboratory	2.9.2019
Date and Time of commencing examination	2.9.2019
Date and Time of completing	3.9.2019

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Total Coliform Count	20	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	8	CFU/100ml	Not detected
pH	6.4		6.5 - 8.5
Turbidity	430	NTU	5 NTU
Colour (True)	220	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature:

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature:

Name: Soe Th[illegible]
B.E (Civil) 1980,
Technical Officer
ISO T[illegible]

SGS

ANALYSIS REPORT

ORIGINAL

Job Ref : 2000528/2019
Date : 06/09/2019
Page : 1 of 1

Sample Described as	:	**Surface Water**
Client Name	:	**Mon Petral Co.,Ltd**
Sample Received Date	:	02.September.2019
Sample Brought By	:	Client
Sample Marking	:	3
Sample Location	:	Point (3), Kantone Paw
Analysed Date	:	03.September.2019
Lab Code No.	:	301/19

No.	Test Parameter	Method	LOQ	Unit	Result
1	Total Nitrogen (organic)	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012; 4500-N_{org} B.Macro Kjeldahl Method	1	mg/L	<1
2	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	0.01	mg/L	0.083
3	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;5520B	5	mg/L	<5

End of Report

SGS (Myanmar) Limited

(Nu Nu Yi)
Manager

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W0919 024

WATER QUALITY TEST RESULTS FORM

Client: Mon Petrol Co.,Ltd.
Nature of Water: Surface Water (Point - 3)
Location: [illegible]
Date and Time of collection: 1.9.2019
Date and Time of arrival at Laboratory: 2.9.2019
Date and Time of commencing examination: 3.9.2019
Date and Time of completing: 8.9.2019

Results of Water Analysis

			WHO Drinking Water Guideline (Geneva - 1993)
pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness		mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron		mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium chloride (as NaCL)		mg/l	
Sulphate (as SO_4)		mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids	47	mg/l	
Total Dissolved Solids		mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature: Hein
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature:
Name: Soe Tait
B.E (Civil) 1980
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18, Lanthit Road, Nanthamone Quarter, Insein Township, Yangon, Myanmar

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W0919 024

WATER QUALITY TEST RESULTS FORM

Client	Mon Petrol Co.,Ltd.
Nature of Water	Surface Water (Point - 3)
Location	ဝက်စလေပါ၊ မုဒုံမြို့နယ်
Date and Time of collection	1.9.2019
Date and Time of arrival at Laboratory	2.9.2019
Date and Time of commencing examination	3.9.2019
Date and Time of completing	8.9.2019

Results of Water Analysis — **WHO Drinking Water Guideline (Geneva - 1993)**

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate (N.NO_3)		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	32	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	12	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (Si)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature: Hein
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature:
Name: Soe Thin
B.E (Civil) 1980
Technical Officer
ISO [illegible]

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E.(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-1-2016
Effective Date - 01-1-2016
Issue No - 1.0/Page 1 of 1

M0919 003

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client: Mon Petrol Co.,Ltd.

Nature of Water: Surface Water (Point - 3)

Location: ကလိုစေပါ်၊ မုဒုံမြို့နယ်

Date and Time of collection: 1.9.2019

Date and Time of arrival at Laboratory: 2.9.2019

Date and Time of commencing examination: 2.9.2019

Date and Time of completing: 3.9.2019

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Total Coliform Count	8	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	2	CFU/100ml	Not detected
pH	6.2		6.5 - 8.5
Turbidity	39	NTU	5 NTU
Colour (True)	20	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature:

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature:

Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

ANALYSIS REPORT

PROJECT NAME : MON PETROL PROJECT
CUSTOMER NAME : E-GUARD ENVIRONMENTAL SERVICE CO., LTD
ADDRESS : NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR
CONTACT INFORMATION : TEL : +97 9700 5170 e-mail : Chue@guardservice.com
SAMPLING SOURCE : MUDON TOWNSHIP
SAMPLE TYPE : SOIL
SAMPLING DATE : SEPTEMBER 1, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHONTHANAN APHIPATPAPHA

RECEIVED DATE : SEPTEMBER 5, 2019
ANALYTICAL DATE : SEPTEMBER 5-18, 2019
REPORT NO. : 2019-US5246
WORK NO. : 2019-000446
ANALYSIS NO. : T19AM467-0001

PARAMETER	UNIT	METHOD OF ANALYSES	RESULT S-1 T19AM467-0001	DETECTION LIMIT
pH (T1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D.)	6.6 (28°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B. AND 1992:7061 A)	24.6	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B. AND 2007:7000 B)	ND	0.300
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B. AND 2007:7000 B)	64.1	0.500
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B. AND 2007:7000 B)	25.8	1.55
NICKEL (Ni)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B. AND 2007:7000 B)	84.3	1.00
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE

*United Analyst Engineering Consultant Co., Ltd is Sub-contractor of REM-UAE Laboratory and Consultant Co., Ltd

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

SEPTEMBER 23, 2019

United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

ANALYSIS REPORT

PROJECT NAME	: MON PETROL PROJECT		
CUSTOMER NAME	: E-GUARD ENVIRONMENTAL SERVICE CO., LTD		
ADDRESS	: NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR		
CONTACT INFORMATION	: TEL. : +97 9700 5170 e-mail : Chue@guardservies.com		
SAMPLING SOURCE	: MUDON TOWNSHIP		
SAMPLE TYPE	: SOIL	**RECEIVED DATE**	: SEPTEMBER 5, 2019
SAMPLING DATE	: SEPTEMBER 1, 2019	**ANALYTICAL DATE**	: SEPTEMBER 5-18, 2019
SAMPLING TIME	: -	**REPORT NO.**	: 2019-U55248
SAMPLING METHOD	: -	**WORK NO.**	: 2019-006446
SAMPLING BY	: CUSTOMER	**ANALYSIS NO.**	: T19AM467-0002
ANALYZED BY	: MISS CHONTHANAN APHIPATPAPHA		

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT S-2 T19AM467-0002	DETECTION LIMIT
pH(1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004/9045 D)	7.3 (29°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1998/3050 B AND 1992/7061A)	17.0	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1998/3050 B AND 2007/7000 B)	ND	0.300
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1998/3050 B AND 2007/7000 B)	46.6	0.500
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1998/3050 B AND 2007/7000 B)	36.1	1.55
NICKEL (Ni)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1998/3050 B AND 2007/7000 B)	91.8	1.00
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

*United Analyst Engineering Consultant Co., Ltd is Sub-contractor of REM-UAE Laboratory and Consultant Co., Ltd

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

SEPTEMBER 23, 2019

APPENDIX D

Public Consultation Meeting

Attendees List

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံဖြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြို့လုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လက်မှတ်
၁။					
၂။					
၃။					
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၉။					
၁၀။					

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံဖြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြို့လုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လက်မှတ်
၁။					
၂။					
၃။					
၄။					
၅။					
၆။					
၇။					
၈။					
၉။					
၁၀။					

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြိုလုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ရပ်မိရပ်ဖဒေသခံပြည်သူများ — ၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လက်မှတ်
၁။	[illegible]	[illegible]	[illegible]	09·25589458 03	[signature]
၂။	[illegible]	[illegible]	[illegible]	09. 4252682 20-	[signature]
၃။	[illegible]	[illegible]	[illegible]	[illegible]	[signature]
၄။	[illegible]	[illegible]	[illegible]	09 425271575	[signature]
၅။	[illegible]	[illegible]	[illegible]		[signature]
၆။	[illegible]	[illegible]	[illegible]	09. 2686086	[signature]
၇။	[illegible]	[illegible]	[illegible]		[signature]
၈။	[illegible]	[illegible]	[illegible]	09403026 274	[signature]
၉။	[illegible]	[illegible]	[illegible]	0942-73-8-35995	
၁၀။	[illegible]	[illegible]	[illegible]	[illegible]	[signature]

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြိုလုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ရပ်မိရပ်ဖဒေသခံပြည်သူများ — ၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လက်မှတ်
၁။	[illegible]	[illegible]	[illegible]	[illegible]	[signature]
၂။	[illegible]	[illegible]	[illegible]		[signature]
၃။	[illegible]		[illegible]	[illegible]	[signature]
၄။	[illegible]	[illegible]	[illegible]		[signature]
၅။	[illegible]	[illegible]	[illegible]	[illegible]	[signature]
၆။	[illegible]	[illegible]	[illegible]	09428718348	[signature]
၇။	[illegible]				
၈။	[illegible]	[illegible]	[illegible]	0973535970 208	[signature]
၉။	[illegible]				
၁၀။	[illegible]	[illegible]	[illegible]	[illegible]	[signature]

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်းပေါ်ရှိ ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြိုလုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

အစိုးရဌာနဆိုင်ရာအဖွဲ့အစည်းများ ၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	ရာထူး	ဌာန/အဖွဲ့အစည်း	ဆက်သွယ်ရန်ဖုန်း	လက်မှတ်
၁။	[illegible]	[illegible]	[illegible]	09 790151450	
၂။	[illegible]	[illegible]	[illegible]	09 49810559	
၃။	[illegible]	[illegible]	[illegible]	09 255716021	
၄။	[illegible]	[illegible]	[illegible]	09 974174981	
၅။	[illegible]	[illegible]	[illegible]	09 420976477	
၆။	[illegible]	[illegible]	〃	09 401626193	
၇။	[illegible]	[illegible]		09 255945781	
၈။	[illegible]	[illegible]	[illegible]	09 255752442	
၉။	[illegible]	[illegible]	[illegible]	09 974892249	
၁၀။	[illegible]	[illegible]	[illegible]	09 260744945	

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်းပေါ်ရှိ ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြိုလုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ရပ်မိရပ်ဖဒေသခံပြည်သူများ ၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လက်မှတ်
၁။	[illegible]	[illegible]	[illegible]		
၂။	[illegible]	[illegible]	[illegible]		
၃။	[illegible]	[illegible]	[illegible]		
၄။	[illegible]	[illegible]	[illegible]		
၅။	[illegible]	[illegible]			
၆။	[illegible]	[illegible]	[illegible]		
၇။	[illegible]	[illegible]	[illegible]		
၈။	[illegible]				
၉။	[illegible]				
၁၀။					

Mon Petrol Company Limited မှ မွန်ပြည်နယ်၊ မုဒုံမြို့နယ်၊ ကတုံးပေါ်ကျေးရွာ အနီးတွင် အကောင်အထည်ဖော် ဆောင်ရွက်နေသော ကုန်ပစ္စည်းတင် သင်္ဘောဆိပ်ကမ်း တည်ဆောက်ခြင်း အကြိုလုပ်ငန်းများ အတွက် ရေးသားပြုစုနေသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ စီမံကိန်းအကြောင်းအရာ ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူ သဘောထား ရယူခြင်း အခမ်းအနားသို့ တက်ရောက်ကြသူများ စာရင်း။

ပုဂ္ဂလိက ကုမ္ပဏီများ

၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်

စဉ်	အမည်	ရာထူး	ဌာန/အဖွဲ့အစည်း	ဆက်သွယ်ရန်ဖုန်း	လက်မှတ်
၁။	စောဇင်ဝင်း	Finance Dept;			
၂။	ဘော်ဇင်ဖြိုး				
၃။	လင်းထက်အောင်				
၄။	Aung Khant	operator			
၅။					
၆။					
၇။					
၈။					
၉။					
၁၀။					

Mon Petrol Company Limited

၏

စားသုံးဆီ၊ စက်သုံးဆီနှင့် သဘာဝဓါတ်ငွေ့များ တင်/ချ ဆိပ်ကမ်းနှင့်
သိုလှောင်ကန်များ၊ အထွေထွေကုန်တင်/ချဆိပ်ကမ်းနှင့်
သိုလှောင်ရုံများ၊ လုပ်ငန်းစုံ စက်ရုံမြေ အကောင်အထည်ဖော်
ဆောင်ရွက်မည့် အကြိုလုပ်ငန်းများ

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်
(Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍
စီမံကိန်း အကြောင်းအရာ ရှင်းလင်း တင်ပြခြင်းနှင့် အများပြည်သူ
သဘောထား ရယူခြင်း

၂၀၁၉ ခုနှစ်၊ စက်တင်ဘာလ (၂၂) ရက်၊ တနင်္ဂနွေနေ့

1

အခမ်းအနား အစီအစဉ်များ

အစီအစဉ် (၁) ။ ။ အခမ်းအနားဖွင့်လှစ်ကြောင်း ကြေငြာခြင်း။

အစီအစဉ် (၂) ။ ။ Mon Petrol Company Limited ၏ ဒါရိုက်တာ ဦးမြင့်တင် မှ စီမံကိန်းနှင့် ပတ်သက်၍ ရှင်းလင်းတင်ပြခြင်း။

အစီအစဉ် (၃) ။ ။ E Guard Environmental Services Company Limited ၏ အုပ်ချုပ်မှု ဒါရိုက်တာ ဦးအေးသီဟ မှ စီမံကိန်း နှင့် ပတ်သတ်သော ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (Environmental Management Plan) လုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ လုပ်ဆောင်နေမှုများအား ရှင်းလင်းတင်ပြခြင်း။

အစီအစဉ် (၄) ။ ။ တက်ရောက်လာသူများမှ သိရှိလိုသည်များကိုဆွေးနွေးမေးမြန်းခြင်း။

အစီအစဉ် (၅) ။ ။ Mon Petrol Company Limited ၏ ဒါရိုက်တာ ဦးမြင့်တင်မှ နိဂုံးချုပ် ကျေးဇူးတင် စကားပြောကြားခြင်း။

အစီအစဉ် (၆) ။ ။ အခမ်းအနား အောင်မြင်စွာ ပြီးမြောက်ကြောင်း ကြေငြာခြင်း။

2

စီမံကိန်းဆိုင်ရာအချက်အလက်များကို

Mon Petrol Company Limited ၏

တာဝန်ရှိသူမှ ရှင်းလင်းတင်ပြခြင်း

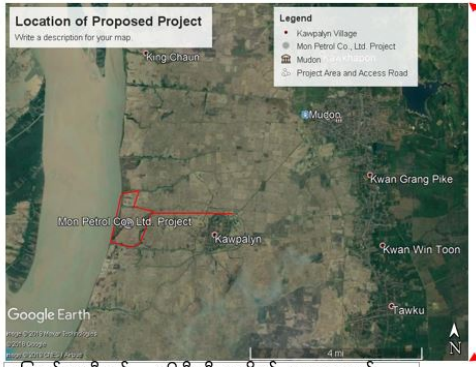
3

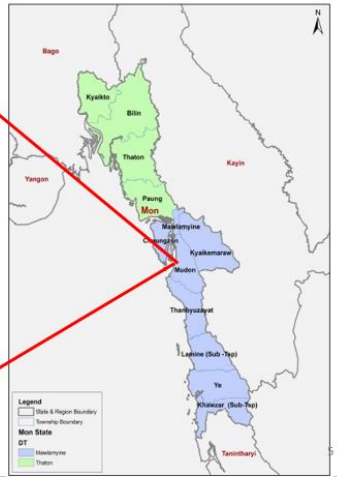
စီမံကိန်းဆိုင်ရာအချက်အလက်များ

ရင်းနှီးမြှုပ်နှံမှုပုံစံ	၁၀၀ ရာခိုင်နှုန်း နိုင်ငံသားရင်းနှီးမြှုပ်နှံမှုပုံစံ
စီမံကိန်းဧရိယာအကျယ်အဝန်း	၆၁၁.၁၃ ဧက
ကုမ္ပဏီအမည်	Mon Petrol Company Limited
မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင် မှ ခွင့်ပြုသည့်ရက်စွဲ	၂၁.၁၁.၂၀၁၇
စီမံကိန်းအမျိုးအစား	စားသုံးဆီ၊ စက်သုံးဆီနှင့် သဘာဝဓါတ်ငွေ့များ တင်/ချ ဆိပ်ကမ်းနှင့် သိုလှောင်ကန်များ၊ အထွေထွေကုန်တင်/ချဆိပ်ကမ်းနှင့် သိုလှောင်ရုံများ၊ လုပ်ငန်းစုံ စက်ရုံမြေ အကောင်အထည်ဖော် ဆောင်ရွက်မည့် အကြိုလုပ်ငန်းများ
အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ ဆောင်ရွက်မည့် ကာလ (မြေနေရာ ရှင်းလင်းခြင်း၊ ရုံးခန်းတည်ဆောက်ခြင်းနှင့် လမ်းဖောက် လမ်းခင်းခြင်း။)	ခန့်မှန်းခြေ ၆ လ

4

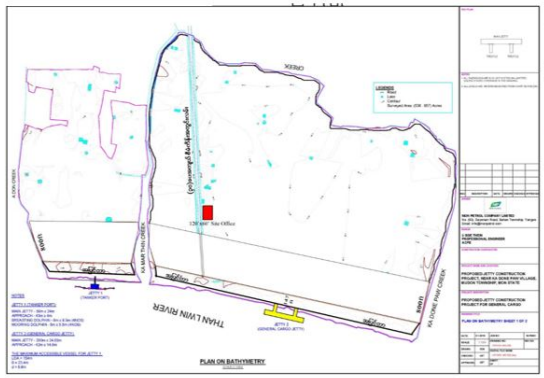
စီမံကိန်းတည်နေရာပြမြေပုံ

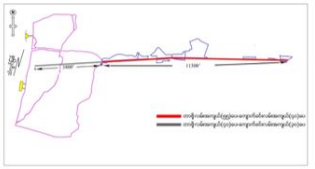




မြောက်လတ္တီတွဒ် - ၁၆ ဒီဂရီ ၁၃ မိနစ် ၂၁.၉၈ စက္ကန့်
အရှေ့လောင်ဂျီကျူ - ၉၇ ဒီဂရီ ၃၈ မိနစ် ၃၂.၅၄ စက္ကန့်

အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများပြမြေပုံ





Access Road Construction

Site Office Construction

စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ လုပ်ဆောင်ရာတွင် အဓိကအသုံးပြုမည့် အရင်းအမြစ်သုံးစွဲမှု	**အရင်းမြစ်သုံးစွဲမှု (တစ်လ)**	**ပမာဏ (ခန့်မှန်း)**
	ရေ သုံးစွဲမှု	၂၄၀၀၀ ဂါလံ (ရုံးခန်းတည်ဆောက်ခြင်း) ၃၀၀၀၀၀ ဂါလံ (လမ်းဆောက်လုပ်ခြင်း) (ယာယီသာ)
	လောင်စာဆီ သုံးစွဲမှု	၂၄၀၀ ဂါလံ
	လူအရင်းအမြစ် သုံးစွဲမှု	၁၀ ဦး (ရုံးခန်းတည်ဆောက်ခြင်း) ၁၀၀ ဦး (လမ်းဖောက်လုပ်ခြင်း)
	စက်ယန္တရားများ သုံးစွဲမှု	မြေတူးစက် (၁) စီး၊ ဂျဟောဆော်စက် (၂) ခု၊ ဖြတ်စက် (၂) ခု၊ လေးလက်မ ရေစုပ်စက် (၂) ခု၊ မီးစက် (၁) ခု (ရုံးခန်းတည်ဆောက်ခြင်း) မြေတူးစက် (၄) စီး၊ လမ်းကြိတ်စက် (၄) စီး၊ မြေညှိစက် (၁) စီး၊ ဒိုဇာ (၂) စီး၊ ရေသယ်ယာဉ် (၁) စီး၊ မြေသယ်ကား (၁၅) စီး၊ အင်ဂျင်ပို့ ရေစုပ်စက် (၄) ခု (လမ်းဆောက်လုပ်ခြင်း)
	လမ်းခင်းရန် အရင်းအမြစ်သုံးစွဲမှု	ဂဝံကျောက်၊ နှမ်းဖတ်ကျောက်

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်
(Environmental Management Plan) လုပ်ငန်းစဉ်
များအား E Guard Environmental Services
တာဝန်ရှိသူမှ ရှင်းလင်းတင်ပြခြင်း

စီမံကိန်း၏ ဖြစ်နိုင်ခြေရှိသော အကျိုးသက်ရောက်မှုများ:

စစ်ဆေးခြင်း

- ✓ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆောင်ရွက်ရန် လိုအပ်ခြင်း ရှိ၊ မရှိ
- ✓ ပတ်ဝန်းကျင်ထိခိုက်မှုများလျော့ချနိုင်ရန် အတွက် ဆောင်ရွက်ရမည့်နည်းလမ်းများကို အကြံပေးခြင်း

ဆောင်ရွက်သည့်အဖွဲ့အစည်း - E Guard Environmental Services

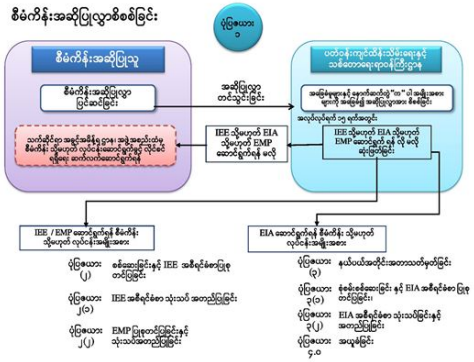
စိစစ်ခွင့်ပြုမည့်အဖွဲ့အစည်း - သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာန

လိုက်နာရမည့် နည်းဥပဒေ၊ စည်းမျဉ်းစည်းကမ်းများ - ပြည်ထောင်စု သမ္မတ မြန်မာနိုင်ငံတော် ဖွဲ့စည်းပုံအခြေခံဥပဒေ(၂၀၀၈)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများ

9

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ် နောက်ဆက်တွဲ (ခ)

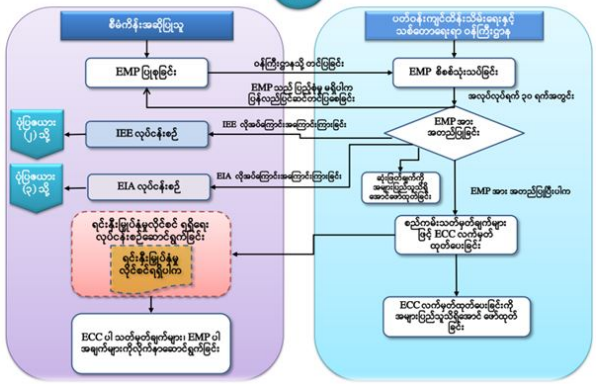
စီမံကိန်းအဆိုပြုလွှာစိစစ်ခြင်း



10

EMP သုံးသပ်ခြင်းနှင့် အတည်ပြုခြင်း

ပုဒ်ဖေယောင်း ၂ (၂)



11

- စီမံကိန်းဆောင်ရွက်မှုကြောင့်ဖြစ်ပေါ်လာနိုင်သည့် ပြဿနာရပ်များကို ဖော်ထုတ်ခြင်း။
- ဖြစ်နိုင်ခြေရှိသော ထိခိုက်မှုများကို လျော့ချပေးနိုင်မည့်အစီအစဉ်များအား အကြံပြုတင်ပြခြင်း။
- လျော့ချပေးနိုင်မည့် အစီအစဉ်များ ကြိုတင်ပြင်ဆင်ပြီး အကောင်အထည် ဖော်ဆောင်ရွက်ခြင်း။

12

- မြေနေရာ ရှင်းလင်းခြင်း၊ ရုံးခန်းအဆောက်အဦး ဆောက်လုပ်ခြင်း နှင့် လမ်းဖောက်လုပ်ခြင်း (အကြိုတည်ဆောက်ခြင်း ကာလ)

ဆိုးကျိုးသက်ရောက်ခြင်းမှ
- ကာကွယ်ရန်
- ရှောင်လွှဲရန်
- လျော့နည်းစေရန်

နည်းလမ်းနှင့် အစီအစဉ်များ ပါဝင်သည့်စီမံချက်

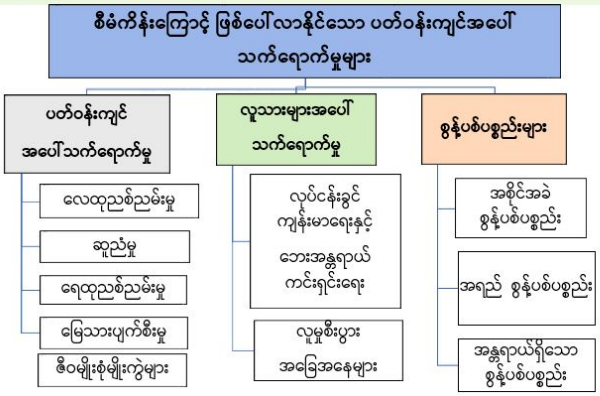
13

အများပြည်သူနှင့် ဆွေးနွေးညှိနှိုင်းသဘောထားရယူခြင်း၏ ရည်ရွယ်ချက်များ

- ဖြစ်ပေါ်လာနိုင်သည့် ကောင်းကျိုး/ဆိုးကျိုးများကိုတင်ပြခြင်း။
- ပါဝင်ပတ်သက်သူများ၏ အမြင်နှင့် အကြံပြုချက်များ၊ ထိခိုက် သက်ရောက် လာနိုင်မှုများကို လျော့ချပေးနိုင်မည့်အစီအစဉ်များ၊ စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်များတွင် ထည့်သွင်းစဉ်းစားပေးခြင်း။
- အငြင်းပွားမှုလျော့ချခြင်းနှင့် စီမံကိန်းအကောင်အထည်ဖော်ရာတွင် ချောမွေ့မှုရှိရန်ဆောင်ရွက်ခြင်း။

14

စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်အပေါ်သက်ရောက်မှုများ



15

ရေနှင့်လေ အရည်အသွေး တိုင်းတာခြင်း

16

ဆူညံသံနှင့် တုန်ခါမှု တိုင်းတာခြင်း

17

မြေနှင့်ရေ နမူနာကောက်ယူခြင်း နှင့် အနံ့ တိုင်းတာခြင်း

18

ဒေသခံပြည်သူများနှင့် တွေ့ဆုံခြင်း

19

ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာသက်ရောက်နိုင်မှုများ (သိသာထင်ရှားမှုသတ်မှတ်ခြင်း)

သက်ရောက်မှု အမျိုးအစား	စီမံကိန်းလုပ်ငန်းများ	သိသာထင်ရှားမှု အဆင့်
ကုန်းမြေအပေါ် သက်ရောက်မှု	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်း	အသင့်အတင့်
	လမ်းဖောက်လုပ်ခြင်း	အသင့်အတင့်
မြေဆီလွှာ ညစ်ညမ်းခြင်း	လုပ်ငန်းခွင်သုံးရုံးခန်း အဆောက်အဦး တည်ဆောက်ခြင်း	နှည်း
	လမ်းဖောက်လုပ်ခြင်း	နှည်း
	ယာဉ်ယန္တရားများမှ လောင်စာဆီများ မတော်တဆယိုဖိတ်ခြင်း	နှည်း

20

ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာသက်ရောက်နိုင်မှုများ (သိသာထင်ရှားမှုသတ်မှတ်ခြင်း)

သက်ရောက်မှု အမျိုးအစား	စီမံကိန်းလုပ်ငန်းများ	သိသာထင်ရှားမှု အဆင့်
လေထုညစ်ညမ်းခြင်း	မြေကြီးများ သယ်ယူရွှေ့ပြောင်းခြင်းမှ ဖုန်မှုန့်များ ထွက်ရှိခြင်း	နည်း
	ယာဉ်ယန္တရားများနှင့် မီးစက်များအသုံးပြုခြင်း	နည်း
ဆူညံသံနှင့် တုန်ခါမှု	ကြီးမားသော စက်ယန္တရားများနှင့် ယာဉ်ယန္တရားများ အသုံးပြုခြင်း	နည်း
	ဆောက်လုပ်ရေးလုပ်ငန်းများ ဆောင်ရွက်ခြင်း	နည်း
ရေထုညစ်ညမ်းခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းများမှ စွန့်ပစ်ရေများ ထွက်ရှိခြင်း	နည်း

21

ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာသက်ရောက်နိုင်မှုများ (သိသာထင်ရှားမှုသတ်မှတ်ခြင်း)

သက်ရောက်မှု အမျိုးအစား	စီမံကိန်းလုပ်ငန်းများ	သိသာထင်ရှားမှု အဆင့်
ဒေသမျိုးရင်းအပင်များ	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်း	အသင့်အတင့်
ဒေသမျိုးရင်းတိရိစ္ဆာန်များ	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်း	အသင့်အတင့်
	ဆောက်လုပ်ရေးလုပ်ငန်းများ ဆောင်ရွက်ခြင်း	နည်း
စွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်း	နည်း
	ဆောက်လုပ်ရေးလုပ်ငန်းများ ဆောင်ရွက်ခြင်း	အသင့်အတင့်
	အလုပ်သမားစခန်းများ တည်ဆောက်ခြင်း	အသင့်အတင့်

22

ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာသက်ရောက်နိုင်မှုများ (သိသာထင်ရှားမှုသတ်မှတ်ခြင်း)

သက်ရောက်မှု အမျိုးအစား	စီမံကိန်းလုပ်ငန်းများ	သိသာထင်ရှားမှု အဆင့်
လုပ်ငန်းခွင်ဆိုင်ရာ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်း	နည်း
	ဆောက်လုပ်ရေးလုပ်ငန်းများ ဆောင်ရွက်ခြင်း	အသင့်အတင့်
လူမှုစီးပွားရေး	ယာယီအလုပ်အကိုင်များ ပေးခြင်း	ကောင်းကျိုး

23

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်

ဆိုးကျိုးလျော့ချပေးနိုင်မည့် အစီအစဉ်များ

24

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျော့ချရေး အစီအမံများ

အကြိုတည်ဆောက်ခြင်း လုပ်ငန်းများ လုပ်ဆောင်သည့်ကာလ		
သက်ရောက်မှု အမျိုးအစား	**မျော်မှန်းသက်ရောက်နိုင်မှုများ**	**လျော့ချရေး အစီအမံများ**
မြေဆီလွှာ အရည်အသွေး	လုပ်ငန်းခွင် မြေနေရာ ရှင်းလင်းခြင်းနှင့် တည်ဆောက်ရေး လုပ်ငန်း များမှ အမျိုးမျိုးသော စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိခြင်း။ ယာဉ်ယန္တရားများမှ လောင်စာဆီများ မတော်တဆယိုဖိတ်ခြင်း။	ထိုစွန့်ပစ်ပစ္စည်းအချို့သည် အန္တရာယ် ဖြစ်နိုင်သောကြောင့် သင့်လျော်သည့် ယာဉ်ယန္တရားများဖြင့် သယ်ယူ ပို့ဆောင်ပြီး လုပ်ငန်းခွင် တည်နေရာ အပြင်ဘက်သို့ ရှင်းလင်းဖယ်ရှားခြင်း။ ယာဉ်ယန္တရားများကို ပုံမှန် ပြင်ဆင် ထိန်းသိမ်းခြင်းနှင့် လောင်စာဆီများ သို့လောင်ရန် ယို့စိမ့်မှုကို ကာကွယ် ပေးနိုင်သော ကန်၊ တိုင်ကီများ အသုံးပြုခြင်း။

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျော့ချရေး အစီအမံများ

သက်ရောက်မှု အမျိုးအစား	**မျော်မှန်းသက်ရောက်နိုင်မှုများ**	**လျော့ချရေး အစီအမံများ**
လေထု အရည်အသွေး	မြေကြီးများ သယ်ယူရွှေ့ပြောင်းခြင်း။ ကြီးမားသော စက်ယန္တရားကြီးများ၊ ယာဉ်ယန္တရားကြီးများနှင့် မီးစက်ကြီးများ ကြောင့် လေထု အရည်အသွေးပေါ် သက်ရောက်မှုရှိခြင်း။	ဖုန်မှုန့်များပျံ့လွင့်မှုကို လျော့ချရန်မြေကြီးကို စိုစွတ်စေခြင်း။ စက်ယန္တရားများကို လိုအပ်မှသာ လည်ပတ်စေခြင်း၊ ဖြစ်နိုင်လျှင် စက်ယန္တရားများဖြင့် သယ်ယူပို့ဆောင်ခြင်းနှင့် လုပ်ငန်း လည်ပတ်ခြင်းတို့ကို အချိန် အကန့်အသတ်ဖြင့် သင့်လျော်သလို ဆောင်ရွက်စေခြင်း၊ မီးစက်များကို အကာအရံရှိသော ဧရိယာတွင်သာ လည်ပတ်စေခြင်း။
ဆူညံသံနှင့် တုန်ခါမှု	အဆောက်အဦးဆောက်လုပ်ခြင်းနှင့် အခြားဆက်စပ်သောလုပ်ငန်းများ ဆောင်ရွက်ခြင်း၊ ကြီးမားသော စက်ယန္တရားများနှင့် ယာဉ်ယန္တရားများကို အသုံးပြုခြင်း။	ဆူညံသံ လျော့ပါးစေရန်အတွက် အကာအကွယ် ကိရိယာများနှင့် ဆူညံသံကိုလျော့ချပေးသော ယာယီ အတားအဆီးများ လုပ်ဆောင်ပြီး အသုံးချခြင်း၊ လုပ်ငန်းများ ကို အလုပ်ချိန် အတွင်းတွင်သာ ဆောင်ရွက်စေခြင်း။

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျော့ချရေး အစီအမံများ

အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ လုပ်ဆောင်သည့်ကာလ		
သက်ရောက်မှု အမျိုးအစား	**မျော်မှန်းသက်ရောက်နိုင်မှုများ**	**လျော့ချရေးအစီအမံများ**
ရေထုအရည်အသွေး	ဆောက်လုပ်ရေးလုပ်ငန်းများမှ စွန့်ပစ်ရေများ ထွက်ရှိခြင်း	စွန့်ပစ်ရေများကို ရေအစုအဝေး နေရာများ ထဲသို့ တိုက်ရိုက် စွန့်ထုတ်ခြင်းကို ရှောင်ရှားခြင်း၊ ဆောက်လုပ်ရေး လုပ်ငန်းများမှ စွန့်ပစ် ပစ္စည်းများကို ရေအစုအဝေး နေရာများ ထဲသို့ စွန့်ပစ်ခြင်းကို တားမြစ်ခြင်း။
ဂေဟဗေဒဆိုင်ရာ သယံဇာတများ	လုပ်ငန်းခွင် မြေနေရာ ရှင်းလင်းခြင်း၊ လုပ်ငန်းခွင်သုံး ရုံးခန်း အဆောက်အဦး တည်ဆောက်ခြင်းနှင့် လမ်းဖောက်လုပ်ခြင်း။	လုပ်ငန်းခွင်၏ လက်ရှိ အနေအထားနှင့် မူလ ပုံစံ အချို့ကို ပြန်လည် ဖြစ်ပေါ်စေရန် သစ်ပင်များကို သင့်လျော်သော တခြား နေရာတွင် ပြန်လည်စိုက်ပျိုးစေခြင်း။

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျော့ချရေး အစီအမံများ

အကြိုတည်ဆောက်ခြင်းလုပ်ငန်းများ လုပ်ဆောင်သည့်ကာလ		
သက်ရောက်မှု အမျိုးအစား	**မျော်မှန်းသက်ရောက်နိုင်မှုများ**	**လျော့ချရေးအစီအမံများ**
စွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်းနှင့် တည်ဆောက်ရေးလုပ်ငန်းများ ဆောင်ရွက်ခြင်း ဆောက်လုပ်ရေးအလုပ်သမားစခန်းများမှ စွန့်ပစ်အမှိုက်များ ထွက်ရှိခြင်း	ကောင်းမွန်သည့် စွန့်ပစ်ပစ္စည်း စွန့်ထုတ်ခြင်းစနစ်နှင့် ၎င်းတို့ကို ပုံမှန် စုဆောင်း သိမ်းဆည်းစေရန် မြို့နယ်စည်ပင် သာယာရေး အဖွဲ့နှင့် ညှိနှိုင်း ဆောင်ရွက်ခြင်းများ တို့ကို အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်း၊ စွန့်ပစ် ပစ္စည်းများ မီးရှို့ခြင်းကို ခွင့်မပြုခြင်း။ အလုပ်သမားများ အတွက် ယာယီ အိမ်သာများ ဆောက်လုပ် ပေးခြင်း နှင့် ၎င်းမှ ထွက်ရှိလာသော စွန့်ပစ် အညစ်အကြေး များကို အညစ်အကြေး စုဆောင်း သိမ်းဆည်းသည့်အရာဖြင့် ပုံမှန် ရှင်းလင်း ဖယ်ရှားခြင်း။

စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျှော့ချရေး အစီအမံများ

အကြုံတည်ဆောက်ခြင်းလုပ်ငန်းများ လုပ်ဆောင်သည့်ကာလ		
သက်ရောက်မှု အမျိုးအစား	မျော်မှန်း သက်ရောက်နိုင်မှုများ	လျှော့ချရေးအစီအမံများ
လုပ်ငန်းခွင်ဆိုင်ရာ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	လုပ်ငန်းခွင်မြေနေရာ ရှင်းလင်းခြင်းနှင့် တည်ဆောက်ရေး လုပ်ငန်းများ ဆောင်ရွက်ခြင်း	ဘေးအန္တရာယ်ကင်းစေသော လုပ်ငန်းခွင်သုံးလက်အိတ်၊ ဦးထုပ်၊ မျက်မှန်နှင့် နားကို ကာကွယ်ပေးသော ပစ္စည်း စသည့် တစ်ကိုယ်ရည်သုံး ကာကွယ်ရေး ပစ္စည်းများကို ထောက်ပံ့ပေးခြင်း၊ အလုပ်သမားများအား တစ်ကိုယ်ရည်သုံး ကာကွယ်ရေးပစ္စည်းများ အသုံးပြုရန် တိုက်တွန်းခြင်း၊ လုပ်ငန်းခွင် အတွင်း၌ အရေးပေါ် ရေးဦးပြုစုခြင်း အထောက်အပံ့ ပစ္စည်းများအပါအဝင် ပြည့်စုံသော ဘေးအန္တရာယ်ကင်းရှင်းရေး စီမံချက်များ ထားရှိစေခြင်း၊ သင့်လျော်သော ယာဉ်အန္တရာယ် သတိပေးချက် အမှတ်အသားများ ထားရှိစေခြင်း၊ လမ်းအသုံးပြုသူများနှင့် ဆောက်လုပ်ရေး အလုပ်သမားများကို သတင်း အချက်အလက်ပေးခြင်းနှင့် ယာဉ်မောင်းရာတွင် အမြန်နှုန်း လျှော့ချစေရန် ညွှန်ကြားထားခြင်း။

စီမံကိန်းနှင့် ပတ်သက်၍ သိရှိ မေးမြန်းလိုပါက

အမည်	ဦးမြင့်တင်
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ယခုရှင်းလင်းတင်ပြခဲ့သော Presentation ဖိုင်အား အောက်ပါ Website Link မှ လည်းကောင်း၊ QR Code Scanner ဖြင့် လည်းကောင်း အလွယ်တကူ ရယူ လေ့လာနိုင်ပါသည်။

http://www.mediafire.com/file/jdq39edkjur5kdj/MON_PETROL_SHM_PRESENTATION_22092019.pdf/file

ကျေးဇူးတင်ပါသည်