ENVIORNMENTAL IMPACT ASSESSMENT (EIA) REPORT FOR POLYESTER STAPLE FIBER, PET PACKING TAPE AND PE/PP RECYCLE PELLETS PRODUCTION FACTORIES BEING INVESTED BY DAHUA (MYANMAR) CO., LTD.


De-baling in Bale Breaker


Removing Unwanted Materials


Grinding


Clean Plastic Chips


Spinning


Cooling after Extrusion


Bundling


Drafting and Crimping


Shaping


Cutting


Spraying Silicone


Packaging

Reported By

Ever Green Tech Environmental Services and Training Co., Ltd.

1/9, Baho Road, 16th Quarter, Hlaing Township, Yangon, Myanmar.

Ph: 09-5099230, 09-5099232

Email: md@evergreentechmyanmar.com, green.evergreentech@gmail.com

December, 2023

List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BOD	Biological Oxygen Demand
CDC	City Development Committee
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CSR	Corporate Social Responsibility
dB	Decibel
EAP	Environmental Assessment Practitioner
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department, MONREC
EGT	Ever Green Tech Environmental Services and Training Co., Ltd.
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPAS	Environmental Perimeter Air Station
ESMP	Environmental and Social Management Plan
GSS	Gas Sensing Semiconductor
GPS	Global Positioning System
HIA	Health Impact Assessment
HIV	Human Immunodeficiency Virus
H_2S	Hydrogen Sulphide
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature and Natural Resource
MONREC	Ministry of Natural Resources and Environmental Conservation
NAAQS	National Ambient Air Quality Standard
NaOCl	Sodium Hypochlorite
NEQG	National Environmental Quality (Emission) Guidelines
NGO	Non-Governmental Organization
NO	Nitrogen Monoxide
NO_2	Nitrogen Dioxide
NOx	Nitrous Oxides
O_3	Ozone
PM	Particulate Matter
PPE	Personal Protective Equipment
PEL	Permissible Exposure Limit
PGA	Peak Ground Acceleration
RS	Richter Scale
SO_2	Sulfur Dioxide
VIA	Visual Impact Assessment
VOC	Volatile Organic Compound

CONTENTS

LIST OF FIGURES

LIST OF TABLES

၁။ အနှစ်ချုပ်အစီရင်ခံစာ

၁.၁။ နောက်ခံအကျဉ်းချုပ်

ရန်ကုန်တိုင်း ဒေသကြီး၊ မှော်ဘီမြို့နယ် မြောင်းတကာသံမဏိစက်မှုဇုန်တွင် တည်ရှိသော Da Hua (Myanmar) Company Limited သည် Polyester Staple Fibers၊ Polyethylene Terephthalate (PET) packing tape and recycle pellets ထုတ်လုပ်ရန်အတွက်တည်ထောင်ရန် လျာထားခြင်းဖြစ်သည်။ အဆိုပြုစီမံကိန်းတွင် စက်ရုံ (၂) ခုပါရှိပြီး၊ စက်ရုံ ၁ သည် စက်ရုံ ၂ မှ ၀.၉ကီလိုမီတာ(၉၀၀မီတာ)အကွာအဝေး တွင်တည်ရှိပါသည်။ စက်ရုံအားလုံး သည် ရန်ကုန်တိုင်း ဒေသကြီး၊ မှော်ဘီမြို့နယ်မြောင်းတကာသံမဏိစက်မှု ဇုန်တွင် တည်ရှိပါသည်။ Polyester Staple Fibers ကို စက်ရုံ ၁ တွင်ထုတ်လုပ်ပြီး၊ PTE ပါကင်တိတ်နှင့် ပြန်လည်အသုံးပြုနိုင်ရန်ပြင်ဆင်ထားသည့် ကော်စေ့ (recycle pellets) ကို စက်ရုံ ၂ တွင် ထုတ်လုပ်ပါမည်။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) အရ အဆိုပြုစီမံကိန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆောင်ရွက်ရန် ပတ်ဝန်းကျင်ထိန်း သိမ်းရေးဦးစီးဌာန (နေပြည်တော်) မှ နောက်ဆက်တွဲ (က)ပါရည်ညွှန်းစာဖြင့်ညွှန်ကြားလာပါသည်။ထိုသို့လုပ် ဆောင်နိုင်ရေးအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လုပ်ငန်းများလုပ်ဆောင်လျက်ရှိသည့်တတိယအဖွဲ့ အစည်းတစ်ခု ဖြစ်သော Ever Green Tech Environmental Services and Training Co., Ltd. အားအပ်နှံဆောင်ရွက်ခဲ့ပါသည်။

၁.၂။ နိဒါန်းအကျဉ်းချုပ်

(က) စီမံကိန်းအဆိုပြုသူအကျဉ်း

အောက်ဖော်ပြပါဇယားတွင် စီမံကိန်းအဆိုပြုသူနှင့် စီမံကိန်းအကြောင်းအရာအကျဉ်းအားဖော်ပြထားပါသည်။

စီမံကိန်းအဆိုပြုသူ	
စီမံကိန်းအဆိုပြုသူ	Da Hua (Myanmar) Polyester Staple Fiber Co., Ltd
ကုမ္ပဏီအမျိုးအစား	ဖက်စပ်ကုမ္ပဏီ (က) Da Hua Environmental Sei-Tech, H.K Limited (၈၀%) (ခ) Da Hua Co., Ltd. (၂၀%)
ကုမ္ပဏီမှတ်ပုံတင်အမှတ်	၁၀၄၈၇၉၆၁၆ (ယခင် ၉၂၇FC/၂၀၁၇-၂၀၁၈ (ရန်ကုန်))
တည်ဆောက်ရေးကာလ	၁၂ လ
လုပ်ငန်းလည်ပတ်ရေးကာလ	၂၀ နှစ်

လုပ်သားအင်အား	ပြည်တွင်းလုပ်သား - ၂၁၉ ဦး ပြည်ပမှပညာရှင် - ၂၉ ဦး
ရင်းနှီးမြှုပ်နှံမှုပမာဏ	အမေရိကန်ဒေါ်လာ ၅.၁၈၉၉၅ မီလီယံ
လုပ်ငန်းအမျိုးအစား	CMP အခြေခံကုန်ကြမ်းအဖြစ် ပြည်ပသို့တင်ပို့ခြင်း
ထုတ်ကုန်အမျိုးအစား	အဆိုပြုစီမံကိန်းသည် စက်ရုံ (၂) ခုပါရှိပါသည်။ စက်ရုံအမှတ် (၁) - CMP အခြေခံကုန်ကြမ်းအဖြစ် ပြည်ပသို့တင်ပို့သည့် Polyester Staple Fiber ထုတ်လုပ်ခြင်း စက်ရုံအမှတ် (၂) - PTE ပါကင်တိတ်နှင့် ပြန်လည်အသုံးပြုနိုင်ရန်ပြင်ဆင်ထားသည့် ကော်စေ့များ (recycle pellets) ထုတ်လုပ်ခြင်း
စီမံကိန်းတည်နေရာ	စက်ရုံအမှတ် (၁) - လုပ်ကွက်အမှတ် (၂၀၉ နှင့် ၂၃၈)၊ မြောင်းတကာသံမဏိ စက်မှုဇုန်၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်။ စက်ရုံအမှတ် (၂) - လုပ်ကွက်အမှတ် (၃၇၅၊ ၃၇၆၊ ၃၇၇၊ ၃၇၈၊ ၃၇၉၊ ၃၈၀၊ ၃၈၁) မြောင်းတကာသံမဏိ စက်မှုဇုန်၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်။
ဆက်သွယ်ရန်ပုဂ္ဂိုလ်	ဒေါ်မေမိုး Da Hua (Myanmar) Co. Ltd. 09250064251

(ခ) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်လေ့လာမည့်တတိယအဖွဲ့အစည်းအကျဉ်း

အောက်ဖော်ပြပါဇယားသည် EIA ပြုလုပ်မည့် တတိယအဖွဲ့အစည်းဖြစ်သော Ever Green Tech Environmental Services and Training Co. Ltd. ၏ နောက်ခံအကျဉ်းဖြစ်ပါသည်။

Ever Green Tech Environmental Services & Training Co., Ltd.	
ရုံးအမည်	Ever Green Tech Environmental Services and Training Co., Ltd.
ကုမ္ပဏီမှတ်ပုံတင်အမှတ်	115575996
ကြားကာလအကြံပေး လုပ်ကိုင်သူမှတ်ပုံတင်အမှတ်	0047
ဆက်သွယ်ရန်လိပ်စာ	အမှတ် ၁/၉၊ ဗဟိုလမ်း၊ ၁၆ ရပ်ကွက်၊ လှိုင်မြို့နယ်၊ ရန်ကုန်မြို့။

ဖုန်းနံပါတ်	09-5099230, 09-5099232
အီးမေးလ်လိပ်စာ	md@evergreentechmyanmar.com green.evergreentech@gmail.com
ဆက်သွယ်ရန် ပုဂ္ဂိုလ်	ဒေါ်အေးချောစုလှိုင် မန်နေဂျင်းဒါရိုက်တာ 09-797111000 11kyawswar@gmail.com

(ဂ) ပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းအတွက် ရွေးချယ်ထားသော အကြံပေးပုဂ္ဂိုလ်များ

No.	Name	Degree	Responsibility	Area of Expertise
1.	Dr. Ni Ni Aye	M.B.B.S (Ygn); MS.Med. (Public Health)	Team Leader	(a) Health Impact Assessment (b) Water Pollution Control, Preventation and Monitoring
2.	Ms. Tin Tin Ohm	B.Ag (Agricultural), M.Sc. (Forest Soil Science), USA	Consultant	(a) Soil Quality Preservation (b) Geology
3.	Mr. Min Min Htwe	M.E. (Mining)	Consultant	(a) Geology (b) Noise and Vibration
4.	Mr. Aung Naing Tun	L.L.B, M.B.A	Consultant	(a) Laws and Legal Requirement (b) Analysis for Economic Point of View
5.	Ms. Phoo Mon Mon Phyo	M.Sc. (Zoology)	Consultant	(a) Biodiversity (b) Natural Resources Management (Fisheries)
6.	Ms. Phyu Phyu Thet	B.Ecom. (Eco)	Consultant	(a) Analysis for Economic Point of View
7.	Ms. Thazin Moe Myint	B.E. (Civil)	Consultant	(a) Meteorology, Air Quality Assessment and Prediciton

8.	Ms. Aye Chaw Su Hlaing	B.A. (History)	Consultant	(a) Cultural & Heritage
9.	Mr.Ye Wai Phyo	B.Sc. (Chemistry)	Consultant	(a) Air Pollution Prevention and Control
10.	Ms. Yee Mon Kyaw	B.A. (Psychology)	Consultant	(a) Socio-economic
11.	Mr. Win Ko Aung	B.Sc. (Chemistry)	Consultant	(a) Air Quality Monitoring
12.	Mr. Pyae Moe Han	BE. (Chemical)	Consultant	(a) Water Pollution Control, Preventation and Monitoring
13.	Ms. Hnin Einzali	B.E. (Chemical)	Consultant	(a) Solid and Hazardous Waste Management (b) Soil Quality Preservation
14.	Mg Lwin Myint Mg	B.E. (Mining)	Consultant	(a) Noise and Vibration (b) Land Use
15.	Mr. Moe Pyi Kyaw	B.Sc. (Forestry)	Consultant	(a) Biodiversity (b) Natural Resources Management (Forestry)
16.	Ms. Nwe Nwe Aung	B.Sc.(Zoology)	Consultant	(a) Natural Resources Management (Fisheries)
17.	Ms. Hnin Hnin Phyo	B.E. (Mining)	Consultant	(a) Risk Assessment and Management (b) Natural Resources Management (Mineral Resources)

(ဃ) စီမံကိန်းပြုလုပ်ရခြင်း၏ ရည်ရွယ်ချက်

အဆိုပြုထားသော စီမံကိန်းသည် မြန်မာနိုင်ငံ အတွင်းလိုအပ်သည့် အကြောင်းအရင်းများအား အောက်တွင် ဖော်ပြ ထားပါသည်။

(က) ပလတ်စတစ်အမှိုက်(ပလတ်စတစ်သောက်ရေဘူး)ကို အသုံးဝင်သောစက်မှုကုန်ကြမ်း (Polyester staple fiber)သို့ ပြန်လည်အသုံးပြုနိုင်ရန်။

(ခ) အရည်အသွေးကောင်းမွန်သော polyester ဖိုင်ဘာများ၊ ပါကင်တိတ်များ၊ ကော်စေ့များအား ပြည်တွင်းတွင် အသုံးပြုရန်နှင့် ပြည်ပနိုင်ငံများ သို့ တင်ပို့ရောင်းချရန်နှင့်

(ဂ) ဒေသခံပြည်သူများအတွက် အလုပ်အကိုင်အခွင့်အလမ်းများတိုးပွားလာစေရန်၊ အစိုးရဝင်ငွေများတိုးပွားလာစေရန်နှင့် ဝယ်သူနှင့်ရောင်းသူနှစ်ဦးစလုံးအတွက် အကျိုးခံစားခွင့်များရရှိစေရန်။

(c) သဘာဝပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်းနယ်နိမိတ်သတ်မှတ်ချက်

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် အဆိုပြုစီမံကိန်းကြောင့် တိုက်ရိုက် (သို့မဟုတ်) သွယ်ဝိုက်၍ ဖြစ်ပေါ်လာနိုင်သည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာသက်ရောက်မှုများကိုဖော်ထုတ်သွားမည်ဖြစ်ပြီး၊ စီမံကိန်းအကြိုတည်ဆောက်ရေးကာလ၊ စီမံကိန်းတည်ဆောက်ရေးကာလ၊ စီမံကိန်းလည်ပတ်ရေးကာလ၊ စီမံကိန်းဖျက်သိမ်းကာလ စသည့် အဆင့် (၄)ဆင့်လုံးကို ထည့်သွင်းစဉ်းစားသွားမည်ဖြစ်သည်။ ပတ်ဝန်းကျင်နှင့် လူမှုရေးထိခိုက်မှုလေ့လာဆန်းစစ်ခြင်းများ အားလုံးသည် အဆိုပြုစီမံကိန်း၏ ၃ ကီလိုမီတာ ပတ်လည် (အချင်း ၆ကီလိုမီတာအတွင်း) အတွင်း တွင်ပြုလုပ်မည်ဖြစ်သည်။

၁.၃။ မူဝါဒ၊ ဥပဒေဆိုင်ရာနှင့် အဖွဲ့အစည်းဆိုင်ရာလိုက်နာဆောင်ရွက်ချက်

မြန်မာနိုင်ငံသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းကာကွယ်ရေးနှင့်ပတ်သတ်သည့် ဥပဒေနှင့်စည်းမျဉ်းစည်းကမ်း များစွာကို ပြဋ္ဌာန်းထားပါသည်။ အဆိုပြုစီမံကိန်းနှင့် တိုက်ရိုက်ဖြစ်စေ၊ သွယ်ဝိုက်၍ဖြစ်စေသက်ဆိုင်သည့် မြန်မာနိုင်ငံတွင် ထုတ်ပြန်ထားရှိပြီးသော ဥပဒေဆိုင်ရာ စည်မျဉ်းစည်းကမ်း များ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများအား အောက်ဖော်ပြပါဇယားတွင် အကျဉ်းဖော်ပြထားရှိ ပါသည်။

ဇယား - မြန်မာနိုင်ငံရှိ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ဥပဒေများနှင့် စည်းမျဉ်းများ

ဥ ပဒေများနှင့် စည်းမျဉ်းစည်းကမ်းများ	နှစ်
ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်ဖွဲ့စည်းပုံအခြေခံဥပဒေ (ပုဒ်မ ၂၄၊ ၄၅၊ ၃၄၉၊ ၃၅၉)	၂၀၀၈
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (ပုဒ်မ ၇(ဏ)၊ ၁၄၊ ၁၅၊ ၂၄၊ ၂၅၊ ၂၉)	၂၀၁၂
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ (နည်းဥပဒေ ၆၉)	၂၀၁၄
ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (အပိုဒ် ၁၀၂-၁၁၀၊ ၁၁၃၊ ၁၁၅၊ ၁၁၇)	၂၀၁၅

အမျိုးသားသဘာဝပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များ (အပိုဒ် ၁.၁၊ ၁.၂၊ ၁.၃)	၂၀၁၅
တိုင်းရင်းသားလူမျိုး များ၏ အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့်ဥပဒေ (ပုဒ်မ ၅)	၂၀၁၅
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ (ပုဒ်မ ၅၀၊ ၅၁၊ ၆၅၊ ၇၃)	၂၀၁၆
အလုပ်သမားအဖွဲ့အစည်းဥပဒေ (ပုဒ်မ ၁၈၊ ၁၉၊ ၂၀၊ ၂၁၊ ၂၂)	၂၀၁၁
အလုပ်သမားရေးရာ အငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ (ပုဒ်မ ၃၈၊ ၃၉၊ ၄၀)	၂၀၁၂
အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှု ဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ (ပုဒ်မ ၅၊ ၁၄၊ ၃၀ (က၊ခ))	၂၀၁၃
ခွင့်ရက်နှင့် အလုပ်ပိတ်ရက်အက်ဥပဒေ ၁၉၅၁ (၂၀၁၄ ပြင်ဆင်) (အပိုဒ် ၃၊ ၅၊ ၁၄၊၁၆)	၂၀၁၄
အနည်းဆုံးအခကြေးငွေဥပဒေ (ပုဒ်မ ၁၂၊ ၁၃ (က မှ ဆ)	၂၀၁၃
အခကြေးငွေပေးချေရေးဥပဒေ (ပုဒ်မ ၃၊ ၄၊ ၅၊ ၁၄၊ ၈၊ ၁၀ ၁၄)	၂၀၁၆
မြန်မာ့အာမခံဥပဒေ (ပုဒ်မ ၁၅၊ ၁၆)	၁၉၉၃
လူမှုဖူလုံရေးဥပဒေ (ပုဒ်မ ၁၁ (က)၊ ၁၅ (က)၊ ၁၈ (ခ)၊ ၄၈၊ ၄၉၊ ၇၅)	၂၀၁၂
အလုပ်သမားလျော်ကြေးအက်ဥပဒေ ၁၉၂၄ (၂၀၀၅ ပြင်ဆင်) (အပိုဒ် ၃)	၁၉၂၄
မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေ	၂၀၁၅
၁၉၅၁ ခုနှစ်စက်ရုံများအက်ဥပဒေကိုပြင်ဆင်သည့်ဥပဒေ (ပြည်ထောင်စုလွှတ်တော်)	၂၀၁၆
ပြည်ထောင်စုမြန်မာနိုင်ငံပြည်သူ့ကျန်းမာရေးဥပဒေ (ပုဒ်မ ၃၊ ၅)	၁၉၇၂
သစ်တောဥပဒေ(ပုဒ်မ ၁၂)	၂၀၁၈
ဇီဝမျိုးစုံမျိုးကွဲနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ကာကွယ်စောင့်ရှောက်ခြင်းဆိုင်ရာ ဥပဒေ (ပုဒ်မ ၁၉ (ငါ)၊ ၃၅ (က၊ ဂ၊ ဃ) ၊ ၃၉ (ဃ))	၂၀၁၈
ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (ပုဒ်မ ၂၁ (ဃ)	၁၉၉၈
ကူးစက်ရောဂါများကာကွယ်ထိန်းချုပ်ရေးဥပဒေ (ပုဒ်မ ၃၊ ၄၊ ၁၁)	၁၉၉၅
ဆေးလိပ်နှင့် ဆေးရွက်ကြီးထွက်ပစ္စည်းသောက်သုံးမှုထိန်းချုပ်ရေးဥပဒေ (ပုဒ်မ ၉)	၂၀၀၆
ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးဥပဒေ ၂၀၀၆ (၂၀၀၇ ပြင်ဆင်) (ပုဒ်မ ၈(က)၊ ၁၁၊ ၁၉၊ ၂၁ (ခ)၊ ၂၂၊ ၂၄(ခ)၊ ၃၀၊ ၄၇၊ ၄၈၊ ၄၉)	၂၀၀၆
ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးနည်းဥပဒေများ ၂၀၁၃ (၂၀၂၀ ပြင်ဆင်) (အပိုဒ် ၄၇၊ ၄၈၊ ၄၉)	၂၀၁၃
လယ်ယာမြေဥပဒေ (ပုဒ်မ ၃၀)	၂၀၁၂
ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေး နည်းဥပဒေ (အပိုဒ် ၁၅၊ ၁၆၊ ၁၇၊ ၂၂၊ ၂၇၊ ၃၀)	၂၀၁၃
မြန်မာနိုင်ငံ အင်ဂျင်နီယာကောင်စီ ဥပဒေ (ပုဒ်မ ၃၄၊ ၃၇)	၂၀၁၃
ရေနံနည်းဥပဒေ (အပိုဒ် ၆၃၊ ၆၆၊ ၇၂၊ ၈၀၊ ၉၂၊ ၉၃)	၁၉၃၇
အလုပ်ရုံများ အက်ဥပဒေ (၁၉၅၁) (၂၀၁၆ ပြင်ဆင်) (အပိုဒ် ၁၉)	၁၉၅၁
ဘွိုင်လာဥပဒေ (ပုဒ်မ ၅၊ ၆၊ ၇၊ ၁၂ (က၊ခ)၊ ၁၄၊ ၁၅၊ ၁၈၊ ၂၀၊ ၂၁၊ ၂၄၊ ၃၁၊ ၃၈)	၂၀၁၅
သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှုဥပဒေ (ပုဒ်မ ၉ (က))	၂၀၁၃
ပို့ကုန်သွင်းကုန်ဥပဒေ (ပုဒ်မ ၇) (Law No.7)	၂၀၁၂

လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေး ဆိုင်ရာဥပဒေ (ပြည်ထောင်စုလွှတ်တော်ဥပဒေ အမှတ် ၈) (ပုဒ်မ ၁၂၊ ၁၄၊ ၁၆၊ ၁၇၊ ၁၈၊ ၂၆၊၂၇၊ ၃၄၊ ၃၆)	၂၀၁၉
စံချိန်စံညွှန်းသတ်မှတ်ခြင်းဆိုင်ရာဥပဒေ (ပုဒ်မ ၁၇၊ ၁၉၊ ၂၆)	၂၀၁၄
တီထွင်မှုမူပိုင်ခွင့်ဥပဒေ	၂၀၁၉
ကုန်အမှတ်တံဆိပ်မူပိုင်ခွင့်ဥပဒေ (ပုဒ်မ ၁၇)	၂၀၁၉
စက်မှုဒီဇိုင်းမူပိုင်ခွင့် ဥပဒေ (ပုဒ်မ ၁၉)	၂၀၁၉
စားသုံးသူကာကွယ်ရေးဥပဒေ (ပုဒ်မ ၂၁)	၂၀၁၉
နယ်နိမိတ်တိုင်းတာပိုင်းခြား သတ်မှတ်ရေးဥပဒေ (ပုဒ်မ ၁၈၊ ၁၉၊ ၂၀)	၂၀၁၉
အခွန်ဆိုင်ရာ စီမံအုပ်ချုပ်မှု ဥပဒေ (ပုဒ်မ ၁၈၊ ၂၀)	၂၀၁၉
စာချုပ်စာတမ်းများမှတ်ပုံတင်ဥပဒေ (ပုဒ်မ ၁၆)	၂၀၁၈

၁.၃.၂။ စီမံကိန်းအဆိုပြုသူ၏ကတိကဝတ်အကျဉ်းချုပ်

စီမံကိန်းအဆိုပြုသူ Da Hua (Myanmar) Polyester Staple Fiber Co., Ltd သည် အောက်ပါအချက်များကို လိုက်နာမည်ဟု ကတိပြုပါသည်။

ကတိကဝတ်အား ရှင်းလင်းဖော်ပြချက်	ရည်ညွှန်းအခန်း
ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ပါအခန်းများအလိုက်အနှစ်ချုပ်များအားရွေးထုတ်တင်ပြထားပါသည်။	အခန်း ၁
အစီရင်ခံစာတွင်ဖော်ပြထားသောစီမံကိန်းနှင့်ပတ်သတ်သည့် နောက်ခံအကြောင်း အရာများ အားလုံးသည် တိကျမှန်ကန်ပါသည်။	အခန်း ၂
စီမံကိန်းနှင့် သက်ဆိုင်သည့် ဥပဒေများ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများ၊ စံ သတ်မှတ်ချက်များ၊ နိုင်ငံတကာသဘောတူညီချက်များနှင့် စည်းမျဉ်းများအတိုင်း စီမံ ကိန်းကို အကောင်အထည်ဖော်ဆောင်ရွက်မည်ဖြစ်ပါသည်။	အခန်း ၃
အစီရင်ခံစာတွင် ဖော်ပြထားသော စီမံကိန်းအကြောင်းအရာဖော်ပြချက်များနှင့်စီမံကိန်း လုပ်ငန်းစဉ်များမှာ မှန်ကန်မှုရှိပါသည်။	အခန်း ၄
အစီရင်ခံစာတွင် ဖော်ပြထားသော စီမံကိန်းအနီးအနားရှိ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ အား အမှန်တကယ်ကွင်းဆင်းတိုင်းတာခဲ့သည့် ရလဒ်များ ဖြစ်ပါ သည်။	အခန်း ၅
အစီရင်ခံစာပါ ထိခိုက်မှုများဖော်ထုတ်ခြင်း၊ ထိခိုက်မှုအဆင့်သတ်မှတ်ခြင်း၊ လျော့ နည်းသက်သာစေရန် လုပ်ဆောင်ခြင်း၊ အစရှိသည့်လုပ်ငန်းစဉ်များမှာ စီမံကိန်းနှင့် ဆက်စပ်	အခန်း ၆

ဖြစ်ပေါ်လာသည့် လုပ်ငန်းစဉ်များဖြစ်ကြောင်းနှင့် လျော့နည်းသက်သာစေရန်နည်းလမ်းများအား သိရှိလိုက်နာဆောင်ရွက်သွားပါမည်။	
အစီရင်ခံစာတွင်ဖော်ပြထားသောဆင့်ပွားသက်ရောက်မှုများနှင့် ကြွင်းကျန်သက်ရောက်မှု များသည် စီမံကိန်းနှင့်သက်ဆိုင်မှုရှိပြီး လျော့နည်းသက်သာစေမည့်နည်း လမ်းများအား လိုက်နာဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။	အခန်း ၇
အစီရင်ခံစာတွင်ဖော်ပြထားသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်များ၊ စောင့်ကြည့်လေ့လာရေးအစီအစဉ်များ၊ စီမံခန့်ခွဲမှုများအားသိရှိပြီး ခန့်မှန်းကုန်ကျစရိတ် များအတိုင်းလုပ်ဆောင်သွားပါမည်။ ကုန်ကျစရိတ်လိုအပ်မှုရှိပါက ထပ်မံသုံးစွဲသွား ပါမည်။လုပ်ငန်းခွင်ဘေးအန္တရာယ် ကင်းရှင်းရေးလုပ်ငန်းစဉ်များ၊ သဘာဝ ဘေးအန္တရာယ် စီမံခန့်ခွဲမှုများနှင့်လူမှုဖွံ့ဖြိုးရေးရံပုံငွေအားလည်းဖော်ပြထားရှိသည့်အတိုင်းလိုက်နာဆောင်ရွက်ပါမည်။	အခန်း ၈
စီမံကိန်းကြောင့် ထိခိုက်နိုင်သည့် လူနေရပ်ကွက်များအတွင်းသို့အမှန်တကယ်ကွင်းဆင်းစစ်တမ်းများကောက်ယူပြီးလူထုတွေ့ဆုံပွဲပြုလုပ်ကာဒေသခံပြည်သူများလိုအပ်ချက်များနှင့် စိုးရိမ်ပူပန်မှုများအား စီမံကိန်းအကောင်အထည်ဖော်ဆောင်ရာတွင် အလေးထားလုပ် ဆောင်သွားပါမည်။	အခန်း ၉
စီမံကိန်းပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ရေးဆွဲခြင်းလုပ်ငန်းစဉ်အား ခြုံငုံသုံးသပ် ပြီး အဓိကထိခိုက်နိုင်မှုများနှင့် စီမံကိန်းအားလုပ်ဆောင်နိုင်ခြင်းရှိ/မရှိ သုံးသပ်တင် ပြထားပါသည်။	အခန်း ၁၀

၁.၄။ စီမံကိန်းဖော်ပြချက်နှင့် အခြားနည်းလမ်းစီစစ်ချက်အကျဉ်းချုပ်

၁.၄.၁။ စီမံကိန်းဖော်ပြချက်အကျဉ်းချုပ်

(က) စီမံကိန်းအမျိုးအစားနှင့် ထုတ်ကုန်များ

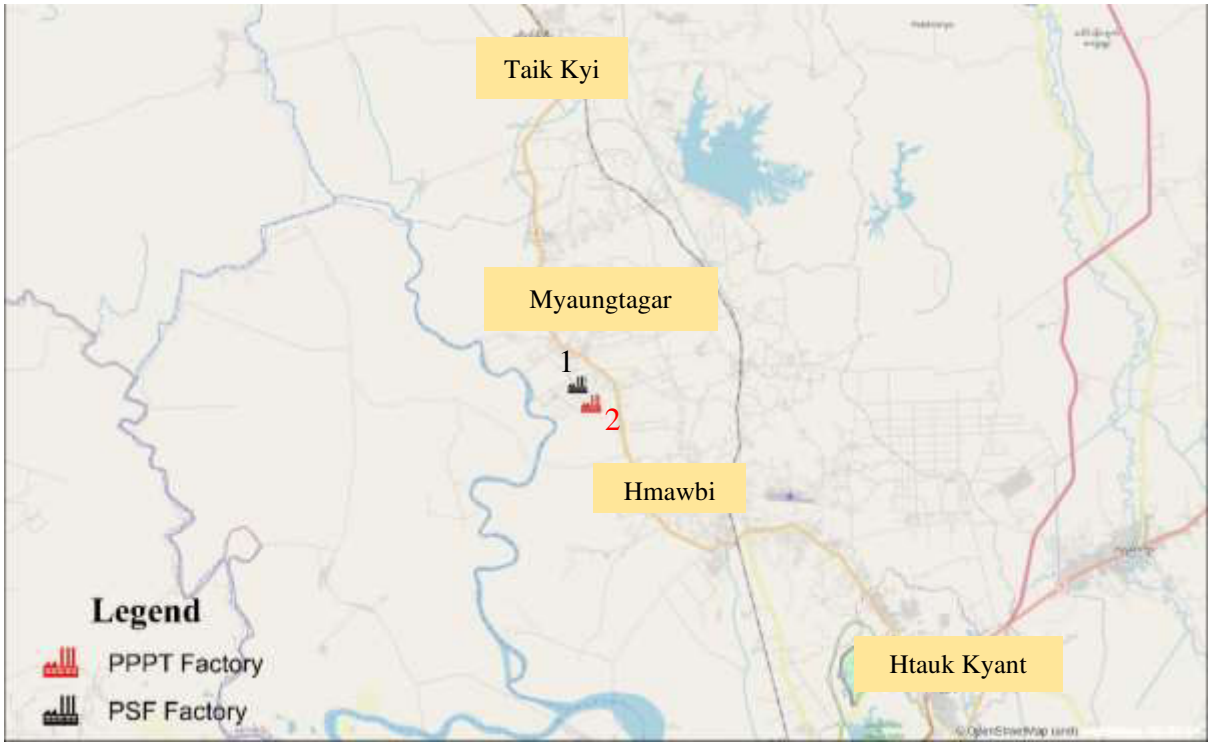
Da Hua Myanmar Company Limitedသည် အမျိုးမျိုးသောရည်ရွယ်ချက်များအတွက် ဆီလီကွန်အမျှင်များအဖြစ် အသုံးပြုနိုင်သည့် polyester staple fiber ဖြစ်သည့် ထုတ်ကုန်သုံးမျိုးကိုထုတ်လုပ်ခြင်းဖြစ်ပါသည်။ အခြားထုတ်ကုန်အမျိုးအစားများမှာ ထုပ်ပိုးခြင်းရည်ရွယ်ချက်အတွက်ကြိုးများအဖြစ်အသုံးပြုနိုင်သော PET တိပ်များနှင့် PE/PP ထုတ်လုပ်ရာတွင်အသုံးပြုသော ကော်စေ့များထုတ်လုပ်ခြင်းဖြစ်သည်။ PSFကို ကုန်ကြမ်းအဖြစ် PET ပုလင်းများ (ရေဘူးများ၊ ဆီဘူးများနှင့် အခြားသောပလပ်စတစ်ပုလင်းများကဲ့သို့) ပြုပြင်ခြင်းဖြင့် ထုတ်လုပ်ခြင်းဖြစ်ပါသည်။ ထုတ်ပိုးရာတွင်အသုံးပြုသော PET တိပ်များနှင့် PE/PP ကော်စေ့များအား ပလတ်

စတစ်ဘူးအဖုံးများမှ ထုတ်လုပ်ခြင်းဖြစ်ပါသည်။ အဆိုပါထုတ်ကုန်သုံးမျိုးအနက် PSF ကို PSFစက်ရုံ (စက်ရုံအမှတ် ၁)တွင် ထုတ်လုပ်မည်ဖြစ်ပြီး ထုတ်ပိုးရာတွင်အသုံးပြုသော PET တိတ်နှင့် ပြန်လည်အသုံးပြုနိုင်သော PE/PP ကော်စေ့များအား PPPTစက်ရုံ (စက်ရုံအမှတ် ၂)တွင် ထုတ်လုပ်မည်ဖြစ်ပါသည်။

(ခ) စီမံကိန်းတည်နေရာ

Da Hua Myanmar Company Limitedသည် ထုတ်ကုန်ပစ္စည်းသုံးမျိုးထုတ်လုပ်ရန်အတွက် စက်ရုံနှစ်ရုံတည် ဆောက်ထားပါသည်။ PSF စက်ရုံ(စက်ရုံအမှတ် ၁) သည် ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာသံမဏိစက်မှုဇုန် လုပ်ကွက်အ မှတ် ၂၀၉နှင့် ၂၃၈၊ ကိုဩဒိနိတ် အမှတ် မြောက်လတ္တီကျူ (၁၇° ၁၀' ၃.၄၂") နှင့် အရှေ့လောင် ဂျီကျူ (၉၅° ၅၈' ၄၁.၆၈") တွင် တည်ရှိပါသည်။ PPPT စက်ရုံ(စက်ရုံအမှတ် ၂) သည် ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာသံမဏိစက်မှုဇုန် လုပ်ကွက်အမှတ် ၃၇၅မှ ၃၈၁၊ ကိုဩဒိနိတ် အမှတ် မြောက်လတ္တီကျူ (၁၇° ၉' ၃၅.၃၇") နှင့် အရှေ့လောင်ဂျီကျူ (၉၅° ၅၉' ၄.၁၀") တွင် တည်ရှိပါသည်။ စက်ရုံနှစ်ခုသည် ၀.၉ ကီလိုမီတာ (မီတာ ၉၀၀) ကွာဝေးပါသည်။ စီမံကိန်းတည်နေရာသည် မြို့ပြဧရိယာနှင့်လှိုင်မြစ်အနီးတွင် တည်ရှိပါသည်။ စီမံကိန်းကြောင့် သက်ရောက်မှုရှိသော နေရာများသည် ရန်ကုန်-ပြည်အမြန်လမ်းမှ (၁)ကီလိုမီတာနှင့်အထက် အကွာဖြစ်ပါ သည်။ စီမံကိန်း ဧရိယာ၏ တည်နေရာပြ မြေပုံကို အောက်ပါပုံတွင် တွေ့နိုင်သည်။

ပုံ - စက်ရုံနှစ်ခုကြား အကွာအဝေး



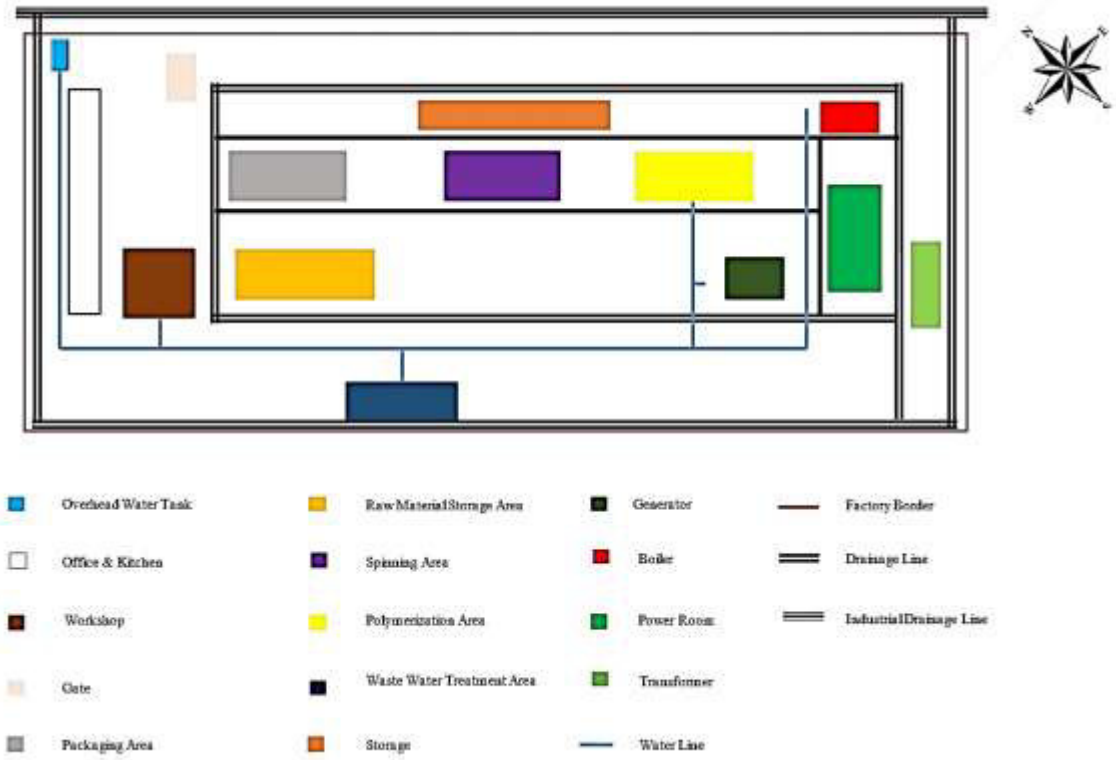
ပုံ - စီမံကိန်းတည်နေရာပြမြေပုံ

Location	Coordinates	
	Latitude	Longitude
PPPT Factory	17° 9'35.37"N	95°59'4.10"E
PSF Factory	17°10'3.42"N	95°58'41.68"E
Myaung Dagar	17°10'40.13"N	95°58'39.24"E
Hmawbi	17° 9'59.11"N	95°59'35.36"E
Taik Kyi	17°17'45.12"N	95°58'26.56"E
Htauk Kyant	17° 2'35.07"N	96° 7'57.36"E

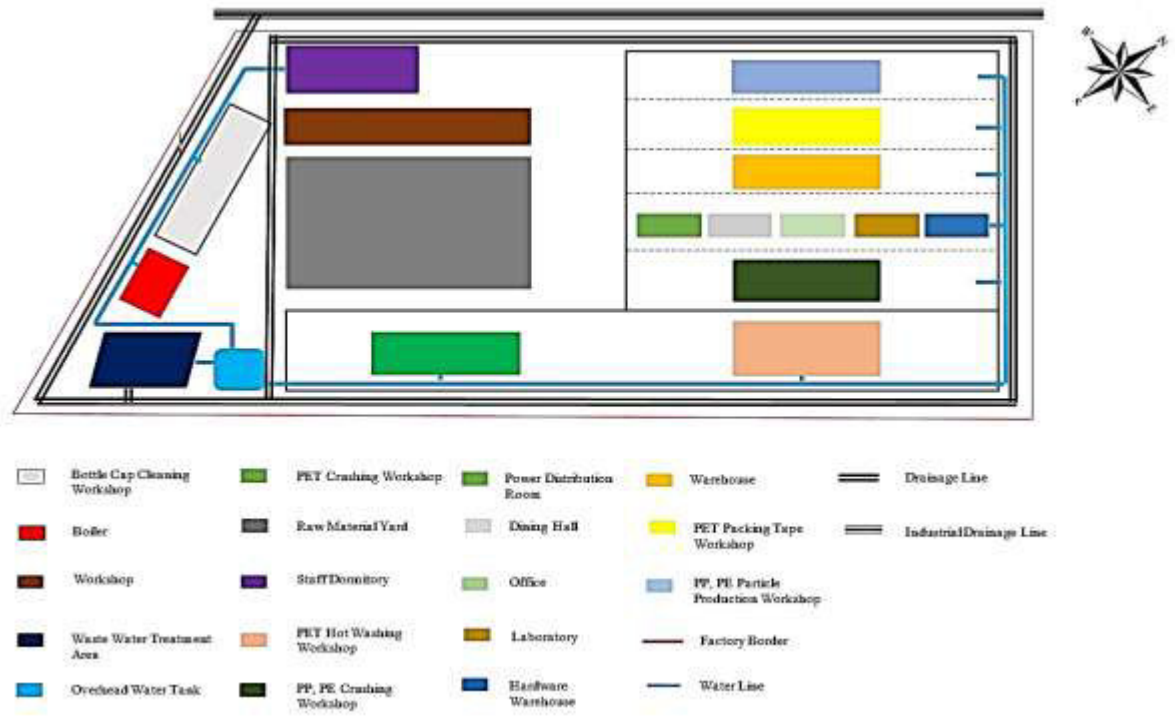
(ဂ) စီမံကိန်းဧရိယာ

Da Hua (Myanmar) Polyester Staple Fibers စက်ရုံ၏ အဓိကအဆောက်အဦးမှာ ပေ၈၀၀xပေ၁၀ ရှိပြီး စက်ရုံစုစုပေါင်းအကျယ်အဝန်းသည် ၄.၀၀၄ ဧကရှိပါသည်။ ကုန်ကြမ်းအနေဖြင့် PET ဘူးခွံများကို တစ်နေ့လျှင် တန်ဖ၀ အသုံးပြု၍ စီလီကွန်အမျှင်စများ တစ်နေ့လျှင် တန် ၄၀ အထိ ထုတ်လုပ်လျက်ရှိသည်။ PPPT စက်ရုံ (စက်ရုံအမှတ် ၂)သည် ၈.ဖဖ၇ ဧကရှိပါသည်။

(ဃ)စီမံကိန်းတည်ဆောက်ထားရှိပုံ



ပုံ - PSF စက်ရုံတည်ဆောက်ပုံ (စက်ရုံအမှတ် ၁)



ပုံ - PPPT စက်ရုံတည်ဆောက်ပုံ (စက်ရုံအမှတ် ၂)

(c) စီမံကိန်းအကြောင်းအရာအကျဉ်း

စီမံကိန်းအကျဉ်းအား အောက်ပါဇယားတွင်ဖော်ပြထားရှိပါသည်။

ဇယား - စီမံကိန်းအကြောင်းအရာအကျဉ်း (စက်ရုံအမှတ် ၁)

အကြောင်းအရာ	ဖော်ပြချက်
ထုတ်ကုန်	Polyester Staple Fiber
ထုတ်လုပ်မှု	စက်ရုံအမှတ် (၁) တစ်နေ့လျှင် စီလီကွန်အမျှင်စ ၄၅တန် ထုတ်လုပ်သည်။
စီမံကိန်းဧရိယာ	စက်ရုံအမှတ် ၁ မှာ ၄.၀၀၄ ဧကရှိပါသည်။
ရေသုံးစွဲမှု	တစ်နေ့လျှင် ဂါလံ ၁၅၀၀ ခန့်မှန်း
ရေအရင်းအမြစ်	အဝီစိတွင်းရေနှင့် အအေးခံခြင်းလုပ်ငန်းစဉ်မှထွက်ရှိသည့်ရေများကို ပြန်လည်အသုံးပြုပါသည်။ အနက် ၃၀၀ ပေ၊ အချင်း၀က် ၄လက်မရှိ အဝီစိတွင်း ၂တွင်းမှ ရေကိုထုတ်ယူသုံးစွဲပါသည်။ မြေအောက်ရေကို တစ်မိနစ်လျှင် ၁၀ ဂါလန်နှုန်း (တစ်နာရီလျှင် ၆၀၀ ဂါလန်နှုန်း) ဖြင့်ထုတ်ယူပြီး၊ ၁၂၀၀ ဂါလန်ဆံ့ မြေအောက်ရေကန်နှင့် ၃၀၀၀ ဂါလန်ဆံ့ ရေစင်များတည်ဆောက်ထားရှိပြီး သိုလှောင်သုံးစွဲပါသည်။
အိမ်သုံးရေအရင်းအမြစ်	အဝီစိတွင်းရေ
လျှပ်စစ်ဓာတ်အား အရင်းအမြစ်	မြန်မာ့လျှပ်စစ်ဓာတ်အားလုပ်ငန်းမှ ၃၃/၀.၄ ကီလိုဗို့အား ရယူသုံးစွဲ၊ ၁၀၀၀ ကီလိုဗို့ အားရှိ ထရန်စဖော်မာ ၂လုံး၊
အရံဓာတ်အား အရင်းအမြစ်	၁၀၀၀ ကီလိုဗို့အားရှိ open type ဒီဇယ်မီးစက် ၁ လုံး၊ ၁၅၀၀ ကီလိုဗို့အားရှိ Jiangsu အသံတိတ်မီးစက် ၁ လုံး၊ နှင့် ၅၀၀ ကီလိုဗို့အားရှိ Stanford အသံတိတ်မီးစက် ၁ လုံး
ဓာတ်အားသုံးစွဲမှု	တစ်ရက်လျှင် ၂,၀၀၀ ယူနစ် တစ်လလျှင် ၅၀,၀၀၀ ယူနစ် တစ်နှစ်လျှင် ၆၀၀,၀၀၀ ယူနစ်

ရေသုံးစွဲမှု	ဘွိုင်လာအတွက် တစ်ရက်လျှင် - ၅၅၀ ဂါလန်ခန့် ကုန်ကြမ်းဆေးကြောရန် တစ်ရက်လျှင် - ၁,၅၀၀ ဂါလန်ခန့် အလုပ်သမား ၁၀၀ စာ တစ်ရက်သုံးစွဲရေ (အိမ်သုံး) - ၁,၀၀၀ ဂါလန်ခန့်
ကုန်ကြမ်းပစ္စည်းနှင့် ကုန်ကြမ်းအရင်းမြစ်များ	အခြေခံကုန်ကြမ်းပစ္စည်းဖြစ်သည့် PTE ပုလင်းများကို သန့်စင်၍ အသုံးပြုပါသည်။ တစ်ရက်လျှင် ကုန်ကြမ်း ၆၀ တန်ခန့်လိုအပ်ပြီး တစ်ရက်လျှင် ကုန်ချော ပမာဏ အနည်းဆုံး ၄၅ တန်ခန့် ထွက်ရှိမည်ဖြစ်ပါသည်။ ဆီလီကွန်အဆီနှင့် PTE ချေးခွာတ်ပေါင်ဒါတို့ကို ပြည်ပမှတင်သွင်း ပါသည်။ ဆီလီကွန်အဆီ ၁၅,၀၀၀ ကီလိုဂရမ်ခန့်၊ spinning oil ၆၀,၀၀၀ ကီလိုဂရမ်ခန့် ၊ ချေးခွာတ်အမှုန့် ၁,၆၈၀,၀၀၀ ကီလိုဂရန်ခန့် အသုံးပြုမည်ဖြစ်ပါသည်။ ရေဆိုးသန့်စင်စက်ရုံအတွက် SGS ၏ RSL နှင့် ကိုက်ညီသည့် Sodium hydroxide, Polyacrylamide, Polyaluminium Chlorid တို့ကိုအသုံးပြုပြီး ၎င်းတို့ကို ပြည်တွင်းagentများထံတွင် လွယ်ကူစွာ ဝယ်ယူနိုင်ပါသည်။
ကုန်ချောများရောင်းချခြင်း	ကုန်ချောများကို ယခုကာလ (၂၀၂၄ခုနှစ်) တွင် USA နှင့် တရုတ်နိုင်ငံသို့ တင်ပို့ပါသည်။
အဆောက်အဦး	အဓိကစက်ရုံအဆောက်အဦး (ရေဆေးခန်း၊ မီးစက်၊ ထရန်စဖော်မာ၊ ပါဝါ၊ အရည်ဖျော်ခြင်း၊ ဘွိုင်လာ၊ ထုတ်ကုန်သိုလှောင်ရုံ၊ မွှေစက်ခန်း၊ ယာယီသိုလှောင်ရုံ အပါအဝင်)၊ လူနေအဆောက်အဦးများနှင့် ရုံးခန်း၊ မီးဖိုချောင်နှင့် လုံခြုံရေးအဆောက်အအုံ။
စွန့်ပစ်အစိုင်အခဲ	ယေဘုယ်အားဖြင့် ကုန်ချော ၆၀တန်ခန့်ထုန်လုပ်ရန် ကုန်ကြမ်း ၆၅ တန်ခန့်ကိုအသုံးပြုရပြီး၊ ကျန်ရှိနေသည့် အလေအလွင့် ၅တန်ခန့်ကို ပြန်လည် အသုံးပြုသည့်အတွက် ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစင်မှ စွန့်ပစ် အစိုင်အခဲ မထွက်ရှိပါ။ ရေသန့်ဘူးခွံကဲ့သို့ အမှိုက်ခြောက်များကို ကုန်ထုတ်လုပ်ငန်း များတွင် ပြန်လည်အသုံးပြုမည်ဖြစ်ပြီး၊ အခြားသော ပြန်လည်သုံးစွဲနိုင် သည့် အမှိုက်များဖြစ်သည့် သံဘူး၊ အအေးဘူးများကို ပြန်လည် အသုံးပြုသူများထံသို့ ရောင်းချ

	သွား ပါမည်။ ပြန်လည်အသုံးပြု၍ မရသော စွန့်ပစ်အမှိုက်များကို မြောင်းတကာ စက်မှုဇုန် အမှိုက်ပစ်ကန်တွင် နေ့စဉ်စွန့်ပစ်ပါမည်။
စွန့်ပစ်ရေ	sodium hydroxide, polyacrylamide နှင့် poly aluminium chloride တို့ကိုသုံး၍ သန့်စင်ပြီး လုပ်ငန်းတွင် ပြန်လည်အသုံးပြုသည်။
အလုပ်သမားခန့်ထားနိုင်မှု	လုပ်ငန်းအပြည့်အဝလည်ပတ်မှုအတွက် ဝန်ထမ်းစုစုပေါင်း ၂၄၈ ယောက် အသုံးပြုပါမည်။
အလုပ်ချိန်	နေ့ဆိုင်း (မနက် ၇နာရီ - ည ၇နာရီ) နှင့် ညဆိုင်း (ည ၇နာရီ - မနက် ၇နာရီ)
အလုပ်လုပ်ရက်ပေါင်း	နှစ်စဉ်၃၀၈ ရက်
ရင်းနှီးမြုပ်နှံမှု	အမေရိကန်ဒေါ်လာ ၅.၁၈၉၅ သန်း
ဘွိုင်လာ	မီးခိုးခေါင်းတိုင်အမြင့် – ၁၅ မီတာ မီးခိုးခေါင်းတိုင်အချင်း – ၈၀၀ မီလီမီတာ *ရေလျှောင်ကန်ထုထည်* - *၁၁၀၀ ဂါလန်* *ရေငွေ့အလျင် (steam velocity)* - *တစ်စက္ကန့်လျှင် ၂၀ မီတာ* *ရေငွေ့အပူချိန်* - *၃၀၀ ဒီဂရီစင်တီဂရိတ်* *ရေအသုံးပြုမှု* - *ခန့်မှန်းခြေ တစ်ရက်လျှင် ၅ တန်ခန့်* *ကျောက်မီးသွေးအသုံးပြုမှု* - *တစ်ရက်လျှင် ၅ တန်မှ ၁၀ တန်ခန့်* *ကုန်ကြမ်းရရှိသည့်နေရာ* – *ကျောက်မီးသွေး (ကလောဒေသ)*

ဇယား - စီမံကိန်းအကြောင်းအရာအကျဉ်း (စက်ရုံအမှတ် ၂)

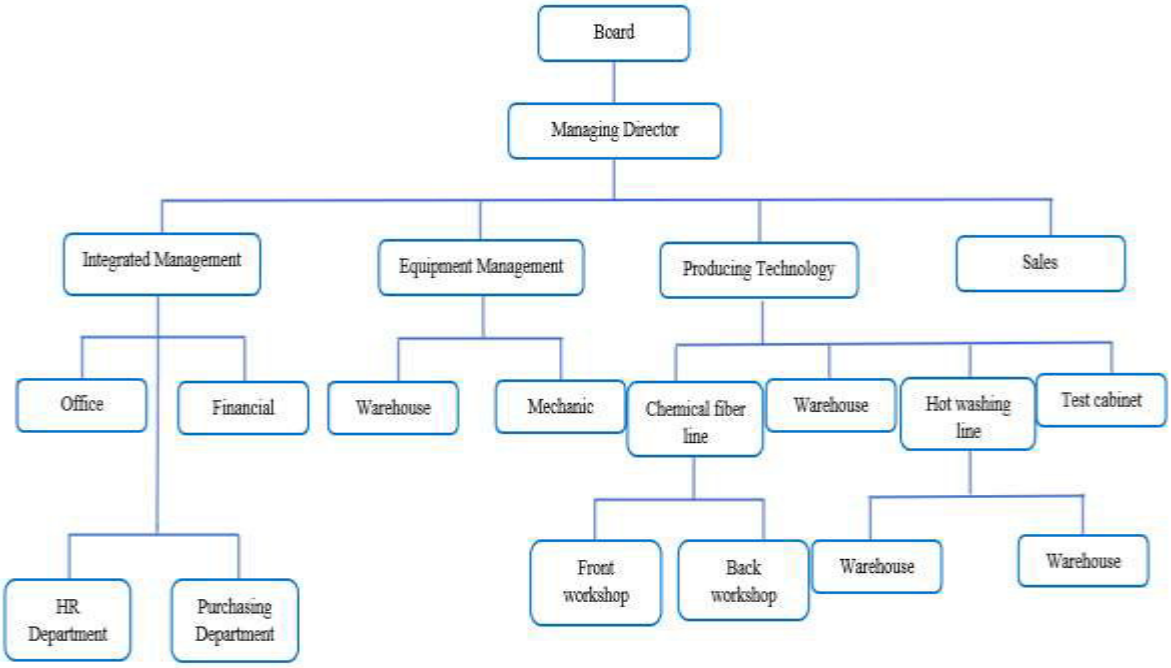
အကြောင်းအရာ	ဖော်ပြချက်
ထုတ်ကုန်	PET **ပါကင်တိတ်နှင့် ပြန်လည်သုံးစွဲရန်ပြုပြင်ထားသည့်** PP/ PE **ကော်စေ့** (PP/PE Recycle Pallet (PPPT))
ထုတ်လုပ်မှု	စက်ရုံအမှတ် (၂)

	တစ်နေ့လျှင်ကုန်ကြမ်း PET ဘူးခွံ တန်ဖိုကိုအသုံးပြုသည်။
စီမံကိန်းဧရိယာ	စက်ရုံအမှတ် (၂)သည် ၈.၆၆၇ ဧကရှိပါသည်။
ရေသုံးစွဲမှု	တစ်နေ့လျှင် ဂါလံ ၃,၀၀၀ ခန့်မှန်း
ရေအရင်းအမြစ်	ကုန်ကြမ်းများကိုဆေးကြောခြင်းအတွက် အဝီစိတွင်းရေနှင့် စွန့်ပစ်ရေစစ်ကန်မှ ရေများကို ပြန်လည်အသုံးပြုပါသည်။
အိမ်သုံးရေအရင်းအမြစ်	အဝီစိတွင်းရေ
လျှပ်စစ်ဓာတ်အားအရင်းအမြစ်	မြန်မာ့လျှပ်စစ်ဓာတ်အားလုပ်ငန်းမှ ၃၃/၀.၄ ကီလိုဗို့အား ရယူသုံးစွဲ၊ ၂၀၀၀ ကီလိုဗို့ အားရှိ ထရန်စဖော်မာ ၁ လုံး၊ ၁၀၀၀ ကီလိုဗို့အားရှိ ဒီဇယ်မီးစက် ၁ လုံး၊ ၁၅၀၀ ကီလိုဗို့အားရှိ Jiangsu အသံတိတ်မီးစက် ၁ လုံး၊ နှင့် ၅၀၀ ကီလိုဗို့အားရှိ Stanford အသံတိတ်မီးစက် ၁ လုံး
အဆောက်အဦး	ခုတ်စသိုလှောင်ရုံ၊ ရုံးခန်း၊ စွန့်ပစ်ရေကန်များ၊ ရေစည်နှင့်သန့်စင်စက်၊ ကုန်ကြမ်းပစ္စည်းများပြင်ဆင်သည့်အဆောက်အအုံ (ပုလင်းများအမျိုးအစား ခွဲခြင်း၊ ဆေးကြောခြင်း နှင့် ဖြတ်တောက်ခြင်း)၊ Piling Yard ကုန်ကြမ်း၊ ဘွိုင်လာ၊ ပါကင်တိပ်နှင့် ပြန်လည်သုံးစွဲရန်ပြုပြင်ထားသည့် ကော်စေ့ ထုတ်လုပ်ရေး အလုပ်သမားများအတွက် အဆောက်အဦး၊ လုံခြုံရေး အဆောက်အအုံ။
စွန့်ပစ်အစိုင်အခဲ	ယေဘုယ်အားဖြင့် ကုန်ချော ဖိုတန်ခန့်ထုန်လုပ်ရန် ကုန်ကြမ်း ၆၅ တန်ခန့်ကိုအသုံးပြုရပြီး၊ ကျန်ရှိနေသည့် အလေအလွင့် ၅တန်ခန့်ကို ပြန်လည်အသုံးပြုသည့်အတွက် ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းစင်မှ စွန့်ပစ် အစိုင်အခဲ မထွက်ရှိပါ။ ရေသန့်ဘူးခွံကဲ့သို့ အမှိုက်ခြောက်များကို ကုန်ထုတ်လုပ် ငန်းများတွင် ပြန်လည်အသုံးပြုမည်ဖြစ်ပြီး၊ အခြားသော ပြန်လည်သုံးစွဲနိုင် သည့်အမှိုက်များဖြစ်သည့် သံဘူး၊ အအေးဘူးများကို ပြန်လည် အသုံးပြုသူများထံသို့ ရောင်းချသွားပါမည်။ ပြန်လည်အသုံးပြု၍ မရသောစွန့်ပစ်အမှိုက်များကိုမြောင်းတကာစက်မှုဇုန် အမှိုက်ပစ်ကန်တွင် နေ့စဉ်စွန့်ပစ်ပါမည်။
စွန့်ပစ်ရေ	sodium hydroxide, polyacrylamide နှင့် poly aluminium chloride

	တို့ကိုသုံး၍ သန့်စင်ပြီး လုပ်ငန်းတွင် ပြန်လည်အသုံးပြုသည်။
အလုပ်သမားခန့်ထားနိုင်မှု	လုပ်ငန်းအပြည့်အဝလည်ပတ်မှုအတွက် ဝန်ထမ်းစုစုပေါင်း ၂၄၈ ယောက် အသုံးပြုပါမည်။
အလုပ်ချိန်	နေ့ဆိုင်း (မနက် ၇နာရီ - ည ၇နာရီ) နှင့် ညဆိုင်း (ည ၇နာရီ - မနက် ၇နာရီ)
အလုပ်လုပ်ရက်ပေါင်း	နှစ်စဉ်၃၀၈ ရက်
ရင်းနှီးမြှုပ်နှံမှု	အမေရိကန်ဒေါ်လာ ၁၀ သန်း
ဘွိုင်လာ	မီးခိုးခေါင်းတိုင်အမြင့် – ၁၅ မီတာ မီးခိုးခေါင်းတိုင်အချင်း – ၈၀၀ မီလီမီတာ *ရေလျှောင်ကန်ထုထည်* - *၁၁၀၀ ဂါလန်* *ရေငွေ့အလျင် (steam velocity)* - *တစ်စက္ကန့်လျှင် ၂၀ မီတာ* *ရေငွေ့အပူချိန်* - *၃၀၀ ဒီဂရီစင်တီဂရိတ်* *ရေအသုံးပြုမှု* - *ခန့်မှန်းခြေ တစ်ရက်လျှင် ၅ တန်ခန့်* *ကျောက်မီးသွေးအသုံးပြုမှု* - *တစ်ရက်လျှင် ၅ တန်မှ ၁၀ တန်ခန့်* *ကုန်ကြမ်းရရှိသည့်နေရာ* – *ကျောက်မီးသွေး* (*ကလောဒေသ*)

(စ) စီမံကိန်း၏ အဖွဲ့အစည်းပြကားချပ်

စီမံခန့်ခွဲမှုကို ဒါရိုက်တာအဖွဲ့ဝင်များမှ ဦးဆောင်ပြီး၊ စက်ရုံစီမံခန့်ခွဲမှုကို မန်းနေးဂျင်းဒါရိုက်တာမှ ဦးဆောင်စီမံခန့်ခွဲပါသည်။ စက်ရုံတွင် အထွေထွေစီမံဌာန၊ စက်ပစ္စည်းစီမံဌာန၊ ထုတ်လုပ်ရေးနည်း ပညာဌာနနှင့်၊ အရောင်းဌာနဟူ၍ အဓိကဌာန (၄) ခုရှိပါသည်။ စက်ရုံဖွဲ့စည်းမှုတွင် စီမံခန့်ခွဲမှု၊ ငွေစာရင်း၊ HR နှင့် ဝယ်ယူရေး၊ စတို၊ ဓာတုဗိုက်ဘာလိုင်း၊ ရေပူအသုံးပြုဆေးကြောရေးလိုင်း၊ စစ်ဆေးရေးလိုင်း တို့ပါဝင် သည်။ နိုင်ငံခြားသားပညာရှင် ၂၀ကျော်ခန့်ဦးဆောင်၍ ကုန်ထုတ် လုပ်ငန်းများလည်ပတ်ရန်လျာထားပြီး၊ စက်ရုံအနေနှင့် ပြည်သူများ၏ ပညာရေးနှင့် အရည်အချင်းပေါ် မူတည်၍ ပြည်တွင်းအလုပ်ကိုင်အခွင့်အလမ်း ၂၂၀ ကျော် ဖန်တီးပေးနိုင်မည်ဖြစ်သည်။ လက်ရှိအချိန်တွင် ပြည်တွင်းလုပ်သား ၁၀၀ခန့် ခန့်အပ် ထား နိုင်ပြီဖြစ်သည်။ စက်ရုံအမှတ် (၁) နှင့် (၂) အဆိုပြုစီမံကိန်း၏ အဖွဲ့အစည်းပြကားချပ်မှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။



ပုံ - အဆိုပြုစီမံကိန်းအတွက် ဖွဲ့စည်းပုံပြကားချပ်

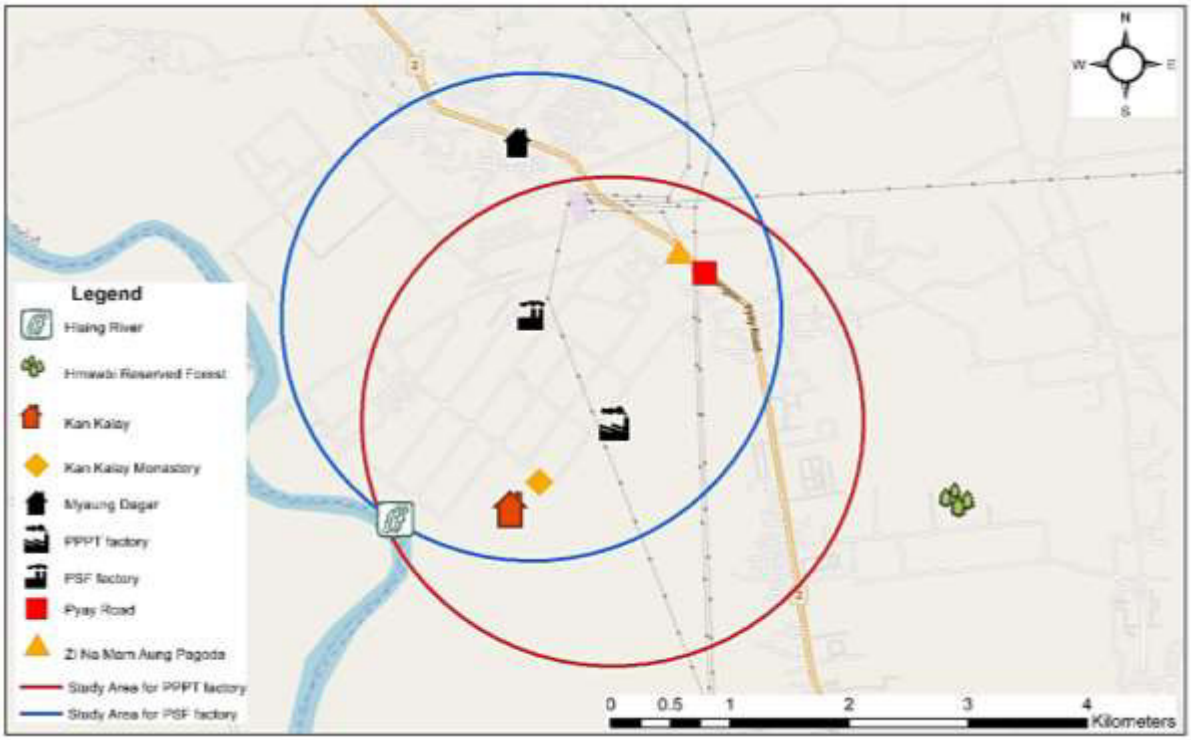
(စ) အဆိုပြုစီမံကိန်းအနီးပတ်ဝန်းကျင်

အနီးနားဆုံး လူနေထိုင်ရာကျေးရွာသည် မြောင်းတကာရွာဖြစ်သည်။ စီမံကိန်းအနီးအနားတွင် ထိခိုက်မှုရှိနိုင်သည့်အရာများအား အောက်ပါဇယားတွင်ဖော်ပြထားရှိပါသည်။ သို့ရာတွင် အဆိုပြုထားသောစီမံကိန်းကြောင့် ထိခိုက်လွယ်နိုင်သောနေရာများအားလုံးကို ထိခိုက်နိုင်သည်ဟု ဆိုလိုခြင်းမဟုတ်ဘဲ အနီးဆုံးထိခိုက်လွယ်နိုင်သည့်ဧရိယာများကိုသာ ဇယားတွင်ဖော်ပြထားခြင်း ဖြစ်ပါသည်။

အဆိုပြုစီမံကိန်းအနီးပတ်ဝန်းကျင်

စဉ်	အကြောင်းအရာ	ဖော်ပြချက်	စက်ရုံအမှတ် (၁) မှ အကွာအဝေး (ကီလိုမီတာ)	စက်ရုံအမှတ် (၂) မှ အကွာအဝေး (ကီလိုမီတာ)
၁။	အနီးဆုံးလူနေရပ်ကွက်	ကံကလေးကျေးရွာ	၁.၄၄	၁.၀၃
၂။	အနီးဆုံး မျက်နှာပြင်ရေထု	လှိုင်မြစ်	၁.၈၅	၁.၈၈
၃။	အနီးဆုံးလူနေအထူထပ်ဆုံးနေရာ	မြောင်းတကာ	၁.၁၃	၂.၁၁
၄။	အနီးဆုံးလမ်း	ပြည်လမ်း	၁.၇၃	၁.၄၀
၅။	အနီးဆုံးဘုရား	ဇနမာန်အောင်ဘုရား	၁.၂၇	၁.၄၃

၆။	အနီးဆုံးဘုန်းကြီးကျောင်း	ကံကလေးဘုန်းကြီးကျောင်း	၁.၃၈	၀.၇၉
၇။	အနီးဆုံးသစ်တောကြိုးဝိုင်း	မှော်ဘီသစ်တောကြိုးဝိုင်း	၃.၆၄	၂.၇၇



ပုံ - စက်ရုံ (၁)နှင့် (၂)၏ စီမံကိန်းအနီးပတ်ဝန်းကျင်

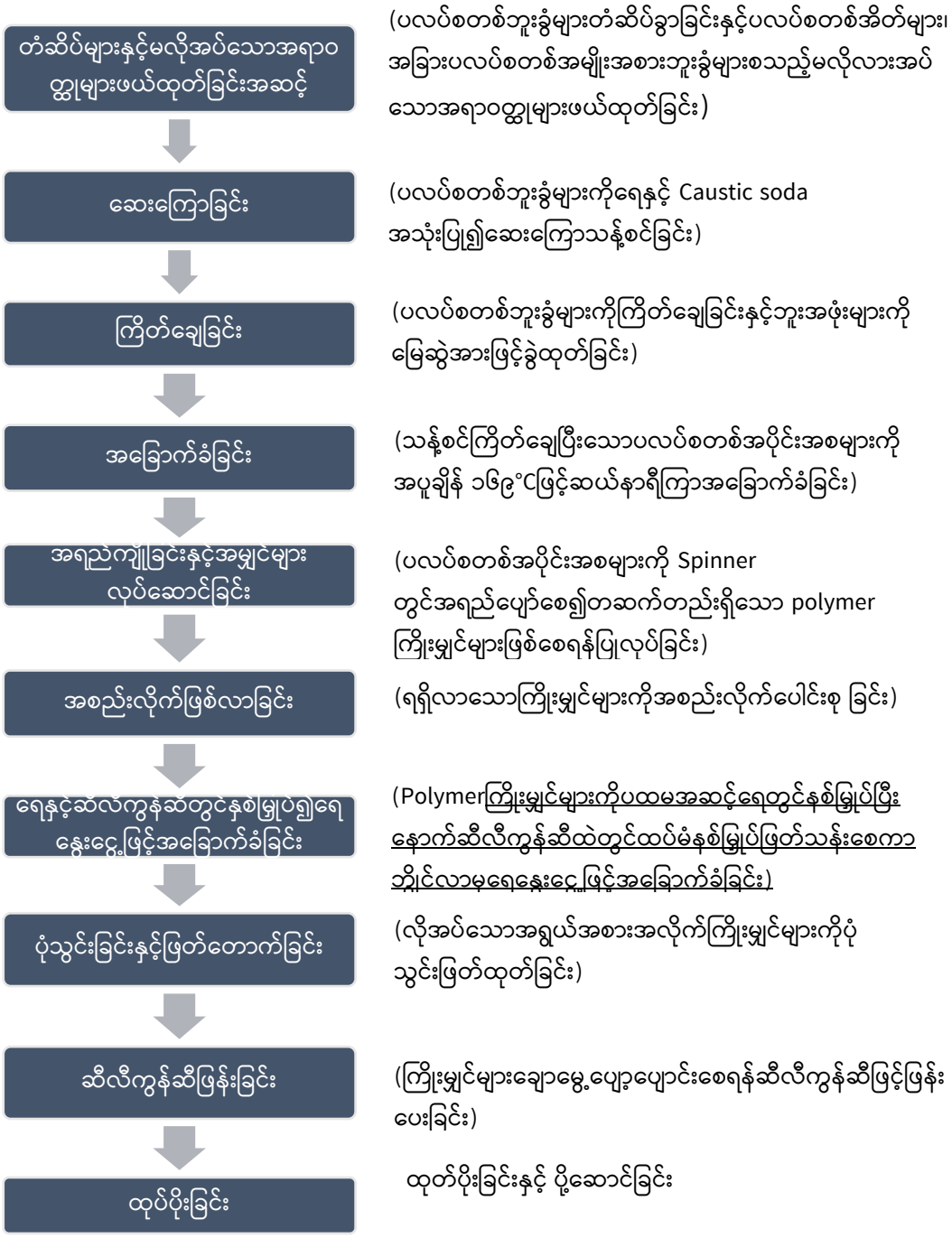
၁.၄.၂။ လုပ်ငန်းစဉ်အကျဉ်းချုပ်

အဆိုပြုထားသည့်ပိုလီစတာပြန်လည်အသုံးပြုသည့်စက်ရုံတွင် ပြန်လည်အသုံးပြုမည့် စွန့်ပစ်ပစ္စည်းများ ဝယ်ယူခြင်း၊ PTE ပုလင်းများစုဆောင်းခြင်းနှင့် အမျိုးအစားခွဲခြင်း၊ ကော်ချပ်များထုတ်လုပ်ခြင်းနှင့် ကုန်ချောထုတ်ရန် ပြင်ဆင်၍ ကုန်ချောထုတ်ခြင်း ဟူ၍ အဝိုင်း ၃ဝိုင်းပါရှိသည်။

(၁) Polyester Staple Fiber (PSF)ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်

ကုန်ကြမ်းထုတ်ရုံမှ ပို့ဆောင်လာသော သန့်စင်ပြီး ပလတ်စတစ်ခုတ်စများကို အခြောက်ခံစက်တွင် အပူပေး၍ ထွက်လာသော ပေါ်လီမာအားလေဖြင့် ဦးစွာအအေးခံပြီးနောက် အအေးခံတာဝါ၌ ရေဖြင့်ထပ်မံအအေးခံရသည်။ အအေးခံပြီးနောက် ပေါ်လီမာအမျှင်များသည် ရောထွေးသွားသည့်အတွက် ဦးစွာရေတွင်ဖြတ်ကာ ဖြောင့်တန်းစေရန် ဆွဲဆန့်ပြီး ထိုမှတဆင့် ဆီလီကွန်ဆီတွင်ဖြတ်စေသည်။ ထို့နောက် ၎င်းတို့အား ဘွိုင်လာ

တွင် ရေနွေးငွေ့ကိုသုံး၍အခြောက်ခံစေသည်။ ထို့နောက်တွင်မှ လိုအပ်သည့် ပုံသဏ္ဌာန်နှင့် အရွယ်အစား အလိုက် ဖြတ်တောက်ပုံသွင်းပြီး ကုန်ကြမ်း၏ အရည်အသွေးပေါ်မူတည်၍ ကုန်ချောအဆင့် များခွဲခြား သတ်မှတ်သည်။ နောက်ဆုံးကုန်ချောမထွက်မီ အမျှင်စများကို မျက်နှာပြင်များချောမွေ့စေရန် ဆီလီကွန်ဆီဖြင့် မှုတ်ဖြန်းပေး သည်။ ထို့နောက်တွင်မှ ရရှိလာသည့် ကုန်ချောများကို ထုတ်ပိုးရာ တစ်ထုတ်လျှင် ၃၀၀ ကီလို ဂရမ်ရှိသည်။



ပုံ - Polyester Staple Fiber (PSF) ထုတ်လုပ်ပုံပြဇယား

(၂) PET Packing Tape ထုတ်လုပ်ခြင်း

ကုန်ကြမ်းသိုလှောင်ရုံမှ ပေးပို့လာသော သန့်စင်ပြီး PET ခုတ်စများကို hopper မှတဆင့် dryer သို့ ပို့ဆောင်ကာ ကြိုးပြားပြုလုပ်ရန်လုံလောက်သည်အထိ အခြောက်ခံစေသည်။ Automatic feedingလုပ်ငန်းစဉ် ဖြင့် အမျှင်များကိုသမမျှတစွာပျံ့နှံ့စေကာ ခုတ်စများအခြောက်ခံပြီး လိုအပ်သည့်အခြေအနေ ရောက်သည် အထိ အပူပေးပါသည်။ ခုတ်စများလိုအပ်သည့် အခြေအနေထိ အခြောက်ခံပြီးနောက် မွှေစက် (Spinnerette) ထဲသို့ အလိုအလျောက်ပို့ဆောင်စက် ဖြင့်ရောက်ရှိစေပြီး ယင်းခုတ်စများကို ပျစ်နှစ်ချွဲကပ် သောအရည်အဖြစ် သို့ပြောင်းလဲစေသည်။ ထိုမှတဆင့် ထွက်လာသော ပေါ်လီမာအား ကြိုးပြားအဖြစ်သို့ ပုံလောင်း၍လေဖြင့်တစ်လှည့် ရေဖြင့် တစ်လှည့် အအေးခံစေသည်။ ထို့နောက် ရရှိလာသော ကြိုးပြားများကို ဖြောင့်ဖြူးတောင့် တင်းစေရန် ရေကိုဖြတ်၍ဆွဲဆန့်ရသည်။ အပူပေးခြင်းလုပ်ငန်းတွင် ဖိုင်ဘာကြိုးပြားများအား ဘွိုင်လာတွင်းတွင် ရေနွေးငွေ့ကိုအသုံးပြုပြီး ထပ်မံခြောက် သွေ့၍ဖြောင့်တန်းစေသည်။ အပူပေးခြင်းလုပ်ငန်းပြီးနောက် ရရှိလာသောကြိုးပြားများကို ပြန်လည်အအေးခံ၍ မာကြောစေသည်။ အဆုံးသတ်အဆင့်တွင်မှ အအေးခံ၍ ရရှိသော ကြိုးပြားများကို လိပ်စက်ဖြင့် အခွေလိုက်ဖြစ် စေရန်ပြုလုပ်ပြီးနောက်နောက်ဆုံးထုတ်ကုန်ဖြစ်သည့်ဖိုင်ဘာ ကြိုး ပြားခွေများကို ရရှိသည်။

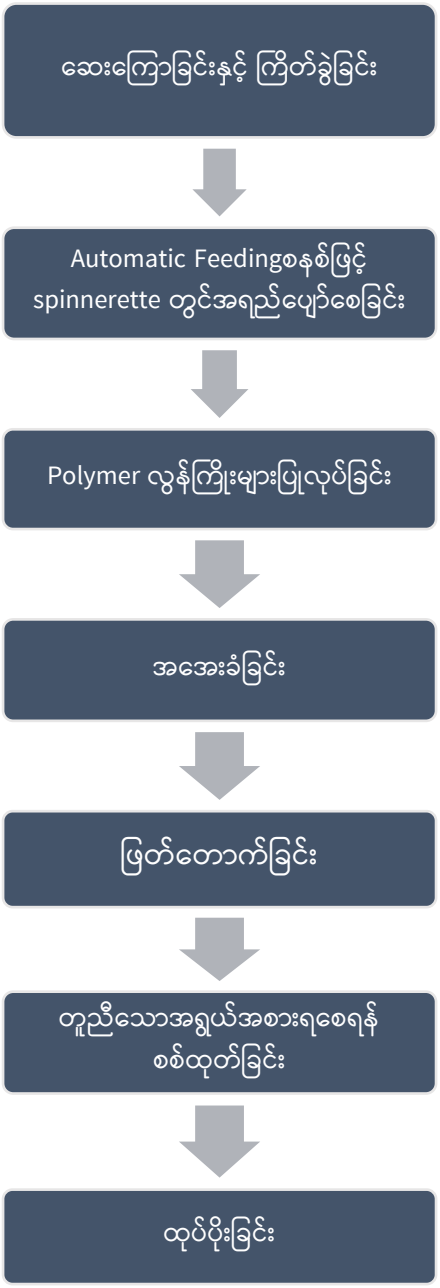
ပုံ - PET Packing Tape (ကြိုးပြား)ထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်ပြဇယား

(၃) PE/PP Recycle Pellet (ကော်စေ့)ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်

PE/PP recycle pellet (ကော်စေ့) ကုန်ချောထုတ်လုပ်မှုသည် စက်ရုံအမှတ်(၂)တွင် လုပ်ဆောင်ခြင်းဖြစ်ပါသည်။ PE/PP recycle pellet (ကော်စေ့)ကုန်ချောထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်ကို အောက်ဖော်ပြပါ အဆင့်

များဖြင့်ဆောင်ရွက်ပါသည်။PP/PE ကော်စေ့ထုတ်လုပ်ရန်အတွက် ပလတ်စတစ်ဘူးခွံများ၏ အဖုံးများကို အဓိကအားဖြင့် အသုံးပြုပါသည်။ ထို့ပြင်သန့်စင်ရေးအတွက်မူ ၎င်းပလတ်စတစ်အဖုံးခွံများအား ရေဖြင့်ထပ်ခါတလဲလဲဆေးကြောသန့်စင်ပြီးနောက်တွင်မှကော့စတစ်ဆိုဒါနှင့်ထပ်မံဆေးကြောရပါသည်။ထို့နောက်ဘွိုင်လာတွင် ရေနွေးကိုအသုံးပြု၍ ကျန်ရှိနေနိုင်သော ကော့စတစ်ဆိုဒါများကို အရည်ဖျော်ခြင်းဆေးချခြင်းလုပ်ဆောင်ရပါသည်။ နောက်ဆုံးတွင် ကုန်ကြမ်းပြင်ဆင်ခြင်းပြီးဆုံးပြီး ကုန်ချောထုတ်လုပ်ရန် အသင့်အနေအထား သို့ရောက်ရှိပါသည်။

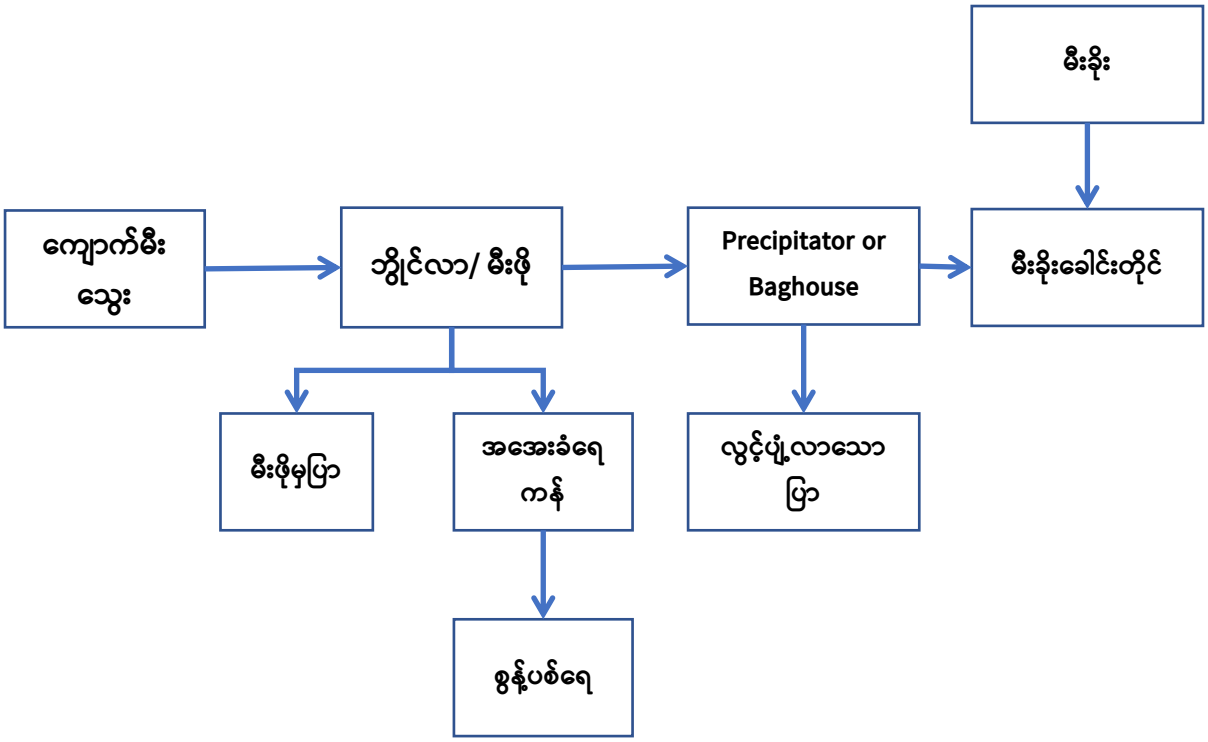
ကြိတ်ခွဲသန့်စင်ပြီး ကုန်ကြမ်းများကို ဖီလ်ဒါမှတဆင့် မွှေစက် (Spinnerette) သို့ပို့ကာ လိုအပ်သည့် အပူချိန်ဖြင့် ထူပျစ်သော အရည်အဖြစ်သို့ ရောက်အောင်ပြုလုပ်ပါသည်။ မွှေစက်မှထွက်ရှိလာသော ပေါ်လီမာများအား ကြိုးမျှင်များအဖြစ်သို့ ပုံလောင်း၍ လေဖြင့်တစ်လှည့် ရေဖြင့် တစ်လှည့် အအေးခံစေသည်။ အအေးခံသည့် လုပ်ငန်းစဉ်သည် ပေါ်လီမာအမျှင်များအား မာကြောစေကာ ဖြတ်စက်ဖြင့် ဖြတ်တောက်ပြီးနောက် အစေ့များအဖြစ်သို့ ပြောင်းလဲရောက်ရှိသည်။ ဆက်လက်၍ ၎င်းအစေ့များမှ မလိုအပ်သည့် အရာများ ဖယ်ရှားခြင်းနှင့် အရွယ်အစား တူညီသော ကော်စေ့များအဖြစ်သို့ရောက်ရှိစေရန် ရွွေ့လျားဇကာဖြင့်စစ်ချခြင်းကို ပြုလုပ်သည်။ နောက်ဆုံး တွင် PP/PE ကော်စေ့များထွက်ရှိပြီးနောက် ၎င်းထုတ်ကုန်များကို ထုတ်ပိုးခြင်းလုပ်ဆောင်သည်။



ပုံ - PP/PE Recycle ကော်စေ့ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်

(၄) ကျောက်မီးသွေးဘိုင်လာလည်ပတ်ခြင်း

ဘိုင်လာကို အခြောက်ခံခြင်းအဆင့်တွင် လိုအပ်သည့်ရေငွေ့ထုတ်ယူရန်သုံးသည်။ ဘိုင်လာအသုံးပြုခြင်း လုပ်ငန်းစဉ် ကို အောက်ပါဇယားဖြင့် ဖော်ပြထားပါသည်။

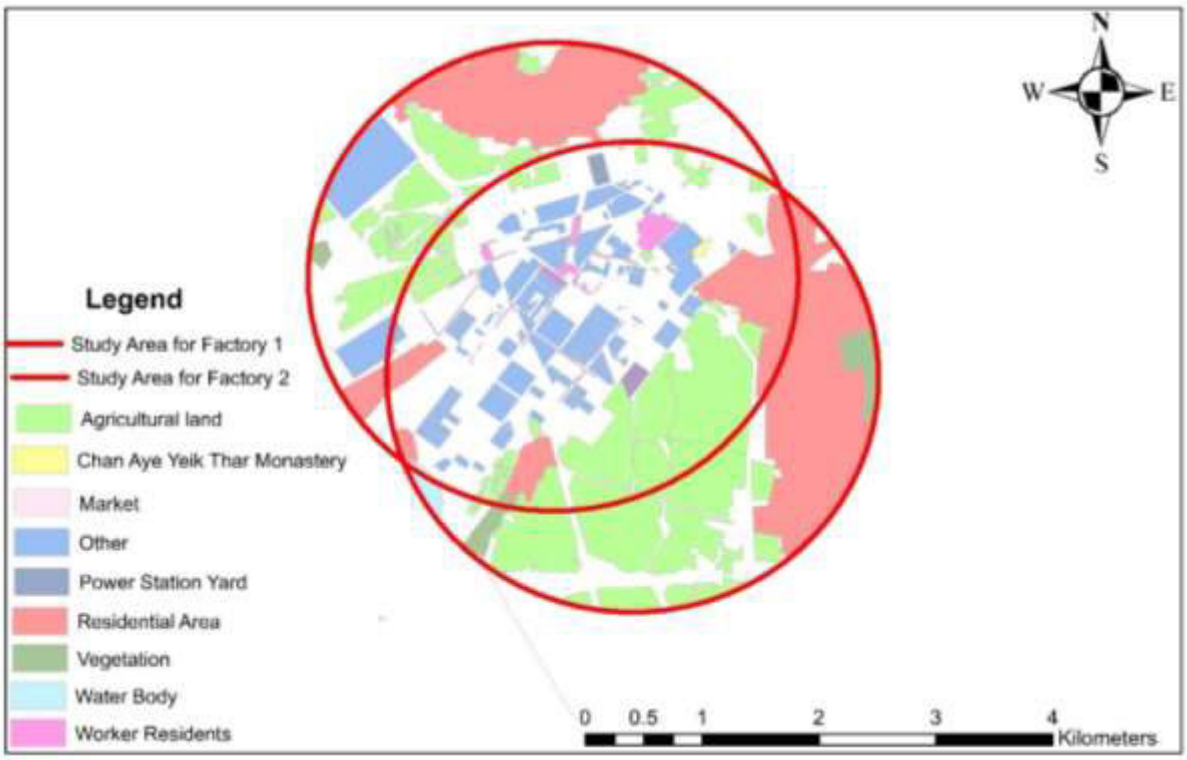


ပုံ - ကျောက်မီးသွေးဘွိုင်လာလည်ပတ်ပုံ

ကျောက်မီးသွေးဘွိုင်လာတွင် ကျောက်မီးသွေးကို ကုန်ကြမ်းအဖြစ်သုံးကာ ရေနွေးငွေ့ထုတ်လုပ်ပါသည်။ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းအဖြစ် မီးဖိုအခြေတွင် ကျောက်မီးသွေးလောင်ကျွမ်းရာမှထွက်ရှိသောပြာ၊ bage filter မှ လေထဲပျံ့လွင့်နိုင်သောပြာများထွက်ရှိနိုင်ပါသည်။ စွန့်ပစ်ရေအနေနှင့် အအေးခံစနစ်မှ ရေထွက်ရှိမည်ဖြစ်ပြီး၊ ကျောက်မီးသွေးလောင်ကျွမ်းရာမှ လေထုထဲသို့ဓာတ်ငွေ့ထွက်ရှိနိုင်ပါသည်။

၁.၄.၃ မြေအသုံးချမှု

စီမံကိန်းဧရိယာသည် ထိန်းသိမ်းကာကွယ်တောနှင့် လူနေအိမ်များမရှိသော မြောင်းတကာစက်မှုဇုန် အတွင်းတည်ရှိသည်။ မြေစာရင်းဦးစီးဌာနမှ ရရှိသောမှတ်တမ်းအချက်အလက်များအရ စက်ရုံအဟောင်းအတွက် မြေဧက ၄.၀၀၄ကေနှင့် စက်ရုံအသစ်အတွက် ၈.၆၆၇ဧက စက်ရုံ(၂)ခုလုံး၏သက်ရောက်မှု နယ်မြေ (၃)ကီလိုမီတာပတ်လည် (အချင်း ၆ ကီလိုမီတာ) အတွင်းရှိ မြေအသုံးပြုမှုမှာအောက်ပါအတိုင်းဖြစ်ပါသည်။



ပုံ –စက်ရုံနှစ်ခုအတွက်မြေအသုံးချမှုပြမြေပုံ

စက်ရုံအမှတ် ၁ (polyester Staple Fiber စက်ရုံ)

For Factory 1 (Polyester Staple Fiber Factory)

မြေအမျိုးအစား	မြေအသုံးပြုမှု ရာခိုင်နှုန်း
အခြားစက်ရုံများ	၁၂.၅၉၂
စျေး	၀.၀၁၈
အဆိုပြုစီမံကိန်းစက်ရုံရေယာ (Da Hau)	၀.၁၀၆
ဘုန်းကြီးကျောင်း	၀.၁၇၃
လူနေရပ်ကွက်များ	၃၃.၁၀၂
ဘူတာ	၀.၂၃၀
ဝန်ထမ်းအိမ်ယာ	၀.၆၆၇
စိုက်ပျိုးမြေ	၄၁.၀၄၅
မြစ်ချောင်းများ	၆.၄၇၂
သဘာဝပေါက်ပင်များ	၅.၅၉၅

စက်ရုံအမှတ် ၂ (Plastic Pallets and Packing Tape စက်ရုံ)

Land Use Type	Percentage (%)
အခြားစက်ရုံများ	၁၂.၀၁၄
ဈေး	၀.၀၁၇
အဆိုပြုစီမံကိန်းစက်ရုံဧရိယာ (Da Hau)	၀.၂၁၆
ဘုန်းကြီးကျောင်း	၀.၁၆၅
လူနေရပ်ကွက်များ	၃၁.၃၉၃
ဘူတာ	၀.၂၁၉
ဝန်ထမ်းအိမ်ယာ	၀.၆၃၇
စိုက်ပျိုးမြေ	၃၃.၂၀၉
မြစ်ချောင်းများ	၄.၆၂၂
သဘာဝပေါက်ပင်များ	၁၇.၅၀၈

မြေအသုံးပြုမှုအမျိုးအစားလေ့လာချက်များအရ ရေစီးဆင်းမှုအများဆုံးမြေအသုံးပြုမှုအမျိုးအစား မှာ စိုက်ပျိုးမြေ၊ မြစ်ချောင်းနှင့်လူနေရပ်ကွက်များဖြစ်ပါသည်။အချုပ်ဆိုရသော်စီမံကိန်းဧရိယာအနီးဝန်းကျင်တွင်ပတ်ဝန်းကျင်အခြေအနေထိလွယ်ရှလွယ်ဖြစ်သည့် ဧရိယာမရှိပါ။

၁.၄.၄။ အဆိုပြုစီမံကိန်းတွင် အသုံးပြုသည့် ယာဉ်နှင့် စက်ယန္တရားများ

အောက်ဖော်ပြပါဇယားသည် အဆိုပြုစီမံကိန်းတွင် အသုံးပြုသည့်ယာဉ်နှင့်စက်ယန္တရားများကိုဖော်ပြထားခြင်း ဖြစ်ပါသည်။

စဉ်	စက်ယန္တရားများ	အရေအတွက်
၁	ရေဆေးစက်/လျှော်စက်	၃
၂	ရွှေ့လျားသယ်ယူစက် (၃၀၀ x ၃၀၀၀ မီလီမီတာ)	၁၀
၃	လေဖြင့်ရွှေ့လျားသယ်ယူစက်	၂

၄	ရွှေ့လျားစက်ခါးပတ်	၆
၅	ရွှေ့လျားသယ်ယူစက် (၆၀၀ x ၄၅၀၀ မီလီမီတာ)	၃
၆	ရွှေ့လျားသယ်ယူစက် (၆၀၀ x ၈၀၀၀ မီလီမီတာ)	၄
၇	ရေကန်	၁၁
၈	Kydroex Tractor	၄
၉	ကြိတ်စက်	၅
၁၀	အလေးချိန်စက်	၄
၁၁	ကြိတ်ခွဲစက်	၁၃
၁၂	ရွှေ့လျားသယ်ယူစက် (၆၀၀ x ၄၀၀၀ မီလီမီတာ)	၂
၁၃	ကုန်ကြမ်းတံဆိပ်ခွာစက်	၃
၁၄	မြန်နှုန်းမြင့် ရေစုပ်စက်	၃
၁၅	ရွှေ့လျားသယ်ယူစက် (၄၀၀ x ၅၀၀၀ မီလီမီတာ)	၃
၁၆	ရွှေ့လျားသယ်ယူစက် (၄၀၀ x ၄၅၀၀ မီလီမီတာ)	၃
၁၇	မြန်နှုန်းမြင့် friction စက်	၃
၁၈	အပူပေးအိုး	၃
၁၉	ရေညှစ်စက်	၂
၂၀	အရောင်ခွဲစက်	၁
၂၁	Stainless steel silo	၁
၂၂	ဒေါင်လိုက်လေမှုတ်စက်	၁
၂၃	ရေဖယ်စက်	၁
၂၄	ရွှေ့လျား လယ်ဗယ်ညှိစက်	၁
၂၅	ထုတ်ပိုးစက်	၃
၂၆	ဆိုင်ကလုန်းစပရေတာ	၁
၂၇	Pre-crystallizer	၁

၂၈	Seven-roller ဆွဲစက်	၁
၂၉	အခြောက်ခံစက်	၁
၃၀	လေဖြင့်အခြောက်ခံစက်	၁
၃၁	လေမှုတ်စက်	၁
၃၂	ရုံးသုံးယာဉ်	၂
၃၃	ပစ်ကပ်	၃
၃၄	ပင့်တင်ယာဉ် (Forklift)	၈

၁.၄.၅။ အကောင်အထည်ဖော်မှုအချိန်ဇယား

စီမံကိန်းတစ်ခုလုံးအတွက်အကောင်အထည်ဖော်မှုအချိန်ဇယားအားအောက်တွင်ဖော်ပြထားပါသည်။

လုပ်ငန်းခွင်ကာလ	**အကောင်အထည်ဖော်မှုအချိန်ဇယား**	
	စက်ရုံ ၁	**စက်ရုံ ၂**
အကြိုတည်ဆောက်ရေးကာလ	၂လ	၂လ
တည်ဆောက်ရေးကာလ	၁နှစ်	၁နှစ်
လုပ်ငန်းလည်ပတ်သည့်ကာလ	နှစ်၂၀ သို့မဟုတ် ထိုထက်ပို၍	နှစ်၂၀ သို့မဟုတ် ထိုထက်ပို၍
လုပ်ငန်းပိတ်သိမ်းသည့်ကာလ	၁နှစ်	၁နှစ်

၁.၄.၆။ အလုပ်သမားခန့်ထားနိုင်မှု

အဆိုပြုစီမံကိန်း၏ လုပ်ငန်းလည်ပတ်ကာလတစ်လျှောက်လုံးတွင် ဒေသခံပြည်သူ ၂၁၉ ယောက်နှင့် နိုင်ငံခြား သားအလုပ်သမား ၂၉ ယောက် ခန့်ထားလည်ပတ်မည်ဟု လျာထားသည်။ လက်ရှိ လည်ပတ်နေသော အလုပ် ချိန်သည် နေ့အချိန် (မနက် ၇ - ည ၇) နှင့် ညအချိန် (ည ၇ - မနက် ၇) ဟူ၍ နှစ်ဆိုင်းရှိပါသည်။ လုပ်ငန်းလည် ပတ်မှုများအား နိုင်ငံခြားသားပညာရှင် အယောက်(၂၀)မှ ဦးစီး လျက်ရှိပါသည်။ နှစ်စဉ် အလုပ်လုပ်ရက်စုစု ပေါင်းသည် ၃၀၈ ရက်ဖြစ်သည်။

၁.၄.၇။ စီမံကိန်း၏သုံးစွဲမှုအနှစ်ချုပ် (စက်ရုံနှစ်ခုအတွက်)

Da Hua (Myanmar) သည် လုပ်ငန်းလည်ပတ်မှုတစ်ခုလုံးအတွက် ခန့်မှန်းချေ ရေဂါလံပေါင်း ၁၅၄၀၀၀ နီးပါး အသုံးပြုမည်ဖြစ်သည်။ လုပ်ငန်းသုံးရေလိုအပ်ချက်အတွက် ပေ ၃၀၀ အနက် ၂ x ၄ လက်မ အဝိစိတွင်းတူးဖော် ထားရှိသည်။ ဂါလံ ၁၂၀၀၀ ဆန့် မြေအောက်ရေကန်နှင့် ဂါလံ ၃၀၀၀ ဆန့် ရေစင် ၂ မျိုး ဆောက်လုပ်ထားသည်။ ဘွိုင်လာအတွက် တစ်နေ့ ရေအသုံးပြုမှုသည် ၅၅၀ ဂါလံရှိသည်။ ကုန်ကြမ်းရေ ဆေးခြင်းအတွက် တစ်နေ့လျှင် ဂါလံ ၁၅၀၀ နှင့် လုပ်သား ၁၀၀ အတွက် အိမ်သုံးရေ တစ်နေ့လျှင် ဂါလံ ၁၀၀၀ အသုံးပြုမည်ဖြစ်သည်။ လျှပ်စစ် ဓာတ်အားအရင်းအမြစ်သည် မြန်မာ့လျှပ်စစ်ဓာတ်အားပေးလုပ်ငန်းမှ ၃၃/၀.၄ ကီလိုဗို့ နှင့် စက်မှုဇုန်ကြီးကြပ် ရေးဌာန (လျှပ်စစ်စွမ်းအားဦးစီးဌာန)မှ ၁၀၀၀ ကီလိုဗို့အားရှိ ထရန်စဖော်မာ ၂ လုံးမှရရှိသည်။ လျှပ်စစ်အန္တ ရာယ်ကင်းရှင်း ရေးအတွက်လည်း အထောက်အထားလက်မှတ်ရရှိပြီးဖြစ်သည်။နှစ်စဉ်လျှပ်စစ်ဓာတ်အားလိုအပ်ချက်မှာ ယူနစ် ၆ သိန်း ဖြစ်ပြီး တစ်လလျှင် ယူနစ် ၅သောင်း ဟုယူဆရ သည်။ နေ့စဉ်သုံးစွဲနှုန်းမှာ အနည်း ဆုံး ၂၀၀၀ ယူနစ်ရှိသည်။

၁.၄.၈။ သိုလှောင်မှုစနစ်နှင့် ရောင်းချရေး

နောက်ဆုံးထုတ်ကုန်များကို လိုအပ်သည့် အရည်အသွေးနှင့် ပမာဏမရရှိမချင်း ဂိုဒေါင်တွင် ခေတ္တသိုလှောင် ထားသည်။ လိုအပ်သည့် အရည်အသွေးနှင့် ပမာဏ ရရှိသော် Polyester Staple Fiber အသုံးပြုသည့်စက်ရုံ များသို့လည်းကောင်း အခြားသောနိုင်ငံများဖြစ်သည့် ထိုင်းနိုင်ငံ၊ ဗီယက်နမ်၊ တရုတ်နိုင်ငံ၊ အမေရိကန်နိုင်ငံနှင့် ထိုင်ဝမ်နိုင်ငံများသို့လည်းကောင်း ပို့ဆောင်ပါသည်။

၁.၄.၉။ စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု

အချို့စက်မှုဇုန်စွန့်ပစ်ပစ္စည်းများတွင် Polyester အမှိုက်များ၊ ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အတွင်းထွက်ရှိသော ဖြတ်စအမှိုက်များပါဝင်သည်။ ၎င်းအမှိုက်များ အများစုကို ထုတ်လုပ်ရေးလုပ်ငန်းတွင် ပြန်လည်အသုံးပြုပါသည်။ ရေဆေးခြင်းလုပ်ငန်းစဉ်မှ စွန့်ပစ်ရေများကိုလည်း ပြန်လည်သန့်စင်ပြီး ထုတ်လုပ်မှုလုပ်ငန်းစဉ်တွင် ပြန်လည် အသုံးပြုမည်။

၁.၄.၁၀။ အခြားနည်းလမ်းစီစစ်ချက်အကျဉ်းချုပ်

အခြားနည်းလမ်းစီစစ်ချက်သည် အဆိုပြုစီမံကိန်း၏ရည်ရွယ်ချက်များ ပြီးမြောက်အောင်မြင်နိုင်ရန် အခြား နည်းလမ်းများကို ဆန်းစစ်ခြင်းဖြစ်သော EIA လုပ်ငန်း၏ တစ်စိတ်တစ်ဒေသပင်ဖြစ်သည်။ အခြားနည်းလမ်း စီစစ်ချက်ကိုပြုလုပ်ရခြင်း၏ ရည်ရွယ်ချက်မှာ မလိုလားအပ်သောသက်ရောက်မှုများကို အနည်းဆုံးဖြစ်စေပြီး ကောင်းကျိုးသက်ရောက်မှုများအများဆုံးဖြစ်စေသည့် ဖွံ့ဖြိုးတိုးတက်မှုအဆင့်သို့ ရောက်ရှိနိုင်ရန်ဖြစ်သည်။ Da Hua (Myanmar) Polyester Staple Fibers စက်ရုံအတွက် အခြားနည်းလမ်း စီစစ်ချက်ကို (၁) စီမံကိန်းဆောင်ရွက်ခြင်းမရှိသည့် အခြားနည်းလမ်း စီစစ်ချက်၊ (၂) လုပ်ငန်းခွင်တည်နေရာ အခြားနည်းလမ်း စီစစ်ချက်၊(၃)လုပ်ငန်းစဉ်နှင့်နည်းပညာများ အတွက် အခြားနည်းလမ်းစီစစ်ချက်ဟူ၍ သုံးမျိုးပြုလုပ်နိုင်ပေသည်။

(၁) စီမံကိန်းပြုလုပ်ခြင်းမရှိသည့် အခြားနည်းလမ်းစီစစ်ချက်

ဤအခြားနည်းလမ်း စီစစ်ချက်သည် စီမံကိန်းအကောင်အထည်ဖော်ခြင်းမရှိသည့် အခြေအနေ ဖြစ်သည်။ စီမံ ကိန်းဆောင်ရွက်ခြင်းမရှိသည့် အခြေအနေတွင် သဘာဝပတ်ဝန်းကျင်နှင့် ဒေသခံလူ ထုအပေါ် ထိခိုက်မှုများ လည်းမရှိနိုင်ပေ။ သို့ရာတွင် စီမံကိန်းဆောင်ရွက်သည့်အခြေအနေ၌ဒေသခံနေထိုင် သူများ၏ ဘဝနေထိုင်မှု အရည်အသွေးများအပေါ်တွင် ကောင်းကျိုးသက်ရောက်မှုများရှိနိုင်ပေသည်။ စီမံကိန်းပြုလုပ်ခြင်းမရှိသည့် အခြားနည်းလမ်းသည် ဖြစ်နိုင်ချေရှိသော ပတ်ဝန်းကျင်နှင့် လူမှုဆိုင်ရာထိခိုက်မှု များကို ရှောင်ရှားနိုင်မည် ဖြစ်သော်လည်း စီမံကိန်းနှင့်ပက်သက်သော အကျိုးများ ဖြစ်သည့် ဒေသတွင်း စက်မှုဆိုင်ရာဖွံ့ဖြိုး တိုးတက်မှု၊ အစိုးရဝင်ငွေတိုးပွားမှု၊ ဒေသခံပြည်သူလူထုအတွက် ရာနှင့်ချီသော အလုပ် အကိုင်အခွင့်အလမ်းများ၊ ဒေသတွင်း ဖွံ့ဖြိုးတိုးတက်မှုများ၊ ဒေသခံပြည်သူများအတွက် စီးပွားရေး အခွင့်အလမ်း တိုးတက်မှုများ၊ ကျွမ်းကျင်မှုဖွံ့ဖြိုးရေး၊ ဒေသခံများ၏ ဝင်ငွေတိုးတက်မှုနှင့် ဝန်ဆောင်မှုနှင့် ဒေသတွင်းဖွံ့ဖြိုးတိုးတက်မှုများစသည်တို့လည်း ရှိနိုင်မည်မဟုတ်ပေ။ အခြားနည်းလမ်းစီစစ်ချက်များကို လေ့လာချက်များအရ စီမံကိန်းပြုလုပ်ခြင်း မရှိသည့်အခြားနည်းလမ်းစီစစ်ချက်သည် စီမံကိန်း ၏ အကျိုးကျေးဇူးများကြောင့် လက်ခံနိုင် ဖွယ် မရှိ

သည့်အပြင် EIA လေ့လာမှုအရ သင့်လျော်သော လျော့ပါး သက်သာရေး အစီအမံများဖြင့် ဆိုးကျိုး သက်ရောက်မှုများကို လျော့ပါးစေနိုင်ပါသည်။

(၂) လုပ်ငန်းခွင်တည်နေရာအခြားနည်းလမ်းစိစစ်ချက်

လုပ်ငန်းခွင်တည်နေရာအခြားနည်းလမ်းရွေးချယ်စရာစိစစ်ချက်အတွက် တည်နေရာ နေရာနှစ်ခုကို ထည့်သွင်း စဉ်းစားပါမည်။ ပထမတည်နေရာသည် လူနေထိုင်ရာဧရိယာအတွင်းနှင့် ဒုတိယ နေ ရာသည် စက်မှုဇုန်အတွင်း ဖြစ်သည်။ လုပ်ငန်းခွင်တည်နေရာလေ့လာဆန်းစစ်မှုအရ၊ စက်မှုဇုန် အတွင်း ရှိစီမံကိန်းသည် ကျောက်မီးသွေးသုံး ဘွိုင်လာအသုံးပြုခြင်းကြောင့် လူနေထိုင်ရာ ဧရိယာအတွင်းတွင် ရှိသော စီမံကိန်း ထက် ပိုမိုသင့်လျော်မည်ဖြစ်ပါသည်။

(၃) လုပ်ငန်းစဉ်နှင့် နည်းပညာဆိုင်ရာ အခြားနည်းလမ်းစိစစ်ချက်

ဤအခြားနည်းလမ်းစိစစ်ချက်သည် (၁) ကုန်ကြမ်းဆေးကြောရာတွင် အသုံးပြုသည့် ဓာတု ပစ္စည်း များ (caustic soda and magnesium hydroxide) နှင့် ဘွိုင်လာအတွက် ကုန်ကြမ်း များ(လောင်စာ) စသည်တို့အပေါ်တွင် အခြေခံပြုလုပ်ပါမည်။ အောက်ပါတို့သည်လုပ်ငန်းစဉ်နှင့်နည်း ပညာဆိုင်ရာ အခြားနည်းလမ်းစိစစ်လေ့လာခြင်း ဖြစ်ပြီး အခန်း(၄)တွင် အသေးစိတ် ဖော်ပြချက်များ ကို ဖော်ပြထားပါသည်။

(က) လုပ်ငန်းစဉ်တွင်အသုံးပြုသော ကုန်ကြမ်း

အခြားနည်းလမ်းစိစစ်လေ့လာချက်အရ ရေသုံးစွဲမှု၊ လျှပ်စစ်သုံးစွဲမှု၊ ရေညစ်ညမ်းမှုတို့ကို လျှော့ချရန် ညစ်ပေသော ပုလင်းအစား သန့်စင်သော PET ပုလင်းကို အသုံးပြုသင့်ပါသည်။

(ခ) ကုန်ကြမ်းဆေးကြောရာတွင် အသုံးပြုသည့် ဓာတုပစ္စည်းဆိုင်ရာ အခြားနည်းလမ်းစိစစ်ချက်

အခြားနည်းလမ်းစိစစ်လေ့လာချက်အရ ကော့စတစ်ဆိုဒါသည် သဘာဝပတ်ဝန်းကျင်နှင့် စီးပွားရေးရှု ထောင့်မှ ကြည့်လျှင် magnesium hydroxide ထက် ကုန်ကြမ်းဆေးကြောသည့် ဓာတုပစ္စည်းအဖြစ် ရွေးချယ်ရန်ပို၍ သင့်တော်သည်။

(ဂ) ဘွိုင်လာလောင်စာရွေးချယ်ခြင်းအတွက် အခြားနည်းလမ်းစိစစ်ချက်

အခြားနည်းလမ်းစိစစ်လေ့လာချက်အရ ဖြစ်နိုင်ပါက ကျောက်မီးသွေးအစား ကုတ်မီးသွေး (Coke) အသုံးပြုခြင်း သို့မဟုတ် anthracite ကျောက်မီးသွေးကို လောင်စာအဖြစ်ရရှိနိုင်ပါက bituminous ကျောက်မီးသွေး အစား အသုံးပြုသင့်သည်။

၁.၅။ စီမံကိန်းအနီးပတ်ဝန်းကျင်ဖော်ပြချက် အကျဉ်းချုပ်

စီမံကိန်းသည် ရန်ကုန်တိုင်းဒေသကြီး မှော်ဘီမြို့နယ်ရှိ မြောင်းတကာသံမဏိစက်မှုဇုန်တွင် တည်ရှိပါသည်။ ရန်ကုန်မြို့လယ်မှ ၁ နာရီခွဲခန့် ကားဖြင့်သွားလျှင် ကြာပါသည်။စက်ရုံဧရိယာသည်ရန်ကုန်မှ ဘတ်စ်ကားဖြင့် အလွယ်တကူရောက်ရှိနိုင်ပါသည်။ အနီးပတ်ဝန်းကျင်ဖော်ပြချက်တွင် အဆိုပြုစီမံကိန်း၏ လက်ရှိရင်းစွဲ ရုပ်ပိုင်း ဆိုင်ရာ၊ ဇီဝဗေဒဆိုင်ရာနှင့်လူမှုစီးပွားဆိုင်ရာအခြေအနေများပါဝင်မည်ဖြစ်သည်။

အနီးဆုံးထိခိုက်လွယ်နိုင်သည့်ဧရိယာများ	
အနီးဆုံးရှိဒေသခံနေထိုင်သူများ	အနီးဆုံးဒေသခံနေထိုင်သူများသည် အဆိုပြုစီမံကိန်းဘေးတွင် တရားမဝင်နေထိုင်သည့်သူများဖြစ်သည်။
အနီးဆုံးရှိမြေပေါ်ရေထုများ	အနီးဆုံးရှိမြေပေါ်ရေထုမှာ အဆိုပြုစီမံကိန်း၏ ၁၉၄. ကီလိုမီတာ အကွာအဝေးရှိ လှိုင်မြစ်ဖြစ်ပြီး အဆိုပြုစီမံကိန်းမှ စွန့်ထုတ်လိုက်သော ရေဆိုးများကို ပုံမှန် စနစ်တကျ စီမံခန့်ခွဲခြင်းမရှိပါက စက်မှုဇုန်၏ ဆင့်ပွားသက်ရောက်မှုအဖြစ် မြေပေါ်ရေကို သက်ရောက်မှုရှိလိမ့်မည်ဖြစ်သည်။
လူနေထူထပ်သောဧရိယာ	အနီးဆုံးလူနေထူထပ်သောနေရာသည် မှော်ဘီမြို့နယ်ဖြစ်သည်။ စီမံကိန်းကို မြောက်ဘက်တွင် တိုက်ကြီးမြို့နယ်၊ အရှေ့ဘက်တွင်လှည်းကူးမြို့နယ်၊အရှေ့တောင်ဘက်တွင် မင်္ဂလာဒုံမြို့နယ်၊ တောင်ဘက်တွင် ရွှေပြည်သာ မြို့နယ်နှင့် အနောက်တောင်၊ အနောက်နှင့် အနောက်မြောက်ဘက်တွင် ထန်းတပင် မြို့နယ် တို့က ဝန်းရံထားပါသည်။

ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင် (Physical Environment)	
မိုးလေဝသနှင့် ရာသီဥတု	ရန်ကုန်မိုးလေဝသဌာန၏ဖော်ပြချက်အရ မော်ဘီမြို့နယ်သည် အပူပိုင်းမုတ်သုံ ရာသီဥတုရှိပါသည်။ ထိုနေရာသည် အပူချိန် အနည်းငယ်သာ ပြောင်းလဲမှု ရှိသည်။ စီမံကိန်းတည်နေရာသည် လတ္တီကျူ အနိမ့်ပိုင်းဇုန်တွင် ရှိသောကြောင့် မျှတသောရာသီဥတုရှိပါသည်။ မော်ဘီမြို့သည် ပုံမှန်အတိုင်းမေလမှ အောက်တိုဘာလအထိ မိုးရာသီဖြစ်ပြီး နွေရာသီသည် နိုဝင်ဘာလမှ စတင်ကာ ဧပြီလအထိဖြစ်ပါသည်။ တစ်နှစ်တာလုပ်ဆောင်မှုအတွင်းပျမ်းမျှအပူချိန်သည် ၂၆ C°နှင့် ၂၅ C°အထိရှိပြီးပျမ်းမျှအနိမ့်ဆုံးအပူချိန် ၁၈ C°မှ ၃၆ C°ကြား ရှိသည် ကိုတွေ့ရပါသည်။ အပူဆုံးလသည် ဖေဖော်ဝါရီလမှ မေလအတွင်း ဖြစ်ပြီး ယင်းကာလတွင် မိုးအနည်းငယ်ရွာ သွင်းပါသည်။ ဤရာသီ၏ အဆုံးတွင် ယေဘုယျအားဖြင့် မတ်လမှ ဧပြီလအထိလစဉ် ပျမ်းမျှအပူချိန်သည် ၃၀C° အထက်သို့ရောက်ရှိသည်။ ရန်ကုန်မြို့၏ ပျမ်းမျှအပူချိန်သည် အပူပိုင်းကာလ ဖြစ်သည့် ဧပြီလတွင် ၂၄အထိရှိပြီး C°မှ ၃၆ C°အထိရှိသည်။ C°မ ၃၂ C°အအေးပိုင်းကာလဖြစ်သည့် ဇန်နဝါရီလတွင် ၁၈ စီမံကိန်းဧရိယာသည် ပူနွေးပြီး စိုစွတ်သောရာသီတွင် အပူချိန် (C°၃.၃၉)နှင့် အနိမ့်ဆုံးအပူချိန် (C°၁၀)ရှိပါသည်။
ပတ်ဝန်းကျင်လေထုအရည်အသွေး	နမူနာအမှတ်(၁) စောင့်ကြည့်မှုရလဒ်များအရ နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်သည် ၁၈၇.၁၅ **µg/m³** ရှိပြီး **NEQG** ၏ယေဘုယျ လမ်းညွှန်ချက်တန်ဖိုး ၂၀၀ **µg/m³** အောက်နည်းပါသည်။ စက်မှုလုပ်ငန်းအတွက် ဆာလဖာဒိုင်အောက်ဆိုဒ် ရလဒ်သည်လည်း သတ်မှတ်ထားသော တန်ဖိုးအောက် လျော့နည်းပါသည်။ စောင့်ကြည့်ရေး နေရာများသည် သယ်ယူပို့ဆောင်ရေးလမ်းများအနီးတွင် ရှိသောကြောင့် **PM10** နှင့် **PM2.5** ရလဒ်မှာ သတ်မှတ်ထားသော လမ်းညွှန်ချက် တန်ဖိုးထက် အနည်းငယ်များနေကြောင်း တွေ့ရှိရပါသည်။ အိုဇုန်းတန်ဖိုးများ မှာသတ်မှတ်

	ထား သည် အောက်တွင်ရှိသောကြောင့် ဘေးကင်းသော ကန့်သတ်ချက်များ အတွင်း ရှိပါသည်။ နမူနာအမှတ်(၂) နမူနာအမှတ်(၂)တွင် နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် ပါဝင်မှုနှုန်းမှာ **NEQG** ၏ယေဘုယျသတ်မှတ်ချက်အောက် တွင်ရှိပါသည်။ ဆာလဖာဒိုင်အောက်ဆိုဒ် ပါဝင်မှု မတွေ့ရှိရပေ။ အမှုန်အမွှားပါဝင်မှုရလဒ်မှာလည်း သတ်မှတ်ထားသော တန်ဖိုးအောက်လျော့နည်းပါသည်။ အိုဇုန်းပါဝင်မှုမှာဘေးကင်းသောကန့်သတ်ချက်များအတွင်းရှိပါသည်။ ထို့ကြောင့်နမူနာအမှတ်(၂)ခုလုံးအတွက် စောင့်ကြည့်ထားသောရလဒ်များအားလုံးသည် ဘေးကင်း စိတ်ချရသော ကန့်သတ်မှု အတွင်း ရှိပါသည်။
ရှိရင်းစွဲရေအရည်အသွေး	**BOD** နှင့် **COD** အတွက် ရေနမူနာ(၁)နှင့် ရေနမူနာ(၂) ရလဒ်များမှာ သတ်မှတ်ထားသော လမ်းညွှန်ချက်တန်ဖိုးများထက် သိသိသာသာ များနေရခြင်း မှာ ရေစီးရေလာမကောင်းခြင်း၊ မြေဆီလွှာတိုက်စားခြင်း၊ အနီးအနားနေထိုင်သူများထံမှ စွန့်ပစ်ရေ၊ ရေဆိုးရေညစ်များနှင့် မိလ္လာကန်စသည့် **BOD** နှင့် **COD** ပါဝင်မှုအပေါ်သက်ရောက်မှုရှိသော စက်မှုဇုန်အတွင်း ချောင်းများနှင့် ရေနုတ်မြောင်းများ မှ ကောက်ယူခဲ့သောကြောင့် ဖြစ်ပါသည်။ စုစုပေါင်း **suspended soild** ပါဝင်မှုနှုန်းတွင် ရေနမူနာ(၁)ရလဒ်မှာ သတ်မှတ်ထားသော လမ်းညွှန်ချက်တန်ဖိုးထက် များနေပါသည်။ ၎င်းမှာလည်း စက်မှုဇုန်၏ ရေဆိုးရေမြောင်းစနစ်မှ ကောက်ယူခဲ့သည့် အကြောင်းအရင်းနှင့် အတူတူပင် ဖြစ်သည်။ **pH level** အတွက် စက်ရုံအသစ်၏ စွန့်ပစ်ပစ္စည်းမှ ကောက်ယူခဲ့ သောကြောင့် ရေနမူနာ အမှတ် (၅) မှလွဲ၍ ကျန်ရေနမူနာအမှတ်များ အားလုံးသည် ဘေးကင်းစိတ်ချရသောဇုန်အတွင်းရှိပါသည်။နမူနာအမှတ် အားလုံး၏ အခြားတန်ဖိုးများသည် **NEQG** ၏ယေဘုယျ လမ်းညွှန်သတ်မှတ်ချက်အရ ဘေးကင်းစိတ်ချရ သော ကန့်သတ်မှုအတွင်းရှိပါသည်။

ဇလဗေဒ (Hydrology)	စီမံကိန်းနေရာသည် ရန်ကုန်မြစ်အတွင်းသို့ စီးဝင်ရန် တောင်ဘက်သို့ ဦးတည်စီးဆင်းသည့် စီမံကိန်းအနောက်ဘက်သို့ စီးဆင်းနေသောလှိုင်မြစ်၏ ရေဖမ်းဧရိယာအနား တွင် တည်ရှိသည်။ ရန်ကုန်မြစ် ရန်ကုန်မြစ် သို့မဟုတ်) သည် ပဲခူးမြစ်နှင့် မြစ်မ (လှိုင်မြစ်ဟုလည်း ခေါ်သည်ခမြစ်တို့ ပေါင်းဆုံရာမှ ဖြစ်ပေါ်လာပြီး ကြီးမားသော ကပ္ပလီပင်လယ် ၏ အစိတ်အပိုင်းဖြစ်သည့် မုတ္တမပင်လယ်ကွေ့အတွင်းသို့ စီးဆင်းသည်။ ရန်ကုန်မြစ်သည် မြန်မာနိုင်ငံ တောင်ပိုင်းမှ ဧရာဝတီမြစ်ဝကျွန်းပေါ်ဒေသသို့ ဧရာဝတီမြစ်၏ ထွက်ပေါက် အဖြစ် ကီလိုမီတာ ၄၀ အကွာတွင် စီးဆင်းသည်။ ပဲခူးမြစ် (မြစ်ဝကျွန်းပေါ်) ၏ အပိုင်းငယ်သည် ရန်ကုန်တိုင်းဒေသကြီးအတွင်း၌ တည်ရှိသည်။ ပုဇွန်တောင် ချောင်းနှင့် ပဲခူးမြစ်တို့သည် ရန်ကုန်မြစ်နှင့် ဆက်စပ်နေပြီး ထိုမှ အနောက်တောင်ဘက်သို့ ဦးတည်ကာ ကပ္ပလီ ပင်လယ်ပြင်သို့ စီးဆင်းသည်။
ဘူမိဗေဒ(Geology)	မြေနုများ alluvial deposits) from Pliestocene to Recent)၊ ဧရာဝတီမြစ်မှ အဏ္ဏဝါမဟုတ်သော မြစ်ကြမ်းပြင်အနည်အနှစ်များ)Pliocene) နှင့် Pegu series)early - late Miocene) ၏ သဲကျောက်ခဲကြီးများသည် ရန်ကုန် ဧရိယာ၏ အောက်ခံအဖြစ် ရှိနေသည်။ မြေနု (alluvial deposits) များသည် ကျောက်စရစ်၊ ရွှံ့စေး၊ နုန်းများ၊ သဲများနှင့် ဂဝံကျောက်များဖြင့် ဖွဲ့စည်းထားပြီး ပျမ်းမျှပင်လယ်ရေမျက်နှာပြင်အထက် ၃) ၆ မီတာ.၄-MSL) တွင် ဧရာဝတီ မြစ်ကြောင်း၏ တိုက်စားခံရသော မျက်နှာပြင်ပေါ်တွင် တည်ရှိသည်။ ရန်ကုန်မြို့ရှိ ကျောက်အမျိုးအစားမှာ အဓိကအားဖြင့် သဲကျောက်၊ shale ကျောက်များ၊ ထုံးကျောက်များနှင့် conglomerate ကျောက်များဖြင့် ပေါင်းစပ်ပါဝင်သည့် ပျော့ပျောင်းသောကျောက် အမျိုးအစားဖြစ်သည်။
လူမှုစီးပွားနှင့် ယဉ်ကျေးမှုပတ်ဝန်းကျင်	
လူမှုစီးပွားအခြေအနေ	**ကနဦးစစ်တမ်းကောက်ယူခြင်း (က)** အိမ်ထောင်စုစစ်တမ်းကောက်ယူချက်အရ ကျေးရွာ(၃)ရွာတွင် ကရင်လူမျိုး

	နှင့် ဗမာလူမျိုးမှာ အဓိကလူမျိုးရေး အုပ်စုဖြစ်ပါသည်။ အများစုမှာ ဗုဒ္ဓ ဘာသာ ကိုးကွယ်သူများ ဖြစ်ကြသည်။အိမ်ထောင်စုအများစုသည်မီးအလင်းရောင်အတွက် လျှပ်စစ်နှင့်ဆိုလာစွမ်းအင်ကို အသုံးပြုကြပြီးချက်ပြုတ်ရာတွင် လျှပ်စစ်မီးကိုအသုံးများသော်လည်း လျှပ်စစ်မီးမရရှိနိုင်သောနေရာများတွင်ထင်းမီးကို အသုံးပြုကြပါသည်။ သောက်ရေနှင့်သုံးရေအတွက် တွင်းရေကို အများဆုံးအသုံးပြုကြပါသည်။ အိမ်ထောင်စုအားလုံးသည် တွင်းတူးသည့် မိလ္လာစနစ်ကို အသုံးပြုကြပြီး အများစုမှာ အမှိုက်များကို မီးရှို့ကြပါသည်။ သယ်ယူ ပို့ဆောင်သွားလာရေးတွင် မော်တော်ဆိုင်ကယ် ကို အများဆုံး သုံးကြပါသည်။ ဒေသခံအများစုသည် ကျပန်းအလုပ် လုပ်ကိုင်ကြပြီး အလယ်တန်း အဆင့်နှင့်အထက်တန်းအဆင့် ပညာရေး ဖြစ်ကြသည်။ သို့သော်တက္ကသိုလ်/ကောလိပ်များမှ ဘွဲ့ရရှိ သူများလည်း ရှိကြပါသည်။စစ်တမ်းကောက်ယူချက်များအရဒေသခံအများစု၏ ဝင်ငွေသည် ခန့်မှန်းခြေ (၂)သိန်းကျပ်ဝန်းကျင်ရှိကြပြီး ၎င်း တို့၏ဝင်ငွေသည် စားသောက်စရိတ်အတွက် အများဆုံးကုန်ကျပါသည်။ **ဆင့်ပွားစစ်တမ်းကောက်ယူခြင်း (ခ)** ဗမာလူမျိုးနှင့်ကရင်လူမျိုး အများစုဖြစ်ပြီး ဗုဒ္ဓဘာသာ အများဆုံး ကိုးကွယ်ကြပါသည်။ ကျေးလက်ဒေသများတွင် အသက်အရွယ်အများစုမှာ (၁၈)နှစ်အောက်များဖြစ်ကြသည်။ မြေအများစုသည် စိုက်ပျိုးမြေများဖြစ်ကြသည်။ စာတတ် မှုနှုန်းမြင့်၍ အလုပ်လုပ်ကိုင်မှုနှုန်းမှာလည်း မြင့်ပါသည်။ ဒေသခံအများစုသည် စိုက်ပျိုးရေး၊ သစ်တောနှင့်ငါးဖမ်းလုပ်ငန်းများကို လုပ်ကိုင်ကြသည်။ ဆင့်ပွားစစ်တမ်းကောက် ယူချက်များအရ အိမ်ထောင်စု အများစုသည် သစ်သားအိမ်ဖြင့်နေထိုင်ကြ၍ ရေလောင်းအိမ်သာကိုအဓိက အသုံးပြုကြပါသည်။ သောက်ရေကိုအဝီစိတွင်းရေမှ အဓိကသုံးကြပြီးအများစုသည်မီးအလင်းရောင်အတွက် လျှပ်စစ်မီးသုံး၍ ချက်ပြုတ်ရာတွင် ထင်းမီးကိုသုံးကြပါသည်။စက်ဘီးကိုသွားလာရေးတွင် အများဆုံး အသုံးပြု ကြပါသည်။ မှော်ဘီမြို့ နယ်ရှိ

	အစိုးရဆေးရုံမှာ ကုတင်(၅၀)ရှိသော အများဆုံး ဆေးရုံဖြစ်ပြီး ကျေးလက် ကျန်းမာရေး စောင့်ရှောက်မှု ဌာနခွဲ အရေအတွက် သည် ကျေးလက် ကျန်းမာရေး စောင့်ရှောက်မှုဌာနထက် ပိုများပါသည်။ ၎င်းဒေသတွင် ဝမ်းပျက် ဝမ်းလျှော ရောဂါဖြစ်ပွားမှုမှာ အများဆုံး ဖြစ်သည်။ စစ်တမ်း ကောက်ယူချက်များအရ ကလေးမွေးဖွားမှုနှုန်း မြင့်မားပြီး မိခင်သေဆုံးမှုနှုန်းမှာ အလွန်နည်း ပါသည်။ အချုပ်အားဖြင့်ဆိုသော် စက်မှုဇုန်များ မြှင့်တင်ခြင်းသည် လက်ရှိလူနေမှု အဆင့်အတန်းကြောင့် ဒေသတွင်းစီးပွားရေးကို သိသိသာသာ အကျိုးသက်ရောက်စေမည်ဖြစ်သည်။
ဇီဝမျိုးစုံမျိုးကွဲပတ်ဝန်းကျင်	စီမံကိန်းဧရိယာ၌ ကွင်းဆင်းလေ့လာရာတွင် တိရစ္ဆာန်မျိုးနွယ်စု ၃၂ ခုနှင့် မျိုးဆက်စဉ် ၂၄ မျိုးအောက်မှ မျိုးစု ၄၈ ခုရှိ တိရစ္ဆာန်မျိုးကွဲပေါင်း ၅၅ မျိုးကို ရှာဖွေတွေ့ရှိခဲ့သည်။ Apple snail (Pomacea canliculata) ဟုခေါ်သော ခရုမျိုးစိတ်များကိုလေ့လာခဲ့သည့် ဧရိယာအတွင်း အများဆုံး တွေ့ရှိခဲ့ပါသည်။ ရွှံဂဏာန်း)Dyspanipeus sayi) နှင့် ပုဇွန်)Litopenaeus vannamei) မျိုးစိတ်တို့ကို ကြီးမားသော ရေနေမျိုးစိတ် များအဖြစ် တွေ့ရှိခဲ့ရပါသည်။ အင်းစက်မျိုးစိတ်များအတွက် မျိုးရင်း ဖိုခုအောက် တွင် မျိုးစိတ်စုစုပေါင်း ၂၂မျိုး၊ မျိုးစု ၁၈မျိုးကို မှတ်တမ်းတင်ခဲ့ပါသည်။ ၎င်းမျိုးစိတ်ထဲတွင် အများဆုံး ဖြစ်သော Lepidoptera မျိုးစိတ် ၁၀ခုနှင့် ကွဲပြားမှုအနည်းဆုံးဖြစ်သော မျိုးစိတ်အဖြစ် Coleoptera မျိုးစိတ် ၁ခုတွေ့ရှိခဲ့ပါသည်။ ငှက်မျိုးစိတ်များကို မျိုးစဉ် ၇ခု၊ မျိုးရင်း ၁၀ခု အောက်တွင် စုစုပေါင်း မျိုးစိတ် ၁၇ခုနှင့် မျိုးစု ၁၈ ခုတွေ့ရှိခဲ့ရပါသည်။ IUCN Red List အရ တွားသွား သတ္တဝါမျိုးစိတ် ၃ခု၊ ကုန်းနေရေနေသတ္တဝါမျိုးစိတ် ၂ခု၊ ငါးမျိုးစိတ် ၈ခု ကိုတွေ့ရှိရပါသည်။ သို့သော်လည်း လေ့လာခဲ့သည့်ဧရိယာအတွင်းတွင် တွေ့ရှိရသည့်မျိုးစိတ်များမှာ IUCN RED List စာရင်းတွင် စိုးရိမ်မှုအနည်းဆုံး)LC) မျိုးစိတ်များကိုသာ တွေ့ရှိ ရပါသည်။ ထို့အပြင် Zoolplankton များကို

	Phylum Rotifera နှင့် Arthropodaအောက်တွင် မျိုးစဉ် ၃၃၊ မျိုးရင်း ၉၃၊ စုစုပေါင်းမျိုးစိတ် ၁၅၃နှင့် မျိုးစု ၁၀ ခု တွေ့ရှိ ခဲ့ရပါသည်။ လေ့လာ ရန် အဆို ပြုထားသော နေရာသည် စိုက်ပျိုးရေးမြေများနှင့် ရောနှောထားသော မြို့ပြ စက်မှုဇုန်ဖြစ်ပါသည်။ ကောက်စိုက်ခင်းများ၊ မြက်ခင်းများ၊ စိုက်ပျိုးမြေများ ကိုလည်း စစ်တမ်းကောက်ယူခဲ့ပါသည်။ လေ့လာခဲ့သောဇရိယာအတွင်းတွင် သစ်ပင်မျိုးရင်း ၂၅၃အောက်မှမျိုးစိတ် ၃၁၃ုကို တွေ့ရှိခဲ့ပြီး သစ်ပင် ၃၈.၇၁၊ % သစ်ပင်ငယ် ၆.၄၅၊ ချုံနွယ် ၂၉%.၀၃၊ ဟင်းသီးဟင်းရွက် ၂၂%.၅၈နှင့် % ဝါးပင် ၃.၂၃ တွေ့ရှိခဲ့ပါသည်။ %Ear leaf Acacia (Acacia auriculiformis), Siam weed (Chromolaena odorata), and Giant sensitive plant (Mimosa diplotricha) တို့ကို ဒေသမျိုးရင်းမဟုတ်သောမျိုးစိတ်များအဖြစ် ၎င်းဇရိယာတွင်တွေ့ရှိခဲ့ရပါသည်။
ယဉ်ကျေးမှုအမွေအနှစ်များ	အဆိုပြုစီမံကိန်းအနီးတစ်ဝိုက် ယဉ်ကျေးမှုအမွေအနှစ်ရင်းမြစ်များကို ၂၀၁၂ ခုနှစ် စည်းမျဉ်းနှင့် ၁၉၉၈ ယဉ် ကျေးမှုဒေသများကာကွယ်ရေးနှင့် ထိန်းသိမ်း စောင့်ရှောက်ရေးဥပဒေ၊ ရှေးဟောင်းပစ္စည်းများကာကွယ်ရေးနှင့်စောင့်ရှောက် ရေးဥပဒေ နှင့် သမိုင်းဝင်အဆောက်အအုံများ ဥပဒေတို့အရ ခွဲခြား (၂၀၁၅) ခဲ့ပါသည်။ ရလဒ်အနေဖြင့်၊ အောက်ပါဇယားတွင် အဆိုပြု စီမံကိန်းဇရိယာ နယ်နိမိတ် ၃ ကီလိုမီတာအတွင်း ရှာဖွေတွေ့ရှိထားသော အမွေအနှစ်များကို ဖော်ပြထားပါသည်။

Heritage Resource Type	Observation
နေရာများ၊ အဆောက်အဦးများ၊ ဖွဲ့စည်း ပုံများနှင့် ပစ္စည်းကိရိယာများ	ဇိနမန်အောင်စေတီ၊ ကိုးထောင်ပြည့်ဘုရား၊ ကံကလေးဘုန်းကြီးကျောင်း၊ ကံကလေးနှစ်ခြင်းဘုရားကျောင်း၊ ချမ်းအေးရိပ်သာဘုန်းကြီးကျောင်း၊

		ဓမ္မဘာနာကဘုန်းကြီးကျောင်း၊ ရွှေအင်းဝဘုန်းကြီးကျောင်း၊ ရွာဦးဘုန်းကြီးကျောင်း၊ မိဂဒါဝုန်တောရဘုန်းကြီးကျောင်း၊ ရာပြည့် ဗုဒ္ဓဂူဘုရားကျောင်း၊ မန်ကျောင်းဓမ္မရိပ်သာဘုန်းကြီး ကျောင်း၊ ထန်းတောဘုန်းကြီးကျောင်း မြောင်တ)ကာ၊(ရေလည်ဘုန်းကြီးကျောင်း၊ မြသိန်းနာဘုန်းကြီးကျောင်း။
	ဓလေ့ထုံးတမ်းများ (သို့) လူနေမှု အမွေ အနှစ်များနှင့်ဆက်စက်နေသည့်နေ ရာများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	ရှုခင်းများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	သဘာဝအသွင်အပြင်များ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	ရိုးရာသချိုင်းနေရာများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	သိပ္ပံဆိုင်ရာ (သို့) ယဉ်ကျေးမှုဆိုင်ရာ အရေးပါသောဘူမိဗေဒဆိုင်ရာနေ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။

	ရာများ	
	ရှေးဟောင်းသုတေသတနေရာများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	သမိုင်းဝင်အခြေချနေထိုင်မှုများနှင့် မြို့ပြများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	အများသူငှာအထိမ်းအမှတ်နေရာများ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	စစ်မြေပြင်များ	အဆိုပြုထားသော စီမံကိန်းဧရိယာအတွင်း မရှိပါ။
	အဆိုပြုစီမံကိန်း၏ အနည်းငယ်ဝေးကွာသည့်နေရာတွင် တည်ရှိနေသောအထင် ကရဘုရားမှာ ဂျပန်ဘုရားဟု လူသိများသော ရှေးဟောင်း ဗုဒ္ဓရုပ် ပွားတော်မြတ် (၃၀၁) ဆူကိန်းဝပ်တော်မူရာ အောင်ဇမ္ဗူတောရ ဓမ္မရိပ်သာ ဖြစ်သည်။ ဂျပန်ဘုရားသည် စီမံကိန်းမှ မြောက်ဘက် ၂၂.၆ ကီလိုမီတာ ကွာဝေးသည့် မြန်မာနိုင်ငံ၊ ရန်ကုန် တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်တွင်တည်ရှိသည်။	

၁.၆။ ဖြစ်နိုင်ချေရှိသောပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများနှင့် လျော့ပါးစေရန် လုပ် ဆောင်ချက်များအ ကျဉ်းချုပ်

အဆိုပြုစီမံကိန်းတွင် အောက်ပါ လုပ်ငန်းဆောင်ရွက်မှုအဆင့်ဆင့်နှင့် ၎င်းတို့၏ အဓိက ဖြစ်ပေါ် နိုင်သော သက်ရောက်မှုများ ဖော်ပြထားပါသည်။

(က) အကြိုတည်ဆောက်ရေးကာလ ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ

အကြိုတည်ဆောက်ရေးကာလအတွင်း လုပ်ငန်းခွင် ရှင်းလင်းခြင်းနှင့် မြေညှိပြုပြင်ခြင်း လုပ်ငန်းများ ဆောင်ရွက်ခဲ့ပါသည်။ အကြိုတည်ဆောက်ရေးကာလအတွင်း အဓိကဖြစ်နိုင်ချေရှိသော သက်ရောက်မှုများကို အောက်ပါအတိုင်းဖြစ်ပါသည်။

စဉ်	ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ	သက်ရောက်မှုအဆင့် သတ်မှတ်ချက်	လျော့ပါးစေရေးနည်းလမ်းများ	တာဝန်ရှိသူ
၁။	သစ်ပင်များခုတ်လှဲခြင်း (သစ်တောပြုန်းတီးခြင်း)	Low Impact	- သစ်ပင်ခြတ်လှဲခြင်း နှင့် လုပ်ငန်းခွင်ရှင်းလင်းခြင်းအား ကန့်သတ်ခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်း ဆောင်ရွက်သူ
၂။	ဖုန်မှုန့်များထွက်ရှိမှု	Low Impact	- ရေဖြန်းပေးခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်း ဆောင်ရွက်သူ
၃။	ဆူညံသံ	Low Impact	- ညအချိန်တွင်အလုပ်လုပ်ခြင်းကို ရှောင်ရှားခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်း ဆောင်ရွက်သူ
၄။	ဓာတ်ငွေ့ထုတ်လွှတ်မှု	Low Impact	- စက်များအား ပုံမှန်ထိန်းသိမ်းခြင်းနှင့် အရည်အသွေးကောင်းသော စက်သုံးဆီများအသုံးပြုခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်း ဆောင်ရွက်သူ

(ခ) တည်ဆောက်ရေးကာလ ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ

တည်ဆောက်ရေးလုပ်ငန်းများတွင် ဆောက်လုပ်ရေးအလုပ်သမားများအတွက် ယာယီ အဆောင်များ ဆောက် လုပ်ခြင်းနှင့် စီမံကိန်းဖွံ့ဖြိုးမှုအတွက် လိုအပ်သော အရာများ (ကျောက်မီးသွေးသုံး ဘွိုင်လာ၊ မီးစက်နှင့် အခြားသော အဆောက်အဦးများ) တည်ဆောက်ခြင်းတို့ပါဝင်မည်ဖြစ်ပါသည်။အကြို တည်ဆောက်ရေးကာလကဲ့သို့ တည်ဆောက်ရေးကာလအတွင်းဖြစ်ပေါ်နိုင်သောအဓိကသက်ရောက်နိုင်မှုများသည် ယာယီ မြေပေါ်ရေ ညစ်ညမ်းမှု၊ မြေဆီလွှာညစ်ညမ်းမှု၊ ဓာတ်ငွေ့ ထုတ်လွှတ်ခြင်း၊ ဖုန်မှုန့်ထုတ်လွှတ်ခြင်း၊ ဆူညံသံနှင့် အမြင်ပသာဒ သက်ရောက်မှုတို့ဖြစ်ပါသည်။ တည်ဆောက်ရေးကာလ သဘောသဘာဝကြောင့် သက်ရောက်မှုများသည် သိသာထင်ရှားမှုမရှိ ရေတိုဖြစ်ပြီး လွယ်ကူစွာ လျော့နည်း သက်သာအောင် ပြုလုပ်နိုင်ပါသည်။

စဉ်	ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ	သက်ရောက်မှုအဆင့် သတ်မှတ်ချက်	လျော့ပါးစေရေးနည်းလမ်းများ	တာဝန်ရှိသူ
၁။	ဓာတ်ငွေ့ထုတ်လွှတ်မှု	Low Impact	- အရည်အသွေးကောင်းမွန်သော စက်များနှင့်စက်သုံးဆီများအသုံး ပြုခြင်း၊ပုံမှန်စစ်ဆေးမှု များ ပြုလုပ်ခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းဆောင်ရွက်သူ
၂။	ဖုန်မှုန့်များထွက်ရှိမှု	Low Impact	- ရေဖြန်းခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းဆောင်ရွက်သူ
၃။	ဆူညံသံ	Low Impact	- ညအချိန်တွင်အလုပ်လုပ်ခြင်းကို ရှောင်ရှားခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းဆောင်ရွက်သူ
၄။	မြေပေါ်ရေညစ်ညမ်းမှု	Low Impact	- မိုးရာသီတွင်လုပ်ငန်း လုပ်ဆောင်ခြင်းကို ရှောင်ရှားခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းဆောင်ရွက်သူ
၅။	အမြင်ပသာဒသက်ရောက်မှု	Low to Moderate Impact	- ဆောက်လုပ်ရေးလုပ်ငန်းခွင်ကို ကာအယံပြုလုပ်ထားခြင်း	ဆောက်လုပ်ရေး လုပ်ငန်းဆောင်ရွက်သူ

(ဂ) လည်ပတ်ရေးကာလ ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ

လုပ်ငန်းလည်ပတ်ရေးကာလအတွင်း အဓိက လည်ပတ်ဆောင်ရွက်သည့် လုပ်ငန်းစဉ်မှာ PET ထုတ်ကုန်များ ထုတ်လုပ်မှု၊ ကုန်ကြမ်းများ (ကျောက်မီးသွေး) ပို့ဆောင်ခြင်းနှင့် လုပ်ငန်းစဉ် တစ်ခု လုံးအတွက် ရေနွေးငွေ့နှင့် လျှပ်စစ်ဓာတ်အား ဖြန့်ဖြူးခြင်းတို့ ဖြစ်ပါသည်။ လည်ပတ်မှုအဆင့်အတွင်း အဓိကဖြစ်နိုင်ချေရှိသော သက်ရောက်မှုများမှာ ဓာတ်ငွေ့ထုတ်လွှတ်မှု၊ အမှုန်အမွှားထုတ်လွှတ်မှု

(ပြာမှုန့်)၊ အနုံ၊ ဆူညံမှု၊ မြေပေါ်ရေ ညစ်ညမ်းမှုနှင့် မြေဆီလွှာညစ်ညမ်းမှုတို့ဖြစ်သည်။ လုပ်ငန်းလည်ပတ်မှုဆိုင်ရာ သက်ရောက်မှုအများစုသည် သိသာ ထင်ရှားပြီး ရေရှည်ဖြစ်ပါသည်။

စဉ်	ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ	သက်ရောက်မှုအဆင့် သတ်မှတ်ချက်	လျော့ပါးစေရေးနည်းလမ်းများ	တာဝန်ရှိသူ
၁။	ဘွိုင်လာမှ ဓာတ်ငွေ့နှင့် အနံ ထုတ်လွှတ်ခြင်း	Moderate Impact	- အရည်အသွေးကောင်းမွန်သော ကျောက်မီး သွေးအသုံးပြုခြင်း၊ **water scrubber** တပ်ဆင်ခြင်း၊ မီးခိုးခေါင်းတိုင်ကို မြင့်မြင့်တပ်ဆင်ခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး
၂။	ဘွိုင်လာမှ အမှုန်အမွှား(Fly Ash) ထုတ်လွှတ်ခြင်း	Moderate Impact	- bag filter တပ်ဆင်ခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး
၃။	ဘွိုင်လာမှ စွန့်ပစ်အစိုင်အခဲ (Bottom Ash) ထွက်ရှိခြင်း	Moderate Impact	- အုတ်လုပ်ငန်းတွင် ပြာများကို ပြန်လည်အသုံး ပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး
၄။	ဘွိုင်လာမှ ရေဆိုး ထုတ်လွှတ်ခြင်း	Moderate Impact	- ရေဆိုးသန့်စင်စနစ်တပ်ဆင်ခြင်းနှင့် လုပ်ငန်းစဉ်အတွင်း သန့်စင်ပြီး ရေများပြန်လည်အသုံးပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး
၅။	ဘွိုင်လာမှ Blow Down Water ထွက်ရှိခြင်း	Low Impact	- စနစ်ကျသော ရေမြောင်းစနစ်ဖြင့် ရေသန့်စင်စနစ်တပ်ဆင်ပြီး စက်ရုံတွင် ပြန်လည်အသုံးပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး
၆။	ပြုပြင်ခြင်းစနစ်မှ အနံ့ထုတ်လွှတ်ခြင်း	Low Impact	- စက်ရုံအတွင်း **exhaust fan** အသုံးပြုခြင်းနှင့် ကောင်းမွန်သော လေဝင်လေထွက်စနစ်အ	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင်ရာ ညှိနှိုင်းရေးမှူး

			သုံးပြုခြင်း	
၇။	မီးစက်မှ ဆူညံသံထွက်ရှိခြင်း	Low Impact	- ညအချိန်အလုပ်လုပ်ခြင်း ကန့်သတ်ခြင်းနှင့် အသံလုံ မီးစက်များအသုံးပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင် ရာ ညှိနှိုင်းရေးမှူး
၈။	ယာဉ်များတိုးပွားလာ ခြင်းနှင့် လမ်းပျက်ဆီးခြင်း	Low Impact	- ဒေသခံအလုပ်သမားများ တတ်နိုင်သမျှ အသုံးပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင် ရာ ညှိနှိုင်းရေးမှူး
၉။	လူဦးရေဝင်ရောက် လာမှုများနှင့်ဆက်စပ် သက်ရောက်မှုများ	Low Impact	- ဒေသခံအလုပ်သမားများ တတ်နိုင်သမျှ အသုံးပြုခြင်း	EMMT မှ သဘာဝ ပတ်ဝန်းကျင်ဆိုင် ရာ ညှိနှိုင်းရေးမှူး

(ဃ) လုပ်ငန်းပိတ်သိမ်းကာလတွင် ဖြစ်နိုင်ချေရှိသောသက်ရောက်မှုများ

လုပ်ငန်းဖျက်သိမ်းသည့်ကာလအတွင်း၊ ကွန်ကရစ်နှင့် သံမဏိအဆောက်အဦများနှင့် စက်ကိရိယာ အားလုံးကို ဖျက်သိမ်းပြီး ဖယ်ရှားမည်ဖြစ်ပါသည်။ လုပ်ငန်းဖျက်သိမ်းသည့်ကာလအတွင်း အဓိက ဖြစ်ပေါ်နိုင်သည့် သက်ရောက်မှုများမှာ ဖုန်မှုန့်ထုတ်ရှိခြင်း၊ မြေပေါ်ရေညစ်ညမ်းခြင်း၊ ဆူညံသံနှင့် မြေဆီလွှာညစ်ညမ်းခြင်း တို့ဖြစ်လိမ့်မည်။ လုပ်ငန်းဖျက်သိမ်းသည့်ကာလအတွင်း သက်ရောက်မှုများ ၏ သဘောသဘာဝသည် ရေတိုဖြစ်ပြီး သိသာထင်ရှားမှုရှိလိမ့်မည် မဟုတ်ပါ။

စဉ်	**ဖြစ်နိုင်ချေရှိသော သက်ရောက်နိုင်မှုများ**	**သက်ရောက်မှု အဆင့်သတ်မှတ်ချက်**	**လျော့ပါးစေရေးနည်းလမ်းများ**	**တာဝန်ရှိသူ**
၁။	ဖုန်မှုန့်ပျံလွှင့်ခြင်း	Low impact	- ရေဖြန်းပေးခြင်း	ဆောက်လုပ်ရေးလုပ်ငန်း လုပ်ဆောင်သူ
၂။	ဆူညံသံ	Low impact	- ညအချိန်၌ အလုပ်လုပ် ခြင်းကို ရှောင်ရှားခြင်း	ဆောက်လုပ်ရေးလုပ်ငန်း လုပ်ဆောင်သူ

၃။	ဓာတ်ငွေ့ထုတ်လွှတ်မှု	Low impact	- စက်များအား ပုံမှန်ထိန်းသိမ်းခြင်းနှင့် အရည် အသွေးကောင်းသော စက်သုံးဆီများ အသုံးပြုခြင်း	ဆောက်လုပ်ရေးလုပ်ငန်းလုပ်ဆောင်သူ

ဖြစ်နိုင်ချေရှိသောပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ၊ လျော့ပါးစေရန် စီမံခန့်ခွဲမှု လုပ်ဆောင်ချက်များအား အခန်း(၆)တွင်ဖော်ပြထားပါသည်။

(c) ကြွင်းကျန်သက်ရောက်မှုများ အကျဉ်းချုပ်

လျော့ပါးရေးအစီအမံများအပြီးတွင် ကြွင်းကျန်သက်ရောက်မှုများအဖြစ် ဆူညံသံ၊ အမှုန်အမွှား နှင့် ဓာတ်ငွေ့ ထုတ်လွှတ်ခြင်းများ ကျန်ရှိနိုင်သည်။ ဘွိုင်လာမှ ဖုန်မှုန့်၊ အခိုးအငွေ့ထုတ်လွှတ်မှုနှင့် မီးစက်မှ ဆူညံသံများကို လျော့ပါးသက်သာစေရန် သစ်ပင်များပြန်လည်စိုက်ပျိုးခြင်း (green belt development) ပြုလုပ်မည် ဖြစ်ပါသည်။

၁.၇။ ဆင့်ပွားသက်ရောက်နိုင်မှုများ အကျဉ်းချုပ်

အဆိုပြုစီမံကိန်းအတွက် စီမံကိန်းများသည် စက်မှုဇုန်တွင် တည်ရှိသောကြောင့် ဖြစ်ပေါ်လာသော ဆင့်ပွား သက်ရောက်နိုင်မှုများမှာ ဓာတ်ငွေ့ထုတ်လွှတ်မှု၊ ဆူညံသံ၊ အနှံများ၊ မြေပေါ်ရေ ညစ်ညမ်းမှု၊ ယာဉ်ကြော ပိတ်ဆို့မှုနှင့် လမ်းပျက်စီးမှုများ ဖြစ်ပါသည်။ သစ်ပင်များပြန်လည်စိုက်ပျိုးခြင်း (green belt development)၊ ညအချိန်တွင် အလုပ်လုပ်ခြင်းကို ကန့်သတ်ခြင်း၊ ရေဆိုး သန့်စင်ခြင်းနှင့် ပြန်လည်အသုံးပြုခြင်းစနစ်၊ ဒေသယာဉ်ကြောပိတ်ဆို့သည့်အချိန်နှင့် ဒေသခံပြည်သူများ အသုံးပြုချိန်အတွင်း သယ်ယူပို့ဆောင်ရေးကို ရှောင်ကြဉ်ခြင်းစသည် လုပ်ဆောင်ခြင်းတို့သည် အဆိုပါဆင့်ပွား သက်ရောက်မှုများကို လျှော့ချနိုင်မည်ဖြစ်ပါသည်။

၁.၈။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အကျဉ်းချုပ်

၁.၈.၁။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုနှင့်စောင့်ကြည့်လေ့လာရေးအဖွဲ့(EMMT)

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုနှင့် စောင့်ကြည့်လေ့လာရေးအဖွဲ့(EMMT)အား အောက်ဖော်ပြပါ အတိုင်း ဖွဲ့စည်းထားပါသည်။

၁.၈.၂။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုနှင့်စောင့်ကြည့်လေ့လာခြင်းအတွက် စုစုပေါင်းကုန်ကျစရိတ်

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုနှင့် စောင့်ကြည့်လေ့လာခြင်းအတွက် စုစုပေါင်းကုန်ကျစရိတ်မှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်။

(က) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအတွက်ခန့်မှန်းကုန်ကျစရိတ်

စက်ရုံအမှတ်(၁)

	Estimated Cost	Duration	Overall Estimated Cost
လည်ပတ်ခြင်းလုပ်ငန်းစဉ်	975 Lakhs/Time	25 years	975 Lakhs
ပိတ်သိမ်းခြင်းလုပ်ငန်းစဉ်	8000 Kyats/day	1 year	25 Lakhs

စက်ရုံအမှတ်(၂)

	Estimated cost/ Year	Duration	Overall Estimated Cost
လည်ပတ်ခြင်းလုပ်ငန်းစဉ်	975 Lakhs/Time	25 years	975 Lakhs
ပိတ်သိမ်းခြင်းလုပ်ငန်းစဉ်	8000 Kyats/day	1 year	25 Lakhs

(ခ) ပတ်ဝန်းကျင်စောင့်ကြည့်လေ့လာခြင်းအတွက် ခန့်မှန်းကုန်ကျစရိတ်

စက်ရုံအမှတ်(၁)

	Estimated cost/ Year	Duration	Overall Estimated Cost
လည်ပတ်ခြင်းလုပ်ငန်းစဉ်	1,560,000 kyats	25 years	39,000,000 kyats

စက်ရုံအမှတ်(၂)

	Estimated cost/ Year	Duration	Overall Estimated Cost
လည်ပတ်ခြင်းလုပ်ငန်းစဉ်	1,560,000 kyats	25 years	39,000,000 kyats

၁.၉။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် အများပြည်သူသို့ထုတ်ဖော်တင်ပြခြင်း အကျဉ်းချုပ်

အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်းနှင့်လူထုပူပေါင်းပါဝင်ခြင်းကိုအောက်ဖော်ပြပါလုပ်ငန်းစဉ်များအတိုင်း ပြုလုပ်မည်ဖြစ်ပါသည်။

(က) လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်း(**Household survey)**

(ခ) လူထုတွေ့ဆုံပွဲများပြုလုပ်ခြင်း (**Public consultation meetings)**

(ဂ) အများပြည်သူသို့ထုတ်ဖော်တင်ပြခြင်း (**Public disclosure)**

(က) လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်းမှ လူမှုစီးပွားအချက်အလက်များ စုဆောင်းခြင်း

လူမှုစီးပွားအချက်အလက်များ primary data ကို လူနေရပ်ကွက်များအတွင်းသို့ ကွင်းဆင်း ဆောင်ရွက်ခြင်း (Household survey) ဖြင့် ကောက်ယူမည်ဖြစ်ပြီး secondary dataများကို အုပ်ချုပ် ရေးမှူးရုံး(မော်ဘီ) မှ ရယူမည် ဖြစ်ပါသည်။ သက်ရောက်မှုနယ်နိမိတ်(AOI) ၄ကီလိုမီတာ အတွင်းရှိ ကံကလေးကျေးရွာ၊ ကုလားကုန်း ကျေးရွာနှင် မြောင်းတကာကျေးရွာတို့တွင်လူနေရပ်ကွက်များအတွင်းသို့ ကွင်းဆင်းဆောင်ရွက်ခြင်းကိုပြုလုပ်ခဲ့ပါသည်။ကွင်းဆင်းဆောင်ရွက်ခြင်းမှရရှိသောအဓိကတွေ့ရှိချက်များမှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။

အမှတ်စဉ်	လူထုစိုးရိမ်မှုများ	ကျေးရွာများ	စီမံကိန်းအဆိုပြုသူ၏ကတိကဝတ်များ
၁။	ညအချိန် မီးစက်နှင့်စက်ယန္တရားများမှ ဆူညံသံများ	မြောင်းတကာ (စက်မှုဇုန်အတွင်း)	ညအချိန် အလုပ်လုပ်ခြင်းကို ကန့်သတ်ခြင်း
၂။	စွန့်ပစ်ရေမှ အနံ့ထွက်ရှိခြင်း	မြောင်းတကာ (စက်မှုဇုန်အတွင်း)	ရေဆိုးသန့်စင်သည့်စနစ်တပ်ဆင်ပြီး စက်မှုဇုန်၏ စည်းမျဉ်းစည်းကမ်းများကို လိုက်နာဆောင်ရွက်သွားမည်။
၃။	ဘွိုင်လာလည်ပတ်ခြင်းကြောင့် အမှုန်အမွှား၊ ဓာတ်ငွေ့၊ အနံ့ထွက်ရှိခြင်း	မြောင်းတကာ (စက်မှုဇုန်အတွင်း) ၊ မြောင်းတကာ (စက်မှုဇုန်အနီး)	Bag filter၊ water scrubberနဲ့ proper stake height ကို တပ်ဆင်သွားမည်။

အမှတ်စဉ်	လူထုလိုအပ်ချက်များ	ကျေးရွာများ	စီမံကိန်းအဆိုပြုသူ၏ကတိတဝတ်များ
၁။	ဒေသခံပြည်သူများအတွက် အလုပ်အကိုင်အခွင့်အလမ်းများ	ကံကလေး၊ ကုလားကုန်း၊ မြောင်းတကာ	အနည်းဆုံးဒေသခံပြည်သူ၅၀ရာခိုင်နှုန်းအလုပ်ခန့်ရန် ကုမ္ပဏီ၏မူဝါဒကို ချမှတ်မည်။
၂။	ကျေးရွာအတွင်းလမ်းနှင့် ရေမြောင်းများ အဆင့်မြှင့်တင်ရေး ကူညီဆောက်ရွက်ပေးရန်	ကံကလေး၊ ကုလားကုန်း	ဒေသခံအဖွဲ့အစည်းများနှင့် ဆွေးနွေးပြီး CSR ရန်ပုံငွေကို ပုံမှန်အသုံးပြုမည်။

လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်းအတွင်းလူထုစိုးရိမ်မှုများအတွက်အသေးစိတ်အချက် အလက်များကို အခန်း(၉)တွင် ဖော်ပြထားပါသည်။

(ခ) လူထုတွေ့ဆုံပွဲများ (PCMs)

လူထုတွေ့ဆုံပွဲများကို အောက်ဖော်ပြပါအတိုင်း နှစ်ကြိမ်ပြုလုပ်မည် ဖြစ်ပါသည်။

(ကက) နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအစီရင်ခံစာ (Scoping Proposal) အတွက် လူထုတွေ့ ဆုံပွဲ

(ခခ) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်လေ့လာရန် (EIA Study)အတွက် လူထုတွေ့ဆုံပွဲ

Covid 19 ကာလအတွင်း (10.9.2021) တွင် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း (Scoping Proposal) အတွက် လူထုတွေ့ဆုံပွဲပြုလုပ်ခဲ့ပါသည်။ ထိုကြောင့် ဒီလူထုတွေ့ဆုံပွဲကို Covid စည်းမျဉ်း များအတိုင်း ပြုလုပ်ခဲ့ပါသည်။ အဆိုပြုစီမံကိန်းကြောင့် တိုက်ရိုက် သို့မဟုတ် သွယ်ဝိုက်သောနည်းဖြင့် သက်ရောက်မှုခံရသော ဒေသခံလူထုမှလူ ၃၀ ခန့် (Covid 19 ကာလအတွင်း အစည်းအဝေးအတွက် အများဆုံးကန့်သတ်ချက်) ဤအစည်းအဝေးသို့ တက်ရောက်ခဲ့ကြပါသည်။

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်လေ့လာရန် (EIA Study)အတွက် လူထုတွေ့ဆုံပွဲအကျဉ်းချုပ်

စဉ်	တွေ့ဆုံပွဲ	တည်နေရာ	နေ့စွဲ	တက်ရောက်သူ အရေအတွက်	မှတ်ချက်
၁။	နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာ(Scoping Proposal)အတွက်လူထုတွေ့ဆုံပွဲ	Da Hua (Myanmar) စက်မှုဝန်ထမ်းအိမ်ရာ	၁၀.၉.၂၀၂၁	၃၀	Covid 19 ကာလအတွင်း
၂။	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်လေ့လာရန် (EIA Study) အတွက် လူထုတွေ့ဆုံပွဲ	မြောင်းတကာ စက်မှုဇုန်ရှိ ကော်မတီရုံးခန်းမ	၁၉.၆.၂၀၂၂	ဒေသဆိုင်ရာအာဏာပိုင်များ=၁၉ ဒေသခံပြည်သူများ= ၆၈	

အောက်ဖော်ပြပါတို့သည် လူထုတွေ့ဆုံပွဲမှ အဓိကဆွေးနွေးမှုများ နှင့် စီမံကိန်းအဆိုပြုသူ၏ ကတိကဝတ်များ အကျဉ်းချုပ်ဖြစ်ပါသည်။

အမှတ်စဉ်	လူထုစိုးရိမ်မှုများ	စီမံကိန်းအဆိုပြုသူ၏ကတိတဝတ်များ
၁။	ဘွိုင်လာမှ အနံ့နှင့် ဓာတ်ငွေ့များ ထုတ်လွှတ်ခြင်း	Bag filter ၊ water scrubberနဲ့ proper stake height ကို တပ်ဆင်သွားမည်။
၂။	ဘွိုင်လာမီးခိုးခေါင်းတိုင်မှ ထွက်လာသောပြာများ	Bag filter ကို တပ်ဆင်သွားမည်။
၃။	ညအချိန် မီးစက်မှ ထွက်ပေါ်လာသော ဆူညံသံ	ညအချိန် အလုပ်လုပ်ခြင်းကို ကန့်သတ်ပါမည်။
၄။	စက်ရုံမှ ထွက်ရှိသော ရေဆိုးများ	ရေဆိုးသန့်စင်စနစ်အသုံးပြုပြီး သန့်စင်ပြီးရေများကို ပြန်လည် အသုံးပြုပါမည်။
အမှတ်စဉ်	လူထုလိုအပ်ချက်များ	စီမံကိန်းအဆိုပြုသူ၏ကတိတဝတ်များ
၁။	ကျေးရွာလမ်းများအား အဆင့်မြှင့်တင်ပေးရန်	CSR ရန်ပုံငွေကို ပုံမှန်အသုံးပြုမည်။
၂။	ကျန်းမာရေး စောင့်ရှောက်မှုအတွက် ဝန်ဆောင်မှုများနှင့် အဆောက်အဦးများအား ထောက်ပံ့ပေးရန်	CSR ရန်ပုံငွေကို ပုံမှန်အသုံးပြုမည်။
၃။	အလုပ်အကိုင်အခွင့်အလမ်းများဖန်းတီးပေးရန်	အနည်းဆုံးဒေသခံပြည်သူ၅၀ရာခိုင်နှုန်းအလုပ်ခန့်မည်။

(ဂ) အများပြည်သူသို့ထုတ်ဖော်တင်ပြခြင်း (Public disclosure)

EIA အစီရင်ခံစာမူကြမ်းနှင့် နောက်ဆုံး EIA အစီရင်ခံစာကို Da Hua တရားဝင်ဂက်ဘ်ဆိုက်တွင် ထုတ်ဖော် တင်ပြမည်ဖြစ်သည်။

၁.၁၀။ အနှစ်ချုပ်သုံးသပ်ချက်

အဆိုပြုစီမံကိန်းသည် စက်မှုဇုန်အတွင်း တည်ရှိသောကြောင့် စီမံကိန်း၏လုပ်ငန်းလည်ပတ်မှုကြောင့် ဖြစ်ပေါ် လာနိုင်သည့် သဘာဝပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားဆိုင်ရာ ထိခိုက်မှုများမှာ လူနေရပ် ကွက်များ တွင် တည်ရှိသည့် အခြားသောစီမံကိန်းများထက် လူထု၏စိုးရိမ်မှုများလျော့နည်း မည်ဖြစ် ပါသည်။ မည်သို့ပင်ဆိုစေကာမူ Da Hua ကုမ္ပဏီသည် အဆိုပြုထားသော စီမံကိန်းနှင့် ပတ်သတ်သည့် ဆိုးကျိုး များကို လျော့နည်းသက်သာအောင် ထိန်းချုပ်မည်ဖြစ်ပါသည်။သက်ရောက်မှုများကိုလေ့လာခြင်းအရ၊ သိသာထင်ရှားသော ဆိုးကျိုးသက်ရောက်မှု များမှာ ကျောက်မီးသွေးသုံး ဘွိုင်လာကြောင့် လေထုညစ်ညမ်ခြင်း ၊ဘွိုင်လာမှစွန့်ပစ်အဆိုင်အခဲများကြောင့် မြေဆီလွှာညစ်ညမ်းခြင်း၊ ညဘက် အလုပ် လုပ်စဉ် ကြားရသည့်မီးစက်လည်ပတ်ခြင်းကြောင့်ထွက်ပေါ်လာသည့်ဆူညံသံနှင့်ပလပ်စတစ် များကို ပြန်လည်ပြုပြင်ခြင်းလုပ်ငန်းစဉ်ကြောင့် မြေပေါ် ရေညစ်ညမ်းခြင်းတို့ဖြစ်ပါသည်။ဤအစီရင်ခံ စာတွင် အဆိုပြုစီမံကိန်း၏အဓိကဖြစ်ပေါ်နိုင်သည့်သဘာဝပတ်ဝန်းကျင်နှင့်လူမှုစီပွားဆိုင်ရာဆိုးကျိုး သက်ရောက်မှုများကို ဖော်ပြထားပါသည်။ ထို့အပြင် ဖြစ်ပေါ်နိုင်သည့် သက်ရောက်မှု များအတွက် သင့်လျော်သော လျော့ပါးသက်သာစေရေး အစီအမံများနှင့် ကောင်းမွန်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အလေ့အကျင့် ကောင်းများကိုလည်း ဖော်ပြထားပါသည်။ EIA လေ့လာမှုအရ၊ စီမံကိန်းအဆိုပြုသူ(Da Hua)သည် ဤအစီရင်ခံ စာတွင် ဖော်ပြထားသော သက်ရောက်မှုများလျော့ပါးသက်သာစေရေးနှင့် မြှင့်တင်ရေးအစီအမံများ အတိုင်း လိုက်နာဆောင်ရွက်မည်ဆိုပါက အဆိုပြုစီမံကိန်းသည် ထိခိုက်မှု နည်းပါးစာဖြင့် လည်ပတ်နိုင်မည်ဖြစ်ပါကြောင်း အနှစ်ချုပ် သုံးသပ်ရပါသည်။

1. EXECUTIVE SUMMARY

1.1. Summary of Project Background

Da Hua (Myanmar) Company Limited will develop and produce polyester staple fiber, Polyethylene Terephthalate (PET) packing tape and recycle pellets in Myaung Dagar Industrial Zone, Hmawbi Township, Yangon. The proposed project will include two factories; Factory No.(1) and Factory No. (2). Factory No. (1) is situated 0.9km (900m) away from Factory No. (2). All of the factories are located in Myaung Dagar Steel Industrial Zone. Polyester staple fiber production will be made in Factory No. (1) and PET packing tape and recycle pellets will be made in Factory No. (2). According to the Environmental Conservation Law, 2012 and Environmental Impact Assessment Procedure, 2015, it is necessary to conduct Environmental Impact Assessment (EIA) for the proposed project and so the Environmental Conservation Department (ECD, Naypyidaw) was instructed to conduct EIA for the proposed factories as shown in the official letter in Appendix A. Ever Green Tech Environmental Services and Training Co., Ltd. was appointed to conduct EIA for the proposed factories.

1.2. Summary of Introduction

(a) Brief of the Project Proponent

The followings are the brief of project proponent.

Project Developer	
Project Developer	Da Hua (Myanmar) Polyester Staple Fiber Co., Ltd
Type of Company	Joint Venture Company (a) Da Hua Environmental Sei-Tech, H.K Limited (80%) (b) Da Hua Co., Ltd. (20%)
Company Registration Number	104879616 former 927 FC/2017-2018 (YGN)
Construction Period	12 months
Operation Period	20 years
Employment	Local Workers – 219 Foreign Technicians – 29
Total Investment	5.18995 million USD
Types of Business	Export to CMP Basic
Types of Products	The proposed project will have two factories as follow: Factory No. (1)

	Production of Polyester Staple Fiber, export to CMP basis. Factory No. (2) Production of PET packing tape and recycle pellets
Projects Location	Factory (1) Plot No (209 & 238), Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division Factory (2) Plot No (375, 376, 377, 378, 379, 380 & 381) Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division
Contact Person	Daw May Moe Da Hua (Myanmar) Co., Ltd 09-250064251

(b) Brief of the Environmental Assessment Practitioner

Below is the background information on Ever Green Tech Environmental Services and Training Co., Ltd (Third party) who will conduct the EIA.

Ever Green Tech Environmental Services & Training Co., Ltd.	
Company Name	Ever Green Tech Environmental Services and Training Co., Ltd.
Company Registration Number	115575996
Transition Consultant Registration Number	0047
Contact Address	No.1/9, Baho Road, 16th quarter, Hlaing Township, Yangon
Telephone Number	09-5099230, 5099232
E-mail	md@evergreentechmyanmar.com green.evergreentech@gmail.com
Contact person	Aye Chaw Su Hlaing Managing Director green.evergreentech@gmail.com 09-966611100

(c) Selected Consultants for Conducting EIA Study and Report Writing

The following table shows the selected consultants for the proposed project.

No.	Name	Degree	Responsibility	Area of Expertise
1.	Dr. Ni Ni Aye	M.B.B.S (Ygn); MS.Med. (Public Health)	Team Leader	(a) Health Impact Assessment (b) Water Pollution Control, Preventation and Monitoring
2.	Ms. Tin Tin Ohm	B.Ag (Agricultural), M.Sc. (Forest Soil Science), USA	Consultant	(a) Soil Quality Preservation (b) Geology
3.	Mr. Min Min Htwe	M.E. (Mining)	Consultant	(a) Geology (b) Noise and Vibration
4.	Mr. Aung Naing Tun	L.L.B, M.B.A	Consultant	(a) Laws and Legal Requirement (b) Analysis for Economic Point of View
5.	Ms. Phoo Mon Mon Phyo	M.Sc. (Zoology)	Consultant	(a) Biodiversity (b) Natural Resources Management (Fisheries)
6.	Ms. Phyu Phyu Thet	B.Ecom. (Eco)	Consultant	(a) Analysis for Economic Point of View
7.	Ms. Thazin Moe Myint	B.E. (Civil)	Consultant	(a) Meteorology, Air Quality Assessment and Prediciton
8.	Ms. Aye Chaw Su Hlaing	B.A. (History)	Consultant	(a) Cultural & Heritage
9.	Mr.Ye Wai Phyo	B.Sc. (Chemistry)	Consultant	(a) Air Pollution Prevention and Control
10.	Ms. Yee Mon Kyaw	B.A. (Psychology)	Consultant	(a) Socio-economic

11.	Mr. Win Ko Aung	B.Sc. (Chemistry)	Consultant	(a) Air Quality Monitoring
12.	Mr. Pyae Moe Han	BE. (Chemical)	Consultant	(a) Water Pollution Control, Preventation and Monitoring
13.	Ms. Hnin Einzali	B.E. (Chemical)	Consultant	(a) Solid and Hazardous Waste Management (b) Soil Quality Preservation
14.	Mg Lwin Myint Mg	B.E. (Mining)	Consultant	(a) Noise and Vibration (b) Land Use
15.	Mr. Moe Pyi Kyaw	B.Sc. (Forestry)	Consultant	(a) Biodiversity (b) Natural Resources Management (Forestry)
16.	Ms. Nwe Nwe Aung	B.Sc.(Zoology)	Consultant	(a) Natural Resources Management (Fisheries)
17.	Ms. Hnin Hnin Phyo	B.E. (Mining)	Consultant	(a) Risk Assessment and Management (b) Natural Resources Management (Mineral Resources)

(d) The Aim of the Project

The developer statements publicly that the proposed project will necessary for local industry in Myanmar due to the following reasons:

- To recycle plastic waste (plastic drinking water bottle) to useful industrial raw materials.
- To produce good quality polyester staple fiber, packing tape and plastic pellet for local use and export, and
- To get benefits for both customers and supplier together with increasing employment opportunities for local people as well as resulting in government revenues.

(e) Scope of EIA Study

EIA study will cover all of the project stages: pre-construction phase, construction phase, operation phase and decommissioning phase. The study area (area of influence- AOI) for EIA will be within 3km radius (6km diameter).

1.3. Summary of Policy, Legal and Other Requirements

1.3.1. Relevant Laws and Regulations

Myanmar has promulgated several laws and regulations concerning protection of the environment. The following table describes laws and regulations which are directly or indirectly associated with the proposed project.

Table – Relevant Environmental, Social, Health and Safety Laws and Regulations in Myanmar

Laws and Regulations	Year
Constitution of the Republic of the Union of Myanmar (Articles 24,45, 349, 359)	2008
Environmental Conservation Law (Law No.7(o), 14,15,24,25,29)	2012
Environmental Conservation Rules (Rule No.69)	2014
EIA Procedures (Article 102 to 110, 113, 115, 117)	2015
National Environmental Quality (Emission) Guidelines (Section -1.1, 1.2, 1.3)	2015
The Protection of rights of National Race Law (Law No. 5)	2015
Myanmar Investment Law (Law No. 50, 51, 65,73)	2016
Myanmar Foreign Investment Law (Law No. 4, 17)	2012
Myanmar Citizen Investment Law (Law No. 15,16)	2013
Labor Organization Law (Law No. 18,19,20,21,22)	2012
The Settlement of Labor Dispute Law (Law No. 38, 39, 40)	2012
Employment and Skill Development Law (Law No. 5, 14, 30(a,b))	2013
The Leave and Holiday Act, 1951 (Law Amended July, 2014)	2014
The Minimum Wages Law (Law No. 12, 13 (a to g)	2013
Payment of Wages Act (Law No. 3,4, 5, 14, 8 with 7,10)	2016
The Myanmar Insurance Law (Law No. 15, 16)	1993
The Social Security Law (Law No. 11(a), 15(a), 18(b), 48, 49, 75)	2012
Workman Compensation Act (Law No. 3)	1951
Myanmar Fire Bridge Law, (Law No. 25)	2015
Law Amending the Factories Act 1951 (Pyidaungsu Hluttaw Law No. 12/2016)	2016
Public Health Law (Law No. 3, 5)	1972
Private Industrial Enterprise Law (Law No 13(a))	1990
Forest Law (Law No. 12)	2018
Protection of Biodiversity and Protected Area Law (Law No. 19(e), 35(a,c,d), 39(d)	2018
Protection and Preservation of Cultural Heritage Regions Laws (Law No. 21 (b))	2019

Prevention and Control of Communicable Diseases Law (Law No. 3, 4, 11)	1995
The Control of Smoking and Consumption of Tobacco Product Law (Law No. 9)	2006
Conservation of Water Resources and Rivers Law (Law No. 8(a), 11, 19, 21(b), 22, 24(b), 30, 47, 48, 49)	2006
Conservation of Water Resources and Rivers Rules (Law No. 47,48,49)	2013
Farm Land Law (Law No. 30)	2012
The Prevention of Hazard from Chemical and Related Substances Rules (Law No. 15,16,17,22,27,30)	2013
The Freshwater Fisheries Law (Law No. 36,40,41)	1991
Automobile Law Pyidaungsu Hluttaw Law No. 55/2015	2015
The Myanmar Engineering Council Law (Law No. 34,37)	2013
The Petroleum Rules (Law No. 63,66,72,80,92,93)	1937
The Factories Act	1951
Boiler Law (Law No. 5,6,7,12(a,b)14,15,18,20,21,24,31,38)	2015
Natural Disaster Management Law (Law No. 9(a))	2013
The Export and Import Law (Law No.7)	2012
Occupational Safety and Health Law (Pyidangsu Hluttaw Law: No.8) (Law No. 12,14,16,17,18,26,27,34,36)	2019
The Standardization Law, (Law No. 17,19,26)	2014
Patent Law	2019
Trademark Law (Law No.17)	2019
Industrial Design Law (Law No. 19)	2019
Consumer Protection Law (Law No.21)	2019
The Boundary Demarcation and Survey Law (Law No. 18,19,20)	2019
Tax Administration Law (Law No. 18,20)	2019
Registration of Deeds (Law No. 16)	2018

1.3.2. Summary of Statement of Commitments

Da Hua will commit to comply with the followings:

List of Commitments	Chapter
Summary have been selected and presented according to the chapters of the environmental management plan.	Chapter 1
All the background information about the project developer mentioned in this report is accurate.	Chapter 2
The proposed project will be implemented according to the laws and regulations, international agreements and regulations and guidelines related to the project.	Chapter 3
The description of the project and project activities described in this report are correct and accurate.	Chapter 4
The baseline data in the vicinity of the project mentioned in this chapter are the actu11al onsite data.	Chapter 5
The description of the environmental impacts, significant of the impacts and mitigation measures for these impact are resulted from the operation of the	Chapter 6

project and Da Hua will implement and follow all of the mitigation measures.	
The residual impacts and cumulative impacts described in the report are relevant to the project and will be implemented according to mitigation measures.	Chapter 7
The project developer has to proceed the estimated fund for the environmental management plan, and environmental monitoring plan. If necessary, the fund will be used for management and monitoring plan. Occupational safety and health plan, natural disaster management plans and the CSR fund community development plan will be accomplished as described.	Chapter 8
The household survey and public meeting have been conducted and held in the project affected area and the requirement and concerns have been thoroughly collected.	Chapter 9
Reviewing the project environmental management plans, the main environmental impacts and the feasibility of the project is described.	Chapter 10

1.4. Summary of Project Description and Alternative Selection

1.4.1. Summary for Project Description

(a) Types of Project and Products

Da Hua Myanmar Company Limited is manufacturing three types of products, one of which is polyester staple fiber which can be used as silicone fibers for various purposes. The other ones are PET packing tape which can be used as ropes for packing purposes and PE/PP recycle pellets. PSF will be produced by processing PET bottles (such as water bottles, oil and other plastic bottles) as raw materials. PET Packing Tape and PE/PP Recycle Pellets are produced from lids of the plastic bottles. Among these three products, PSF will be produced in PSF Factory (Factory No 1) and packing tape and recycle pellets will be produced in PPPT Factory (Factory No 2).

(b) Project Location

As Da Hua Myanmar Company Limited operate two factories for three products, there are two locations for them. PSF factory (Factory No.1) is located in Block 209 & 238, Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division at the coordinates of 17°10’ 3.42” N Latitude and 95° 58’ 41.68” E Longitude. PPPT Factory (Factory No.2) is located in Block (375 to 381), Myaung Dagar Steel Industrial Zone at the coordinates of Latitude 17° 9'35.37"N, Longitude 95°59'4.10"E. The distance between 2 factories is 0.9km (900m).

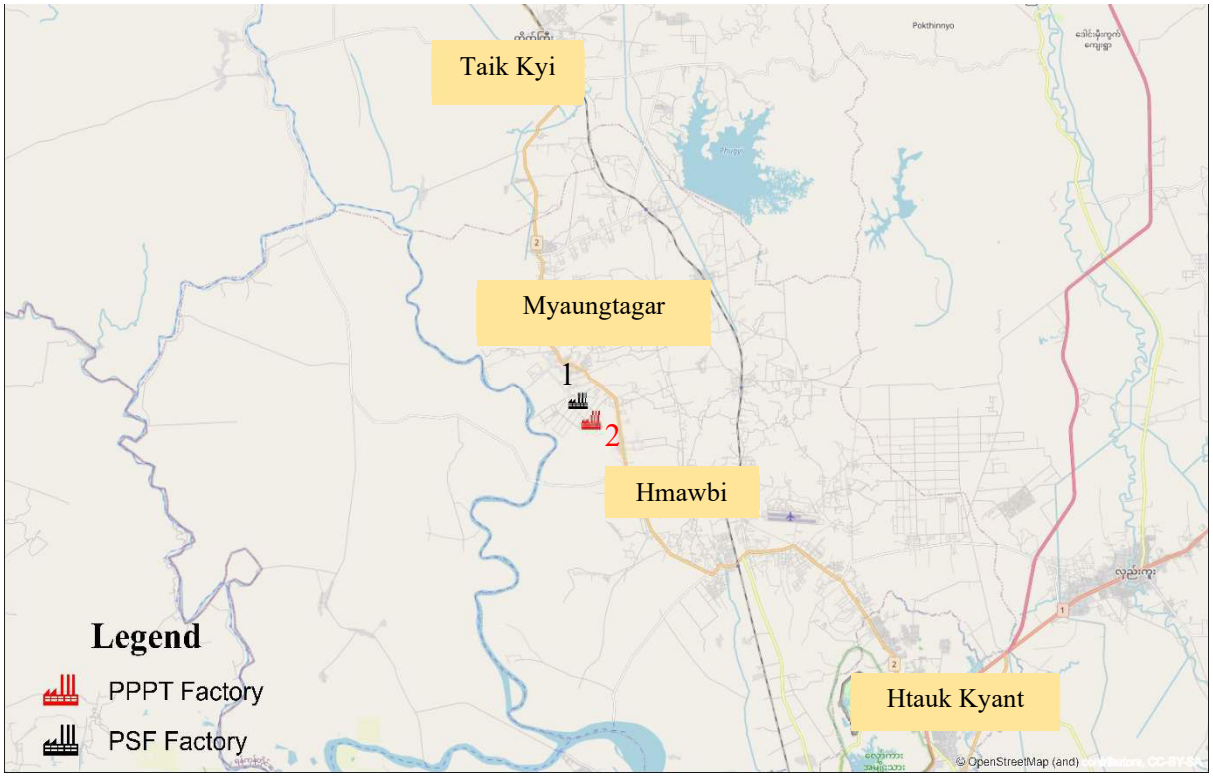


Figure - Location Map of Proposed Projects

Location	Coordinates	
	Latitude	Longitude
PPPT Factory	17° 9'35.37"N	95°59'4.10"E
PSF Factory	17°10'3.42"N	95°58'41.68"E
Myaung Dagar	17°10'40.13"N	95°58'39.24"E
Hmawbi	17° 9'59.11"N	95°59'35.36"E
Taik Kyi	17°17'45.12"N	95°58'26.56"E
Htauk Kyant	17° 2'35.07"N	96° 7'57.36"E

Figure – Distance between Two Factories

(c) Project Area

The main building in Da Hua (Myanmar) PSF Factory (Factory No 1) is 800′ x 120′ and total factory area is 4.004 acres of land. Using 60 tons/day of used PET bottles as raw material and produces 40 tons/day of Polyester Staple fiber. PPPT Factory (Factory No 2) is 8.667 acres.

(d) Project Layout Plan

The following tables show the project layout plans of the proposed projects.

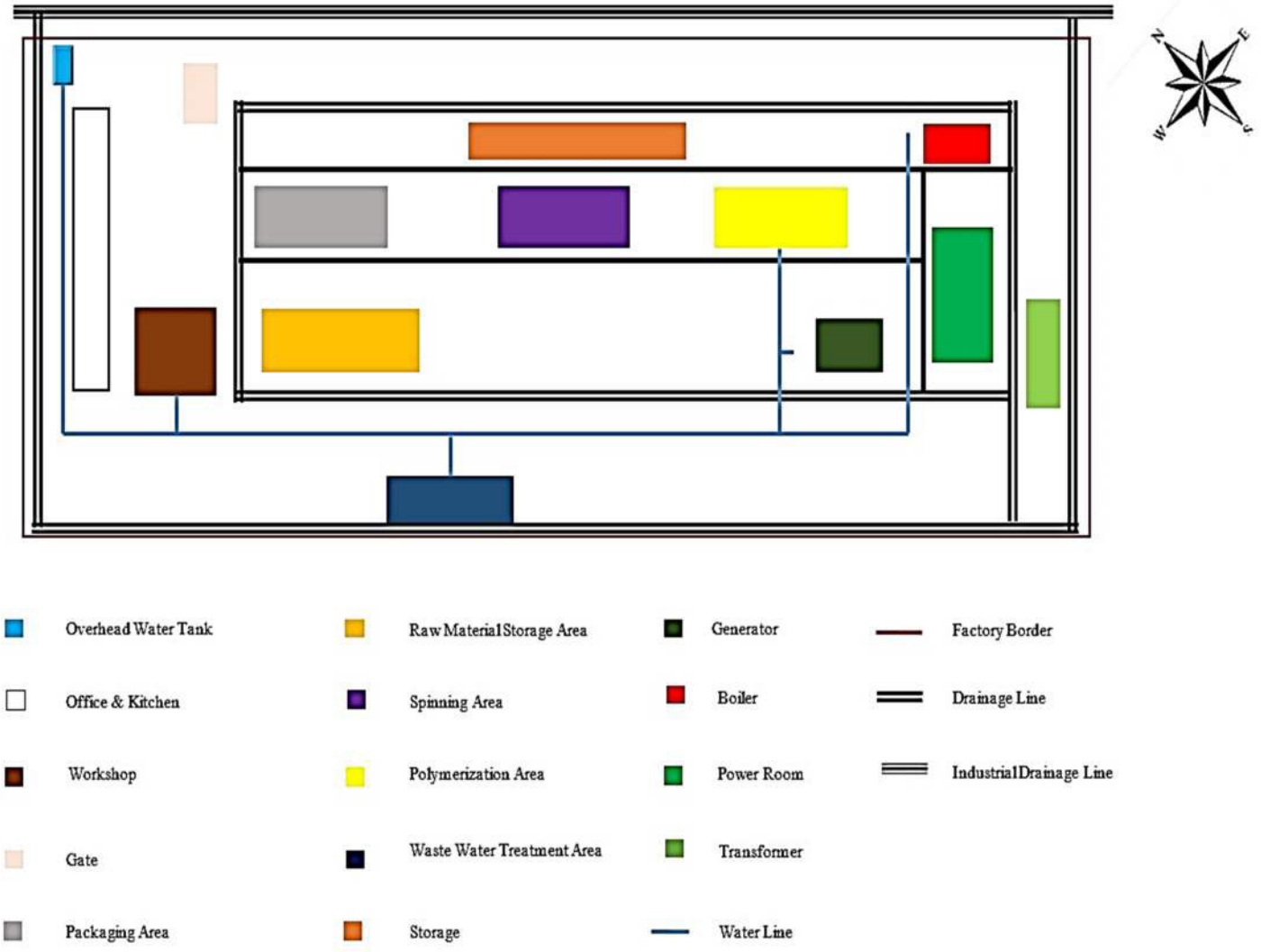


Figure – Site Layout Map and Drainage System for PSF Factory (Factory 1)

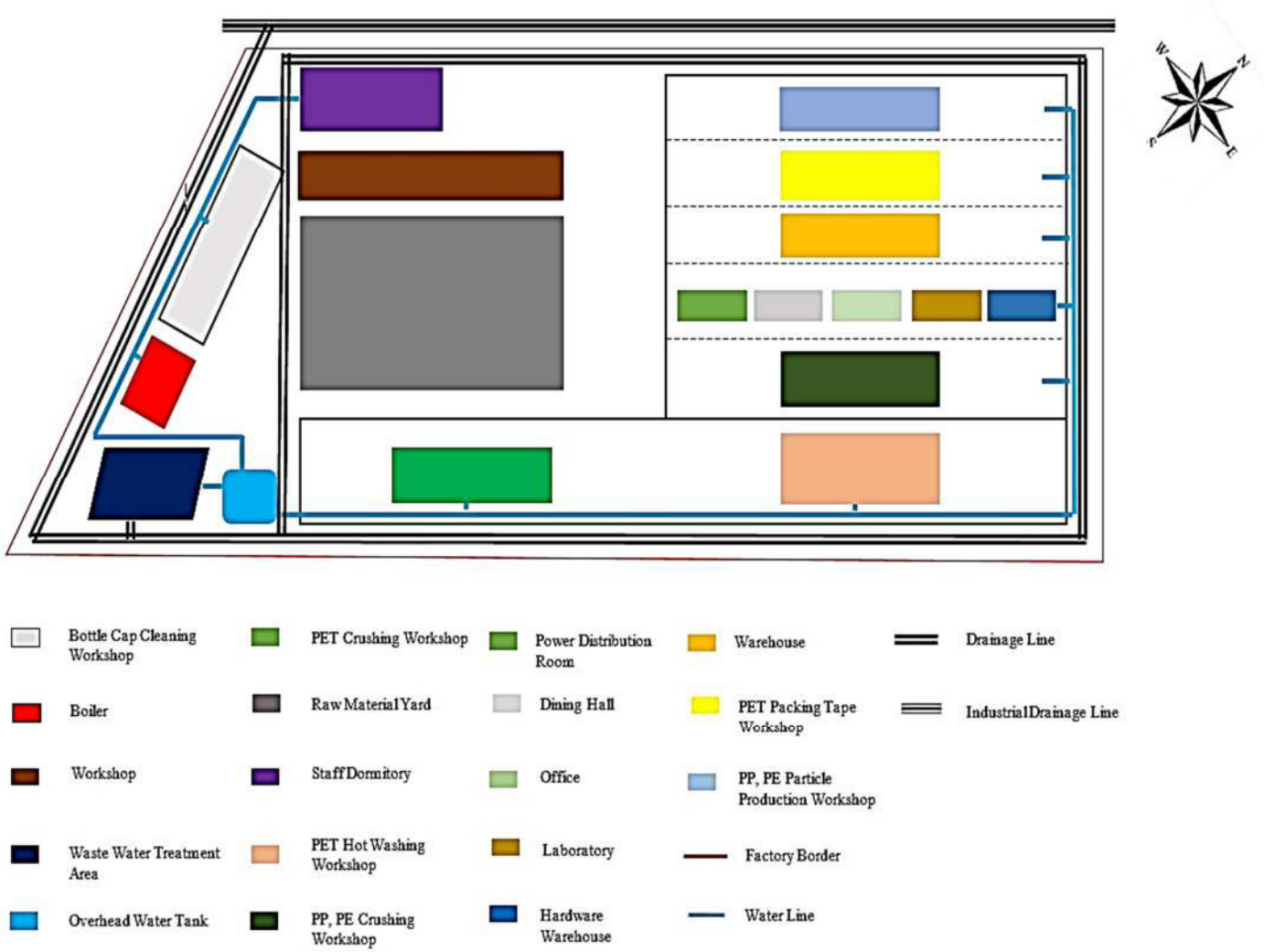


Figure – Site Layout Map and Drainage System for PPPT Factory (Factory 2)

(e) Brief of the Project

The following table shows the brief descriptions of the proposed project. Detailed description will be described in Chapter 4.

Table – Brief of the Factory No.1

Aspects	Descriptions
Production	Polyester Staple Fiber (PSF)
Production capacity	45 tons/day of Polyester Staple fiber
Total Project Area	4.004 acres for factory no.1
Domestic Water Demand	Approximately 1,500 gallons/day
Source of Process Water	Tube well water for industrial use and recycle water from the cooling of processing materials. Underground water has been produced by 2 x 4″Ø tube well from 300 feet aquifer. Underground water is being extracted from tube well with 10 gpm, and 600 gallons per hour. 12,000 gallons capacity ground tank and 3,000 gallons overhead tank has been already built.
Source Domestic Water	Artesian well water for domestic use
Source of Electrical Power	Myanma Electric Power Enterprise 33/0.4 KV, 2 transformers of (1000 KV)
Auxiliary Power Supply	One unit of 1,000 KVA Cummins, Open type, Diesel generator, One unit of 1,500 KVA Jiangsu silent type generators and One unit of 500 KVA, Stamford (UK) silent type generator
Power Consumption	2,000 units per day 50,000 units per month 600,000 units per year
Water Consumption	Estimated Water consumption is 550 gallons per day for Boiler, 1,500 gallons per day for raw material washing Section, 1,000 gallons per day domestic use for about 100 employees
Raw Materials and Their Sources	Basic raw material will be cleaned PET bottle and will require 60 tons per day for finished product minimum 45 tons per day. Silicon oil and PET detergent washing powder are imported. The

	estimated consumption is 15,000 kg of Silicon oil, 60,000 kg of spinning oil and 1,680,000 kg of scouring powder. For the wastewater treatment plant, Such Sodium hydroxide, Polyacrylamide, Polyaluminium Chloride are common used like as other factory and they can be easily purchased in local official agent, which have got RSL compliance by SGS.
Selling Final Product	Final finished products are exported to USA and China in these days (this year 2024)
Infrastructure	Main factory building (including washing room, generator, transformer, power, melting, boiler, finished product warehouse, spinning section, temporary warehouse), residential components and office, kitchen and security building.
Solid wastes	Generally, the production rate is 60 tons of products for the processing of 65tons of raw materials. But the 5tons-left are recycled in the process so there would be no residues from the processes. Dry domestic wastes such as drinking water bottles will be reused in factory process and recycleable wastes such as cans, and soft drinks bottles will be sold to recycler. Other domestic waste will be disposed daily to Myaung Dagar Industrial Zone Waste Management Station.
Liquid wastes	Process water will be treated using sodium hydroxide, polyacrylamide and poly aluminum chloride and will be recycled and reused.
Employment	For the full-strength operation, total 248 employees will be used.
Working time	Two Shift as Day (7:00 AM – 7:00 PM) & Night (7:00 PM – 7:00 AM)
Total working days	308 days annually
Investment	5.1895 million USD
Boiler	Stack Height – 15m Stack Diameter – 800mm Waster Storage Capacity – 1100gallons Steam Velocity – 20 m/s Steam Temperature – 300˚C Water Usage – 5tons/day (estimated) Coal Consumption – 5-10 tons/day Source of Raw Material – Coal (Kalaw Area)

Table – Brief of the Factory No.2

Aspects	Descriptions
Production	PET Packing Tape and PP/PE Recycle Pallet (PPPT)
Production capacity	Factory No. (2) 60 tons/day of used PET bottle as raw material
Total Project Area	8.667 acres for factory no.2
Domestic Water Demand	Approximately 3,000 gallons/day
Source of Process Water	Tube well water for washing of the raw materials and recycle water from the waste water settling ponds
Source Domestic Water	Artesian well water for domestic use
Source of Electrical Power	Myanma Electric Power Enterprise 33/0.4 KV, 1 transformer of (2000 KV), one-unit of 1000 KVA diesel generator, one-unit of 1500 KVA Jiangsu silent type generator and one unit of 500 KVA Stamford silent type generator
Infrastructure	Chip Storage building, Office building, Waste water Settling Ponds, Water Tank and Purifier, Raw material preparation building (classification of bottles, washing and cutting), Raw material Piling Yard, Boiler, building for production of Packaging tape and recycle pallets Worker's Dormitory, Security gate,
Solid wastes	Generally, the production rate is 60 tons of products for the processing of 65tons of raw materials. But the 5tons-left are recycled in the process so there would be no residues from the processes. Dry domestic wastes such as drinking water bottles will be reused in factory process and recycleable wastes such as cans, and soft drinks bottles will be sold to recycler. Other domestic waste will be disposed daily to Myaung Dagar Industrial Zone Waste Management Station.
Liquid wastes	Process water will be treated by using sodium hydroxide, polyacrylamide and poly aluminum chloride and will be reused.
Employment	For the full-strength operation, total 200 employees are required.
Working time	Two Shift as Day (7:00 AM – 7:00 PM) & Night (7:00 PM – 7:00 AM)
Total working days	308 days annually
Investment	10 million USD
Boiler	Stack Height – 15m Stack Diameter – 800mm

	Waster Storage Capacity – 1100gallons Steam Velocity – 20 m/s Steam Temperature – 300˚C Water Usage – 5tons/day (estimated) Coal Consumption – 5-10 tons/day Source of Raw Material – Coal (Kalaw Area)

(f) Project Organization Structure

The management is led by board of directors and factory management is planned and led by Managing Director. There are four main departments in this factory, and they are integrated management, equipment management, production technology and sales departments. Administrative, financial, HR and purchasing, warehouse, chemical fiber line, warehouse, hot washing line and test cabinet are included in factory organization. Over 20 persons of oversea technicians are planned for leading to run in this factory operation. And it is intended to employ in this factory as job opportunities more than 220 local employees in this factory as per their qualification and education levels. Currently more than 100 local employees have been appointed. Organization structure for both of the factory no (1) and (2) will be as follow:

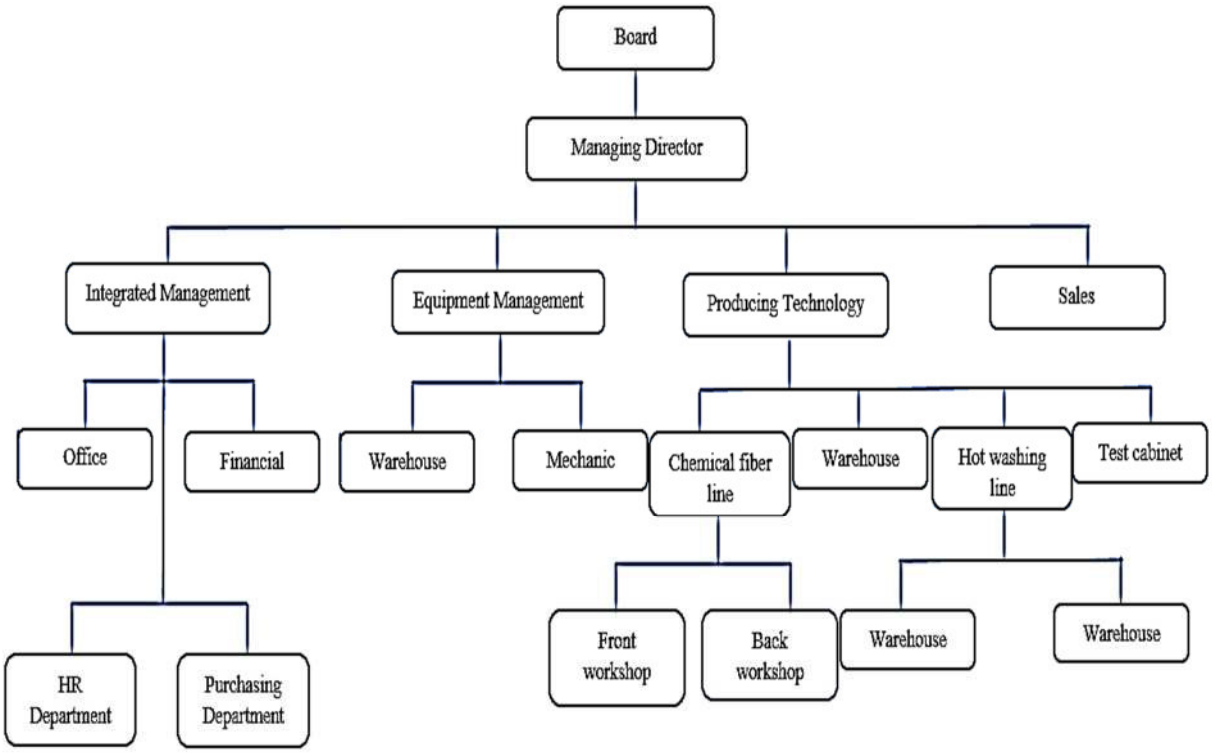


Figure – Organization Chart for Proposed Project

(g) Vicinity around the Project

The nearest local resident is Myaung Dagar Village. The vicinities around the proposed project are shown in the following table. However, it does not mean that all of the sensitive areas can be affected by the proposed project and the table just shows the nearest sensitive areas.

Table - Vicinity around the Proposed Project

No.	Vicinity	Description	Distance from factory 1	Distance from factory 2
1.	Nearest Public Residents	Kan Ka Lay Village	1.44 km	1.03 km
2.	Nearest Water Body	Hlaing River	1.85 km	1.88 km
3.	Nearest Densely Populated Area	Myaung Dagar	1.13 km	2.11 km
4.	Nearest Road	Pyay Road	1.73 km	1.40 km
5.	Nearest Pagoda	Zi Na Marn Aung Pagoda	1.27 km	1.43 km
6.	Nearest Monastery	Kan Ka Lay Monastery	1.38 km	0.79 km
7.	Nearest Reserved Forest	Hmawbi Reserved forest	3.64 km	2.77 km

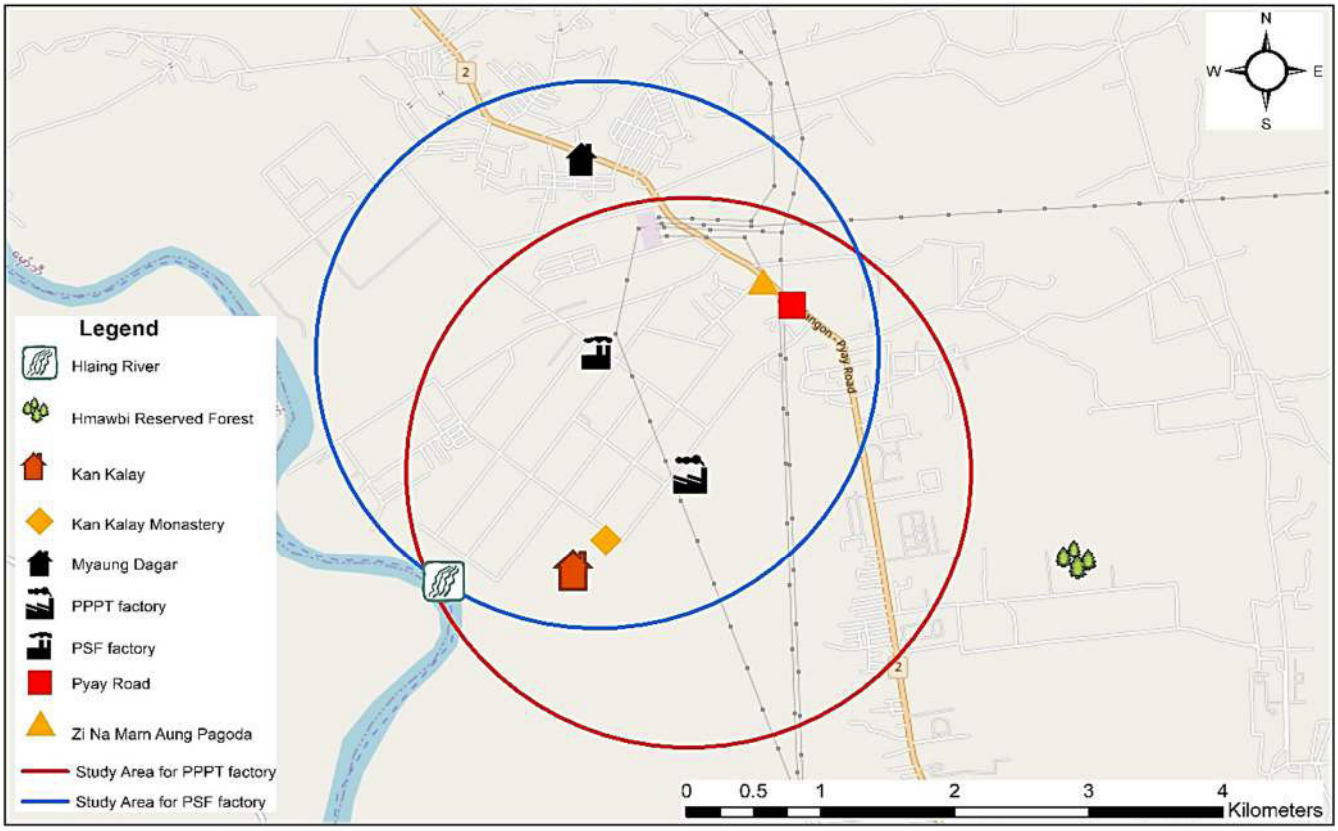


Figure – Vicinity Around the Proposed Project for Both Factories

1.4.2. Summary of Process Description

The established polyester recycling industry consists of three major sections; waste logistics, PET bottle collection and waste separation, flake production and after that turns to flake processing, and conversion of flakes to final product.

(i) Process for Manufacturing of Polyester Staple Fiber (PSF)

The cleaned plastic chips delivered from the raw material storage is first dried in the dryer and the polymer coming out is cooled by using air first and then by the water from the cooling tower. After cooling, the polymer strands are bundled. The bundled fibers are drafted and crimped through the water first and then through the silicone oil. Then they are dried by using steam from the boiler. Then those fibers are done shaping and cutting according to the designated size which depends on the quality of the raw materials. Before the final product comes out, the fibers are sprayed with the silicone oil to smoothen the texture. Finally, the product is done packaging and one package is nearly 300kg.

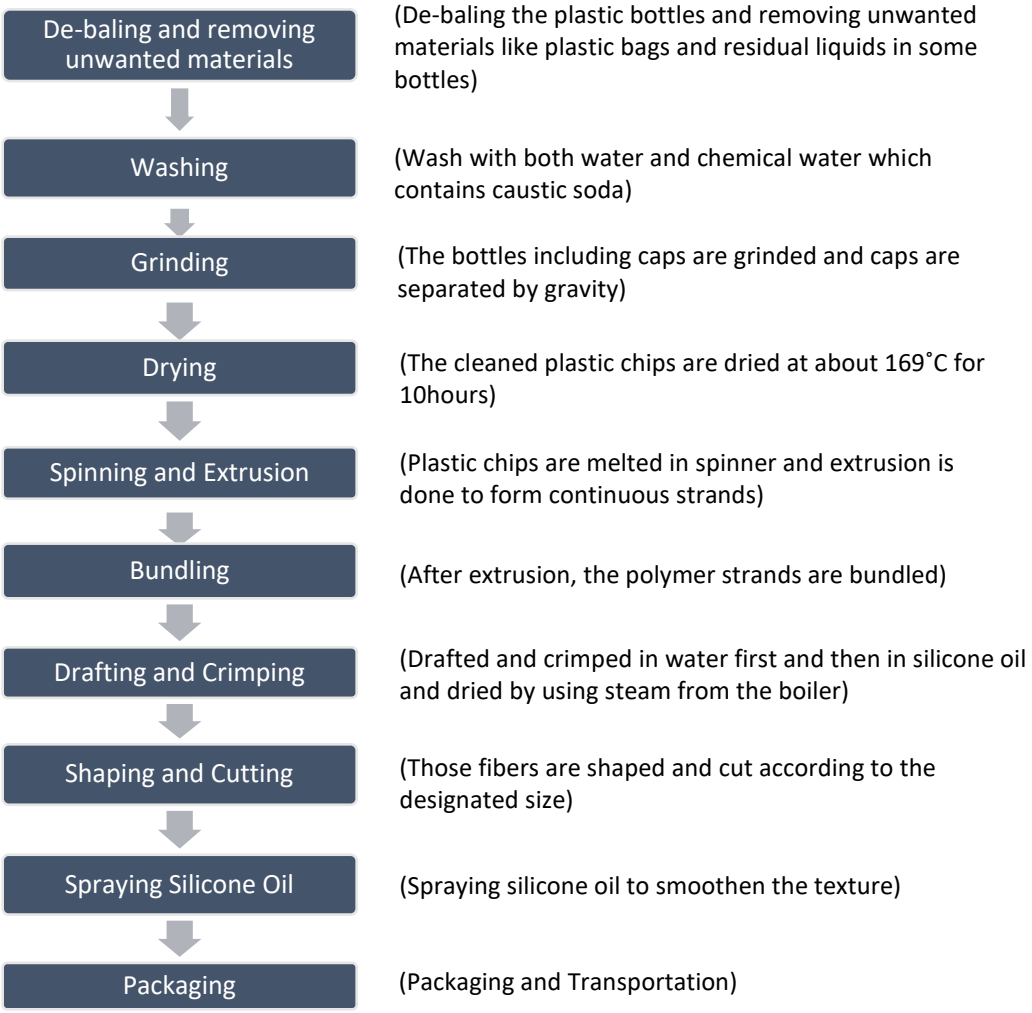


Figure – Flow Chart of the Processes of PSF Production from Recycled

(ii) Process for Manufacturing of PET Packing Tape

The cleaned PET flakes delivered from the raw material storage is first dried in the dryer via the hopper, and kept warm to make sure the flakes are dry enough to make straps. When the flakes are dried and warmed at desired conditions, the automatic feeding process is done which provides the constant feeding volume of material and a uniform distribution of the fibres. The flakes are fed to the spinnerette. In spinnerette, the dried flakes are melted to form a thick viscous liquid. The polymer coming out from the spinnerette is done extrusion to form continuous strands, and is cooled by using air first and then by the water from the cooling tower. After cooling, the polymer strands are drafted and crimped through the water. In the heating treatment process, the fiber strands are dried and stretched by using steam from the boiler. After the heat treatment, the fiber strands are cooled downed and hardened. In the last stage of the process, the cooled fiber strands are winded by the winding machine and the end product is achieved.

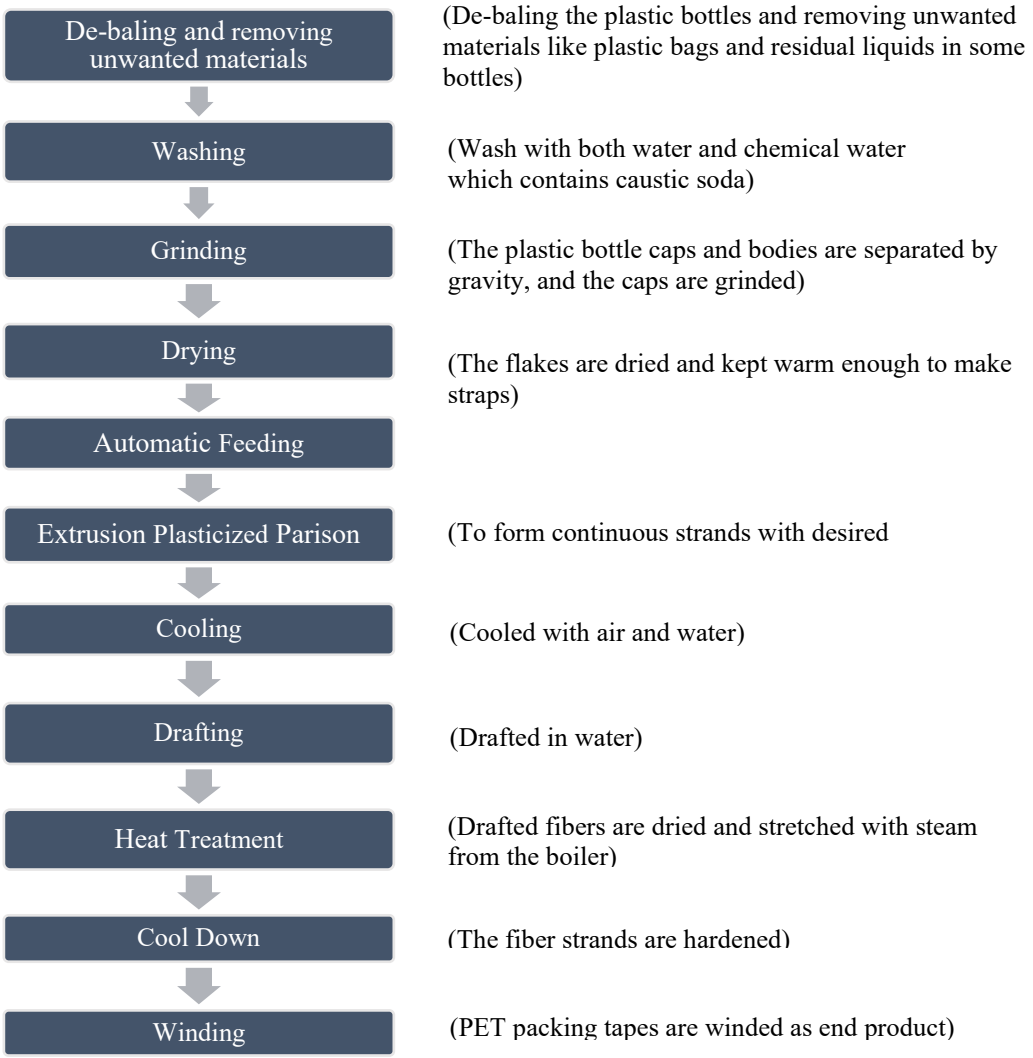


Figure - Flow chart of the Process of PET Packing Tape

(iii) Process for PE/PP Recycle Pellet Production

The manufacturing of PE/PP recycle pellet production is situated in factory 2. The following are the manufacturing process of PE/PP recycle pellet production. To produce PP/PE pellets, the caps of the plastic bottles are mainly used. For further purification, these crashed plastic caps are washed again with water and again with caustic soda water. After that, the warm water from the boiler is used to melt and wash off the caustic soda, which may remain on the bottle caps. Finally, the preparation of raw materials is done and ready for the manufacturing process.

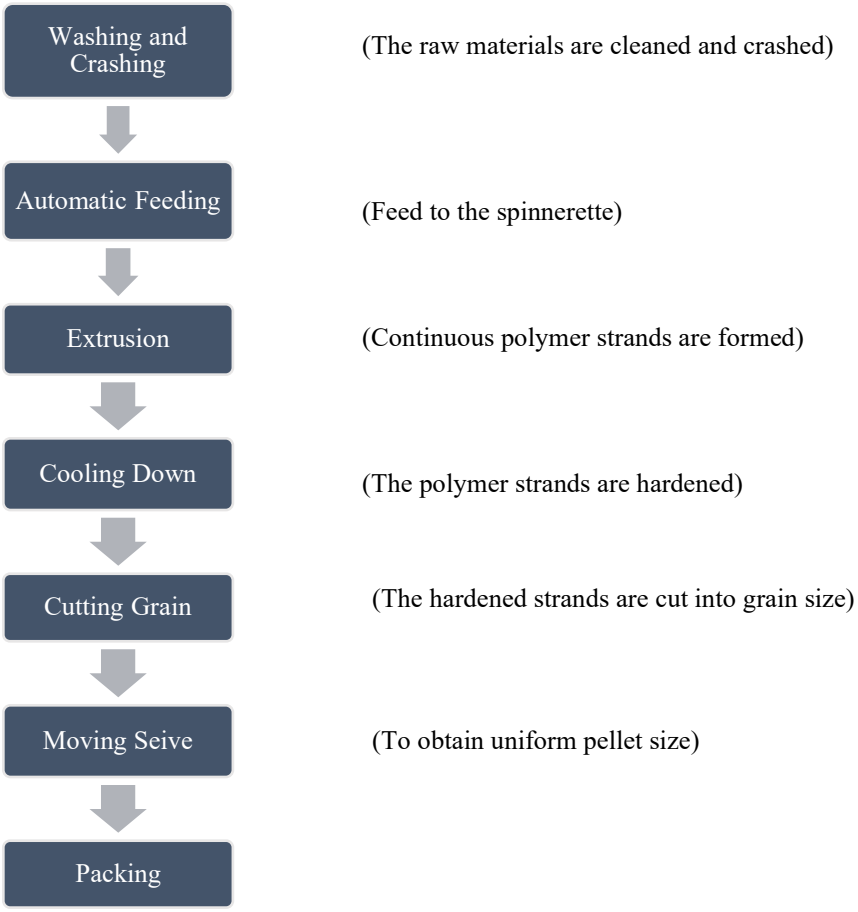


Figure - Flow Chart of the Process of PP/PE Recycle Pellet Production

The washed and crashed raw materials are sent to the feeder by automatic feeding method and then feeder sent the materials into spinnerette. In the spinnerette, the plastic chips are melted at a certain temperature to form thick viscous liquid. The polymer coming out from the spinnerette is done extrusion, which helps the polymer to form continuous strands. The strands are cooled down with air first and then with water from the cooling tower. The

cooling process hardened the polymer strands, and these strands are sent to the cutter, which cuts the hardened polymer strands into grains. Continuously, the grains are filtered by moving sieve to get the uniform pellet size and filter unwanted fine particles. Finally, the PP/PE recycle pellets are produced, and the product is done packing.

(iv) Operation of Coal Fired Boiler

Boiler will use to produce the required steam for drying process. The following flow chart shows the operation of coal fired boiler.

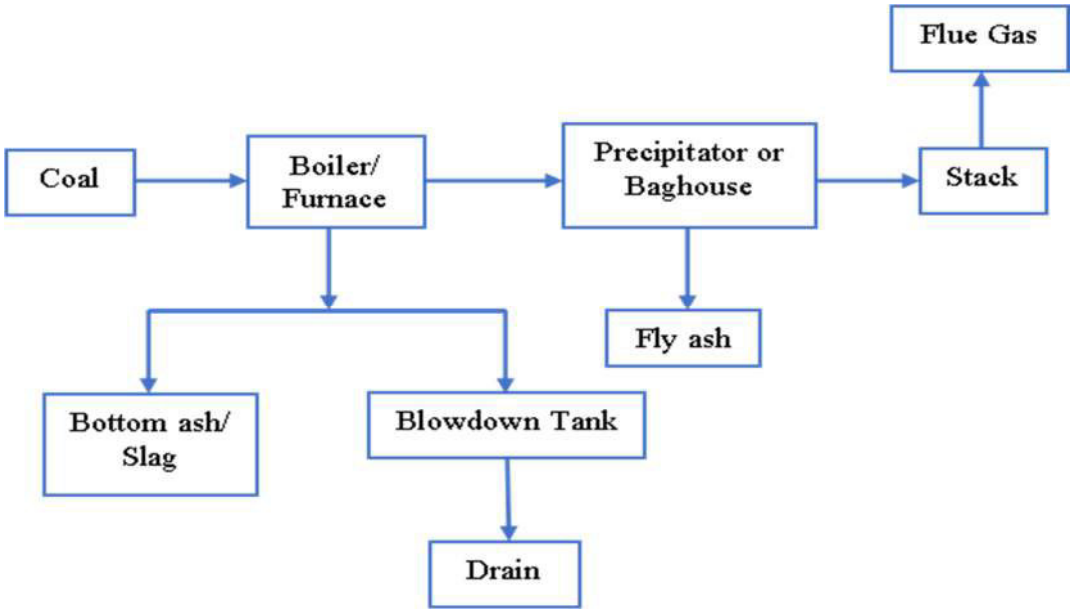


Figure – Flow Chart for the Coal-Fired Boiler Operation

According to the above figure, coal fired boiler will used coal as raw material and produce steam as final product. The solid waste will be bottom ash from coal fired furnace, fly ash from bag filter. The liquid waste will be blowdown water from cooling system. Gaseous emissions will also produce from burning of coal.

1.4.3. Land Use

This area is only found in the Myaung Dagar Industrial Zone without reserved forest area and residential area. When they do have access to the information required by the Department of Land Records, the areas of the project site of 4.004 acres of land for old factory (factory no.1) and 8.667 acres for new factory (factory no.2) are reported. The land use types within 3km radius (6km boundaries) (AOI) of the proposed projects are as follow:

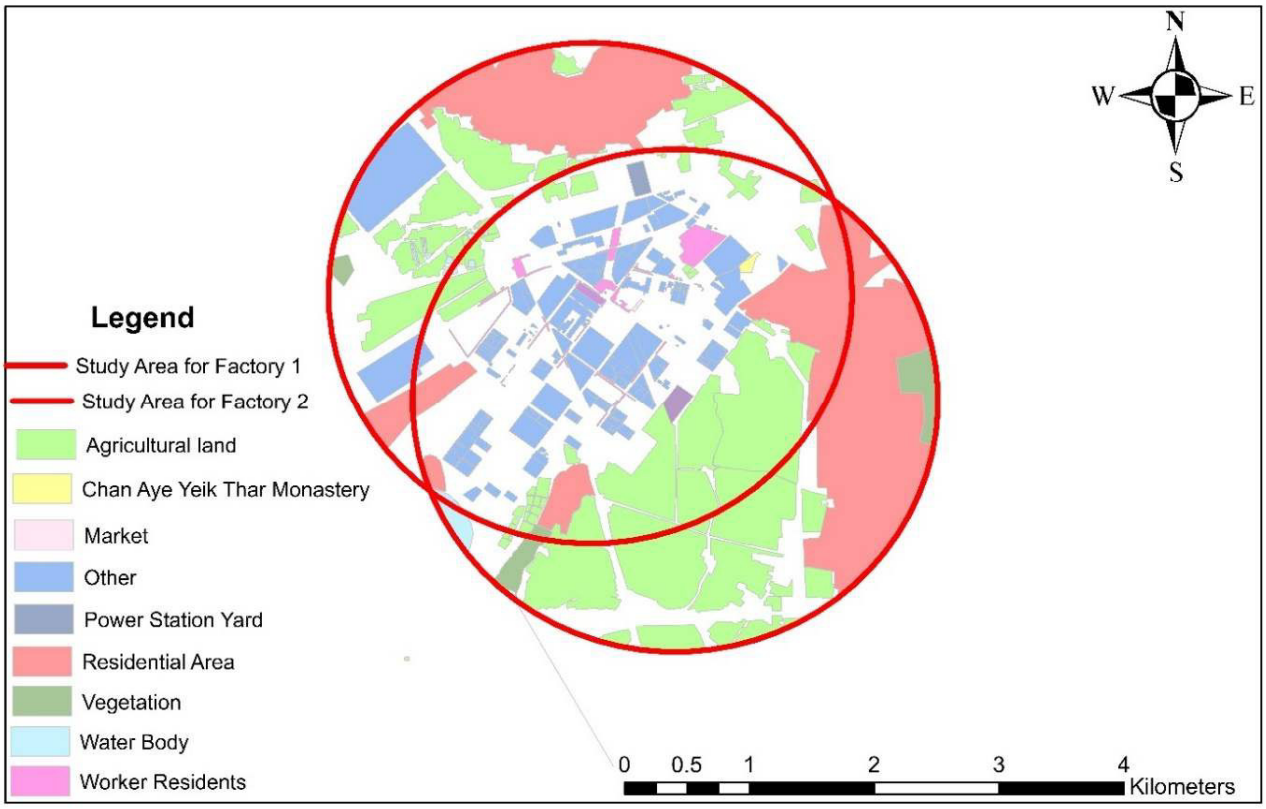


Figure – Land Use and Land Cover (LULC) Maps for both Factories

LULC for Factory 1 (Polyester Staple Fiber Factory)

Land Use Type	Percentage (%)
Other factories	12.592
Market	0.018
Project Area	0.106
Monastery	0.173
Residential Area	33.102
Substation	0.230
Worker's Residence	0.667
Agricultural land	41.045
Water Body	6.472
Vegetation	5.595

LULC for Factory 2 (Plastic Pallets and Packaging Tape Factory)

Land Use Type	Percentage (%)
Other factories	12.014
Market	0.017

Project Area	0.216
Monastery	0.165
Residential Area	31.393
Substation	0.219
Worker's Residence	0.637
Agricultural land	33.209
Water Body	4.622
Vegetation	17.508

According to the land use types, the most effluent land use will be agricultural lands, surface water body and residential areas. It can be concluded that there will no environmentally sensitive area near the proposed project.

1.4.4. Vehicles and Mechanization used in Proposed Project

The following table shows the vehicles and mechanization used in the proposed factory.

Sr.No.	Equipment	Numbers
1	Washing Machine	3
2	Conveyor Machine (300x3000mm)	10
3	Air Conveying Machine	2
4	Conveyor Belt	6
5	Conveyor Machine (600x4500mm)	3
6	Conveyor Machine (600x8000mm)	4
7	Water Sink	11
8	Kydroex Tractor	4
9	Grinding Machine	5
10	Weight Scale	4
11	Crusher	13
12	Conveyor Machine (600x4000mm)	2
13	Label Remover	3
14	High-speed Friction Dewatering Machine	3
15	Conveyor Machine(400x5000mm)	3
16	Conveyor Machine (400x4500mm)	3
17	High-speed Friction Machine	3
18	Heating Stripping Pot	3
19	Uniaxial Rinsing Machine	2
20	Host+ supporting a full range of color separation machine	1
21	Stainless steel silo	1
22	Vertical blow crumbs machine	1
23	Dewatering machine	1

24	Mobile hydraulic dock leveler	1
25	Packing machine	3
26	Cyclone separator	1
27	Pre-crystallizer	1
28	Seven-roller drawing machine	1
29	Drying oven	1
30	Air dryer	1
31	Air blower	1
32	Truck for office use	2
33	Pickup truck	3
34	Forklift	8

1.4.5. Implementation Schedule

The implementation schedule for the entire project are shown in the following table.

Phase	Implementation Schedule	
	Factory 1	Factory 2
Pre- construction Phase	2 months	2 months
Construction Phase	1 year	1 year
Operation Phase	20 years or more	20 years or more
Decommissioning Phase	1 year	1 year

1.4.6. Employment

It is estimated that 219 local persons and 29 foreign persons will be employed during the operation of the proposed project. Currently operation is running with 2 shifts of day time (7:00 AM to 7:00 PM) and night time (7:00 PM to 7:00 AM). Operation processes are leaded by 20 foreign technicians and total working days is 308 days annually.

1.4.7. Utilities Consumption

Da Hua (Myanmar) uses approximately 1,584,000 gallons of water during the full operation. The process water requirements will be planned by 2x4"Ø tube well from 300 feet aquifer. One 12,000 gallons capacity ground tank and 3,000 gallons overhead tank has been built. Estimated water consumption for boiler per day is 550 gallons, 1,500 gallons per day for raw material washing section and 1,000 gallons per day domestic use for about 100 employees. Electricity source is from Myanma Electric Power Enterprise 33/0.4 KV with 2 transformers of 1000KV Industrial Supervision Inspection Department (Department of Electrical Power) of the electricity distribution industry has issued safety certificate for electrical safety. The annual requirement of power is estimated 600,000 units and monthly requirement is estimated as 50,000 units. Daily minimum usage is 2,000 units.

1.4.8. Storage System and Selling

The final products are stored at the warehouse temporarily until the required quantity and quality. After the quality testing and reaching up to the required quantity, it is transported to the factory used polyester stable fiber and exported to the foreign countries like Thailand, Vietnam, China, USA and Taiwan.

1.4.9. Waste Management

Some industrial waste materials such as waste polyester, cutting pieces will produce from the polyester production process. Most of the industrial waste will reuse in the manufacturing process. Wastewater from the washing process will recycle and reuse in the production process. The discharge effluent from the sewage will dispose systematically under guideline and arranged and comply with the Hmawbi Township Municipal Department.

1.4.10. Summary of Alternative Analysis

Alternative analysis will be considered as an integral part of the EIA process, which involves examination of alternative ways of achieving the objectives of the proposed project. The aim of alternative analysis is to arrive at a development option, which maximizes the benefits while minimizing the unwanted impacts. Here, alternative analysis for Da Hua (Myanmar) polyester staple fiber industry will be done as (1) The "No Action" Alternative, (2) Location Alternative and (3) Alternative Analysis for process and Technologies.

(1) The "No Action" Alternative (No Project Alternative)

This alternative avoids the implementation of the proposed project. In no project scenario case, there will be no impact on the natural environment and local communities. But there will be positive impacts on residents' life quality in the "Project Scenario" case. Although some potential environmental impacts and negative social impacts will be avoided by no-go option of the proposed project, the public benefits associated with the project such as industrial development in the region, increased revenue to the government, hundreds of employment opportunities for local people, infrastructure development including roads and electricity in the region, increased business opportunities for local people, skill development, increased income generation for local people and improved services and community development potential among other benefits would not be realized. According to the alternative study for No Action Alternative, "No Project" alternative is not acceptable due to

the benefits of the project and all of the impacts can be mitigated by proper mitigation measures according to the EIA study.

(2) Site Location Alternative

Site location alternative will be considered two locations. The first location will be inside the residential area and the second will be inside the industrial zone. According to the site location analysis, the project inside the industrial zone will be more appropriate rather than the project inside the residential area due to the present of coal fired boiler.

(3) Alternative Analysis for Process and Technologies

This alternative will be based on (i) process raw material (ii)raw material for washing chemicals (caustic soda and magnesium hydroxide) and (ii) raw material (fuel) for boiler. The following are the summary of alternative analysis for process and technologies and detailed description are described in Chapter 4.

(i) Process Raw Material

According to the alternative analysis, it should be used cleaned PET bottle instead of dirty bottle to reduce the use of water, electricity consumption and water pollution.

(ii) Alternative Analysis for Washing Chemical

According to the alternative analysis, it should be selected caustic soda for washing process rather than magnesium hydroxide from environmental and economical perspectives.

(iii) Alternative Analysis for Boiler Fuel

According to the alternative consideration for boiler fuel, the use of coke instead of coal if feasible or anthracite coal should be use instead of bituminous coal if available as alternative fuel.

1.5. Summary of Description of the Surrounding Environment

The project is located at Myaung Dagar Steel Industrial Zone in Hmawbi, Yangon Division. It is about 1.5 hours' drive from the Yangon downtown. The factory area can be accessed by bus easily from Yangon. The surrounding environment will include the existing physical, biological, and socio-economic conditions of the proposed project.

Nearest Sensitive Areas	
Nearest Local Residents	Nearest local residents is illegal residential area beside the proposed project.
Nearest Surface Water Bodies	Nearest surface water bodies is Hlaing River which is 1.94 kilometers far away from the proposed project site and it will impact as cumulative impact of industrial zone due to the dispose of wastewater regularly if they are not properly managed.
Densely Populated Area	The nearest densely populated area will be Hmawbi Township. The project is surrounded by: Taikkyi Township to the north; Hlegu Township to the east; Mingaladon Township to the southeast; Shwepyitha Township to the south; and Htantabin Township to the southwest, west and northwest
Physical Environment	
Meteorology and Climatology	According to the Yangon Meteorological Station, Hmawbi Township has a tropical monsoon climate. The area has only slight changes in temperature. The project area has temperate weather, as it is in the low latitude zone. The city typically experiences a distinct rainy season from the month of May through to October and dry season which starts from November and ends in April. During the performance of a year, average temperature shows some variance with the average highs ranging from 26ºC to 36ºC and average low temperature occur between 18 ºC and 25 ºC. The hottest period is between February and May and there is a very little rain during this period. At the end of this season, generally from March to April, the average monthly temperature reaches the upper 30 ºC. The average temperature in Yangon ranges from 24 ºC to 36 ºC in April during the hot season and it ranges from 18 ºC to 32 ºC in January during the cold season. The project area is warm and wet season with the high temperature (39.3 ºC) and lowest temperature (10ºC).
Ambient Air Quality	**Sample Point 1** According to the monitoring results, nitrogen Dioxide is 187.15 µg/m^3, lower than the NEQG general guideline values, 200 µg/m^3. Sulphur dioxide results are also far below from the guideline values which is 20 µg/m^3 for industrial purposes. PM10 and PM2.5 results are a little over guideline values since the monitoring locations are within the project, near the transportation roads. Ozone values are lower than the guideline values so it is also within the safe limits.

	Sample Point 2 For sample point 2, concentration of nitrogen dioxide is below NEQG general guideline values. There is no sulphur dioxide concentration found at all. And the results of particulate matter are all below guideline values. Ozone is found in safe limits. Thus, for sample point 2, all monitoring results are within safe limit.
Existing Water Quality	For BOD and COD, results of WS1 and WS2 are significantly higher than guideline values. This is because of the fact that these samples were taken from the creeks and drainages existed within the industrial zone that affect BOD and COD concentrations due to high flow rare, soil erosion, urban runoff, wastewater and septic effluent, etc. Also for concentration of total suspended solids, result of WS1 is over the guideline values, this is also as the same reason of which it was collected from wastewater drainage of the industrial zone. For pH level, all of the samples are within the safe zone except for WS5 since it is collected from waste effluent of the new factory. Other values of all samples are within the safe limits according to NEQG General guidelines.
Hydrology	The Project Site lies along the catchment of the Hlaing River which flows west of the site in a southerly direction to converge into the Yangon River. The Yangon River (also known as the Rangoon River or Hlaing River) is formed by the confluence of the Pegu and Myitmaka rivers and flows into the Gulf of Martaban which is part of the larger Andaman Sea. The river flows along a 40 km stretch flowing from southern Myanmar as an outlet of the Ayeyarwady River into the Ayeyarwady delta. A small portion of the Bago River (the estuary) lies within the Yangon Division. The Pazundaung Creek and Bago River joins the Yangon River and from there, flow towards the southwestern direction into Andaman Sea.
Geology	The Yangon area is underlain by alluvial deposits (Pliestocene to Recent), the non-marine fluvialtile sediments of Irrawady formation (Pliocene), and hard, massive sandstone of Pegu series (early-late Miocene). Alluvial deposits are composed of gravel, clay, silts, sands and laterite which lie upon the eroded surface of the Irrawaddy formation at 3-4.6 m above mean sea level (MSL). The rock type in Yangon is mainly soft rocks, which consist of sandstone, shale, limestones and conglomerate.
Socio-economic and Cultural Environment	
Socio-economic Conditions	**(a) From Primary Data Collection** Kayin and Burmese are the major ethnic groups among three villages where household surveys were conducted. The dominant religion is Buddhism. Most of the households mainly use electricity and solar energy for lightning and also electricity is mainly use for cooking but firewood is used in some households where electricity cannot get. Most of the households get their

	drinking water and domestic water from tube wells. According to household survey, all of the households use pits as their sanitation system and waste burning is the main method used by the local people. Most people in this survey area are mainly used motorbike for transportation. There is a relatively large amount of local people who work in common/random works in this survey area. Most of the people are middle and high school education level but there are people who have been graduated from university or college. In this survey area, the common average monthly income is around 200,000 kyats and most of the households cost their expenditure for food. **(b) From Secondary Data Collection** Most of the people are Burmese and Kayin and their religion is mostly Buddhism in this survey area. The most common age of the people are under 18 in rural areas. Agriculture land is the mainly used as land use. The literacy rate is higher and the employment rate is also high but most of the employed people are skilled agricultural, forestry and fishery workers. According to the secondary data, most of the households are living in wooden houses and mainly use water seal toilet. Tube well/ borehole is mainly use for drinking water in this survey area. Most of the households mainly use electricity for lightning but firewood is mainly used for cooking. Bicycle is mainly used in most households as their transportation. The government hospital in Hmawbi township has 50 beds is maximum and the number of rural healthcare sub-center is larger than rural healthcare center. In this survey area, Diarrhea is the most common disease. Birth rate is higher and maternal mortality rate is very low according to the survey. By summarized, the improvement in industrial zone will be greatly affected on local people economy due to current situations of living standards.
Biodiversity	A total of 55 fauna species in 48 genera under 32 families and 24 orders were recorded in the study area during the study period. Mollusk species, called apple snail (*Pomacea canliculata)* was commonly found in the study area. Mud crab, (*Dyspanopeus sayi)* and whitleg shrimp and (*Litopenaeus vannamei*) were found as crustacean species. For insect species, a total of 22 species, 18 genera, six families under four orders were recorded. Among these, the most diverse species, Lepidoptera 10 species and the least diverse, Coleoptera (one species) were recorded. Birds were found in a total of 17 species, 14 genus under 10 families and seven orders. As IUCN red-list species, 3 species of reptiles, 2 species of amphibians and 8 species of fish are found. However, the species found in the study area are recorded as least concern (LC) in IUCN red-list. Moreover, Zooplanktons were found in a total of 15 species, 10 genera belonging to nine families and three orders under two phylum: *Rotifera a*nd Arthropoda in waste water canal. The proposed study area is an urban industrial area mixed with agricultural

<table>
<tr><td></td><td>landscapes. Paddy fields, grass lands, cultivated lands also occurred during the survey. In the study area, there are a total of (31) flora species that belong to (25) families were recorded along the study area, comprising 38.71% of trees, 6.45% of small trees, 29.03% of shrubs, 22.58% of herbs and 3.23% of bamboo. Ear leaf Acacia (Acacia auriculiformis), Siam weed (Chromolaena odorata), and Giant sensitive plant (Mimosa diplotricha) are observed as invasive alien species (IAS) of that area.</td></tr>
<tr><td>Cultural Heritage</td><td>In this proposed project area, cultural heritage sites and resources are identified according to the 2012 Rule & 1998 Protection and Preservation of Cultural Regions Law, 2015 Protection and Preservation of Antique Objects Law and Ancient Monuments Law. As a result, the following table shows the discovered heritages in the proposed project area within 3 km boundaries.
<table>
<tr><th>Heritage Resource Type</th><th>Observation</th></tr>
<tr><td>Places, Buildings, Structures, and equipment</td><td>Zina Man Aung Pagoda, Koe Htaung Pyae Pagoda, Kan Ka Lay Monastery, Kan Ka Lay Baptist Church, Chan Aye Yeik Thar Monastery, Dhamma Bar Na Ka Monastery, Shwe Innwa Monastery, Ywar Oo Monastery, Migadawon Taw Ya Monastery, Yar Pyae Buddhist Temple, Hman Kyaung Dhamma Yeiktha Monastery, Htan Taw Monastery (Myaungtagar), Yay Lal Monastery, Mya Thein Nar Monastery</td></tr>
<tr><td>Places associated with oral traditions or living heritage</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Landscapes</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Natural features</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Traditional burial places</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Geological sites of scientific or cultural importance</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Archaeological Sites</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Historical settlements and townscapes</td><td>None were identified within the proposed project area</td></tr>
<tr><td>Public monuments</td><td>None were identified within the proposed project</td></tr>
</table></td></tr>
</table>

	and memorials	area
	Battlefields	None were identified within the proposed project area
	The popular cultural site which is a little far from the project is Aung Zabu Tawya Dhamma Center, the residential of ancient 301 Buddha statues, which is commonly known as Japan Paya. It is located in Hmawbi Township, Yangon Region, Myanmar, which is 22.6 kilometer north from the project.	

1.6. Summary of Environmental Impact and Mitigation Measures

The proposed project will have the following operational stages and key potential impacts.

(i) Key Potential Impacts in Pre-construction Phase

Pre-construction activities will involve site clearing and earth working for access road, mine site area and other facilities. The key potential impacts during the pre-construction phase will be as follow:

No.	Key Potential Impacts	Impact Rating	Mitigation Measures	Responsibility
1.	Tree Cutting (Deforestation)	Low Impact	Limit tree cutting and site clearing	Construction Services Provider
2.	Dust Generation	Low Impact	Water Spraying	Construction Services Provider
3.	Noise	Low Impact	Avoid working at night	Construction Services Provider
4.	Gaseous Emission from Vehicles	Low Impact	Regular maintenance and good quality fuel	Construction Services Provider

(ii) Key Potential Impacts in Construction Phase

The construction activities will include the construction of the temporary camp for construction workers and construction of project development (coal fired boiler, generator and other facilities). Like pre-construction phase, the key potential impacts during construction phase will be temporary surface water pollution, soil contamination, gaseous emissions, dust generation, noise and visual impact. Due to the nature of construction phase, the impact will be short-term, not significant and easy to mitigate.

No.	Key Potential Impacts	Impact Rating	Mitigation Measures	Responsibility
1.	Gaseous Emissions	Low Impact	Good engine, regular maintenance and good	Construction Services Provider

	from Vehicles		quality fuel	
2.	Dust Generation	Low Impact	Water spraying	Construction Services Provider
3.	Noise	Low Impact	Avoid working at night	Construction Services Provider
4.	Surface Water Pollution	Low Impact	Avoid construction during rainy seasons	Construction Services Provider
5.	Visual Impact	Low to Moderate Impact	Shelter the construction site	Construction Services Provider

(iii) Key Potential Impacts in Operation Phase

The main operation process is production of PET products, transportation of raw materials (coal) and distribution of steam and electrical power for the whole process. The key potential impacts during the operation phase will be gaseous emissions, particulate matter emission (fly ash), odour, noise, surface water pollution, and soil contamination. Most of the operational impacts will be significant and long term.

No.	Key Potential Impacts	Impact Rating	Mitigation Measures	Responsibility
1.	Gaseous Emission and odour form Boiler	Moderate Impact	Use good quality coal or coke, Install water scrubber, Install enough chimney high	EO of EMMT
2.	PM (Fly Ash) Generation from Boiler	Moderate Impact	Install bag filter	EO of EMMT
3.	Solid Waste (Bottom Ash) from Boiler	Moderate Impact	Ash will be reused in brick making	EO of EMMT
4.	Waste Water from Cleaning Process	Moderate Im pact	Will install waste water treatment system and reuse treated water in the process	EO of EMMT
5.	Blow Down Water from Boiler	Low Impact	Will install water treatment system with proper drainage system and reuse in the factory	EO of EMMT
6.	Odour from recycling process	Low Impact	Will use exhaust fan and good ventilation system withing the factory	EO of EMMT
7.	Noise from Generator	Moderate Impact	Will limit working at night and will use sound proof generator	EO of EMMT

8.	Increased in traffic and road damage	Low Impact	Use local people as much as possible	EO of EMMT under the Da Hua Policy
9.	Impact related to Population Influx	Low Impact	Use local people as much as possible	EO of EMMT under the Da Hua Policy

(iv) Decommissioning

During decommissioning phase, all concrete and steel structures and equipments would be dismantled and removed. The key potential impacts during the decommissioning phase will be dust generation, surface water pollution, noise, and soil contamination. The nature of impacts during the decommissioning phase will be short-term and not significant.

No.	Potential Impacts	Impact Rating	Mitigation Measures	Responsibility
1.	Dust Generation	Low Impact	Water Spraying	Construction Services Provider
2.	Noise	Low Impact	Avoid Working at Night	Construction Services Provider
3.	Gaseous Emission from Vehicle	Low Impact	Regular Machine Maintenance and Good Quality Fuel	Construction Services Provider

All of the environmental impacts, proper mitigation and management measures are described in Chapter 6.

(v) Summary of Residual Impacts

Noise, PM and gaseous emissions can be left as the residual impacts after mitigation measures. Green belt development will be developed to mitigate the dust and gaseous emission from the boiler and noise from generator.

1.7. Summary of Cumulative Impacts

For the proposed project, the cumulative impacts will be gaseous emissions, noise, odour, surface water pollution, traffic congestion and road damage as the proposed projects were situated in industrial zone. Green belt development, limit working at night, wast water treatment and recycling system, avoid transportation during local traffic time and the use of local people will reduce of these cumulative impacts.

1.8. Summary of Environmental Management and Monitoring Plan

The specific location and number of sample points will be determined in the implementation stage. The following tables show the estimated cost and budget for environmental management and monitoring.

Table - Estimated Cost for Environmental Management Measures

The following table shows the total estimated costs for environmental management measures during operation and decommissioning phase.

For Factory 1

	Estimated Cost	Duration	Overall Estimated Cost
Operation Phase	975 Lakhs/Time	25 years	975 Lakhs
Decommissioning Phase	8000 Kyats/day	1 year	25 Lakhs

For Factory 2

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	975 Lakhs/Time	25 years	975 Lakhs
Decommissioning Phase	8000 Kyats/day	1 year	25 Lakhs

Table - Estimated Cost for Environmental Monitoring Measures

The following table shows the total estimated costs for environmental monitoring measures during operation and decommissioning phase.

For Factory 1

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	1,560,000 kyats	25 years	39,000,000 kyats

For Factory 2

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	1,560,000 kyats	25 years	39,000,000 kyats

Summary of Management and Monitoring Sub-Plans

Management and monitoring sub-plands will mainly based on key potential impacts as follow:

(a) Waste Management Plan;

(a) Air Quality Management Plan;

(b) Community Development Program.

1.9. Summary of Public Consultation and Disclosure

Public consultation and participation will be made as the following procedures:

(a) Household survey and focus group discussion;

(b) Public Consultation Meeting; and

(c) Public Disclosure.

(a) Socio-economic Data Collection

Primary socio-economic data will be collected by household survey and secondary data will be collected from Administrative Office (Hmawbi). Household survey was carried out in Kan Kalay Village, Kalar Kone Village and Myaung Tagar Village within 4km boundary of AOI.

(b) Summary of Public Consultation Meetings (PCMs)

Public consultation will be made two times as follow:

PCM for Scoping Proposal

Public meeting for scoping proposal was completed in (10.9.2021) during Covid 19 period. So, this public meeting was made as per the Covid Rules and Regulation. So, there were about 30 people (maximum limitation for meeting during Covid period) from local communities who are directly or indirectly affected by the proposed project are attended in this meeting.

Summary of Public Consultation Meeting for EIA

No.	Meeting	Location	Date	No. of Participants	Remark
1.	Public Meeting for Scoping Proposal	Da Hua (Myanmar) Industry Compound	10.9.2021	30	During Covid 19 period
2.	Public Meeting for EIA Study	Committee Office Hall at Myaung Dagar Industrial Zone	19.6.2022	Local Authorities = 19	
				Local People = 68	

The followings are the summary of key discussions and developer commitments from public meetings.

No.	Public Concerns	Developer Commitments
1.	Odour and gaseous emissions from boiler	Bag filter, water scrubber and proper stake height will be installed.
2.	Ash from boiler chimney	Bag filter will be installed.
3.	Noise from generator during at night	Limit working at night.
4.	Waste water from the factory	Will use waste water treatment system and reused treated waste water
No.	**Public Needs**	**Developer Commitments**
1.	Upgrading of the village roads	Will use CSR fund regularly.
2.	Provide health care facilities	Will use CSR fund regularly.
3.	Create job opportunities	Will appoint at least 50% of local people.

(b) Public Disclosure

Draft EIA report and final EIA report will be disclosed in Da Hua official website.

1.10. Summary of Conclusion

As the proposed project is located in industrial zone, the environmental and social impacts related to the operation of the project will be fewer public concerns than project located in residential areas. Nevertheless, the Da Hua will control with all of the adverse impact related to the proposed project. According to the impact study, the most significant impacts will be air pollution due to coal fired boiler, soil contamination due to solid wastes from boiler, noise from operation of generator during working at night and surface water pollution due to plastic recycling process. In this report, the key anticipated environmental and social impacts of the proposed project are described. Moreover, proper mitigation measures for all anticipated impacts and good environmental management practices are also described. According to the EIA study, the proposed project can be allowed to operate if the developer (Da Hua) will do all of the mitigation and enhancement measures described in this report.

2.0. Introduction

2.1. Project Background

Da Hua (Myanmar) Company Limited plans to develop production of Polyester Staple fiber factory which located at Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division. The established polyester recycling industry consists of three major sections; waste logistics: PET bottle collection and waste separation, flake production. Production of clean PET bottle flakes, and flake processing: conversion of flakes to final product. On 2017, the company was certified as a private company limited by shares with the company registration 104879616 (former 927 FC/2017-2018 (YGN). Da Hua (Myanmar) Polyester Staple Fiber Co., Ltd has been issued of Permit (No. 057/2018) from Myanmar Investment Commission in accordance with Foreign Investment Law, which was enacted by the Government of the Republic of the Union of Myanmar. All of the permission letters from related authorities are shown in Appendix A.

According to the Environmental Conservation Law, 2012 and Environmental Impact Assessment Procedure, 2015, it is necessary to conduct Environmental Impact Assessment (EIA) for the proposed project. Ever Green Tech Environmental Services and Training Co., Ltd. were appointed to conduct Environmental Impact Assessment (EIA) for the proposed factory.

2.2. Brief of the Project Proponent

The followings are the brief description of project proponent.

Project Developer	
Project Developer	Da Hua (Myanmar) Polyester Staple Fiber Co., Ltd
Project Type	Joint Venture Company in accordance with the provision of the Myanmar Companies Act between Mr. Xu Jianjun, Passport No. EB4914269 having its resident at Room No.27-401, Yunggung Hutaing, Tohglu, Hangzhou City, Zhejiang, China, Mother Company Da Hua Environmental Sci-Tech (HK) Limited, Hong Kong (holding 80% Share) and Daw Su Mon Thant (NRC 14/ Ma Ma Na (Naing) 198832 residence of No.57, U Ba Cho Street, Myaung Mya Township, Ayarwaddy Division, representing of Da Hua Company Limited a State Entity constituted under the laws of the Republic of the Union of Myanmar with its head office at 225, Makayar Min Thar

	Gyi Road, Shwe Lin Ban Industrial Zone, Hlaing Thar Yar Township, Yangon Region, and Myanmar (Holding 20% Share)
Type of Business	Export to CMP Basic
Company Registration Number	104879616 former 927 FC/2017-2018 (YGN)
Construction Period	12 months
Operation Period	20 years
Employment	Local Workers – 219 Foreign Technicians – 29
Total Investment	5.18995 million USD
	The proposed project will have two factories as follow: Factory No. (1) Production of Polyester Staple Fiber, Export to CMP basis Factory No. (2) Production of PET Packing Tape and All Kinds of Recycle Pellets, Export to FOB basic
Project Location	Factory (1) Plot No (209 & 238), Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division Factory (2) Plot No (375, 376, 377, 378, 379, 380 & 381) Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division
Contact Person	Daw May Moe Da Hua (Myanmar) Co., Ltd 09-250064251

2.3. Brief of the EIA Service Provider

Below is the background information on Ever Green Tech Environmental Services and Training Co., Ltd., (Third party) who will conduct the EIA.

Ever Green Tech Environmental Services & Training Co., Ltd.	
Company Name	Ever Green Tech Environmental Services and Training Co., Ltd.
Company Registration Number	115575996
Transition Consultant Registration Number	0047

Contact Address	No.1/9, Baho Road, 16th quarter, Hlaing Township, Yangon
Telephone Number	09-5099230, 5099232
E-mail	green.evergreentech@gmail.com
Contact person	Dr. Kyaw Swar Tint Ph.D. (Mining) Principle Environmental and Social Consultant 11kyawswar@gmail.com 09-797111000

2.4. Selected Consultants for Conducting EIA

The following table shows the consultants who are participating in the field survey and report writing.

No.	Name	Degree	Responsibility	Area of Expertise
1.	Dr. Ni Ni Aye	M.B.B.S (Ygn); MS.Med. (Public Health)	Team Leader	(c) Health Impact Assessment (d) Water Pollution Control, Preventation and Monitoring
2.	Ms. Tin Tin Ohm	B.Ag (Agricultural), M.Sc. (Forest Soil Science), USA	Consultant	(a) Soil Quality Preservation (b) Geology
3.	Mr. Min Min Htwe	M.E. (Mining)	Consultant	(c) Geology (b) Noise and Vibration
4.	Mr. Aung Naing Tun	L.L.B, M.B.A	Consultant	(a) Laws and Legal Requirement (d) Analysis for Economic Point of View
5.	Ms. Phoo Mon Mon Phyo	M.Sc. (Zoology)	Consultant	(a) Biodiversity (b) Natural Resources Management (Fisheries)
6.	Ms. Phyu Phyu Thet	B.Ecom. (Eco)	Consultant	(a) Analysis for Economic Point of View
7.	Ms. Thazin Moe Myint	B.E. (Civil)	Consultant	(a) Meteorology, Air Quality Assessment and Prediciton
8.	Ms. Aye Chaw Su Hlaing	B.A. (History)	Consultant	(a) Cultural & Heritage

9.	Mr.Ye Wai Phyo	B.Sc. (Chemistry)	Consultant	(a) Air Pollution Prevention and Control
10.	Ms. Yee Mon Kyaw	B.A. (Psychology)	Consultant	(a) Socio-economic
11.	Mr. Win Ko Aung	B.Sc. (Chemistry)	Consultant	(a) Air Quality Monitoring
12.	Mr. Pyae Moe Han	BE. (Chemical)	Consultant	(a) Water Pollution Control, Preventation and Monitoring
13.	Ms. Hnin Einzali	B.E. (Chemical)	Consultant	(c) Solid and Hazardous Waste Management (d) Soil Quality Preservation
14.	Mg Lwin Myint Mg	B.E. (Mining)	Consultant	(c) Noise and Vibration (d) Land Use
15.	Mr. Moe Pyi Kyaw	B.Sc. (Forestry)	Consultant	(a) Biodiversity (b) Natural Resources Management (Forestry)
16.	Ms. Nwe Nwe Aung	B.Sc.(Zoology)	Consultant	(a) Natural Resources Management (Fisheries)
17.	Ms. Hnin Hnin Phyo	B.E. (Mining)	Consultant	(a) Risk Assessment and Management (b) Natural Resources Management (Mineral Resources)

2.5. Aim of the Project

The developer statements publicly that the proposed project will necessary for local industry in Myanmar due to the following reasons.

(a) To recycle plastic waste (plastic drinking water bottle) as the raw material (polyester staple fiber) used in industry,

(b) To produce good quality polyester staple fiber, packing tape and plastic pellets for local use and export, and

(c) To get benefits for both customers and supplier together with increasing employment opportunities for local people as well as resulting in government revenues.

2.6. Scope of the EIA Study

The EIA study will cover both of the Factory I and Factory II. All of the environmental and social impact assessment for both of the factories will be conducted within the 4 km boundaries (2km radius) around the proposed projects. The reasons for conducting 4 km around the proposed projects are to cover the most significant impacts of (a) air pollution due to coal fired boiler and (b) surface water pollution due to recycling process. The EIA study will include the impact assessment for (a) pre-construction phase, (b) construction phase, (c) operation phase and (d) decommissioning phase.

2.7. The Need of EIA

An EIA and EMP are required for environmentally approvals from Environmental Conservation Department (ECD, Nay Pyi Daw). The Environmental Conservation Department under Ministry of Natural Resources and Environmental Conservation is the lead authority for this EIA process and the development needs to be authorized by this department in accordance with this Environmental Conservation Law (2012). Although the proposed project is FS stage, the environmental impacts associated with the proposed project require investigation in compliance with this Environmental Conservation Law (2012) and the EIA (Environmental Impact Assessment) procedures (2015).

2.8. Purpose and Objective of the EIA Study

The Environmental Conservation Department under Ministry of Natural Resources and Environmental Conservation is the lead authority for this EIA process and the development needs to be authorized by this Department in accordance with this Environmental Conservation Law (2012). The environmental impacts associated with the proposed project require investigation in compliance with the EIA (Environmental Impact Assessment) procedures (2015). The main purpose of an EIA is to provide the relevant authorities with sufficient information on the proposed activities to allow them to make an informed decision on whether or not the EIA should be authorised. This EIA will be conducted according to Environmental Impact Assessment Procedures, 2015. The objectives of an EIA are to:

- Ensure that social and environmental considerations are explicitly addressed and incorporated into the development decision-making process;
- Anticipate and avoid, minimize or offset significantly adverse biophysical, social and other relevant impacts of proposed developments;

- Protect the productivity and capacity of natural systems and the ecological processes which maintain their functions; and
- Promote development that is sustainable and that optimizes resource use and management opportunities.

An EIA functions as a planning tool which helps determine the social, economic and Environmental impacts of a proposed project through Public Participation (PP) and independent specialist assessment. Through the EIA, potential negative and positive impacts are identified and recommendations are made for reducing or avoiding negative impacts, and enhancing positive impacts.

The findings of an EIA are transferred into clear and measurable objectives that must be achieved during construction, operation and decommissioning of a proposed project. These objectives, and plans for achieving them, are captured in an Environmental Management Plan (EMP). The EMP is a public document and typically becomes a component of the project financing terms and conditions should the project go ahead.

The basic guiding principles of the EIA are:

- To inform decision-makers and result in appropriate levels of Environmental protection and community well-being;
- To provide timely information and outputs which assist with design and engineering modifications that reduce negative impacts;
- To identify any significant Environmental effects and key issues (i.e. the matters that must be taken into account when making decisions) and apply the necessary mitigation measures;
- To provide opportunities to inform and involve Interested and Affected Parties (I&APs), incorporating their inputs and concerns explicitly into the documentation and decision-making;
- To allow opportunities for participation by the authorities involved;
- To ensure that the EGT EIA Team has implemented appropriate methodologies and experts from the relevant disciplines, and to ensure the team has assessed potential interrelationships between the biophysical, social and economic issues; and
- To provide as far as possible, an objective, rigorous and balanced assessment of the issues.

2.9. About the EIA and EMP Report

EIA is a formal process used to predict how the proposed project will affect natural resources such as water, air, land, socio-economic and wildlife. It is desirable to ensure that the development options under consideration are sustainable. It also aims to make

recommendations for the mitigation of the potential negative impacts and enhancement of the positive ones.

EMP is a site-specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental impacts arising from the proposed project and take appropriate actions to properly manage that risk. EMP also ensures the project implementation is carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts during its life cycle.

The EIA and EMP reports will contain:

the present status of air, noise, water, land, biological, socio-economic and health components of the environment;

(a) identification and evaluation of positive and negative impacts due to the development of the project;
(b) proposed pollution control measures, environmental management plan (EMP) to be adopted for mitigation of adverse impacts;
(c) measures for the improvement of the community around the area, and
(d) post-project environmental quality monitoring programme.

In making impact assessment, Ever Green Tech ESIA Team mostly referred to the pollution limits set by Myanmar National Emission Guidelines, USEPA, OSHA and WHO.

2.10. Data Collection

The project related data, factory layout plans and design parameters are provided by Da Hua Myanmar Co., Ltd. Secondary data on demographic distribution in the area are sourced from General Administrative Department (Hmawbi) and data on public health are sourced from Public Health Department (Hmawbi), Primary data for public concerns, socio-economic and health profiles will be conducted by household survey.

2.11. Project Implementation Plan

The followings are the project implementation stage of the proposed project.

(a) Company Registration
(b) MIC Permit
(c) Land lease program
(d) Preparation of Building and factory organization
(e) Position imported machine and material
(f) Employee Recruitment plan

(g) Raw material importing plan

(h) Submission of Scoping Report to ECD

(i) Test run of the factory (Project is currently in this situation)

(j) When received ECD comments for submitted Scoping report, to make solving in revised report according to ECD comments

(k) When received approval of Scoping report, have to prepare for EIA report

(l) Submission of EIA report

(m) When received ECD comments for submitted EIA report, to make solving in revised report according to ECD comments.

(n) Submission of Revised EIA report and EMP report to ECD

(o) When received approval for EIA report, to make preparation what are necessary for factory project

(p) To maintain as necessary actions and test run factory operation again

(q) Full strength operation with implementation of Environmental and social Management

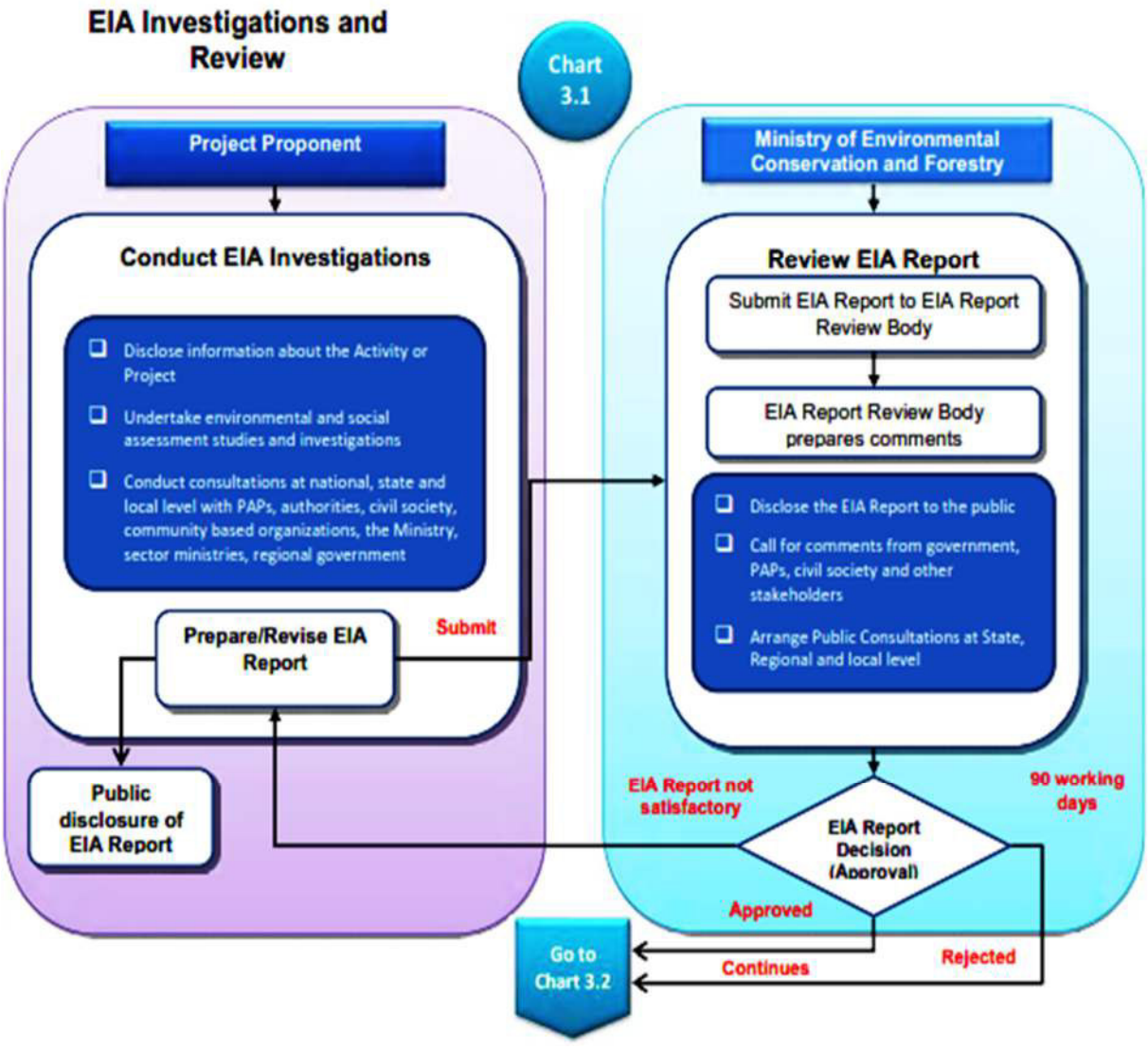
(r) Fully implementation of factory operation, at the same time implementation and managing ESMP continuously.

3. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter sets out the relevant legal and policy context in Myanmar and documents the environmental and social standards with which the proposed project has to comply with, as well as the international standards that the project will follow.

3.1. National Requirements

The EIA has been undertaken in accordance with the Myanmar Environmental Impact Assessment Procedure which was promulgated on December 29th, 2015, and provides legislation for environmental and social governance of economic development in Myanmar, under the Environmental Conservation Law 2012 and Environmental Conservation Rules 2014 of the National Environmental Policy for Myanmar 1994. An overview of the process (from the Myanmar EIA Procedure, 2015) is shown in Figure 3.1.



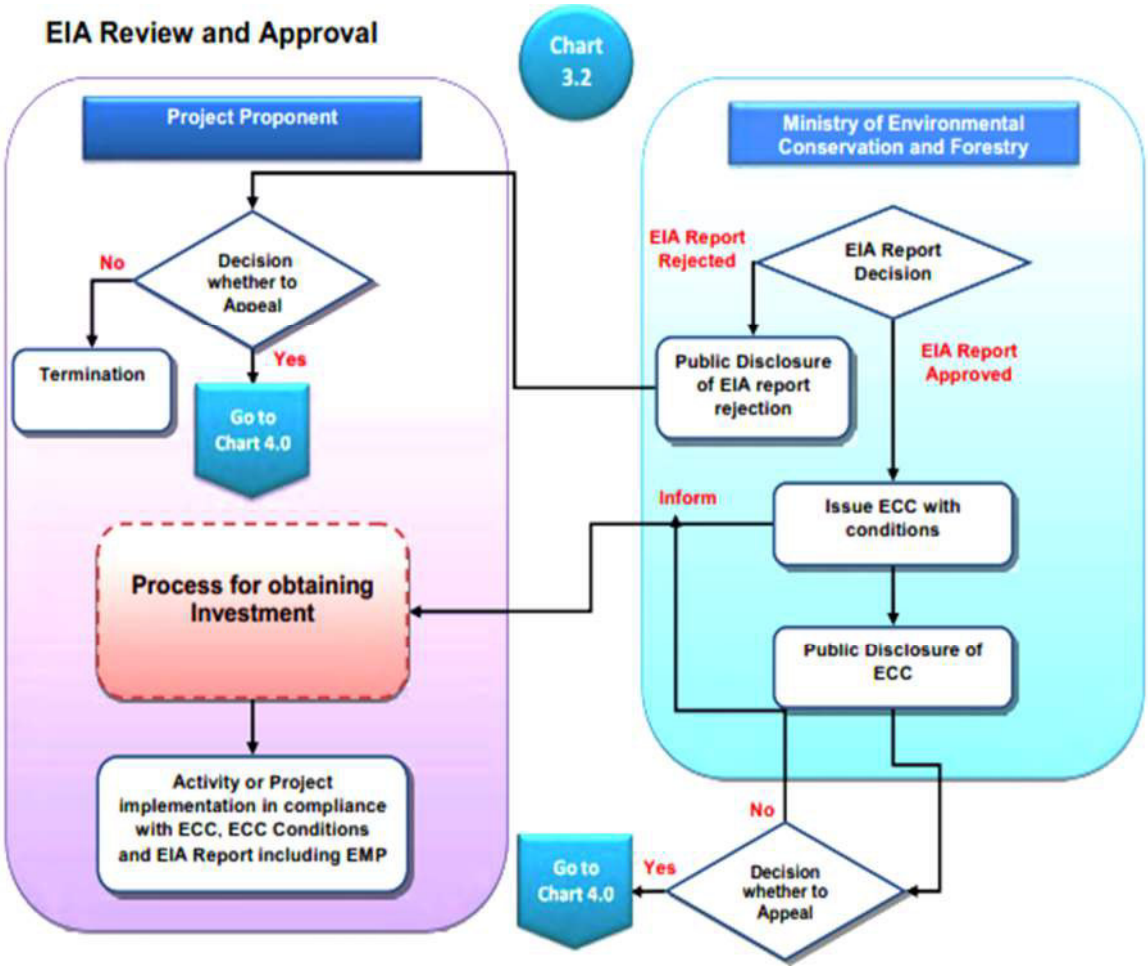


Figure 3.1 - EIA Review and Approval Process

3.2. International Finance Corporation (IFC), Policy on Environmental and Social Sustainability (2012)

There are eight performance standards for a big company to do business in a new area.

(a) Assessment and Management of Environmental and Social Risks and Impacts

- identify and evaluate environmental and social risks and impacts of the project adopt mitigation measures to avoid, or if avoidance is not possible, minimize or mitigate the impact;
- compensate for the impacts on people and on the environment
- promote improved environmental and social performance through the effective use of management system
- ensure that grievances from the effected people are responded and managed appropriately
- promote and provide means for adequate engagement with the community throughout the project period

(b) Labour and Working Conditions

- promote the fair treatment, non-discrimination and equal opportunity of workers
- establish, maintain and improve the worker-management relationship
- promote compliance with national employment and labor laws
- promote safe and healthy working conditions and the health of workers
- avoid the use of forced labor and child labor

(c) Resources Efficiency and Pollution Prevention

- avoid or minimize adverse impacts or human health and the environment by avoiding or minimizing pollution from project activities
- promote more sustainable use of resources, including energy and water
- reduce project-related GHG emissions IV) Community Health, Safety and Security
- avoid adverse impact on the health and safety of the community during the project life ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the community

(d) Biodiversity Conservation and Sustainable Management of Living Natural Resources

- protect and conserve biodiversity
- maintain the benefits from ecosystem services
- promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities

(e) Indigenous Peoples

- ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of indigenous peoples
- avoid adverse impacts of project on indigenous people, or when avoidance is not possible, minimize and/or compensate for such impacts
- promote sustainable development benefits and opportunities for indigenous people in a culturally appropriate manner
- establish and maintain an ongoing relationship with these people throughout the project period
- respect and preserve the culture, knowledge and practices of indigenous peoples

(f) Cultural Heritage

- protect cultural heritage from the adverse impacts of project activities and support its preservation
- promote the equitable sharing of benefits from the use of cultural heritage

3.3. Laws and Regulations Related to the Proposed Project

Myanmar has promulgated several laws and regulations concerning protection of the environment. The project proponent will comply the following laws and regulations which are directly or indirectly associated with the proposed project.

Table 3.1 – Purposes of Relevant Laws and Regulations with the Proposed Project in Myanmar

Laws and Regulations	Year	Purposes
Constitution of the Republic of the Union of Myanmar (Articles 24,45,349,359)	2008	- To conserve the natural environment, - To prevent and upgrade the rights and lives of the workers
Environmental Conservation Law (Law No.7(o), 14,15,24,25,29)	2012	- To enable to implement the Myanmar National Environmental Policy; - To enable to lay down the basic principles and give guidance for systematic integration of the matters of environmental conservation in the sustainable development process;
Environmental Conservation Rules (Rule 55, 69 (a), (b))	2014	- To implement correctly according to the environmental management plan
EIA Procedures (Article 102 to 110, 113, 115, 117)	2015	- To develop the environmental impacts and to draw the environmental management plan;
National Environmental Quality (Emission) Guidelines (Section 1.1, 1.2,1.3)	2015	These national Environmental Quality (Emission) Guidelines (hereafter referred to as Guidelines) provide the basis for regulation and control of noise and vibration, air emissions, and wastewater from various sources in order to prevent pollution for purposes of protection of human and ecosystem health.
The Ethnic Rights Protection Law	2015	Consists of four bills, as submitted to the legislature; Buddhist Women's Special Marriage Bill, Religious

(Law No. 5)		Conversion Bill, Monogamy Bill and Population Control Bill.
Myanmar Investment Law	2016	To develop responsible investment businesses which do not cause harm to the natural environment and the society for the benefit of the Union and its citizens
Foreign Investment Law	2012	To restrict or prohibit investment activities which affect public health, the environment and ecosystems, which produce toxic waste or which engage with toxic chemicals, duties of investors to conduct business in such a way as to avoid environmental damage, air and water pollution, in accordance with existing laws
Myanmar Citizen Investment Law	2013	Board provision supporting environmental conservation and protection and adherence to existing laws related to environmental matters, restrictions on business which cause damage to the natural environmental ecosystems
Labor Organization Law	2011	This Law was enacted, to protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labour organizations systematically and independently
The Settlement of Labor Dispute Law,	2012	The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace.
Employment and Skill Development Law,	2013	▪ To facilitate employment which is appropriate to the age and ability of the job seeker ▪ To help workers obtain employment and to provide stability of employment and skills development for employees ▪ To help employers obtain appropriate employees
The Leave and Holiday Act, 1951 (Law Amended July, 2014)	2014	▪ To allow worker for leave and holiday allowances, religious or social activities with earn allowance, and benefits for Health allowances. ▪ Concerned workers: Daily wage workers/ temporary workers/permanent workers.
The Minimum Wages Law	2013	This Law was enacted to meet with the essential needs of the workers, and their families, who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness,
Payment of Wages Act	2016	(a) Pay in local currency or foreign currency recognized by the Central Bank of Myanmar. This may be in cash, check or deposit into the bank account of Employee. (b) Moreover, pay can be in the means of… (1) Totally in cash OR half the cash and half in things set according to the local price to those employees working in trade, manufacturing and service sectors. (2) Totally in cash OR half the cash and half in things set as

		local price according to local traditions or common agreement to those working in agriculture and livestock sectors. But this must be for the sake of the employees and their families. And, it also must be reasonable/fair. (3) An employee shall receive the payment for 60 days when he/she is in Alternative Civil Service.
The Myanmar Insurance Law	1993	(a) to overcome financial difficulties by effecting mutual agreement of insurance against social and economic losses which the people may encounter, due to common perils; (b) to promote the habit of savings individually by effecting life assurance, thus contributing to the accumulation of resources of the State; (c) to win the trust and confidence of the people in the insurance system by providing effective insurance safeguards which may become necessary in view of the social and economic developments.
The Social Security Law	2012	The employers and workers shall co-ordinate with the Social Security Board or insurance agency in respect of keeping plans for safety and health in order to prevent employment injury, contracting disease and decease owing to occupation and in addition to safety and educational work of the workers and accident at the establishment.
The Workman Compensation Act	1951 (Amen-dment 1955, 1957, 2005)	To protect personal injury caused to a workman by accident arising out of and in the course of his employment and to compensate in accordance with the provisions of the Workman Compensation Act
The Myanmar Fire Bridge Law, (Law No. 25)	2015	▪ To take precautionary and preventive measure and loss of state own property, private property, cultural heritage and the lives and property of public due to fire and other natural disasters ▪ To organize fire brigade systemically and to train the fire brigade ▪ To prevent from fire and to conduct release work when fire disaster, natural disaster, epidemic disease or any kind of certain danger occurs ▪ To educate, organize an inside extensively so as to achieve public corporation ▪ To participate if in need for national security, peace for the citizens and law and order
Law Amending the Factories Act 1951 (Pyidaungsu Hluttaw Law No. 12/2016)	2016	To make effective arrangements in every factory for disposal of waste and effluent, and matters on health, cleanliness and precaution against danger.
Union of Myanmar Public Health Law	1972	To promote and safeguard public health and to take necessary measures in respect of environmental health.

Private Industrial Enterprise Law	1990	To narrow down the gap between rural development and urban development by the development and improvement of industrial enterprises; to avoid or reduce the use of technical know-how which cause environmental pollution; to cause the use of energy in the most economical manner.
Forest Law	2018	To implement forest policy and environmental conservation policy, to promote public cooperation in implementing these policies, to develop the economy of the State, to prevent destruction of forest and biodiversity, to carry out conservation of natural forests and establishment of forest plantations and to contribute towards the fuel requirement of the country.
Protection of Biodiversity and Protected Area Law	2018	To protect wildlife, wild plants and conserve natural areas, to contribute towards works of natural scientific research, and to establish zoological gardens and botanical gardens.
Protection and Preservation of Cultural Heritage Regions Laws	2019	To implement the protection and preservation policy with respect to perpetuation of cultural heritage that has existed for many years; to protect and preserve the cultural heritage regions and the cultural heritage.
Prevention and Control of Communicable Diseases Law	1995	To prevent the outbreak of Communicable Diseases, by implementing following project activities: (a) immunization of children by injection or orally; (b) immunization of those who have attained majority, by injection or orally, when necessary; (c) carrying out health educative activities relating to Communicable Disease.
The Control of Smoking and Consumption of Tobacco Product Law	2006	▪ To convince the public that health can be adversely affected due to smoking and consumption of tobacco product and to cause refraining from the use of the same; ▪ To protect from the danger which affects public health adversely by creating tobacco smoke-free environment; ▪ To obtain a healthy living style of the public including child and youth by preventing the habit of smoking and consumption of tobacco product;
The Conservation of Water Resources and Rivers Law	2006	▪ To conserve and protect the water resources and rivers system for beneficial utilization by the public ▪ To prevent environmental impact
The Conservation of Water Resources and Rivers Rules	2013	To conserve and protect the water resources and rivers system for beneficial utilization by the public; to prevent environmental impact.
Farm Land Law	2012	To protect the rights of the people who are working on the farm.
The Protection and Preservation of Antique	2015	▪ To implement the policy of protection and preservation for the perpetuation of antique objects; ▪ To protect and preserve antique objects so as not to

Objects Law		deteriorate due to natural disaster or man-made destruction; ▪ To uplift hereditary pride and to cause dynamism of patriotic spirit by protection and preservation of antique objectives; ▪ To have public awareness of the high value of antique objectives; ▪ To carry out in respect of protection and preservation of antique monuments in conformity with the International Convention and Regional Agreement ratified by the State.
The Protection and Preservation of Ancient Monuments Law	2015	▪ To implement the policy of protection and preservation for the perpetuation of ancient monuments; ▪ To protect and preserve ancient monuments so as not to deteriorate due to natural disaster or man-made destruction; ▪ To uplift hereditary pride and to cause dynamism of patriotic spirit by protecting and preserving ancient monuments; ▪ To have public awareness of the high value of ancient monuments; ▪ To protect and preserve ancient monuments from destruction; ▪ To search and maintain ancient monuments; ▪ To carry out in respect of protection and preservation of ancient monuments in conformity with the International Convention and Regional Agreement ratified by the State.
The Prevention of Hazard from Chemical and Related Substances Rules	2013	▪ Performing the sticking pictogram for being least the health impacts and accident injuries in the occupational area according to the prescribed standards and norms of the Globally Harmonized System GHS); ▪ Making the necessary arrangements to be safety of the occupational area and issuing orders and directives for preventing and decreasing the accident; ▪ Laying down the proliferation plans on knowledge, and safety of chemical and related substances to administrators, license holders, public and workers; ▪ Cooperating with local and foreign governmental departments, organizations and non-governmental organizations in respect of safety management for chemicals hazard.
The Freshwater Fisheries Law	1991	▪ To further develop the fisheries; ▪ To prevent the extinction of fish; ▪ To safeguard and prevent the destruction of freshwater fisheries waters; ▪ To obtain duties and fees payable to the State; ▪ To manage the fisheries and to take action in accordance with the Law.

Automobile Law Pyidaungsu Hluttaw Law No. 55/2015	2015	▪ For the safe driving of motor vehicles in public areas through registration according to official rules and regulations. ▪ To provide driving licenses for driving particular types of motorized vehicles after qualification checks. ▪ For the easy flow of road users and for the protection against road risks and vehicle perils. ▪ To avoid traffic congestion and to use high technology transportation systems efficiently in order to implement protection against road risks and vehicle perils. ▪ To reduce environmental pollution caused by motor vehicles.
The Myanmar Engineering Council Law	2013	▪ To uphold and upgrade the dignity, ethics and quality of the Myanmar citizen engineers, graduate technicians and technicians who are practicing engineering works; ▪ To explore using engineering technology and information technology combined the good methods, research and development activities by which the natural resources and human resources of the State may be beneficially applied with least impact environment; ▪ To carry out guidance and supervision, and to take necessary actions for fulfillment of the requirements of stipulated technical standard, proper method, free from danger, keeping ethic and being dutiful in the fields of engineering and technology education, researches and services; ▪ To service engineering and technology related functions and duties beneficial for the State assigned by the relevant Ministry and relevant organizations.
The Petroleum Act	1934 (Amen -ded 2010)	▪ To regulate production storage, and transport of oil so as not to cause pollution or the outbreak of fires
The Factories Act	1951	▪ For the proper disposal of waste and effluents in factories, treatment of wastewater, regulations for health and cleanliness in factories, and prevention of hazards
Boiler Law	2015	▪ To acquire boilers which are consistent with Myanmar standards or international standards ▪ Not to be damaged and lost the state and public by preventing the risk of boiler accident ▪ To advance the boiler technologies and to develop competent persons who are able to manufacture, repair and maintain boilers ▪ To enable to use the boiler with full capacity by using fuel energy effectively ▪ To enable to use the boilers for maximum span of life and to reduce the impact on natural social health environment due to such use of boiler

Natural Disaster Management Law	2013	▪ To implement natural disaster management programmes systematically and expeditiously in order to reduce disaster risks; ▪ To form the National Committee and Local Bodies in order to implement natural disaster management programmes systematically and expeditiously ▪ To coordinate with national and international government departments and organizations, social organizations, other nongovernment organizations or international organizations and regional organizations in carrying out natural disaster management activities ▪ To conserve and restore the environment affected by natural disasters ▪ To provide health, education, social and livelihood programmes in order to bring about better living conditions for victims.
The Export and Import Law	2012	▪ To enable to implement the economic principles of the State successfully. ▪ To enable to lay down the policies relating to export and import that supports the development of the State. ▪ To cause the policies relating to export and import of the State and activities are to be in conformity with the international trade standards. ▪ To cause to be streamlined and speedy in carrying out the matters relating to export and import.
Occupational Safety and Health Law (Pyidangsu Hluttaw Law: No.8)	2019	▪ The purpose to effectively implement measures related to safety and health at every industry prevent by the workplace accidents and occupational diseases and set occupational safety and health standards.
The Standardization Law	2014	▪ To enable to support export promotion by promoting quality of production organizations and their products, production processes and service industries and to enable to determine Myanmar Standards. ▪ to enable to protect consumers and users by guaranteeing that imports and products are not lower than the prescribed standard and are safe and free form health hazards; ▪ To enable to support protection from impact on environment related to products, production processes and services and conservation of natural resources; ▪ To enable to protect distribution and import of disqualified goods which do not meet the prescribed standard, goods which are not safe and goods which are endangered to the environment;
The Patent Law	2019	▪ To protect the rights and interests of the patentee and the inventor in accordance with this Law; ▪ To develop Myanmar's manufacturing by promoting technological innovations and distribution and transfer

		of technological knowledge; ▪ To establish a mutually-beneficial relationship between the inventors and users of inventions in order to promote technical know-how and socio-economic development; ▪ To help balance the rights and obligations of the inventors and users of inventions; ▪ To prevent the patentee or right holder from abusing patent rights and monopolizing trade. ▪ To promote an environment of innovation
Trademark Law	2019	▪ To promote investment, trade and commerce by protecting marks; ▪ To protect the interests of the owners and right holders of marks; ▪ To establish a fair market competition system and to create a safe environment for consumers by prohibiting the entry of mark counterfeiting and counterfeit goods into the market; ▪ To improve the quality of regional products of Myanmar and to promote the economic development of people in these regions by penetrating the global market through protection of geographical indications.
Industrial Design Law	2019	▪ To protect the rights and interests of the owner of the industrial design and the inventors in accordance with this Law; ▪ To support the development of industrial businesses by providing protection for industrial design creations; ▪ To support the development and spread of industrial design technology; ▪ To establish a mutually-beneficial relationship between the inventor and users of industrial design in order to promote technical know-how and socio-economic development; ▪ To help balance the rights and duties of the inventor and users of industrial design.
Consumer Protection Law	2019	▪ To ensure the fulfillment of consumer's rights; ▪ To raise comprehensive awareness on consumer protection; ▪ To disseminate accurate, correct and clear information on consumer protection; ▪ To fulfill the high quality of goods or services that guarantee on safety, health and satisfaction of the consumers; ▪ To be followed by the entrepreneur on consumer protection in accordance with the law; ▪ To prevent the consumers from hazardous goods or services and any damage from consumption of it; ▪ To manage and regulate the establishment of consumer protection associations and to cooperate with each other

		in order to strengthen such associations; ▪ To take action rapidly on hazardous goods or services to the consumer.
Tax Administration Law	2019	▪ To effectively collect taxes; ▪ To make the administration of different types of taxes consistent; ▪ To precisely establish rights and obligations of taxpayers; ▪ To exactly specify the powers and duties of the Internal Revenue Department; ▪ To facilitate and simplify the application of the self-assessment system;
Registration of Deeds	2018	▪ To effectively register the deeds with the proper laws and regulations.

The following table shows more detailed about rules and regulations associated with the proposed project.

Table 3.2 – Legal Commitments of Relevant Laws and Regulations with the Proposed Project

Law name and section	Legal Commitments
Constitution of the Republic of the Union of Myanmar, 2008	
Section 24	Project proponent has to comply with section 24 of Constitution of the Republic of the Union of Myanmar in association with the chance of workers.
Section 45	Project proponent understand and accepts section 45 of Constitution of the Republic of the Union of Myanmar in association with conservation of natural environment.
Section 349	Project proponent understand section 349 of Constitution of the Republic of the Union of Myanmar in association with development of project.
Section 359	Project proponent understand and accept section 359 of Constitution of the Republic of the Union of Myanmar in association with forced to work.
Environmental Conservation Law, 2012	
Section 7 (o)	The project proponent has to manage according to the Section 7(o).
Section 14	The project proponent has to carry out treating of emitting substances which cause pollution in the environment in accord with stipulated environmental quality standards.
Section 15	The project proponent has to install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution.
Section 24	The project proponent has to follow the Ministry terms and condition relating to environmental conservation.
Section 29	The project proponent has to follow the rules, notifications, orders, directives and procedures issued under this Law.

Environmental Conservation Rules, 2014	
Rule 69	The project proponent has to follow the rule of not to pollute the environment, not to cause damage to the ecosystem.
EIA Procedures, 2015	
Article 102 to 110	The project proponent has to report the monitoring included in EIA procedure article 102 to 110.
Article 113	The project proponent has to comply with the determination of Ministry if environmental obligations are not being complied by project proponent.
Article 115	The project proponent has to cost all the inspection and monitoring of project according to article 115 of EIA Procedure.
Article 117	The project proponent has to follow the Ministry program described in Article 117 of EIA procedure.
National Environmental Quality (Emission) Guidelines, 2015	
Section 1.1, 1.2,1.3	The project proponent has to comply with the National Environmental Quality (Emission) Guidelines for air emission, nois and vibration and wastewater.
The Protection of rights of National Race Law, 2015	
Section 5	The project proponent has to completely be informed, coordinated and performed with the relevant local ethnic groups in the case of development works, major projects, businesses and extraction of natural resources will be implemented within the area of ethnic groups.
Myanmar Investment Law, 2016	
Section 50	The project proponent has to invest according to the section 50 of Myanmar Investment Law.
Section 51	The project proponent has to comply with section 51 of Myanmar Investment Law.
Section 65	The project proponent has to comply with section 65 of Myanmar Investment Law.
Section 73	The project proponent has the type of insurance specified in the rules in any insurance business authorized to conduct insurance business in the State.
Foreign Investment Law, 2012	
Section 4	The project proponent has to conduct without doing the activities described in Section 4 of Foreign Investment Law, 2012
Section 17	The project proponent has to perform not to affect environmental pollution and spoilage as per existing law in connection with the investment activities.
Myanmar Citizen Investment Law, 2013	
Section 15	The project proponent has to comply with the duties in accordance with section 15 of Myanmar Citizen Investment Law, 2013.
Section 16	The project proponent has to conduct with the duties for the workers in accordance with section 15 of Myanmar Citizen Investment Law, 2013.
Labor Organization Law, 2011	
Section 18	The project proponent has to comply for dismiss of worker with section 18 of the Labor Organization Law.
Section 19	The project proponent has to comply for dispute between employer and worker with section 19 of the Labor Organization Law.

Section 20	The project proponent has to comply for dispute between employer and worker with section 20 of the Labor Organization Law.
Section 21	The project proponent has to comply for dispute between employer and worker with section 21 of the Labor Organization Law.
Section 22	The project proponent has to comply with section 22 of the Labor Organization Law.
The Settlement of Labor Dispute Law, 2012	
Section 38	The project developer has to negotiate and coordinate in respect of the complaint within the prescribed period.
Section 39	The project developer has not to alter the conditions of service relating to the workers in accordance with the section 39 of The Settlement of Labor Dispute Law.
Section 40	The project developer has not to lock-out or strike without accepting negotiation under the section 40 of the Settlement of Labor Dispute Law.
Employment and Skill Development Law, 2013	
Section 5	The project proponent has to employ according to section 5 of Employment and Skill Development Law.
Section 14	The project proponent has to carry out training programmes in accord with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present.
Section 30 (a & b)	The project proponent has to pay money not less below 0.5% of salary, total wages paid to the level of worker supervisor and the workers below such level in such work monthly without fail as the contribution to the fund. The project proponent has to ensure that put in money paid has to not be deducted from the wage or salary of the workers.
The Leave and Holiday Act, 1951 (Law Amended July, 2014), 2014	
Section 3	The project proponent has to comply for the holiday of worker according to section 3 of 1951 Leave and Holidays Act.
Section 5	The project proponent has to comply in related to leave of worker according to section 3 of 1951 Leave and Holidays Act.
Section 14	The project proponent has to comply with section 14 of 1951 Leave and Holidays Act.
Section 16	The project proponent has to comply with section 16 of 1951 Leave and Holidays Act.
The Minimum Wages Law, 2013	
Section 12	The project proponent has to pay wage according to section 12 of Minimum Wages Law.
Section 13	The project proponent has to carry out with section 13 of Minimum Wages Law.
Payment of Wages Act, 2016	
Section 3	The project proponent has to pay the wages according to section 3 of Payment of Wages Act.
Section 4	The project proponent has to pay the wages according to section 4 of Payment of Wages Act.
Section 5	The project proponent has to difficulty to pay the wages according to Section 4 sub-section (c) because of significant happenings, including natural disaster, the employer must report to the Department with solid evidence that wages will be paid at the mentioned day upon the workers'

	agreement.
Section 7	The project proponent has to comply according to section 7 of Payment of Wages Act.
Section 8	The project proponent has to comply according to section 8 of Payment of Wages Act.
Section 10	The project proponent has to comply according to section 10 of Payment of Wages Act.
Section 14	The project proponent has to allow the presiding overtime rate for an employee carries as set by the Law of Payment of Wages Act
The Myanmar Insurance Law, 1993	
Section 15	The project proponent has to follow compulsory Third Party Liability Insurance with the Myanmar Insurance.
Section 16	The project proponent has to comply with section 16 of the Myanmar Insurance Law.
The Social Security Law, 2012	
Section 11a	The project proponent has to comply in accordance with section 11 of the Social Security Law, 2012.
Section 15(a, b)	The project proponent has to pay Social Security Fund described in section 15 of the Social Security Law, 2012.
Section 18 (b)	The project proponent has to deduct contributions to be paid by worker from his wages together with contribution to be paid by him and pay to the social security fund.
Section 48 (b)	The project proponent has to comply with section 48 of the Social Security Law, 2012.
Section 75	The project proponent has to prepare and keep records described in section 75 of the Social Security Law, 2012 and lists correctly and submit to the relevant township social security office in accord with the stipulations. The project proponent has to inform the relevant township social security office if the matters described in section 75b arise and submit records of work and lists if requested by inspectorate or official assigned by the Social Security Head Office and various levels of Regional Social Security Office under this Law.
The Workman Compensation Act, 1951(Amended 1955,1957,2005)	
Section 3	The project proponent has to liable to pay compensation in accordance with section 3 of the Workmen's Compensation Act if personal injury is caused to a workman by accident arising out of and in the course of his employment
The Myanmar Fire Bridge Law, 2015	
Section 25	The project proponent has not to fail to form the Reserve Fire Brigade and not fail to provide fire safety equipment.
Law Amending the Factories Act 1951 (Pyidaungsu Hluttaw), 2016	
Section 19	Project proponent has to comply with section 19 of Law Amending the Factories Act 1951 in relating to hearing and the safety of workers.
Union of Myanmar Public Health Law, 1972	
Section 3	The project proponent has to allow the government to improve the health of the working population and advising on the health issues described in section 3 of 1972 Union of Myanmar Public Health Law to protect the health of the working population.

Section 5	The project proponent has to follow the organizations formed under this law to inspect and instruct the project at any time.
Forest Law, 2018	
Section 12	The project proponent has to get approval of the Ministry to carry out any development work or economic scheme within forest land or forest covered land.
The Conservation of Biodiversity and Protected Area Law, 2018	
Section 19 (e)	The project proponent has to follow the Ministry of Forest Department according to section 19 of the Conservation of Biodiversity and Protected Areas Law.
Section 35 (a, c, d)	The project proponent has to comply with section 35 of the Conservation of Biodiversity and Protected Areas Law.
Section 39 (d)	The project proponent has to comply with the punishment according to the section 39 of the Conservation of Biodiversity and Protected Areas Law.
Protection and Preservation of Cultural Heritage Regions Laws, 2019	
Section 21 (b)	The project proponent has to comply with the Regional Conservation Committee in accordance with the stipulations, to obtain the prior approval that there is no harm to the cultural heritage area.
Prevention and Control of Communicable Diseases Law, 1995	
Section 3(a)(9)	The project proponent has to follow the Ministry of Health to prevent the spread of infectious diseases.
Section 4	The project proponent has to comply with the provisions of Article 3 of the Ministry of Health and the Department of Health regarding the prevention and control of communicable diseases.
Section 11	The project proponent has to allow the health officer according to section 11 of Infectious Disease Prevention and Control Law for the prevention of spread of infection diseases.
The Control of Smoking and Consumption of Tobacco Product, 2006	
Section 9	The project proponent has to carry out the task according to section 9 of the Control of Smoking and Consumption of Tobacco Product Law.
Conservation of Water Resources and River Law, 2006	
Section 8 (a)	The project developer does not have to do anything or change the course of the river with the intention of damaging the water source and the rivers.
Section 11	The project developer has to comply with section 11 of Water Resources and Rivers Conservation Law related to damping into stream.
Section 19	The project developer has to comply not to dump into the river that may cause damage to the waterway or change course in a stranded or sunken vessel.
Section 21 (b)	The project developer has to carry out no excavation without the permission of the Department.
Section 22	The project developer does not have to use sand, gravel or gravel for commercial purposes in the coastal and coastal areas without the permission of the Department and do not pile up rocks or other heavy objects.
Section 24 (b)	The project developer has to follow the rules prescribed by the Department in order to prevent water pollution in the river and not to change the waterway.

Section 30	The project developer has to get the approval of the Ministry for construction of bridge to protect the water source and the rivers.
Section 47	The project developer has to get the opinion from the Department by stating the location of work, scope of work and the period of operation.
Section 48	The project developer has to comply with the department according to section 48 of Conservation of Water Resources and Rivers Law.
Section 49	The project developer has to pay the service fee prescribed by the Ministry for measurement printing and field inspection and river water use fee prescribed by the Ministry on the use of river water for other activities and river maintenance fee.
Conservation of Water Resources and Rivers Rules, 2013	
Section 47	The project proponent has to get the opinion from the Department by stating the location of work, scope of work and the period of operation.
Section 48	The project proponent has to comply with the department according to section 48 of Conservation of Water Resources and Rivers Law.
Section 49	The project proponent has to pay the service fee prescribed by the Ministry for measurement printing and field inspection and river water use fee prescribed by the Ministry on the use of river water for other activities and river maintenance fee.
Farm Land Law, 2012	
Section 30	The project proponent has to comply related to the use of farmland according to section 30 of Farmland Law.
The Protection and Preservation of Antique Objects Law, 2015	
Section 12	The project proponent who finds the object which has no owner or custodian has to inform the relevant Ward or Village-Tract Administrator if he knows or it seems reasonable to assume that the said object is an antique object.
The Protection and Preservation of Ancient Monuments Law, 2015	
Section 12	The project proponent has to promptly inform the relevant Ward or Village-Tract Administrative Office when he finds an ancient monument.
Section 15	The project proponent has to apply to get prior permission to the Department when the project is within the specified area of an ancient monument.
Section 20 (f)	The project proponent does not have to carry out discarding chemical substance and rubbish which can affect an ancient monument and the environment within the specified area of an ancient monument or of a listed ancient monument without a written prior permission.
The Prevention of Hazard from Chemical and Related Substances Rules, 2013	
Section 15	The project proponent has to carry out inspection and training according to section 15 of Prevention of Hazard from Chemical and Related Substances Law.
Section 16	The project proponent has to comply Section 16 of Prevention of Hazard from Chemical and Related Substances Law.
Section 17	The project proponent has to put the insurance in accordance with the prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses.

Section 22	The project proponent has to abide the regulations consisted in the registration certificate furthermore shall also abide the order and instructions issued occasionally by the Central Supervisory Board.
Section 27	The project proponent has to control and decrease the hazard of the chemical and related substance according to section 27 of Prevention of Hazard from Chemical and Related Substances Law.
Section 30	The project proponent has to comply according to Section 30 of Prevention of Hazard from Chemical and Related Substances Law.
The Freshwater Fisheries Law, 1991	
Section 36	Project proponent has to comply with section 36 of Freshwater Fisheries Law in the case of constructing, using any obstruction in a fresh water fisheries water.
Section 40	Project proponent has to comply not to cause harassment of fish and other aquatic organisms or pollution of the water in a freshwater fisheries water.
Section 41	Project proponent has to comply not to alter the quality of water, volume of water or the water-course in a leasable fishery, reserved fishery and creeks contiguous thereto or in water-courses.
Automobile Law Pyidaungsu Hluttaw Law No. 55/2015, 2015	
Section 49	Project proponent has to comply with section 49 of Automobile Law in driving at the public area.
The Ethnic Rights Protection Law, 2015	
Section 22	The project developer has to comply with the section 22 of the Ethnic Rights Protection Law.
Section 23	The project developer has not to misuse the section 23 of the Ethnic Rights Protection Law in accordance with the political facts.
Section 24	The Project Developer has to be responsible not to perform that makes the ethnic groups misunderstood or disappointment.
Natural Disaster Management Law, 2013	
Section 9 (a)	The project proponent has to follow the National Committee in the case of natural disaster and implementing natural disaster management.
Occupational Safety and Health Law, 2019	
Section 12	(A) The project proponent has to appoint the person in charge of occupational safety and health to closely monitor the safety and health of the workers according to the type of work. (B) The project proponent has to form occupational safety and health committee, consisting of workers' representatives, in accordance with the provisions of the Ministry.
Section 14	The project proponent has to follow Rules and regulations issued under this law.
Section 16	The project proponent has to allow the inspection officers for inspection of safety and health conditions of the workplaces.
Section 17	The project proponent has to allow inspectors for conducting the actions described in section 17 of Occupational Safety and Health Law.
Section 18	The project proponent has to report the inspection officers any injuries to the workplace for reasons described in section 18 of Occupational Safety and Health Law
Section 26	The project proponent has to perform the tasks described in section 26 of Occupational Safety and Health Law.

Section 27	The project proponent does not have to dismiss or demote an employee for the reason described in section 27 of Occupational Safety and Health Law.
Section 34	The project proponent has to be responsible for occupational injury, dangerous event, in case of serious work injury and if an employee suffers from a specified occupational disease.
Section 36	The project proponent has to follow the inspecting officer for any workrelated injuries, dangerous events, occupational diseases, workplace poisoning
The Myanmar Engineering Council Law, 2013	
Section 34	The project proponent has to comply according to the section 34 of Myanmar Engineering Council Law.
Section 37	The project proponent has to follow the section 37 of Myanmar Engineering Council Law.
The Petroleum Rules, 1937	
Section 63	The project proponent has to comply according to section 63 of the Petroleum Rules, 1937.
Section 66	The project proponent has to responsible that petroleum not be transported on any public vehicle which is carrying passengers.
Section 72	The project proponent has to responsible to carry out the provisions of these rules according to section 72 of the Petroleum Rules, 1937.
Section 80	The project proponent has to comply according to section 80 of the Petroleum Rules, 1937.
Section 92	The project proponent has to be responsible for all operations within an installation or storage shed to be conducted under the supervision of an experienced responsible agent or supervisor.
Section 93	The project proponent has to comply according to section 93 of the Petroleum Rules, 1937.
Boiler Law, 2015	
Section 5	The project proponent has to register according to the section 5 of the Boiler Law.
Section 6	The project proponent has to comply with the local or international standard of boiler according to the section 6 of the Boiler Law.
Section 7	The project proponent has to submit registration along with the required certificate or information of the boiler according to the section 13 of the Boiler Law.
Section 12 (a, b)	The project proponent has to follow the registration process according to the section 12 (a, b) of the Boiler Law.
Section 14	The project proponent has to request the permit from the related government personnel if the proponent want to use the boiler more than the permitted pressure or change the pressure part of the boiler.
Section 15	The project proponent has to show the related department asked for the required boiler certificate.
Section 18	The project proponent has to inform the related personnel when the accident occur.
Section 20	The project proponent has to know the using of non-certified boiler or certification expired boiler or certification rejected boiler are prohibited.
Section 21	The project proponent has to mark the registration number which is given by the related personal.

Section 24	The project proponent has to make sure that installing or repairing the boiler should be done by the certified professional.
Section 31	The project proponent has to restrict the boiler operator not to use the boiler over the given parameter.
Section 38	The project proponent has to know the right of the inspector represented the government.
The Private Industrial Enterprise Law, 1990	
Section 13 (a)	The project developer has to pay the registration fees, fees for the renewal of registration and other payable duties and taxes prescribed by the Directorate.
The Export and Import Law, 2012	
Section 7	The project proponent has to comply with section 7 of the Export and Import Law.
The Standardization Law, 2014	
Section 17	The project proponent has to apply to the department and organization which has obtained the accreditation in case of obtaining certificate of certification.
Section 19	The project proponent has to know the action taking by the committee according to the section 19 of the Standardization Law.
Section 26	The project proponent has to know and comply the offences and penalties which is described in section 26 of the Standardization Law.
Patent Law (Pyidaungsu Hluttaw Law No.7), 2019	
	The project proponent has to know and comply with the inventions eligible for protection and inventions ineligible for protection according to the Patent Law.
Trademark Law (Pyidaungsu Hluttaw Law No.3), 2019	
Section 17	The project proponents has to comply with int section 17 of Trademark Law in registration of a mark.
Industrial Design Law (Pyidaungsu Hluttaw Law No.2), 2019	
Section 19	The project proponents has to comply with the section 19 of Industrial Design Law in the case of applying for the registration of an industrial design.
Consumer Protection Law, 2019	
Section 21	The project proponent has to comply with the roles and responsibilities described in section 21 of the Consumer Protection Law.
The Boundary Demarcation and Survey Law (Pyidaungsu Hluttaw Law No.11), 2019	
Section (18,19,20)	The project proponent has to know and comply with the prohibitions described in the Boundary Demarcation and Survey Law.
Tax Administration Law, 2019	
Section 18	The project proponent has to know the Taxpayer's Right to Information that described in section 18 of the Tax Administration Law.
Section 20	The project proponent has to comply with the keeping accounts and records according to the section 20 of Tax Administration Law.
Registration of Deeds (Pyidaungsu Hluttaw Law No.9), 2018	
Section 16	The project proponent has to comply and register the documents according to the section 16 of the Registration of Deeds Law.

3.4. International Agreements and Conventions

In addition to the domestic laws listed above, the project proponent will also comply the following international agreements and Conventions directly or indirectly related to the proposed project activities.

Refer to the following Table.

Table 3.3 – International Agreements and Conventions Relevant to the Proposed Project

International Agreements and Conventions	Status	Purposes
Vienna Convention for the Protection of the Ozone Layer, 1985	1998	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone depleting substances.
Montreal Protocol on Substances that Deplete the Ozone Layer, 1989	1993	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone depleting substances.
Basel Convention, 1989	2015	The Convention regulates the trans boundary movements of hazardous wastes and provides obligations to its parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.
United Nations Framework Convention on Climate Change (UNFCCC), New York, 1992 and Kyoto Protocol 1997	1995 and 2005	Provide a framework for intergovernmental efforts to tackle climate change. Recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases.
Convention on Biological Diversity, Rio de Janeiro, 1992	1994	Aims to promote national policies for the conservation of wild flora, fauna and habitat that needs to be included in planning policies. The three main goals are: (1) the conservation of the biological diversity; (2) the sustainable use of its components; (3) fair and equitable sharing of the benefits.
Asia Least Cost Greenhouse Gas Abatement Strategy (1998 ALGAS)	1998	Develop national and regional capacity for preparation of GHG inventories. Assist in identifying GHG abatement options and preparation of a portfolio of abatement projects for each country.
United Nations Agenda 21	1997	Formed by the National Commission for Environmental Affairs (NCEA) in Myanmar. Provides a framework of programmes and actions for achieving sustainable development in the country. Building on the National Environment Policy of Myanmar, takes into account principles contained

		in the Global Agenda 21. Myanmar Agenda 21 also aims at strengthening and promoting systematic environmental management in the country.
Relevant ILO Conventions in force in Myanmar • C1 Hours of Work (Industry) • C14 Weekly Rest (Industry) • C17 Workmen's Compensation (Accidents) • C19 Equality of Treatment (Accident Compensation) • C26 Minimum Wage Fixing Machinery • C29 Forced Labour Convention • C42 Workmen's Compensation (Occupational Diseases) Revised 1934 • C52 Holidays with Pay • C87 Freedom of Association and Protection of the Right to Organize		Sets out legal instruments drawn up by the ILO's constituents (governments, employers and workers) and setting out basic principles and rights for workers. Sets out legal instruments drawn up by the ILO's constituents (governments, employers and workers) and setting out basic principles and rights for workers.

3.5. National and International Guidelines for Proposed Project

National Guidelines and Internal standard guidelines are referred for Environmental Management Plan of the proposed project.

1. Environmental Impact Assessment Procedure (2015)
2. National Environmental Quality (Emission) Guidelines (2015)
3. World Health Organization Guidelines (WHO)
4. National Ambient Air Quality Standard (NAAQS), USEPA
5. IFC Guidelines for Waste Management Facilities, 2007
6. IFC Guidelines for Water and Sanitation, 2007
7. IFC Guidelines for Community Health and Safety
8. IFC Guidelines for Occupational Health and Safety

3.5.1. National Environmental Quality (Emissions) Guidelines for Proposed Project

(i) Air Emissions

Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that: (i) emission do not result in concentrations that reach or exceed national ambient quality guidelines and standards, or in their absence current World Health Organization (WHO) Air Quality Guidelines for the most common pollutants as summarized below; and (ii) emissions do not contribute a significant portion to the attainment of relevant ambient air quality guideline or standards (i.e. not exceeding 25 percent of the applicable air quality standards) to allow additional, future sustainable development in the same air shed. Industry-specific guidelines summarized hereinafter shall be applied by all projects to ensure that air emissions conform to good industry practice. Reference should be made to WHO's Air Quality Guidelines for air pollutants not included in the following table.

Table – Air Emission Guideline in NEQG

Parameter	Averaging Period	Guideline Value μ g/m3
Nitrogen dioxide	1-year 1-hour	40 200
Ozone	8-hour daily maximum	100
Particulate matter PM_{10} [a]	1-year 24-hour	20 50
Particulate matter $PM_{2.5}$ [b]	1-year 24-hour	10 25
Sulfur dioxide	24-hour 10-minute	20 500

[a] Particulate matter 10 micrometers or less in diameter

[b] Particulate matter 2.5 micrometers or less in diameter

The following small-combustion facilities emission, guideline applies to project systems designed to deliver electrical or mechanical power, steam, heat or any combination of these, regardless of fuel type, with a total, rated heat input capacity of 3-50 megawatt thermal. The industry-specific. Thermal power guideline applies to larger facilities exceeding 50 megawatt generation.

Combustion Technology/ Fuel	Particulate matter PM_{10}[a]	Sulfur Dioxide	Nitrogen Oxides
Gas	-	-	200[b] mg/Nm^3[c] 400[d] mg/Nm^3 1600[e] mg/Nm^3
Liquid	100	3%	1600 – 1850[f] mg/Nm^3

Natural gas (3-<15 MW[g])	-	-	90[h] mg/Nm^3 210[i] mg/Nm^3
Natural gas (15-<50 MW)	-	-	50 mg/Nm^3
Fuels other that natural gas (3-<15 MW)	-	0.5% sulfur	200[h] mg/Nm^3 310[i] mg/Nm^3
Fuels other that natural gas (15-<50 MW)	-	0.5% sulfur	150 mg/Nm^3
Gas	-	-	320 mg/Nm^3
Liquid	150 mg/Nm^3	2000 mg/Nm^3	460 mg/Nm^3
Solid[j]	150 mg/Nm^3	2000 mg/Nm^3	650 mg/Nm^3

[a] Particulate matter 10 micrometers or less in diameter, [b] Spark ignition, [c] Milligrams per normal cubic meter at specified temperature and pressure, [d] dual fuel, [e] compression ignition, [f] Higher value applies if bore size>400mm, [g] Megawatt, [h] Electric generation, [i] mechanical drive, [j] Includes biomass

(ii) Wastewater (Operation)

Industry-specific guidelines apply during the operations phase of the projects and cover direct or indirect discharge of wastewater to the environment. They are also applicable to industrial discharges to sanitary (domestic) sewers that discharge to the environment without any treatment. Wastewater generated from project operations includes process wastewater, wastewater from utility operations, runoff from process and storage areas, and miscellaneous activities including wastewater from laboratories, and equipment maintenance shops. Projects with the potential to generate process wastewater, sanitary sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety or the environment. Industry-specific guidelines summarized hereinafter shall be applied by all projects, where applicable, to ensure that effluent emissions conform to good industry practice. For project types where industry-specific guidelines are not set out in these Guidelines, the following general guideline values, or as stipulated on a case-by-case basis, apply during project operations.

Table - Wastewater, Storm Water Runoff, Effluent and Sanitary Discharges (general Application)

Parameter	Unit	Guideline Value
5-day Biochemical oxygen demand	mg/l	50
Ammonia	mg/l	10
Arsenic	mg/l	0.1
Cadmium	mg/l	0.1
Chemical oxygen demand	mg/l	250
Chlorine (total residue)	mg/l	0.2
Chromium (hexavalent)	mg/l	0.1
Chromium (total)	mg/l	0.5
Copper	mg/l	0.1

Cyanide (free)	mg/l	0.1
Cyanide (total)	mg/l	1
Fluoride	mg/l	20
Heavy metals (total)	mg/l	10
Iron	mg/l	3.5
Lead	mg/l	0.1
Mercury	mg/l	0.01
Nickel	mg/l	0.5
Oil and Grease	mg/l	10
pH	S.U.[a]	6-9
Phenols	mg/l	0.5
Selenium	mg/l	0.1
Silver	mg/l	0.5
Sulphide	mg/l	1
Temperature increase	˚C	<3[b]
Total coliform bacteria	100 ml	400
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50
Zinc	mg/l	2

[a]Standard unit

[b]At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity; when the zone is not defined, use 100 meters from the point of discharge.

Wastewater (Construction)

In addition to general and industry-specific wastewater guidelines applicable during project operations, the following guideline values apply during the construction phase of projects, covering storm water or surface water, and sanitary wastewater discharges from all project sites.

Table - Site Runoff and Wastewater Discharges (construction phase)

Parameter	Unit	Maximum Concentration
Biological oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	125
Oil and grease	mg/l	10
pH	S.U.[a]	6-9
Total coliform bacteria[4]	100 ml	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

[4]Coliforms refer to a group of bacteria which are found in the intestines of warm-blooded animals and therefore are present in sewage, and on / in soils, surface waters and vegetation. Total coliforms are used as an indicator organism which, although by itself is not considered to cause diseases in man or animals, usually indicates the presence of pathogenic or disease-causing organisms.

(iii) Noise Quality Guideline

Noise prevention and mitigation measures should be taken by all projects where predicted or measured noise impacts from a project facility or operation exceed the applicable noise level guideline at the most sensitive point of reception. Noise impacts should not exceed the levels shown below, or result in a maximum increase in background levels of three decibels at the nearest receptor location off-site.

Table – Noise Levels set in NEQG

Receptor	One Hour LAeq (dBA)[a]	
	Daytime 07:00 - 22:00 (10:00 - 22:00 for Public holidays)	Nighttime 22:00 - 07:00 (22:00 - 10:00 for public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

[a] *Equivalent continuous sound level in decibels*

(iv) National Water Quality Guideline

Table - Proposed National Drinking Water Quality Standard, Myanmar (2014)

Parameter	Unit	Maximum Permissible Limit
TCU (True Color Unit)	Pt.Co	20
Turbidity (NTU-Nephelometric Turbidity Unit)	NTU	5
Total Dissolved Solvents (TDS)	mg/l	1000
Chloride	mg/l	250
Total Hardness (as $CaCO_3$)	mg/l	500
Iron	mg/l	1
pH	mg/l	6.5-8.5
Sulphate	mg/l	400
Calcium	mg/l	200
Magnesium	mg/l	150
Electrical Conductivity	µs/cm	1500

3.5.2. International Environmental Quality Guidelines for Proposed Project

(a) Air Quality (WHO and NAAQS)

Table - WHO Air Quality Guideline Values

Pollutants	Averaging Period	WHO 2021 Air Quality Guideline		
PM 2.5 (µg/m³)	Annual	5		

	24-hour	15		
PM10 (µg/m³)	Annual	15		
	24-hour	45		
O3 (µg/m³)	Peak Season	60		
	8-hour	100		
NO2 (µg/m³)	Annual	10	0.005ppm	5ppb
	24-hour	25	0.013ppm	13ppb
	1-hour	200	0.106ppm	106ppb
SO2 (µg/m³)	24-hour	40	0.015ppm	
	10-minute	500	0.191ppm	
CO (mg/ m³)	24-hour	4		
	8-hour	10	8.729ppm	
	1-hour	35		
	15-minute	100		

Table - National Ambient Air Quality Standards (NAAQS), USEPA

Pollutants	Averaging Period	Guideline Value (µg/m³, ppm, ppb)
Carbon Monoxide	1-hour 8-hours	9 ppm 35 ppm
Nitrogen dioxide	1-hour 1-year	100 ppb 53 ppb
Ozone	8-hour daily maximum	0.070 ppm
Particulate matter PM_{10}[a]	24-hours	150 µg/m³
Particulate matter $PM_{2.5}$[b]	1-year 24-hour	15 µg/m³ 35 µg/m³
Sulfur dioxide	1-hour 3-hours	75 ppb 0.5 ppm

(b) IFC Guidelines for Waste Management Facilities, 2007

Section 1.0 Industry-Specific Impacts and Management

Section 2.0 Performance Indicators and Industry Benchmarks

(c) IFC Guidelines for Water and Sanitation, 2007

Section 1.0 Industry-Specific Impacts and Management

Section 2.0 Performance Indicators and Industry Benchmarks

(d) IFC Guidelines for Community Health and Safety

Section 3.0 Community Health and Safety

(e) IFC General EHS Guideline

Section 2.0 Occupational Health and Safety

3.6. Project's Environmental, Social and Health Policies

Based on IFC' Policy on Environmental and Social Responsibility, the main policy and commitment of Da Hua (Myanmar) can be identified in the following points:

- The protection of public safety, the health and safety of the workforce and the local communities
- The protection and promotion of human rights, the economic and social development of local communities
- The protection of the environment and the conservation of biodiversity and ecosystems
- The continuous improvement of the quality of the processes, services and products of our activities and operations
- Visible and active leadership that promotes HSE excellence, which engages and motivates employees and contractors alike to succeed
- Setting objectives and targets for measuring and improving HSE performance in line with Company activities and strategic objectives
- Manage HSE in order to achieve our objective of incident free operations
- Implementing sustainable development principles in our activities
- Seek and achieve continuous improvement in our processes, consistent with our strategic objectives and priorities, by adopting the most advanced systems for environmental protection and energy efficiency
- Creating a culture in which Da Hua employees, Contractors and Visitors share these commitments and understand that working safely is a condition of employment.

3.6.1. Sustainability Policy

Da Hua's sustainability model is "To operate in a sustainable manner means to create value for stakeholders, and to use resources so that the needs of future generations will not be compromised, respecting people, the environment and the society as a whole." Da Hua adheres to a sustainability policy, which is composed of the following principles:

- *Stakeholder relations* – "Engaging stakeholders and involving them in company's business are both prerequisites for sustainability and for the construction of reciprocal value."
- *Human Rights* – "The respect of Human Rights represents the basis for an inclusive growth of societies, of the territories and, consequently, of the companies that work there."

- *Relations with communities and contribution to local development* – "Dialogue, the respect of local communities, the evaluation of impacts are all preconditions for an effective cooperation, targeted at creating territorial value."
- *Climate strategy* – "To satisfy the world's energy demand, by containing, at the same time, emissions of gases that have an impact on climatic change, is one of the greatest challenges of modern society."

Da Hua will fully implement the EMP, all Project commitments, and conditions, and is liable to ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, mitigation measures, and plans that have been presented in EIA report.

Pre-Construction Phase and Construction Phase	
• Take responsibility to support after discussion for the impacted people to ensure for their stable livelihood not lower than before the project. • It is promised that the materials required for the proposed project will be obtained from organizations with environmental compliance. • Give priorities for the occupational health and safety of the workers. • All the required resources are obtained by tendering and local resources are prioritized to be used.	
Operation Phase	
• Take responsibility for all of the works and absence of the officers and representatives of the company in operating the processes. • Utilize the exact amount of fund as stated in proposed expenditure for cooperate social responsibility funds. • Give priorities for the occupational health and safety of the workers. • Take responsibility for all the environmental impacts that can cause by the usage of the boiler and other chemical used for the production purposes.	
Compliance and Responsibility	• Comply with the commitments of the environmental and socio-economic development revealed in this report. • Acknowledge and comply the laws, regulations and guidelines associated with the project, included in the report. • Comply and proceed the alternative methods, mitigation measures and monitoring plans included in the report for the reduction of the negative environmental impacts; and take responsibility for the environmental impacts due to non-compliance of the commitment. • This environmental impact assessment (scoping) is accurate and complete. • This scoping report has been prepared in strict compliance with applicable laws including the TOR for the EIA • There is no international lone in this project and if there is need to carry out with international lone, the project developer will comply with its environmental policy.

Internal Compliance Team	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has its own dedicated Internal Compliance team having a Compliance Manager who is under the direct supervision of Managing Director. All the Compliance Officers are well educated in Local labor Law, Company law, as well as Environmental Law. They are also trained in Wages and Benefit policy, Health & Safety policy. The compliance officers conduct daily routine check of the factory and report to the Managing Director through the Compliance Manager. Compliance Manager is involved in Conducting Training Programs for workers on Compliance Issues for Social Compliance.
Recruitment Policy	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has a written Recruitment Policy. All Recruits are above 18 years of age. It has a strong Recruitment committee, where the Recruitment committee directly takes part to recruit the workers and staffs considering the age first then experiences and skills
Record Policy	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory maintains Personal File for all workers and staffs with their full Bio-data and necessary particulars. The factory always arranges Attendance Card, makes record of Working Hour, Salary Statement, Leave Record, Disciplinary Action, etc.
Forced Labor	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has no any practice of use forced labor, whether in the form of prison labor, indentured labor, bonded labor or otherwise
Child Labor	No person is employed here at an age younger than 18 or younger than the age for completing a certain level of education in Myanmar where such age is higher than 18.
Health and Safety	Health and Safety, Da Hua (Myanmar) Company's Polyester Staple Fiber Factory provides a safe and healthy working environment to prevent accidents and injury to health arising out of, linked with, or occurring in the course of work or as a result of the operation of employer facilities. I-IN believes that in a sound work place workers can give their best output to reach at the goal.
Freedom of Association and Collective Bargaining	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory Management recognizes and Association and respects the right of employees to freedom of Collective.
Wages and Benefits	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory Management also recognizes that wages are essential to meeting employees' basic needs. , So The Company pays employees, as a Company Floor, at least the minimum wage required by our local law in Myanmar prevailing industry wage whichever is higher, and always provides legally mandated benefits. Wages and overtime charges are paid within the 7th of the following month. Da Hua (Myanmar) Company's Polyester Staple Fiber Factory pays 4800 mmk (minimum) wages as the monthly Minimum Salary to a new worker.
Hours of Work	Except in extraordinary business circumstances, employees are (i) not Required to work more than the lesser of (a) 48 hours per week and 12 hours overtime or (b) the limits on regular and overtime hours allowed by the law of Myanmar, and (ii) are entitled to at least one day off in

	every seven day period.
Overtime Compensation	Workers are compensated for regular and overtime hours in accordance with local law.
Leave & other Facilities	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory provides all kinds of leave benefits to its worker as HN treats all the workers as its valuable asset. Maternity Leave Benefits, Two festival Bonus, Yearly increment of Monthly Salary, Attendance Bonus, and Financial supports to all employees in accordance with the recommendations by the Social Welfare Committee.
Health & Hygiene	The Factory is lighted well with sufficient Tube lights, natural flow of air. All floors are well ventilated and well furnished with sufficient hygienic toilets. Toilets are cleaned and well maintained with detergent, liquid toilet cleaner and ESIA Report for Da Hua (Myanmar) Company Limited's Polyester Staple Fibre Manufacturing Factory flashing with sufficient quantity of tap water. Workers are provided with pure & safe drinking water.
Doctor' Room/ Medical Center	Considering the provision of health care facility to our workers' and staffs under the prevailing labor act, Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has a complete dispensary supported by a Medical Officer trained in medicine and gynecology and one trained nurses. Necessary First Aid, along with supply of emergency medicines provided at free of cost from this dispensary. In the case of long term treatments of any worker, Da Hua (Myanmar) Company's Polyester Staple Fiber Factory takes the patient to a better hospital. Under the circumstances the authority takes necessary steps to provide full course of treatment. Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has a standby vehicle and all time ready for service to our workers.
Dining Hall	Dining hall is situated at beside factory compound and engaged to maintain a hygienic environment taking necessary measures. All workers can sit at a time to take their lunch
Recreational Facilities	We arrange an annual picnic or special feast for the workers every year on our Myanmar New Year's Day. All workers and staffs enjoy and celebrate the day with a festive mood. In the evening they participate in a cultural event.
Safety Facilities/ Fire Fighting	The Factory has Three spacious exits on each opposite side. The Factory is also staged with full range of Firefighting equipment. Aisles are properly marked and are kept clear at all time to easily move. Fire drills are conducted every month. Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has its own trained designated Firefighting team, First Aid, and Rescue team who can be easily distinguished by their uniform. Beside this 40% of work forces are trained on how to operate fire extinguishers.
Machine Guarding	All machines are equipped with safety guarding, Eye guard, Pulley guard and Belt Cover etc.
Personal Protective Equipment	Da Hua (Myanmar) Company's Polyester Staple Fiber Factory provides Personal Protective (PPE) such as Metallic Hand gloves, Equipment Masks for all workers, Nose mask & Goggles, Mask for relevant machine operators.

Power House	To overcome the effects of the irregular and insufficient power supply system of our country, Da Hua (Myanmar) Company's Polyester Staple Fiber Factory has set up a complete power supply unit to keep its production running. Fuel generator units have been set up for this purpose.
Workplace Temperature	Entire floors are well ventilated by installing sufficient number of air circulation devises. Workers can work in cool atmosphere

3.7. Statement of Commitments

The followings are the commitments of the project developer and environmental assessment practitioner.

3.7.1. Commitments of Project Developer

We (Da Hua) will commit the following.

Phase	Commitments of Project Developer
Pre-construction Phase	• Not to damage to the nearest local people due to site clearing and earth working • Take responsibility to support after discussion for the impacted people to ensure for their stable livelihood not lower than before the project. • Give priorities for the occupational health and safety of the workers.
Construction Phase	• It is promised that the materials required for the proposed project will be obtained from organizations with environmental compliance. • Take responsibility for all of the workers and absence of the contractors, sub-contractors, officers and representatives of the company in operating the processes. • Give priorities for the occupational health and safety of the workers. • At least 50% of local people will be used as worker required for the construction phase. • All the required resources are obtained by tendering and local resources are prioritized to be used.
Operation Phase	• Utilize the exact amount of fund as stated in proposed expenditure for cooperate social responsibility funds. • Take responsibility for all the environmental impacts that can cause by the operation of boiler, disposal of wastewater, operation of auxillary generator and transporation activities.
Decommissioning and mine closure	• The demolitions of the buildings and facilities will be done not to damage to the surrounding environment.
Overall Commitments	• Comply with the commitments of the environmental and social-economic development revealed in the Environmental Impact Assessment report.

	• Acknowledge and comply the laws, regulations and guidelines associated with the project, included in the report. • Comply and proceed the alternative methods, mitigation measures and monitoring plans included in the report for the reduction of the negative environmental impacts; and take responsibility for the environment impacts due to non-compliance of the commitment. • This environmental impact assessment is accurate and complete. • This EIA has been prepared in strict compliance with applicable laws including this procedure and with the TOR for the EIA • Comply fully with the commitments, mitigation measures, and plans in the EIA report. • There is no international lone in this project and if there is needed to carry out with international lone, the project developer will comply with its environmental policy.

Moreover, Da Hua will commit the following sections in EIA report.

Summary of Commitments	No.	Clear Statement of Commitment	Chapter Reference
Collection of Data	2.8	Data collection in this IEE study has been conducted and complied in accordance with Chapter 1.8.	Chapter 2
Legal Frameworks	3.3, 3.4	The project developer will undertake to implement the project in compliance with the laws and regulations related to the project which has been mentioned in Chapter 3.3 and 3.4 of the report.	Chapter 3
National and International Standards and Guidelines	3.5	The project developer will undertake to implement the project in compliance with the National and International guidelines mentioned in Chapter 3.5 of the report.	Chapter 3
Description of the Project	4.0	The project developer affirms that all the descriptions and activities of the project provided in Chapter 4 are accurate and true.	Chapter 4
Description of the Surrounding Environment	5.0	All the primary and secondary data described in Chapter 5 of the report are affirmed to be accurate and true and the baseline data in that chapter were indeed conducted and measured.	Chapter 5
Risk Assessment and Mitigation Measures	6.9	The project developer will adhere to implement the mitigation measures for occupational safety and natural disaster outlined in Chapter 6.5 of the report.	Chapter 6
Cumulative Impacts and Mitigation Measures	7.2	The project developer will adhere to implement the mitigation measures for cumulative impacts outlined in Chapter 7.1 of the report.	Chapter 7

Residual Impacts and Mitigation Measures	7.3	The project developer will adhere to implement the mitigation measures for residual impacts outlined in Chapter 7.3 of the report.	Chapter 7
Environmental Impacts and Mitigation Measures	8.1	The project developer acknowledges the environmental impacts and pledge to implement the mitigation measures outlined in the report.	Chapter 8
Environmental Monitoring Plan	8.1.1	The project developer will adhere to implement the environmental monitoring plans outlined in Chapter 8.1.1 of the report.	Chapter 8
Management and Monitoring Sub - Plans	8.8	The project developer will adhere to implement the environmental management and monitoring sub plans outlined in Chapter 8.8 of the report.	Chapter 8
Community Development Plan	8.8.5	The community development activities described in the report have been indeed undertaken by the project developer and pledge to allocate at least 2 percent of the annual net profit after tax as CSR fund.	Chapter 8
Household Surveys	9.2.2	The apprehensions and needs of the local people will be addressed and the project will be implemented in alignment with the preferences of the community.	Chapter 9
Conclusion	10.0	The project developer will prioritize and implement with the aspects discussed at the conclusion of the report.	Chapter 10

(Signature)

Name -

Occupation -

3.7.2. Commitments of the Environmental Assessment Practitioner

The proposed EIA report was designed in accordance with the environmental conservation law and environmental impact assessment procedures. All facts including in this report are systematically surveyed without bias. As a third party, we commit and take full responsibility for all of the factors described in this report. In addition, the commitments of the environmental assessment practitioner are described below.

Name	Article No.	Commitment	Chapter
Executive Summary	1.1 to 1.10	EGT commits the summaries according to the chapters of the environmental management plan have been selected and presented without omission.	Chapter 1
Description of the Project Background	2.1, 2.3, 2.6, 2.7, 2.8	EGT commits the description of the project background and information related to the third-party are correct and accurate.	Chapter 2
Policy, Legal and Other Requirements	3.3, 3.4, 3.5	EGT commits laws and regulations related to the proposed project, international agreements and conventions and national and international guidelines have been carefully chosen.	Chapter 3
Project Description	4.4, 4.5, 4.9, 4.11, 4.12	EGT commit the project description and project activities, operation process for the factory and waste management system will be accurately performed during the operation of the project.	Chapter 4
Description of Surrounding Environment	5.8, 5.9, 5.10, 5.11, 5.12	EGT commits the air, water and soil monitoring quality, biodiversity conditions, socio-economic conditions, traffic study and cultural heritage near the project area described in chapter 5 of the report are the actual onsite data of the proposed project.	Chapter 5
Environmental Impacts and Mitigation Measures	6.4, 6.5, 6.6, 6.7	EGT commits the anticipated environmental impacts and mitigation measures during the pre-construction, construction, operation and decommissioning phases without bias.	Chapter 6
Anticipated Residual and Cumulative Impacts	7.1, 7.2	EGT commits the systematic analysis of residual and cumulative impacts that may occur due to the operation of the factory.	Chapter 7
Environmental Management	8.1, 8.2, 8.3	EGT commits all of the factors are correct in the environmental	Chapter 8

Plan		management plan, environmental monitoring plan, occupational safety and health plan, risk management plan, monitoring sub-plans and community development plan.	
Public Participation Process	9.4, 9.5, 9.6	EGT commits the public participation processes, households survey within the project affected area, public concerns and socio-economic information was correctly conducted.	Chapter 9
Conclusion	10.0	EGT commits the conclusion of the EMP is the correct consideration about the feasibility of the project.	Chapter 10

3.8. Penalties and other Administrative Punishment

The developer must know the penalties and other administrative punishment granted as EIA Procedures in Myanmar.

No.	Non-Compliance	Penalties	Specific Administrative Punishment of the Ministry
1.	Failure or delay in timely submission of reports within Period prescribed by Ministry	100 to 500 US$ or equivalent Myanmar Kyat + 10-25 US$/ day unit cured or equivalent Myanmar Kyat	-Issue Enforcement Notice
2.	Obstruction or interference with an official in the course of their duties	250 to 5,000 US$ or equivalent Myanmar Kyat	-Issue Enforcement Notice -Criminal prosecution
3.	Failure to provide information to the Ministry or any representative	1,000 to 5,000 US$ or equivalent Myanmar Kyat	-Suspension of Approval of EMP, EMP-CP, EMP-OP in whole or in part
4.	Failure to provide information to the Ministry Inspector or any representative when requested in regard to inspection and monitoring	250 to 5,000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice
5.	Undertaking or allowing any preparatory or other construction works without the prior approval by the Ministry of a reserved EMP or EMP-CP	1,000 to 5,000 US$ or equivalent Myanmar Kyat +50 to 500 US$/ day until cured or equivalent Myanmar Kyat	-Criminal prosecution
6.	Operating/implementing without a permit, or approval by the Ministry of an EMP or EMP-Op	1,000 to 5,000 US$ or equivalent Myanmar Kyat +50 to 500 US$/ day unit cured or equivalent Myanmar Kyat	- Criminal prosecution
7.	Non-compliance with an Enforcement Notice or Suspension Notice issued by the Ministry	2,000 to 10,000 US$ or equivalent Myanmar Kyat +100-500 US$/day unit cured or equivalent Myanmar Kyat	-Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
8.	Failure to notify to the Ministry of any knowledge of any event of an imminent of Environmental damage	1,000 to 5,000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part

9.	Failure to take reasonable steps to prevent an imminent thread of damage to the Environment, social, human health, livelihoods, or property, where application based on the EMP, EMP-CP or EMP-OP	2,500 to 10,000 US$ or equivalent Myanmar Kyat	-Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
10.	Non-compliance with conditions in 'the ECC and allowable Emission Limit Values	1,000 to 10,000 US$ or equivalent Myanmar Kyat	-Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
11.	Failure to take pay compensation amounts required in respected in respect of social impacts	1,000 to 10,000 US$ or equivalent Myanmar Kyat	-Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
12.	Failure to fully restore social conditions upon resettlement	1,000 to 10,000 US$ or equivalent Myanmar Kyat	-Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP or EMP-OP in whole or in part -Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part

Notes:

1. All penalty amounts set forth in this Annex are denominated in United States Dollars (US$) and are subject to annual inflation adjustment.
2. Abbreviations are as follows;

   EMP = Environmental Management Plan

   EMP-CP = Environmental Management Plan – Construction Phase ,

   EMP-OP = Environmental Management Plan –Operational Phase

4.0. PROJECT DESCRIPTION AND ALTERNATIVE SELECTION

Da Hua (Myanmar) Company Limited is manufacturing three types of products, one of which is polyester staple fiber which can be used as silicone fibers for various purposes. The other ones are PET packing tape which can be used as ropes for packing purposes and PE/PP recycle pellets. PSF will be produced by processing PET bottles (such as water bottles, oil and other plastic bottles) as raw materials. PET Packing Tape and PE/PP Recycle Pellets are produced from lids of the plastic bottles. Among these three products, PSF will be produced in PSF Factory (Factory No.2). The followings are the description of the proposed projects.

4.1. Project Location

As Da Hua Myanmar Company Limited runs two factories for three products, there are two locations for both productions. PSF factory (Factory 1) is located in Block 209 & 238, Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Division at the coordinates of 17°10’ 3.42” N Latitude and 95° 58’ 41.68” E Longitude. PPPT Factory (Factory No 2) is located in Block (375 to 381), Myaung Dagar Steel Industrial Zone at the coordinates of Latitude 17° 9'35.37"N, Longitude 95°59'4.10"E. The distance between 2 factories is 0.9km (900m). Project target sites are situated at 1km and above from the Yangon-Pyay Expressway. The location maps of project area are shown in the following figures.

Location	Coordinates	
	Latitude	Longitude
PPPT Factory	17° 9'35.37"N	95°59'4.10"E
PSF Factory	17°10'3.42"N	95°58'41.68"E
Myaung Dagar	17°10'40.13"N	95°58'39.24"E
Hmawbi	17° 9'59.11"N	95°59'35.36"E
Taik Kyi	17°17'45.12"N	95°58'26.56"E
Htauk Kyant	17° 2'35.07"N	96° 7'57.36"E

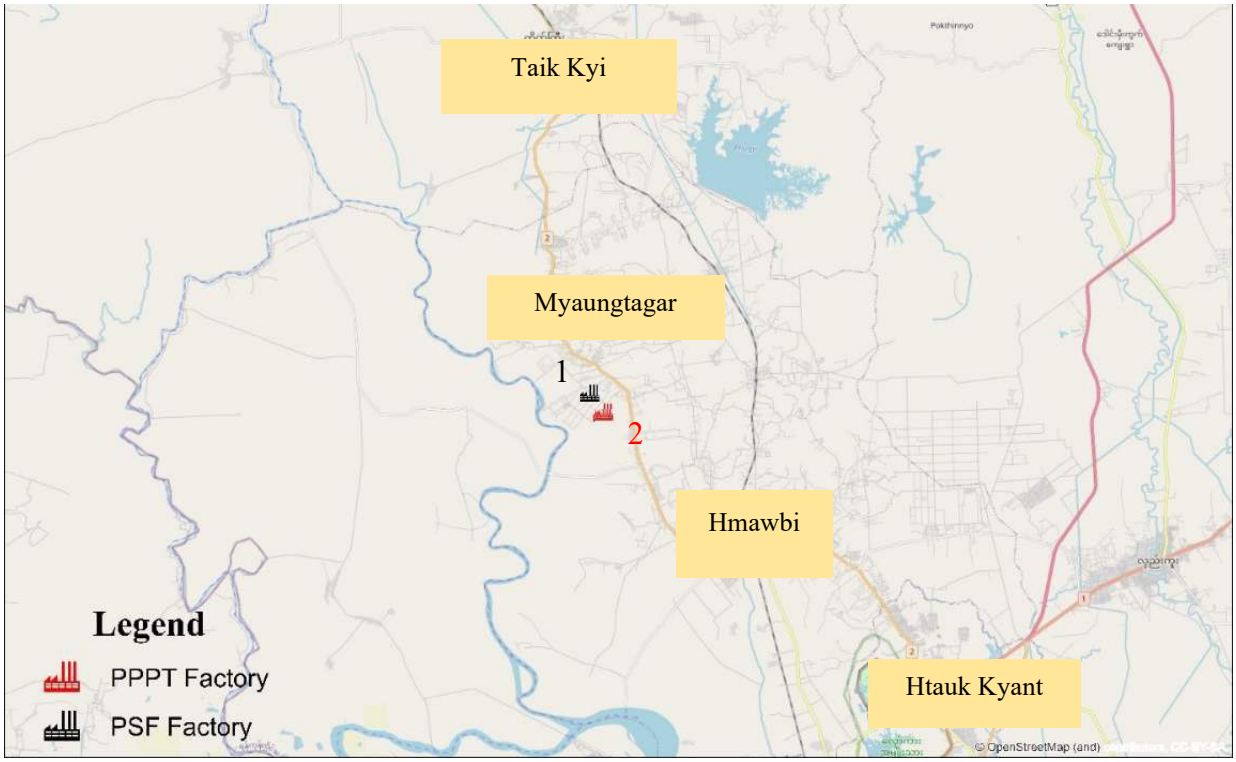


Figure 4.1- Location Map of Project Area

Figure 4.2- Distance between Two Factories

4.2. Project Boundary Map, Layout and Drainage System

The main building in Da Hua (Myanmar) PSF Factory (Factory No 1) is 800’ x 120’ and total factory area is 4.004 acres of land. Using 60 tons/day of used PET bottles as raw material and produces 40 tons/day of Polyester Staple fiber. PPPT Factory (Factory No 2) is 8.667 acres.

Figure 4.3 – Boundary Map of Factory 1 (PSF Factory)

Figure 4.4 – Boundary Map of Factory 2 (PPPT Factory)

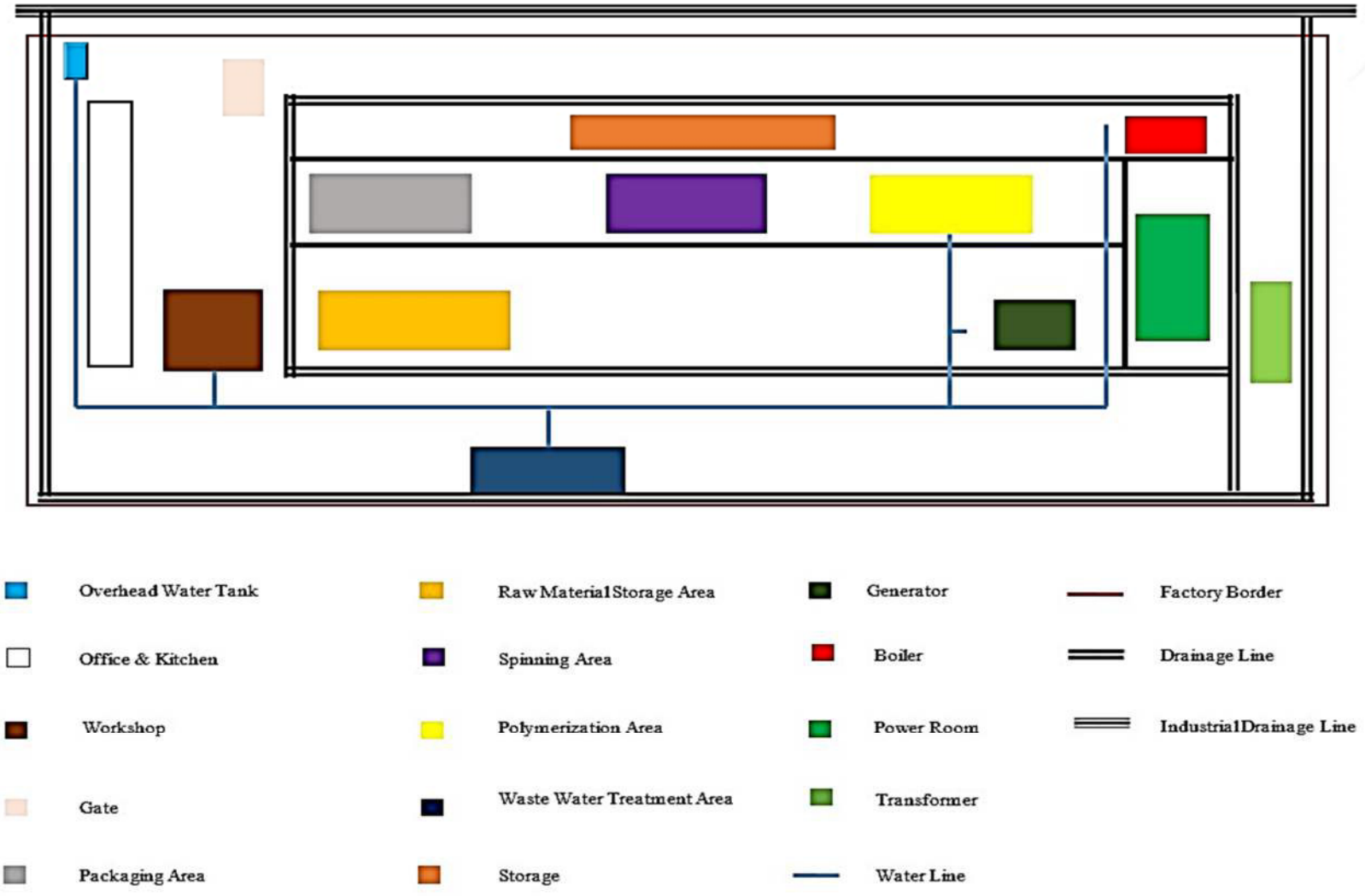


Figure 4.5 – Site Layout Map and Drainage System for PSF Factory (Factory 1)

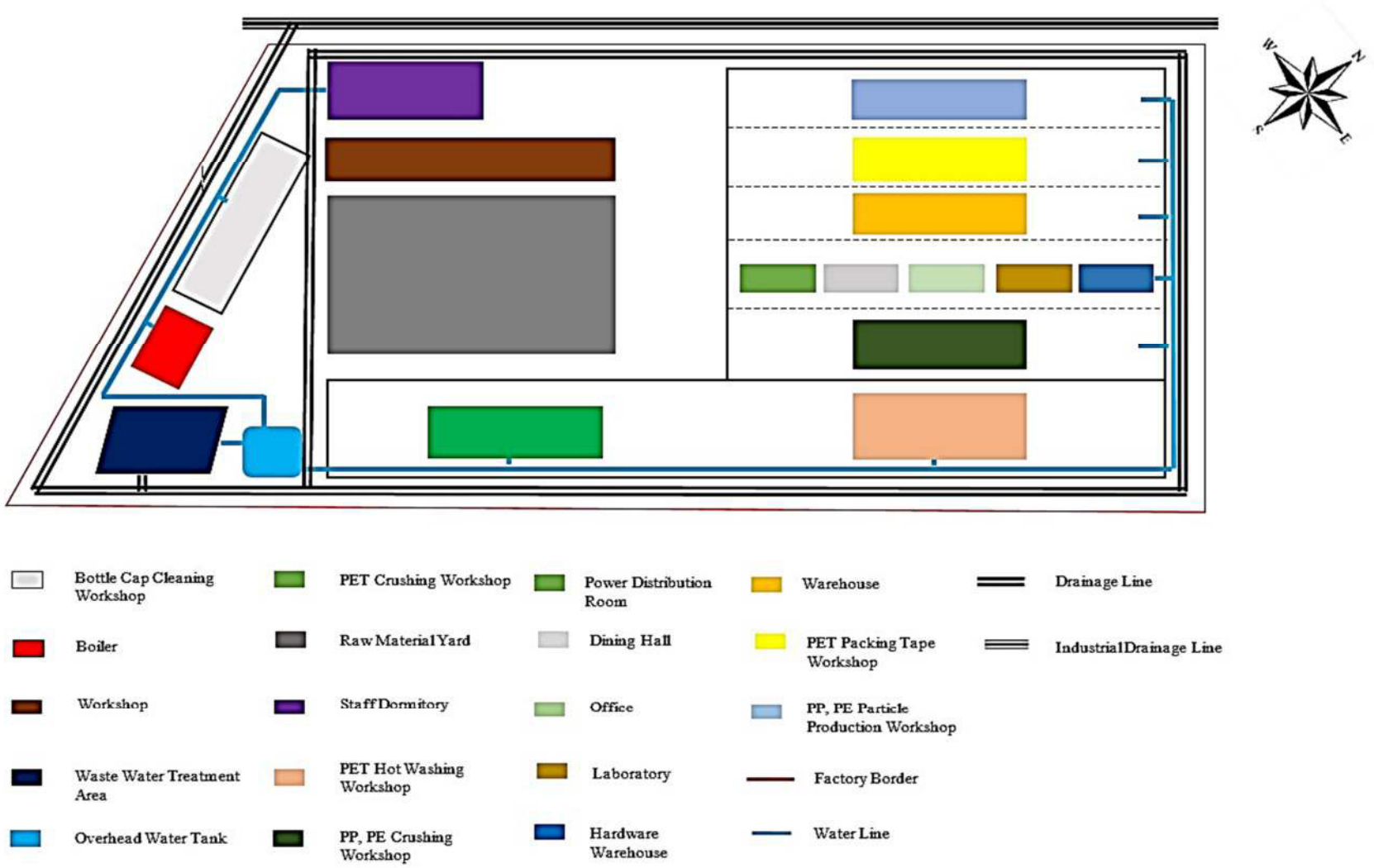


Figure 4.6 – Site Layout Map and Drainage System for PPPT Factory (Factory 2)

4.3. Vicinities around the Proposed Project

The nearest local resident is Myaung Dagar Village. The vicinities around the proposed project are shown in the following table. However, it does not mean that all of the sensitive areas can be affected by the proposed project and the table just shows the nearest sensitive areas.

No.	Vicinity	Description	Distance from factory 1	Distance from factory 2
1.	Nearest Public Residents	Kan Ka Lay Village	1.44 km	1.03 km
2.	Nearest Water Body	Hlaing River	1.85 km	1.88 km
3.	Nearest Densely Populated Area	Myaung Dagar	1.13 km	2.11 km
4.	Nearest Road	Pyay Road	1.73 km	1.40 km
5.	Nearest Pagoda	Zi Na Marn Aung Pagoda	1.27 km	1.43 km
6.	Nearest Monastery	Kan Ka Lay Monastery	1.38 km	0.79 km
7.	Nearest Reserved Forest	Hmawbi Reserved forest	3.64 km	2.77 km

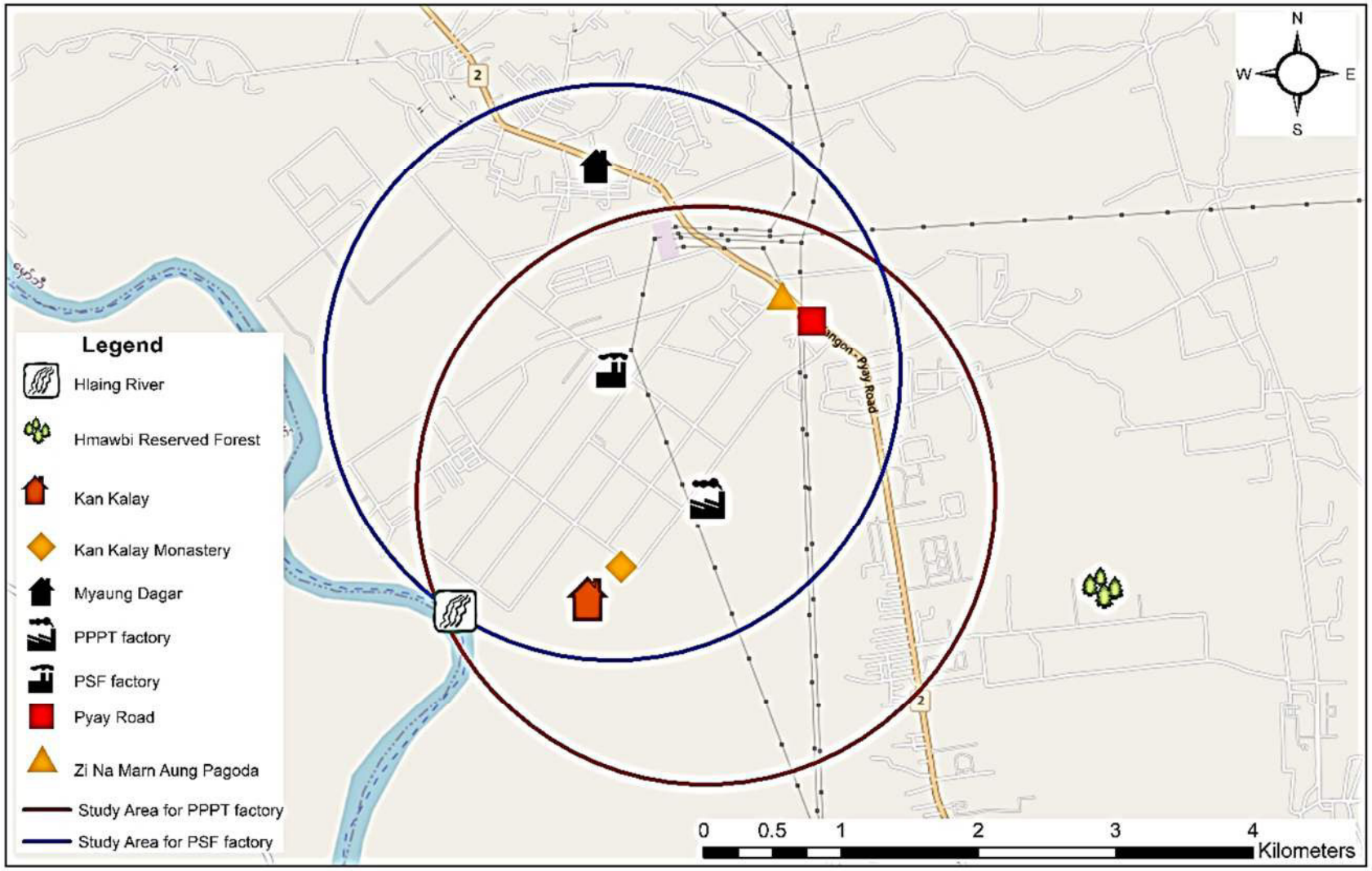


Figure 4.7 - Vicinity around the Proposed Project

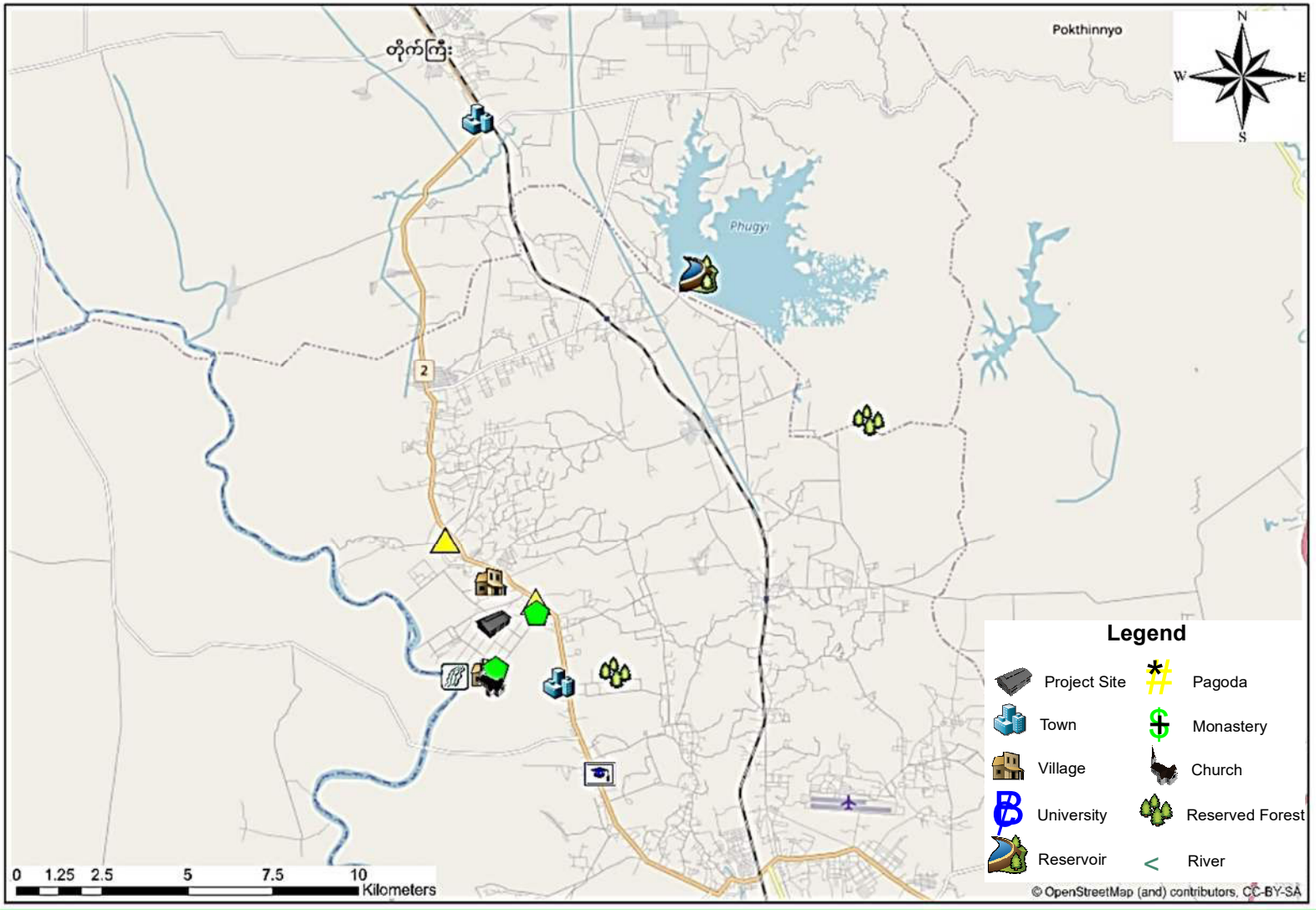


Figure 4.8 - Surrounding Environment of the Proposed Project

The distances from the Da Hua's Factory to the surrounding environment are shown in the following tables and figures.

Surrounding Environment	Factory	Distance (Km)
Taik Gyi	PSF Factory	14.20
	PPPT Factory	15.00
Kalar Kone	PSF Factory	1.59
	PPPT Factory	1.17
Myaungtagar	PSF Factory	1.13
	PPPT Factory	2.12
Kan Ka Lay	PSF Factory	1.45
	PPPT Factory	1.00
Phu Gyi Reservoir	PSF Factory	11.20
	PPPT Factory	11.60
Hlaing River	PSF Factory	1.94
	PPPT Factory	1.90
Zi Na Marn Aung Pagoda	PSF Factory	1.27
	PPPT Factory	1.45
Yar Pyae Buddhist Temple	PSF Factory	2.10
	PPPT Factory	3.16
Koe Taung Pyae Pagoda	PSF Factory	2.62
	PPPT Factory	3.70
Chan Aye Yeik Thar Monastery	PSF Factory	1.22
	PPPT Factory	1.19
Shwe Innwa Monastery	PSF Factory	2.46
	PPPT Factory	2.35
Dhamma Bar Na Ka Monastery	PSF Factory	2.10
	PPPT Factory	2.21
Ywar Oo Monastery	PSF Factory	1.39
	PPPT Factory	2.33
Migadawon Taw Ya Monastery	PSF Factory	2.51
	PPPT Factory	3.44
Htan Taw Monastery	PSF Factory	2.27
	PPPT Factory	3.34
Yay Lal Monastery	PSF Factory	2.30
	PPPT Factory	3.38
Hman Kyaung Dhamma Yeik Thar Monastery	PSF Factory	2.16
	PPPT Factory	3.23
Mya Thein Nar Monastery	PSF Factory	2.66
	PPPT Factory	3.74
Kan Ka Lay Monastery	PSF Factory	1.37
	PPPT Factory	0.79
Kan Ka Lay Baptist Church	PSF Factory	1.56
	PPPT Factory	1.00

Technological University, Hmawbi	PSF Factory	5.30
	PPPT Factory	4.23
Hmawbi Reserved Forest	PSF Factory	3.71
	PPPT Factory	2.81
Wanetchaung Reserved Forest	PSF Factory	11.90
	PPPT Factory	11.80

4.4. Project Development and Implementation Time Schedules

The proposed project is started in January, 2018 and the implementation schedule for the entire project are shown in the following table.

Phase	Implementation Schedule
Pre- construction Phase	2 months
Construction Phase	1 year
Operation Phase	20 years or more
Decommissioning Phase	1 year

4.5. Description of the Projects

4.5.1. Project at a Glance

As the proposed project has two factories; Factory No. 1 and Factory No.2. The following table shows the brief descriptions of the proposed factories.

Table 4.1. Brief of the Factory No.1

Aspects	Descriptions
Production	Polyester Staple Fiber
Production capacity	45 tons/day of Polyester Staple fiber
Total Project Area	4.004 acres for factory no.1
Domestic Water Demand	Approximately 1,500 gallons/day
Source of Process Water	Tube well water for industrial use and recycle water from the cooling of processing materials
Source Domestic Water	Artesian well water for domestic use
Source of Electrical Power	Myanma Electric Power Enterprise 33/0.4 KV, 2 transformers of (1000 KV)
Auxiliary Power Supply	One unit of 1,000 KVA Cummins, Open type, Diesel generator, One unit of 1,500 KVA Jiangsu silent type generators and One unit of 500 KVA, Stamford (UK) silent type generator
Power Consumption	2,000 units per day 50,000 units per month 600,000 units per year

Source of Water	Underground water has been produced by 2 x 4"Ø tube well from 300 feet aquifer. Underground water is being extracted from tube well with 10 gpm, and 600 gallons per hour. 12,000 gallons capacity ground tank and 3,000 gallons overhead tank has been already built.
Water Consumption	Estimated Water consumption is 550 gallons per day for boiler, 1,500 gallons per day for raw material washing section, 1,000 gallons per day domestic use for about 100 employees. Total daily estimated water consumption is 3,000 gallons. When CMP order is tight position, maximum 4,500 gallons or 20 m^3 of water may be required per day. Maximum requirement is 600 m^3 per month and 7200 m^3 (1,584,000 imperial gallons) annually. Currently Dahua (Myanmar) Polyester Staple fiber Factory has been purchased Cleaned PET chips as raw material instead of purchase used PET bottles. It is not necessary to use water at raw material washing section. It can be said; almost no industrial wastewater will be generated.
Raw Materials	Basic raw materials requirement for 60 tons as proposed, finished products production per day is minimum 45 tons. Silicon oil and PET detergent washing powder are imported. The estimated consumption is 15,000 kg of Silicon oil, 60,000 kg of spinning oil and 1,680,000 kg of scouring powder. For the wastewater treatment plant, Such Sodium hydroxide, Polyacrylamide, Polyaluminium Chloride are common used like as other factory and they can be easily purchased in local official agent, which have got RSL compliance by SGS. The usage of raw material (chemical) such as silicon oil, PET detergent washing powder (caustic soda) for 20 tons finished products (polyester staple fiber) : Daily Raw Material Requirement for 20 Ton Polyester Staple Fiber (Finished Products) of this report. They are stored in well cleaned, tidy, and systematic warehouse inside factory. (Already mentioned in Figure 8: Chemical warehouse)
Selling Final Product	Finished products by production are stored at finished product warehouse temporarily until the required quantity. When reaching up to required quantity, re-exporting program is commenced as procedure by sea freight. As planned by Da Hua Environmental Sci-Tech (HK) Limited, Mostly final finished products are exported to USA and China in these days (this year 2023)
Infrastructure	Build up Coverage, Main factory building (including washing room, generator, transformer, power, melting, boiler, finished product warehouse, spinning section, temporary warehouse), Residential components and office, Kitchen and Security building

Solid wastes	Being a recycling project, nearly 100% of the raw material will be reused in the manufacturing process. So, there will have no process waste during the operation phase generally. However, some unwanted solid waste such plastic pipe and rubber ring will be reused in manufacturing process or sell to recycler. Sand and soil particle during cleaning process will be reused in sand filling. Other industrial wastes (packing paper, packing tape etc.) will sell to recycler. Office wastes (tissues, paper, and some plastic materials) will sell to recycler. Dry and wet domestic wastes will be separated by different recycle bins and has been disposed to Myaung Dagar Industrial Zone Waste Management Station daily.
Liquid wastes	Process water will be treated by using sodium hydroxide, polyacrylamide and poly aluminum chloride and will be reused in the process.
Vehicles used in factory	PVC recycling granulator & with accessories PVC, washing machine, conveyor machine, conveyor belt, Air conveying machine, water sink, Kydroex tractor, grinding machine, packing machine, crusher, pet plastic production machine, High-speed friction dewatering machine, Heating stirring pot, uniaxial rinsing machine, Host + Supporting a full range of color separation machine, Vertical blow crumbs machine, Mobile hydraulic dock leveler, Pick-up truck, Forklifts and Electric cabinet, weight scale, Pre-crystallizer, Drying oven, Air dryer, Seven-roller drawing machine.
Employment	For the full-strength operation, total 248 employees are required.
Working time	Two Shift as Day (7:00 AM – 7:00 PM) & Night (7:00 PM – 7:00 AM)
Total working days	308 days annually
Investment	5.1895 million USD
Boiler	Stack Height – 15m Stack Diameter – 800 mm Waster Storage Capacity – 1100 gallons Steam Velocity – 20 m/s Steam Temperature – 300 °C Water Usage – 5 tons/day (estimated) Coal Consumption – 5-10 tons/day Source of Raw Material – Coal (Kalaw Area)

Table 4.2. Brief of the Factory No.2

Aspects	Descriptions
Production	PET Packing Tape and PP/PE Recycle Pallet (PPPT)
Production capacity	Factory No. (2) 60 tons/day of used PET bottle as raw material

Total Project Area	8.667 acres for factory no.2
Domestic Water Demand	Approximately 3,000 gallons/day
Source of Process Water	Tube well water for washing of the raw materials and recycle water from the waste water settling ponds
Source Domestic Water	Artesian well water for domestic use
Source of Electrical Power	Myanma Electric Power Enterprise 33/0.4 KV, 1 transformer of (2000 KV), one-unit of 1000 KVA diesel generator, one-unit of 1500 KVA Jiangsu silent type generator and one unit of 500 KVA Stamford silent type generator
Infrastructure	Chip Storage building, Office building, Waste water Settling Ponds, Water Tank and Purifier, Raw material preparation building (classification of bottles, washing and cutting), Raw material Piling Yard, Boiler, building for production of Packaging tape and recycle pallets Worker's Dormitory, Security gate,
Solid wastes	Being a recycling project, nearly 100% of the raw material will be reused in the manufacturing process. So, there will have no process waste during the operation phase generally. However, some unwanted solid waste such plastic pipe and rubber ring will be reused in manufacturing process or sell to recycler. Sand and soil particle during cleaning process will be reused in sand filling. Other industrial wastes (packing paper, packing tape etc.) will sell to recycler. Office wastes (tissues, paper, and some plastic materials) will sell to recycler. Dry and wet domestic wastes will be separated by different recycle bins and has been disposed to Myaung Dagar Industrial Zone Waste station daily.
Liquid wastes	Process water was treated using sodium hydroxide, polyacrylamide and poly aluminum chloride and used back in process.
Vehicles used in factory	PVC recycling Granulator & With Accessories PVC, washing machine, Conveyor machine, Conveyor belt, Air conveying machine, Water sink Kydroex tractor Grinding machine, packing machine, Crusher, Label remover, High- speed friction dewatering machine, Heating stirring pot, Uniaxial rinsing machine, Host + Supporting a full range of color separation machine, Vertical blow crumbs machine, Mobile hydraulic dock leveler, Pick-up truck, Forklifts and Electric cabinet, Sewage Treatment Equipment, Transformer, Low voltage distribution cabinet, High voltage distribution cabinet, weighbridge, 200 Ton Baler, 40 Ton Baler, Plate shearing machine, Bending machine, Tube Winding machine, Plasma cutting machine, PET Packing tape production line, particle production line
Employment	For the full-strength operation, total 200 employees are required.

Working time	Two Shift as Day (7:00 AM – 7:00 PM) & Night (7:00 PM – 7:00 AM)
Total working days	308 days annually
Investment	10 million USD
Boiler	Stack Height – 15m Stack Diameter – 800 mm Waster Storage Capacity – 1100 gallons Steam Velocity – 20 m/s Steam Temperature – 300 °C Water Usage – 5 tons/day (estimated) Coal Consumption – 5-10 tons/day Source of Raw Material – Coal (Kalaw Area)

4.5.2. Project Organization Structure and Workforce

Organization structure of the proposed project for both factories will be as follow.

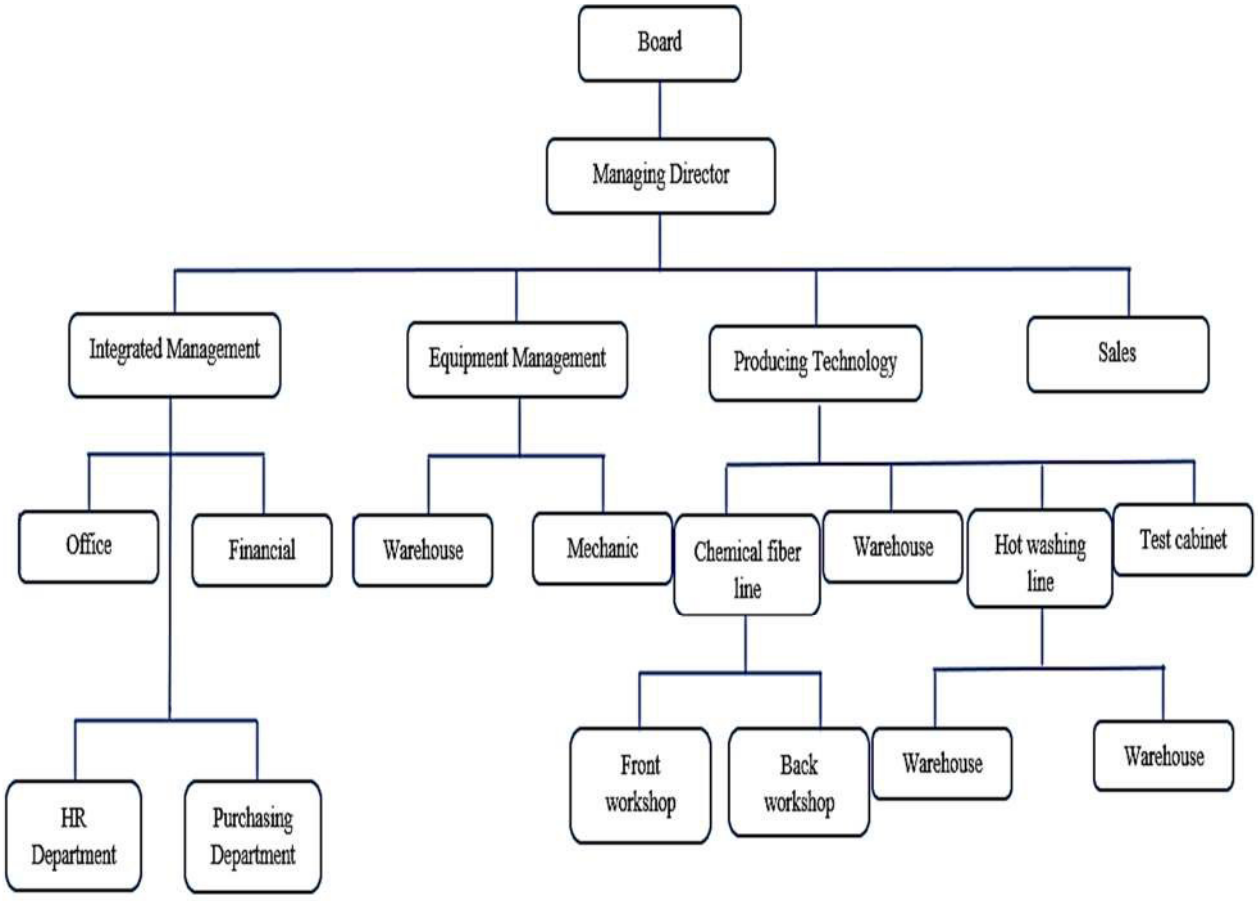


Figure 4.9 – Organization Chart for Proposed Projects

4.5.2.1. Workforce for Factory 1

The workforce used in factory 1 will be as follow:

Position	Quantity
Foreign Person	
Factory Manager	1
Technician	10
Engineer	5
Supervisor	10
Quality Control	3
Local Person	
Factory Manager	1
HR Manager	1
Account Manager	1
Account staff	2
Supervisor	6
Security	3
Driver	2
Cleaner	3
Workers	200
Total	248

According to above table, for the full strength operation, total 248 employees will be required for factory 1. Currently operation is running with operational 2 shifts by 103 local employees (Day -7:00 AM –7:00 PM, Night 7:00 PM to 7:00 AM). 60 employees are working in day shift, and 43 employees are working with night shift. Operation process are leaded by 20 oversea technicians.

4.5.2.2. Workforce for Factory 2

The workforce used in factory 2 will be as follow:

Position	Quantity
Local Person	
Supervisor	6
Security	3

Driver	2
Cleaner	3
Workers	186
Total	200

According to above table, for the full strength operation, total 200 employees is required to be employed for factory 2. Manager and account staff will be the same as Facory 1. Factory 2 will also be run with 186 local employees (Day -7:00 AM –7:00 PM, Night 7:00 PM to 7:00 AM). 120 employees are working in day shift, and 66 employees are working with night shift for full strength operation.

4.5.3. Land Use and Land Cover (LULC)

This area is only found in the Myaung Dagar Industrial Zone without reserved forest area and residential area. When they do have access to the information required by the Department of Land Records, the areas of the project site of 4.004 acres of land for old factory and 8.667 acres for new factory are reported. In accordance with the procedures and application to the Management Committee, they received permission to operate on 2017.

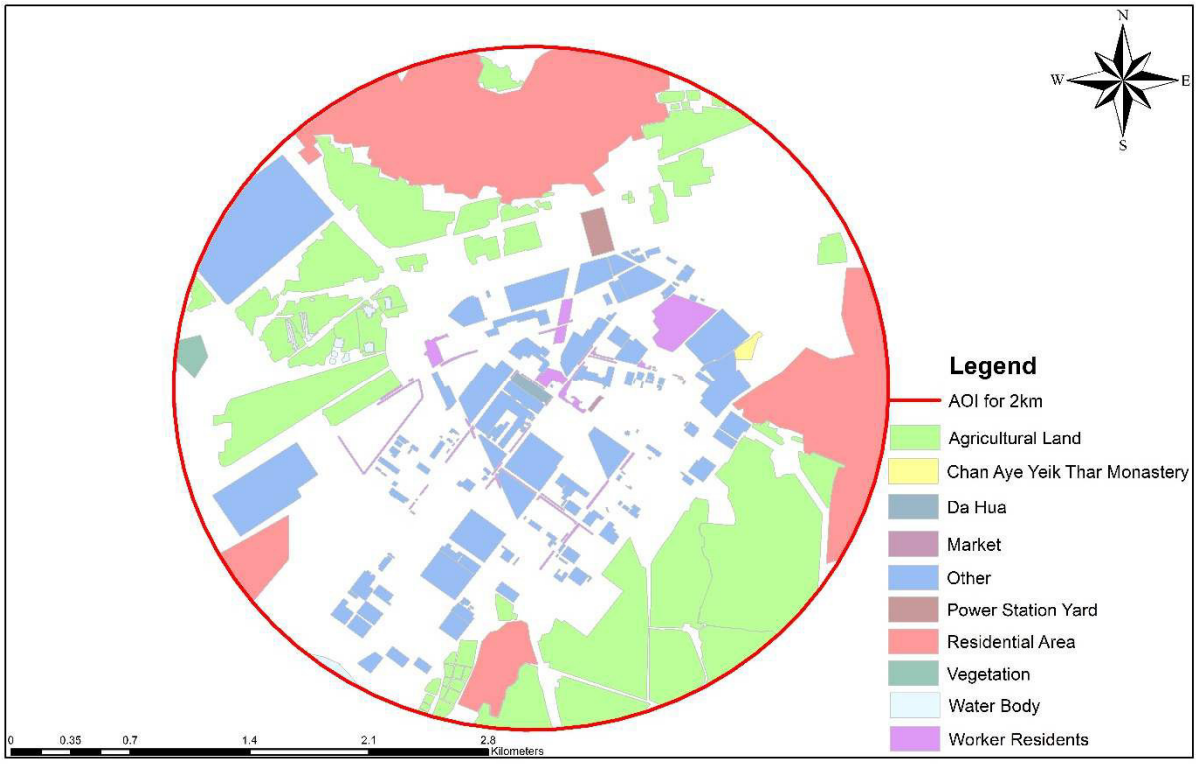
LULC for Factory 1 (Polyester Staple Fiber Factory)

Land Use Type	Percentage (%)
Agricultural land	35.18
Other factories	36.46
Residential area	25.65
Vegetation	0.39
Water body	0.42
Market	0.03
Substation	0.44
Monastery	0.16
Workers' Resident	1.27

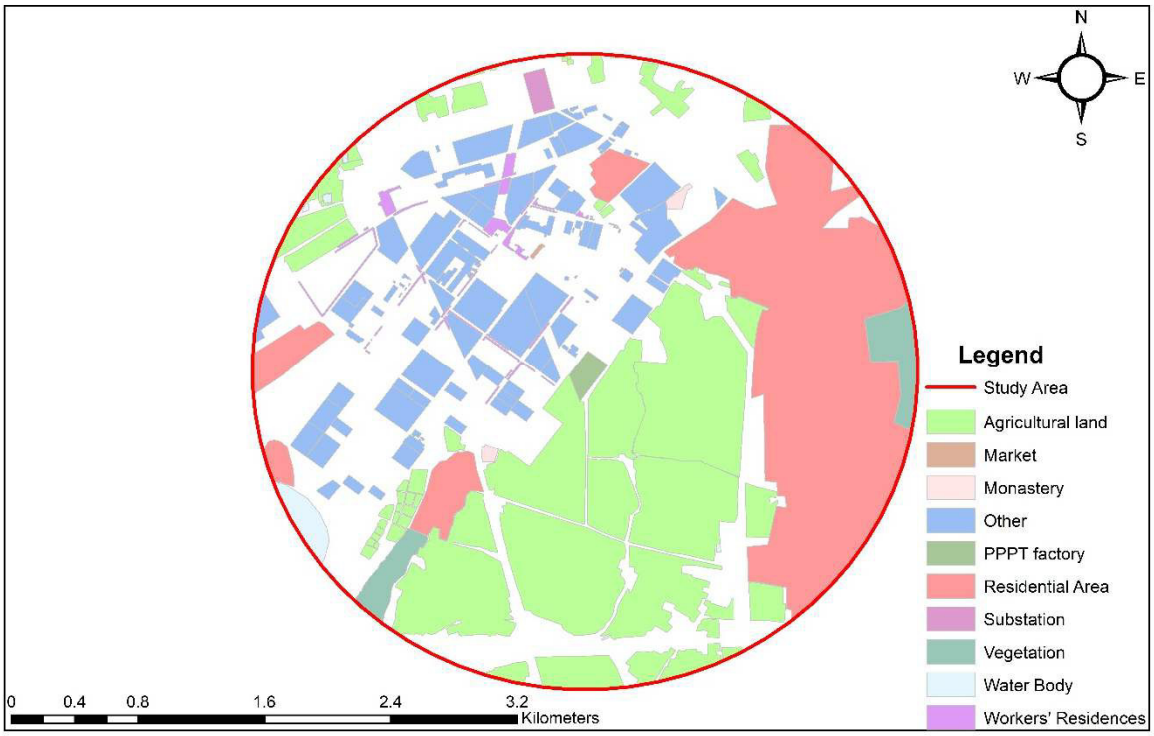
LULC for Factory 2 (Polyester Factory)

Land Use Type	Percentage (%)
Agricultural land	43.34
Other factories	17.58
Residential area	33.01
Vegetation	2.87
Water body	1.18
Market	0.03

Substation	0.44
Monastery	0.27
Workers' Resident	1.28



Land Use and Land Cover (LULC) Maps for PSF Factory (Factory 1)



Land Use and Land Cover (LULC) Maps for PPPT Factory (Factory 2)

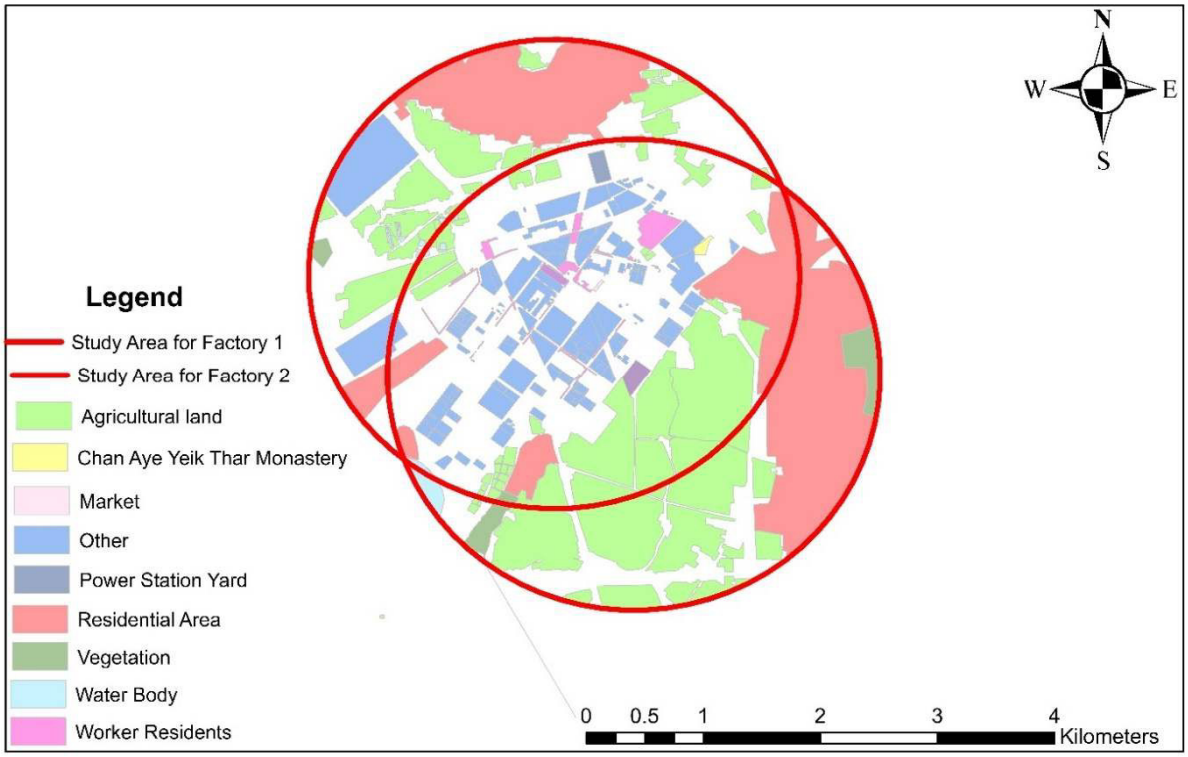


Figure 4.10. Land Use and Land Cover for both Factories

According to the land use types, the most effluent land use will be agricultural lands, surface water body and residential areas. So, it can be concluded that there will no environmentally sensitive area near the proposed project.

4.6. Process Description of the Project

4.6.1. Pre-construction Phase

Being in a industrial zone, pre-construction phase will include minor site clearing activities will be carried out which includes trees cutting and ground leveling. As the proposed project is about 4 acres for old factory and 8.8 acres for the new factory, only a low number of workforce and machineries is used due to short period of time.

4.6.2. Construction phase

After minor site clearing activities is carried out in pre-construction phase, the project has begun constructing of buildings and factories. The construction phase will last for about 1 year.

4.6.3. Operation Phase

Da Hua Myanmar Company Limited is producing polyester staple fiber (PSF) which will be produced in Factory 1 (PSF Factory), PET packing tape and PE/PP recycle pellets which will

be produced in Factory 2 (PPPT Factory) by processing used PET (Polyethylene Terephthalate) bottles as raw materials. The processes can be divided into (i) raw material preparation, and (ii) manufacturing.

4.6.3.1. Process of Polyester Staple Fiber Production from Recycled PET Bottles

Generally, in the process of producing PSF, the production rate is 60 tons of products for the processing of 65tons of raw materials. But the 5tons-left are recycled in the process so there would be no residues from the processes.

(i) Raw Material Preparation

The main raw materials are the used plastic bottles which are bought from the local market. The raw materials can be categorized into as follows:

(i) Grade A – only water bottles

(ii) Grade B – only oil bottles

(iii) Grade C – mixture of PET bottles.

The manufacturing procedure is same for all types of raw materials. The used plastic bottles are first de-baled in bale breaker and the bottles with the labels are done label scrapping. These bottles are sent with the conveyor to remove unwanted materials like plastic bags and some bottles which still have liquids in the bottle.

Figure – De-baling in Bale Breaker

Figure – Removing Unwanted Materials

Then they are rinsed with water and dried by air-drying which can also make the bottle reshape from flattening. After that, wet grinding of the bottles including the caps is done. The grinded caps are separated by gravity. These grinded plastic chips are washed with water and then with the caustic soda water again to remove the impurity. For the chemical water wash, the warm water from the boiler is used in order to melt the caustic soda.


Figure – Grinding

Before washing with caustic water, the grinded plastic chips are passed through the metal detector to make sure there would be no metal pieces in the cleaned plastic chips. Finally, the cleaned plastic chips are sent to the manufacturing for further processing.


Figure – Clean Plastic Chips

(ii) Manufacturing

The cleaned plastic chips delivered from the raw material storage are first dried in the dryer via the hopper at about 169˚C for about 10hours. The solid wastes from the processes are also sent to these dryers and recycled together with the plastic chips. If the dried plastic chips have the desired conditions, they are sent to the spinner. In spinner, the dried plastic chips are melted at to form a thick viscous liquid. The polymer coming out from the spinnerets is done extrusion to form continuous strands, and is cooled by using air first and then by the water from the cooling tower.

Figure – Spinner

Figure – Cooling after

After cooling, the polymer strands are bundled. The bundled fibers are drafted and crimped through the water first and then through the silicone oil.

Figure – Bundling

Figure – Drafting and Crimping

Then they are dried by using steam from the boiler. Then those fibers are done shaping and cutting according to the designated size which depends on the quality of the raw materials.

Figure – Shaping

Figure – Cutting

Before the final product comes out, the fiber are sprayed with the silicone oil to smoothen the texture. Finally, the product is done packaging and one package is nearly 300kg.

Figure – Spraying

Figure – Packaging

Figure - Sample of PSF Final Product

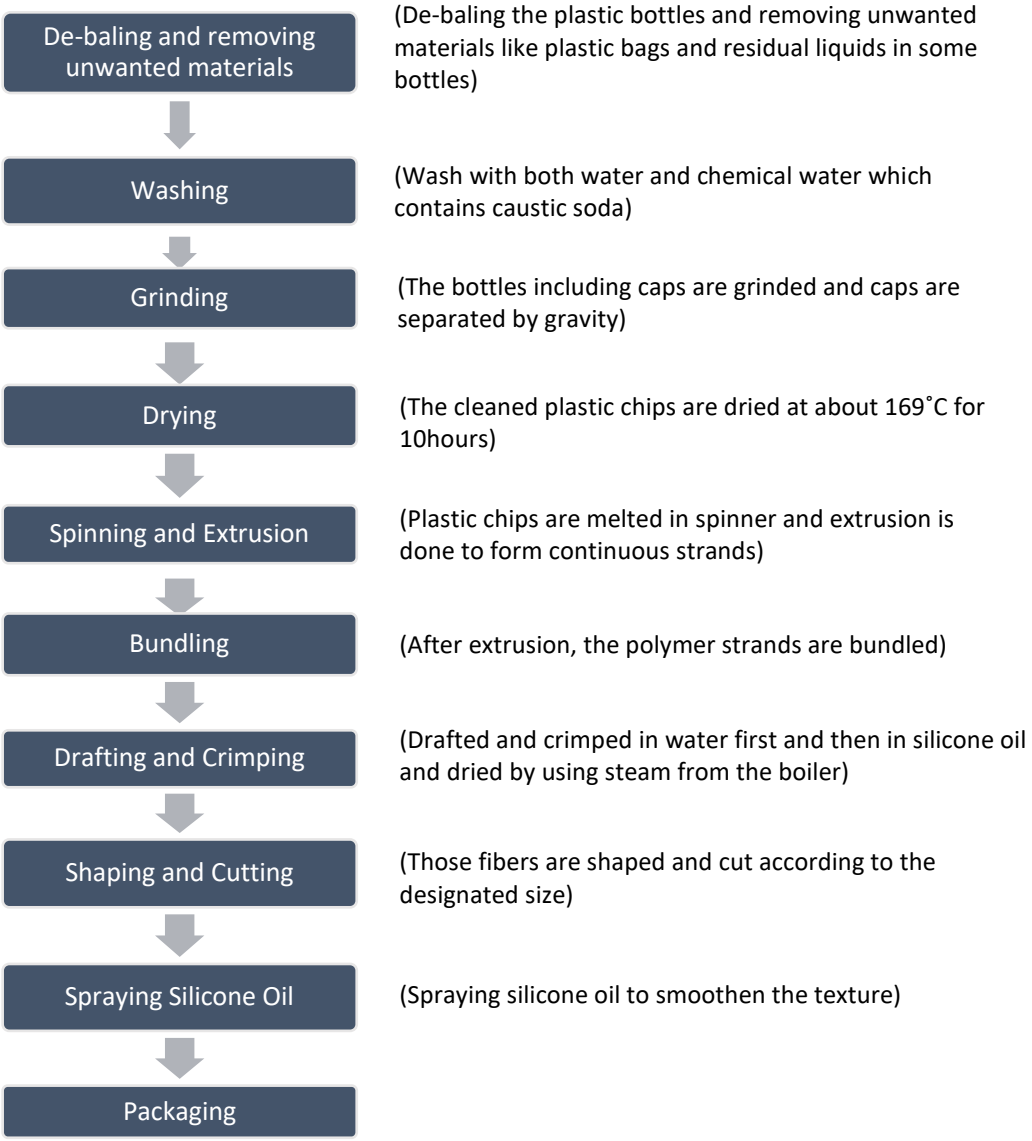


Figure 4.11. Flow Chart of the Processes of PSF Production from Recycled

4.6.3.2. Process of PET Packing Tape Production from Recycled PET Bottles

Da Hua Myanmar Company Limited is producing PET (Polyethylene Tetraphthalate) packing tapes by processing used PET bottles as raw materials. Generally, the production rate is 60 tons of products for the processing of 65tons of raw materials. But the 5tons-left are recycled in the process so there would be no residues from the processes. The processes can be divided into (i) raw material preparation, and (ii) manufacturing.

(i) Raw Material Preparation

The main raw materials are the used plastic bottles which are bought from the local market. The raw materials can be categorized into as follows:

(i) Grade A – only water bottles

(ii) Grade B – only oil bottles

(iii) Grade C – mixture of PET bottles.

Figure – Sample of Raw Materials

The manufacturing procedure is the same for all types of raw materials. The used plastic bottles are first de-baled in bale breaker and the bottles with the labels are done label scrapping. These bottles are sent with the conveyor to remove unwanted materials like plastic bags and residual liquids in the used bottles.

Then they are rinsed with water and blow dried by the blower which can also reshape the bottles from flattening. After that, wet grinding of the bottles including the caps is done. The flaked of grinded caps, plastic bottles, and other foreign materials are separated by hydro

cyclone with the use of gravity. After the separation, the grinded flakes of plastic bottles are passed through the metal detector where the unwanted metals are detected. There, the pure plastic flakes are obtained. These pure plastic flakes are washed with water and then with the caustic soda water again to remove the impurity. To remove possible residues of caustic soda on the flakes, they are washed again with the warm water from the boiler. Finally, the cleaned PET bottle cap flakes raw materials are achieved to produce PET packing tape. The manufacturing process is performed as below.

(ii) Manufacturing

The cleaned PET flakes delivered from the raw material storage is first dried in the dryer via the hopper, and kept warm to make sure the flakes are dry enough to make straps. When the flakes are dried and warmed at desired conditions, the automatic feeding process is done which provides the constant feeding volume of material and a uniform distribution of the fibres. The flakes are fed to the spinnerette. In spinnerette, the dried flakes are melted to form a thick viscous liquid. The polymer coming out from the spinnerette is done extrusion to form continuous strands, and is cooled by using air first and then by the water from the cooling tower. After cooling, the polymer strands are drafted and crimped through the water. In the heating treatment process, the fiber strands are dried and stretched by using steam from the boiler. After the heat treatment, the fiber strands are cooled downed and hardened. In the last stage of the process, the cooled fiber strands are winded by the winding machine and the end product is achieved.

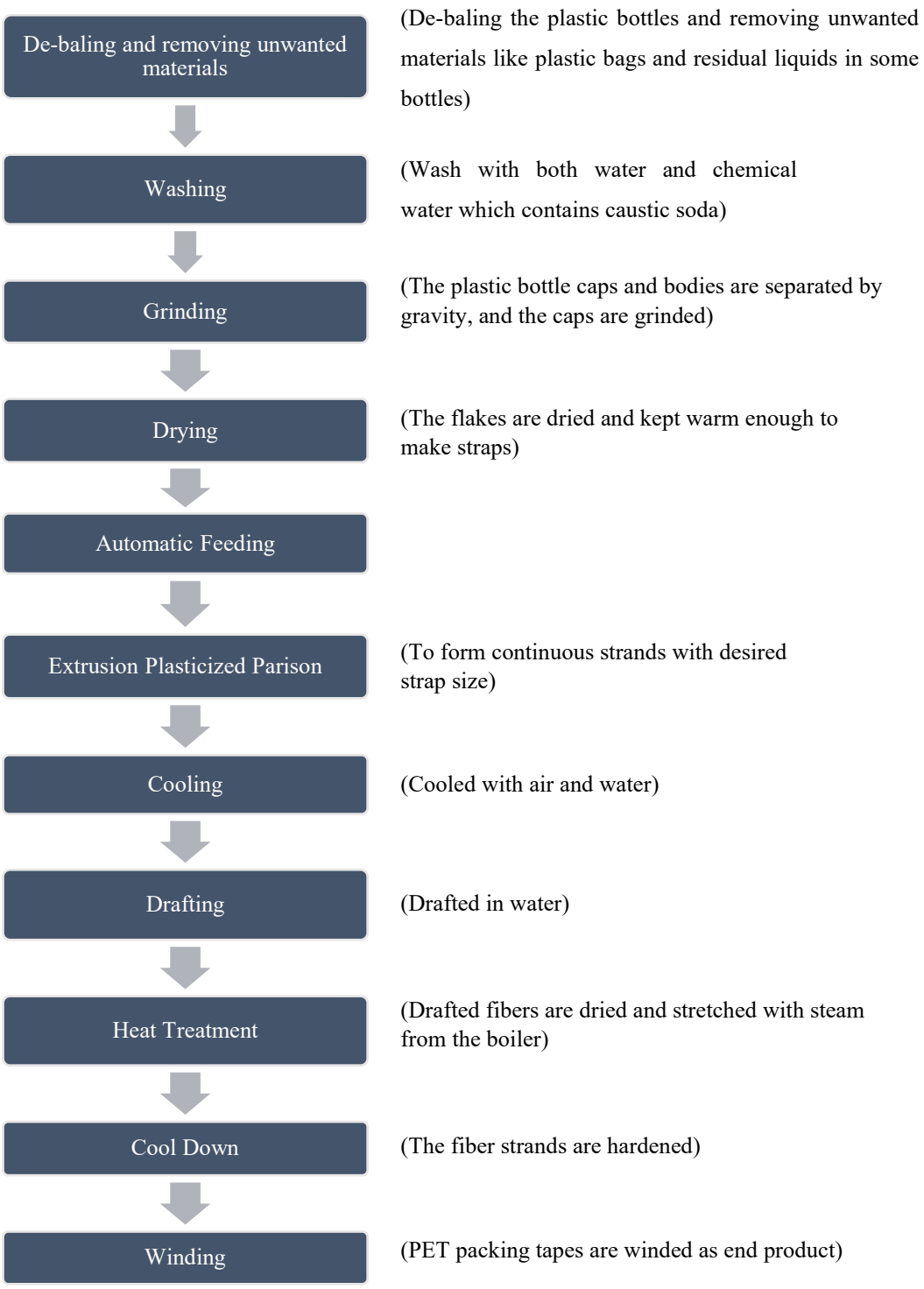


Figure 4.12 - Flow chart of the Process of PET Packing Tape

4.6.3.3. Process of PE/PP Recycle Pellet Production

(i) Raw Material Preparation

The main raw materials are use PE(Polyethylene) and PP(Polypropylene) plastic bottles which are bought from the local markets.

The manufacturing procedure is the same for all types of raw materials. The used PP/PE bottles are first de-baled in bale breaker and the bottles with the labels are done label scrapping. These bottles are sent with the conveyor to remove foreign materials and residual liquids in the used bottles.

Figure - Cleaned Raw Materials

Then the plastic bottles are washed with water and blow dried which also help reshape the flattened bottles. The washed bottles including the caps are crashed, followed by gravity separation. In separation, the plastic caps and the containers are separated by gravity. To produce PP/PE pellets, the caps of the plastic bottles are mainly used. For further purification, these crashed plastic caps are washed again with water and again with caustic soda water. After that, the warm water from the boiler is used to melt and wash off the caustic soda, which may remain on the bottle caps. Finally, the preparation of raw materials is done and ready for the manufacturing process.

(ii) Manufacturing

The washed and crashed raw materials are sent to the feeder by automatic feeding method and then feeder sent the materials into spinnerette. In the spinnerette, the plastic chips are melted at a certain temperature to form thick viscous liquid. The polymer coming out from the spinnerette is done extrusion, which helps the polymer to form continuous strands. The strands are cooled down with air first and then with water from the cooling tower. The cooling process hardened the polymer strands, and these strands are sent to the cutter, which cuts the hardened polymer strands into grains. Continuously, the grains are filtered by moving sieve to get the uniform pellet size and filter unwanted fine particles. Finally, the PP/PE recylce pellets are produced, and the product is done packing.

Figure – Final Product (PE/PP Recycle Pellets)

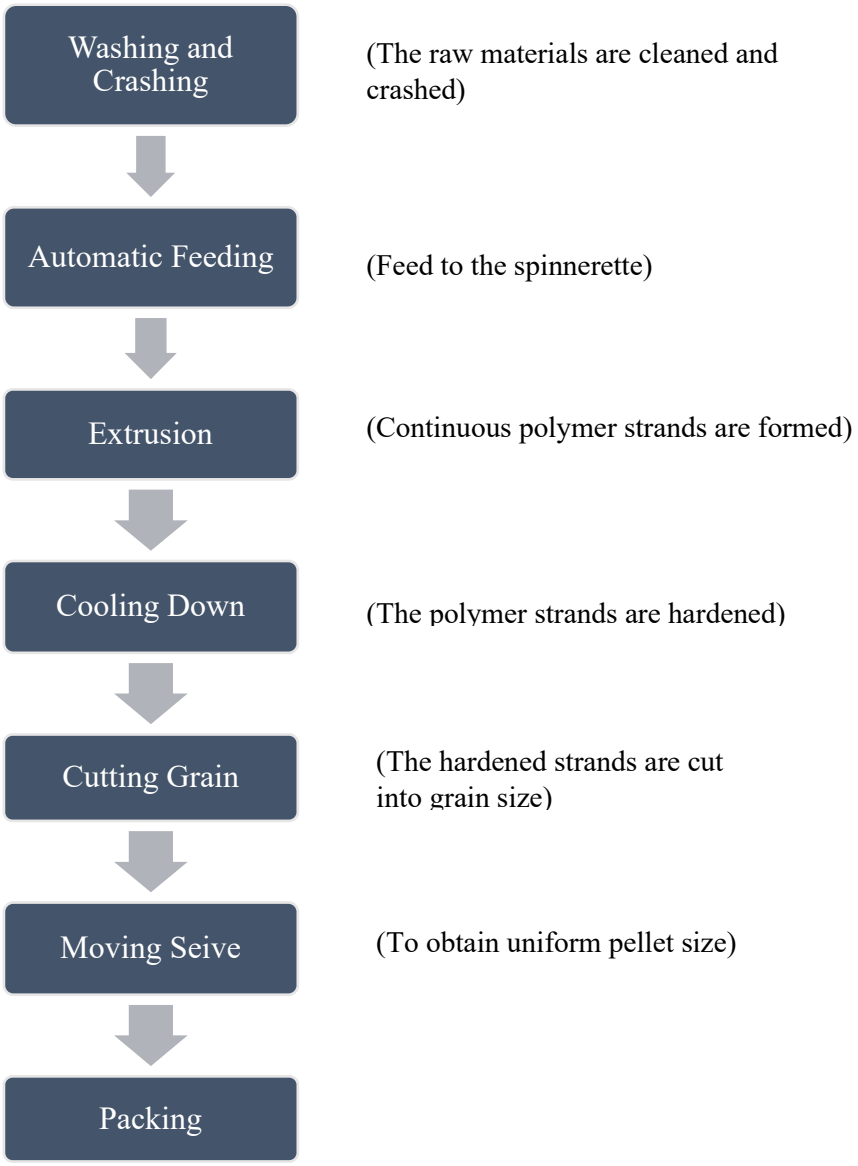


Figure 4.13 - Flow Chart of the Process of PP/PE Recycle Pellet Production

4.6.3.4. Boiler Operation

On-site boiler will be used to generate steam for the process operation. Steam will be used for the drying purposes and most drying activities are equipped with duct line systems to draw steam through the surface and ventilate it to the outdoor environment. Coals used for the boiler are purchased from the Kalaw area as a contract and purchased two trucks (15 tons each) per one time. In the factory, total amount of 75 tons of coals can be stored. It can be stored separately with the flammable materials. It is stored on a concrete floor systematically, and storage is where easily extracted coal for boiler. The daily consumption of coal for boiler is 5 to 10 tons approximately as depends on CMP order. Coal burning will do with extra care in order to reduce fire risk and emergency fire extinguisher will be provided within the factories. The estimated used of water for the boiler operation is maximum of 5tons/day with 12 hours per day and the boiler water tank capacity is 1,100 gallons with the diameter of chimney of 800 mm and the height is 15 meters.

Figure – Coal Storage inside the Factory

The following figure shows the operation of coal fired boiler.

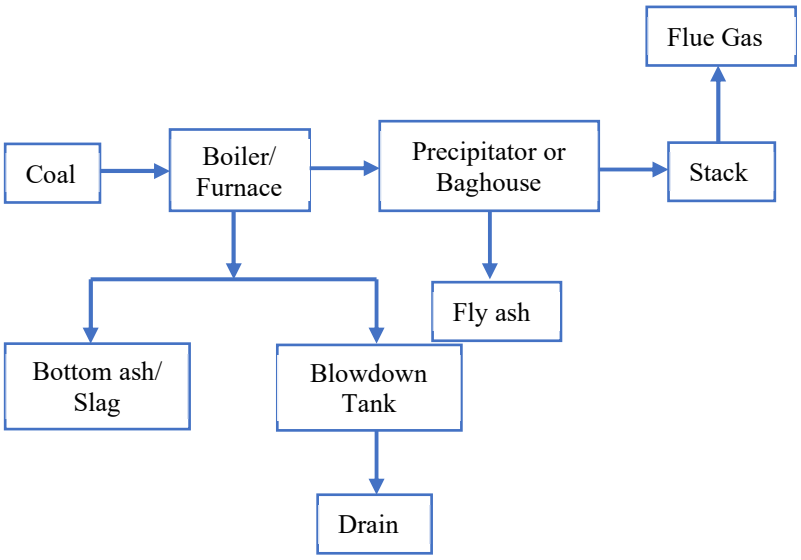


Figure 4.14. Flow Chart for the Coal-Fired Boiler Operation

According to the above figure, boiler will use coal as raw material and produce steam with the gaseous emissions, solid waste (bottom ash, fly ash) and liquid waste (blowdown water).

4.6.4. Decommission Phase

The decommission phase will include dismantling of equipment like pumps, filters and machines, disposal of resulting materials and filling of drains with mix of topsoil, sand and stone. The estimated time period for decommission phase is 1 year.

4.7. Power Requirement and Supply

Electrical instrument has been systematically installed at proposed factory. The planning of power for the project is provided by Township Electricity Department. Electricity source is from Myanma Electric Power Enterprise 33/0.4 KV with 2 transformers of 1000KV Industrial Supervision Inspection Department for electrical safety. The annual requirement of power is estimated 600,000 units and monthly requirement is estimated as 50,000 units. Daily minimum usage is 2,000 units.

It will be installing auxiliary generators for emergency use if the YESB power breaks down. The planning of power for the project will be provided by one unit of 1,000 KVA Cummins open type diesel generator, one unit of 1,500 KVA Jiangsu silent type generators and one unit of 500 KVA Stamford (UK) silent type generators. These three generators have been positioned systematically and separately on the concrete floor at generators room.

4.8. Water Supply and Demand

The total estimated demand for water by the project during full operation is approximately

1,584,000 gallons of water a year. The process water requirements will be planned by 2x4"Ø tube well from 300 feet aquifer. One 12,000 gallons capacity ground tank and 3,000 gallons overhead tank has been built. Estimated water consumption for boiler per day is 550 gallons, 1,500 gallons per day for raw material washing section and 1,000 gallons per day domestic use for about 100 employees. Total daily estimated water consumption is 3,000 gallons. Drinking water as purified water will be outsourced. It has also installed waste water treatment system for washing process. The treated water will be used for the raw materials washing process.

Figure 4.15- Wastewater Treatment System in Factory 2

4.9. Source of Raw Materials

(i) Purchasing PET Bottles

The basic required raw materials needed for the proposed project (PET Bottles) are mostly purchased from local market. Due to the scarcity of raw materials that are not available locally, as planned, raw materials are provided by Da Hua Environmental Sci-Tech (HK) Limited by import system. The importing sample table has been shown below for raw materials (cleaned PET chips).

Most of the cleaned PET chips are mostly imported from Singapore. Also, they are imported from China. The related data of importing and purchasing from the local markets can be seen in Appendix A.

Table – Estimated Purchased Raw Materials from Local

No.	Particular	Unit	Year 1	Year 2	Year 3	Year 4	Year 5 - 10
	Quality						
1	PET Bottle	Ton	5000.00	5000.00	5500.00	5500.00	5500.00

2	PE/PP Bottle Cup (Green, Blue, White)	Ton	3000.00	3000.00	3300.00	3300.00	3300.00
	Price						
1	PET Bottle	Ks/ ton	250000	250000	250000	250000	250000
2	PE/PP Bottle Cup (Green, Blue, White)	Ks/ ton	250000	250000	250000	250000	250000
	Total						
1	PET Bottle	Kyats	1,250,000,000	1,250,000,000	1,375,000,000	1,375,000,000	1,375,000,000
2	PE/PP Bottle Cup (Green, Blue, White)	Kyats	750,000,000	750,000,000	825,000,000	825,000,000	825,000,000
			2,000,000,000	2,000,000,000	2,200,000,000	2,200,000,000	2,200,000,000

Table- Imported Raw Material List

No.	Particular	Unit	Year 1	Year 2	Year 3	Year 4	Year 5 - 10
1	Cleaned PET Chips	ton	18,816.00	18,816.00	19,404.00	19,404.00	19,874.40
2	Scouring Powder	kg	160,000.00	160,000.00	165,000.00	165,000.00	169,000.00
3	Caustic Soda Flakes	kg	160,000.00	160,000.00	165,000.00	165,000.00	169,000.00
4	Silicon Oil	kg	320,000.00	320,000.00	330,000.00	330,000.00	338,000.00
5	108 Spinning Oil	kg	240,000.00	240,000.00	247,500.00	247,500.00	253,500.00
6	Antistatic Agent	kg	240,000.00	240,000.00	247,500.00	247,500.00	253,500.00
7	Packing Materials	SET	64,000.00	64,000.00	66,000.00	66,000.00	67,600.00
8	Blue Powder	kg	8,000.00	8,000.00	8,250.00	8,250.00	8,450.00
9	Titanium Dioxide	kg	32,000.00	32,000.00	33,000.00	33,000.00	33,800.00
10	Filter Materials	SET	8,000.00	8,000.00	8,250.00	8,250.00	8,450.00
11	Conduction Oil	kg	40,000.00	40,000.00	41,250.00	41,250.00	42,250.00
12	RE insulation Materials	Drum	800.00	800.00	825.00	825.00	845.00
13	Machine Blade	pcs	1,600.00	1,600.00	1,650.00	1,650.00	1,690.00

Remark: Raw materials from Thailand and Vietnam

Table – Import Cleaned PET Chips as Raw Material (2020)

Date	Raw Materials	Weight (Kg)	From
10.2.2020	Cleaned PET Chips	106,452	Singapore
29.2.2020	Cleaned PET Chips	122,508	Singapore
3.3.2020	Cleaned PET Chips	51,126	Singapore
4.3.2020	Cleaned PET Chips	124,737	Singapore
22.3.2020	Cleaned PET Chips	46,824	Singapore
22.3.2020	Cleaned PET Chips	175,760	Singapore
28.3.2020	Packaging Materials, silicon oil, PET detergent washing powder	50,000	Singapore
31.3.2020	Cleaned PET Chips	49,417	Singapore

5.4.2020	Cleaned PET Chips	48,568	Singapore
12.4.2020	Cleaned PET Chips	21,660	Singapore
13.4.2020	Cleaned PET Chips	126,804	Singapore
11.5.2020	Cleaned PET Chips	24,000	Shanhai, China
		947,856	

The table above shown that about 1625 tons of waste drinking water bottles, which are basic raw materials can be purchased locally and according to the production plan of the factory, 625 tons are required per month and for a year, 7500 tons is required but it has not met till now. Therefore, cleaned PET chips are imported in order to fulfill the requirement of raw materials at the moment.

(ii) Type of Chemical Use

The types of chemicals used for the production plant are silicon oil and PET detergent washing powder which are imported. The estimated consumption is 15,000 kg of silicon oil, 60,000 kg of spinning oil and 1,680,000 kg of scouring powder. Sodium hydroxide, polyacrylamide and poly aluminum chloride are commonly used for the wastewater treatment plant and can easily be purchased from the local economy. The chemicals that have been used in the factories are not included in the list of prohibited chemicals that is included in the Central Committee for the Prevention of Chemical and Related Hazards and it is shown in Appendix A.

The following table shows the material requirement for 1 ton and 2 ton of PSF at Factory 1. For material requirements for PET Packing Tape and Recycle Pellets at Factory 2, the exact amount required cannot be provided since the factory will only run according to the purchase from CMP's order. Chemicals are pack and store with extra care , stored away from flammable materials and other reactive agents. Moreover, the store floor are construct with concrete and cover the chemical storage area with fence. Storage of chemicals are shown in the following figure.

Table – Material requirement for 1 ton of PSF

Sr.No	Particular	Unit	All kinds of Ployester Staple Fiber
1	Cleaned PET Chips	Ton	1.176
2	Scouring Powder	Kg	10
3	Caustic Soda flakes	Kg	10
4	Silicone oil	Kg	20
5	108 spinning oil	Kg	15
6	Antistatic agent	Kg	15
7	Packing materials	SET	4
8	Blue powder	Kg	0.5

9	Titanium dioxide	Kg	2
10	Filter materials	SET	0.5
11	Conduction oil	Kg	2.5
12	RE insulation materials	Drum	0.05
13	Machine blade	Pcs	0.1

Table – Material requirement for 20 ton of PSF

Sr.No	Particular	Unit	All kinds of Ployester Staple Fiber
1	Cleaned PET Chips	Ton	25
2	Scouring Powder	Kg	200
3	Caustic Soda flakes	Kg	200
4	Silicone oil	Kg	400
5	108 spinning oil	Kg	300
6	Antistatic agent	Kg	300
7	Packing materials	SET	80
8	Blue powder	Kg	10
9	Titanium dioxide	Kg	40
10	Filter materials	SET	10
11	Conduction oil	Kg	50
12	RE insulation materials	Drum	1
13	Machine blade	Pcs	1

Figure 4.16. Storage of Chemical Used for the Factories

4.10. Vehicles and Mechanization

The vehicles and mechanization used for each process of the proposed project are shown in the following table.

Table 4.3 - List of Machinery

Sr.No.	Equipment	Numbers
1	Washing Machine	3
2	Conveyor Machine (300x3000mm)	10
3	Air Conveying Machine	2
4	Conveyor Belt	6
5	Conveyor Machine (600x4500mm)	3
6	Conveyor Machine (600x8000mm)	4
7	Water Sink	11
8	Kydroex Tractor	4
9	Grinding Machine	5
10	Weight Scale	4
11	Crusher	13
12	Conveyor Machine (600x4000mm)	2
13	Label Remover	3
14	High-speed Friction Dewatering Machine	3
15	Conveyor Machine(400x5000mm)	3
16	Conveyor Machine (400x4500mm)	3
17	High-speed Friction Machine	3
18	Heating Stripping Pot	3
19	Uniaxial Rinsing Machine	2
20	Host+ supporting a full range of color separation machine	1
21	Stainless steel silo	1
22	Verticle blow crumbs machine	1
23	Dewatering machine	1
24	Mobile hydraulic dock leveler	1
25	Packing machine	3
26	Cyclone separator	1
27	Pre-crystallizer	1
28	Seven-roller drawing machine	1
29	Drying oven	1
30	Air dryer	1
31	Air blower	1
32	Truck for office use	2
33	Pickup truck	3
34	Forklift	8
35	Generator	3

4.11. Infrastructures

The PSF factory includes the infrastructure such as 2 storey office building, kitchen and dining hall building, weighting for vehicle garage, workshop building, security gate, Packaging area, generator room, boiler room, power room and groundwater tank. The infrastructures within the boundaries of the factory 1 are shown in the following figures.

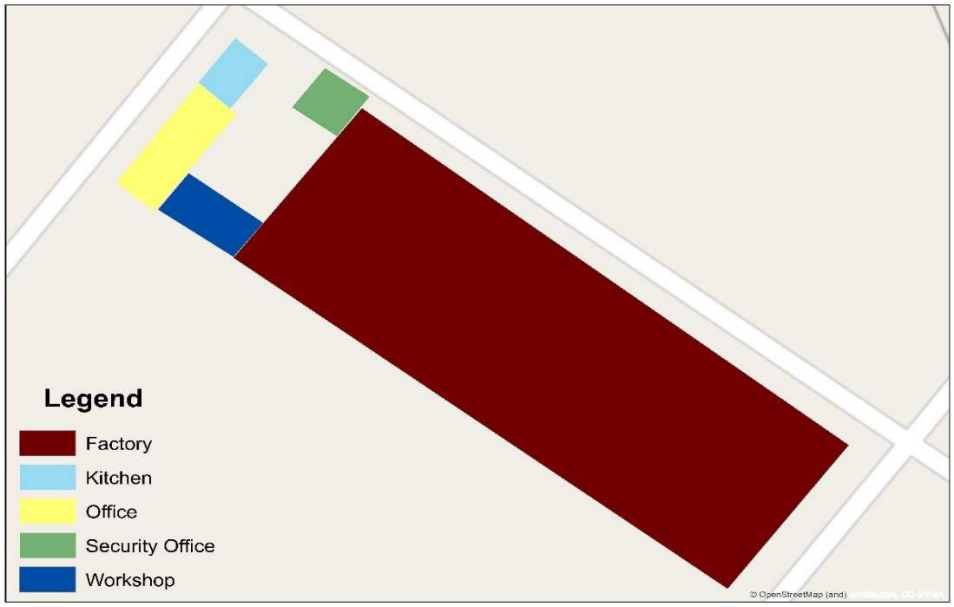


Figure 4.17 – Infrastructures for PSF Factory (Factory 1)

Raw material washing, crushing and cleaning section, overhead water tank area, waste water treatment plant, staff dormitory, power distribution room, dining hall, office building and warehouse are inside the factory boundary. The infrastructures within the boundaries of the factory 2 are shown in the following figures.

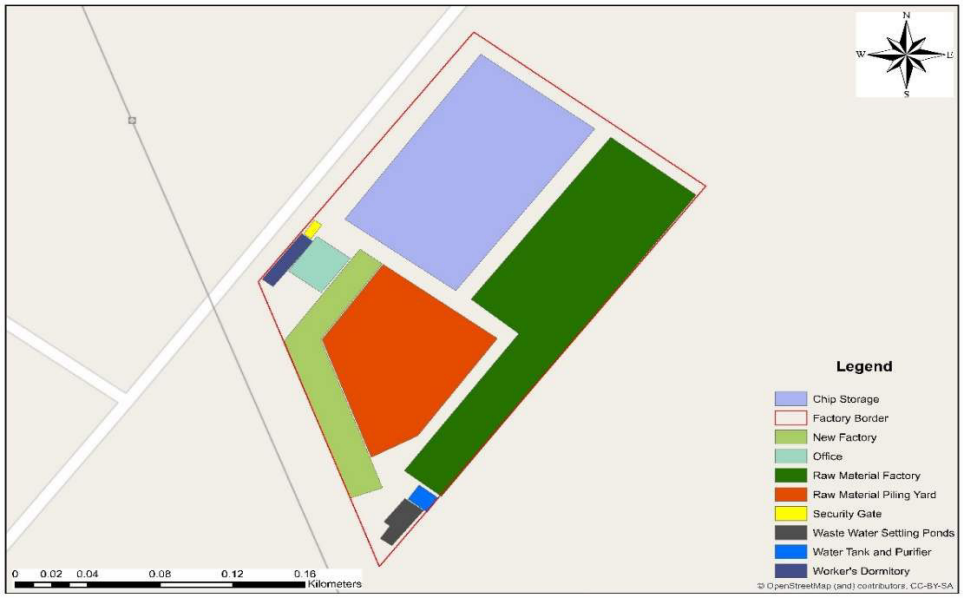


Figure 4.18 – Infrastructures for PPPT Factory (Factory 2)

4.12. Storage System and Selling of Final Product

The final products are stored at the warehouse temporarily until the required quantity and quality are met. After the quality testing and reaching up to the required quantity, it is transported to the factory used polyester stable fiber and exported to the foreign countries like Thailand, Vietnam, China, USA and Taiwan. The evidences of exporting finished products can be seen in Appendix E.

Table – Export List for PSF (Factory 1)

Date	Finished Products	Weight (kg)	Export
15.4.2020	PSF	24900.0	USA, Taxas, Dalas
15.4.2020	PSF	24900.0	USA, Los Angles
17.4.2020	PSF	24900.0	USA, Los Angles
17.4.2020	PSF	24900.0	USA, Norfolr
15.4.2020	PSF	24900.0	USA, Norfolr
29.4.2020	PSF	49800.0	Thailand, Bangkok
15.5.2020	PSF	22747.5	Vietnum
12.6.2020	PSF	21334.0	China, Nasha
16.6.2020	PSF	39605.0	USA, Taxas, Dalas
17.6.2020	PSF	8343.5	Thailand, Bangkok
26.6.2020	PSF	42181.0	USA, Los Angles
26.6.2020	PSF	42935.0	USA, Los Angles
26.6.2020	PSF	64071.0	USA, Savannah
8.6.2020	PSF	26032.0	Malaysia
30.6.2020	PSF	42471.0	USA, Long Beach
		484020.0	

Table – Estimated Export Statement for PET Packing Tape & Recycle Pellets (Factory 2)

Sr; No	Particular	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7–10
	(a) Export Sale (90%)								
1	PET Packing Tape	Kg	1296000	1296000	1296000	1296000	1296000	1296000	1296000
2	All kinds of Recycle Pellets	Kg	3240000	3240000	3240000	3240000	3240000	3240000	3240000
	(b) Export Sale Price								
1	PET Packing Tape	US $/ kg	0.6	0.6	0.62	0.62	0.62	0.62	0.62
2	All kinds of Recycle Pellets	US $/ kg	0.6	0.6	0.62	0.62	0.62	0.62	0.62
	(c) Value (axb)								
1	PET Packing Tape	US $/ ML	0.7776	0.7776	0.8035	0.8035	0.8035	0.8035	0.8035
2	All kinds of Recycle Pellets	US $/ ML	1.9440	1.9440	2.0088	2.0088	2.0088	2.0088	2.0088
Total Export Sale Value		US $/ ML	2.7216	2.7216	2.8123	2.8123	2.8123	2.8123	2.8123

Remark: 90% export to USA, Vietnam, China, Taiwan and Thailand

Figure – Storage of Final Product

4.13. Utilities Consumption

4.13.1. Power Requirement and Supply

Electrical instrument has been systematically installed at proposed factory. The planning of power for the project is provided by Township Electricity Department. Electricity source is from Myanma Electric Power Enterprise 33/0.4 KV with 2 transformers of 1000KV Industrial Supervision Inspection Department for electrical safety. The annual requirement of power is estimated 600,000 units and monthly requirement is estimated as 50,000 units. Daily minimum usage is 2,000 units.

It will be installing auxiliary generators for emergency use if the YESB power breaks down. The planning of power for the project will be provided by one unit of 1,000 KVA Cummins open type diesel generator, one unit of 1,500 KVA Jiangsu silent type generators and one unit of 500 KVA Stamford (UK) silent type generators. These three generators have been positioned systematically and separately on the concrete floor at generators room. All of these generators will not be run at the same time and only each unit is driven at the time as necessary. All these generators will be used diesel fuel and it is easily purchased from the nearby fuel stations such as Star High Fuel Station – Myaungdagar. Diesel fuel will be stored together with the generator sets and their capacities are 50 gallons each. Specifications of the generators are shown as below.

Table – Specification of Diesel Generators

Sr.No	Particulars			
	Brand	Cummins	Jiangsu Gianghao	Stamford (UK)
1	Rate output	1000 KVA	1500 KVA	
2	KW	800 KW	-	

3	Rated frequency	50 HZ	50 HZ	50 HZ
4	Rated Voltage	380 V	230/ 400 V	400 V
5	Model	KTA – 38 – G 5	JHK – 1500 CF	U 13 G 1206
6	Dimension or weight	4800 x 215 G x 2300 m	10300 kg	1300
7	No of stacks	1	1	1
8	Rated speed	1500 rpm	1500 rpm	1500 rpm
9	Diesel consumption (L/hr)	21.6	51	27
10	Sulphur content (%)	0.05	0.05	0.05
11	Density of oil (kg/m^3)	97.7	97.7	97.7
12	High of stacks (m)	30	30	30
13	Diameter of stacks (m)	0.5	0.5	0.5
14	Gas flow rate (M^3/S)	1.15	1.15	1.15
15	Exit velocity of gas (M/S)	2.93	2.93	2.93

4.13.2. Water Supply and Demand

The total estimated demand for water by the project during full operation is approximately 1,584,000 gallons of water a year. The process water requirements will be planned by 2x4"Ø tube well from 300 feet aquifer. One 12,000 gallons capacity ground tank and 3,000 gallons overhead tank has been built. Estimated water consumption for boiler per day is 550 gallons, 1,500 gallons per day for raw material washing section and 1,000 gallons per day domestic use for about 100 employees. Total daily estimated water consumption is 3,000 gallons. Drinking water as purified water will be outsourced. It has also installed waste water treatment system for washing process. The treated water will be used for the raw materials washing process.

4.14. Generation of Waste

4.14.1. Solid Waste Generation

Some industrial waste materials such as waste polyester, cutting pieces are produced from the polyester production process which is approximately daily up to 0.5 ton and annual 177.3 ton. The recorded solid wastes types are shown in the following table.

Table – Recorded Solid Waste Type

Solid waste type	Jan	Feb	Mar	April	May	June	July	August	Sep	Oct	Nov	Dec	Total ton
Domestic Waste	16 kg	18 kg	20 kg	6 kg	18 kg	18 kg	17.5 kg	18 kg	19 kg	12 kg	18 kg	22 kg	0.18
Waste from more than 100 Employees	0.75	0.6	0.7	0.52	0.73	0.7	0.69	0.72	0.65	0.92	0.66	0.5	8.14

Industrial Waste													
Packing bags (ton)	1.8	2.3	2.4	1.4	1.9	2.7	3.3	3.7	2.3	2	1.5	1	26.3
Polyester chips (ton)	11	13	12	6	16	17	21	24	25	17	15	0.3	177.3

Solid waste will also produce from coal fire boiler as bottom ash and fly ash.

4.14.2. Liquid Waste Generation

The liquid waste produced from the industry is mainly sewage, wastewater generated from the raw material washing process and domestic waste water including both dissolved and suspended matter and a small amount of wastewater from the boiler operation. The total amount of waste water production is estimated as 5 cubic meter per day in maximum. The estimated monthly wastewater generation is 150 m^3 and the annual production rate of wastewater may be 1,800m^3 (394,200 gallons).

4.15. Waste Management

4.15.1. Liquid Waste Management

Wastewater from the washing process will be treated in the wastewater treatment plant and reused in the production process. The discharge effluent from the sewage is disposed systematically under guideline and arranged and complied with the Hmawbi Township Municipal Department. The flowchart of the effluent water treatment system is shown in the following figure.

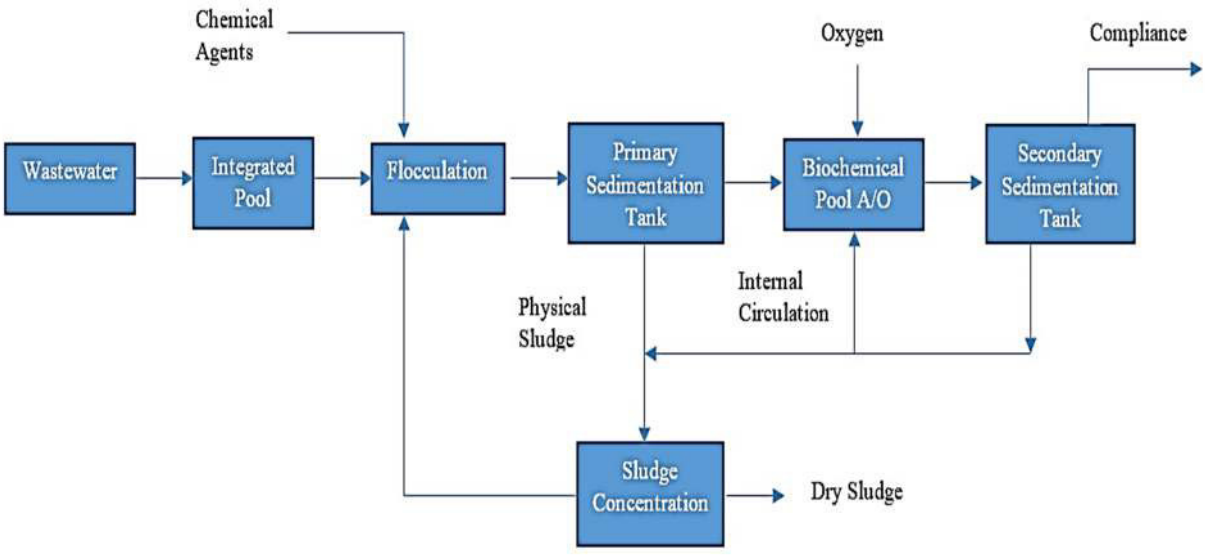


Figure 4.19. Process Flowchart of the Wastewater Treatment System

Process description of Wastewater Treatment System

The effluent water obtained from the operation of the proposed project firstly enters the grid tank through the pipeline, and the large particle suspension materials are filtered/removed by the grid and enter the regulating tank (integrated pool). The regulating tank balances the water quality and quantity, and then the untreated water is pumped into the flocculation reaction tank. NaOH (Sodium Hydroxide) is added to the flocculation tank in order to adjust the pH of the effluent water. PAC (Poly aluminum chlorides) and PAM (Polyacrylamides) are also added to the tank to remove suspend particles, oil and grease. The estimated average amounts needed to treat the effluent water are, 100mg of NaOH per 1 liter of wastewater, PAM 5mg per 1 liter, and PAC 0.1ml per 1 liter. Flocculation of sludge is formed in the flocculation reactor, and the sludge mixture is separated in the primary sedimentation tank. The suspended matters in the water are adsorbed and co-settled. The water-soluble organic matter enters the A / O biochemical tank with the supernatant self-flowing. In the A / O biochemical tank, the oxygen is supplied by using fans and the microorganisms in the water consume the organic matter as food. This process can decompose the organic matter, and at the same time, form a new sludge. All the sludge mixture (liquid sludge) from the primary and secondary sedimentation tank are circulated again to the flocculation tank in order to separate sludge more efficiently. The bottom sludge is collected as dry sludge. The treated water from the surface of secondary sedimentation tank is collected, and used again in the operation process.

Overview of Wastewater Treatment Process

The amount of wastewater produced from the project is about 5 m^3/d, maximum 20 m^3/d with maximum CMP order. The wastewater treatment plant design quantity of the proposed project is 50 m^3/d. It means 50 m^3 per day can be treated by this designed wastewater treatment plant. According to the operation of 20 hours per day, the maximum average treatment water quantity is 15- 20 m^3/h. Therefore, selected water treatment plant is enough to cover the whole project.

Chemical used in wastewater treatment plan such as Sodium hydroxide, Polyacrylamide, Poly aluminum Chloride are commonly used chemicals and they can be easily purchased in local official agent. The untreated and treated waste water quality of the proposed project will be monitored and submitted to the Environmental Conservation Department according to the procedures in EIA.

4.15.2. Solid Waste Management

Most of the industrial waste will be reused in the manufacturing process. The dry domestic dry domestic wastes such as drinking water bottles are reuse in factory process and recycleable wastes such as cans, and soft drinks bottles will be sold to recycler and other domestic wastes such as plastic garbage cans, soft drink bottles which comes from people's daily lives and municipal waste from the workers' dormitory have been disposed to the Myaung Dagar Industrial Zone Waste station daily. Ash generated from operation of boilers (both of the bottom ash and fly ash) will be provided back to Government Brick Factory with free of charge but with own transportation which is located near the proposed project.

4.15.3. Hazardous Waste Management

Most of the hazardous waste produced from the factory are empty chemical containers and used chemical bags from the production. The estimated generation of empty spinning oil drums is 72 drums annually. Empty drums are temporarily stored in the warehouse and sold back to the recycle contractor weekly. The generation of changing lubricants for generator engines has been planned to sell back to the reused contractor and the other used chemical containers and bags has been sold out to the chemical imported company. The amount of chemical used in proposed project is less and so is the amount of waste. Therefore, the current disposal/ selling to recycler method can be considered as significance.

4.15.4. Gaseous Emission from Boiler

Coal-fired boilers emit several gaseous pollutants during combustion. Carbon dioxide (CO_2), a greenhouse gas, is released as a byproduct. Sulfur dioxide (SO_2) is mostly generated when coal with sulfur content reacts with oxygen, contributing to air pollution and acid rain. Nitrogen oxides (NO_x) are formed at high temperatures and contribute to smog and respiratory issues. SO_2 will be reduced by lime water sparaying and PM (fly ash) will be reduced bag filter.

4.16. Description of Project Alternative

Alternative analysis will be considered as an integral part of EIA process, which involves examination of alternative ways of achieving the objectives of the proposed project. The aim of alternative analysis is to arrive at a development option, which maximizes the benefits while minimizing the unwanted impacts. Alternative analysis is also a form of mitigation measures. Alternatives to a proposed activity are meeting the general purpose and requirements of a proposed activity, and may include alternatives to:

- The property on which or location where it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and
- The option of not implementing the activity (the "No-Project" alternative)

Alternatives help identify the most appropriate method of developing a project, and also help identify the activity with the least environmental and social impacts.

4.16.1. The "No Action" Alternative (No Project Alternative)

This alternative avoids the implementation of the proposed project. In no project scenario case, there will be no impact on natural environment and local communities. But there will be positive impacts on residents' life quality in "Project Scenario" case. The "No Action" alternative will be made according to the following perspective:

(a) From an Environmental Perspective

Although the development of the proposed project will have more or less environmental impacts, the levels of acceptability will be decided in conjunction with threshold criteria as shown in the following table.

Table 4.4 - Threshold Criteria to Determine the Acceptability of Environmental Impacts

Level of Acceptability	*Threshold Criteria for Potential Impacts*
Unacceptable	Exceeds legal or regulatory standard, e.g. water quality standard. Increases level of risk to public health. Extinction of biological species, loss of genetic diversity, rare or endangered species, critical habitat.
Normally Unacceptable	Conflict with policies or land-use plans. Loss of populations of commercial biological species. Large scale loss of productive capacity of renewable resources.
May be Acceptable with Mitigation	Avoidance of spread of biological disease, pests, feral animals or weeds. Some loss of threatened habitat.
Normally Acceptable	Some loss of populations and habitats of non-threatened species. Modification of landscape without downgrading special aesthetic values. Emissions demonstrably less than the carrying capacity of the receiving environment.

Source: Modified from Sippe (1999)

From the above threshold criteria, the proposed project can be regarded as "Normally Unacceptable" without proper mitigation measures. However, according to the EIA study, all of the environmental and social impacts can be mitigated by proper mitigation measures. So, the proposed project can be considered as "May be Acceptable with Mitigation".

(b) From Socio-economic Perspective

A "No Action or No-project" option will mean that the status quo remains and all the social impacts related to the existence of the projects are not envisaged. This implies that if the project were not to proceed, none of the positive or negative impacts identified in this study will materialize. A no-project option will see all the anticipated project benefits not realized. Although some potential environmental impacts and negative social impacts will be avoided by no-go option of the proposed project, the public benefits associated with the project such as industrial development in the region, getting of foreign currency, increased revenue to the government, hundreds of employment opportunities for local people, infrastructure development including roads and electricity in the region, increased business opportunities for local people, skill development, increased income generation for local people and improved services and community development potential among other benefits would not be realized. So, the project will be acceptable from socio-economic point of views.

(a) From Technical and Economic Perspectives

Nowadays, the use of the PSF and PET tape and PP/PE plastic pallet is increasing. So, the project will be acceptable from technical and economic point of views.

According to the above consideration about "No Project Alternative", it can be concluded that the proposed project will be acceptable if all of the environmental and social impacts related to the proposed project will be mitigated by proper mitigation measures.

4.16.2. Site Location Alternative

Site location alternative will be considered two locations. The first location will be inside the residential area and the second will be inside the industrial zone. The selection of the project location for the operation of the industrial should be the less environmental, social and the technical process should be flexible to the surrounding environment. The following table shows the comparison between the two proposed location for the project area.

Perspectives	Project area within Industrial Zone	Project area near Residential area
Environmental Perspective	- The impact significance for the environmental impacts like noise, odor, dust, increased in traffic and gaseous emission will be low due to the presence of the low density of population.	- The impact significance for the environmental impacts like noise, odor, dust, increased in traffic and gaseous emission will be more sensitive due to the present of the environmental sensitive areas especially the local residents. - Amenity and nuisance will be high due to the transportation of the raw materials and products
Technical Perspective	- The availability of electricity and water usage for the proposed project will not be difficult. - The transportation will be more flexible because of the presence of the existing haul roads. - The production of steam from the coal boiler for the industry will be more flexible in industrial park. - The installation of waste water treatment system will more flexible in industrial zone.	- The availability of electricity and water usage for the proposed project will not be difficult but little social tension due to high electricity consumption. - The transportation will be more flexible because of the presence of the existing haul roads.
Economical Perspectives	- Compensation for the land use in industrial zone will be less. - Transportation cost will be nearly the same due to the presence of the Pyay Road.	- Compensation for the land use in residential area will be high. - Transportation cost will be nearly the same due to the presence of the Pyay Road.
Social Perspectives	- Impact significance for road accidents and road damage can be less because there will have the vehicle transportation for the industry purposes only and the vehicle usage can be reduced in industrial zone.	- Amenity and nuisance will be high due to the presence of high density of population. - The impact significance for road damage and road accidents will be sensitive from the transportation of the raw material and final product and also from the transportation of other vehicles used in residential areas.

Overall Consideration

	Project area within Industrial Zone	Project area near Residential area
Environmentally feasible	√	-
Technically feasible	√	-
Economically feasible	√	-
Socially feasible	√	-

According to the environmental point of view, both project locations will have significant impacts although the impact types are different. But public concerns will be high if the project is situated near the residential area due to the operation of boiler and generator. From technical perspectives, both locations can get required facilities for project development but the present of boiler and the presence of the waste water treatment system will be more flexible in industrial zone. From the economic point of view, compensation for land use in residential area will be higher than that of industrial zone because of the population area. From socio-economic perspectives, both locations can create the job opportunities but the social tension will be high in residential areas because of the usage of the village road, electricity consumption and population influx. So, the selection of the project site in industrial zone will be more suitable from the overall consideration of perspectives.

4.16.3. Alternative Analysis for Raw Material Washing Chemicals

The following table shows the alternative analysis for chemical used for washing process.

	Caustic Soda	Magnesium Hydroxide
Economical Perspective	- Does not cost a lot for commercial use - Easily available on the market - Consume less fuel cost	- Cost more than Caustic Soda - Not easily available on the market - Consume higher fuel cost
Environmental and Socio-economic Perspective	- While handling, caustic soda may cause hazards to human skin - Can be diluted with water before discharging to the environment - The alkalinity can be tested right away	- While handling, magnesium hydroxide may not cause hazards to human skin. - Can be diluted with water before discharging to the environment - The alkalinity takes longer to be tested, hence

	- Low melting point, hence, does not need higher temperature. - Less gas emission from the boiler into the atmosphere.	time consuming - Higher melting point than caustic soda, hence, need higher temperature - More gas emission from the boiler into the atmosphere

In the washing process of recycled plastics, magnesium hydroxide can be used instead of caustic soda. When an alkaline compound dissolves in water, it produces hydroxide ions, OH-, These ions are responsible for the alkalinity of the solution. Because magnesium hydroxide $Mg(OH)_2$ provides two hydroxides for alkalinity compared to one with NaOH caustic soda (Sodium Hydroxide), the usage rate for $Mg(OH)_2$ is much less than that required for NaOH. Moreover, it is environmentally friendly with long lasting alkalinity and pH control. However, since it has long lasting alkalinity, the reaction time is longer than caustic soda, and it will be harder to wash off $Mg(OH)_2$ residue after the process. Therefore, using $Mg(OH)_2$ will increase the usage of warm water from the boiler, hence, increases the usage of coal and water. Additionally, the melting point of $Mg(OH)_2$ is higher than that of caustic soda, so it will take longer to be completely washed off by warm water, thus, required higher temperature from boiler. The higher temperature of boiler means the higher gas emission into the atmosphere. Thus, choosing magnesium dioxide as caustic soda alternative could cause some impacts to the environment.

Table - Overall Consideration for Raw Material Washing Chemicals

	Caustic Soda	Magnesium Hydroxide
Environmentally Feasible	√	-
Socio-economically Feasible	-	√
Economically Feasible	√	-

Based on the above considerations, caustic soda for raw material washing from environmental and economical perspectives although it is not feasible from socio-economical point of view. Since the caustic soda will be used together with water, it is already diluted and wearing safety gloves will reduce the direct contact. Therefore, in conclusion, caustic soda is selected as the chemical to wash the raw materials.

4.16.4. Alternative Analysis for Boiler Fuel

In recent times, the use of coal in the world is greatly reduced. The use of other fuels such as fossil fuel and biomass instead of coal can reduce environmental pollutions. However, it is a little difficult to change the boiler fuel since the boiler has already been constructed before the EIA study. Nowdays, coke can be used instead of coal to reduce SO2 and other volatile matters emissions. Generally, the use of coke instead of coal will reduce emissions of some gases (CO_2 and SO_2) because coke is the purification of coal by burning in the absence of air. It reduces the content of sulphur and other combustible substances in coal.

Additionally, the types of coal used as fuel will be considered. There are four types of coal. They are anthracite, bituminous coal, sub-bituminous coal, and lignite, where, anthracite is the highest-ranking coal and bituminous coal is most commonly used as fuel. In the proposed project, bituminous coal is used as boiler fuel. Bituminous coal is the second-best coal after anthracite; hence, anthracite coal will be considered as alternative for bituminous coal in this section.

Table - Comparison between Anthracite Coal and Bituminous Coal

Anthracite Coal	Bituminous Coal
- Very rare, available in small amount - Highest carbon content, less impurities (burns cleaner) - 3 - 6% moisture - High heating value (small amount of coal is burned, less gas emission) - Expensive	- Abundant - Higher impurities than anthracite - 17% moisture - Lower heating value (more amount of coal is burned, more gas emission) - Cheaper

According to the table, although anthracite has better properties than bituminous coal, the requirement of coal cannot be easily ordered and purchased continuously. The reason is that they are still very rare, produced in small amount and also, more expensive than bituminous coal. Therefore, in conclusion, as the bituminous coal used in the project is the second-best coal after anthracite, and most commonly used fuel, it is selected as boiler fuel for the proposed project.

4.16.5. Water Usage Alternative

The proposed project will use the underground water from the tube well. The total maximum estimated demand for water by the both factories during full operation is approximately about

1,584,000 gallons/year for each factory. That is the amount of 5000 gallons/day. The process water requirements will be planned by 2x4"Ø tube well from 300 feet aquifer. As daily consumption of overall water usage is high and can cause underground water depletion, the alternative way for water consumption is taken into account.

The daily water supply need by the proposed project is high but both of the factories have wastewater treatment systems and it can recover significant amount of water. Therefore, regular consumption of 5000 gallons/day would not be occurred as the treated water will be used as much as possible. The amount of wastewater produced from the each project is about 5 m^3/d (1300gallons/day), maximum 20 m^3/d (5000gallons/day) with maximum CMP order. The wastewater treatment plant design quantity of the proposed project is 50 m^3/d (13000gallons/day). It means 50 m^3 per day can be treated by this designed wastewater treatment plant. According to the operation of 20 hours per day, the maximum average treatment water quantity is 15- 20 m^3/h.

As an alternative way for water usage, Hlaing River is located near Myaung Dagar Industrial Zone and using river water would be the most suitable alternative selection. Hlaing River locates 1.47 miles away from factory 1 and 1.42 miles away from factory 2. There is two ways if the proposed projects intend to use water resources from the Hlaing River, collecting water by using pipelines from the river to factories and using water tankers for transportation of water. Since, collecting water by installing pipelines cannot be technically possible because the project sites located over 1 mile away from the river and installation process will be difficult as both project located in the industrial zone. Therefore, the use of water tankers is more suitable way to transport water in alternative selection. The average capacity of the normal use water trucks are around 1000 gallons and if the project use the 1000 gallons trucks, the transportation will take 5 times a day or will need 5 trucks at once. The water tanker truck will also need an engine pump to collect water in the tank. The estimation of the maximum fuel consumption are 0.227 liter per mile for 150 HP truck and 0.6 liter per hour for the 2 HP engine pump. The calculation was done by the BSFC (Brake-Specific Fuel Consumption) method. The significant drawback of using river water is that water will be needed to treat before using because Hlaing river flow near the industrial zones such as Hlaing Tharyar Industrial Zone, Shwe Pyi Thar Industrial Zone and Myaung Dagar Industrial Zone and the overall effluent (discharges) from those industrial zones can pollute the river water. Therefore, 2 step water treatment system will be needed as the project will need to treat both the input water and discharge water (wastewater).

There is no public concern for the water usage of both factories. The fuel and electricity unit prices are calculated based on the average current price of 2080 kyats/ liter (Diesel) and 200 kyats/unit (approximately value in industrial zone) respectively. The calculation and estimation are average values for both factories but not total value. The comparison between economic, environmental, socio-economic and technical perspectives on two different alternatives are shown below.

Alternative Way	Handling Method	Maximum Fuel / Power Consumption	Economic Perspective	Environmental Perspective	Socio-economic Perspective	Technical Perspective
River Water	150 Hp Water Tanker (Capacity 1000 gallon) 2 HP Engine Pump used in water tanker	0.227 liter/mile 0.6 liter/h	For 14.5 miles = 6,846 Kyats/day For 4.16h = 5,191 Kyats/day	- Gaseous emission from transportation of water - Noise from the water tanker - Dust emission from the transportation	- Increased in traffic	- Need to treat both input water and wastewater
Ground Water	2 HP Electric Pump	1.5 KWh	For 8.3h, Unit = 2490 Kyats/day	- Ground water depletion from the daily consumption of large amount of water		- Only need to treat wastewater

For the economic perspective, the use of ground water by electric motor pump is definitely the best way as it cost a lot cheaper than the transportation of river water by tanker from the Hlaing River. As for the Socio- economic perspective, there is no public concerns for water usage of both factories but increasing traffic in industrial zone can occur if alternative way with water tankers is used. For the technical perspective, using ground water is more favorable way because the river water will need to treat before using it and will also need again in wastewater stage. The cumulative effects will also be occur such as using more manpower, increase in power consumption, and increase in chemical consumption (for water treatment) and so on. For the environmental perspective, the transportation of river water by the water tanker will occur gaseous emission, noise and dust along the roadside whereas the use of underground water can cause the underground water depletion. By consideration, underground water depletion will be high significant of environmental impact than environmental impacts of water tanker (gaseous emission, dust and increased in traffic) because depletion of underground water cannot be mitigated by conventional method. Therefore, using river water is more suitable way for the environment. So, the developer should use the recycle water and river water as much as possible to reduce the impact on the groundwater.

5.0. Description of the Surrounding Environment

5.1. Consideration of AOI

AOI for proposed project will be considered by the above matrix table. This matrix table will be based on key potential environmental and social impacts. According to the above matrix table, the most possible environmental impacts will be gaseous emission from boiler. The following table show the key potential impacts during the pre-construction phase, construction phase, operation phase and decommissioning phase.

		Project Actions/Activities	Air Quality	Noise	Smell	Soil Quality	Surface Water Quality	Groundwater quality	Flora	Fauna	Protected and designed	Cultural Heritage	Community Health and	Community tensions	Economy	Employment	Visual Impact
Pre-Construction & Construction Phase	1.	Clearance of existing land, vegetation	√	√	-	√	-	-	√	√	-	-	-	√	-	-	-
		Vehicular Movement	√	√	√	√	-	-	-	√	-	-	√	-	-	-	-
	3.	Above ground construction, earthworks, cut and fill or excavations	√	√	-	√	-	√	√	√	-	-	-	-	-	-	√
	4.	Borrow pits for earth filling	-	-	-	√	-	√	-	√	-	-	-	-	-	-	√
	5.	Blockage of drainage due to solid wastes	-	-	√	√	√	-	-	-	-	-	√	-	-	-	-
	6.	Construction of Factories	√	√	√	-	-	-	-	-	-	-	√	√	√	√	-
	7.	Rise in the number of migrant workers	-	-	-	-	-	-	-	√	-	-	√	√	√	√	-
Operational Phase	1.	Running of boiler	√	√	√	-	-	-	√	√	-	-	√	√	-	-	-
	2.	Stack of coals in front of factory used for boiler	-	-	-	√	-	-	-	-	-	-	-	-	-	-	√
	3.	Operation of machines used for production of polyester staple fiber (PSF)	√	√	√	-	-	-	-	-	-	-	√	-	-	√	-
	4.	Wastes	-	-	√	√	√	-	√	√	-	-	-	-	-	-	√
	1.	Running of boiler	√	√	√	-	-	-	√	√	-	-	√	-	-	-	-
	2.	Using caustic soda water for cleaning raw materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3.	Operation of machines for both raw materials cleaning and manufacturing of PET Packing Tape and PE/PP Recycled Pellets	√	√	√	-	-	-	-	-	-	-	√	-	-	√	-
	4.	Wastes	-	-	√	√	√	-	√	√	-	-	-	-	-	-	√

	Project Actions/Activities	Air Quality	Noise	Smell	Soil Quality	Surface Water Quality	Groundwater quality	Flora	Fauna	Protected and designed	Cultural Heritage	Community Health and	Community tensions	Economy	Employment	Visual Impact
	5. Rise in the number of migrant workers	-	-	-	-	-	-	-	√	-	-	√	√	√	√	-

According to the above considerations for AOI, the summary tables for considerations are as follow:

Table 5.1 – Consideration of AOI for Factory 1

Phase	Potential Impacts	Affected Receptors	Baseline Study	Considerations of AOI for
Operation	Air Quality (Dust and PM Generation)	- Nearest Local Residents in front of the factory - Fauna and Flora diversity	Baseline study of air quality is moderate since the project is located in the industrial zone whereas the air emissions from other factories will also be included. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project).	PM 10, PM 2.5 are above its guideline value but due to the calculation, the concentration decreases with distances and due to the direction of the air, the emissions may reach the nearest residences. Therefore, AOI for 2km radius centered at the Factory 1 is suitable as all the affected receptors are within the boundary.
	Air Quality (Gaseous Emission)	-Nearest Local Residents in front of the factory	- Baseline study of the gaseous emission is within the range of national and international standards. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project).	- Although the gaseous emission is within the guideline values, it dispersion rate is over 2km radius, so AOI of 2km radius is a suitable choice to assess the impact.

	Noise	- Nearest Local Residents - Fauna diversity	Baseline study of noise quality is still within the range for noise guidelines of industrial purpose even though the project is located in the industrial zone whereas the noises from other factories will also be included. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project) where they might hear.	For industrial, the noises guideline is 70dB and its results during the day at sample point 2 is 63.87 dB. In order to cover all the sensitive areas, AOI of 2km radius centered at Factory 1 is suitable to be used.

Table 5.2 – Consideration of AOI for Factory 2

Phase	Potential Impacts	Affected Receptors	Baseline Study	Considerations of AOI for
Operation	Air Quality (Dust and PM Generation)	- Nearest Local Residents including in front of the factory - Fauna and Flora diversity	Baseline study of air quality is moderate since the project is located in the industrial zone whereas the air emissions from other factories will also be included. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project). The nearest reserved forest is Hmawbi Reserved Forest.	All the air results are below its guideline value but due to the direction of the air, the emissions may reach the nearest residences and forest. According to the calculation above, it is stated that the dust concentration decreases with distance so AOI of 2km radius centered at Factory 2 is suitable as all the affected receptors are within the boundary.
	Air Quality (Gaseous Emission)	- Nearest Local Residents in front of the	- Baseline study of the gaseous emission is within the range of national and international	- Although the gaseous emission is within the guideline values, it

		factory	standards. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project).	dispersion rate is over 2km radius, so AOI of 2km radius is a suitable choice to assess the impact.
	Noise	- Nearest Local Residents including in front of the factory - Fauna diversity	Baseline study of noise quality is still within the range for noise guidelines of industrial purpose even though the project is located in the industrial zone whereas the noises from other factories will also be included. The nearest residences are Myaung Tagar, Kalar Kone, Kan Kalay and Industrial Zone (Infront of the proposed project) where they might hear. The nearest reserved forest is Hmawbi Reserved Forest.	For industrial, the noises guideline is 70dB and its results during the day at sample point 2 is 60.28 dB. In order to cover all the sensitive areas, AOI of 2km radius centered at Factory 2 is suitable to be used.

Figure 5.1. Area of Influence (AOI) of Polyester Staple Fiber Factory (Factory 1)

Figure 5.2. Area of Influence (AOI) of Plastic Pellets and Packaging Tape Factory (Factory 2)

Figure 5.3. Area of Influences (AOI) for both PSF and PPPT Factories

As the project is located within the Industrial Zone, there will have no environmentally sensitive areas such as forest area, agricultural lands, histological place, and other ecological important sites. However, there is some illegal residential area within the industrial zone and some residential areas in or near the proposed projects as shown in the following figure.

Figure 5.4. Residential Areas within AOI of Polyester Staple Fiber Factory

Figure 5.5. Residential Areas within AOI of Plastic Pellets and Packing Tape Factory

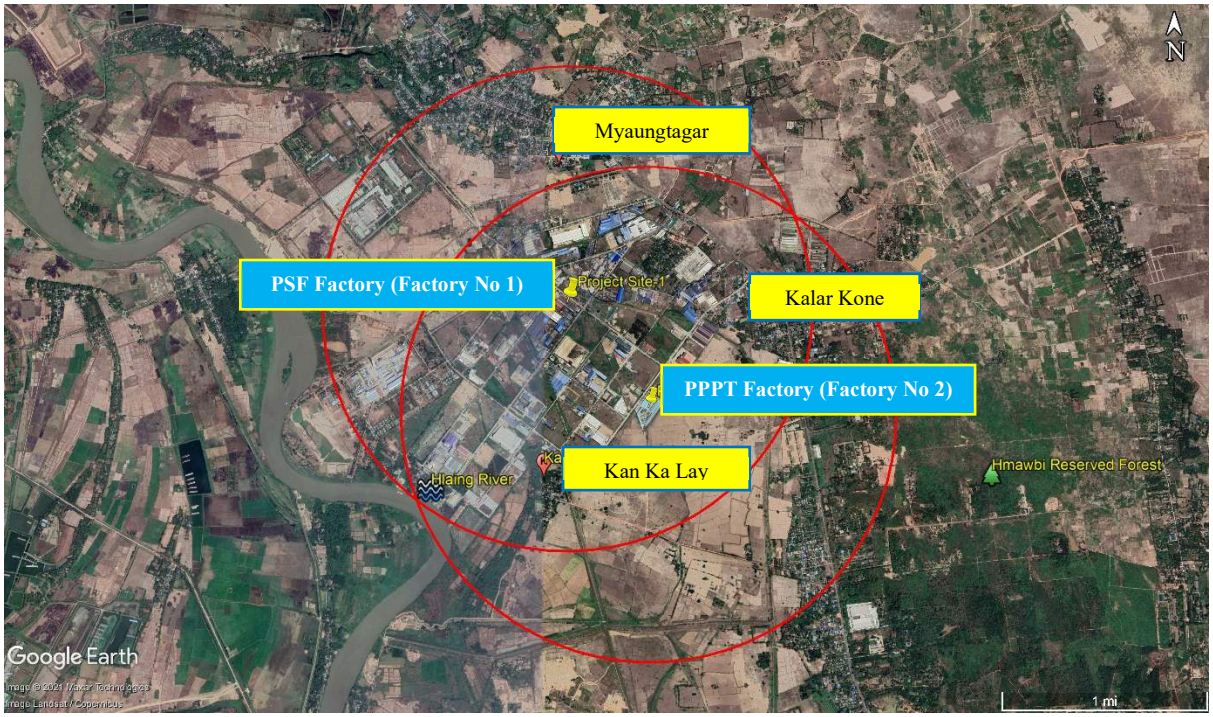


Figure 5.6 – Residential Areas within AOI of both Factory 1 and Factory 2

All of them can be affected gaseous emission and odor. All of the residential areas are within the 2km radius. So, the AOI for 4km boundary considered by project location will be covered for both factories.

5.2. Methodology and Objectives for Environmental Baseline Study

Environmental baseline study will conduct by the following methodology and objectives.

5.2.1. Ambient Air Quality Monitoring

Objectives

Ambient air quality monitoring collects and measures samples of ambient air pollutants to evaluate the status of the atmosphere as compared to clean air standards and historical information. Monitoring helps in assessing the level of pollution in relation to ambient air quality standards. Standards are a regulatory measure to set the target for pollution reduction and achieve clean air.

Methodologies

Ambient Air Quality monitoring will be conducted by Haz-Scanner EPAS by the following methodologies.

Figure - Haz-Scanner EPAS for Ambient Air Quality Monitoring

(a) Monitoring Parameters

The parameters for ambient air quality monitoring will be SO_2, NO_2, CO_2, CO, H_2S, O_3, $PM_{2.5}$ and PM_{10}.

(b) Sampling Rate and Sensors

Determination and analysis of ambient air qualities were conducted by using Haz-Scanner Environmental Perimeter Air Station (EPAS).

Sampling rate of air quality will be recorded automatically every one minute for important gases (Sulfur dioxide, Nitrogen dioxide, Carbon dioxide, Carbon monoxide, Hydrogen sulfide, Particulate matter, Hydrogen sulfide and Ozone) to describe ambient air quality. Sampling pump was adjusted to 2 liter/min. Different analysis methods will be integrated in the instrument, such as particulates 90° Infrared Light Scattering for particulate matters (PM_{10}, $PM_{2.5}$), electrochemical sensors for toxic gases (SO_2, NO_2, CO, H_2S), NDIR (optional sensor) for (CO_2) and Gas Sensing Semiconductor- GSS technology (optional sensor) for O_3.

Table - Important Gases for Ambient Air Quality

No.	Parameters	Analysis Methods
1.	Sulfur dioxide (SO_2)	Electrochemical sensors
2.	Nitrogen dioxide (NO_2)	Electrochemical sensors
3.	Carbon Dioxide (CO_2)	NDIR (optional sensor)
4.	Carbon monoxide (CO)	Electrochemical sensors
5.	Hydrogen Sulfide (H_2S)	Electrochemical sensors
6.	Particulate matter 2.5 ($PM_{2.5}$)	Infrared Light Scattering

7.	Particulate matter 10 (PM_{10})	Infrared Light Scattering
8.	Ozone (O_3)	Gas Sensing Semiconductor- GSS technology (optional sensor)

5.2.2. Existing Noise Level Monitoring

Objectives

Since the proposed project is located in the industrial area and near residential area, noise level should be carefully monitored to ensure that the local community is not disturbed by the operation of the factories.

Methodology

The approach will be based on SANS 10328:2008, 'Methods for Environmental noise impact assessments' as well as the IFC PS and Equator Principles. The technical guidelines will be based on good engineering practice, SANS 10103:2008, 'The measurement and rating of Environmental noise with respect to annoyance and to speech communication' and the IFC EHS Guidelines for noise.

Scope of Work

Given the generally rural and agricultural nature of the existing environment, noise levels can be predicted to be low. So, measure the present ambient noise levels at point 1 and point 2 that have been identified for the project.

Noise Level Monitoring Equipment

To monitor the existing noise level, the team will use TES-1353H Integrating Sound Level Meter which is applicable with IEC61672-1: 2003, IEC60651: 1979, ANSI S1.4: 1983 and IEC60804: 1985 standards. Existing noise level will be monitored in both day time (07:00 to 22:00) and night time (22:00 to 07:00).

Figure - TES 1353H Integrating Sound Level Meter

Noise Quality Monitoring Results

The results for noise level monitoring will be calculated by using Panel V8.01 Software as follow:

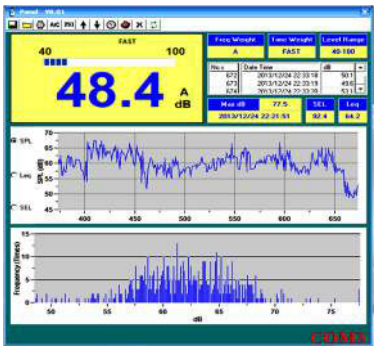


Figure - Integrating Sound Level Software (Panel V8.01)

Noise Level Monitoring Standard

Noise level monitoring results will be compared with National Environmental Quality (Emission) Guidelines, 2015 for residential, institutional and educational areas as follow:

Table 5.3 - Noise Level Monitoring Standard

Receptor	One Hour LAeq (dBA)[a]	
	Day time (07:00-22:00) (10:00-22:00 for Public holidays)	Night time (22:00-07:00) (2200-10:00 for Public holidays)
Residential, Institutional, Educational	55	45

Source: National Environmental Quality (Emission) Guidelines (2015)

5.2.3. Existing Water Quality Monitoring

Objectives

As the proposed project can impact on water environment (depletion of natural water source and impact on water quality), water samples are collected and some parameters of water quality are measured on site and some parameters are sent to respective laboratories.

Methodologies

Sampling Method

Water samples will be collected in terms of Grab sampling method (especially for the river with regular flow rate) with the following approaches;

- Rinsing the water bottle with river water
- Hold uncapped bottle upside down and submerse it
- Tip bottle upright and allow water to fill bottle
- Remove bottle from water and screw on cap

Sample Handling and Preservation

- use water resistant label for each sample bottle with the date, time, and site number/name
- documentation is done in field logbook
- store the samples in ice box immediately after sampling and transport for laboratory analysis.

Analysis Method

Water samples are tested for waste water in National Health Laboratory (one of the national approved laboratories).

5.2.4. Existing Soil Quality Monitoring

Objective

The objectives of the soil quality assessment for will be as follow:

- To assess the current physical and chemical status of the area targeted for the development;
- To determine the pre-development land capability of the soil cover to be affected by the proposed project; and
- To assess the expected impacts posed on the soil resource by the proposed development.

Methodologies

In terms of the legislation, it is proposed to conduct a soil investigation based on the Soil Classification System for SA, 1991. Such an assessment will include a physical investigation of the soil cover to be disturbed by the proposed project. The scope of work entails the following:

- Conduct a desktop study as a prerequisite prior to a field visit;
- Conduct a field visit during which a physical assessment of the soil covering the areas to be disturbed will take place;
- Compile a report on the findings and results of the assessed area.

Desktop Study

A desktop study will be conducted to gain a general understanding of the soil resource covering the area in question. Existing broad scale maps will be obtained and reviewed to address the input requirements for the EIA report.

In-field Soil Assessment

In preparation for a field visit, soil survey locations will be generated to optimize coverage of the expected soil types. Actual field mapping and classification will be supported by soil profiling to serve as a platform for detail level mapping. During soil mapping, the extent of ecologically sensitive areas, such as wetlands, will be identified and delineated on the basis of soil types. The following attributes listed recorded at each location point:

- Soil form and depth;
- Estimated soil texture and structure;
- Content of coarse fragments;
- Current land use; and
- Land capability.

Sampling of Representative Areas

Chemical balance in the soil profile may be subjected to disturbance during the planned development and post-activity restoration. In order to obtain fertility status of the soil resource prior to commencement of any development activities, a sampling program is recommended in conjunction with the soil mapping exercise.

The sampling of major delineated units is good practice. A maximum of 4 sample locations are deemed sufficient to exhibit the required soil properties and chemical status. The following analysis package is proposed and will be submitted to the laboratory of the Department of Agricultural:

- Particle size distribution on selected samples (3-fraction testing);
- pH (water);
- Exchangeable cations Na, K, Ca, Mg (Saturated paste method);
- Phosphorus (Bray1 method);
- Organic carbon content on selected topsoil samples (Walkley Black method); and
- Electrical conductivity (indication of salt presence).

Testing of Soil Quality

The soil samples are collected inside the project compound and inside the agricultural field near the project site. All the soil samples will be tested in National Laboratory under the Myanma Research and Innovation Department.

5.2.5. Existing Biodiversity Situation

Objectives

- To record occurrence and identify the fauna species recorded at project area and its vicinity
- To assess the diversity of species recorded
- To assess the potential impacts, to suggest the mitigation measures and how to monitor by project activities.
- To know current existing or not plant species which are belong to endangered species.

Methodology

This section considers the effects that the proposed project might have on biological, nature conservation resources including habitats, species, and individual sites of nature conservation value. It addresses effects at all stages of the project cycle, including site clearance and construction, operation, and decommissioning.

(a) Desk Based Research

Data on statutory designated sites within 5 km of the proposed project boundary, non-statutory designated sites within 3 km, and protected species within 3 km were requested or gathered from the existing records. Publications mainly consulted included: National Biodiversity Strategy and Action Plan 2011 and National Biodiversity Strategy and Action Plan 2015-2020.

(b) Study Area and Biodiversity Opportunity Areas

The project area is located in the Myaungdagar Industrial Zone. It lies between Latitude 17° 9'18.34"N, Longitude 95°57'31.18"E and Latitude 17°10'59.84"N Longitude 95°59'39.19"E. The area is located nearby urban area and Hlaing River. Project target site is situated at about 1km form the Yangon-Pyay High way road. Zooplanktons and fishes were collected from Hlaing River, near and drain waste water from industrial zone and waste canal, drain waste water from industrial zone.

Proposed Method of Assessment

The assessment will address habitats, plant and animal species and sites of special importance for any of these. It will address these receptors in their scientific, ecosystem functioning, and nature conservation aspects only. It will not address them in respect of their contribution to agriculture or the landscape, nor in their socio-economic aspects. These matters will be addressed in the appropriate chapter.

- ✓ London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990 (Date Ratified: 1993)
- ✓ United Nations Framework Convention on Climate Change (UNFCCC), New York, 1992 (Date Ratified: 1994)
- ✓ Convention on Biological Diversity, Rio de Janeiro, 1992 (Date Ratified: 1994)
- ✓ Stockholm Convention on Persistent Organic Pollutants (POPs), 2001 (Date Ratified: 2004 (Accession))

Desk-based Studies

- ✓ Records will also be requested from governmental and non-governmental natural history and conservation groups that are likely to be consulted as part of the ecological assessment process.
- ✓ An air-photo assessment of border networks in an 1km buffer around the proposed project site will be conducted.
- ✓ A further search for published literature and reports of previous surveys relevant to the survey area will be conducted.

Field Surveys

A number of habitat and species surveys have been and will be undertaken and he following additional field surveys will be required:

- ✓ initial surveys of areas for which access was not available in May 2019 (follow-on surveys that arise from the findings);
- ✓ scientifically botanical surveys
- ✓ scientifically fauna surveys
- ✓ scientifically bat surveys

Data Analysis of Plant Species

Samples of some species were not directly identified in field. After field trip, plant identification will be conducted based on available literatures such as key to the families of the flowering plants, issued by Department of Botany, Yangon University (1994), Backer *et. al.* (1963), Kress *et. al.* (2003), Gardner *et al.* (2000), Caton *et al.* etc., and verification will be also conducted by recorded field photographs and some useful internet websites. Finally, the threatened levels of plant species of the survey area will be checked and mentioned in accordance with "The IUCN Red List of Threatened Species, 2018".

Data Analysis of Fauna Species

Bird Species: The recorded species will be identified using reference books.

Mammal Species: All data recorded in the survey area will be entered into the field data sheet. Information on some species will obtained from interviews with the local people.

Interview Survey for Flora and Fauna

In addition to the field observation, secondary data will also be surveyed by interviewing local residents and through literature review. In the interview survey, the surveyor visited the residents in and around the survey area and asked about the name of plants and animals existing in and around the area.

Procedure Impact Assessment

In order to assess the likely significant environmental impacts, potential impacts of the proposed project will be preliminary identified based on the project description and overall environmental conditions. The impacts of flora and fauna will be classified as A to D in accordance with the following criteria, assuming no specific measures toward the impacts are taken:

1) A-: Significant negative impact, A+: Significant positive impact
2) B-: Some negative impact, B+: Some positive impact
3) C: Impacts are not clear, need more investigation
4) D: No impact or impacts are negligible, no further study required

5.2.6. Baseline Hydrological Environment

Objectives

It aims at assessing sensitivity of the baseline hydrological environment and potential impacts of the proposed development upon it and proposes mitigation measures in order to ensure that

the potential adverse impacts of the proposed project development on the hydrological environment will be slight and neutral. For the proposed project, the potential impact will be impact on surface water quality during operation. So, the impact study for surface water quality will be based on during production of the factory. The potential impacts on the surface water environment from the proposed project development, in the absence of suitable mitigation measures, are considered to be as follows:

- Direct impacts of the project operation on the hydrological environment for example contamination of surface water from the discharge of the waste water and the waste water from the boiler operation

The following tasks will also be done;

- Compilation of a baseline report to characteristic the existing hydrology and water quality of the area;
- Development of floodlines for the area;
- Development of a stormwater management plan for the site

Methodology

Scope of Work

The scope of work for the surface water assessment will be below.

Site Visits for Surface Water Quality

Two site visits will be conducted. The first visit will be a reconnaissance visit to understand the site location of and the next site visit is to set up the baseline monitoring program and take field measurements.

Water Quality Testing

As the surface water quality will be tested in water quality testing laboratory under the Department of Occupational Health.

5.2.7. Cultural and Heritage

Objectives

The preparation of cultural and heritage impact assessment involves the listing of

- Classified or listed monuments and sites together with their protective perimeter, and the perimeters of Areas of Protection of Architectural, Urban and Landscape Heritage,
- Known Archaeological areas and areas of high archaeological potential.
- Declaration file that contains the description of works, the surface area used as a basis for calculating the preventive archaeology fees and impacts on the subsurface.

Methodology

In fact, there are possible necessaries to do cultural heritage assessment as follows;

1. Baseline data for the existing cultural heritage sites
2. Making cultural map

5.3. Physical Components

5.3.1. Topography

The proposed project area lies near the northeast of the Bago bay, and it can also be found a little hilly place in north and south places of the Hmawbi region. It is also situated the west part of the Yangon-Pyay Highway Road. The Hlaing River is situated at the corner of the north part of the Hmawbi Township. Hmawbi Chaung, Dontapae Chaung and Myaung Dagar Chaung flow into the Hlaing River. The elevation of the site is 46 ft above sea level and the location of this sites is (17°10‘5.52“) to (17°10’ 3.19“) North Latitude and (95°58’39.65”) to (95°58’ 43.66”) East Longitude as shown in the following figure.

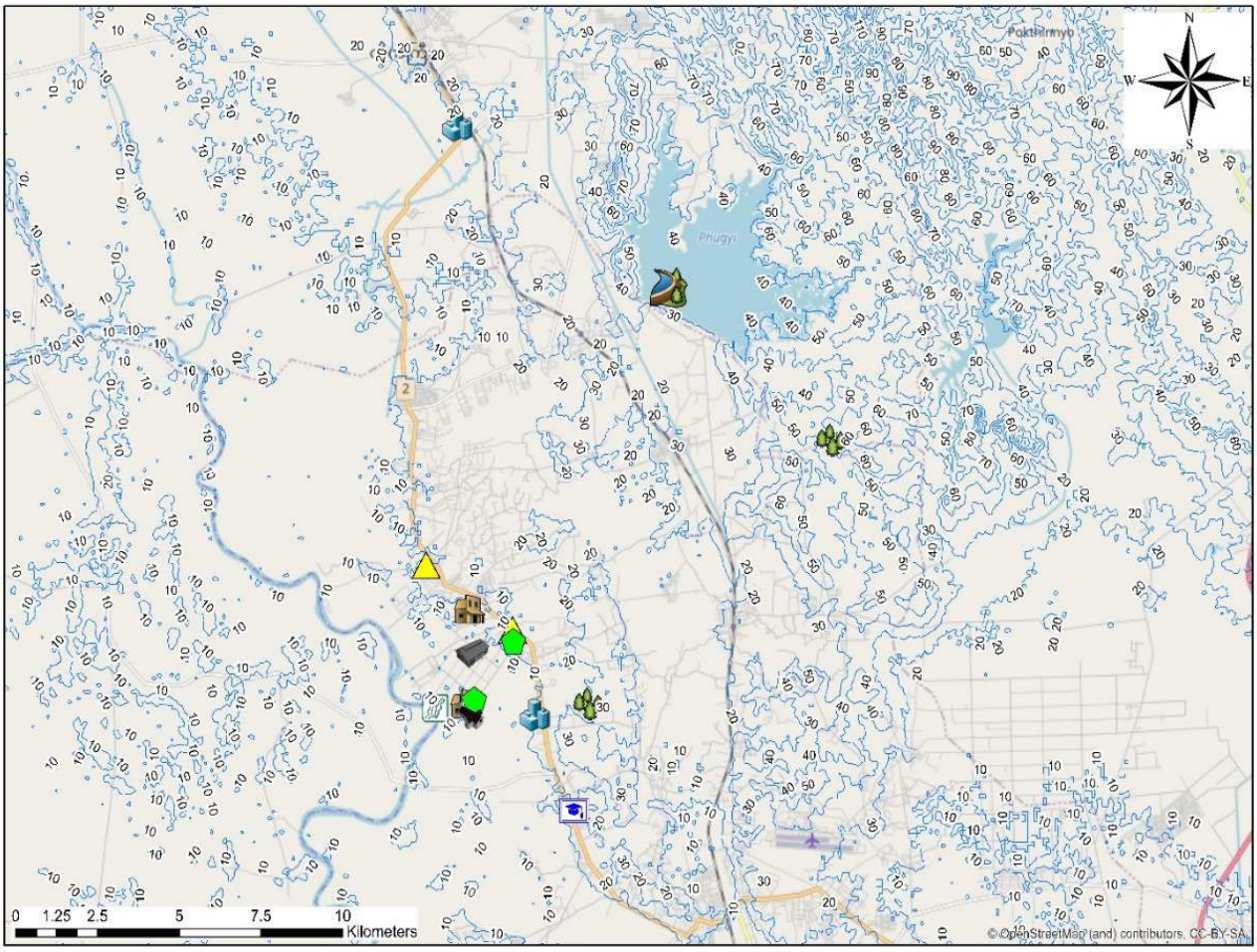


Figure 5.7 - Topography Map of Proposed Project

5.3.2. Water Resources

The project site lies along the catchment of the Hlaing river which flows west of the site in a southerly direction to coverage into the Yangon River. The Yangon River (also known as the Rangoon River or Hlaing River) is formed by the confluence of the Pegu and MyitMaKa Rivers and flows into the Gulf of Martaban which is part of the larger Andaman Sea. The river flows along a 40km stretch flowing from southern Myanmar as an outlet of the Ayeyarwady River into the Ayeyarwady delta. A small portion of the Bago River (the estuary) lies within the Yangon Division. The Pazundaung Creek and Bago River joins the Yangon River and from there, flow forwards the southwestern direction into Andaman Sea.

5.3.3. Geological Characteristics

The proposed area is underlain by alluvial deposit (Pleistocene to Recent), the non-marine fluviatile sediments of Irrawaddy formation (Pliocene) and hard, massive sandstone of Pegu series (early late Miocene). Alluvial deposits are composed of gravel, clay, silts, sand, and laterite which lie upon the eroded surface of the Irrawaddy formation at 3-4.6m above mean sea level (MSL). The rock type in Yangon is mainly soft rocks, which consist of sandstone, shale, limestones, and conglomerate.

Tectonics

Yangon is situated in the southern part of the Central Lowland which is one of the three major tectonic provinces of Myanmar. The Taungnio Range of the Gypphyu catchments area of Taikkyi District, north of Yangon, through the Thanlyin Ridge, south of Yangon forming a series of isolated hills probably resulted from the progressive deformation of the Upper Miocene rocks as the eastern continuation of the subduction or stretching and compression along the southern part of the Central Basin and regional uplifting of the Pegu Yoma.

Soil Structure

The underlying soil type at the Project Site and its surrounding is characterized as the Meadow and Meadow Alluvial Soil. Meadow soil is soil which occurs near the river plains exposed to occasional tidal floods, is non-carbonate and usually contains a large amount of salt. Both materials mainly comprise silty clay loam and neutral soil rich in plant nutrient. The upper layers (approximately 0 to 7 m) of the soil at the Project Site comprise largely of cohesive layers with traces of sand and gravel, followed by sand layers with low silt content

and trace gravel from 7 to 35 m. The lower layers comprise denser silt layer with traces of sand and gravel from approximately 57 to 70 m. Standard Penetration Test (SPT) results obtained from testing at the Project Site indicate that the soil strength generally increases with depth.

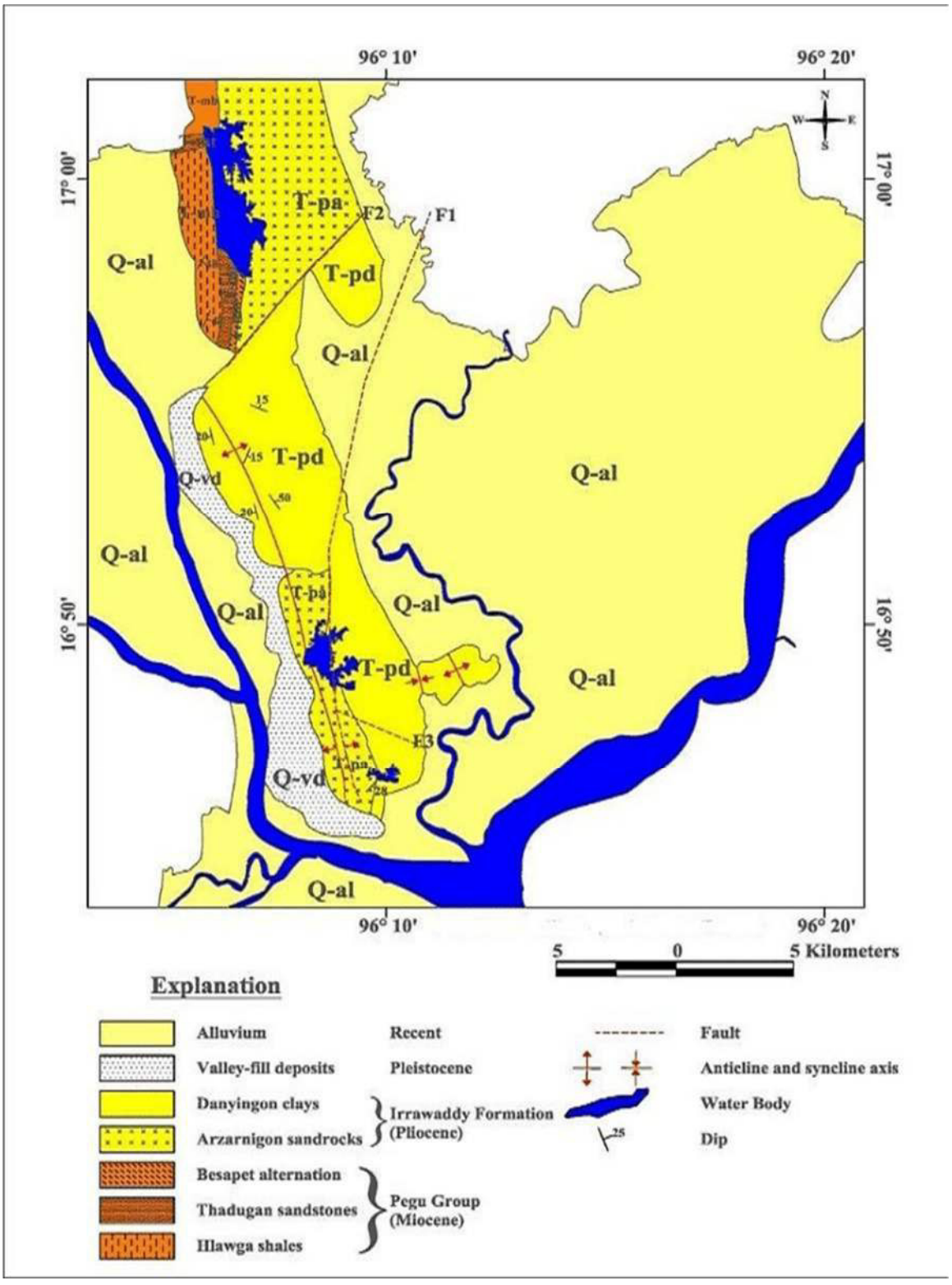


Figure 5.8 – Geological Map of Yangon

Geographical Boundaries and Temporary Boundaries

Geographical boundaries are used for site selection, neighborhood analysis, market & trend analysis, redistricting environmental, medical research & analysis, and historical studies. According to this study, it can be made demarcation of geographical boundaries by Hmawbi Township area, and Myaungdagar Industrial Area by physical condition. Hmawbi is a township located 50 km northwest from the Yangon City. Most of the areas are rural with green paddy fields, big trees and relaxing atmosphere. Hmawbi Township has many significant places. Japan Pagoda, Shwe Maw Tin Pagoda, Daydalon Pagoda, Technological University are the most well-known places. Hmawbi Myoma Market is famous for having fresh vegetables and fruits.

Myaung Dagar Industrial Zone was constructed in 2006-2008 and it was intended only to be house of Yangon's steel factories. Area of Industrial Zone is 1034.87 acres. The industrial zone is located in north part of Hmawbi Township and near the Hmawbi- Taikkyi Road (Pyi Road). Currently there has been increased industries and factories in the industrial zone rather than before. As an industrial zone, there have big landscape and many factories. At first , most of the factories are steel factories but other factories such garment, apparel, and plastic factories are operating at present.

Although Myaung Dagar Industrial Zone is located in Hmawbi Township, the industrial zone stand alone in the rural area and the nearest densely populated area is Myaung Da Gar village. Therefore, the Myaung Dagar Industrial Zone and the rest of Hmawbi Township can be considered as separate geographical boundaries.

The Hmawbi- Taikkyi Road (Pyi Road) separated the industrial zone with the other area at the north and Hlaing River separated at the southern part of the industrial zone. The area in the east and west of the industrial zone are mostly farmlands. Therefore, temporary boundary can be considered by above characteristics.

It can be seen in maps of industrial zone and Google map as mentioned below;

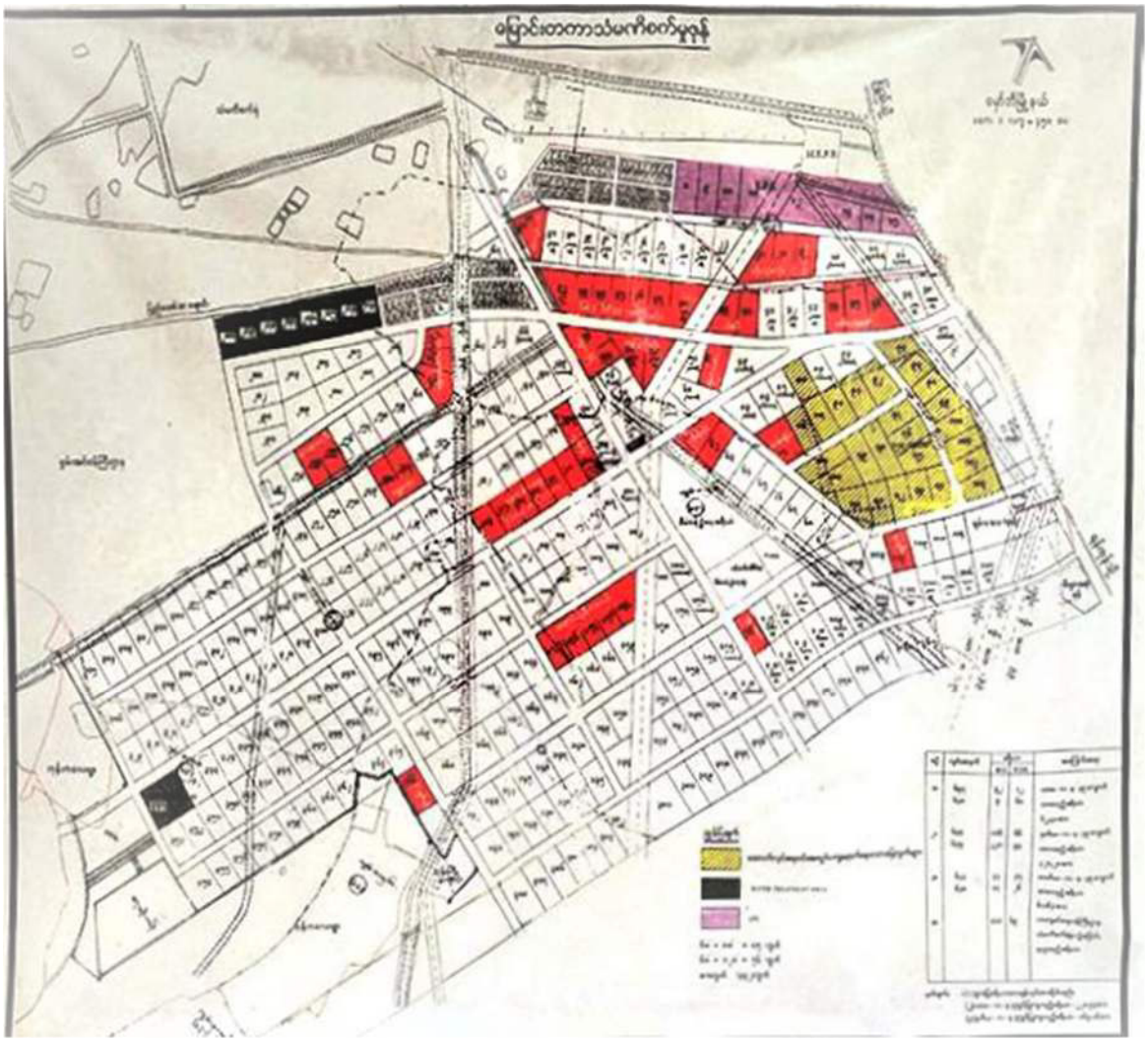


Figure 5.9 – Geographical Boundaries

Figure 5.10 – Temporal Boundaries

5.3.4. Environmental Quality

The overall conditions of air quality, water quality, soil quality and noise levels are quoted from the scoping report for Da Hua (Myanmar) polyester staple fiber production project. The location of the environmental survey for overall conditions is shown in the following figure.

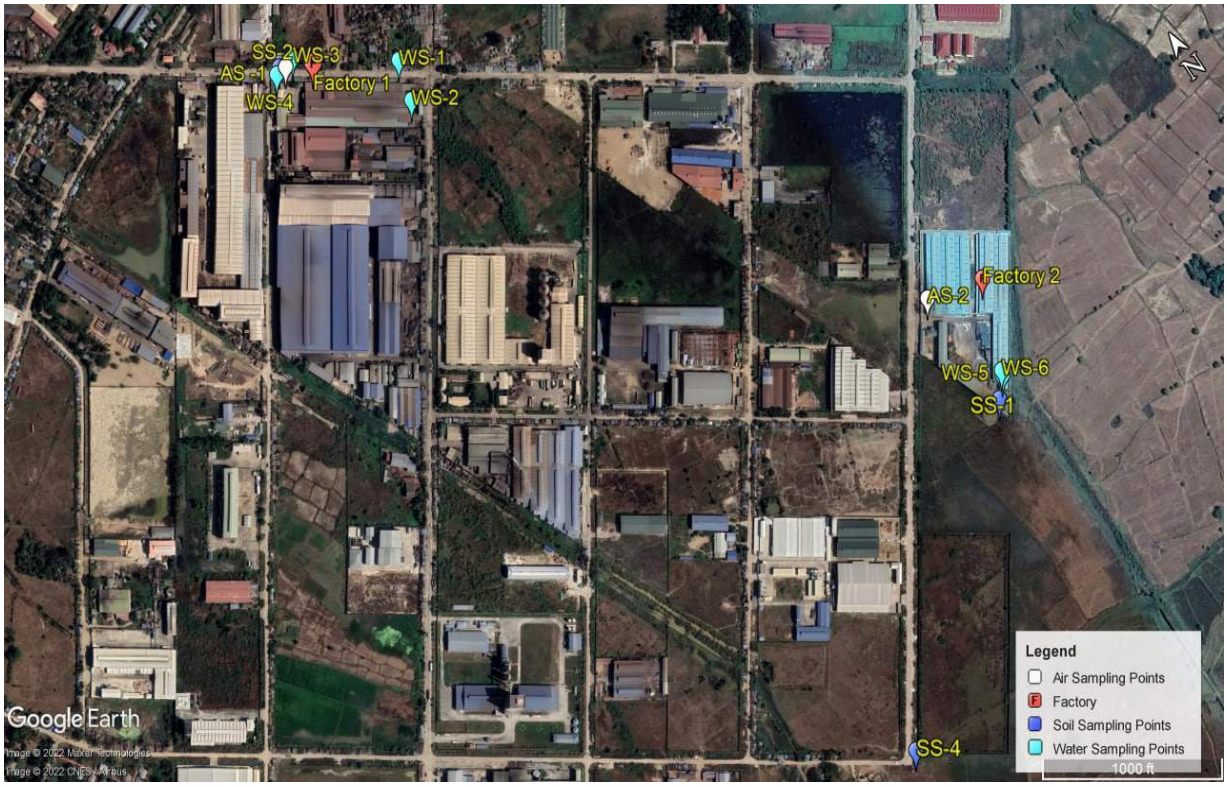


Figure 5.11 - Location of Sampling for Overall Environmental Conditions

5.3.4.1. Air Quality

The project site is in a urban environment within the industrial zone and largely characterized by factories. The primary sources of air pollution are therefore anticipated to include dust arising from unpaved roads and vehicle movements, agricultural activities and domestic fuel burning from rural households (fuel wood and charcoal for cooking and space heating).

(a) Location of Air Quality Monitoring Points

The air quality monitoring was conducted near the Hmawbi Township. As the project is inside the industrial compound, there are various gaseous emission industrial types and so the air quality monitoring within the industrial zone is suitable to monitor the ambient air quality of the proposed project. The sampling points for the air quality monitoring are shown in the following figure.

Figure 5. 12 - Location of Air Sampling Points

S/N	Coordinates	
	Latitude	Longitude
AQ-1 (Factory 1)(near storage)	17°10'6.24"N	95°58'39.22"E
AQ-2 (Factory 2) (near production workshop)	17°09'36.26"N	95°59'01.79"E

(b) Monitoring Period

Air quality was monitored by 12 hours for daytime and 12 hours for nighttime. Detailed for measurements are shown in following table.

Duration of Air Quality Monitoring

Monitoring Points	Duration
Night Time	(07:00 pm to 07:00 am)
Day Time	(07:00 am to 07:00 pm)

Figure 5.13- Recorded Photo for Air Quality Monitoring

(c) Air Quality Monitoring Result

The air quality monitoring results obtained by every minute were combined to make average values for day time (12 hours) and night time (12 hours) for evaluation and comparison with standard values.

Air Quality Monitoring Results for Sample Point 1 (17°10'6.24"N, 95°58'39.22"E)

Parameters	Unit	Measured Values
Nitrogen Dioxide	µg/m^3	187.15
Sulphur Dioxide	µg/m^3	0.3
Particulate matter PM $_{10}$	µg/m^3	55.97
Particulate matter PM $_{2.5}$	µg/m^3	28.32
Ozone	µg/m^3	82
Ammonia	ppm	0
Carbon Dioxide	ppm	419
Carbon Monoxide	ppm	0
Volatile Organic compound	ppb	0
Oxygen	%	20.22

Air Quality Monitoring Results for Sample Point 2 (17°09'36.26"N, 95°59'01.79"E)

Parameters	Unit	Measured Values
Nitrogen Dioxide	µg/m^3	154.63
Sulphur Dioxide	µg/m^3	0
Particulate matter PM $_{10}$	µg/m^3	16.88
Particulate matter PM $_{2.5}$	µg/m^3	8.95
Ozone	µg/m^3	81

Ammonia	ppm	0
Carbon Dioxide	ppm	411
Carbon Monoxide	ppm	0.1
Volatile Organic compound	ppb	0
Oxygen	%	20

(d) Comparison with Guidelines Values

The monitoring results are compared with National Environmental Quality (Emission) Guidelines – NEQ(E)G 2015; as shown in the following table.

Parameters	Sample Pt.1	Sample Pt.2	Unit	Measuring Avg. period	Guideline Value	Avg. Period	Remark for Pt.1	Remark for Pt.2
Nitrogen Dioxide	187.15	154.63	µg/m^3	24 hrs	200 µg/m^3 (NEQG)	1-hour	15/7/2021 6:13-7:13 (peak hr)	16/7/2021 3:50-4:50 (peak hr)
Sulphur Dioxide	0.3	0	µg/m^3	24 hrs	20 µg/m^3 (NEQG)	24-hour	-	-
Particulate matter PM$_{10}$	55.97	16.88	µg/m^3	24 hrs	50 µg/m^3 (NEQG)	24-hour	-	-
Particulate matter PM$_{2.5}$	28.32	8.95	µg/m^3	24 hrs	25 µg/m^3 (NEQG)	24-hour	-	-
Ozone	82	81	µg/m^3	24 hrs	100 µg/m^3 (NEQG)	8-hour daily maximum	9:15-17:15 (14/7/2021)	10:50-18:50 (15/7/2021)
Ammonia	0	0	ppm	24 hrs	NG	-	-	-
Carbon Dioxide	419	411	ppm	24 hrs	NG	-	-	-
Carbon Monoxide	0	0.1	ppm	24 hrs	NG	-	-	-
Volatile Organic compound	0	0	ppb	24 hrs	NG	-	-	-
Oxygen	20.22	20	%	24 hrs	NG	-	-	-

Note:

NG = No Guideline

NEQ(E)G = National Environmental Quality (Emission) Guidelines 2015

Analysis of Air Quality Monitoring Results

Ambient air qualities monitorings were conducted within both of the factory 1 and 2. As both of the factoires are within the industrial zone, air qualities monitoring will be covered for analysing ambient air qualities. Air qualities monitoring at other points will be complicated as there are other gaseous emission industires within the Myaungdagar industrial zone.

Sample Point 1 (Factory 1)

Monitoring results of Nitrogen Dioxide is 187.15 µg/m3, lower than the NEQG general guideline values, 200 µg/m3. Sulphur dioxide results are also far below from the guideline values which is 20 µg/m3 for industrial purposes. PM10 and PM2.5 results are a little over guideline values since the monitoring locations are within the project, near the transportation roads , moreover, PM10 and PM2.5 value will also decrease with distance. Ozone values are lower than the guideline values so it is also within the safe limits.

Sample Point 2(Factory 2)

For sample point 2, concentration of nitrogen dioxide is below NEQG general guideline values. There is no sulphur dioxide concentration found at all. And the results of particulate matter are all below guideline values. Ozone is found in safe limits. Thus, for sample point 2, all monitoring results are within safe limit.

5.3.4.2 Existing Water Quality

The location of the environmental survey for water quality condition is shown in the following figure.

Figure 5.14 - Locations of Water Quality Sampling

S/N	Coordinates	
	Latitude	Longitude
WS-1 (Waste water Discharge point at factory 1)	17°10'2.84"N	95°58'44.65"E
WS-2 (Waste water Treatment plant at factory 1)	17°10'0.84"N	95°58'44.02"E
WS-3 (Tube well in front of the factory 1)	17°10'6.38"N	95°58'39.82"E
WS-4 (Domestic water usage at Factory 1)	17°10'6.23"N	95°58'38.58"E
WS-5 (Waste water Discharge point at factory 2)	17° 9'30.77"N	95°59'2.91"E
WS-6 (Waste water Treatment plant at factory 2)	17° 9'31.00"N	95°59'3.03"E

All of the water quality sampling points will be the potential source of water pollution due to recycling process.

Water Quality Monitoring Results

The following table shows the water qualities testing results for all of the water monitoring points.

Table- Results for Water Quality Monitoring

Sr. No.	Parameters	Unit	Analysis Value						Minimum measurement range of methods	NEQ(E) guidelines general application
			W-1	W-2	W-3	W-4	W-5	W-6		
1	5-day BOD	mg/l	388	74	ND	ND	ND	ND	30	50
2	COD	mg/l	700	160	ND	ND	ND	ND	30	250
3	Oil and Grease	mg/l	12	6	ND	ND	ND	ND	5	10
4	pH	-	5.51	5.64	5.69	6.55	9.08	6.43	0.1	6-9
5	Total Dissolved Solids	mg/l	560	280	120	220	200	160	1	-
6	Total Suspended Solids	mg/l	80	48	38	20	20	20	1	50
7	Turbidity	NTU	68	24.6	21.8	9.29	9.78	9.36	0.01	-

ND – Not Detected

Analysis of Water Quality Monitoring Results

For BOD and COD, results of WS1 and WS2 are significantly higher than guideline values. This is because of the fact that these samples were taken from the creeks and drainages existed within the industrial zone that affect BOD and COD concentrations due to high flow rare, soil erosion, urban runoff, wastewater and septic effluent, etc. Also for concentration of total suspended solids, result of WS1 is over the guideline values, this is also as the same reason of which it was collected from wastewater drainage of the industrial zone. For pH level, all of the samples are within the safe zone except for WS5 since it is collected from waste effluent of the new factory. Other values of all samples are within the safe limits according to NEQG General guidelines.

5.3.4.3 Existing Soil Quality

The location of the environment survey for soil quality conditions is shown in the following figure.

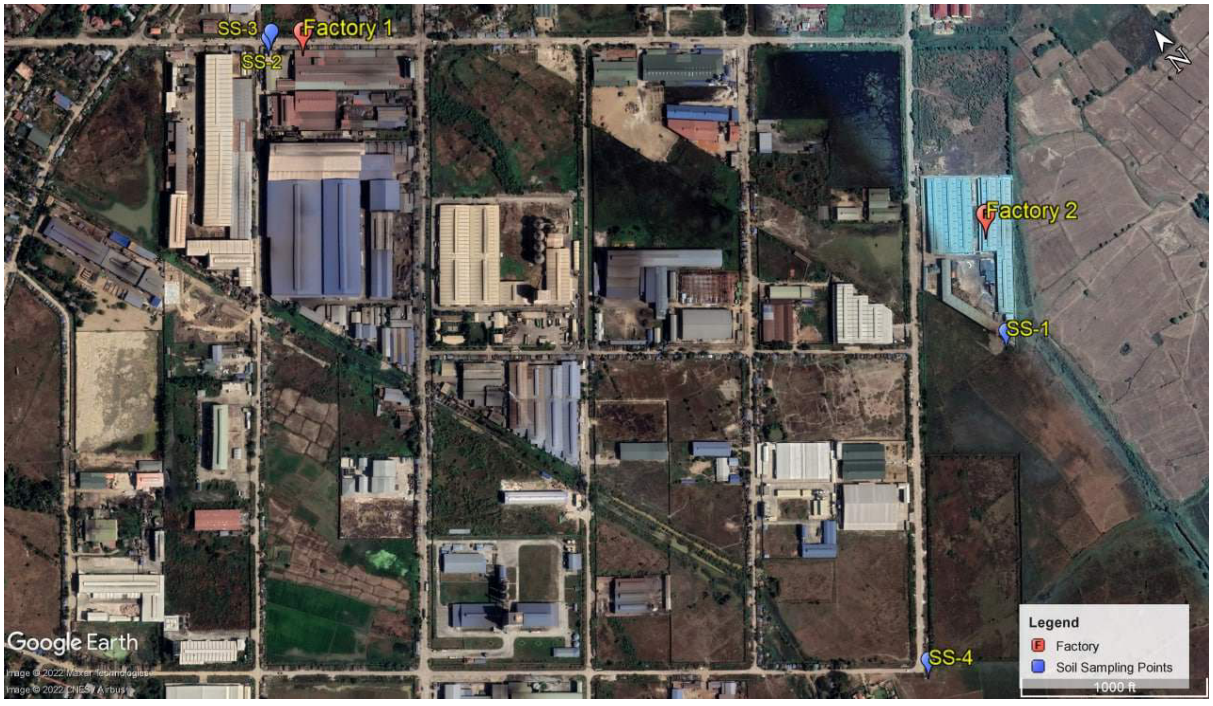


Figure 5.15 - Locations of Soil Quality Sampling

S/N	Coordinates	
	Latitude	Longitude
SS-1 (At Factory 2)	17° 9'29.93"N	95°59'2.06"E
SS-2 (At Factory 1)	17°10'6.43"N	95°58'38.91"E
SS-3 (In front of Factory 1)	17°10'6.62"N	95°58'39.25"E
SS-4 (Near Kan Ka Lay Village)	17° 9'18.69"N	95°58'47.49"E

All of the soil quality sampling points will be the potential to soil pollution due to proposed project.

Soil Quality Testing Result

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	Organic Carbon %	Humus %	Total N %	Exchangeable Cations (meq/100gm)	Available Nutrients	
							K^+	P (ppm) (O)	K_2O mg/100 gm
1	SS – 1	3.72	8.99	0.34	0.58	0.109	0.32	4.57	14.97
2	SS – 2	0.79	10.49	0.25	0.42	0.070	0.44	10.89	20.56
3	SS – 3	4.69	7.34	1.37	2.36	0.183	0.66	25.60	30.85
4	SS - 4	2.40	7.11	1.00	1.73	0.143	0.30	1.64	14.14

O=Olsen Method

Sr No.	Sample	pH Soil:Water 1:2.5	Organic Carbon	Total N	Available Nutrients	
					P	K_2O
1	SS – 1	Strongly Alkaline	Very Low	Low	Low	Medium
2	SS – 2	Extremely Alkaline	Very Low	Very Low	Medium	High
3	SS – 3	Slightly Alkaline	Low	Low	Very High	High
4	SS - 4	Slightly Alkaline	Low	Low	Low	Medium

Analysis of Soil Qualities Testing Results

The soil samples taken in the area of the proposed project may be adequate for growing crops such as rubber plantation. It can be seen that SS-1, SS-2, SS-3 and SS-4 can do well for plantation except for some lack of nutrients, fertilizers can be used to maintain the quality of the soil. The pH level of soil which are very acidic can become neutral due by adding lime or wood ash to the soil. For soil which are low organic carbon or low amount of nitrogen, organic fertilizers can be used.

5.3.4.4 Existing Noise Level

The locations of the noise level monitoring points are sample point 1 (Factory 1-near storage) (17°10'6.24"N Latitude and 95°58'39.22"E Longitude) and sample point 2 (Factory 2-near production workshop) (17°09'36.26"N Latitude and 95°59'01.79"E Longitude). The result for the existing noise level monitored by integrated noise level meter (dBA) is shown in the following table.

Table – Comparison of Results Value and Guideline Standard

No.	Monitoring Points	Result	Unit	Measuring Avg. Period	Guideline Value	Avg. Period	Remark
1.	AQ-1	63.49	dBA	7:00-10:00 (am-pm)	70	24- hours	Industrial
		63.80		10:00-7:00 (pm-am)	70		
2.	AQ-2	60.28	dBA	7:00-10:00 (am-pm)	70	24- hours	Industrial
		59.96		10:00-7:00 (pm-am)	70		

Noise level monitoring points will be the potential of noise pollution due to industrial process.

Figure 5.16 – Noise Level Monitoring

Analysis of Noise Results

There were two sample points which are named AQ-1 and AQ-2. All of the results are below NEQG guideline values for industrial purpose and thus they are within safe limits.

5.3.5. Climate Conditions

5.3.5.1 Meteorology and Climatology

According to the Yangon Meteorological Station, Hmawbi Township has a tropical monsoon climate. The area has only slight changes in temperature. The project area has temperate weather, as it is in the low latitude zone. The city typically experiences a distinct rainy season from the month of May through to October and dry season which starts from November and ends in April. During the performance of a year, average temperature shows some variance with the average highs ranging from 26ºC to 36ºC and average low temperature occur between 18 ºC and 25 ºC. The hottest period is between February and May and there is a very little rain during this period. At the end of this season, generally from March to April, the average monthly temperature reaches the upper 30 ºC. The average temperature in Yangon ranges from 24 ºC to 36 ºC in April during the hot season and it ranges from 18 ºC to 32 ºC in January during the cold season. The project area is warm and wet season with the high temperature (39.3 ºC) and lowest temperature (10 ºC) and shown in the following figures.

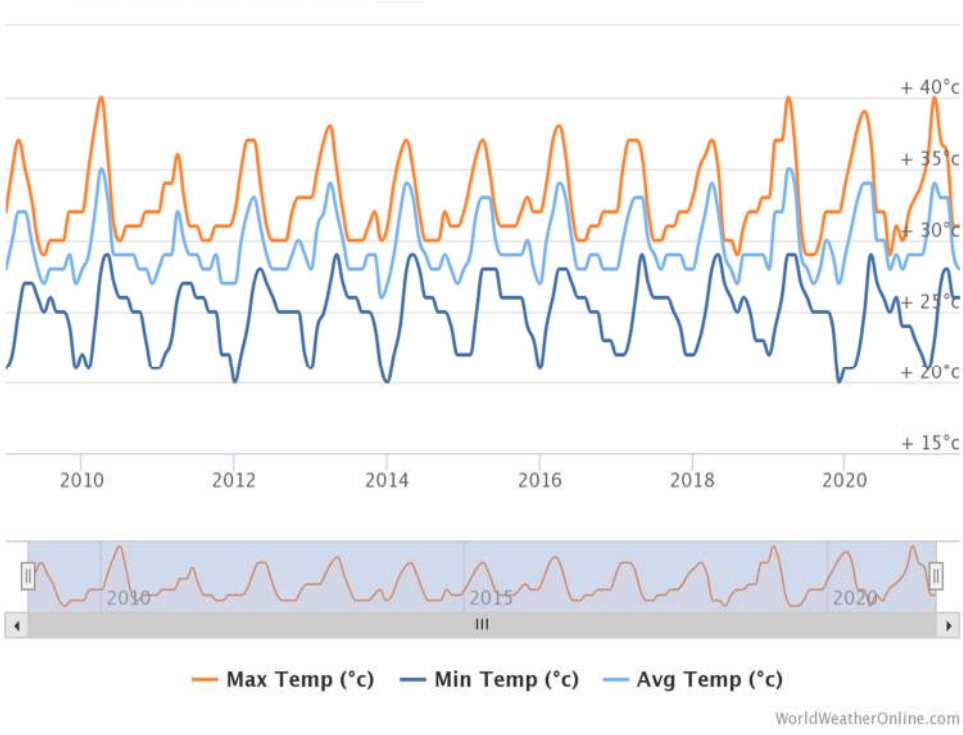


Figure 5.17 – Max, Min & Annual Average Temperature in Yangon

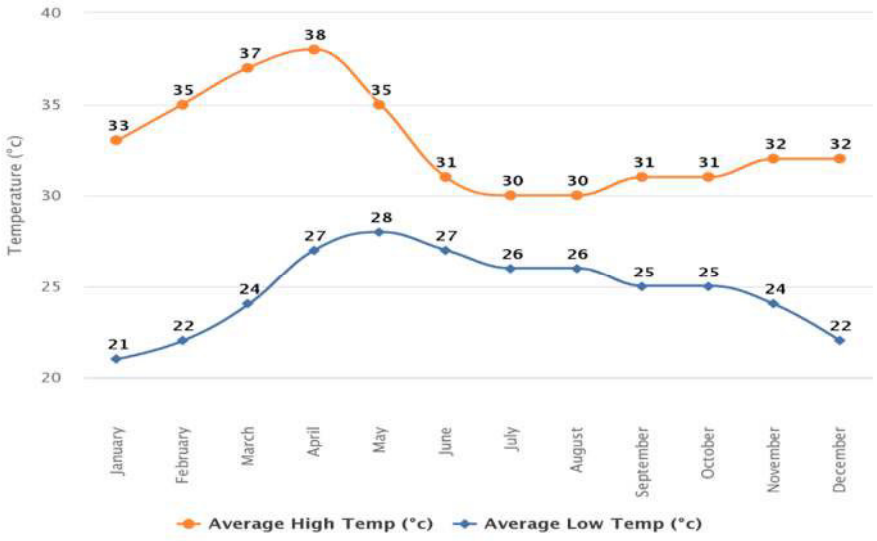


Figure 5.18 – Average Temperature (°C) Graph in Yangon

5.3.5.2. Rainfall and Relative Humidity

The climate of Myanmar follows a typical monsoon pattern. Historically, the average annual mean rainfall for Yangon is 2,681 mm with the annual average rainy days of 129.3 days. The Department of Meteorology and Hydrology (Myanmar) reported an annual precipitation of approximately 2700 mm. The month with the most precipitation was in July. The relative humidity was generally higher from May to October. The dry season occurs from November to April. Based on the historical weather for the last twelve months in Yangon, no precipitation was observed in December 2012, February 2013 and March 2013. The least humid month of the last 12 months was February 2013 with an average daily low humidity of 34%, and the most humid month was September with an average daily high humidity of 80%.

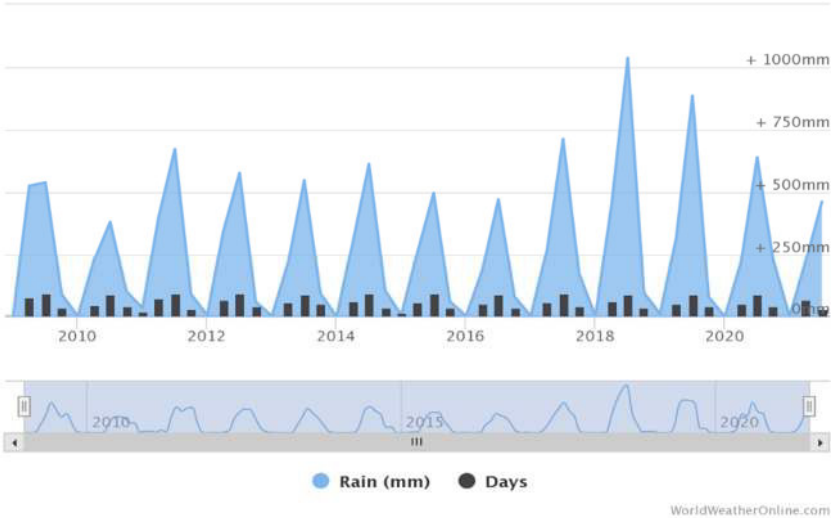


Figure 5.19 – Average Rainfall Amount (mm) and Rainy Days

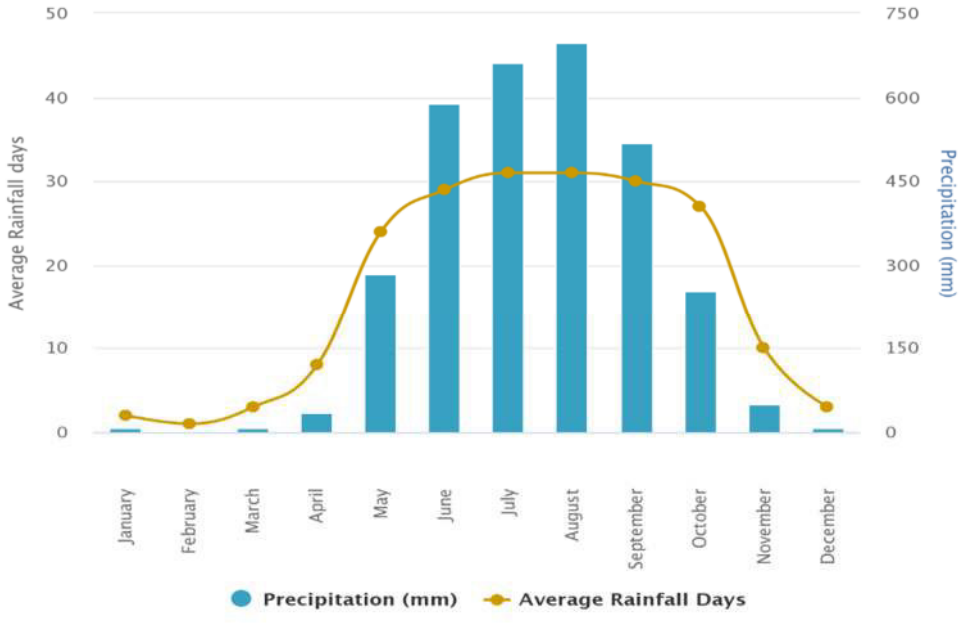


Figure 5.20 – Average Rainfall (mm graph for Yangon)

5.3.5.3. Wind Speed and Direction

Based on 2013 data, it was reported that the month with the highest wind speed was April 2013 with an average wind speed of 3 m/s while the least windy month was December 2012 with an average wind speed of 1m/s. The highest sustained wind speed was 54 m/s, occurring on September 19, 2013, and the highest daily mean wind speed was 4 m/s, occurred on May 14, 2013.

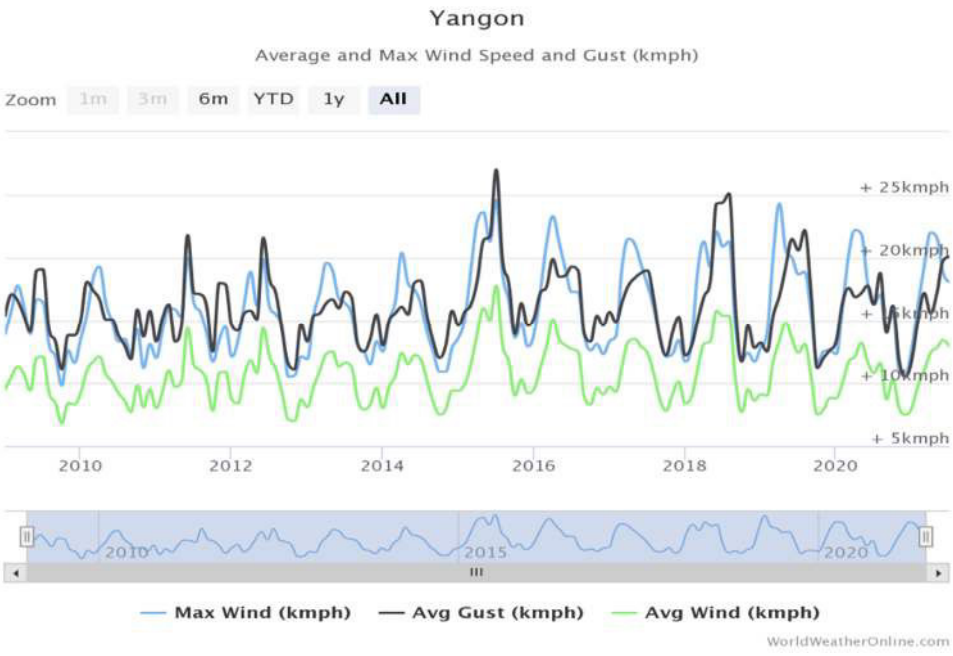


Figure 5.21 – Average and Max Wind Speed (kmph) for Yangon

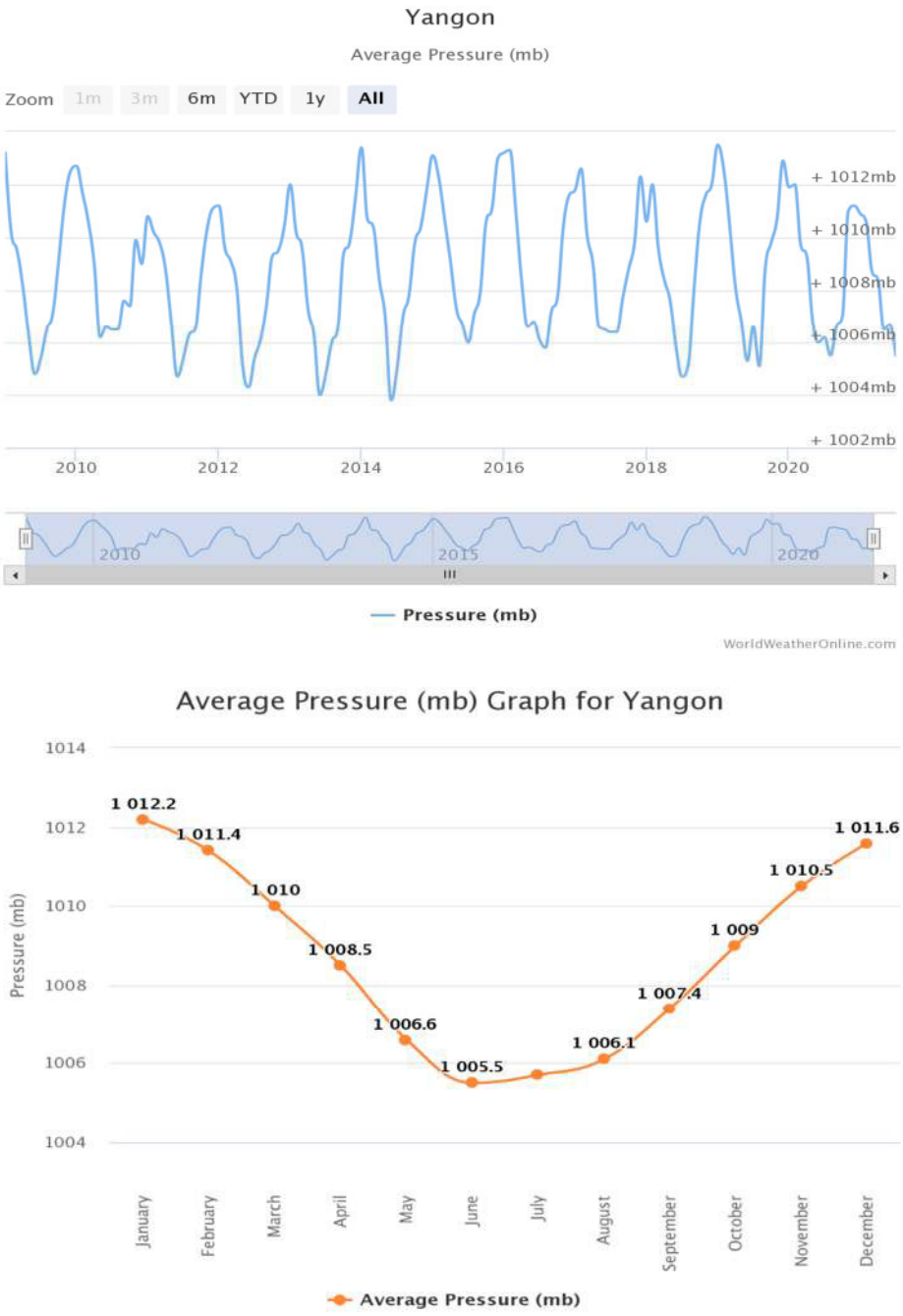


Figure 5.22 – Average Pressure (mb) Graph for Yangon

5.3.6. Land Use

This area is only found in the Myaung Dagar Industrial Zone without reserved forest area and residential area. When they do have access to the information required by the Department of Land Records, the areas of the project site of 4.004 acres of land for old factory and 8.667 acres for new factory are reported. In accordance with the procedures and application to the Management Committee, they received permission to operate on 2017.

For Factory 1 (Polyester Staple Fiber Factory)

Land Use Type	Percentage (%)
Other factories	12.592
Market	0.018
Project Area	0.106
Monastery	0.173
Residential Area	33.102
Substation	0.230
Worker's Residence	0.667
Agricultural land	41.045
Water Body	6.472
Vegetation	5.595

For Factory 2 (Plastic Pallets and Packaging Tape Factory)

Land Use Type	Percentage (%)
Other factories	12.014
Market	0.017
Project Area	0.216
Monastery	0.165
Residential Area	31.393
Substation	0.219
Worker's Residence	0.637
Agricultural land	33.209
Water Body	4.622
Vegetation	17.508

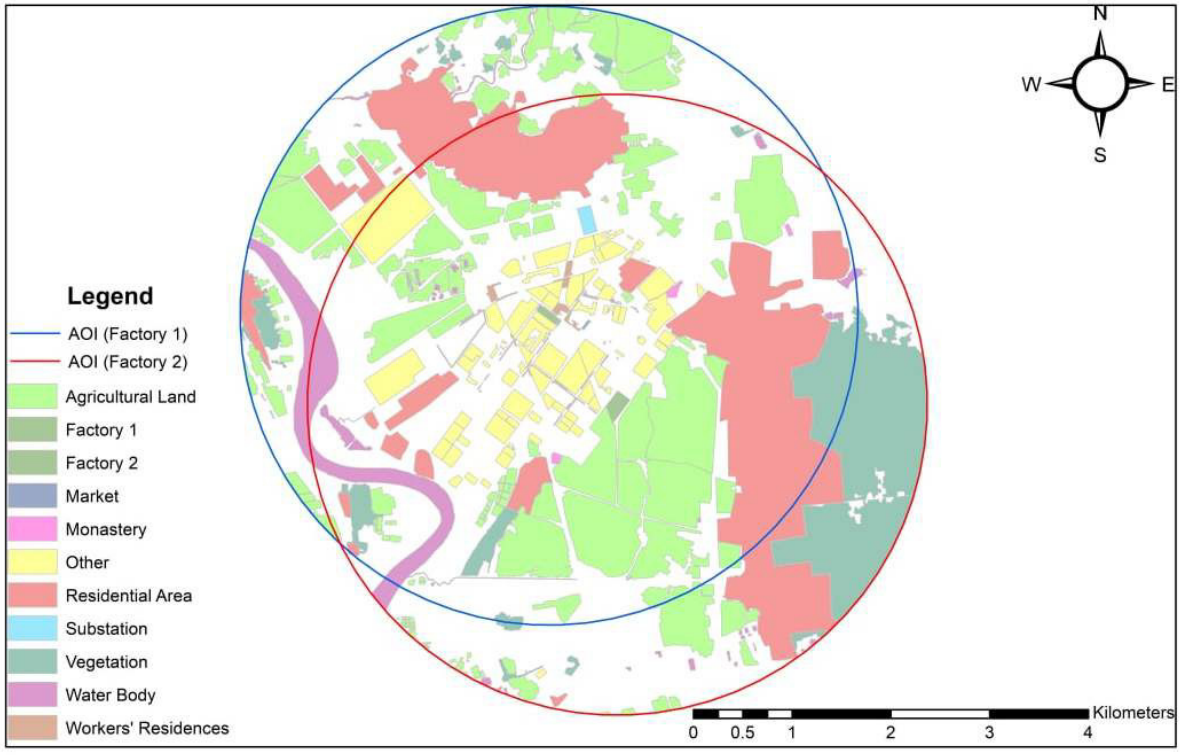


Figure 5.23 – Land Use for Both Factories

5.3.7. Natural Hazards

Seismic Information

Myanmar is an earthquake-prone country because it lies in a one of the world major earthquake belt, Alpide Belt, which extends from northern Mediterranean through Iran, Himalaya region and Myanmar. Most of the earthquake in central and delta region of Myanmar have resulted from movement of Sagaing Fault which extends from the northwest of Katha, through Sagaing, along the eastern flank of Pegu Yoma and finally into the western Gulf of Martaban for about 600 miles. Structurally, Hpa-pon fault and Three - pagoda fault are situated at the northern and southern part of the area and their trend in nearly NW - SE direction. Probabilistic seismic hazard Assessment Map (PSHA Map) of Myanmar show expected peak ground acceleration (PGA) values with 100% probability in 500 years (See in Figure).

Earthquakes affecting the City of Yangon primarily occur along the 1,000 km long Sagaing fault. The western part – the Indian plate – moves northward relative to the eastern half of the Eurasian plate at a rate of approximately 24mm/year. This is a strike-slip, right lateral fault, which is similar in mechanism, length, and slip rate to the well-known San Andreas Fault in California. A list of historical earthquakes in the area is presented by Wang et al (2014) in Figure (5.27.b). In addition to this fault, a number of other faults are also present that can impact the study area, as discussed by Tun et al (2012) in Figure (5.27.a). A significant earthquake could be anticipated every 100 years and the PGA for a M7.0 earthquake would result in PGA of 0.2 – 0.3g for hard underlying soil in Yangon.

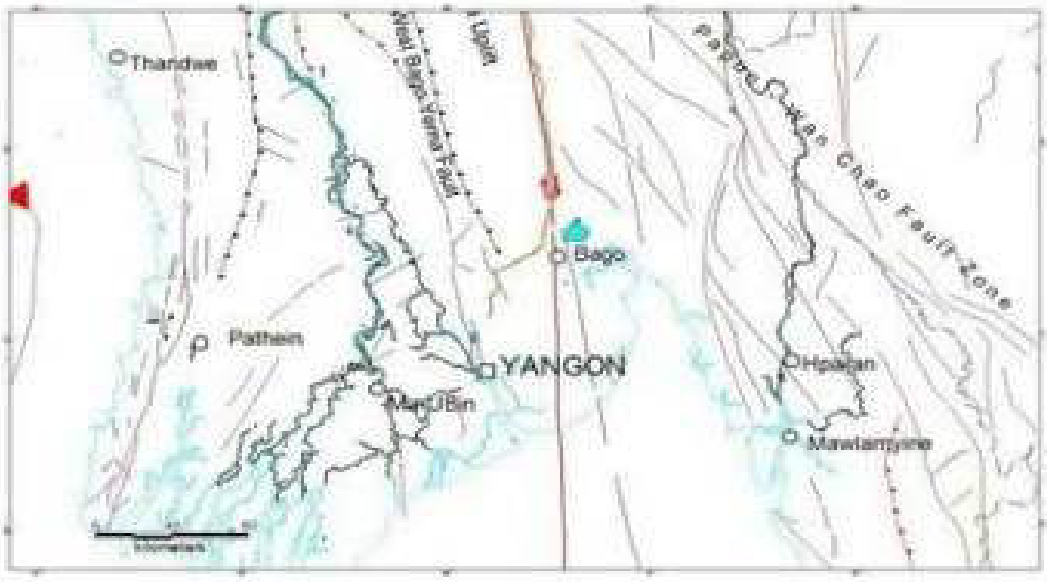


Figure 24 – Faults in southern central Myanmar (Tun et al., 2012)

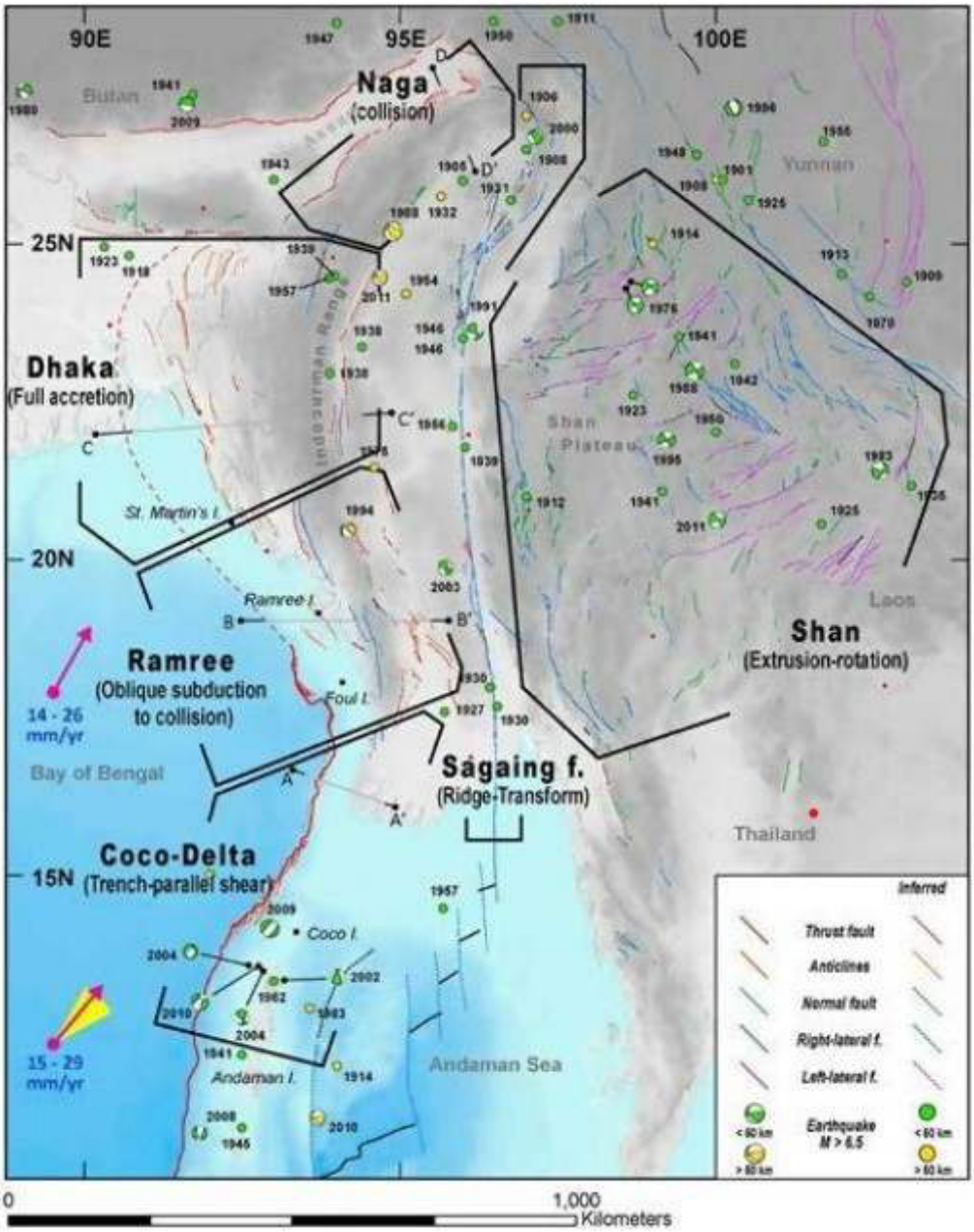
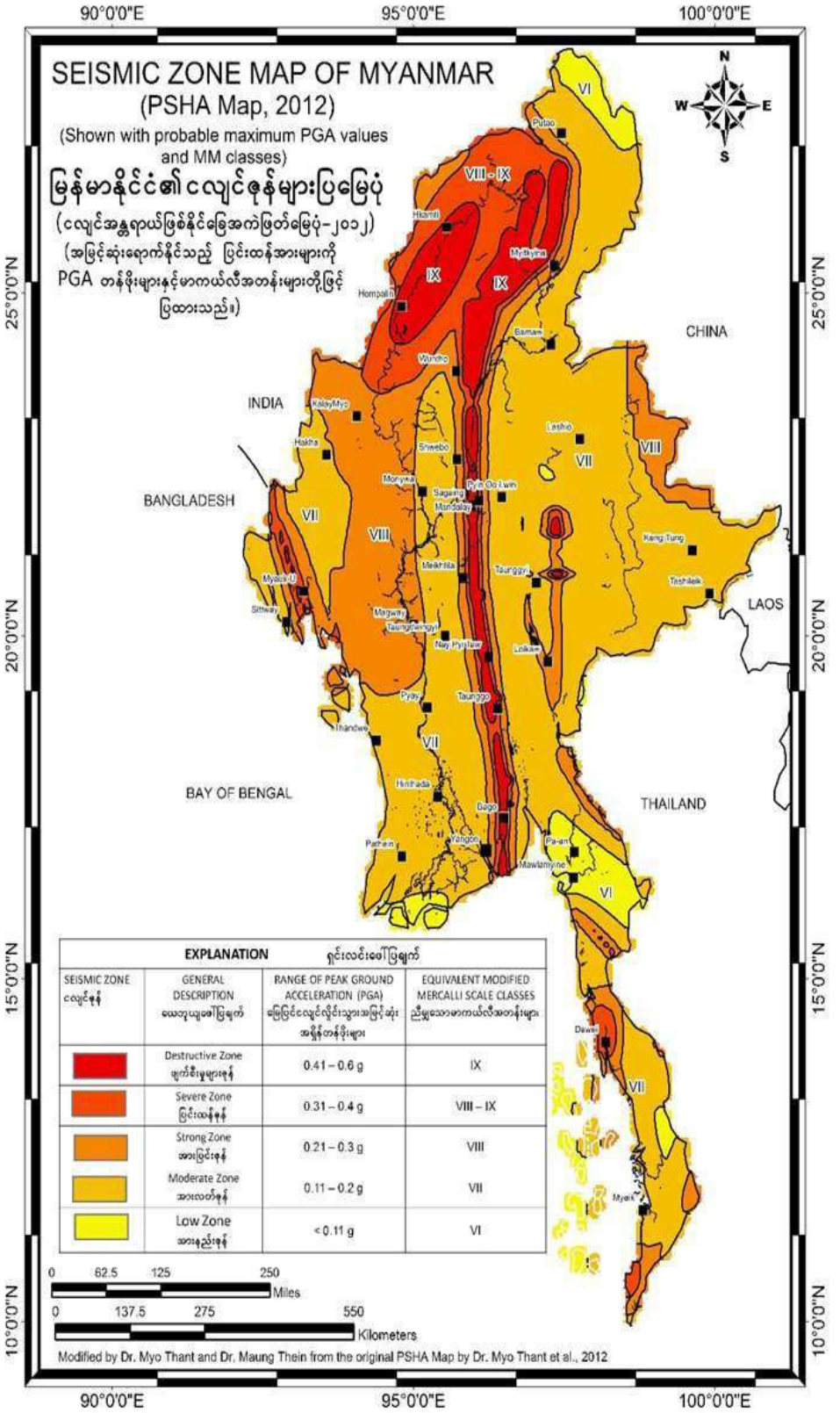


Figure 5.25 – Sagaing fault and historic destructive earthquakes (Wang et al., 2014)



Probabilistic Seismic Hazard Assessment Map (PSHA Map) of Myanmar showing expected peak ground acceleration (PGA) values with 100% probability in 500 years. (Note: 0.21 - 0.3 g zone in the northern part of Shan State is taken from the Seismic Zone Map of Myanmar by Dr. Maung Thein et al., 2005)

Source: MIMU [Myanmar Information Management Unit]

Figure 5.26 – Seismic Zone Map of Myanmar (PSHA Map, 2012)

5.4. Existing Biodiversity Environment

Introduction

Biodiversity means the variability among living organisms from all sources including, inter alia, terrestrial, atmospheric, and marine and other aquatic ecosystems and the ecological complexes of which any such ecosystem is part; this includes diversity within species, and of ecosystem. The Convention on Biological Diversity defines biological diversity as "the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and ecosystems." Biodiversity is generally considered in terms of ecosystem, species, and genetic diversity. Biodiversity refers to all living organisms, and thus includes both wild and domestic species, terrestrial and aquatic.

Aims and Objects

- To record occurrence and identify the fauna species recorded at project area and its vicinity
- To assess the diversity of species recorded
- To assess the potential impacts, to suggest the mitigation measures and how to monitor by project activities.
- To know current existing or not plant species which are belong to endangered species.

Study area

The project area is located in the Myaungdagar Industrial Zone where the forest and paddy fields have already been changed or removed. The most surrounded area is blanked paddy fields with grasses, weeds, herbs and some are factory building. It lies between Latitude 17° 9'18.34"N, Longitude 95°57'31.18"E and Latitude 17°10'59.84"N Longitude 95°59'39.19"E (Figure 5.6). The area is located nearby urban area and Hlaing River. Project target site is situated at about 1km form the Yangon-Pyay High way road. Zooplanktons and fishes were collected from Hlaing River, near and drain waste water from industrial zone and waste canal, drain waste water from industrial zone (Figure 5.34). Survey points and line transects were made between nearly about 250m along follow by Bibby et al., 2000. (Table 5.5 and Figure 5.30). Habitats used of project area was shown in Figure 5.32.

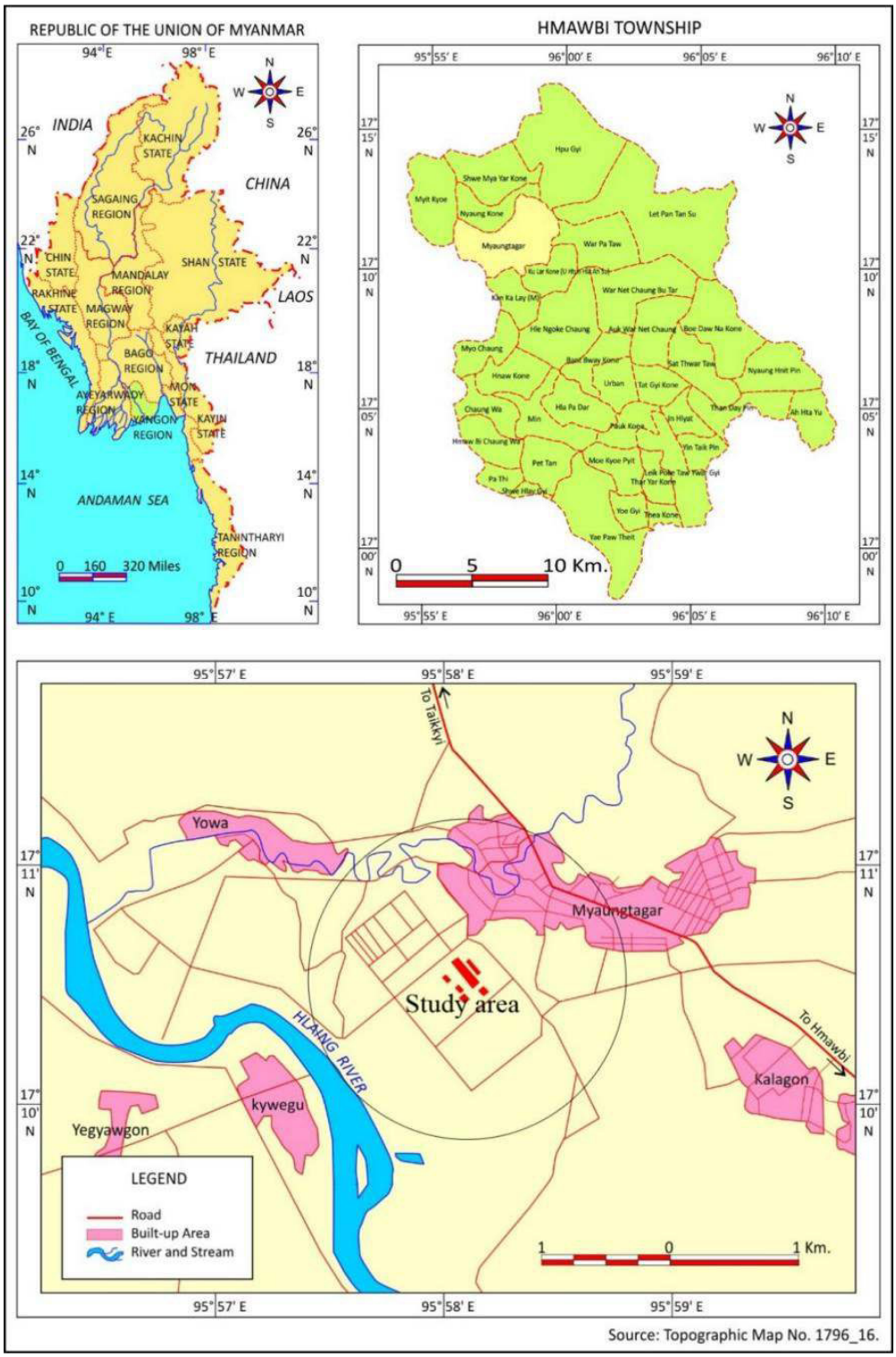


Figure 5.27 - A Map of Study Area

Biodiversity Sampling Points

Within the project boundary, there were (13) sampling points which were carried out by biodiversity team as described in Figure 5.30. Table 5.5 also shows the location of biodiversity survey points.

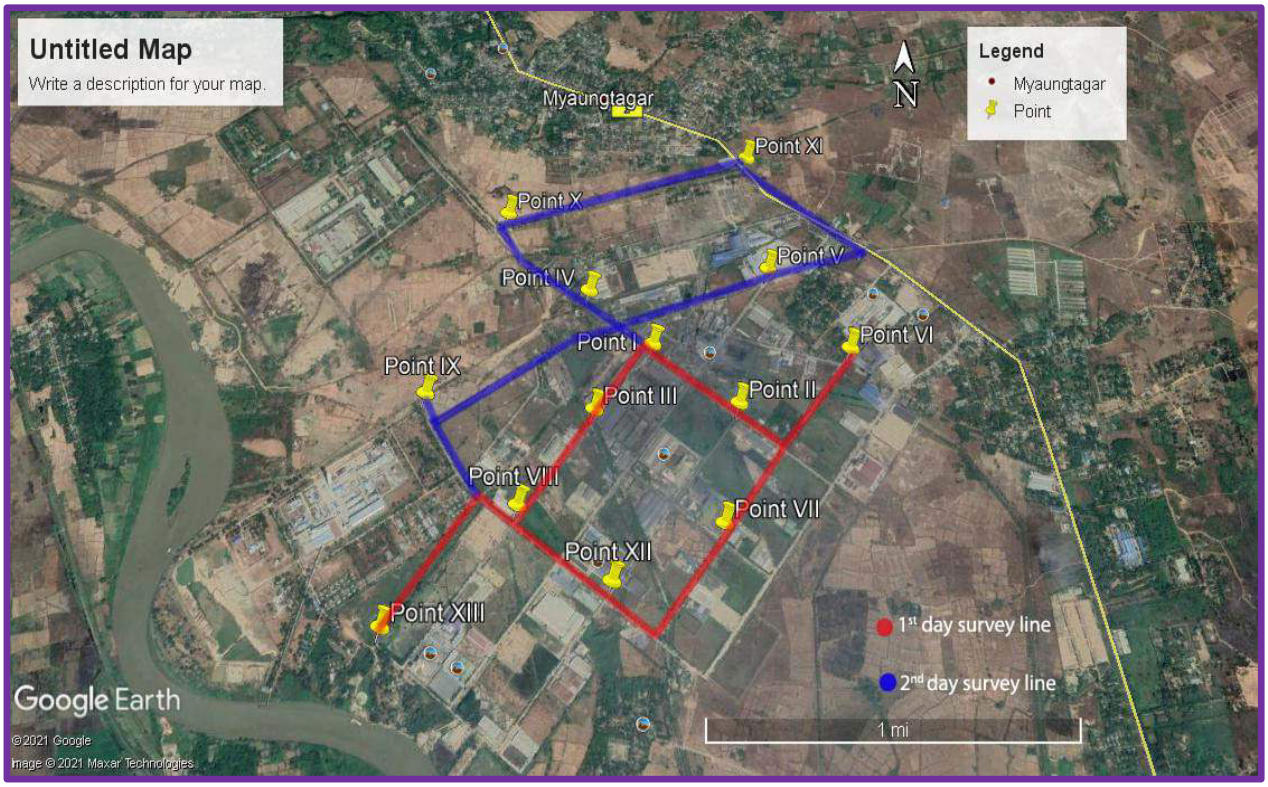


Figure 5.28 - Survey Points and Transect Lines

Table 5.4 – Representative Spatial Points for Project Site and Sampling Site of Biodiversity

Point No.	Latitude	Longitude	Point No.	Latitude	Longitude
I	N 17° 10' 6.11"	E 95° 58' 39.31"	VIII	N 17° 9' 40.91"	E 95° 58' 17.99"
II	N 17° 9' 56.40"	E 95° 58' 53.83"	IX	N 17° 9' 58.05"	E 95° 58' 2.20"
III	N 17° 9' 55.52"	E 95° 58' 24.79"	X	N 17° 10' 28.92"	E 95° 58' 14.25"
IV	N 17° 10' 18.94"	E 95° 58' 59.19"	XI	N 17° 10' 39 40"	E 95° 58' 56.35"
V	N 17° 10' 16.11"	E 95° 58' 48.11"	XII	N 17° 9' 30.05 "	E 95° 58' 32.38"
VI	N 17° 10' 5.45"	E 95° 54' 12.12"	XIII	N 17° 9' 23. 71"	E 95° 57' 58.22"
VII	N 17° 9' 38.32"	E 95° 58' 50.32"			

A. Survey point I

B. Survey point II

C. Survey point III

D. Survey point VI

E. Survey point VIII

F. Survey point XI

G. Survey point XI

H. Survey point XII

Figure 5.29 - Some Important Survey Points and its Environmental Habitats

A. Tall Grass

B. Trees

C. Bamboos and Herds

D. Grasses

E. Wetland Area

F. Trees and Herbs

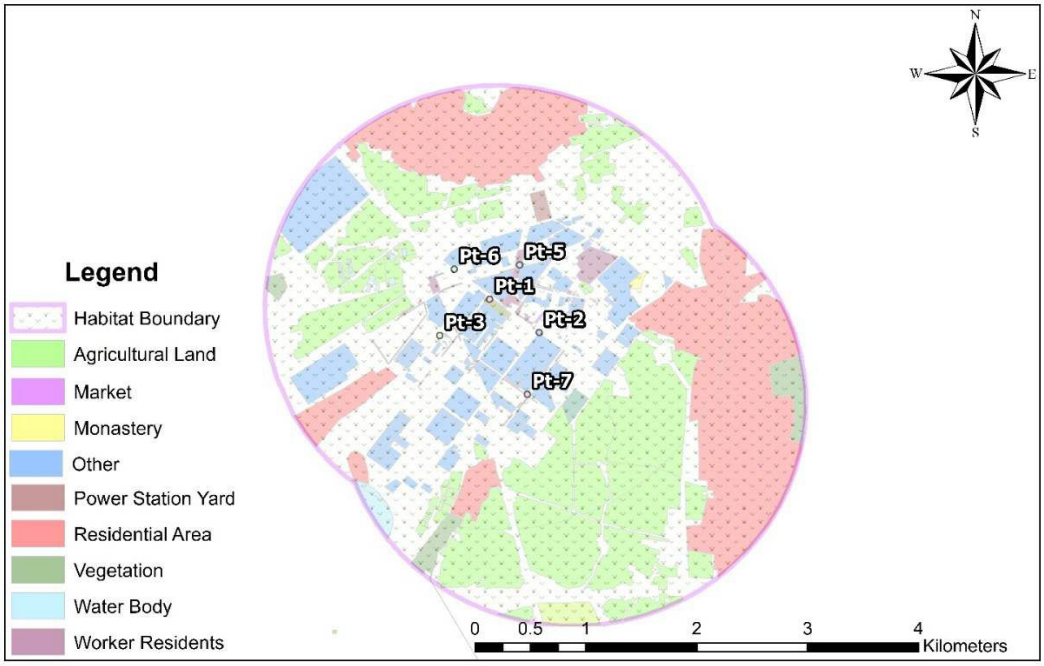
G. Wastewater Canal

H. Hlaing River

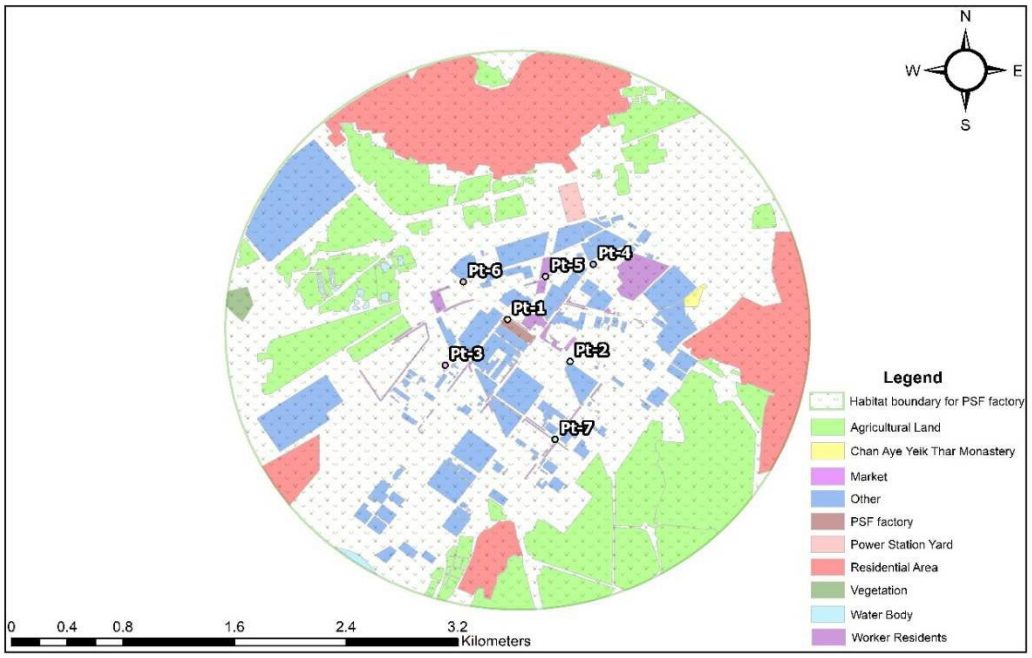
Figure 5.30 – Survey of Habitats

Study Limits and Spatial Boundaries

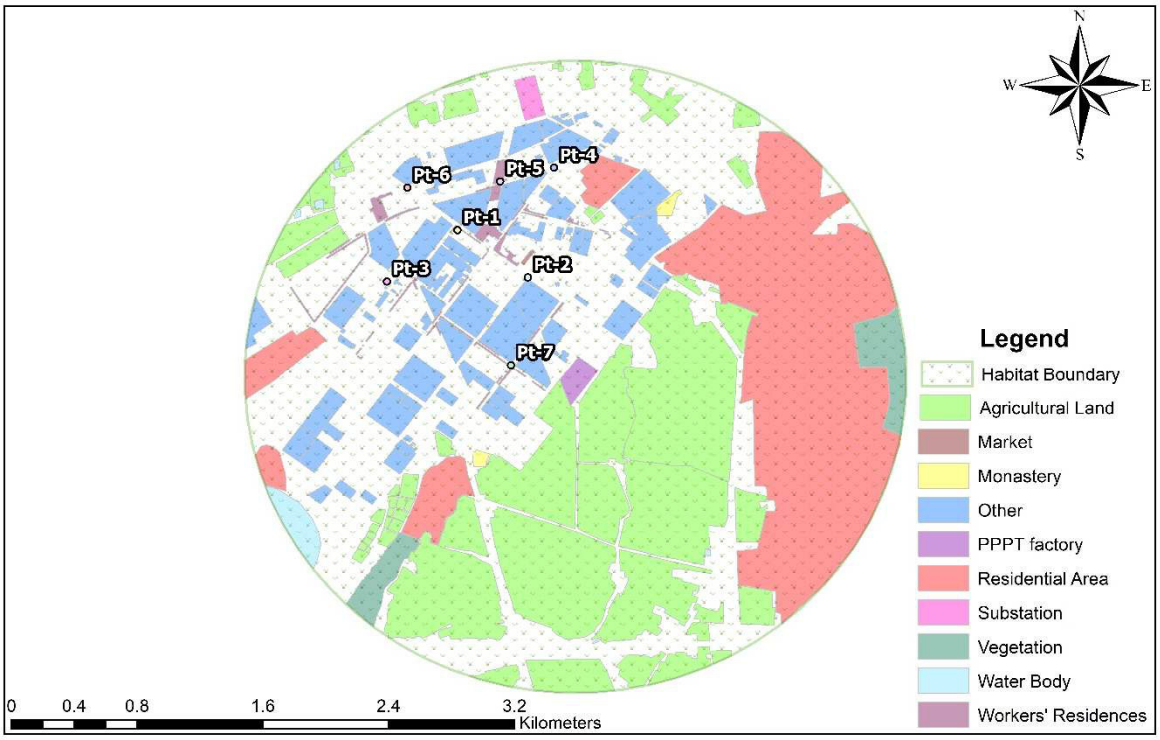
Conservation planning and resulting ecological target identification require selection of both spatial boundary (eg. survey points, agricultural land, residential area, project area, forest, water bodies) and temporal baseline or reference condition. The time period for temporal baseline was between 30th June 2021 to 1st July 2021. Based on the chosen planning boundary, the results can help to select appropriate sites for restoration of damaged ecosystems.



(a)



(b)



(c)

Figure 5.31 – Spatial Boundary for Biodiversity (a) For both Factories, (b) For Factory 1, (c) For Factory 2

Methodology (Flora and Fauna)

Survey Method (Flora)

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 each survey point, digital camera to take the photos of the specimens, Reference books, Measuring tape, Diameter tape, and flora survey forms.

Flora data collected from using random line intercept (Transect) method to get representative checklists of the tree species, plant collection was also carried out by random transect lines along the path way and between one plot and another wherever possible. Specimen collection of trees, shrubs and herbs were made within 30 x 30 meters, 10 x 10 meters and 5 x 5 meters on either side of the transect line. The Global Positioning System (GPS) was used to navigate and mark the coordinates of the sample plots. Tree species in the plot were collected and population of each species were also counted. This method could be considered when surveying an entire site.

In using (***Point count***) method; the observer will stand in a randomly chosen point and every individual of species or a number of species or scatter tree species in the whole study area is counted. It can be useful to label counted individuals to avoid counting them twice.

In this (***Interview***) method, having interviewed with local people who live near the study site, the information of some flora and fauna are gathered and identified. The information of flora, fauna and fish data was recorded by interviewing the local people who are familiar with studied area. The observer prepares questions concern with the secondary flora data and interview the indigenous people.

Identification

Plants specimens were identified with a checklist of the trees, shrubs, herbs, and climbers of Myanmar (Kress *et al*., 2003). Plant species were checked against Handley and Chit Ko Ko (1987), Kress *et al*. (2003) and consulted with Department of Botany, Yadanabon University.

Survey Method (Fauna)

Data collection and Identification of fauna species

Direct observation in the field was taken to collect the primary data and information. Secondary data and interview survey were also done for manipulation and for reference. Appropriate biological survey methods for each kind of fauna are used to collect the data and information. Specimen collection was taken around 13 points within 2 km radius of the project area (Figure 5.35).

Insects

For insects, specimens were collected following after Pollard walk method (Pollard and Yates, 1993). Observations were made along fixed transects has a length of 250 m and a width of 5 m on either side. Collected specimens were identified and classified follow after Garrison et al. (2006), Easton et al. (2012). Koh (1989), Subramanian and Sivaramakrishnan (2007).

Herpetofauna

For the herpetofauna the survey works mainly involved walking and visual inspection. No traps or snares were used. Snakes and other reptiles including lizards are observed in their habitats (resting and foraging habitats). Guide books and camera were used to identify the snake species. Interview survey was also used for information. Identification and classification of herptiles followed by Smith (1935, 1943), Cox et al. (1998), O' Shea and Holliday (2002), Das (2010) and Guraraja KV (2010).

Avifauna

For the avifauna, random point count method was used for the bird survey and took the photograph of birds. Birds were studied using the point count methods using the field guide books with help of the binoculars, camera and GPS. Species identification of birds were made according to Smythies (2001), and Robson (2015) and classification followed after Avibase, 2018.

Fish

For the fish specimens were collected with the help of fishermen who they are fishing along the coastal waters nearby the project area. Fish sample collection was made by use of drifted gill net, trammel-net and line & hook fishing. Identification, classification and diagnostic characters were followed after Day (1978), Jayaram (1981) and Talwar and Jhingran (1991).

Collection and preservation of zooplankton samples

Water samples were collected from two sampling sites. The samples were collected using plankton nylon net with a mouth diameter of 12 cm and 50µm mesh size. Samples were hauled horizontally through the surface water as shown in below figure. Final volume of the filtered sample 150ml were preserved by adding 10% formalin for further analysis. Samples were identified under a compound microscope with a magnification of 4×, 10×, 40×. Identification was made according to Edmonson (1966), Pennak (1989), Shiel (1995) and Witty (2004). Microphotographs were recorded with cannon digital camera attached to compound microscope.

A. Collected from Hlaing River

B. Collected from Wastewater Canal

Figure 5. 32 - Specimen Collection for Zooplankton

A. Field survey

B. Field survey

C. Zooplankton collection

D. Trapping to eel

E. Fish collected

F. Counting and recording to fish

G. Interview survey with local people

H. Interview survey with fisherman

Figure 5.33 - Field Observation and Questionnaire Survey

Data Analysis

The collected field data were calculated by using the following methods.

Relative abundance

The recorded data was analyzed as follows after Bisht *et al*., 2004:

$$\text{Relative abundance} = \frac{\text{No. of individuals of a species}}{\text{No. of individuals of all species}}$$

The average relative abundance was categorized adopted by Bisht *et al*. (2004)

uC = uncommon having relative abundance of less than 0.0100

C = common having relative abundance of 0.0100 and above but less than 0.0500

vC = very common having relative abundance of 0.0500 and above

Relative Diversity

The relative diversity (RDi) of families was calculated using the following formula (Torre-Cuadros *et al.,* 2007):

$$\text{RDi} = \frac{\text{No. of species in a family}}{\text{Total number of species}} \times 100$$

Level of biodiversity

Biological diversity or biodiversity is generally divided into three fundamental categories. In this assessment explored at the condition of three levels diversity. The factors on which the evaluation of importance of biodiversity is made are:

Ecosystem level: In this stage will consider terrestrial, inland aquatic and marine and costal ecosystem, key biodiversity areas, protected areas, reserved forests and others.

Species level: Species composition was determined using their relative densities as described by Krebs (1989), using the formula,

$$\left(\frac{n_i}{N}\right) x\ 100$$

Where n_i is the quantity of individual species per quadrat, while N is the total quantity of species within the same quadrat. The following documents identify rare and endangered species and those prioritized for protection in Myanmar.

- The IUCN Red list of globally endangered species.

- List of protected tree species in Myanmar announced by Ministry of Natural Resources & Environmental Conservation (MONREC) according to the Appendix (I).

The impact on species were calculated according to globally. The following matrix was inspired from technical guidelines for biodiversity impact assessment integrated in the environmental impact assessment process of Vietnam, author by ADB consultants. Sensitivity species generally known by using this matrix.

Species	Conservation Status	Sensitivity
Flora and Fauna	CR, EW, EX concern on IUCN Red List	High
	NT, VU, EN concern on IUCN Red List	Medium
	NE, DD, LC concern on IUCN Red List	Low

Genetic level: It will consider the genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

Species Diversity

Species is the ultimate unit to classify the millions of organisms and is the central theme of biodiversity. Species differ from each other and are recognized as a set of individuals that are genetically similar and have the ability to inbreed. Species diversity is, simply, the variety of species. Species diversity refers to 'species richness' (number of species) and 'species evenness' (the relative population size of those species at one time and one place). It is most commonly used for describing the biodiversity wealth of any area.

Species diversity and endemism of Myanmar

The available information species diversity and endemism indicate that Myanmar supports plant and vertebrate diversity, plus level of endemism comparable to other countries in the Indo-Myanmar Hotspod. Myanmar supports at least 300 mammal species have not been sighted to occur in recent. five mammal species are through to endemic to Myanmar. Myanmar supports at least 1,096 bird species, a greater diversity than any other country in mainland Southeast Asia. Myanmar's avifauna contains only four national endemic species and numerous sub-species. The total number of reptiles and amphibian species known from Myanmar may be high as 425. A number of these species are through to be national endemic,

including six species of turtle. Myanmar is estimated to support at least 520 freshwater fish species, 58 species are endemic (NBSAP Myanmar 2015-2020).

Conservation Status

According to the IUCN Red List (2022), 447 of Myanmar's known species are considered to be globally threatened (Table below).

Table 5.5 - Threatened species in Myanmar

No.	Taxonomic Group	Total
1	Mammal	54
2	Birds	58
3	Reptiles	38
4	Amphibians	5
5	Fishes	99
6	Mollusks	3
7	Invertebrates	75
8	Plants	115
	Total	**447**

Source: IUCN Red List, 2022

Mitigation

Mitigation is the reduction of something harmful or the reduction of its harmful effects. It may refer to measures taken to reduce the harmful effects of hazards that remain in potential, or to manage harmful incidents that have already occurred (Wikipedia).

Ecosystem Level Features

The proposed study area is located in Yangon Region which has state area (9555) km^2, (14) number of ecosystems identified, (1173.2) km^2 of remaining natural ecosystems, (12.28%) proportion of remaining natural ecosystems, (6.1 km^2) of protected areas, (0.06%) of protected area and (0%) of natural ecosystems protected according to threatened ecosystems of Myanmar. Study area occurs terrestrial ecosystem that is an urban industrial area mixed with agricultural landscapes. Yangon Region is one of Key Biodiversity Areas (KBAs) and Protected Area (PA) which included eleven KBAs and one PA according to the geo-referencing of the researcher. Hlawgar Park and Hlawgar Reservoir are distant from project area about 18 kilometers. 10% of south part watershed of Bago Yoma range is within Hmawbi Township which has distance approximately about 6 kilometers from project area. This proposed area can be seen significantly different from KBAs and Protected Area in Figure (5.36). General detailed list of KBAs and Protected Area are shown as Table (5.7).

Wanet chaung reserved forest (2528 acres) and Hmawbi reserved forest (1537 acres) exist in Hmawbi Township. The project will leave no effects on these reserved forest areas which can be distinctively observed in Figure (5.37).

Environmental Protection Zone

Myanmar has published 59 environmental protection zones. Among them, 11 types of sensitive zones defined by the state are Nature Reserve, National Park, Protected Area, National Park and ASEAN Heritage Park, Wildlife Sanctuary, Bird Sanctuary, Wildlife Park, Mountain Park, Wildlife Sanctuary and ASEAN Heritage Park, Elephant Range and Wildlife Sanctuary, there are 52 sensitive areas in total. There are 2 types of environmentally sensitive zones defined by international organizations, namely, biosphere protected areas issued by UNESCO and important wetlands published by the International Wetland Convention, with a total of seven sensitive zones.

The above mentioned environmentally sensitive areas are not included in the proposed project. The proposed project is situated in the Yangon Region that is one of Key Biodiversity Areas (KBAs) and Protected Area (PA). The project is located in 6 kilometers away from the 10% of south part watershed of Bago Yoma range which is within the Hmawbi Township and 18 kilometers from the Hlawagar Park and Hlawgar Reservoir.

Table 5.6. Environmentally Sensitive Area of Near the Purpose Project

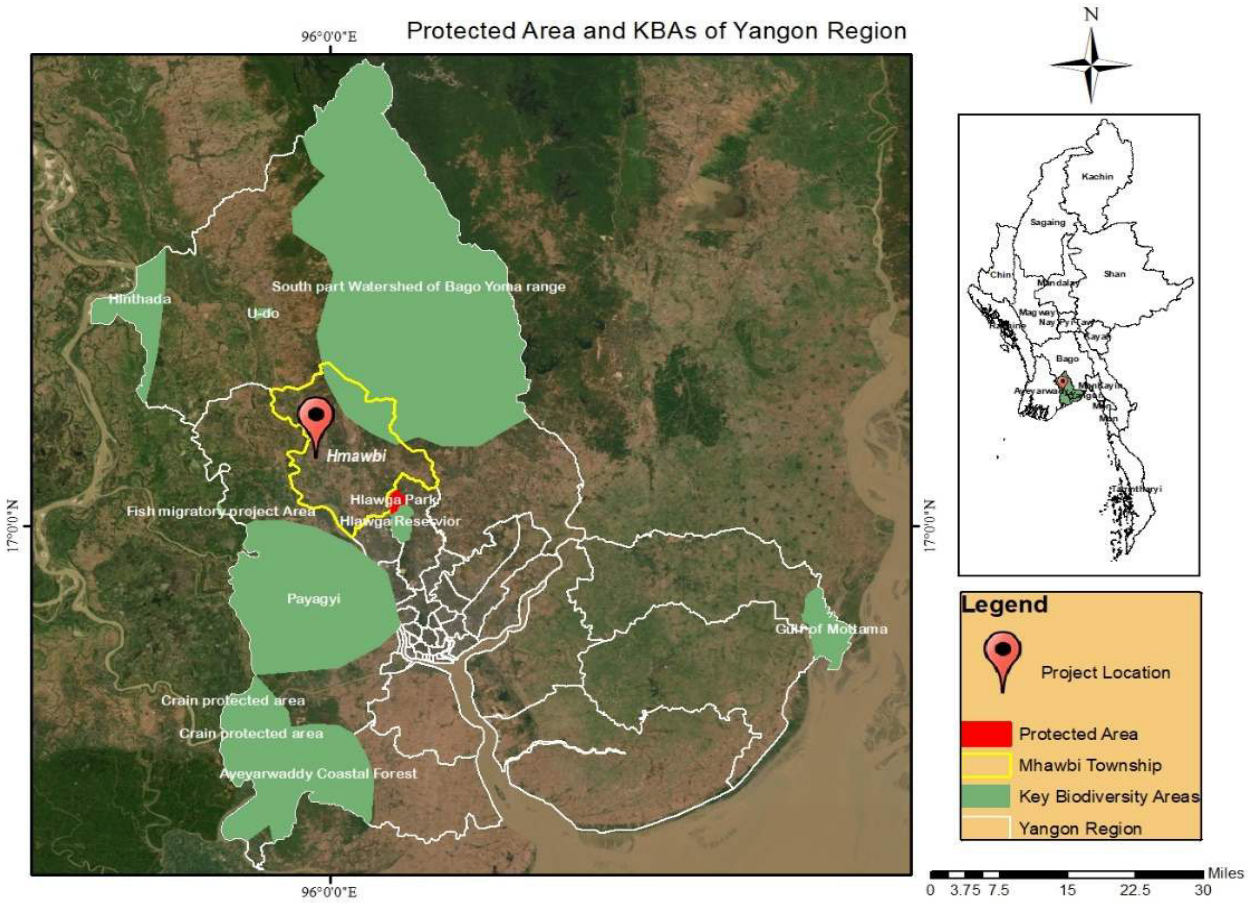
No.	Name	Area (km^2)	Level	Key Species	Position relationship with the line
Key Biodiversity Areas (KBAs)					
1.	South part Watershed of Bago Yoma range	4156.05	Terrestrial KBA	Wild elephants, important watershed of dams which supporting water to Yangon and Bago	About 6 km away from the project
Protected Area (PA)					
2.	Hlawga Park	6.24	Enclosed wildlife park	Mythun, Eld's deer, Sambhur, Barking deer, Hog deer, Migratory birds	About 18 km away from the project

Figure 5.34 – Environmentally Sensitive Area

Table 5.7 - Detailed list of KBAs and PAs

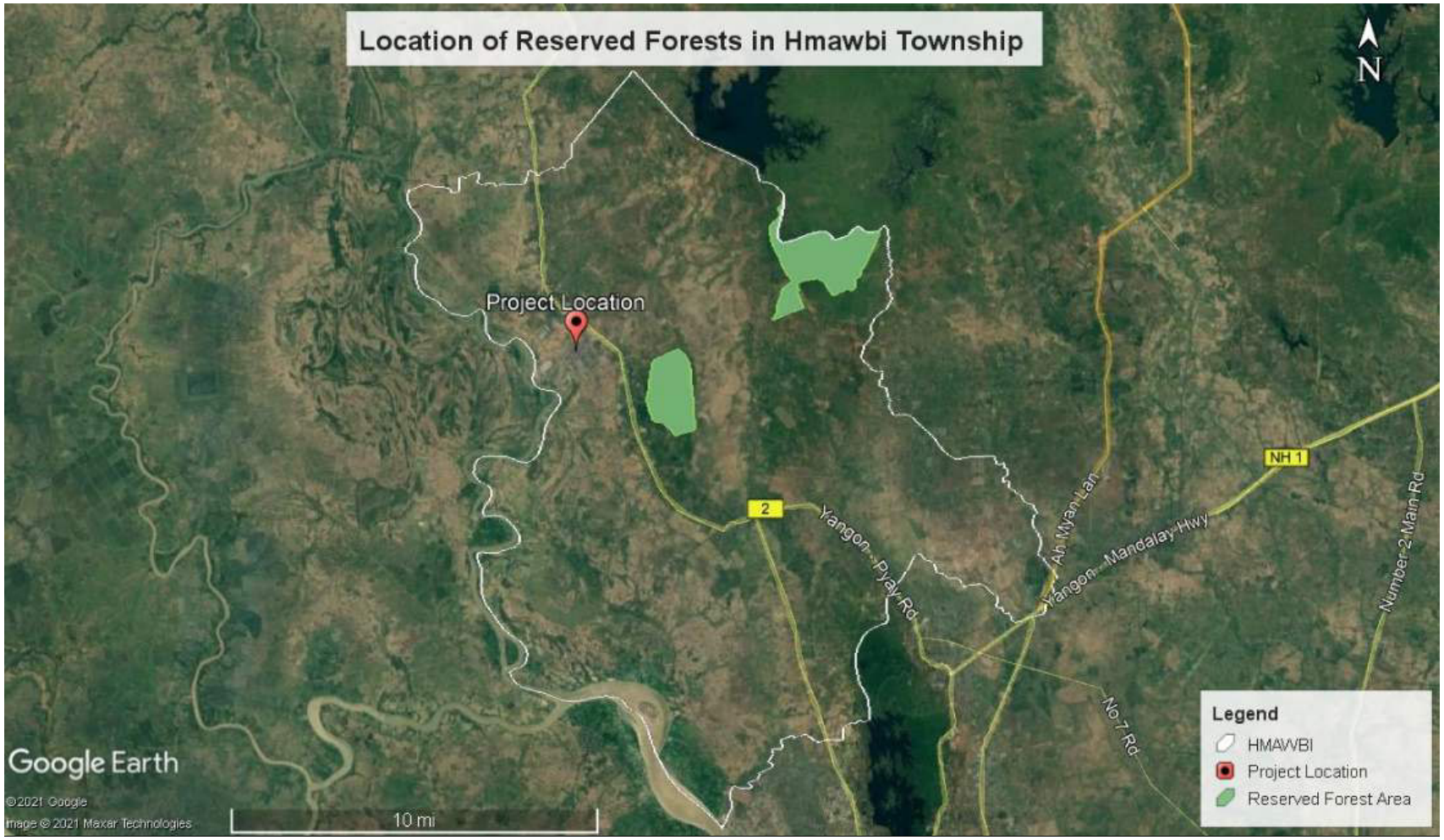
No.	Name	Area (km^2)	Level	Key Species
Key Biodiversity Areas (KBAs)				
1.	Crain protected area	5694.512	Terrestrial KBA	Ayeyarwaddy Dolphin and Freshwater turtle endemic
2.	Fish migratory project area	10319.30	Freshwater KBA	Up to Hinthda, Ingapu, Myanaung, important of migration, Breeding ground of marine species
3.	South part Watershed of Bago Yoma range	4156.05	Terrestrial KBA	Wild elephants, important watershed of dams which supporting water to Yangon and Bago
4.	Ayeyarwaddy costal forest	415.36	-	White eyed bulbul
5.	Hinthada	2043.99	-	Hilsa
6.	U-do	5.30	-	-
7.	Great Coco Island	160.03	-	-

8.	Hlawga Reservoir	23.18	Wildlife Sanctuary	Mythun, Eld's deer, Sambhur, Barking deer, Hog deer, Migratory birds
9.	Maletto Inn	386.14	Terrestrial KBA	Ayeyarwaddy Dolphin and Freshwater turtle endemic
10.	Payagyi	709.55	-	Fish migration and breeding zone
11.	Gulf of Mottama	5098.77	-	Spoon-billed sand piper, black-headed ibis
Protected Area (PA)				
12.	Hlawga Park	6.24	Enclosed wildlife park	Mythun, Eld's deer, Sambhur, Barking deer, Hog deer, Migratory birds



Source: Biodiversity Team

Figure 5.35 - Map of KBAs and Protected Area of Yangon Region



Source: Biodiversity Team

Figure 5.36 - Map of Reserved Forests in Hmawbi Township

Survey Result (Flora)

Species Level Features of Flora

According to the surveys conducted in the project area in and around, there are a total of (31) flora species that belong to (25) families were recorded along the study area, comprising (12) trees, (2) small trees, (9) shrubs, (7) herbs and (1) bamboo. List of recorded flora species from the study area described as following table and also mentioned photographs by Appendix (C). In order to data analysis, Tree species (38.71%) occurred by highest density and highest composition was found as Common jujube (11.54%) in plant species. Species observed during the flora survey were referenced to the IUCN Red List of threatened species. According to conservation status of IUCN, (2) Data Deficient (DD) species and (17) Least Concern (LC) species were existing in the project area. In order to the Notification of No. (127/2019), bill of protected trees issued by the Ministry of Natural Resources and Environmental Conservation, one protected tree species also occurred during the survey.

Table 5.8 - Recorded flora species from the study area

No	Common Name	Scientific Name	Family
Trees			
1	Madagascar Almond	*Terminalia Mantaly*	Combretaceae
2	Ear leaf Acacia	*Acacia auriculiformis*	Fabaceae
3	Indian-almond	*Terminalia catappa*	Combretaceae
4	Mango	*Mangifera indica*	Anacardiaceae
5	Teak	*Tectona grandis*	Lamiaceae
6	Common jujube	*Ziziphus jujuba*	Rhamnaceae
7	Lebbek tree	*Albizia lebbek*	Mimosaceae
8	Cassia tree	*Cassia siamea*	Fabaceae
9	Ceylon wood	*Manilkara hexandra*	Sapotaceae
10	Indian Jack Fruit	*Artocarpus heterophyllus*	Moraceae
11	Mountain Teak	*Podocarpus neriifolius*	Podocarpaceae
12	Kelat Oil	*Eugenia Oleina*	Myrtaceae
Small Trees			
13	Guava	*Psidium guajava*	Myrtaceae
14	Papaya	*Carica papaya*	Caricaceae
Shrubs			
15	Umbrella-sedges	*Cyperus tegetum*	Cyperaceae
16	Aramine fiber	*Urena labata*	Malvaceae
17	Sugarcane grass	*Saccharum spontaneum*	Poaceae
18	Giant sensitive plant	*Mimosa diplotricha*	Fabaceae
19	Elephant creeper	*Argyreia nervosa*	Convolvulaceae
20	Rose	*Rosa centifolia*	Rosaceae
21	Chloranthus	*Chloranthus officinalis*	Chloranthaceae

22	Pinwheel flower	*Tabernaemontana divaricata*	Apocynaceae
23	Siam weed	*Chromolaena odorata*	Asteraceae
Herbs			
24	Snake-needle grass	*Oldenlandia diffusa*	Rubiaceae
25	Sessile joyweed	*Alternanthera sessilis*	Amaranthaceae
26	smallflower umbrella-sedge	*Cyperus difformis*	Cyperaceae
27	Sensitive plant	*Mimosa pudica*	Mimosaceae
28	Aloe	*Aloe vera*	Aloaceae
29	Benghal dayflower	*Commelina benghalensis*	Commelinaceae
30	Water-pepper	*Persicaria hydropiper*	Polygonaceae.
Bamboo			
31	Bamboo	*Bambusa spp.*	Poaceae

Table 5.9 – Relative abundance of recorded flora species from study area

No.	Scientific Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Plot 13	Total	Abundance	Relative Abundance
1	*Acacia auriculiformis*	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.0069	uC
2	*Albizia lebbek*	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0.0139	C
3	*Aloe vera*	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.0069	uC
4	*Alternanthera sessilis*	1	0	2	0	2	0	0	4	0	2	0	0	0	11	0.0764	vC
5	*Argyreia nervosa*	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.0069	uC
6	*Artocarpus heterophyllus*	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.0069	uC
7	*Bambusa spp.*	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0.0139	C
8	*Carica papaya*	0	0	0	0	1	2	0	0	0	0	0	0	0	3	0.0208	C
9	*Cassia siamea*	0	0	0	1	0	2	0	0	0	0	0	0	0	3	0.0208	C
10	*Chloranthus officinalis*	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0.0139	C
11	*Chromolaena odorata*	0	3	2	2	0	0	2	0	3	0	0	0	0	12	0.0833	vC
12	*Commelina benghalensis*	0	2	0	0	0	0	0	1	2	0	0	0	0	5	0.03472	C
13	*Cyperus difformis*	2	0	0	0	0	0	0	4	0	0	0	0	3	9	0.0625	vC
14	*Cyperus tegetum*	0	0	3	0	0	0	2	0	0	3	0	3	0	11	0.0764	vC
15	*Eugenia Oleina*	0	0	0	0	4	2	0	0	0	0	0	0	0	6	0.0417	vC

16	*Mangifera indica*	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0.0139	C
17	*Manilkara hexandra*	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.0069	uC
18	*Mimosa diplotricha*	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.0069	uC
19	*Mimosa pudica*	0	2	2	0	0	0	2	0	3	2	0	2	0	13	0.0903	vC
20	*Oldenlandia diffusa*	0	2	0	0	3	0	2	2	0	2	2	4	0	17	0.1181	C
21	*Persicaria hydropiper*	2	0	0	0	0	1	0	3	2	0	0	0	3	11	0.0764	vC
22	*Podocarpus neriifolius*	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.0069	uC
23	*Psidium guajava*	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0.0139	C
24	*Rosa centifolia*	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0069	uC
25	*Saccharum spontaneum*	0	0	0	0	0	0	0	0	7	0	0	0	0	7	0.0486	C
26	*Tabernaemontana divaricata*	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0.0139	C
27	*Tectona grandis*	0	0	0	1	0	2	0	0	0	0	0	0	0	3	0.0208	C
28	*Terminalia catappa*	0	0	0	1	1	2	0	0	0	0	0	0	0	4	0.0278	C
29	*Terminalia Mantaly*	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0069	uC
30	*Urena labata*	0	1	0	0	0	1	0	2	0	1	0	0	0	5	0.03472	C
31	*Ziziphus jujuba*	0	0	0	0	1	1	0	0	0	0	1	0	0	3	0.0208	C
	Total	7	11	10	9	16	18	8	16	17	10	6	9	7	144		

Table 5.10 - Diversity of various family of tree species from study area

No.	Family	No. of species	RDi (%)
1	Aloaceae	1	3.23
2	Amaranthaceae	1	3.23
3	Anacardiaceae	1	3.23
4	Apocynaceae	1	3.23
5	Asteraceae	1	3.23
6	Caricaceae	1	3.23
7	Chloranthaceae	1	3.23
8	Combretaceae	2	6.45
9	Commelinaceae	1	3.23
10	Convolvulaceae	1	3.23
11	Cyperaceae	2	6.45
12	Fabaceae	3	9.68
13	Lamiaceae	1	3.23
14	Malvaceae	1	3.23

15	Mimosaceae	2	6.45
16	Moraceae	1	3.23
17	Myrtaceae	2	6.45
18	Podocarpaceae	1	3.23
19	Poaceae	2	6.45
20	Polygonaceae	1	3.23
21	Rhamnaceae	1	3.23
22	Rosaceae	1	3.23
23	Rubiaceae	1	3.23
24	Sapotaceae	1	3.23
	Total no. of species	31	

Table 5.11 – Composition of plant species recorded

No.	Scientific Name	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Plot 13	Total	% Composition
1	*Acacia auriculiformis*	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.69
2	*Albizia lebbek*	0	0	0	0	0	1	0	0	0	0	1	0	0	2	1.39
3	*Aloe vera*	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.69
4	*Alternanthera sessilis*	1	0	2	0	2	0	0	4	0	2	0	0	0	11	7.64
5	*Argyreia nervosa*	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.69
6	*Artocarpus heterophyllus*	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.69
7	*Bambusa spp.*	0	0	0	0	0	2	0	0	0	0	0	0	0	2	1.39
8	*Carica papaya*	0	0	0	0	1	2	0	0	0	0	0	0	0	3	2.08
9	*Cassia siamea*	0	0	0	1	0	2	0	0	0	0	0	0	0	3	2.08
10	*Chloranthus officinalis*	0	1	0	0	0	1	0	0	0	0	0	0	0	2	1.39
11	*Chromolaena odorata*	0	3	2	2	0	0	2	0	3	0	0	0	0	12	8.33
12	*Commelina benghalensis*	0	2	0	0	0	0	0	1	2	0	0	0	0	5	3.47
13	*Cyperus difformis*	2	0	0	0	0	0	0	4	0	0	0	0	3	9	6.25
14	*Cyperus tegetum*	0	0	3	0	0	0	2	0	0	3	0	3	0	11	7.64
15	*Eugenia Oleina*	0	0	0	0	4	2	0	0	0	0	0	0	0	6	4.17
16	*Mangifera indica*	0	0	0	1	1	0	0	0	0	0	0	0	0	2	1.39
17	*Manilkara hexandra*	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.69

18	*Mimosa diplotricha*	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.69
19	*Mimosa pudica*	0	2	2	0	0	0	2	0	3	2	0	2	0	13	9.03
20	*Oldenlandia diffusa*	0	2	0	0	3	0	2	2	0	2	2	4	0	17	11.8
21	*Persicaria hydropiper*	2	0	0	0	0	1	0	3	2	0	0	0	3	11	7.64
22	*Podocarpus neriifolius*	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.69
23	*Psidium guajava*	0	0	1	0	1	0	0	0	0	0	0	0	0	2	1.39
24	*Rosa centifolia*	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.69
25	*Saccharum spontaneum*	0	0	0	0	0	0	0	0	7	0	0	0	0	7	7.64
26	*Tabernaemontana divaricata*	0	0	0	1	1	0	0	0	0	0	0	0	0	2	1.39
27	*Tectona grandis*	0	0	0	1	0	2	0	0	0	0	0	0	0	3	2.08
28	*Terminalia catappa*	0	0	0	1	1	2	0	0	0	0	0	0	0	4	2.78
29	*Terminalia Mantaly*	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.69
30	*Urena labata*	0	1	0	0	0	1	0	2	0	1	0	0	0	5	3.47
31	*Ziziphus jujuba*	0	0	0	0	1	1	0	0	0	0	1	0	0	3	2.08
	Total	7	11	10	9	16	18	8	16	17	10	6	9	7	144	

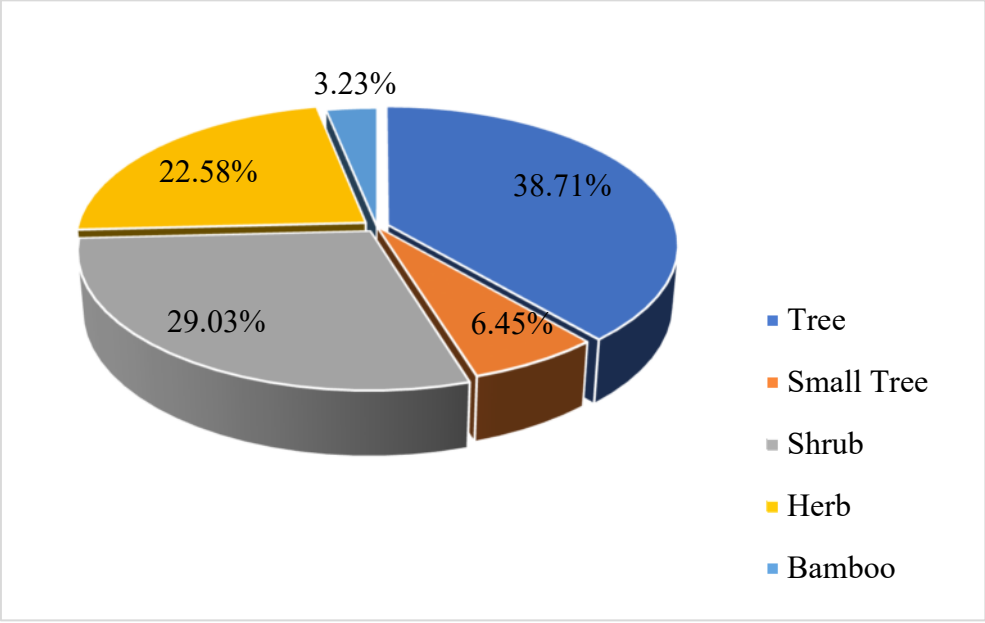


Figure 5.37 - Occurrence of Flora Diverse Species in Study Area

Table 5.12 - Sensitivity species found in the study area

Categories	NE	DD	LC	NT	VU	EN	CR	EW	EX
Plants	0	2	17	0	0	0	0	0	0
Sensitivity	**LOW**			**MEDIUM**			**HIGH**		

Threatened category: NE: Not Evaluate DD: Data deficiency LC: Least Concern NT: Near Threatened VU: Vulnerable EN: Endangered CR: Critically Endangered EW: Extinct in Wild EX: Extinct

The proposed study area is an urban industrial area mixed with agricultural landscapes. Paddy fields, grass lands, cultivated lands also occurred during the survey. Ear leaf Acacia (Acacia auriculiformis), Siam weed (Chromolaena odorata), Giant sensitive plant (Mimosa diplotricha) were observed as invasive alien species (IAS) of that area. IAS generally occurs in cultivated forests and lands, urban areas, wetlands and natural lands. IAS can have severe ecological effects on the invaded environments. They may lack natural predators in their new environments, allowing them to quickly increase their abundance and spread. They can carry diseases, outcompete or prey on native species, alter food chains, and even change ecosystems by. IAS occurred in study area can be seen in following figures.

Acacia auriculiformis

Chromolaena odorata.

Mimosa diplotricha.

Figure 5.38 - Occurrence of invasive alien species (IAS) at the study area

Figure 5.39 - Occurrence of Paddy Fields, Grass Lands, Cultivated Lands at the Study Area

Survey result (Fauna)

Classification of Fauna

Mollusks

The mollusks compose the large phylum of invertebrate animals known as the Mollusks. Numerous mollusks live in freshwater and terrestrial habitats. There are 66,535 identified species of mollusks in the world. In the present study, Apple snail *Pomacea canliculata* was commonly found in the study area. This project area is not suitable for most mollusks since the recorded mollusks species are low and habitat is not seasonally good for this species. (Table 5.14 and Table 5.15, Appendix C).

Crustaceans

Crustaceans form a very large group of arthropods, there are 35,534 identified species of Crustaceans in the world. In the present study, two species: Mud crab, *Dyspanopeus sayi* and Whitleg shrimp, *Litopenaeus vannamei* were found in the study area. Crustaceans are mostly found in ponds, streams, lakes and rivers. This study area is partially wetland and most flora species were herbs. Thus, crustacean species were recorded very low in this project area (Table 5.14 and Table 15, Appendix C).

Insect

Insects are a class of invertebrates within the arthropod phylum. They are the most diverse groups of animals on the planet and representing more than half of all known living organisms. There are 8,67,391 identified species of insects in the world. Several species of insects are of great value to humans. They function as pollinators (*Lepidoptera & Apidae* species), and, they produce several valuable products such as honey, silk, dyes, etc. Several insects are also harmful to humans (causing diseases such as malaria, typhoid, etc) and to crop (for example, rice gundhi bug and leaf folder in paddy, pink bollworm and whitefly in cotton, etc). Some insects are sensitive to environmental effects such as ants, family Formicidae and bee, family Apidae avoid smokes by any way. In the present survey, a total of 22 species, 18 genera, six families under four orders were recorded. Among these, the most diverse species are 10 species of Lepidoptera and one least diverse species of Coleoptera. The individual species commonly recorded are Wood Ant (*Formica rufa)* and Ret Tree Ant (*Oecophylla smaragdina)*. The most abundant species (0.1418) were Comb scarlet (dragonfly) and Red tree ant, and five low-abundant species (0.0071) were found. Among 22 recorded species, six species were very commom (vC), 11 species were common (C) and five species were uncommon (uC). Micro-habitat utilization flora were herbs, grass, shrubs and tree. The most found diversity (45.4545) was in family *Libellulidae* and the lowest (4.4545) was found as their species. The most important habitat for insects is herbs habitat. Thus, the project area is suitable for insect habitation (Table 5.14 and 5.16, Appendix C).

Fish

Fish are found in primarily all aquatic environments: mountain stream, pond and lake, river and sea. With 32,000 identified and classified species, fish represent the most diverse among the vertebrates. The most important source for us is food. In the study period, eight species in eight genera under families, *Clupeidae, Belonidae, Gobiidae, Cynoglossidae, Mugilidae, Synbranchiformes and Mastacembelidae* were recorded. The mostly discovered fish species were those which are brackish water habitat. All species were least concern (LC) in IUCN red-list, 2019. Since Hlaing River is sub-tidal zone river system, the river is significantly good for aquatic species although waste water from the industrial zone flows into this river, (Table 5.14 and 5.17, Appendix C).

Amphibians

Amphibians are extremely sensitive to external factors due to their permeable skin: small changes in the environment can tremendously affect their survival. Therefore, they act as indicators. There are more than 4,000 different kinds of amphibians. In the present study, two

species Grass frog/ Paddy frog and Dark-sided Chorus frog were recorded (Table 5.14 and 5.19, Appendix C). They are very low species found since the most amphibians were nocturnal species. All species recorded are least concern (LC) in IUCN red-list.

Reptiles

Reptiles are cold-blooded animals. There are 5,817 identified species of reptiles in the world. In the present survey, three species, Tree or ground lizard, Garden lizard and Skink were recorded. Some reptiles such as snake, lizards were terrestrial. No snake was found in this study area due to wetland in the rainy season. All species recorded are least concern (LC) in IUCN red-list (Table 5.14 and 5.19, Appendix C).

Birds

Birds are known as good indicators, and they identify the most biologically rich areas, as well as environmental changes and problems (Gill, 1990). There are 10, 976 species in the world. The avifauna of Myanmar include a total of 1147 species, of which seven are endemic, and two have been introduced by humans and 68 species are globally threatened (List of birds of Myanmar Wikipedia). In the present study, a total of 17 species, 14 genus under 10 families and seven orders were recorded. The most abundant species (0.2198) were Eurasian Tree Sparrow and the three lowest species (0.0110) were found as: Comb Duck, Indian Pond Heron and Little Green Bee Eater. The most habitat areas of birds are paddy fields and web land area. The most relative diversity (23.5294) was Rallidae and the lowest (5.8824) was found seven species. There are eight species of water birds and nine species of terrestrial and arboreal habitat species. Thus, this project area is suitable for all species to inhabit (Table 5.14 and 5.18, Appendix C).

Mammal

Most mammals live in/on the ground, case of trees, high trees and buildings. In the present survey, mammals were not found. It is due to the habitat of study area since it is mostly wetland and high and suitable trees for mammal species are rare to be found.

Zooplankton

Zooplankton are affected by levels of pH, heavy metals, calcium, and aluminum. Nutrients like nitrogen and phosphorus will affect the prey of zooplanktons (like algae, protozoa and bacteria), indirectly affecting their survival. There are about 2,375 species of rotifers discovered in freshwater and only 125 of them in the ocean. Most of the rotifers are non-motile (not able to move) but about 100 species are Holoplanktonic. Rotifers eat bacteria,

detritus, other rotifers, algae or protozoa. A total of 15 species, 10 genera belonging to nine families and three orders under two phylum: *Rotifera* and *Arthropoda* were found in waste water canal. The mostly found species belongs to *Rotifera,* and 13 species of them were found. No zooplankton was found in Hlaing River (Table 5.14 and 5.20, Appendix C).

Species Level Features of Fauna

According to the survey results, a total of (70) fauna species from (39) families and Order (24) was recorded in and around the project area. Biodiversity survey group are observed that one species of mollusk belong to one family, 2 species of crustaceans belong to 2 families, 22 species of insect belong to 7 families, 8 species of fish belong to 7 families, 2 species of amphibian belong to one family, 3 species of reptile belong to 2 families, 17 species of birds belong to 10 families and 15 species of zooplanktons belong to 9 families and In species composition, mollusks were (1.43), crustaceans were (2.86), insects were(31.43), fish were (11.43), amphibian were (2.86), reptiles were (4.29), birds were (24.29) and finally zooplanktons were (21.43) respectively included. Species observed during the fauna survey were referenced to the IUCN Red List of threatened species. According to conservation status of IUCN, (1) Near Threatened, (41) Least Concern (LC), (1) Data Deficient (DD), (8) Not Evaluated (NE) species noted from the survey area.

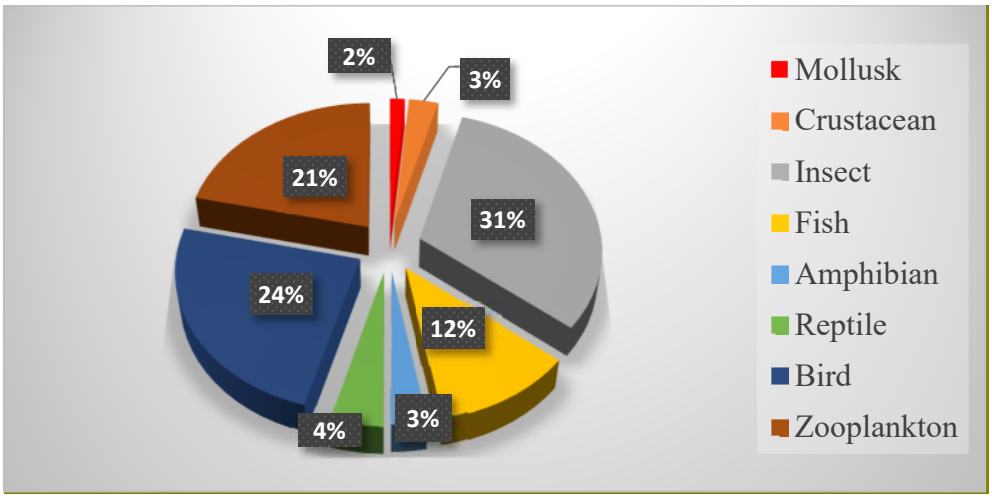


Figure 5.40 - Occurrence of Fauna Diverse Species in Study Area

Table 5.13 - Sensitivity species found in the study area

Categories	NE	DD	LC	NT	VU	EN	CR	EW	EX
Plants	0	0	42	1	0	0	0	0	0
Sensitivity	LOW			MEDIUM			HIGH		

Threatened category: NE: Not Evaluate DD: Data deficiency LC: Least Concern NT: Near Threatened VU: Vulnerable EN: Endangered CR: Critically Endangered EW: Extinct in Wild EX: Extinct

In Order to sensitivity matrix of the species, not highly threatened species found in the study area. There is not included the any endangered, vulnerable species except of *Formica rufa* is found as Nearly Threatened species. Thus, no special care and conservation activities could be needed, but regular or periodical checking should be conducted.

Table 5.14 - List of Identified Fauna Species at Study Area during Study Period

No	Common Name	Scientific Name	Family	Local Name
Mollusk and Crustacen				
1	Mud crab	*Dyspanopeus sayi*	Decapoda	-
2	Whitleg shrimp	*Litopenaeus vannamei*	Decapoda	-
3	Apple snail	*Pomacea canliculata*	Ampullariidae	-
Insects				
4	Asian pintail	*Acisoma panorpoides*	Libellulidae	-
5	The Orange Migrant	*Catopsilia scylla*	Pieridae	-
6	Europian honey bee	*Apis mellifera*	Apidae	-
7	Ditch jewel	*Brachythemis contaminata*	Libellulidae	-
8	The Common Emigrant	*Catopsilia pomona*	Pieridae	-
9	The Mottled Immigrant	*Catopsilia pyranthe*	Pieridae	-
10	Scarlet dragonfly	*Crocothemis erythraea*	Libellulidae	-
11	Common scarlet	*Crocothemis servilia*	Libellulidae	-
12	Flea beetle	*Disonycha xanthomelas*	Chrysomelidae	-
13	Common Indian Crow	*Euploea core*	Nymphalidae	-
14	Wood ant	*Formica rufa*	Formicidae	-
15	The Eggfly	*Hypolimnas bolina*	Nymphalidae	-
16	Great blue skimmer	*Libellula vibrans*	Libellulidae	-
17	The Pied paddy skimmer	*Neurothemis tullia*	Libellulidae	-
18	Red tree ant	*Oecophylla smaragdina*	Formicidae	-
19	White-tailed skimmer	*Orthetrum albistylum*	Libellulidae	-
20	Slender skimmer	*Orthetrum sabina*	Libellulidae	-
21	Globe skimmer	*Pantala flavescens*	Libellulidae	-
22	Lime butterfly	*Papilio demoleus*	Papilionidae	-
23	Small cabbage butterfly	*Pieris canidia*	Pieridae	-
24	The Blue Tiger	*Tirumala limniace*	Nymphalidae	-
25	Long-Legged Marsh Glider	*Trithemis pallidinervis*	Libellulidae	-
Fish				
26	Long tongue sole	*Cynoglossus lingua*	Cynoglossidae	Nga-sat-sar
27	Tank goby	*Glossogobius giuris*	Gobiidae	Ka-tha-boe
28	Elongated Hisha	*Hisha elongata*	Clupeidae	Nga-myat-san-kyal
29	Peackok eel	*Macrognathus aral*	Mastacembelidae	-
30	Cuchia eel	*Monopterus cuchia*	Synbranchidae	Nga-shint-mwe
31	Ray-finned fish	*Rhinomugil corsula*	Mugilidae	-
32	Hilsa Shad	*Tenualosa ilisha*	Clupeidae	Nga-ta-lout
33	Needlenose garfish	*Xenentodon cancila*	Belonidae	Nga-phaung-yoe
Amphibians and Reptiles				
34	Tree or ground lizard	*Calotes mystaceus*	Agamidae	Tree or ground lizard
35	Garden lizard	*Calotes versicolor*	Agamidae	Garden lizard
36	Skink	*Eutropis macularia*	Scincidae	Skink
37	Grass frog/ Paddy frog	*Fejervarya limnocharis*	Dicroglossidae	Grass frog/ Paddy frog
38	Dark-sided Chorus frog	*Microhyla hemonsi*	Dicroglossidae	Dark-sided Chorus frog

Birds				
39	Common Myna	*Acridotheres tristis*	Sturnidae	Zatyat-myay-wa
40	White-breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	-
41	Chinese Pond Heron	*Ardeola bacchus*	Ardeidae	Baying-auk
42	Indian pond heron	*Ardeola grayii*	Ardeidae	Baying-auk
43	House Crow	*Corvus splendens*	Corvidae	Kyi-gan
44	Black Drongo	*Dicrurus macrocercus*	Dicruridae	Lin-mye-swe
45	Little Egert	*Egretta falcinellus*	Ardeidae	-
46	Common Coot	*Fulica atoa*	Rallidae	
47	Common Morhen	*Gallinula chloropus*	Rallidae	-
48	Little green bee eater	*Merops orientalis*	Meropidae	Hnge-pa-sin-hto
49	Intermediate Egert	*Mesophoyx intermedia*	Ardeidae	-
50	House sparrow	*Passer domesticus*	Passeridae	Eain-sa
51	Eurasian Tree Sparrow	*Passer montanus*	Passeridae	
52	Great Commorant	*Phalarcrocorax carbo*	Phalacrocoracidae	din-gyi
53	Grey-breasted Prinia	*Prinia hodgsonii*	Cisticolidae	
54	Plain prinia	*Prinia inornata*		Hnget-lat-ma
55	Spotted Dove	*Spilopelia chinensis*	Columbidae	Gyo-le-pyauk
Zooplanktons				
56	-	*Adineta gracilis*	Adinetidae	-
57	-	*Asplanchna priodonta*	Asplanchnidae	-
58	-	*Brachionus angularis*	Brachionidae	-
59	-	*Brachionus caudatus*	Brachionidae	-
60	-	*Brachionus quadridentatus*	Brachionidae	-
61	-	*Euchlanis dilatata*	Euchlanidae	-
62	-	*Hexarthra mira*	Hexarthridae	-
63	-	*Horaella brehmi*	Trochosphaeridae	-
64	-	*Keratella tropica*	Brachionidae	-
65	-	*Lecane bulla*	Lecanidae	-
66	-	*Lecane luna*	Lecanidae	-
67	-	*Lecane lunaris*	Lecanidae	-
68	-	*Mesocyclops leckurti*	Cyclopidae	-
69	-	*Microcyclops sp.*	Cyclopidae	-
70	-	*Polyarthra vulgaris*	Synchaetidae	-

Table 5.15- Occurrence, Abundance, Status and Habitat of Mollusk and Crustacean Species at Survey Area during Study Period

Sr. No.	Species	Occurrence	Abundance	RA-Status	IUCN Status	Habitat
1	*Dyspanopeus sayi*	1	0.0417	C	NE (Not Evaluated)	Hlaing River
2	*Litopenaeus vannamei*	11	0.4583	vC	NE (Not Evaluated)	Hlaing River
3	*Pomacea canliculata*	12	0.5	vC	LC	wetland
	Total	24				

NE- Not Evaluatead

Table 5.16 - Occurrence, Abundance, Status and Habitat of Insect Species at Survey Area during Study Period

Sr. No.	Scientific name	Occurrence	Abundance	RA-Status	IUCN Status	Habitat
1	*Acisoma panorpoides*	10	0.0709	vC	LC	Grass & ground

2	*Apis mellifera*	8	0.0567	C	DD	Shrubs & Herbs
3	*Brachythemis contaminata*	4	0.0284	C	LC	Grass & herbs
4	*Catopsilia pomona*	3	0.0213	C	-	Shrubs & Herbs
5	*Catopsilia pyranthe*	4	0.0284	C	-	Shrubs & Herbs
6	*Catopsilia scylla*	3	0.0213	C	-	Shrubs & Herbs
7	*Crocothemis erythraea*	14	0.0993	vC	LC	Herbs
8	*Crocothemis servilia*	20	0.1418	vC	LC	Herbs
9	*Disonycha xanthomelas*	11	0.0780	vC	-	Herbs
10	*Euploea core*	1	0.0071	uC	LC	Shrubs & Herbs
11	*Formica rufa*	13	0.0922	vC	NT	Tree & shrub
12	*Hypolimnas bolina*	1	0.0071	uC	-	Herbs & grass
13	*Libellula vibrans*	6	0.0426	C	LC	Herbs & bushes
14	*Neurothemis tullia*	6	0.0426	C	LC	Grass & herbs
15	*Oecophylla smaragdina*	20	0.1418	vC	-	Tree & shrub
16	*Orthetrum albistylum*	5	0.0355	C	LC	Herbs
17	*Orthetrum sabina*	1	0.0071	uC	LC	Herbs
18	*Pantala flavescens*	1	0.0071	uC	LC	Pinwhell flower
19	*Papilio demoleus*	4	0.0284	C	-	Herbs & grass
20	*Peris canidia*	1	0.0071	uC	NE (Not Evaluated)	Shrubs & Herbs
21	*Trithemis pallidinervis*	3	0.0213	C	LC	Herbs
22	*Tirumala limniace*	2	0.0142	C	-	Tree & shrub
	Total number of individuals	141				

DD- Data Deficient, NE- Not Evaluatead, LC- Least Concern, NT- Near Threatened

Table 5.17 - Occurrence, Abundance, IUCN Status and Habitat of Fish Species at Survey Area during Study Period

Sr. No.	Species	Occurrence	Abundance	RA-Status	IUCN Status	Habitat
1	*Cynoglossus lingua*	3	0.0857	vC	LC	Hlaing River
2	*Glossogobius giuris*	5	0.1429	vC	LC	Hlaing River
3	*Hisha elongata*	4	0.1142	vC	LC	Hlaing River
4	*Macrognathus aral*	4	0.1142	vC	LC	Hlaing River
5	*Monopterus cuchia*	6	0.1714	vC	LC	Hlaing River
6	*Rhinomugil corsula*	6	0.1714	vC	LC	Hlaing River
7	*Xenentodon cancila*	4	0.1142	vC	LC	Hlaing River
8	*Tenualosa ilisha*	3	0.0857	vC	LC	Hlaing River
	Total	35				

LC- Least Concern

Table 5.18- Occurrence, Abundance, IUCN Status and Habitat of Bird Species at Survey Area during Study Period

Sr. No.	Scientific name	Occurrence	Abundance	RA-Status	IUCN Status	Habitat
1	*Acridotheres tristis*	12	0.1319	vC	LC	Tree & ground
2	*Amaurornis phoenicurus*	3	0.0330	vC	LC	Webland
3	*Ardeola bacchus*	6	0.0659	vC	LC	Webland
4	*Ardeola grayii*	3	0.0330	C	LC	Webland
5	*Corvus splendens*	3	0.0330	C	LC	Tree
6	*Dicrurus macrocercus*	6	0.0659	vC	LC	Tree & Cow
7	*Egretta falcinellus*	8	0.0879	vC	LC	Paddy field
8	*Fulica atoa*	6	0.0659	vC	LC	Paddy field
9	*Gallinula chloropus*	2	0.0220	vC	LC	Webland
10	*Merops orientalis*	1	0.0110	C	LC	Tree
11	*Mesophoyx intermedia*	1	0.0110	C	LC	Paddy field
12	*Passer domesticus*	7	0.0769	vC	LC	Tree & building
13	*Passer montanus*	20	0.2198	vC	LC	Tree
14	*Phalarcrocorax carbo*	1	0.0110	C	LC	Webland
15	*Prinia hodgsonii*	3	0.0330	C	LC	Shrub & grass
16	*Prinia inornata*	5	0.0549	vC	LC	Shrub & grass
17	*Spilopelia chinensis*	4	0.0440	vC	LC	Tree
	Total number of individuals	91				

LC- Least Concern

Table 5.19 - Occurrence, Abundance, IUCN Status and Habitat of Amphibian and Reptile Species at Survey Area during Study Period

Sr. No.	Species	Local names	Occurrence	Abundance	RA-Status	IUCN Status	Habitat
1	*Calotes mystaceus*	poke-thin-nyo	46	0.4842	vC	LC	Webland
2	*Calotes versicolor*	tauk-too	18	0.1895	vC	LC	Tree
3	*Eutropis macularia*	king-lekk-shaw	14	0.1474	vC	LC	Ground
4	*Fejervarya limnocharis*	kyaw-san-kay	12	0.1263	vC	LC	Webland
5	*Microhyla hemonsi*	hpar-la-tat	5	0.0526	vC	LC	Webland
	Total		95				

LC- Least Concern

Table 5.20 - Occurrence, Abundance, IUCN Status and Habitat of Zooplankton Species at Survey Area during Study Period

Sr. No.	Family	Species	Occurrence		Abundance	RA-Status	IUCN Status
			Hlaing River	Waste water canal			
1	Adinetidae	*Adineta gracilis*	-	40	0.3175	vC	NE (Not

							Evaluated)
2	Asplanchnidae	*Asplanchna priodonta*	-	3	0.0238	C	NE (Not Evaluated)
3	Brachionidae	*Brachionus angularis*	-	8	0.0635	vC	-
4	Brachionidae	*Brachionus caudatus*	-	5	0.0397	C	-
5	Brachionidae	*Brachionus quadridentatus*	-	3	0.0238	C	-
6	Euchlanidae	*Euchlanis dilatata*	-	2	0.0159	C	-
7	Hexarthridae	*Hexarthra mira*	-	4	0.0317	C	-
8	Trochosphaeridae	*Horaella brehmi*	-	9	0.0714	vC	-
9	Brachionidae	*Keratella tropica*	-	3	0.0238	C	NE (Not Evaluated)
10	Lecanidae	*Lecane bulla*	-	28	0.2222	vC	NE (Not Evaluated)
11	Lecanidae	*Lecane luna*	-	7	0.0556	vC	NE (Not Evaluated)
12	Lecanidae	*Lecane lunaris*	-	3	0.0238	C	NE (Not Evaluated)
13	Cyclopidae	*Mesocyclops leckurti*	-	4	0.0317	C	-
14	Cyclopidae	*Microcyclops sp.*	-	3	0.0238	C	-
15	Synchaetidae	*Polyarthra vulgaris*	-	4	0.0317	C	NE (Not Evaluated)
Total			-	126			

NE- Not Evaluated

Table 5.21 - Relative Density (RDi) of Various Families of Insects in Project Area

No.	Family	Genus	Species	RDi
1	Libellulidae	8	10	45.4545
2	Chrysomelidae	1	1	4.5455
3	Papilionidae	1	1	4.5455
4	Pieridae	2	4	18.1818
5	Nymphalidae	3	3	13.6364
6	Formicidae	2	2	9.0909
7	Apidae	1	1	4.5455
Total		18	22	

Table 5.22 - Relative Density (RDi) of Various Families of Fish in Project Area

No.	Family	Genus	Species	RDi
1	Clupeidae	2	2	25
2	Belonidae	1	1	0.125
3	Gobiidae	1	1	0.125
4	Cynoglossidae	1	1	0.125
5	Mugilidae	1	1	0.125

6	Synbranchidae	1	1	0.125
7	Mastacembelidae	1	1	0.125
Total		8	8	

Table 5.23 - Relative Density (RDi) of Various Families of Reptiles in Project Area

No.	Family	Genus	Species	RDi
1	Dicroglossidae	2	2	40.0000
2	Agamidae	1	2	40.0000
3	Scincidae	1	1	20.0000
Total				

Table 5.24 - Relative Density (RDi) of Various Families of Birds in Project Area

No.	Family	Genus	Species	RDi
1	Phalacrocoracidae	1	1	5.8824
2	Ardeidae	3	4	23.5294
3	Rallidae	2	2	17.6471
4	Columbidae	1	1	5.8824
5	Meropidae	1	1	5.8824
6	Dicruridae	1	1	5.8824
7	Corvidae	1	1	5.8824
8	Passeridae	1	2	11.7647
9	Sturnidae	1	1	5.8824
10	Cisticolidae	1	2	11.7647
Total		14	17	

5.5. Infrastructure and Services

Transportation

(a) Water Transport

No.	Name of Water Transport	Starting Point	Ending Point	Distance
1.	Hlaing Myit Kyaung	Myit Kyaung	Yay Paw Thae	18 miles

Source: Hmawbi Township Administrative Office,2019

(b) Train Transport

No.	Name of Train Transport	Starting Point	Ending Point	Distance	Numbers of Stations
1.	Yangon – Pyay	Moe Kyoe Pyit	Phoo Gyi	29 miles	1 big and 3 small stations

Source: Hmawbi Township Administrative Office,2019

(c) Bus Transport

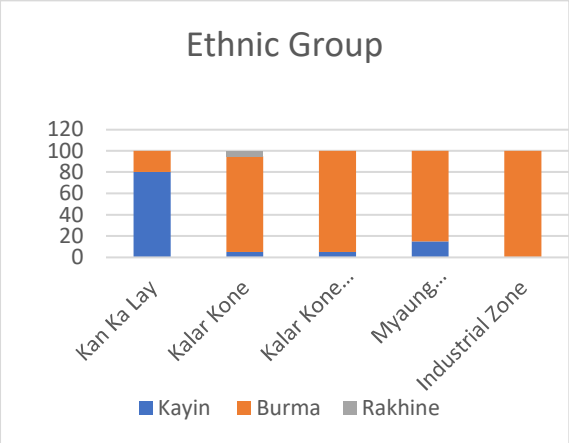
No.	Bus Serial No.	Starting and Ending Bus-stop	Types of Bus	Quantity of Buses
1.	37	GTU – Sule	YBS	38
2.	41	Hmawbi Zay – Thakhin Mya Park	City Bus Mini Bus	37 41
3.	90	Hmawbi Zay – Insein Park	Express	40
4.	91	Hmawbi Zay – Insein Park	Express	35
5.	96	GTU – Hlaw Gar	YBS	8
Total				199

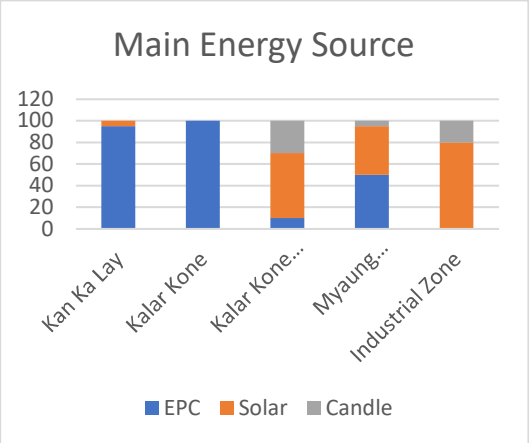
Source: Hmawbi Township Administrative Office,2019

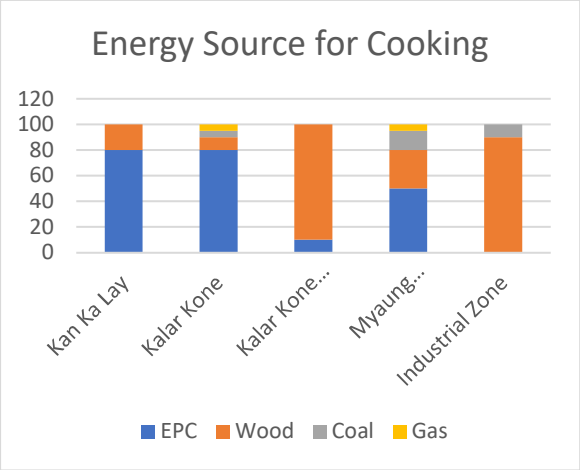
5.6. Socio-Economic Components

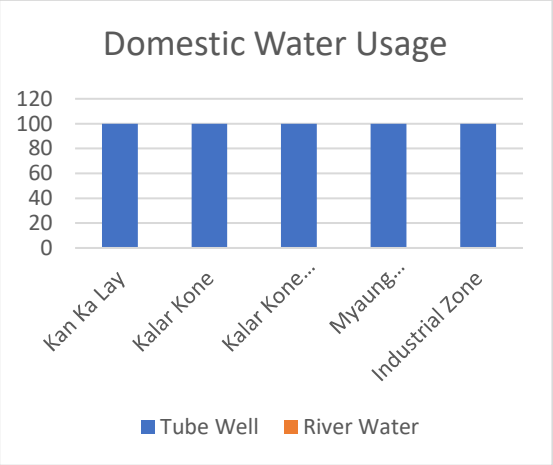
5.6.1. Result from the Primary Data Collection

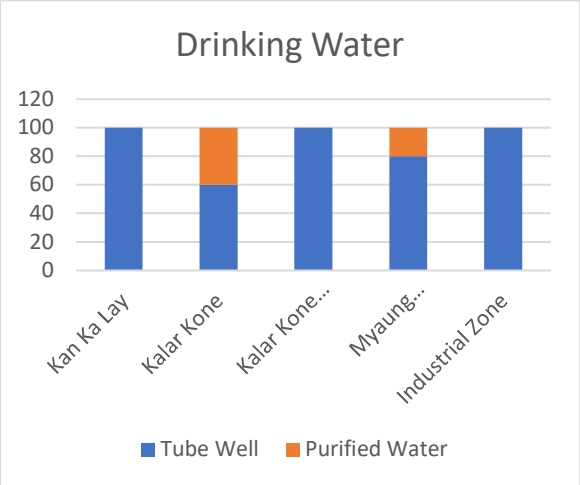
There are three villages, Kan Ka Lay, Kalar Kone and Myaung Dagar, within a 3 km radius of the project that will be affected. Although there is 3 villages with the AOI, the survey area was seperated into 5 parts because Kalar Kone village can be divided into Kalar Kone (East & West) and Kalar Kone (near industrial zone). The survey team also collected the primary data from the local residents who live in the industrial zone too. According to the data collection, Burma and Kayin are the major ethnic groups within the project-affected area. The dominant religion of the people in those villages is Buddhism. All of the houses in those villages obtained their domestic water and drinking water from tube wells. The primary data from the household survey revealed that the energy source for lighting in those villages is electricity from EPC & solar energy. In these villages, the main sources of income are random works, industrial labors and trading.

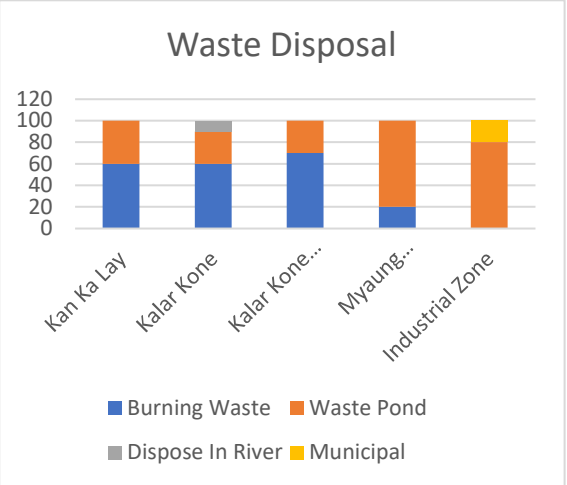


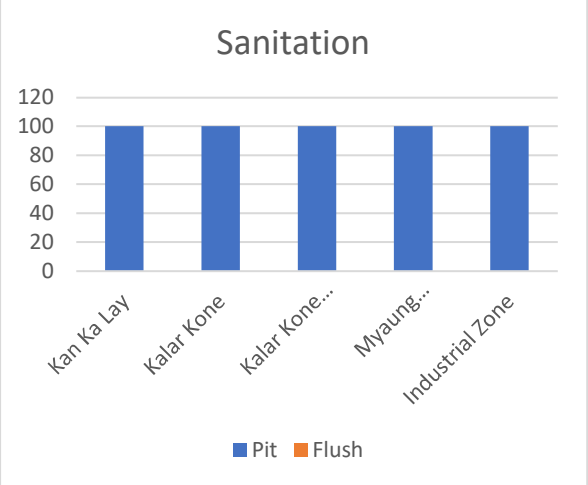


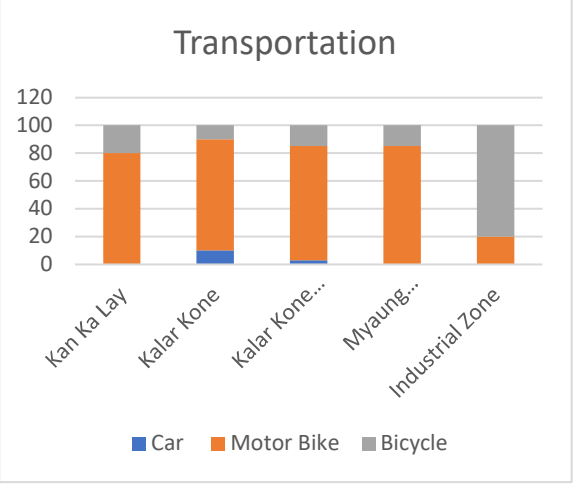

Energy Source for Cooking
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
EPC
Wood
Coal
Gas

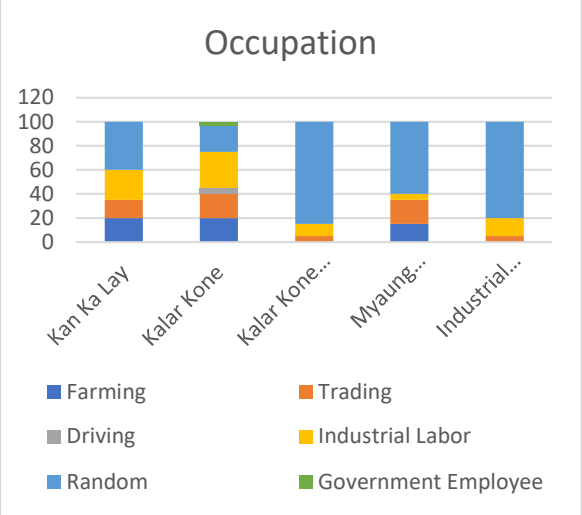

Domestic Water Usage
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
Tube Well
River Water

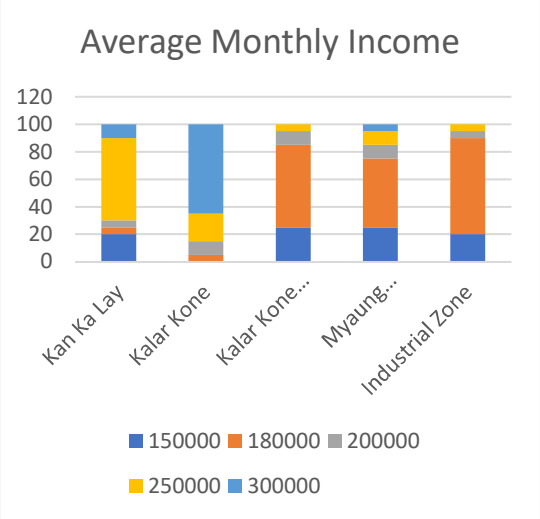

Drinking Water
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
Tube Well
Purified Water

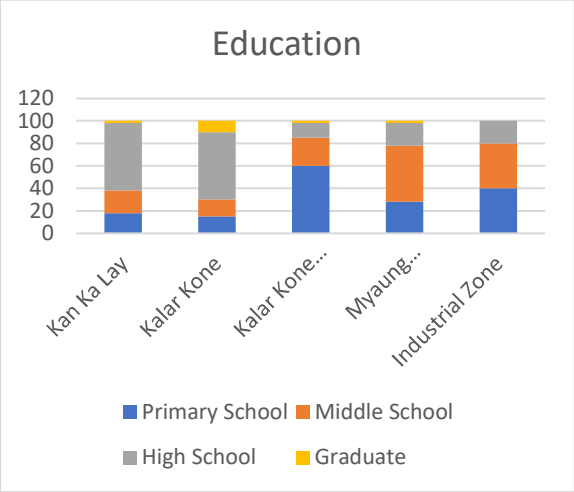

Waste Disposal
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
Burning Waste
Waste Pond
Dispose In River
Municipal

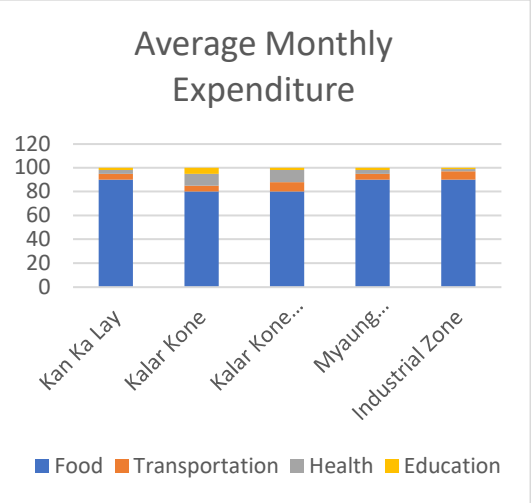

Sanitation
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
Pit
Flush


Transportation
120
100
80
60
40
20
0
Kan Ka Lay
Kalar Kone
Kalar Kone...
Myaung...
Industrial Zone
Car
Motor Bike
Bicycle









Analysis of Primary Baseline Data

Baseline Data	Analysis of Baseline Data
Major Ehnic Groups	Kayin and Burmese are the major ethnic groups. The dominant religion is the Buddhism while Christianity is minority.
Energy Source for Lightning	Electricity are used in some households of Kankalay, Kalar Kone (east & west) and Myaungtagar (near industrial zone) villages and on the other hand, solar and candle are mainly used in other households.
Energy Source for Cooking	Electricity is mainly used as fuel for cooking while firewood is used in some households where electricity cannot get.
Domestic Water Usage	All of the households get their domestic water from the tube wells.

Drinking Water Usage	Most of households get their drinking water from tube wells while minority uses the purified water.
Sanitation	In the survey area, all of the households use pits as their sanitation syatem.
Waste Disposal	Waste burning is the main method used by the local people and some households are disposed in dump.
Transportation	Most people in this survey areas are mainly used motorbike in their transportation needs.
Occupation	As the occupation, there is a relatively large amount of local people who work in common/random works. The other occupations are factory workers, trading and driving.
Education	In this survey area, middle and high school levels are most common levels and there are people who have been graduated from the university or college.
Average Monthly income	The common average monthly income of households in this survey area is around 200000 MMK.
Average Monthly Expenditure	The main source of household expenditure is food.

5.6.2. Resulting from the Secondary Data Collection

The population of Hmawbi was estimated to be 0.2 million in 2019 with the annual percentage of urban population 10.6% and there are more females than males with percentage of 52.1% of female population. The high population numbers can be attributed to the constant in-migration of people from the Yangon to other in search of employment and other opportunities. It covers an area approximately 476 km² and it has a population density of 513.9 persons per square kilometer.

Total Population	0.2 million
Population males	47.9%
Population females	52.1%
Gender ratio (males per 100 females)	98
Percentage of urban population	10.6%
Township Area (km^2)	476.0
Population density (per km^2)	513.9 persons

(a) Ethnicity

Most of the people who live in Hmawbi Township are Bamar, Kayin, Shan, Kayah and Chin. A small number of Kachin, Mon and Rakhine live in Hmawbi Township. The races residing in Hmawbi Township are shown in the following table.

No	Race	No	Percentage (%)
1	Kachin	388	0.19
2	Kayah	2120	1.04
3	Kayin	17524	8.63
4	Chin	1605	0.79
5	Mon	340	0.16
6	Bamar	17524	8.63
7	Rakhine	981	0.48
8	Shan	2198	1.08

Source: Hmawbi Township Administrative Office,2019

(b) Religion

Most of the people living in the township are Buddhists. The different kinds of religious present in Hmawbi Township are shown in the following table.

Township	Religion	Buddhist	Christian	Hindu	Muslim	Total
Hmawbi	Number	185700	14247	656	2301	202904
	(%)	91.5	7.0	0.3	1.2	100.0

Source: Hmawbi Township Administrative Office,2019

At the Union level, the composition of the population by religion is 91.5% Buddhist, 7%, Christian, 1.2% Islam and 0.3% Hindu. According to the above facts and figures, most of the people in study area are Burma and Buddhists.

(c) Age Profile

The age profile for the Hmawbi Township illustrates a developing population dominated by age of above 18 and age of under 18. The populations of age of above 18 is less than the proportion of the age of fewer than 18. Fewer proportions of children and elderly reduce the dependency of those age groups on the working age population.

Table – Population by 5-year age groups, Hmawbi Township

No	Places	Age of above 18			Age of under 18			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Urban	10215	10092	20307	2832	3213	6045	13047	13305	26352
2	Rural	57410	65117	122527	26756	27269	54025	84166	92386	176552
Total		67625	75209	142834	29588	30482	60070	97213	105691	202904

Source: Hmawbi Township Administration Department, 2019

(d) Land Use

Hmawbi Township mainly uses its land for agriculture followed by forest and natural area. Detailed acres for land uses in Hmawbi Township are shown in in the following table

Type of Land	Acre	Percentage (%)
Agricultural land	63272	53.8
Grazing land	5695	4.8
Industrial land	4115	3.5
Urban	1193	1.0
Rural	3450	2.9
Forest land	630	0.5
Virgin land	4621	3.9
Waste land	33099	28.1

Source: Hmawbi Township Administrative Office, 2019

(e) Education

For education sector, although primary school education is compulsory and fee-free, school enrollment rate of 5-year olds is nearly 100% (90%) in the overall township. Percentage of students passing the matriculation is 23.80%. The teacher-student ratios are 1:49 in BEPS, 1:33 in BEMS, and 1:39 in BEHS. Data on education and literacy report that literacy rate in Hmawbi Township was 100%. Detailed for educational facilities in Hmawbi region are as follows.

School	No. of Schools	No. of Teachers	No. of Students	Teacher/Student Ratio
Higher Education	1	224	3007	1:13

BEHS	10	471	18734	1:39
BEHS (Extra)	4	119	3407	1:28
BEMS	2	34	1147	1:33
BEMS (Extra)	4	54	2117	1:39
Post (BEPS)	28	269	9110	1:33
BEPS	95	306	15075	1:49
Monastery School	8	71	1773	1:24

Source: Hmawbi Townshipl Administration Department,2019

School Enrollment

No. of 5 yrs-old children			Enrollment			Enrollment Rate
Male	Female	Total	Male	Female	Total	
1983	2039	4022	1817	1787	3604	90%

Source: Hmawbi Township Administration Department,2019

Literacy Rate

Population	Above 15 Years of Age	Literate	Literacy Rate
202,914	16.725	16725	100%

Source: Hmawbi Township Administration Department,2019

(f) Economic Characteristics

In Hmawbi Township, labor force participation rate for the population aged 15-64 is 63.8 percent. The labor force participation rate of females is 45.6 percent and is obviously lower than that of their male counterparts which is 82.5 percent. In Hmawbi Township, labor force participation rate for the population aged 10-14 is 9.4 percent. The unemployment rate for those aged 15-64 in Hmawbi Township is 3.6 percent. There is not much difference between the unemployment rate for males (3.6%) and for females (3.5%). The unemployment rate for young females aged 15-24 is 0.8 percent. In Hmawbi Township, 23.8 percent of the employed persons aged 15-64 are skilled agricultural, forestry and fishery workers and is the highest population, followed by 18.4 percent in elementary occupations.

Table – Population Aged 10 and over by Labor Force Participation Rate and Unemployment Rate by gender and age group

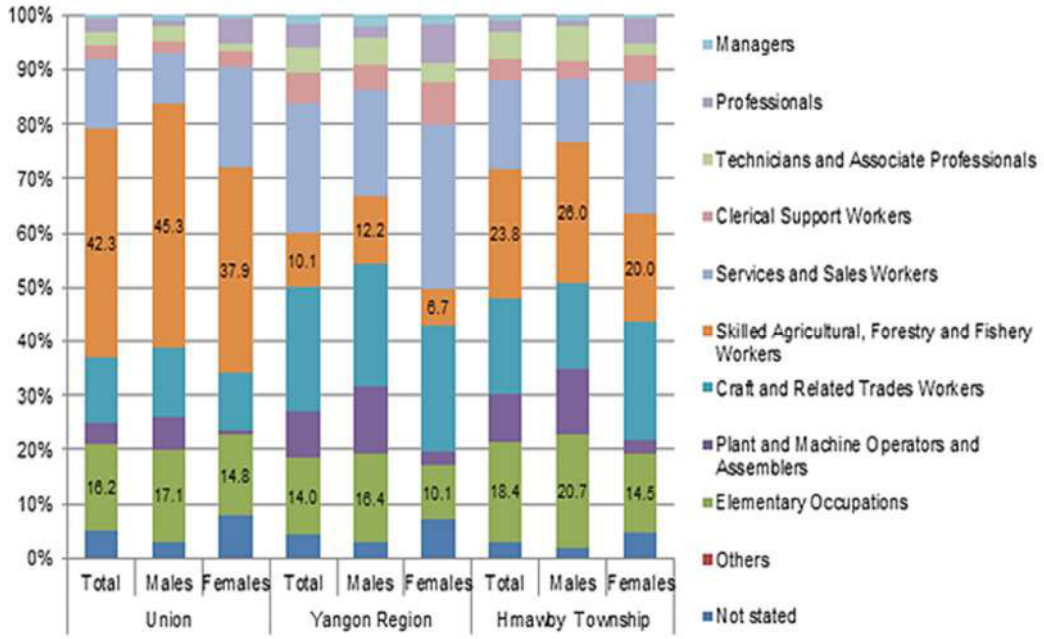
Age Groups	Labor force participation rate			Unemployment rate		
	Total	Males	Females	Total	Males	Females
10-14	9.4	9.5	9.3	11.5	14.2	8.5
15-19	49.4	55.0	43.3	9.8	11.3	7.9
20-24	71.7	86.0	56.8	7.2	6.7	8.0
25-29	72.6	91.8	53.1	3.6	3.6	3.6
30-34	71.1	92.4	49.5	2.6	2.6	2.4
35-39	69.3	91.8	48.0	1.7	2.0	1.3
40-44	67.6	91.2	45.6	1.1	1.4	0.6
45-49	65.5	89.8	43.8	0.9	1.3	0.3
50-54	59.0	84.8	37.0	0.7	0.8	0.5
55-59	52.7	77.3	31.4	0.6	0.7	0.4
60-64	36.1	54.3	19.9	0.7	0.8	0.4
65-69	24.5	37.9	13.5	0.1	0.1	-
70-74	15.7	23.8	9.2	0.4	0.3	0.6
75 +	8.8	14.8	4.7	-	-	-
15-24	60.4	70.2	50.0	8.3	8.5	8.0
15-64	63.8	82.5	45.6	3.6	3.6	3.5

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

Table – Employed persons aged by 15-64 by occupation by gender

Occupation	Employed Persons			Percent (%)		
	Total	Males	Females	Total	Males	Females
Total	95,260	59,467	37,793	100.0	100.0	100.0
Managers	747	541	206	0.8	0.9	0.6
Professions	2190	545	1645	2.3	0.9	4.6
Technicians and Associate Professions	4621	3898	723	4.9	6.6	2.0
Clerical Support Workers	3691	1921	1770	3.9	3.2	4.9
Services and Sales Workers	15615	6947	8668	16.4	11.7	24.2

Skilled Agricultural, Forestry and Fishery Workers	22627	15485	7142	23.8	26.0	20.0
Craft and Related Trades Workers	17100	9295	7805	18.0	15.6	21.8
Plant and Machine Operations and Assemblers	8224	7280	944	8.6	12.2	2.6
Elementary Occupations	17511	12336	5175	18.4	20.7	14.5
Others	-	-	-	-	-	-
Not stated	2934	1219	1715	3.1	2.0	4.8



Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

Figure – Percentage of Employment

(g) Type of Housing Unit

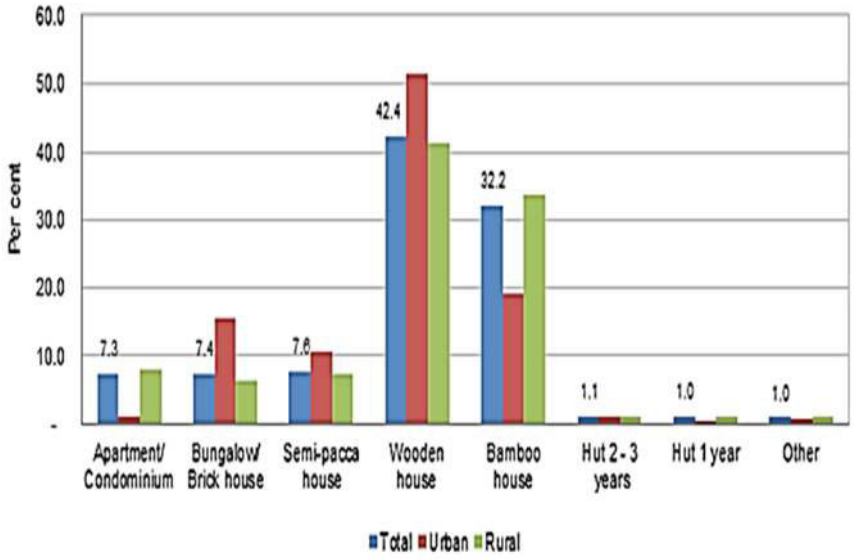
Most of the households in Hmawbi Township are living in wooden houses (42.4%) followed by households in bamboo houses (32.2%). Some 51.5 percent of urban households and 41.3 percent of rural households live in wooden houses.

Table – Conventional Households by type of Housing Unit by Urban/Rural

Residence	Total	Apartment	Brick house	Semi-pacca house	Wooden house	Bamboo house	Hut 2-3 years	Hut 1 year	Other
Total	56,469	7.3	7.4	7.6	42.4	32.2	1.1	1.0	1.0

Urban	5,942	1.1	15.6	10.5	51.5	19.1	1.0	0.4	0.9
Rural	50,527	8.1	6.4	7.2	41.3	33.7	1.1	1.1	1.0

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017



Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

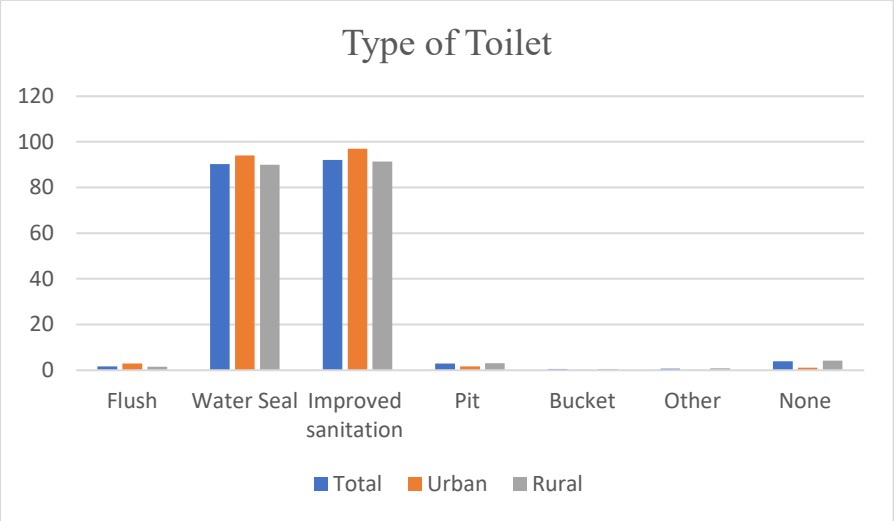
Figure – Types of Housing Units

(h) Type of Toilet

Some 92.0 percent of the households in Hmawbi Township have improved sanitation facilities (flush toilet (1.7%), water seal (90.3%)). Compared to the other townships in Yangon Region, Hmawbi has high proportion of households with improved sanitation facilities. Some 3.9 percent of the households in the township have no toilet facilities.

Type of toilet	Total	Urban	Rural
Flush	1.7	2.9	1.5
Water seal (improved pit latrine)	90.3	94.1	89.9
Improved sanitation	92.0	97.0	91.4
Pit (Traditional pit latrine)	2.9	1.7	3.0
Bucket (Surface latrine)	0.5	0.1	0.6
Other	0.7	0.1	0.8
None	3.9	1.1	4.2
Total (Percent)	100.0	100.0	100.0

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017



Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

Figure – Type of Toilet

(i) Source of Drinking Water

In Hmawbi Township, 89.8 percent of households use improved sources of drinking water (tap water/piped, tube well, borehole, protected well/spring and bottled water/water purifier. Some 10.2 percent of the households use water from tube well, borehole and 11.0 percent use water from protected well/spring. In rural areas, 11.2 percent of the households use water from unimproved sources.

Table: Conventional households by Source of Drinking Water by Urban/Rural

Source of drinking water	Total (%)	Urban (%)	Rural (%)
Tap water/ Piped	5.1	0.3	5.7
Tube well/ Borehole	71.3	94.3	68.6
Protected well/Spring	11.0	1.4	12.1
Bottled water/Water purifier	2.4	2.9	2.4
Total improved drinking water	89.8	98.9	88.8
Unprotected well/Spring	6.7	0.1	7.4
Pool/Pond /Lake	2.3	-	2.5
River/stream/canal	0.4	-	0.4
Waterfall/Rainwater	-	-	-
Other	0.8	1.0	0.9
Total unimproved drinking water	10.2	1.1	11.2

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

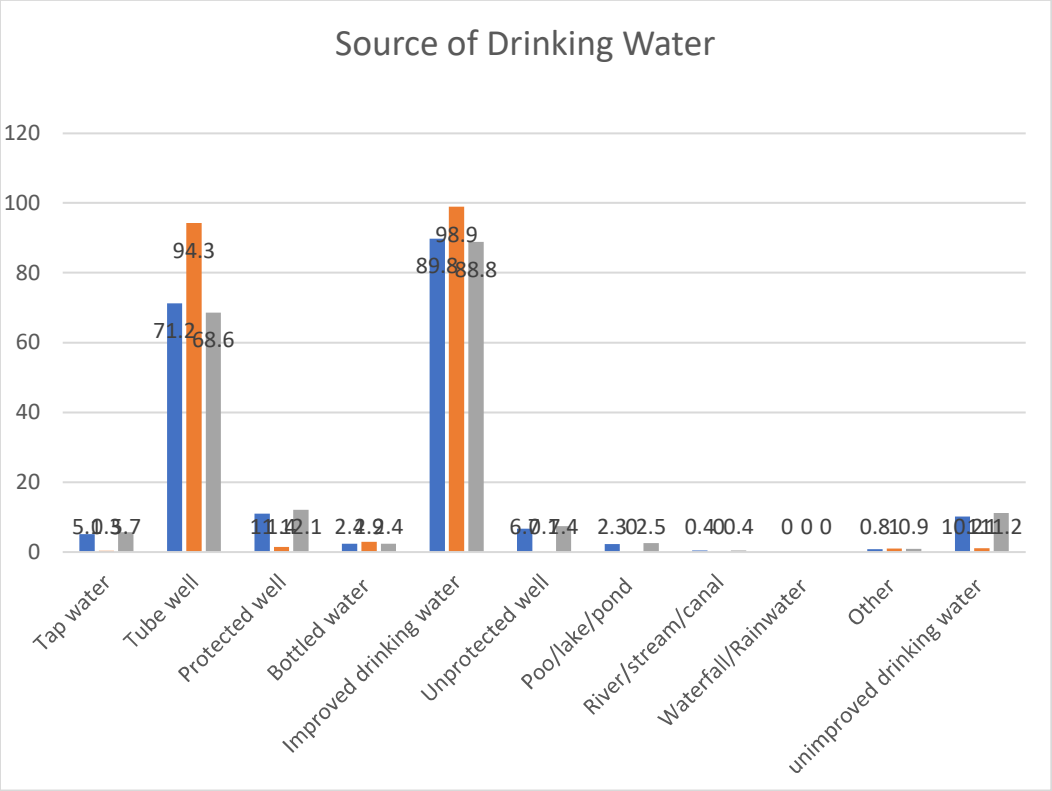


Figure – Source of Drinking Water

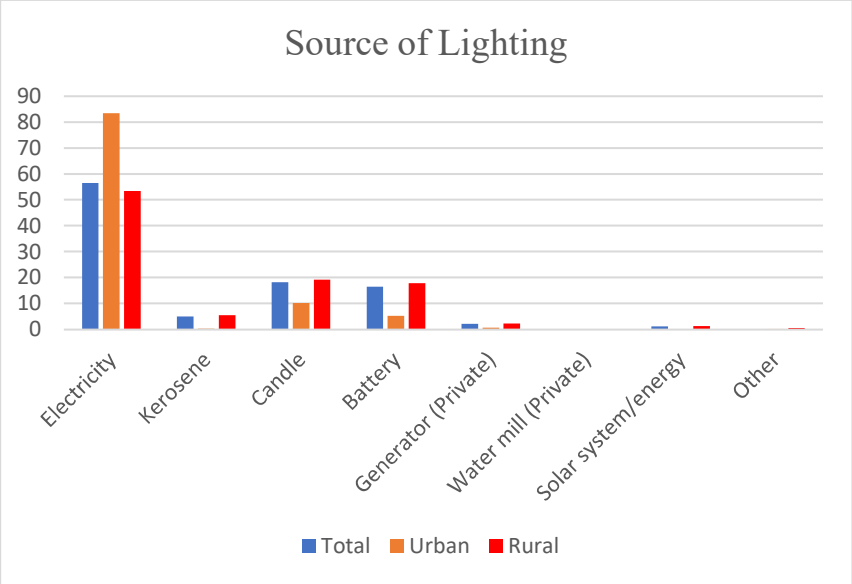
(j) Source of Lighting

In Hmawbi Township, 56.5 percent of the households use electricity for lighting. The proportion is just adequate in electricity usage compared to other townships in Yangon Region. The percentage of households that use electricity in Yangon Region is 69.3 percent. In rural areas, 53.4 percent of the households mainly use electricity for lighting.

Table- Conventional households by source of lighting by urban/rural

Source of Lighting	Total (%)	Urban (%)	Rural (%)
Electricity	56.5	83.4	53.4
Kerosene	5.0	0.3	5.5
Candle	18.2	10.1	19.2
Battery	16.5	5.2	17.8
Generator (Private)	2.1	0.7	2.3
Water mill (Private)	-	-	-
Solar system/energy	1.2	0.1	1.3
Other	0.5	0.2	0.5

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017



Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

Figure – Source of Lighting

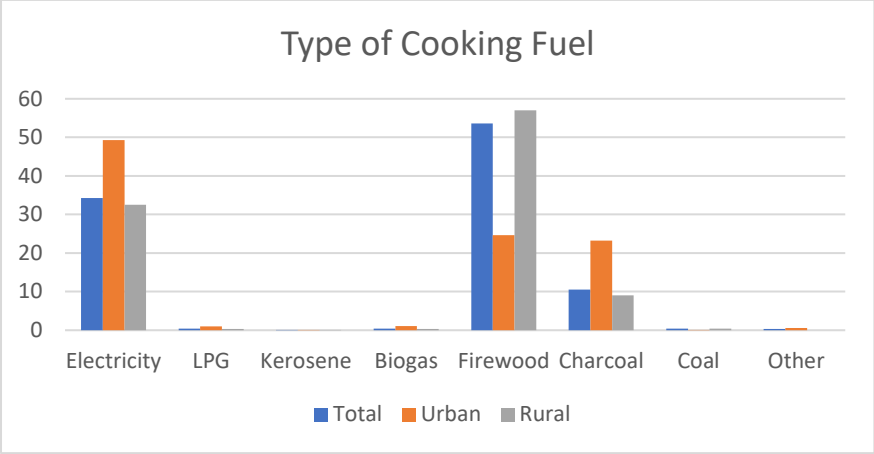
(k) Type of Cooking Fuel

In Hmawbi Township, households mainly use wood-related fuels for cooking with 53.6 percent using firewood and 10.5 percent using charcoal. Only 34.3 percent of households use electricity for cooking. Some 57.0 percent of households in rural areas use firewood and 9.0 percent use charcoal.

Table- Conventional households by type of cooking fuel by urban/rural

Type of cooking fuel	Total (%)	Urban (%)	Rural (%)
Electricity	34.3	49.3	32.5
LPG	0.4	1.0	0.3
Kerosene	0.1	0.1	0.1
Biogas	0.4	1.1	0.3
Firewood	53.6	24.6	57.0
Charcoal	10.5	23.2	9.0
Coal	0.4	0.1	0.4
Other	0.3	0.6	0.3

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017



Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

Figure – Type of Cooking Fuel

(l) Transportation

In Hmawbi Township, 55.4 percent of the households have bicycle means of transport and it is the highest proportion, followed by 29.6 percent of households having motorcycle/moped. Analysis of urban/rural residence, most of the households mainly use bicycle as a means of transport.

Table – Conventional households by transportation items by urban/rural

Township	Car/Truck/Van	Motorcycle/Moped	Bicycle	4-Wheel tractor	Boat	Motorboat	Cart
Hmawbi	2.9%	29.6%	55.4%	1.7%	1.4%	0.7%	6.8%
Urban	6.1%	28%	63%	1%	0.1%	0.3%	2.7%
Rural	2.5%	30%	55%	1.8%	1.6%	0.7%	7.3%

Source: Department of Population, Ministry of Immigration and Population "The 2014 Myanmar Population and Housing Census–Hmawbi Township Report" October 2017

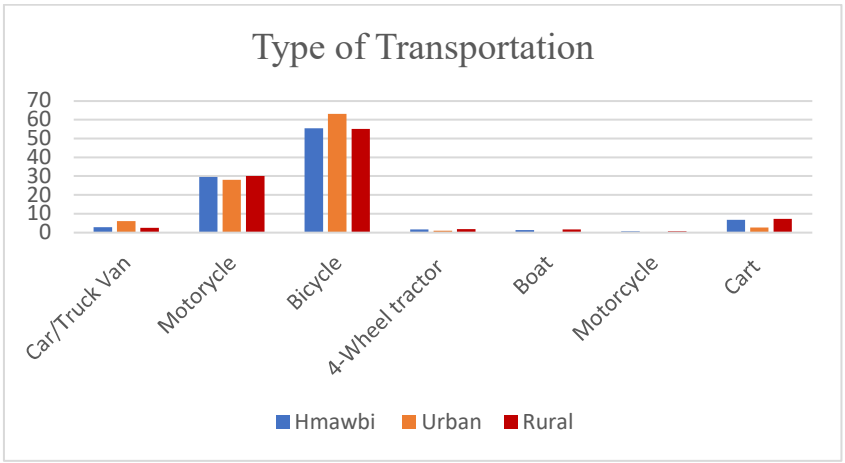


Figure – Type of Transportation

Analysis of Secondary Baseline Data

Baseline Data	Analysis of Baseline Data
Major Ehnic Groups	Burmese and Kayin are the major ethnic groups and Shan, Kayah and Chin are the second major ethnic groups while Rakhine, Kachin and Mon are the small number of people. Most of the people are Buddhism and Hindu is the least.
Age Profile	Most of the population are the age of under 18 in rural areas.
Land Use	In this survey area, agriculture land is the mainly used as land use and the others are forest and natural areas as land use.
Education	The literacy rate in this survey area is 100% and the percentage of students passing the matriculation is 23.8%.
Economic Characteristics	The employment rate for population aged 15-64 is the most while the unemployment rate is the least amount of people in 65-69. Most of the employed people are skilled agricultural, forestry and fishery workers followed by elementary occupations are the second.
Type of Housing Unit	In this study area, most of the households are living in wooden houses followed by households in bamboo houses.
Types of Toilet	Most of the households are mainly used water seal toilet while the small number of households have no toilet facilities.
Source of Drinking Water	Most of the households in the survey area get their drinking water from tube well/borehole while minority use the drinking water from river/stream/canal.
Source of Lightning	Electricity is mainly used for source of lightning and candle is the second maximum used for lightning.
Types of Cooking Fuel	Firewood is the mainly used in most of the households and electricity is the second used as cooking fuel.
Transportation	Most of the households use bicycle as transportation and motorcycle/moped is second maximum used while motorboat is minimum used.

5.7. Public Health Components

Healthcare Services

As described in the following tables, there are two 16-bed district hospitals in the village tract and a 50-bed government hospital in Hmawbi Township. There are also 38 rural healthcare centers and sub- centers. Infrastructures for health care services are also seemed to be insufficient especially for rural people.

Hospitals

Sr. No.	Hospital	Govt./Private	Bed
1.	Hmawbi Township	Govt.	50
2.	Phu gyi district hospital	Govt.	16
3.	War Net Chaung	Govt.	16

Source: Hmawbi Township Administrative Office, 2019

Healthcare Centers

Sr. No.	Type of Healthcare Center	No. of Healthcare Center
1.	Rural Healthcare Center	5
2.	Rural Healthcare Sub-Center	30

Source: Hmawbi Township Administrative Office, 2019

Healthcare Facilities

Population	No. of Doctors	Ratio	No. of Nurses	Ratio	No. of Healthcare Assistant	Ratio
202904	12	1:16908	27	1:7514	6	1:33817

Source: Hmawbi Township Administrative Office, 2019

Common Diseases

According to secondary data available, the most common diseases include Diarrhea, Hepatitis, malaria, stomach ailment, and tuberculosis. It was also found out that there was substantial amount of incidence of Diarrhea, and stomach ailment in the township.

Sr. No.	Disease	Incidence
1.	Malaria	4
2.	Diarrhea	1111
3.	TB	361
4.	Stomach Ailment	100
5.	Hepatitis	-

Source: Hmawbi Township Administrative Office, 2019

HIV/AIDS

2017-2018		2018-19	
Infected	Dead	Infected	Dead
13	-	128	3

Source: Hmawbi Township Administrative Office, 2019

Health Indices

No. of Maternal	No. of Infant	Per 1000			
		Birth Rate	Maternal Mortality Rate	Infant Mortality Rate	Abortion Rate
4346	4097	17	1.0	4.0	5.2

Source: Hmawbi Township Administrative Office, 2019

In public health sector, the ratios of medical service personnel and local population indicate the existing conditions of the insufficient health care facilities, especially for rural people. As described in the above tables, the health care facilities of Hmawbi Region are in good conditions.

5.8. Cultural Heritage Associating with the Project Area

In this proposed project area, cultural heritage sites and resources are identified according to the 2012 Rule & 1998 Protection and Preservation of Cultural Regions Law, 2015 Protection and Preservation of Antique Objects Law and Ancient Monuments Law. As a result, Zina Man Aung Pagoda and Koe Htaung Pyae Pagoda are discovered in the proposed project area within 3km radius.

Heritage Resource Type	Observation
Places, Buildings, Structures, and equipment	Zina Man Aung Pagoda, Koe Htaung Pyae Pagoda, Kan Ka Lay Monastery, Kan Ka Lay Baptist Church, Chan Aye Yeik Thar Monastery, Dhamma Bar Na Ka Monastery, Shwe Innwa Monastery, Ywar Oo Monastery, Migadawon Taw Ya Monastery, Yar Pyae Buddhist Temple, Hman Kyaung Dhamma Yeiktha Monastery, Htan Taw Monastery (Myaungtagar), Yay Lal Monastery, Mya Thein Nar Monastery
Places associated with oral traditions or living heritage	None were identified within the proposed project area
Landscapes	None were identified within the proposed project area
Natural features	None were identified within the proposed project area
Traditional burial places	None were identified within the proposed project area
Geological sites of scientific or cultural importance	None were identified within the proposed project area
Archaeological Sites	None were identified within the proposed project area
Historical settlements and townscapes	None were identified within the proposed project area
Public monuments and memorials	None were identified within the proposed project area
Battlefields	None were identified within the proposed project area

The popular cultural site which is a little far from the project is Aung Zabu Tawya Dhamma Center, which is commonly known as Japan Paya. It is located in Hmawbi Township, Yangon Region, Myanmar, which is 22.6 kilometer north from the project. The monastery is known for a collection of 301 historic Buddha images from the Pagan, Pinnya, Innwa, Taungoo, Nyaungyan, Tagaung and Konbaung eras. The images were donated by a Japanese national named Kumano in 2012. Further assessments for this noble cultural site cannot in any way be done at the moment.

6.0. IMPACT AND RISK ASSESSMENT AND MITIGATION MEASURES

An impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts therefore may be positive (beneficial) or negative (adverse). They may also be direct or indirect, long-term or short-term, and extensive or local in effect. Both positive and adverse environmental impacts could arise during the site preparation, construction and the operations phases.

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities. Anticipated environmental impacts for the proposed resort project will be conducted into the entire life of the project. To cover the entire life of the project, it is necessary to conduct impact assessment for four major phases as follow:

(a) Phase I: Pre-construction Phase (during the pre-construction period),
(b) Phase II: Construction Phase (during the construction period),
(c) Phase III: Operation Phase (during the operation period), and
(d) Phase IV: Decommissioning Phase (after the operation period).

This (EIA) Study aims to identify the potential positive and negative impacts (both biophysical and social) associated with the proposed project. The potential impacts have been identified through baseline investigations and below are summaries per phase.

6.1. Impact and Risk Assessment Methodology

6.1.1. Impact Assessment Methodology

(a) Impact Identification

Impacts were identified during the screening process and combined with environmental baseline study and site survey to make clear.

(b) Impact Evaluation

Professional judgment should ideally be used in conjunction with the different value judgments expressed by various stakeholders. The choice of significance criteria needs to be aligned with a country's political culture and socio-economic framework. The three broad forms of recognition or determination of impact significance are summarized in Table below.

Table 6.1. Determination of Impact Significance

Forms of Recognition	Criteria
Technical recognition	The importance of an environmental resource or attribute is based on scientific or technical knowledge or judgment of critical resource characteristics.

Public recognition	Segments of the public recognize the importance of an environmental resource or attribute. Public recognition may take the form of support, conflict or opposition. Public action may be expressed formally (e.g. letters) or informally (e.g. protest action).
Institutional recognition	The importance of an environmental attribute or resource is acknowledged in the laws, plans or policy statements of government agencies or private groups.

Source: Canter (1996)

The significances of the impacts were determined by using an index matrix that is based on four criteria of magnitude (M), Duration (D), Extend (E) (area) and Probability (P). According to the association of impact assessment – IAIA guidelines, the following terms are used to determine the effects and degrees of the impact.

Significant Point = (Magnitude+Duration+Extend) ×Probability

Significant Point (SP)	Impact Significance
< 15	Very Low (or) No impact (-)
15-29	Low impact (U)
30-44	Moderate significant (C)
45-59	High significant (B)
> 60	Very high significant (A)

Magnitude

- If the impact is only insignificant, the index value is 1.
- If the impact is small and will have no effect, the index value is 2.
- If the impact is moderate and will result in minor changes, the index value is 3.
- If the impact is high and will result in significant changes, the index value is 4.
- If the impact is very high and will result in permanent changes, the index value is 5.

Duration

- If the impact is between 0-1 year in limited time of the project duration, index value is 1.
- If the impact is between 2-5 year in limited time of the project duration, index value is 2.
- If the impact is between 6-15 year in limited time of the project duration, index value is 3.
- If the impact is the life of operation in the project duration, index value is 4.
- If the impact is over the project duration, index value is 5.

Extend (Area)

- If the impact occurs within the site, the index value is 1.
- If the impact occurs nearby limited area, the index value is 2.
- If the impact is limited to the local area, the index value is 3.
- If the impact is limited to the national stage, the index value is 4.
- If the impact is limited to the international stage, the index value is 5.

Probability

- If the impact is not going to happen, the index value is 1.
- If the impact is improbable, the index value is 2.
- If the impact is probable, the index value is 3.
- If the impact is highly probable, the index value is 4.
- If the impact is definite, the index value is 5.

The significance of identified physical, biological and social impacts was assessed using an acceptable method and was informed by the stakeholder comments together with the specialists' findings.

Classification of Impact Levels for Biodiversity

Impacts might be happened by the project activity were classified into four categories: Small, Moderate, Large and Very large followed by the Bureau of Land Management by the US (2016).

Table 6.2. Classification of Impact Levels and Caused Event on Biodiversity

	Impact level	Caused events
1	Low (L)	This is an impact that is limited to the immediate project area, affects a relatively small proportion of the local population (less than 10%), and does not result in a measurable change in carrying capacity or population size in the affected area.
2	Moderate (M)	This is an impact that extends beyond the immediate project area, affects an intermediate proportion of the local population (10 to 30%), and results in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area.
3	High (H)	This is an impact that extends beyond the immediate project area, could affect more than 30% of a local population, and could result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area.
4	Very High (VH)	This is an impact that extends beyond the immediate project area, could affect more than 50% of a local population, and could result in a very large, measurable, and destabilizing change in carrying capacity or population size in the affected area.

(c) Criterion for Impact Mitigations (Hierarchy for Mitigation Measures)

Practicable mitigation and management measures were recommended in accordance with the IFC's management hierarchy. Management measures sought to avoid, and if avoidance is not possible, then reduce, restore, compensate/offset negative impacts, enhance positive impacts and assist project design. Requirement of mitigation measures will be considered by the intensity of impact significance as follow:

Table 6.3. Mitigation Requirement for Impact Significance

No.	Impact Significance	Mitigation Requirement
1	Very Low (Negligible)	Minor or no mitigation required
2	Low	Required minor mitigations
3	Low to Moderate	Require more or less additional mitigations
4	Moderate	Require a number of additional mitigations
5	Moderate to High	Require a number of additional mitigation or modification of the project design
6	High	Require additional mitigations plus modification of the project design or alternative action may be required

Prediction Confidence

Although not explicitly included in the criteria tables, there is uncertainty associated with the information and methods used in an ESIA because of its predictive nature. The certainty with which an impact analysis can be completed depends on a number of factors including:

- Understanding of natural/ecological and socio-economic processes at work now and in the future; and
- Understanding of present and future properties of the affected resource.

The level of prediction confidence for an impact analysis will be discussed when there are questions about the factors reviewed above. Where the level of prediction confidence makes a prediction of the impact problematic, a subjective assessment is made based on the available information, the applicability of information on surrogates and on professional opinion.

The level of prediction confidence is sufficiently low in some cases that an estimate of Environmental consequence cannot be made with a sufficient degree of confidence. Undetermined ratings are accompanied by recommendations for research or monitoring to provide more data in the future.

Development of Mitigation Measures

A common approach to describing mitigation measures for critical impacts is to specify a range of targets, a predetermined acceptable range and an associated monitoring and evaluation plan. To ensure successful implementation, mitigation measures will be unambiguous statements of actions and requirements that are practical to execute. The following summarize the different approaches that may be used in prescribing and designing mitigation measures:

- Avoidance: e.g. mitigation by not carrying out the proposed action on the specific site, but rather on a more suitable site;
- Minimization: mitigation by scaling down the magnitude of a development, reorienting the layout of the project or employing technology to limit the undesirable Environmental impact;
- Rectification: mitigation through the restoration of Environments affected by the action;
- Reduction: mitigation by taking maintenance steps during the course of the action; and Compensation: mitigation through the creation, enhancement or acquisition of similar Environments to those affected by the action.

6.1.2. Social Impact Assessment (SIA) Methodology

The first phase of the Social Impact Assessment (SIA) will provide a baseline description of the study area, specifically focusing on the communities living and working in close proximity to the proposed development. The potential impacts of the proposed development on the social environment will be identified and assessed in terms of an agreed assessment methodology in the EIA phase. Mitigation measures will be proposed to enhance the positive impacts and reduce the significance of the negative impacts. SIA study area was considered after the discussions with key informers project managers from Da Hua (Myanmar) and the heads of Village General Administrative Offices of nearest villages that the nearby villages from the proposed project. Google Map and census are also used for the determination of SIA study area during pilot survey. To assess the baseline socio-economic conditions that may result from the development of the proposed project, the SIA team employed both quantitative and qualitative approaches as follow:

Socioeconomic impact assessment for proposed project was conducted by the following procedures.

Figure 6.1. Main Steps in SIA Study

Step I: Household Survey and Focus Group Discussion

The collection of primary data will consist of focus group discussions and household surveys in the target study areas. Household sample survey will conduct to evaluate primary socio-economic conditions of the project area and to understand the mood, perceptions and extent of preparedness of the people towards the proposed project. The household survey will carry out to tap the baseline socio-economic conditions of project area and to assess project perceptions and attitudes of the local people. To get the accurate data, primary data collection will conduct by social specialist, social consultants, local authorities and local people.

(a) Survey Team

The team was formed with researchers from social, medical, and engineering sciences having research experiences in the field of social impact assessment and social management planning.

(b) Development of Survey Questionnaire

Socioeconomic aspects to be included in questionnaire will base on site visits and issues identified by interviews with local people and village heads during pilot survey. Items will formulate by the consultants and reviewed by social assessment team members as to clarity of item wordings and relevance to the socioeconomic domains measured. The survey questionnaire will be designed to collect information as to the following household characteristics:

- household composition (age, gender, educational status, religion, ethnicity, language used and marital status);
- occupations;
- ownership of agricultural fields and livestock;
- energy sources and facilities;
- agricultural and other economic activities;
- daily movement patterns;
- income and expenditure patterns;
- access to and use of community services/facilities and natural resources;
- health and nutrition; and
- views/concerns/suggestions on the proposed project.

(c) Recruitment and Training

The enumerators will receive a training program prior to commencing with the fieldwork. The training program will include a briefing on the objectives of the survey, socioeconomic aspects to be measured, interview techniques as well as a detailed explanation of each question and its relevance to the survey objectives, how to pose the question and how to code the answer. Discussions will also hold among participants about the socioeconomic conditions and initial questionnaire items will revise based on the discussion results. A set of guidelines will give to each enumerator for administration of survey questionnaire. In the field data collection activities, the enumerators will supervise by experienced supervisors with household survey.

(d) Data Collections

The project related data, factory layout plans and design parameter are provided by Da Hua Myanmar Co., Ltd. Secondary data on demographic distribution in the area are sourced from General Administrative Department (Hmawbi) and data on public health are sourced from Public Health Department (Hmawbi). Primary data for public concerns, socio-economic and health profiles will be conducted by household survey.

(e) Data Analysis

In household survey data collection period, field supervisors will check and ensure the control of data quality. During field surveys, information obtained through household survey and interviews will corroborate through direct observation by the study team aiming at

assessing social and cultural infrastructure existed in the project area, physical assets of people, and living conditions. Observations will back up by photographic records. Quantitative data will be coded and processed using SPSS statistical package. Qualitative data will be coded using standard methods.

6.1.3. Health Impact Assessment Methodology

There is no universally agreed formula for assessing public health significance, although assessments are mostly based on a subjective judgment about the magnitude of the potential health impacts (size of the affected population and scale of the positive or negative health impact); its likelihood of occurrence; and the degree of confidence in the impact actually occurring (based on scientific and other evidence of the health impact occurring in similar circumstances elsewhere). The following table shows a Health Impact Significance Rating Methodology of Ever Green Tech EIA Team.

Table 6.4 - Health Impact Significance Rating Methodology

	Likelihood of Occurrence of Health Impact			**Health Impact Rating**
	Low	Medium	High	
Magnitude of Health Impact	Unlikely to occur	Likely to occur sometimes	Likely to occur often	
None	No significance	No significance	No significance	0
Low	Very Low	Low	Medium	1
Medium	Low	Medium	High	2
High	Medium	High	Very High	3

When analyzing health impacts, it is important to consider the magnitude, likelihood and public health significance of the potential impacts. This analysis will involve expert judgment based on a consideration of the evidence gathered and its applicability to the local context and the specific project.

Distributional, health equity and inequality impacts will be analyzed by examining how particular sub-groups within a population, particularly vulnerable groups, are likely to be affected by the project. The scoping and community profiling steps are likely to have already identified potentially vulnerable groups through existing local information on these individuals/groups or through community surveys and meetings with key informants e.g. community leader, community health worker or local NGO.

Health equity/inequality impacts occur when the projects benefits and harms are unevenly distributed. This includes where the risk is equally distributed, such as air pollution, but the impact is disproportionate – affecting particularly children, older people and those with existing ill health.

Analysis of health impacts will involve systematically determining the range of potential impacts, their relative importance and where, when and how likely they are to occur. The information for the HIA will be obtained from the primary data collection (household survey), literature review, community profile and Health Data from Pubic Health Department as well as knowledge and expertise of the HIA Consultant.

6.2. Anticipated Environmental Impacts and Mitigation Measures during Pre-Construction Phase

The project started in 2018 January along with its company registration and land lease plan. In February, preparation for the project such as minor site clearing activities will be carried out which includes trees cutting and ground leveling. All the anticipated impacts will be covered and assessed for processes of both factory 1 and 2 during its pre-construction stage. The proposed project is about 4 acres for old factory and 8.8 acres for the new factory. As the proposed project is located in Myaung Tagar Industrial Zone, it is not necessary to do a large quantity of site clearing and ground leveling because the industrial zone has already been cleared by human activities before the construction of the proposed project. Therefore, the environmental impacts during pre-construction phase will not be significant due to the requirement of low number of workforce and heavy machinery for minor site clearing and ground leveling activities.

The pre-construction phase will take approximately 2 months and all of the impacts during this phase are all short-term, temporary and will not be significant. The following are the anticipated impacts during this phase:

1) Impacts on Air Environment
2) Impacts on Water Environment
3) Impacts on Soil and Ground Water Environment
4) Impacts on Biodiversity Environment; and
5) Impacts on Socio-economic Environment

6.2.1. Anticipated Environmental Impacts and Mitigation Measures on Air Environment during Pre-Construction Phase

The majority of the impacts on air quality during pre-construction phase will be fugitive dust generation, gaseous emission and noises due to the site clearing and earth working activities.

(a) Fugitive Dust Generation

During pre-construction phase, the main source of air pollution will be dust generation (PM) due to the movement of dozers and trucks for site clearing activities. Since the period of the pre-construction phase is only about 2 months, the impact will not be significant and the people experiencing the dust will only be the workers within the site, residents living nearby the project, and the pedestrian passing near the project.

(b) Vehicular Emission

Site clearing and earth working vehicles and delivery vehicles used in site produced gaseous emissions such as CO_2, CO, NO_x and SO_2 during the operation of vehicles and machineries. The number of vehicles and machines used for site clearing will be low so the impact of gaseous emission on air quality will not very be significant due to the proposed project but since the project is located in the industrial zone, there will still be gaseous emission from other factories.

(c) Noises

The vehicles used within the site for site clearing activities; emit noises so the workers within the site, residents nearby the project area, and pedestrian passing by the project may experience the noises. The period of this phase is only about 2 months so the impact due to this project will not be that significant but since the project is located in the industrial zone, there will still be noises from other factories.

Significant of Impacts on Air Environment before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Fugitive dust generation	Site clearing and ground leveling	2	1	2	4	20	Low Impact (U)
Vehicle Emission		2	1	3	4	24	Low Impact (U)
Noise		3	1	2	4	24	Low Impact (U)

Consideration of Mitigation Requirement for Air Environment

The intensity of mitigation required for air environment according to the consideration of impact evaluation and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation required considered by EIA team	Intensity of Mitigation Required	Responsibility
1.	Fugitive Dust Generation	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)
2.	Vehicle Emission	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)
3.	Noise	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)

Mitigation Measures for Air Environment

(a) Fugitive Dust Generation

Due to the minor mitigation requirement, dust will be countered by sprinkling of water during pre-construction phase. It is also the most cost-effective dust suppressant. Water that may have pressure on water available of local people especially for seasonal streams or natural springs will not be used. Water will be sprayed by using handheld spray within the site. Before leaving the construction site, wheels will be cleaned with water and vehicles delivering materials will also be covered to reduce spills and dust blowing off the load.

(b) Vehicular Emission

Due to the minor mitigation requirement on vehicular emission, there will be a plan to reduce in loading and unloading time and plan to reduce in idle time during working hours. Vehicles used during pre-construction phase will avoid local traffic time which will also reduce vehicular emission. Moreover, pre-construction services provider(s) will be used good engines conditions for every machinery used and low sulphur content fuel (good quality fuel) to reduce gaseous emission.

(c) Noises

Working at night will be limited and even if it is necessary to run the machineries at night, it will still be avoided to do the operation of the machines. Vehicles with good engines will be used and maintenance for those machineries will be carried out regularly. Phase-wise construction will be implemented to avoid running all the noisy equipment at the same time.

Significant of Impacts on Air Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Fugitive dust generation	Site clearing and ground leveling	2	1	1	2	8	Very Low Impact (-)
Vehicle Emission		2	1	3	3	18	Low Impact (U)
Noise		3	1	2	2	12	Very Low Impact (-)

Residual Impact

There will be no residual impact left on air environment during the implementation of pre-construction phase.

6.2.2. Anticipated Impacts and Mitigation Measures on Surface Water Environment during Pre-Construction Phase

During pre-construction phase, impacts on water environment will be surface water pollution in nearest water body due to soil erosion and sedimentation caused by earth working activities. Soil erosion will occur by exposure of soil surfaces to rainwater and wind during site clearing and earth working activities. Unsuitable soil materials from site clearing and domestic wastes from pre-construction workers can also cause water pollution if the wastes are disposed improperly. In addition, handling of fuel oil and lubricants may constitute a risk for pollution of surface. The nearest surface water body is Hlaing River which is 1.88 km far from both factories and since the period of the pre-construction phase is only 2 months, the impact on surface water will be very low and not be significant.

Significant of Impacts on Surface Water Environment before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Liquid Wastes	Earth working activities and domestic wastes from workers	3	1	3	3	21	Low Impact (U)
Solid Wastes		3	1	2	3	18	Low Impact (U)

Consideration of Mitigation Requirement for Surface Water Environment

The intensity of mitigation required for air environment according to the consideration of impact evaluation and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation required considered by EIA team	Intensity of Mitigation Required	Responsibility
1.	Liquid Wastes	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)
2.	Solid Wastes	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)

Mitigation Measures for Impacts on Surface Water Environment

The following mitigation measures are suggested to protect the surface water quality during the pre-construction phases of the proposed project.

No	Construction Activities	Mitigation Measures
1.	Earth Working	- Avoid earth working and excavation during monsoon season.
2.	Stacking and Loading Areas	- All stacking and loading areas should be provided with proper drains to prevent run off from the site to enter any water body.
3.	Wastewater from the Site	- Wastewater channels from the site should be connected to septic tank during pre-construction to prevent wastewater from entering the nearest water bodies.
4.	Leakage of Oil and Lubricants	- Avoid any leakage of oil and lubricant from vehicles and machineries used in pre-construction phase

Moreover, the following prevention measures will be conducted to reduce soil erosion and water pollution.

(a) Limit unnecessary earthworks;
(b) Prevent over-excavation;
(c) Working in a small area at a point of time (phase wise construction);
(d) Temporary sedimentation pond on the waterway to Hlaing River at site; and
(e) Vegetation of bare areas after the pre-construction state.

Significant of Impacts on Surface Water Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Liquid Wastes	Earth working activities and domestic wastes from workers	3	1	3	2	14	Very Low Impact (-)
Solid Wastes		3	1	2	2	15	Low Impact (U)

Residual Impact

There will be no residual impact left on surface water environment due to earth working activities and wastes from workers.

6.2.3. Anticipated Impacts on Biodiversity Environment during Pre-construction Phase

Anticipated Impacts on biodiversity environment during pre-construction phase will be as follows:

(a) Impacts on Flora Diversity

There are not too much tree cutting inside the project site because the project site is already cleared by human activities for industrial zone. So, pre-construction phase of proposed project will have no or very little impact on flora diversity as all of the trees inside the project site are not considered as endangered flora species according to the impact assessment on flora diversity.

(b) Impacts on Fauna Diversity

Cutting down of some trees at the project site can affect the habitats of birds, butterflies, and reptiles. Increase in noise during pre-construction phase may affect the feeding, breeding and movement of wildlife in near area.

Significant of Impacts on Biodiversity Environment

According to the impact assessment for biodiversity environment, there is no endangered species for flora and fauna diversities so, impacts on biodiversity environment during pre-construction phase will be very low or negligible as follows:

(a) Impact Significance on Flora Diversity

As the project area lies within the industrial zone and the area had been already cleared for industrial zone purpose. For this reason, there is no natural vegetation in the direct impact zone. Only the cultivated species were collected in this zone. No endangered species from IUCN red list were identified in the direct impact zone.

(b) Impact Significance on Fauna Diversity

According to the impact assessment on fauna diversity, there will have no significant impacts as there is no endangered species determined on the project site. Noise from pre-construction activities may have impact on fauna diversity in the direct impact zone.

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Impacts on Flora Diversity	Pre-construction activities	2	5	1	3	24	Low Impact (U)
Impacts on Fauna Diversity		2	4	2	3	24	Low Impact (U)

Consideration of Mitigation Requirement for Biodiversity Environment

The requirement of mitigation measures for biodiversity environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern during Public Consultation	Mitigation Requirement by Impact Evaluation	Intensity of Mitigation	Responsibility
1.	Impacts on Flora Diversity	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)
2.	Impacts on Fauna Diversity	Low Impact (U)	No	Yes	Minor	Pre-construction service provider(s)

Mitigation Measures for Impacts on Biodiversity Environment

According to the consideration of intensity of mitigation measures (minor scale) and the nature of industrial zone (noisy environment), it is just necessary to avoid tree cutting as much as possible especially along the road side and also avoid working at night.

Significant of Impacts on Biodiversity Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Impacts on Flora Diversity	Pre-construction activities	2	5	1	2	16	Low Impact (U)
Impacts on Fauna Diversity		2	4	2	2	16	Low Impact (U)

Residual Impact

There will be no residual impact left on biodiversity environment as none of the endangered species were identified nearby the project area and replantation will also be carried out during the whole implementation of the project.

6.2.4. Impacts on Socio-economic Environment during Pre-construction Phase

The potential positive socio- impacts during pre-construction is job creation and the proposed project will provide temporary employment opportunities for local people during the pre-construction period (about 2 months). On the other hand, the potential negative socio impact during pre-construction phase is visual impact as the construction works can affect to public anxiety.

Significant of Impacts on Job Creation without Enhancement Measures

As the proposed project is located near Kan Ka Lay, Kalar Kone, Myaung Tagar villages and within the industrial zone, there are many locals who are in need of jobs. Most of the residents within the industrial zone are mostly migrant workers who fled during the Nargis cyclone. Therefore, most of the pre-construction workers will be migrant workers (not from nearest villages) and so job creation during pre-construction phase can be considered as very low due to the small number of workforce (about 10 people).

Anticipated Impact	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Jobs opportunities in pre-construction site	Positive (+)	3	1	2	2	12	No Impact (-)

Enhancement Measures for Job Creation

Dahua Myanmar Co., Ltd. should encourage pre-construction contractor and sub-contractor to use local labor force as part of tender requirement.

Impact Significance of Job Creation after Enhancement Measures

If the developer follows the proposed enhancement measures for job opportunities, the impact will become very low to low after enhancement actions as follow:

Anticipated Impact	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Jobs opportunities in pre-construction site	Positive (+)	3	1	2	3	18	Low Impact (U)

Significant of Visual Impact without Mitigation Measures

Due to the activities of pre-construction works, negative visual impacts can have adverse social and economic effects.

Anticipated Impact	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Negative Visual Impact	Pre-construction work activities	Negative (-)	3	1	2	4	24	Low Impact (U)

Mitigation Measures for Visual Impact

Dahua Myanmar Co., Ltd. will clean the site every day and implement suitable waste management system. Plantation within the site will also be carried out and rehabilitated with native plant species. Some construction activities will also be covered with suitable coverings.

Impact Significance of Visual Impact after Mitigation Measures

If the developer follows the proposed mitigation measures for visual impact, the impact will become lower after mitigation measures as follow:

Anticipated Impact	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Negative Visual Impact	Pre-construction work activities	Negative (-)	3	1	2	3	18	Low Impact (U)

Residual Impact

There will be no residual impact left on human environment during pre-construction phase.

6.3. Anticipated Impacts and Mitigation Measures during Construction Phase

The construction period is expected to be about one year and all the anticipated impacts that are likely to occur during the construction stage of both factory 1 and 2 will be covered and assessed. Construction of proposed project will include (1) foundation works for concrete and steel structure and (2) erection of steel structures and minor earth works for internal drainage system. Therefore, the major activities during construction phase will include:

(a) Vehicular movement,
(b) Loading and unloading construction materials,
(c) On site storage of construction materials,
(d) Erection of boiler,

(e) Connection of power supply system,
(f) Maintenance of construction machinery, and
(g) Disposal of solid wastes from both construction site and workers etc.

According to the above activities, construction of proposed project can potentially affect the natural environment and local communities. Moreover, construction activities will disturb to wildlife.

The following construction operations and considerations, which could have a particularly significant impact, have been included in the assessment of disruption due to construction:

(a) The scale of earth movements;
(b) The storage and treatment of surplus material before removal;
(c) The likelihood of night-time working;
(d) Number, type and routes of vehicle movements;
(e) Storage and re-use of materials;
(f) Duration and nature of construction activities;
(g) Advance works by utilities if required;
(h) Materials logistics such as origin of materials and routes to site;
(i) Quantities of materials required and an estimate on quantities to be discarded;
(j) Identification of wastes that will be generated including sources; and
(k) The likelihood of contaminants being encountered.

Construction impacts (especially in noise, fugitive dust emission and traffic) are not likely to affect people in places of nearest residents. However, these impacts will affect on people in workplace and nearest factories inside the industrial zone. Some anticipated impacts related to construction of the proposed project will be as follow:

(a) Impacts on Air Environment;
(b) Impacts on Water Environment;
(c) Impacts on Soil and Ground Water Environment;
(d) Impacts on Biodiversity Environment; and
(e) Impacts on Socio-economic Environment.

6.3.1. Impact on Air Environment during Construction Phase

Impacts on air quality during construction phase will be as follow:

(a) Fugitive Dust Generation

The fugitive dust emissions (very fine particulates) will be emitted from transportation of construction materials and also construction activities within the site. These activities will affect some neighborhoods (especially for local residents beside the public road to the project site and nearby project site) though construction is not a long term. Since the main roads within the industrial zone are mostly asphalt and concrete, it may not be dusty in some parts.

(b) Gaseous Emissions

The gases emissions (CO_2, CO, and SO_2) will be emitted from the operation of vehicles and machinery into the atmosphere during the construction phase (including both on-site and the public roads).

(c) Increased in Noise Level

For the proposed project, the major noise generating sources during the construction phase will be from movement of trucks, operation of concrete mixer, welding and generator. If most of the construction machineries (concrete mixer, generator, truck etc.) are running at the same time, this cumulative noise level can increase.

Significant of Impacts on Air Environment before Mitigation Measures

Impacts on air environment during construction phase will not be significant because the duration of the proposed project will be about 1 year. Trucks for transportation of construction materials, concrete mixer, welding machines and generator for construction and no heavy machinery (pilling machine, crane, backhoe etc.) will be used. Most of the brickwork and steel structure work will be carried out by human activities.

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Fugitive dust emission	Construction activities	3	1	2	4	24	Low Impact (U)
Vehicular emission	Construction activities	3	1	2	4	24	Low Impact (U)
Noise	Noise from construction equipment	2	1	2	4	20	Low Impact (U)

Consideration of Mitigation Measures Requirement for Air Environment

The requirement of mitigation measures for air environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Receptor	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by Impact Evaluation	Mitigation Scale	Responsibility
1.	Dust generation	Workers at site	Low Impact (U)	No	Yes	Minor	Construction service provider(s)
2.	Gaseous emissions	Local communities	Low Impact (U)	No	Yes	Minor	Construction service provider(s)
3.	Noise	Workers at site	Low Impact (U)	No	Yes	Minor	Construction service providers

Mitigation Measures for Air Environment during Construction Phase

Dahua Myanmar Co., Ltd. will do the following mitigation measures of air environment during construction phase.

(a) Mitigation Measures for Dust Generation

Dust will be controlled by sprinkling of water at site and also nearby areas around the site during construction phase. Moreover, wheels of the vehicles which travel outside of the project site (along the public road) will be sprayed with water in order to reduce the rate of dust generation. Vehicles carrying construction materials will also be covered properly to avoid spills and dust blowing off the load.

(b) Minimizing of Gaseous Emissions

Certain mitigation measures will be adopted to limit atmospheric impacts to great extent as possible during construction phase.

Reduction of Loading and Unloading Time: For instance, the transportation of personnel and materials will be scheduled such as to avoid periods of peak flow where congested conditions are more likely, and to reduce the overall number of vehicular movements. Overall, it will reduce the duration of traffic interference and therefore, reduce emissions from traffic delay. In addition to proper traffic management, close adherence to the recommended maintenance regime will be applied to both on-site and off-site vehicles.

Reduction of SO_2 and CO Emissions: Good engine condition vehicles will be used.

Improved Maintenance: Significant emission reduction will achieve through regular equipment maintenance.

(c) Mitigation Measures for Noise

For reduction of noises, minor mitigation measures can be carried out by avoiding the following activities:

- Running construction machineries at the same time; and
- Working at night.
- Regular maintenance of machineries

Significant of Impacts on Air Environment after mitigation measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Fugitive dust emission	Construction activities	2	1	2	3	15	Low Impact (U)
Vehicular emission	Construction activities	3	1	2	3	18	Low Impact (U)
Noise	Noise from construction equipment	2	1	2	3	15	Low Impact (U)

Residual Impact

There will be no residual impact left on air environment during construction phase as the overall impacts related to air pollution are low due to its short duration and also can be controlled well if the above mitigations are carried out properly.

6.3.2. Impacts on Surface Water Environment during Construction Phase

Potential construction-induced impacts to surface water quality will be resulting from excavation and grading activities necessary for the construction of infrastructure during rainy seasons. The nearest surface water body is Hlaing River which is 1.85 km far from factory 1 and 1.88 km far from factory 2. Even though Hlaing River is within its AOI of 3 km for both factories, the potential impacts arising from the construction activities may only occur indirectly.

(a) Liquid Waste

Drainage and seepage from construction waste dumping site, temporary construction office and worker's dormitory will have potential to cause surface water pollution. During rainy seasons, construction activities may result in sedimentation of surface water drainage networks and also due to the washing off of soil particles during its transportation to the site.

(b) Solid waste

Waste materials (pallets, packing crates, steel structure off-cuts, and waste concrete) will be generated during construction period. The unsuitable soil material from foundation preparation will also be produced. All of the construction wastes will have potential to soil and water pollution if they are not properly managed. A few small amount of domestic waste will also be generated from construction workforce. The establishment of labor camps will also affect on environment through improper waste (solid & garbage /sewage) disposal.

(c) Spillage Waste

Trucks and cars can leak fuel oil during transportation of construction materials and workers during construction phase. Moreover, lubricants and grease from construction machineries can also leak during construction phase. All of the fuel oil and lubricants can cause surface water pollution (increase in oil and grease content in Hlaing River) for a while.

Significant of Impacts on Surface Water Environment before Mitigation Measures

Impact on water environment during construction phase will not be significant due to the amount of wastewater produced during construction phase (the volume of nearest water bodies (Hlaing River) is very much greater than the volume of wastewater disposed by construction site). Moreover, all the discharge effluents from factory 1,2 and other factories within the industrial zone will travel through drains where it will be handled under the rules and regulations of CDC (MyaungTaGar) and Industrial Supervision Committee before discharging into the river.

Anticipated Impacts	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Surface Water Pollution	Liquid waste	2	1	2	3	15	Low Impact (U)
	Solid waste	2	1	2	3	15	Low Impact (U)
	Spillage waste	3	1	1	3	15	Low Impact (U)

Consideration of Mitigation Requirement for Surface Water Environment

The intensity of mitigation measures for surface water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by Impact Evaluation	Required Mitigation Scale	Responsibility
1.	Liquid waste	Low Impact (U)	No	Yes	Minor	Construction Service Providers
2.	Solid waste	Low Impact (U)	No	Yes	Minor	Construction Service Providers
3.	Spillage waste	Low Impact (U)	No	Yes	Minor	Construction Service Providers

Mitigation Measures for Impacts on Surface Water Environment during Construction Phase

According to the above impact identification and evaluation, minor mitigation measures will only be needed for impact on water environment during construction phase. Construction period should not start in rainy seasons. If construction will have to start in rainy seasons, it is necessary to construct temporary sedimentation pond inside the project compound. The following are the required mitigation measures for surface water quality during construction phase.

No.	Construction Activities	Mitigation Measures
1.	Stacking and Loading Areas	- All stacking and loading areas should be provided with proper drains to prevent run off from the site to enter any water body.
2.	Waste Water from the Site	- Waste water channels from the site and workers' dormitory should be connected to septic tank during construction to prevent wastewater from entering the nearest water bodies.
3.	Leakage of Oil and Lubricants	- Avoid any leakage of oil and lubricant from vehicles and machineries used in construction phase.

Moreover, the following prevention measures will also be considered to reduce water pollution.

(a) Systematic waste disposal site with impermeable lining system within the site

(b) Raising awareness about the consequences of improper disposal and encourage the workers to practice reduce, reuse and recycle (3Rs).

Significant of Impacts on Surface Water Environment after Mitigation measures

Anticipated Impacts	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Surface Water Pollution	Liquid waste	2	1	2	2	10	No Impact (-)
	Solid waste	2	1	2	2	10	No Impact (-)
	Spillage waste	3	1	1	2	10	No Impact (-)

Residual Impact

There will be no residual impact left on surface water environment during construction phase as the all impacts related to surface water pollution after mitigation measures are very low.

6.3.3. Impacts on Soil and Ground Water Environment during Construction Phase

Impact of soil and groundwater environment during construction phase will be leakage of fuel oil, leakage of lubricants and improper disposal of wastes.

(a) Leakage of Fuel Oil and Lubricants

Potential contamination of soil and groundwater during construction phase could possibly occur as a result of leaking of fuel and lubricants from construction equipment and/or temporary on-site storage facilities. Handling of fuel oil, other oil products, chemicals and lubricants may constitute a risk for pollution of soil and ground water.

(b) Construction Debris and Domestic Wastes

During construction phase, construction debris such as packing materials and domestic wastes from construction workers will produce. There will have potential to cause soil contamination and ground water pollution if these solid wastes are not properly disposed. Moreover, seepage and drainage from construction waste dump site will also impact on soil and ground water qualities.

Impacts Significance on Soil and Ground Water Environment before Mitigation Measues

Construction related impacts to soil and groundwater in project site will be minor, temporary in nature and low possibility as follow:

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Soil and Ground Water Pollution	Leakage of fuel oil and lubricants	3	1	1	3	15	Low Impact (U)
	Construction debris and Domestic Wastes	2	1	2	3	15	Low Impact (U)

Intensity of Mitigation Measures for Soil and Ground Water Quality during Construction Phase

The requirement of mitigation measures for soil and ground water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Leakage of fuel oil and lubricants	Low Impact (U)	No	Yes	Minor	Construction Service Providers
2.	Construction debris and domestic Wastes	Low Impact (U)	No	Yes	Minor	Construction Service Providers

Mitigation Measures for Impacts on Soil and Ground during Construction Phase

According to the above consideration for required mitigation measures, there will be minor mitigation measures such as disposed of solid wastes according to the rules and regulations of CDC (MyaungTaGar) and/or rules and regulations of Industrial Supervision Committee to reduce impacts of solid wastes during construction phase. Care should be taken not to leak during the handling of fuel oil and lubricants. All of the fuel tank and lubricants container have to store over concrete floor or impermeable pad. Every machineries used in construction phase have to good conditions.

Significant of Impacts on Soil and Ground Environment after mitigation measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Soil and Ground Water Pollution	Leakage of fuel oil and lubricants	3	1	1	2	10	No Impact (-)
	Construction	2	1	2	2	10	No

	debris and Domestic Wastes						Impact (-)

Residual Impact

There will be no residual impact left on soil and ground water environment during construction phase as the overall impacts are very low.

6.3.4. Impacts on Biodiversity Environment during Construction Phase

The anticipated impacts on biodiversity during construction phase of proposed project will be as follow:

(a) Impact on Flora and Fauna Diversity

Clearing away trees and natural vegetation can cause hazards to the habitats of birds and butterflies. Noise due to construction activities at the site involving human and vehicular movement will disturb aril and wild animals in the area. If waste disposal during construction are not properly done, there will be increased in the habitat loss of native species. Terrestrial micro flora and fauna at the site are also affected. Although the project is adjacent to Hlaing River, there will be no impact on aquatic lives in Hlaing River because waste water produced from construction site will be little amount from small area (about one acre).

Significant of Impacts on Fauna Diversity

The impact on flora and fauna diversity will be minimal due to the site had already cleared by human activities for industrial zone and no fauna species are found within the project site (direct impact zone). However, there will be a little impact on surrounding flora and fauna diversity (indirect impact zone), due to the construction noise.

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Impact Rating
Impacts on flora and fauna diversity	Cutting of trees, wastes and noise	2	1	2	3	15	Low Impact (U)

Consideration of Mitigation Requirement for Biodiversity Environment

The requirement of mitigation measures for biodiversity environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
2.	Cutting of trees, wastes and noise	Low Impact (U)	No	Yes	Minor	Construction Service Providers

Mitigation Measures for Impacts on Biodiversity Environment during Construction Phase

Mitigation measures should be carried out during the constructional phase as below:

- Avoid cutting of trees as much as possible and create the green belt (mangrove tree in the water and native plants on the land) in surrounding area of the project site for recreational and habitat conservation for terrestrial animals (birds, Rhesus monkey) as well as for the aquatic organisms (water birds, fish, crab).
- Avoid running of noisy equipment at night
- Raise environmental conservation awareness among the visitors and workers (not to kill the birds and monkey which are protected by law,
- Manage the waste disposals which should be conducted systemically with the purpose in order to conserve aquatic ecosystem in healthy level for environmental protection.

Significant of Impacts on Biodiversity Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Impact Rating
Impacts on flora and fauna diversity	Cutting of trees, wastes and noise	2	1	2	2	10	No Impact (-)

Residual Impact

There will be no residual impact left on biodiversity environment during construction phase as the overall impacts are very low after mitigation measures.

6.3.5. Impact on Human Environment during Construction Phase

Impacts on human environment will include socio-economic and health impacts. The anticipated socio-economic and health impacts on human environment during construction phase are as follow:

(i) Positive Socio-economic Impacts during Construction Phase

During construction phase, the following positive and negative socio-economic impacts will occur.

(a) Job Creation

According to the information from the developer, the proposed project will provide about 20 temporary employment opportunities for local people during construction phase.

Impact Significance of Job Creation without Enhancement Measures

There will be great benefit the community to a point. As the proposed project is located near Kan Ka Lay, Kalar Kone, Myaung Tagar villages and within the industrial zone, there are many locals who are in need of jobs. Most of the residents within the industrial zone are mostly migrant workers who fled during the Nargis cyclone. Therefore, most of the pre-construction workers will be migrant workers (not from nearest villages) and local residents from nearby villages so job creation during pre-construction phase can be considered as low.

Anticipated Impact	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Positive (+)	2	1	3	3	18	Low Impact (U)

Enhancement Measures for Job Creation during Construction Phase

The following enhancement measures are proposed to the developer for ensuring job opportunities for local people.

(a) As the population of females is slightly higher than that of males in the township, employment opportunities for construction works should also be created to ensure that the local female population also has equal chance for these opportunities (Gender Equality).

(b) Dahua Myanmar will ensure construction contractor to use local labor force in concrete structure and other facilities as part of tender requirements.

(c) Unskilled and semi-skilled job opportunities should be offered to the local communities as much as possible.

Impact Significance of Job Creation after Enhancement Measures during Construction Phase

If the developer will follow the proposed enhancement measures for job opportunities, the impact will become low after enhancement actions as follow:

Anticipated Impact	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Positive (+)	3	1	3	4	28	Low Impact (U)

Job opportunities are one of the most public needs according to the primary data collection. So, Da Hua will create job opportunity for local people during construction phase.

(b) Skill Development for Local People

Local people hired by the proposed project would remain in communities with skills acquired during project construction including construction, woodwork, concrete work, steel/metal work and masonry. Communication skills for local people will also improve in office works during construction period. This is a positive and long-term socio-economic benefit.

Impact Significance of Skill Development without Enhancement Measures during Construction Phase

Most of the sub-contractors for minor construction works in nearest villages are not too familiar with modern construction technique. So, the impact significance of local skill development during construction phase without enhancement measures can be considered very low as follow:

Components	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Local skill development	Construction works	Positive (+)	3	4	3	2	20	Low Impact (U)

Enhancement Measures for Skill Development

The followings are the proposed enhancement measures for local skill development.

(a) Training programs (e.g. maintaining of vehicles, welding, wiring, masonry building etc.) should be implemented prior to and during the construction phase because majority of the local people may not be adequately skilled to qualify for positions requiring skilled labor, if required.

(b) Local construction sub-contractors should be chose as first priority during tender process.

(c) Dahua Myanmar should encourage construction contractors and sub-contractors to stimulate local skill development as part of tender requirement.

Impact Significance of Skill Development after Enhancement Measure

The impact significance of local skill development during construction phase can be considered as low to moderate after enhancement measures as follow:

Components	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Local skill development	Construction works	Positive (+)	3	4	3	3	30	Moderate Significant (C)

(c) Potential to Growth of Local Economy and Business

The construction and operation phase of the project will have temporary positive impacts on the local economy. In addition to the economic benefits derived from employment, the proposed development will also contribute to the local and regional economy in other ways. For instance, local expenditure by employees will have multiplier effects in various sectors of the economy, thereby stimulating business activity and further employment creation.

Impact Significance of Growth of Local Economy and Businesses without Enhancement Measures

Since the construction period is only 1 year, the required food and consumer goods can be bought from the nearest villages. According to the primary data collection, there are no construction contractors and business for construction materials in nearest villages but there are shops in Hmawbi Township. So, this kind of impact during construction period will be considered as very low for local people in nearest villages and low for local business without enhancement measures as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Growth of local economy	Growth of economy in nearest villages	Food and consumer goods for construction workers	3	1	2	3	18	Low Impact (U)
	Growth of business in nearest villages	Supply of construction services and materials	3	1	2	2	12	No Impact (-)

Enhancement Measures for Growth of Local Economy and Businesses

As some parts of the places along the proposed project are just developing, the boost in local economy will have advantage for local people during construction period. The project developer will support local businesses, especially in nearest villages.

Any food and consumer goods that can be bought in nearest villages should be preferred as first priority. Local business for food and consumer goods in nearest villages should boost by buying required things regularly. The project developer should encourage construction contractors and sub-contractors to stimulate the emergence of local small business as part of tender requirement. The project developer should establish a policy to encourage services and materials from local in relation to construction works. Any construction services and construction materials that can be available in nearest villages should be preferred as first priority if feasible and should encourage construction contractors and sub-contractors to stimulate the emergence of local small business as part of tender requirements. But after the construction period is over, the construction site should be restored as the normal condition and make sure there would be no permanent business left in the construction site.

Impact Significance of Local Economy and Businesses after Enhancement Measures

Impact significance can be raised by enhancement measures as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Growth of local economy	Growth of economy in nearest villages	Food and consumer goods for construction workers	3	1	2	4	24	Low Impact (U)
	Growth of business in nearest villages	Supply of construction services and materials	3	1	2	3	18	Low Impact (U)

(i) Negative Socio-economic Impacts during Construction Phase

(a) Traffic Congestion

Traffic Congestion – Road traffic congestion in surrounding area during construction period can cause public anxiety. It can also lead to temporary blockage of village roads.

As the construction operations will last about 1 year, traffic flows can be increased by the activities such as transportation of construction workers and construction materials will lead to increasing in traffic volumes to and from the site. This will lead to an increase the risk of accidents to the employees and in the local community as well as present the potential for nuisance from the increase or if the traffic presents delays to the public. Additionally, equipment, material and construction debris in and out of the site not be secured correctly, there is a risk that this transported material could become a hazard and further increase

the rates of accident and injury. Disruption of access to infrastructure or social resource due to construction activity will cause nuisance and to a certain extent additional cost to the public in terms of longer travel period due to diversion or traffic. It will also pose risk of accident to motorist at night if these blockages and disruption are not clearly demarcated.

Significant of Impact for Traffic Congestion during Construction Phase before Mitigation Measures

Since the project is located in industrial zone, the traffic congestion can also be caused by operation of other factories but the significant of impact due to this proposed project will be low as the duration of the construction phase is very short.

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Traffic congestion	Construction activities	3	1	2	3	18	Low Impact (U)

Consideration of Mitigation Requirement for Traffic Congestion

The intensity of mitigation requirement for Traffic Congestion according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Traffic congestion	Low Impact (U)	No	Yes	Minor	Construction Service Provider(s)

Mitigation Measures for Increased in Traffic during Construction Phase

Traffic control plan which is to be prepared by the contractor, and ensuring that traffic into and out of the site will occur mainly during the daytime, especially for heavy machinery, and will do so in an ordered manner. In addition, the movement of heavy machinery during the construction phase will be limited to off-peak hours and prior notification will be provided to minimize the potential negative impacts of traffic on local communities. Affected communities will be notified regarding the construction schedule during the construction and rehabilitation phase. In addition, a traffic re-routing plan will be provided for the construction phase, with alternative routes delineated where feasible. Any road damage sustained by transportation of heavy equipment will be repaired. It can use alternative road that

will not pressure on public road. And need to avoid hauling of construction materials at local traffic time and hauling of heavy construction materials at night.

Significant of Impact for Traffic Congestion during Construction Phase after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Traffic congestion	Construction activities	3	1	2	2	12	No Impact (-)

(b) Impact Associated with Population Influx

The increase of population during construction phase will increase temporary pressure on existing infrastructure and services including health, food, shelter, water, transport and recreational facilities. Moreover, the proposed project will use foreign workers (Chinese) and there will be some social problem associated foreign workers.

Significant of Impacts Associated with Population Influx without Mitigation Measures

As proposed project is very close to Hmawbi and little number of workers (about 20 people), there will have no impact on local health care facilities and local food consumption. Moreover, the proposed project is situated in the Industrial Zone and the requirements for housing, recreational facilities and water for construction workers will be provided by the existing facilities in industrial zone and no more facilities are required. However, there will be some social problem associated with foreign workers. Impact significances related to population influx during construction period are as follow:

Anticipated Impact	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase pressure on housing, recreational facilities, and water	2	1	1	2	8	No Impact (-)
Increase pressure on health care facility	2	1	2	3	15	Low Impact (U)
Increase pressure on adequate amount of local food	2	1	2	2	10	No Impact (-)

Mitigation Measures for Impacts Associated with Population Influx

No mitigation measures is required for pressure on housing, recreational facilities and water for additional workers because the impact rating is very low. Similarly, impact significant of pressure on local food consumption is very low and no mitigation measure is required. All of the impacts associated with population influx can be minimized by the use of local labor force. Own health care facilities should be supported to additional workers during construction period.

Impact Significance of Skill Development after Enhancement Measure

All of the impacts due to increase in population can be mitigated by appointing local construction workers and it will also reduce pressure on health care facilities for construction workers.

Components	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase pressure on health care facility	2	1	2	2	10	No Impact (-)

(c) Increase in Crime and Security

An inflow of skilled migrant construction workers and their dependents from other areas may increase in social pathologies and crime including drug and alcohol abuse, assault, theft and violence in nearest villages.

Impact Significance of Increase in Crime and Security before Mitigation Measures

The impact can be considered as low without mitigation measures and the impact rating is as follows:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase crime and security	Public security	Migrant construction workers	4	1	2	3	21	Low Impact (U)

Mitigation Measures for Increase in Crime and Security

This kind of impact can be mitigated by the use of local labor force as much as possible. The developer should encourage the construction contractors or sub-contractors to ensure that the local community communicates their expectations of construction workers' behavior, and formalize between the community and them. The developer also needs to continue to work with the local and regional police personnel and local administrative members in the resolution of potential increase in crime and violence. Management of construction camp should be adequately formalized and have communication channels with local police force in

order to take measures for any inappropriate behavior that may occur. Construction workers should be clearly identifiable. Construction site should be fenced and all of the construction workers should not allow going out at night. Security force should be organized and trained to put a stop to crime and violence.

Impact Significance of Crime and Security after Mitigation Measures

After systematically control of foreign and migrant workers and continuous cooperation with local administrative office and police force, the impact will be as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase crime and security	Public security	Migrant construction workers	4	1	2	2	14	No Impact (-)

(d) Damage to Public Road

Transportation of construction materials for the construction process like concrete and other construction material, it can cause the damage to the public road and village roads.

Significant of Impact for Public Road Damage before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Public road damage	Construction activities	3	1	2	3	18	Low Impact (U)

Consideration of Mitigation Requirement for Public Road Damage

The intensity of mitigation requirement for Public Road Damage according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Public road damage	Low Impact (U)	No	Yes	Minor	Construction Service Provider(s)

Mitigation Measures

- Use bypass road instead of public roads.
- Use public roads as per the resistance of roads and bridge if unavoidable.
- Repair the public roads if they are damaged by construction activities.

Significant of Impact for Public Road Damage after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Public road damage	Construction activities	3	1	2	2	12	No Impact (-)

(iii) Potential Health Impact and Mitigation Measures on Community for Construction Phase

During construction phase, the anticipated health related impacts are as follow:

(a) Increase Infection of Air-borne Diseases

An influx of construction workers from other places can lead to overcrowded conditions where air-borne diseases such as tuberculosis, influenza and meningitis can spread easily.

Impact Significance for Increase Infection of Air-borne Diseases

According to the secondary data collection, infections of TB is one of the common diseases in Hmawbi Township but the number of incidences is lowest among the other common diseases. So, impact rating for air-borne diseases will be considered as follow:

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
People in nearest residents	√	-	-	-	√	-	√ (HIR 1)	-	-
Construction workers	√	-	-	-	√	-	√ (HIR 1)	-	-

Mitigation Measures for Infection of Air Borne Diseases

This potential impact will be minimized by providing medical check for workers who are susceptible infection of air-borne diseases.

(b) Increase Infection of Water Borne Diseases

The incidence rate of water borne diseases such as cholera and diarrhea will increase if there will be no proper sanitation practices at the construction site. Improper waste disposal of construction debris will also have potential to increase water borne diseases. Project activities could become sources of pollution, as a result of infiltration into the surface stream. The possible negative impacts considered significant are:

- Loose soil from earthworks may be washed into stream.
- Irresponsible dumping of domestic solid waste can lead to underground water contamination, due to contaminants emanating from various products into the groundwater and filtering through to the aquifers. This will be a particular problem during the rainy season.
- Potential surface water pollution can emanate from waste products generated by construction activities entering the surface drainage.

Impact Significance for Increase Infection of Water Borne Diseases

According to the secondary data collection, infections of water borne diseases such as diarrhea has the highest incidences in Hmawbi Township and so the impact will be considered as high as follow:

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
People in nearest residents	-	-	√	-	√	-	-	-	√ (HIR 3)
Construction workers	-	√	-	-	√	-	-	√ (HIR 2)	-

Mitigation Measures for Increase Infection of Water Borne Diseases

Proper sanitation system should be provided for construction workers during construction period. Construction debris should be disposed at suitable location that does not impact on local water resources. Construction activities should ensure that no loose soil is permitted into watercourses and stockpiles are located away from surface water. All mixing of cement should be carried out in a designated area away from surface water and areas of potential runoff. All areas of fuel storage should be banned to prevent hydrocarbon pollution of surface water.

(c) Potential to Increase Infections from Mosquito

The blockage of drainage system during construction phase will cause bleeding zone for mosquitoes and can cause potential to cause infections from mosquitoes especially in rainy season.

Impact Significance of Infections from Mosquito

The impact can be rated as low because the incidents of malaria is very little in Hmawbi Township.

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
People in nearest residents	√	-	-	-	√	-	√ (HIR 1)	-	-
Construction workers	√	-	-	-	√	-	√ (HIR 1)	-	-

Mitigation Measures for Infections from Mosquito

Proper temporary or permanent drainage system should be compensated as the blocked of drainage system during construction phase. Ensure that there are no stagnant pools of water during the construction phase. Provide local people with impregnated mosquito nets and/or better access to malaria prophylaxis and treatment as part of compensation program to reduce infections from mosquito.

(d) Increase Risk of Sexually Transmitted Infections

During construction phase, the improved economic status of the area and the influx of new people, living away from their families, can also lead to an increased risk of sexually transmitted infections such as HIV/AIDS, gonorrhea and chlamydia. Major outbreaks of infectious diseases can have a devastating effect not only on or near the sugar mill site but also on local communities.

Impact Significance of Increase Risk of Sexually Transmitted Infections

Impact rating for sexually transmitted infection can be considered as low due to the number of incidence in HIV/AIDS infection rate in Hmawbi Township.

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
Local people in Hmawbi Township	√	-	-	-	√	-	√ (HIR 1)	-	-

Construction Workers	√	-	-	-	√	-	√ (HIR 1)	-	-

Mitigation Measures for Increased Risk of Sexually Transmitted Infections

Review sexually transmitted infection clinic access and education to reduce spread of sexually transmitted infections within the community. Provide information and education to workers about safe sex and implement HIV control program for migrant construction workers.

(e) Fugitive Dust Emissions

During construction phase, the main source of air pollution will be dust generation due to site clearing, ground levelling activities, construction activities and transportation of construction materials. Dust will expose the construction workers and the some local people in nearest villages to bronchial and other respiratory tract diseases.

Impact Significance for Fugitive Dust Emissions

The impact will be mainly on construction workers within the project and little on local people in nearest villages.

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
People in nearest residents	√	-	-	-	√	-	√ (HIR 1)	-	-
Construction workers	-	√	-	-	√	-	-	√ (HIR 2)	-

Mitigation Measures for Fugitive Dust Emission

Dust can be controlled by:

(a) Wetting of roads by water spraying;
(b) Seeding storage mound surfaces as soon as is practicable;
(c) Spraying exposed surfaces of mounds regularly;
(d) Restricting vehicle speeds;
(e) Watering roadways; and
(f) Wheel or body washing.

(f) Health Impact Related to Increase in Noise Level

Construction activities normally generate a lot of noise. Noises will also arise from various construction machinery at site. Both acute loud noise and chronic lower level noise have been associated with a variety of negative health effects. Hearing loss and impairment are known to occur as a result of exposure to acute, high decibel noise (greater than 85 dB). Noise annoyance can lead to stress related impacts on health such as feelings of displeasure, interference with thoughts, feelings, and activities and disturbed sleep and can have impacts on mood, performance, fatigue, and cognition.

Impact Significance of Increase in Noise Level

The impact will be considered as low for local people due to the distance of nearest villages and medium to construction workers inside the construction site as follow:

Who will affected?	Magnitude/Consequence of impact			Likelihood/Probability of impact			Health Impact Significance Rating		
	Low	Medium	High	Unlikely to occur	Likely to occur sometimes	Likely to occur often	Low	Medium	High
People in nearest residents	√	-	-	-	√	-	√ (HIR 1)		-
Workers at site	-	√	-	-	-	√	-	-	√ (HIR 2)

Mitigation Measures Health Impact Related to Increase in Noise Level

1. Reduce speed limits for trucks in the project area to reduce noise level.
2. Alert residents of anticipated noise, including time, duration, decibel levels, and machinery to be used to protect public health.
3. Avoid working at night.

(iv) Potential Impact on Workplace Safety and Health on construction workers during Construction Phase

In addition, vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazard accidents such as physical contact, spill, dust emission and noise to workers.

Significance of Impacts on Occupational Health and Safety before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Accidents	Construction activities	3	1	1	3	15	Low Impact (U)

Consideration of Mitigation Requirement for Impacts on Occupational Health and Safety

The intensity of mitigation requirement for Occupational Health and Safety according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Accident	Low Impact (U)	No	Yes	Minor	Construction Service Provider(s)

Mitigation Measures

To mitigate occupational impacts on workers, Dahua Myanmar will prepare occupational health and safety management plan for the construction workers based on the EMP. Posters shown in the following figures in Myanmar language and any other language appropriate will be displayed at the site.

Safety Sign

Personal protective equipment such as safety shoes, safety gloves, helmet, goggles, earmuffs etc., will be provided during construction. For the safety of construction staff, adequate safety measures including availability of first-aid facilities are made available on the project site.

Table - Personal Protective Equipment (PPE) and their Functions

Function of PPE	Feature and Characteristics
Protective Goggles (Suitable for protection from dust, particle, chips, chemical splattering)	
Goggles with direct vents are not suitable for Protection from chemical splattering or smoke.	
Hearing Protection	
Cotton earplugs: disposable earplugs for short-term use – not suitable for high noise levels	
Earmuffs: They offer a high level of sound reduction and are suitable for high noise levels. They can be used in combination with a safety helmet.	
Respiratory Protection	
Dust mask: lightweight mask that is fitted over the nose and mouth and secured behind the head with elastic.	
HeadProtection	
Use head gear which conforms to recognized safety Standards	
HandandArmProtection	
Gloves for common tasks(cotton/leather)	
Foot Protection	
Select footwear that fits the purpose and Conforms to recognized safety standards.	
Body Protection	
Reflective clothing: For working in busy traffic: brightly-colored reflective clothing can increase the visibility of employees and reduce their chances of being struck by vehicles or machinery	

Da Hua will design and constructed in careful consideration of physical stability, structural load capacity, proper ventilation, lighting, fire prevention, sanitation and general safety issues, and will comply with all relevant health and safety requirements, mainly issued by Ministry of Industry. To prevent and reduce of occupational health and safety, anti-slip stair tape treads will be equipped along the stair for highlighting step edge and avoid slipping. Qualified first-aider will be provided at all times. A good ventilation system will be arranged at labor concourse for employees. For food handling, preparation and storage areas for dry and wet food will be arranged for workers and guests' food hygiene. Workers will also be provided with training programs.

Significance of Impacts on Occupational Health and Safety after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Accident	Construction activities	3	1	1	2	10	No Impact (-)

6.4. Anticipated Impacts and Mitigation Measures in Operation Phase

It has been stated that the operating time starts from October 2019 and its overall period for the proposed project will be up to 20 years. The activities in operation phase are as follow:

Da Hua Myanmar Company Limited is producing polyester staple fiber (PSF) which will be produced in Factory 1 (PSF Factory), PET packing tape and PE/PP recycle pellets which will be produced in Factory 2 (PPPT Factory) by processing used PET (Polyethylene Terephthalate) bottles as raw materials. The processes can be divided into (i) raw material preparation, and (ii) manufacturing.

6.4.1. Impacts on Air Environment during Operation Phase

The following are the anticipated impacts on air environment for factory 1 and 2 during the operation phase of the proposed project.

(a) Particulate Matter Emissions

The emissions of particulate matter will be mainly from fly ashes from boilers, and movement of vehicles going to and from the factory along the road. Fly ashes from boilers can have severe impact on the environment as it chemically consists of silica (SiO_2), alumina (AlO_3), calcium oxide (CaO), iron oxide (Fe_2O_3), magnesium oxide (MgO), sodium oxide (Na_2O) and potassium oxide (K_2O), residual carbon and sulfate. Inhaling of fly ashes can

bring irritation of the nose and throat, dizziness and shortness of breath for short-term exposure and for long term exposure, it can lead to liver damage, kidney damage, cardiac arrhythmia and variety of cancers. The most common of deteriorations of bag filter system is caused by excessive particulate loads in the gas stream. When operating temperatures rise above the designed limits of the fabric, whether for short spikes or longer overages, filters will begin to degrade and eventually fail. Bag house filter failure can also occur from a chemical attack. In its simplest form, this can be caused by using the wrong fabric for the chemical makeup of the gas stream. If gas stream characteristics are not taken into consideration when selecting the filter fabric and/or treatments/finishes, chemical attack can cause considerable damage to the bag house filter. The movement of vehicles on road can also generate dust which can affect the respiratory system.

Dust Concentration (C)

The dust concentration is estimated by using equation (2):

$$C(mg/m^3) = \frac{Q(mg/s)}{d(m) \times W(m/s) \times M(m)}$$ Equation (2)

Where,

C = Dust Concentration (mg/m3)

Q = Emissions at Source (mg/s)

d = Width (the smallest dimension is used for worst case scenario) (m) = 500 m

W = Average maximum wind speed (m/s)

M = Mixing Height (m)

The particulate matter concentration (dust) for Factory 1 is shown below:

Particulate Matter	**µg/m^3**	**mg/m^3**
PM $_{10}$	55.97	0.05597
PM $_{2.5}$	28.32	0.02832

The particulate matter concentration (dust) for Factory 2 is shown below:

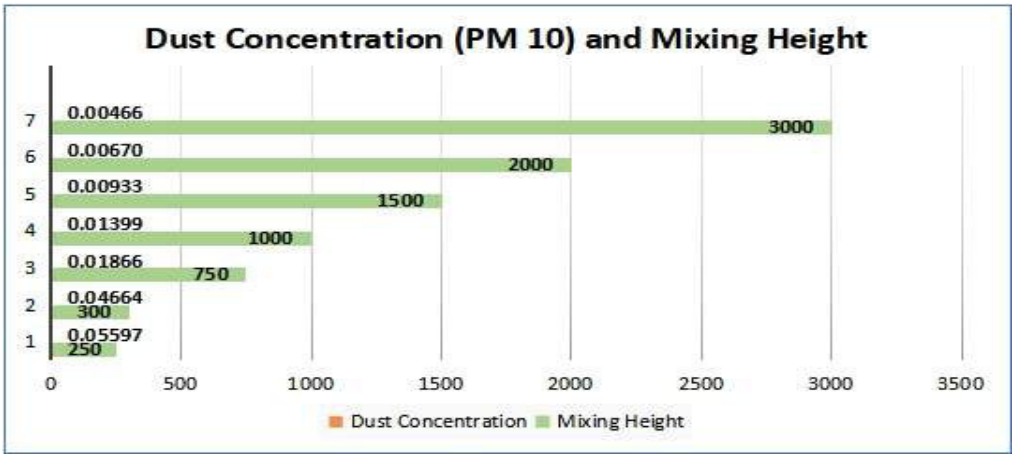
Particulate Matter	**µg/m^3**	**mg/m^3**
PM $_{10}$	16.88	0.01688
PM $_{2.5}$	8.95	0.00895

According to the wind speed condition, wind speed during a year is about 1m / s ~ 3m / s in Myanmar. Thus, assume that average maximum wind speed will be 2 m/s in the calculation. However, the mixing height data is not available in the Meteorology Department. Therefore, the measurement of mixing height data is adopted from the atmospheric simulation models (EU) in which the default mixing height vary from very unstable stage to extremely stages in

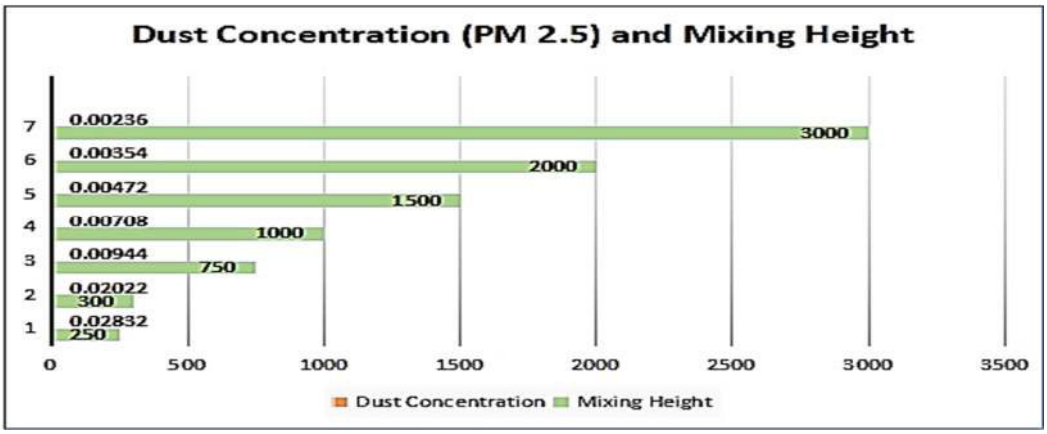
total six stages with default values of mixing height values (2000m, 1970m, 1500m, 1430m, 1000m, 750m, 300m, 250m).

For Factory 1:

Mixing Height (m)	Dust Concentration (PM_{10}), C (mg/m^3)
250	0.05597
300	0.04664
750	0.01866
1000	0.01399
1500	0.00933
2000	0.00670
3000	0.00466
4000	0.00350

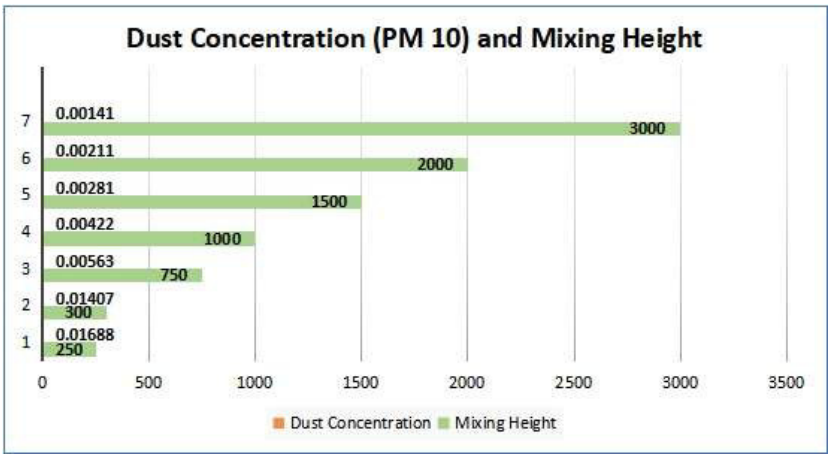


Mixing Height (m)	Dust Concentration ($PM_{2.5}$), C (mg/m^3)
250	0.02832
300	0.02022
750	0.00944
1000	0.00708
1500	0.00472
2000	0.00354
3000	0.00236

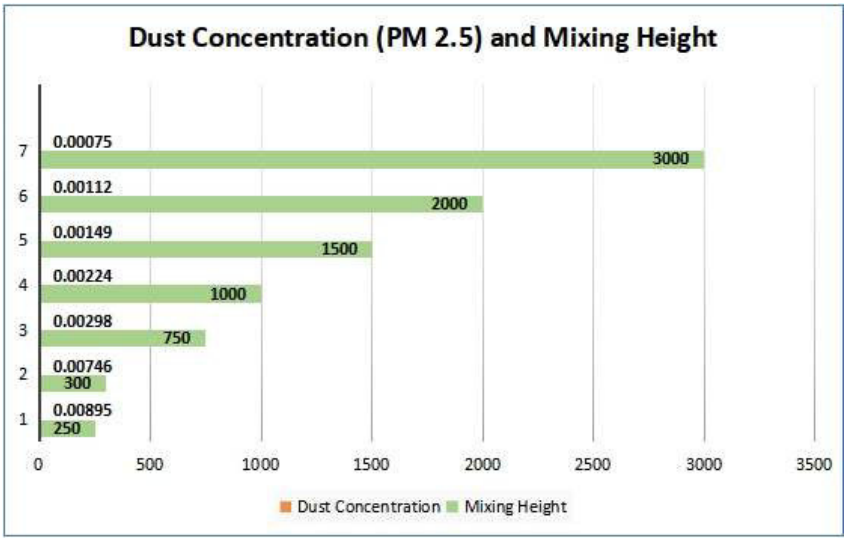


For Factory 2:

Mixing Height (m)	Dust Concentration (PM_{10}), C (mg/m^3)
250	0.01688
300	0.01407
750	0.00563
1000	0.00422
1500	0.00281
2000	0.00211
3000	0.00141
4000	0.00106



Mixing Height (m)	Dust Concentration ($PM_{2.5}$), C (mg/m^3)
250	0.00895
300	0.00746
750	0.00298
1000	0.00224
1500	0.00149
2000	0.00112
3000	0.00075



The above all charts show the estimated results of dust concentration for both Factory 1 and 2 at source varying mixing heights. According to the chart above, the dust emission rate decreases with increasing distances.

(b) Gaseous Emissions

CO_2, CO, SO_2, NO_2 and other volatile compounds will come out from operation of boilers and also sometimes from running of generators during black out. These operations are needed to run the machines used for production of polyester staple fiber (PSF) at Factory 1 and production of PET Packing Tape and PE/PP Recycled Pellets at Factory 2.

As the proposed project will occur gaseous emission on the surrounding, the gas dispersion rate needs to take account in the consideration of AOI. The air dispersion is predicted by using AERMOD VIEW modelling software. Wind speeds, wind directions and gas emission rate are used as input data. And the software gives the concentration level of gases as results.

The following table show the average concentration of pollutants at the sample point of the factory 1 and factory 2.

Sample Time	Sample Point	Average Value Parameters			
		CO_2 (ppm)	CO (ppm)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
24 hours for each point	Factory 1	419	-	0.3	187.15
	Factory 2	411	0.1	-	154.63

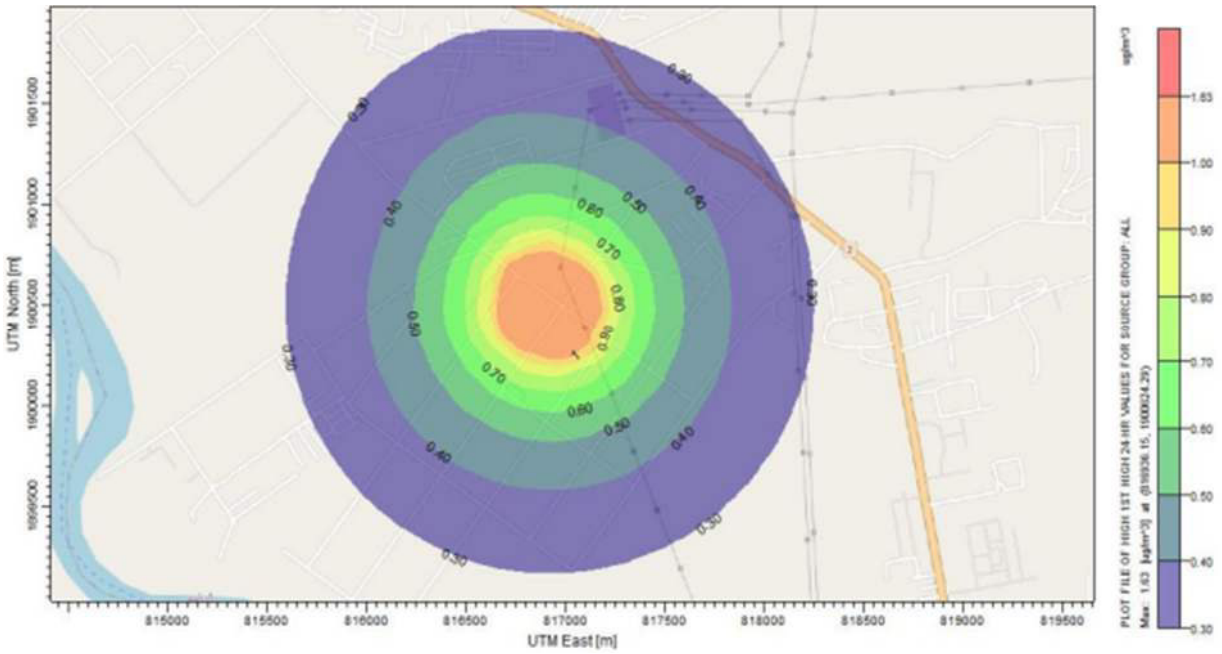
The estimated concentration of the gaseous pollutants that will be emitted from the proposed project are shown in the following table. Estimation include only boilers and mechanical emissions. Factory 2 will only operate when needed.

Sample Time	Sample Point	Average Value Parameters			
		CO_2 (ppm)	CO (ppm)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
24 hours for each point	Factory 1	1566	1.62	1.63	197
	Factory 2	417	0.738	0.137	171

For Factory 1:

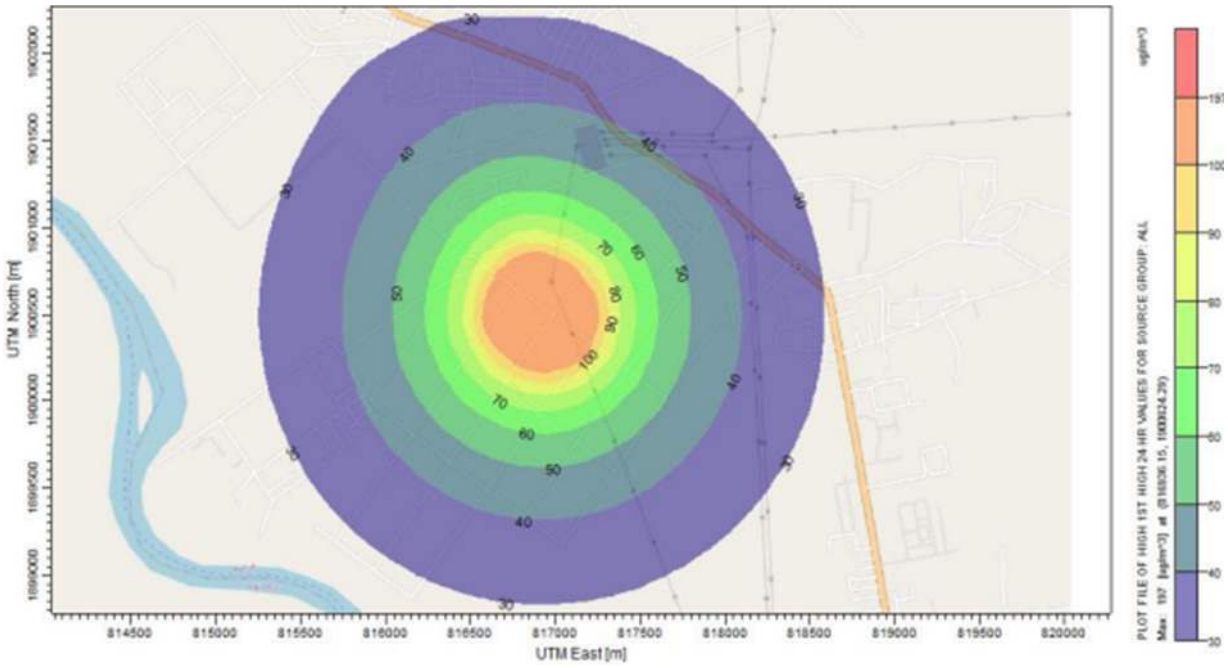
Estimated Gaseous Dispersion in Operation Phase

SO_2



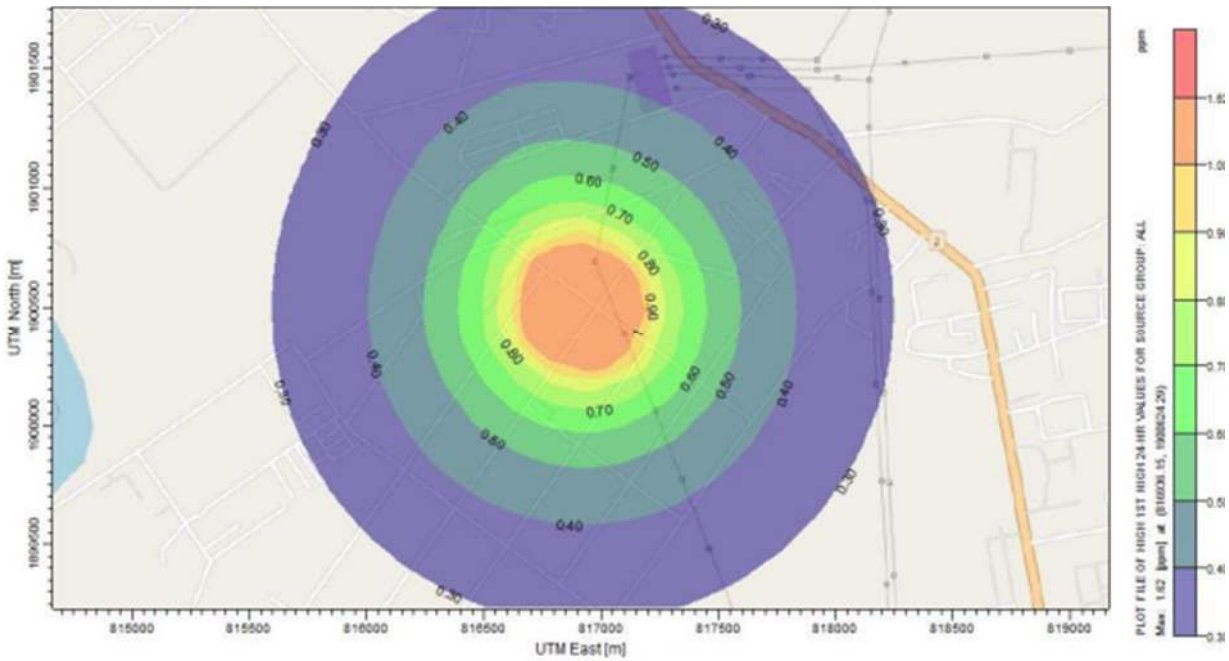
SO_2 Gas Dispersion during Operation

NO_2



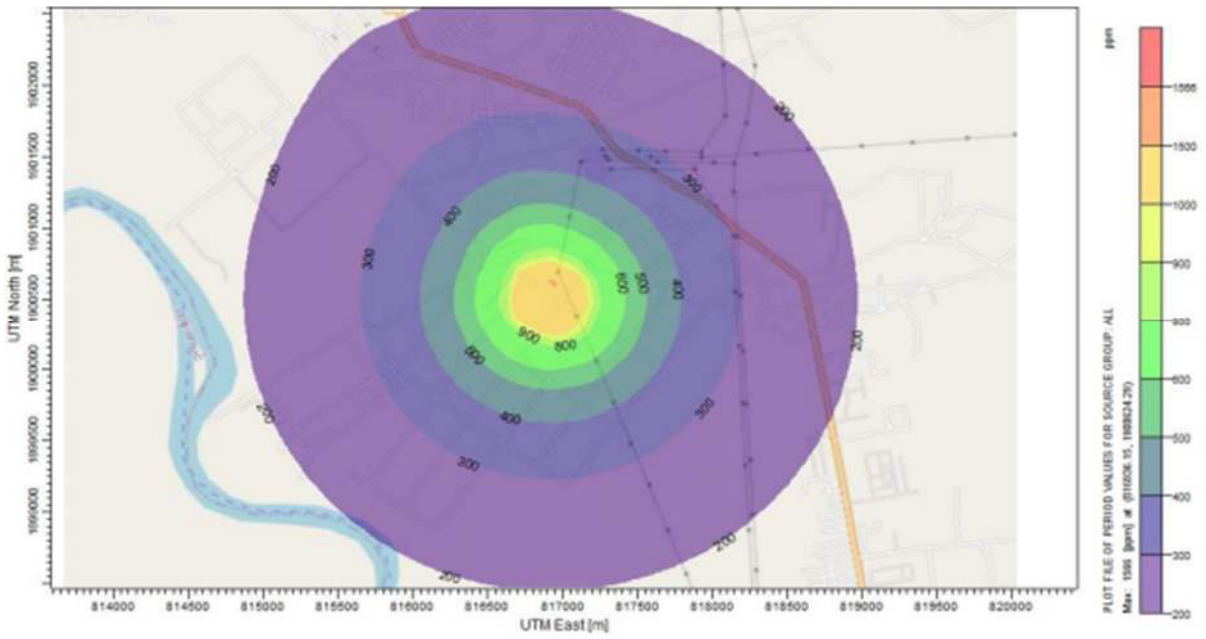
NO_2 Gas Dispersion during Operation

CO



CO Gas Dispersion during Operation

CO_2

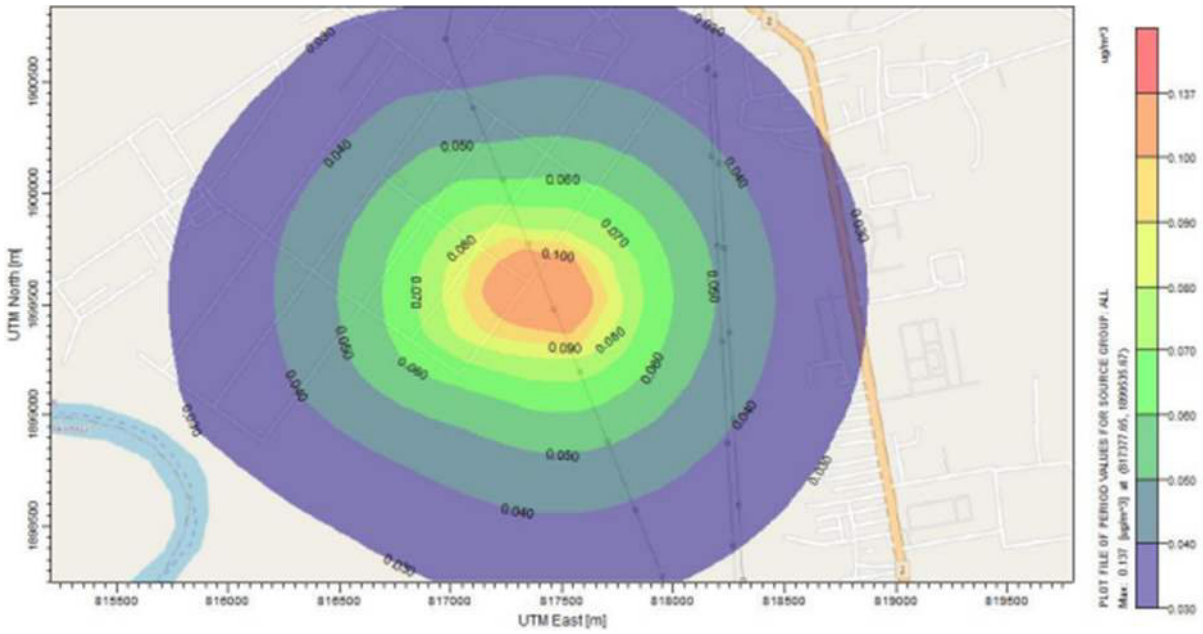


CO_2 Gas Dispersion during Operation

For Factory - 2

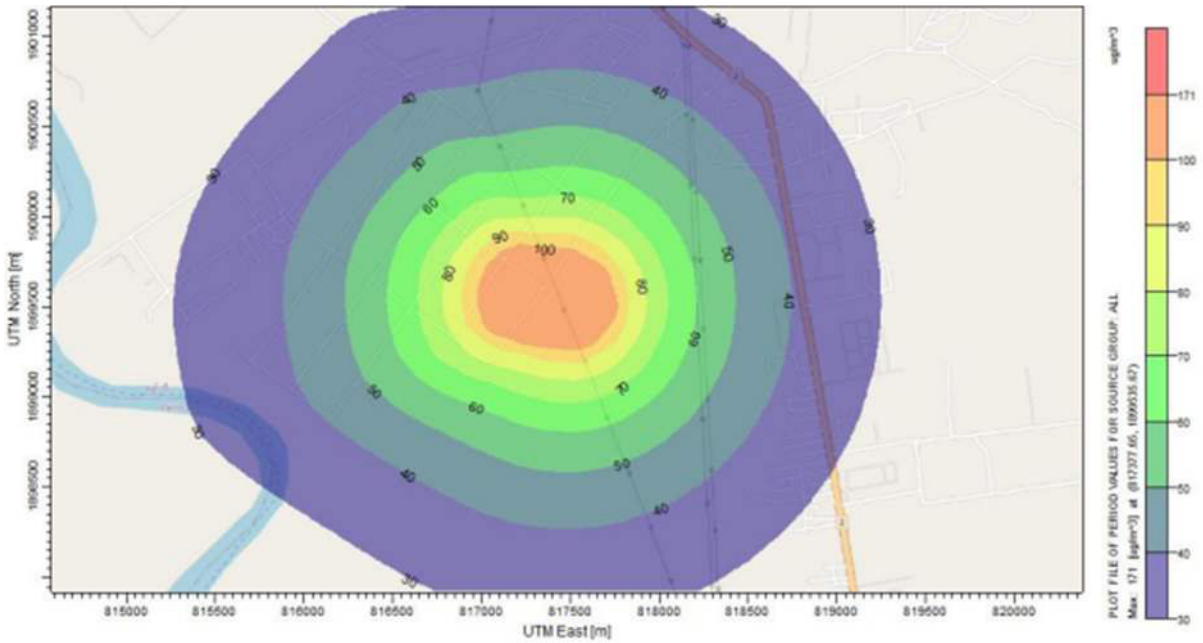
Estimated Gas Dispersion in Operation Phase

SO_2



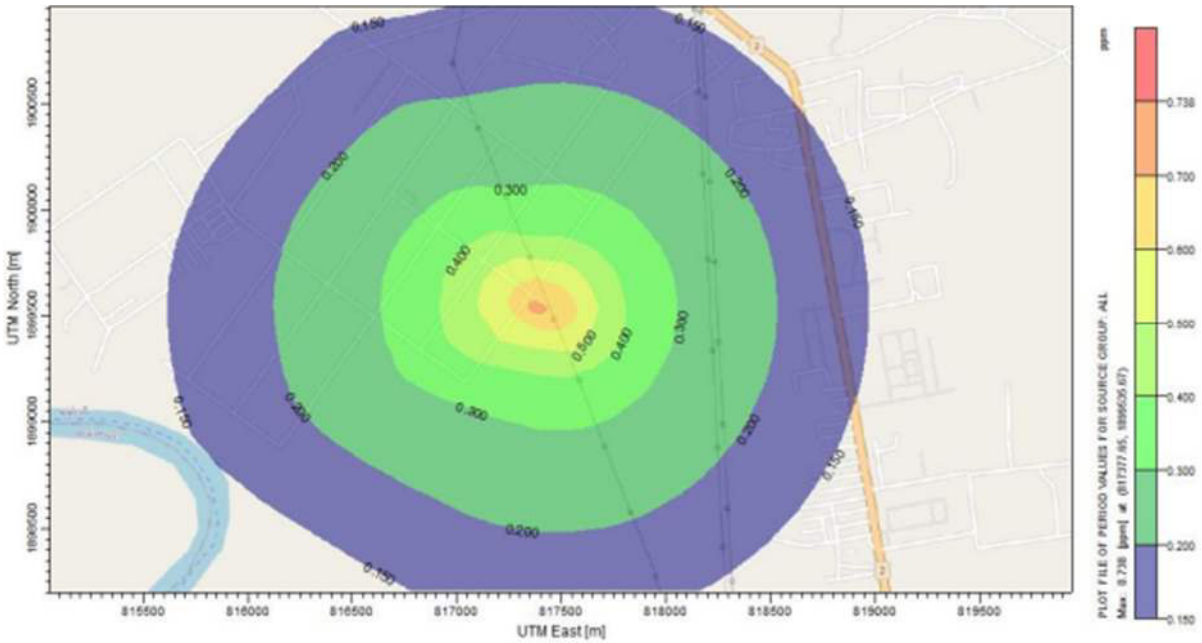
SO_2 Estimated Gas Dispersion during Operation

NO_2



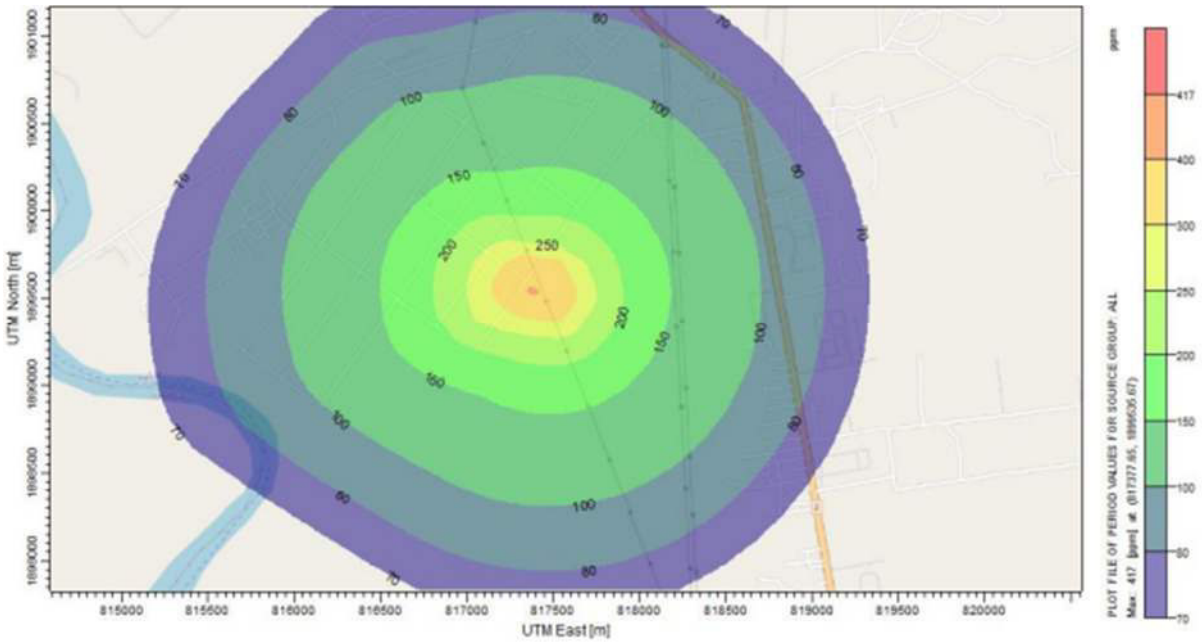
NO_2 Estimated Gas Dispersion during Operation

CO



CO Estimated Gas Dispersion during Operation

CO_2



CO_2 Estimated Gas Dispersion during Operation

According to the predictions for gaseous emission, it can disperse about 2.5 km around the proposed factories. Although it is a little difficult to predict the impact of gaseous emission on local communities because the emissions from the other projects inside the industrial zone.

(c) Odor

Odor (bad smell) will be released from both factories due to operational activities such as running of boilers and from releasing of chemical water wash with caustic soda (wastewater) into the atmosphere can cause odor to the surrounding.

(d) Noise

Noises from operational machines will produce high noise levels during operation period to the surrounding.

	Noise Level during Day Time (Operation)
Factory 1	63.49 dB
Factory 2	60.28 dB

Sound level *L* and Distance *r*

$$L_2 = L_1 - |20 \cdot \log\left(\frac{r_1}{r_2}\right)| \qquad L_2 = L_1 - |10 \cdot \log\left(\frac{r_1}{r_2}\right)^2|$$

$$r_2 = r_1 \cdot 10^{\left(\frac{|L_1 - L_2|}{20}\right)} \qquad r_1 = \frac{r_2}{10^{\left(\frac{|L_1 - L_2|}{20}\right)}}$$

L₂ = the A-weighted, equivalent sound level at a receptor resulting from the operation of a single piece of equipment at distance D (dB(A))
L₁ = Noise emission level of the particular piece of equipment at reference distance D (dB(A)
r ₁ = Distance from the receptor to the piece of equipment (m)
r ₂ = Reference distance where the source noise emission level was measured (m), i.e.,68.60 ft (20.91 m)

Safe Distance Calculation for Factory 1

$L_1 = 70$ dBA

$L_2 = 63.49$ dBA

$r_1 = 20.91$ m

$r_2 = ?$

$r_2 = 20.91 \times 10^{\left(\frac{70-63.49}{20}\right)} = 44.24$ m

Safe Distance Calculation for Factory 2

$L_1 = 70$ dBA

$L_2 = 60.28$ dBA

$r_1 = 93.63$ m

$r_2 = ?$

$r_2 = 93.63 \times 10^{\left(\frac{70-60.28}{20}\right)} = 286.7$ m

The safe distance for Factory 1 is 44.24m so the nearest receptors are the residents living in front of the proposed factory 1. For Factory 2, the safe distance is 286.7m and the nearest receptors are going to be the residents in front of the factory 2. Overall, the above calculations only include about the noise emissions of the proposed factories but since the project is located in the industrial zone, the overall noises from other factories will be heard by the residents from other nearest villages which are Myaung Tagar, Kalar Kone and Kan Ka Lay.

Significant of Impacts on Air Environment during Operation Phase

Significant of impact on air environment can be considered as follow:

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Air pollution	Fly ashes from boiler	3	4	2	4	36	Moderate Significant (C)
	Gaseous emissions from boiler	3	4	3	4	40	Moderate Significant (C)
	Odour from operational activities	3	4	3	4	40	Moderate Significant (C)
	Noise from generator	3	4	2	4	36	Moderate Significant (C)

Consideration of Mitigation Measures Requirement for Air Environment before Mitigation Measures

The requirement of mitigation measures for air environment according to the consideration of impact evaluation and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public consultation Processes	Mitigation requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Fly ashes from boiler	Moderate Significant (C)	No	Yes	Moderate	Dahua Myanmar
2..	Gaseous emissions from boiler	Moderate Significant (C)	No	Yes	Moderate	Dahua Myanmar
3.	Odour from operational activities	Moderate Significant (C)	Yes	Yes	Moderate	Dahua Myanmar
8.	Noise from generator	Moderate Significant (C)	Yes	Yes	Moderate	Dahua Myanmar

Mitigation Measures for Impacts on Air Environment during Operation Phase

The following mitigation measures are recommended to Dahua Myanmar to reduce impacts on air quality during the operation phase.

(a) Mitigation Measures for Particulate Matter Emissions

- To maintain optimal moisture content and control potential coke emissions (i.e. fugitive dust) during storage, pile maintenance, and wetting with water will be done.
- Bag filter will be installed.

(b)Mitigation Measures for Gaseous Emission

Gaseous emission from boilers is collected with the use of exhaust fans and these gases are treated together with the use of lime water scrubber. The use of good quality will also reduce emissions of some gases (CO_2 and SO_2).

(c) Mitigation Measures for Odour

Odour from heating process will be controlled by making good ventilation system with exhaust fan inside the factory. The reduction of sulphur dioxide by lime water spraying will also reduce ddour from boiler.

(d) Mitigation Measures for Impact of Noise

Noise will be reduced by making auxiliary generator in sound proof system or placing generator inside the concrete structure. Moreover, operation of noisy machines and generators will be avoided to use at night.

Significant of Impacts on Air Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Air pollution	Fly ashes from boiler	3	4	2	3	27	Low Impact (U)
	Gaseous emissions from boiler	2	4	3	3	27	Low Impact (U)
	Odor from operational activities	2	4	3	3	27	Low Impact (U)
	Noise from generator	3	4	2	3	27	Low Impact (U)

Residual Impact

Even after carrying out mitigation measures, there will still be residual impact left on the environment due to the gaseous emissions especially CO_2 from the operation of the project as the emission from coal fired boiler cannot be controlled to zero emission. Moreover, noise from generator cannot be controlled to zero emission and will be remain some noise level as residual impact. All of the residual impact will be controlled by green belt development.

6.4.2. Anticipated Impacts and Mitigation Measures on Surface Water Environment during Operation Phase

Potential construction-induced impacts to surface water quality causing water pollution can be resulted due to wastewater from boilers and operation process of both factories 1 and 2 and solid wastes such as ashes, residue from boiler, production process and domestic wastes. The nearest surface water body is Hlaing River which is 1.85 km far from factory 1 and 1.88 km far from factory 2.

(a) Liquid Waste

Both factories 1 and 2 includes coal fired boilers to operate the whole processes so breakdown water will be mainly generated from those. It has been also seen that Factory 1 mostly purchased cleaned PET chips instead of used PET bottles as raw materials in production of PSF so it can be said that washing process may not be required. Unlike factory 1, factory 2 purchased used PET bottles which therefore required washing process with caustic soda. Moreover, both the factories will also produce domestic wastewater from workers and also from some parts of production processes.

(b) Solid waste

Both factories will mainly generate domestic wastes from workers and the main industrial wastes will include fly ashes, slag and bottom ashes from coal-fired boilers and from raw materials such as plastic wraps, polyester chips and cutting plastic pieces.

Significant of Impacts on Surface Water Environment before Mitigation Measures during Operation Phase

Impact on water environment during operation phase will not be significant due to the amount of wastewater produced during operation phase as the volume of nearest water bodies

(Hlaing River) is very much greater than the volume of wastewater disposed from the site). Overall, the discharge effluents from factory 1,2 and other factories within the industrial zone will travel through drains where it will be handled under the rules and regulations of CDC (MyaungTa Gar) and Industrial Supervision Committee before discharging.

Anticipated Impacts	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Surface Water Pollution	Liquid waste	2	4	2	3	24	Low Impact (U)
	Solid waste	2	4	2	4	32	Moderate Significant (C)

Consideration of Mitigation Requirement for Surface Water Environment during Construction Phase

The intensity of mitigation measures for surface water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by Impact Evaluation	Required Mitigation Scale	Responsibility
1.	Liquid waste	Low Impact (U)	No	Yes	Minor	Dahua Myanmar
2.	Solid waste	Moderate Significant (C)	No	Yes	Minor	Dahua Myanmar

Mitigation Measures for Impacts on Surface Water Environment during Operation Phase

Liquid Wastes

Wastewater treatment system will build in both factories in order to use the treated water back for the washing process of the raw materials again. Proper drainage system will be implemented in order to avoid blockage and sanitation system should also be inspected regularly to check if there is any sign of leakage.

Solid Wastes

Empty containers and bags from the production will be recycled back by selling back to the contractor weekly. Moreover, 3R (Reduce, recycle and reuse) techniques will be applied to the plastic wastes which are generated from production processes from both factories. Fly

ashes and bottom ashes from boilers will be utilized back into construction industries such as cement or concrete and they can also be used in land application as composting fertilizer. Domestics wastes are segregated and wastes like drinking water bottle will reuse in factory process, recycleable garbage (cans and soft drinks bottles) will be sold to recycler and other municipal waste from workers will be disposed at the Myaung Dagar Industrial Zone Waste Station on a daily basis..

Significant of Impacts on Surface Water Environment after Mitigation Measures

Anticipated Impacts	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Surface Water Pollution	Liquid waste	2	4	2	2	16	Low Impact (U)
	Solid waste	2	4	2	3	24	Low Impact (U)

Residual Impact

There will be no residual impact left on surface water environment during operation phase as the overall impacts related to surface water pollution are very low.

6.4.3. Anticipated Impacts and Mitigation Measures on Soil and Groundwater Environment during Operation Phase

Impacts of soil and groundwater environment during operation phase will be permeation due to leakage of fuel oil or lubricant, improper disposal of liquid and solid wastes, and on site-raw material storage.

(a) Leakage of Fuel Oil and Lubricants

Potential contamination of soil and groundwater during operation phase will possibly occur as a result of leaking of fuel and lubricants from equipment and/or on-site storage facilities. Mishandling of fuel oil, other oil products, chemicals and lubricants may permeate through soil and groundwater; leading to many further environmental problems.

(b)Improper Disposal of Liquid and Solid Wastes

During operation phase, liquid wastes such as wastewater from boilers and other operating processes and domestic wastes from workers will be produced. Moreover, coal as raw material and waste from boiler (ash and furnace residues) will also cause soil erosion if they are not properly stored. If those wastes are disposed improperly such as discharging

wastewater directly onto soil or throwing solid wastes on the ground for long time will permeate through soil and to groundwater.

(c) Improper On-Site-Raw Material Storage

On-site raw material storage will include several chemicals which are used during the operation process and water treatment process. If those chemicals such as silicon oil, PET detergent washing powder, sodium hydroxide, polyaluminium chloride are not stored properly in warehouse, those chemicals will permeate into the ground; affecting the soil and groundwater.

Impacts Significance on Soil and Ground Water Environment before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Soil and Ground Water Pollution	Leakage of fuel oil and lubricants	3	4	1	3	24	Low Impact (U)
	Improper disposal of solid and liquid wastes	3	4	2	3	27	Low Impact (U)
	Improper on-site raw material storage	3	4	2	3	27	Low Impact (U)

Intensity of Mitigation Measures for Soil and Ground Water Quality during Operation Phase

The requirement of mitigation measures for soil and ground water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Leakage of fuel oil and lubricants	Low Impact (U)	No	Yes	Minor	Dahua Myanmar
2.	Improper disposal of solid and liquid wastes	Low Impact (U)	No	Yes	Minor	Dahua Myanmar

3	Improper on-site raw material storage	Low Impact (U)	No	Yes	Minor	Dahua Myanmar

Mitigation Measures for Impacts on Soil and Ground Water

Workers will be provided with adequate knowledge about the proper waste disposal and disposal of solid wastes according to the rules and regulations of CDC (MyaungTaGar) and/or rules and regulations of Industrial Supervision Committee. Raw material (coal) will be stored in concrete floor inside the factory. Residues (fly ash and bottom ash) will be also stored in cam inside the factory before reused. Care will be taken not to leak during the handling of fuel oil and lubricants. Moreover, all of the fuel tank, lubricants containers and chemicals storage area will be stored over concrete floor or impermeable pad.

Significant of Impacts on Soil and Ground Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Soil and Ground Water Pollution	Leakage of fuel oil and lubricants	2	4	1	3	21	Low Impact (U)
	Improper disposal of solid and liquid wastes	2	4	2	3	24	Low Impact (U)
	Improper on-site raw material storage	2	4	2	2	16	Low Impact (U)

Residual Impact

There will be no residual impact left on soil and ground water environment during operation phase after mitigation measures.

6.4.4. Anticipated Impacts and Mitigation Measures on Biodiversity Environment during Operation Phase

The operation of the factory's boiler resulted in the generation of ash and gas emission. These factors can impact on various reptiles and mammals residing in burrows, potentially influencing their habitats and well-being. There are not many fauna species found in/near it can affect on some fauna species near the factory and its environs by above manners.

Moreover, it is not very significant impact by coal ash, dust particle, gas of the factory because some fauna can avoid ash and dust. But, thought noise and soil pollution can impact on borrowing animals such as snake, frog, toad, and mammals. This can lead to changes in species diversity and fauna of species composition. If waste water from factory will not recycele and release to industrial drainage system, it will also impact on aquatic biodiversity inside the Hlaing River as cumulative and long-term impact.

Significant of Impacts on Fauna Diversity

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Impact Rating
Impacts on flora and fauna diversity	Fly ash, gaseous emissions and waste water	3	4	2	3	27	Low Impact (U)

Consideration of Mitigation Requirement for Biodiversity Environment

The requirement of mitigation measures for biodiversity environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
2.	Cutting of trees, wastes and noise	Low Impact (U)	No	Yes	Minor	Da Hua Myanmar

Mitigation Measures for Impacts on Biodiversity Environment during Construction Phase

At the boundary of the factory, planting trees like barrier plants to reduce the noise, smell and dispersion of ash from operation system can create more peaceful and quieter, support visual impact and also temporary habitats for fauna. Although some ornamental plants occur in factory area, air purifying plants should garden by extra planting. All of the solid waste especially boiler ash will have to collect, store and dispose systematically. It will degrade bad smell form factory's operation system. Also, need to make sure waste water treatment system and recycle water to prevent and reduce the pollution of Hlaing River.

Significant of Impacts on Biodiversity Environment after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Impact Rating
Impacts on flora and fauna diversity	Cutting of trees, wastes and noise	3	4	2	2	18	Low Impact (U)

Residual Impact

There will be no residual impact left on biodiversity environment during operation phase as the overall impacts are very low after mitigation measures.

6.4.5. Impact on Human Environment during Operation Phase

Impacts on human environment will include socio-economic and health impacts. The anticipated socio-economic and health impacts on human environment during operation phase are as follow:

(i) Positive Socio-economic Impacts during Operation Phase

During operation phase, the following positive and negative socio-economic impacts will occur.

(a) Employment

According to the information from the developer, the proposed project will provide over 400 employment opportunities at both factories for local people during operation phase.

***Impact Significance of Job Creation without Enhancement Measures* during Operation Phase**

There will be great benefit the community to a point. As the proposed project is located near Kan Ka Lay, Kalar Kone, Myaung Tagar villages and within the industrial zone, there are many locals who are in need of jobs. Most of the residents within the industrial zone are mostly migrant workers who fled during the Nargis cyclone. Therefore, most of the workers will be migrant workers (not from nearest villages) and local residents from nearby villages.

Anticipated Impact	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Positive (+)	3	4	3	3	30	Moderate Significant (C)

Enhancement Measures for Job Creation during Operation Phase

The following enhancement measures are proposed to the developer for ensuring job opportunities for local people.

(a) Unskilled and semi-skilled job opportunities will be offered to the local communities as much as possible.

(b) Dahua Myanmar will ensure to use local labor force in operation process.

(c) As the population of females is slightly higher than that of males in the township, employment opportunities will be created to ensure that the local female population also has equal chance for these opportunities (Ensure Gender Equality).

Impact Significance of Job Creation after Enhancement Measures during Operation Phase

Anticipated Impact	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Potential to Increase in household income	Positive (+)	3	4	3	4	40	Moderate Significant (C)

Job opportunities are one of the most public needs according to the primary data collection. So, the developer has to consider job opportunities for local people during operation phase.

(b) Skill Development for Local People

Local people hired by the proposed project would remain in communities with skills acquired during project operation phase including knowledge about the industrial production and mechanical skills. Communication skills for local people will also improve in office works during operation period. This is a positive and long-term socio-economic benefit.

Impact Significance of Skill Development without Enhancement Measures during Operation Phase

The impact significance of local skill development during operation phase without enhancement measures can be considered very low as follow:

Components	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Local skill development	Construction works	Positive (+)	3	4	3	2	20	Low Impact (U)

Enhancement Measures for Skill Development

Dahua Myanmar will appoint local people as much as possible for local skill development.

Impact Significance of Skill Development after Enhancement Measure

The impact significance of local skill development during operation phase can be considered as low to moderate after enhancement measures as follow:

Components	Sources	Impact Type	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Local skill development	Construction works	Positive (+)	3	4	3	3	30	Moderate Significant (C)

(c) Potential to Growth of Local Economy and Business

The operation phase of the project will have temporary positive impacts on the local economy. In addition to the economic benefits derived from employment, the proposed development will also contribute to the local and regional economy in other ways. There will be potential to grow local business and enterprise if the developer will buy materials needed from the local market and help hand services from locals. Since the operation period is a long-term project, the required food and consumer goods are bought from the nearest villages.

Impact Significance of Growth of Local Economy and Businesses without Enhancement Measures

According to the primary data collection, there are no contractors and business for raw materials (clean bottle) in nearest villages. So, this kind of impact during operation period will be considered as low for local people in nearest villages and low for local business without enhancement measures as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Growth of local economy	Growth of economy in nearest villages	Food and consumer goods for workers	3	4	2	3	27	Low Impact (U)

Enhancement Measures for Growth of Local Economy and Businesses

If there have contractor for supply of raw material, local contractor will be contracted as raw material supplier as first priority. Any food and consumer goods that can be bought in nearest villages will be preferred as first priority. Local business for food and consumer goods in nearest villages will boost by buying required things regularly.

Impact Significance of Local Economy and Businesses after Enhancement Measures

Impact significance can be raised by enhancement measures as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Growth of local economy	Growth of economy in nearest villages	Food and consumer goods for construction workers	3	4	2	4	36	Moderate Significant (C)

(ii) Negative Socio-economic Impacts during Operation Phase

(a) Impact Associated with Population Influx

The increase of population during operation phase will increase temporary pressure on existing infrastructure and local services including health care, food, shelter, water, transport and recreational facilities. Moreover, the proposed project will use foreign workers (Chinese) and there will be some social problem associated foreign workers.

Significant of Impacts Associated with Population Influx without Mitigation Measures

As proposed project is very close to Hmawbi, there will have little impact on local health care facilities and local food consumption. Moreover, the proposed project is situated in the Industrial Zone and the requirements for housing, recreational facilities and water for construction workers will be provided by the existing facilities in industrial zone and no more facilities are required. However, there will be some social problem associated with foreign workers. Impact significances related to population influx during operation period are as follow:

Anticipated Impact	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase pressure on housing, recreational facilities, and water	2	4	1	2	14	No Impact (-)
Increase pressure on health care facility	2	4	2	3	24	Low Impact (U)
Increase pressure on adequate amount of local food	2	4	2	2	16	Low Impact (U)

Consideration of Mitigation Measures for Impacts Associated with Population Influx

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Increase pressure on housing, recreational facilities, and water	No Impact (-)	No	Yes	Minor	Dahua Myanmar
2	Increase pressure on health care facility	Low Impact (U)	No	Yes	Minor	Dahua Myanmar
3	Increase pressure on adequate amount of local food	Low Impact (U)	No	Yes	Minor	Dahua Myanmar

Mitigation Measures for Impacts Associated with Population Influx

No mitigation measures are required for pressure on housing, recreational facilities and water for additional workers because all of the workers will go back to their home in nearest villages and no more workers expact from foreign workers. All of the impacts associated with population influx can be minimized by the use of local labor force. Own health care facilities will be supported to workers during operation period.

Impact Significance of Skill Development after Enhancement Measure

All of the impacts due to increase in population can be mitigated by appointing local workers and it will also reduce pressure on health care facilities for workers.

Components	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase pressure on health care facility	2	4	2	2	16	Low Impact (U)
Increase pressure on adequate amount of local food	1	4	2	2	14	No Impact (-)

(b) Increase in Crime and Security

An inflow of skilled migrant workers and their dependents from other areas may increase in social pathologies and crime including drug and alcohol abuse, assault, theft and violence in nearest villages.

Impact Significance of Increase in Crime and Security before Mitigation Measures

The impact can be considered as low without mitigation measures and the impact rating is as follows:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase crime and security	Public security	Migrant construction workers	3	4	2	3	27	Low Impact (U)

Mitigation Measures for Increase in Crime and Security

This kind of impact can be mitigated by the use of local labor force as much as possible. The developer also needs to continue to work with the local and regional police personnel and local administrative members in the resolution of potential increase in crime and violence. All of the foreign workers will not allow going out at night. Security force will be organized and trained to put a stop to crime and violence.

Impact Significance of Crime and Security after Mitigation Measures

After systematically control of foreign and migrant workers and continuous cooperation with local administrative office and police force, the impact will be as follow:

Components	Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Increase crime and security	Public security	Migrant construction workers	3	4	2	2	18	Low Impact (U)

(c) Damage to Public Road

Transportation of raw materials and products for the operation process can cause the damage to the public road and village roads.

Significant of Impact for Public Road Damage before Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Public road damage	Operation activities	3	4	2	3	27	Low Impact (U)

Consideration of Mitigation Requirement for Public Road Damage

The intensity of mitigation requirement for Public Road Damage according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Public road damage	Low Impact (U)	No	Yes	Minor	Dahua Myanmar

Mitigation Measures

- Use alternative roads instead of public roads if feasible
- Not to exceed the resistant weight if village roads and bridges are not avoidable to be used and check regularly
- Reduce the speed of the truck
- Repair or upgrade public roads, if damaged by transportation activities

Significant of Impact for Public Road Damage after Mitigation Measures

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Public road damage	Construction activities	2	4	2	3	24	Low Impact (U)

6.4.6. Risk Assessment and Management

Risk assessment and management plan will include the risk assessment for occupational health & safety and risk assessment and management for natural disaster.

6.4.6.1. Occupational Health and Safety Risk

Employees are expected to work near the boiler and with the manual handling. It is crucial that health and safety regulations are closely followed to reduce the chance of injury and protect the lives of workers. Most common safety and health risk in the proposed project site are as follows:

- Intense heat and burn near boiler;
- Electric hazard;
- Power outage risk;
- Fugitive dust emission;
- Noise;

- Hazards of heat, flames, fire and explosion
- Hazards of manual handling and work place

(1) Intense Heat and Burn near Boiler

Workers who work near the coal fired boiler will have emotional impact intense heat intense from the boiler process (about 250 ˚C). Working in a hot environment can also cause the body to overheat. This is known as heat stress. Heat exhaustion can creep up slowly over a period of time without the worker being aware of it and can thus be very dangerous. It can also have a hazard of burn by working near the boiler because high-temperature oil, steam or water can escape from high-pressure chambers or the pipework if an interconnecting system that has been improperly locked out. Depending on the percentage of the body that is affected, burns can range from manageable to highly serious and even lethal.

Risk	Source	C	L	Rating
Suffer from Intense Heat	From the coal fired boiler and drying machine	2	3	Medium

Mitigation Measures for Intense Heat

- Wear appropriate clothing and shoes near boiler at all times.
- Wear gloves when handling or cleaning.
- Wear appropriate eye protection in all designated areas. Use hand shields when visually inspecting the furnace fire
- Wear goggles and respirators when cleaning the fire side of the boiler, breaching or chimney

(2) Electrical Hazard

The main electrical hazard is electric shock or electrocution. Live electrical parts can include the power supply, the power and work cables, and the work itself (if the work is not connected to earth ground).

Risk	Source	C	L	Rating
Electrical Hazard	In contact with live electrical parts	1	3	Low

Mitigation Measures for Electrical Hazard

- The current-carrying capacity of cables, interconnectors, terminals, etc., will be high enough to carry the maximum operation current.
- Avoid working in wet, damp or humid conditions
- Avoid working in a confined space
- Wear dry leather gloves, insulated footwear and other appropriate protective clothing
- Make sure all electrical connections are tight, clean and dry.
- Keep cables and connectors in good condition
- Avoid open-circuit voltage

(3) Power Outage Risk

The project is located in Myaung Dagar Industrial zone and the power outage can happen due to the excessive power load of other factories. In the event of power failure, it can cause many electrical problems that affect the operation, pollution control, lighting, control room, alarm, plant safety and worker safety. When the power outage occurs, the lighting and ventilation system will get failure. When the ventilation system stops, the gaseous can enter into the factory due to its draw back action. Inhalation of these gases can cause many respiratory problems for worker.

Risk	Source	C	L	Rating
Worker Health and Safety Problem	Power Failure	1	4	Medium

Mitigation Measures for Power Outage Risk

The plant will install the most reliable equipment available on market that can withstand disruption caused by weather, power surges, blackouts, and any other outside elements. Since no equipment is perfect, the reliability engineers and operators still need to prepare for the worst-case scenarios as well as the most frequently occurring possibilities. This is where they utilize prevention techniques to detect and fixed the problems before they lead to a power failure, and select protective equipment accordingly.

If power outage occurs,

- Remain calm
- Assess the extent of the outage in your area

- Report the outage to Maintenance Customer Service
- Help persons in darkened work areas move to safety
- Unplug personal computers and non-essential equipment, turn off light switches
- Open windows for additional light and ventilation
- Do not light candles or other types of flames for lighting

Plants must be equipped with emergency generators that activate automatically in the event of an outage. When the generator are equipped, become familiar with the location of electrical outlets provided with emergency power, ensure that critical equipment is plugged in to emergency outlets, do not use emergency power outlets for non-critical equipment if it can be avoided.

If asked to evacuate, secure any hazardous materials if it is safe to do so and proceed directly to the designated Emergency Assembly Point (EAP) for the building you are in and check in. Consult Evacuation Procedures for additional information.

(4) Fugitive Dust Emission

Fugitive dust will emit ash from the boiler operation. It may result in external and internal health problems which may be immediate, short term or long term.

Risk	Source	C	L	Rating
Fugitive Dust	operation of boilers	1	4	Medium

Mitigation Measures for Fugitive Dust Emission

Emission of fugitive dust can be controlled by spraying of water on the road and vehicles delivering materials will be covered to reduce spills and dust blowing off the road. Cloth bag dust collector and electrostatic precipitator will be installed along with boiler to collect fly ash. Every worker who is working near the boiler will use mask.

(5) Noise

Noise will produce from the machineries used for the raw materials preparation and final product production. The machineries used for the classification of raw materials produce 101 dB which generates noise of a higher frequency. Auxiliary generator will also produce high noise level. Exposure to noise over a period of time can result in impairment or loss of hearing. The Occupational Safety and Health Administration (OSHA) has recommended permissible noise exposure limit for industrial workers, which is based on 90dB (A) for 8 hours exposure a day with 5 dB (A) trading rates. The limits are given below.

Table – Permissible Exposure Noise Limits

Total Time of Exposure Per Day in Hours	Noise Level dB (A)
8	90
6	92
4	95
3	97
5	100
1	105
½	110
¼	115

According to OSHA, the maximum allowable noise level for the workers is 90 dB (A) for 8 hours exposure a day.

Risk	Source	C	L	Rating
Noise	Machineries used for classification of raw materials and grinding machine	1	5	Medium

Running the various production machines and using generator during operation can generate noise. Both acute loud noise and chronic lower-level noise have been associated with a variety of negative health effects. Hearing loss and impairment are known to occur as a result of exposure to acute, high decibel noise (greater than 85 dB). Noise annoyance can lead to stress related impacts on health such as feelings of displeasure, interference with thoughts, feelings, and activities and disturbed sleep and can have impacts on mood, performance, fatigue, and cognition.

Mitigation Measures for Noise

Adequate protective measures in the form of ear muffs/ ear plugs to the workers working in high noise areas will be provided because noise level near the grinding machine and separation machine will exceed 90 dB(A). To begin with, an examination will be made to see whether the process or production set-up can be modified to avoid the sources of noise.

- Operating noisy machines during shifts when fewer people are exposed
- Use ear protectors if the noise is disruptive or if there is a risk of hearing damage.
- Limiting the amount of time, a person spends at a noise source

- Providing quiet areas where workers can gain relief from hazardous noise sources
- Restricting worker presence to a suitable distance away from the noisy equipment

(6) Hazards of Manual Handling and Workplace

Manual handling can present a hazard during lifting, lowering, carrying, pushing, tools, materials, equipment and consumables, etc. One of the most common injuries experienced by workers is back injury during manual handling. Other general sources of hazard on industrial premises include moving machinery, site, transport, and delivery vehicles.

Risk	Source	C	L	Rating
Hazard of manual handling and workplace	During lifting, lowering, carrying, pushing, tools, materials, equipment	2	4	Medium

Mitigation Measures for Manual Handling and Workplace

(a) Using specialized or dedicated lifting equipment and systems

(b) Proper safe training should give all employees.

(c) Maintain tidy work areas, removing obstructions and discarded items greatly reduce the risk of injury.

To mitigate occupational impacts on workers, Dahua Myanmar will prepare occupational health and safety management plan for the construction workers based on the EMP. Posters shown in the following figures in Myanmar language and any other language appropriate will be displayed at the site.

Safety Sign

Personal protective equipment such as safety shoes, safety gloves, helmet, goggles, earmuffs etc., will be provided during construction. For the safety of construction staff, adequate safety measures including availability of first-aid facilities are made available on the project site.

Da Hua will design and constructed in careful consideration of physical stability, structural load capacity, proper ventilation, lighting, fire prevention, sanitation and general safety issues, and will comply with all relevant health and safety requirements, mainly issued by Ministry of Industry. To prevent and reduce of occupational health and safety, anti-slip stair tape treads will be equipped along the stair for highlighting step edge and avoid slipping. Qualified first-aider will be provided at all times. A good ventilation system will be arranged at labor concourse for employees. For food handling, preparation and storage areas for dry and wet food will be arranged for workers and guests' food hygiene. Workers will also be provided with training programs.

6.4.6.2. Risk Assessment for Natural Disaster

Although there was no natural disaster in the project area according to the secondary data collection earthquake, flood, and fire hazards can be considered as the most possible natural disaster because the proposed project is situated in Myaung Dagar Industrial Zone and near Hlaing River.

(a) Earthquake Risk

Damage from earthquakes occurs through several mechanisms. Surface displacements across the fault rupture can directly damage facilities that cross the rupture or, if under the ocean can cause tsunamis. Shaking from seismic waves can derail cars and locomotives, can directly damage structures. Appropriate measures to minimize damage or facilitate recovery depend on the mechanism causing the damage.

Magnitude	Earthquake Effects	Estimated Number Each Year
2.5 or less	Usually not felt, but can be recorded by seismograph.	900,000
2.5 to 5.4	Often felt, but only causes minor damage.	30,000
5.5 to 6.0	Slight damage to buildings and other structures.	500
6.1 to 6.9	May cause a lot of damage in very populated areas.	100
7.0 to 7.9	Major earthquake, Serious damage.	20
8.0 or greater	Great earthquake Can totally destroy communities near the epicenter.	One every 5 to 10 years

Earthquake Magnitude Classes

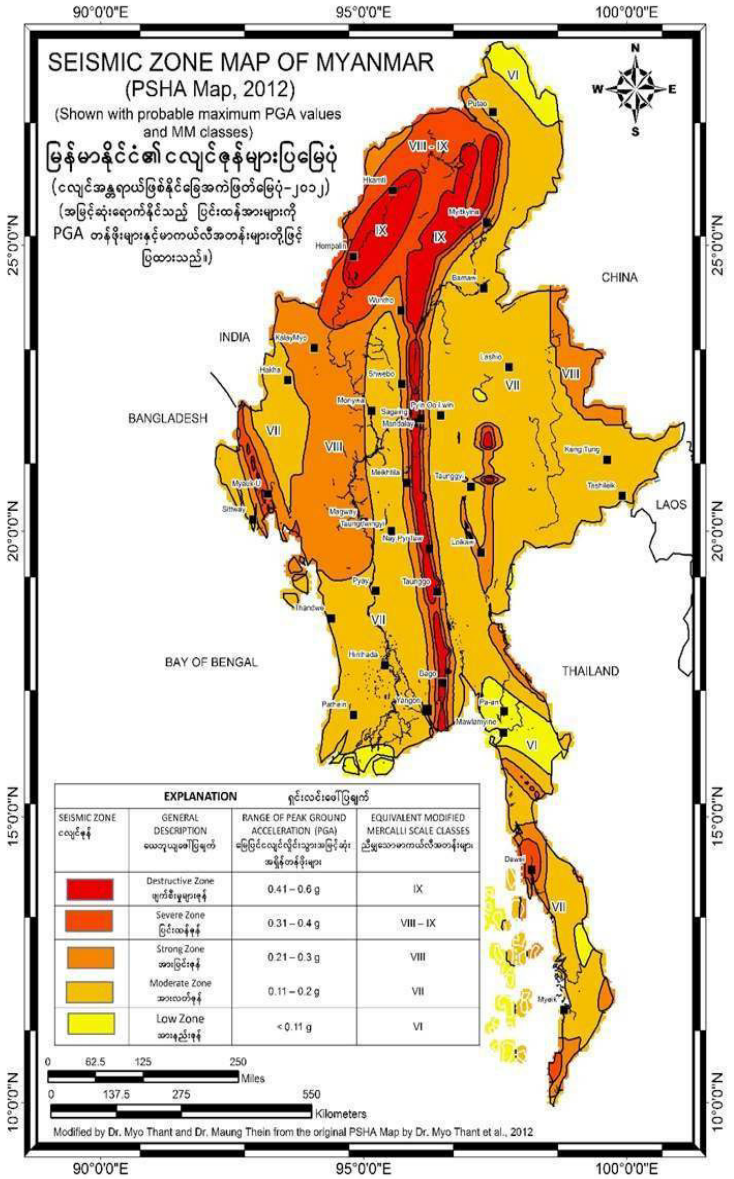
Earthquakes are also classified in categories ranging from minor to great, depending on their magnitude.

Class	Magnitude
Great	8 or more
Major	7 to 7.9
Strong	6 to 6.9
Moderate	5 to 5.9
Light	4 to 4.9
Minor	3 to 3.9

Source: UPSeis

Earthquakes in last 50 years (Source: volcanodiscovery.com)

Township	Date	Magnitude (Richter Scale)	Coordinates	
			Latitude	Longitude
Hmawbi	29.3.2005	4.2	17°13'19.2"N	95°58'26.4"E
	30.3.2017	4.2	17°9'12.24"N	95°54'18.72"E



Probabilistic Seismic Hazard Assessment Map (PSHA Map) of Myanmar showing expected peak ground acceleration (PGA) values with 100% probability in 500 years. (Note: 0.21 - 0.3 g zone in the northern part of Shan State is taken from the Seismic Zone Map of Myanmar by Dr. Maung Thein et al., 2005)

Figure – Seismic Zone Map of Myanmar

Calculation of Probability

In Hmawbi township, an earthquake of magnitude 4.2 Richter Scale occurs in 2005 and 2017. As stated in the above table, the probability of earthquakes, which can be slight to moderate damage (Richter Scale 4 – 5) can be occurred in next 10 years can be taken as "Possible".

Calculation of Consequences

Before Mitigation Measures

Earthquakes in this region are generally 4 to 4.9 Richter Scale, which can be moderate damage to the structures and it is classified as moderate zone in seismic zone map of Myanmar. So, the consequences can be "Moderate".

After Mitigation Measures

After mitigation measures, the consequences taken as "Moderate" can be reduced to "Minor.

Earthquake Risk Assessment Table

Township	Consequences	Probability	Initial Risk	Mitigation Measures	Consequences after mitigation	Probability after mitigation	Reduced Risk
Hmawbi	Moderate	Possible	Medium	• BIS codes relevant to the project site shall be adopted for building standards • Fasten shelves securely to walls.	Minor	Possible	Low

Mitigation Measures for Earthquake Risk

- BIS codes relevant to the project site shall be adopted for building standards
- Fasten shelves securely to walls.
- All the occupiers should be made aware to place large or heavy objects on lower shelves.
- Information would be provided to store breakable items such as bottled foods, glass, and china in low, closed cabinets with latches.
- Hang heavy items such as pictures and mirrors away from beds, settees, and anywhere people sit.
- Repair defective electrical wiring and leaky gas connections. These are potential fire risks.
- Store flammable products securely in closed cabinets with latches and on bottom shaves.

- Identify safe places indoors and outdoors for occupiers:
  a) Under strong dining table or bed
  b) Against an inside wall.
  c) Away from where glass could shatter around windows, mirrors, pictures, or where heavy bookcase or other heavy furniture could fall over.

• Emergency telephone numbers (doctor, hospital, police, etc.) would be displayed on both floors and booklets of the same should be available/ displayed prominently in all rooms.

(b) Flood Risk

For Yangon Region, there are generally two types of floods that occur in Yangon: (i) a combination of riverine floods and flooding due to cyclone and storm surge; and (ii) localized floods. The first type is caused by high water levels in the river and coastal region during the rainy season and the second type is mainly triggered by heavy precipitation. Some flooding can also be attributed to other factors, such as poorly built infrastructure or limited capacity of drainage systems. Sometimes, it can cause man-made flood that caused by insufficient capacity of drainage system during high tide; reduced drainage performance caused by waste accumulation, informal obstacles, sedimentation and inappropriate maintenance of drainage network; decreased retention capacity due to urban development and the encroachment of natural catchment areas due to the expansion of living settlements. The inundation areas are distributed over almost all of the Yangon Region, but the expected inundation depths are just between 0.1m and 1.0m. The flooded area is very limited in the target region, but the maximum expected inundation depth is 2.0m. The expected inundation areas are widely spread, with depths between 0.1m and 2.0m.

Flood History in Last 20 years (Source: DVB News and Hazard Profile of Myanmar)

More than a hundred families in Hmawbi Township are in urgent need of food and water after being displaced from their homes which were hit by flooding in August, 2016. According to local government officials, 103 households in the village tracts of Myaungdaga and Myitkyo were forced to evacuate their inundated homes due to flood and it caused the damage to the houses in Hmawbi Township.

Calculation of Probability

The proposed project is located near the Hlaing River but the annual rainfall in Yangon is relatively low of 2,681mm. According to the figure of cumulated flooding map of Myanmar, the number of years of flood exposure is relatively low and so, the probability can be taken as “Unlikely”.

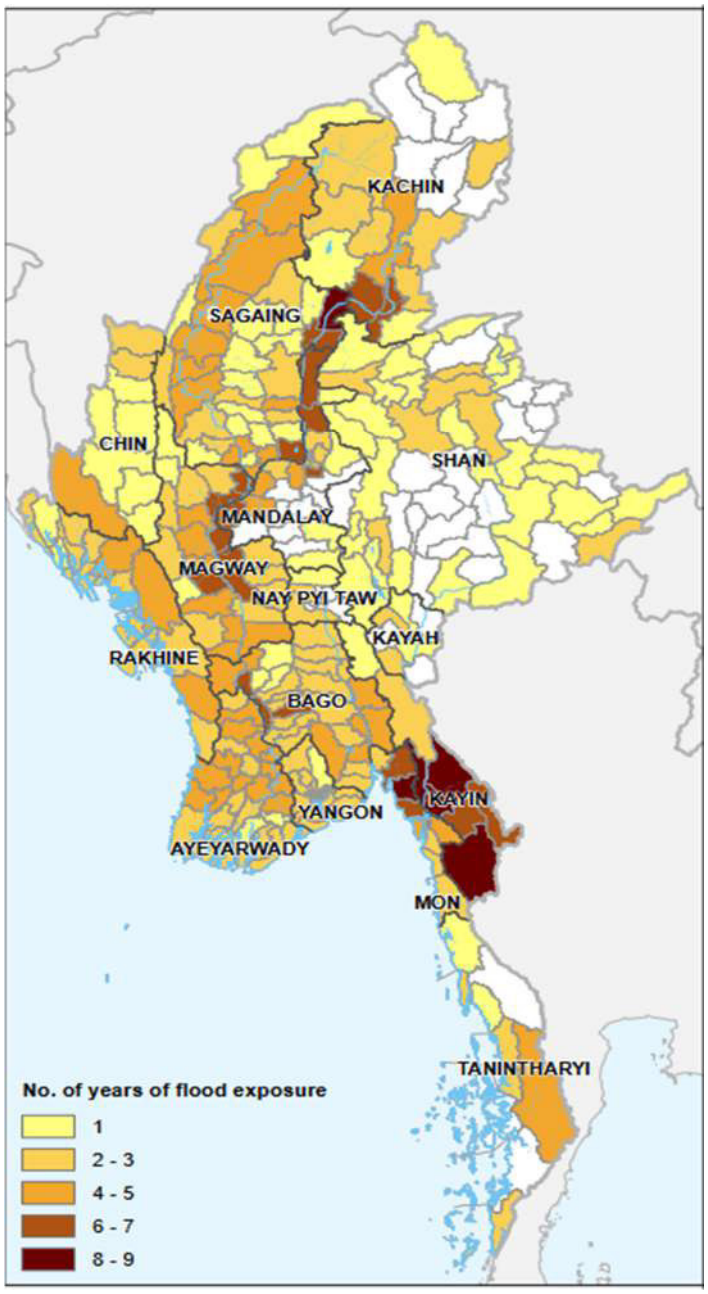
Calculation of Consequences

Before Mitigation

Flash floods occurred during 2016 in Hmawbi Township and it caused damaged to the nearby residential area and 103 households in the villages within the Hmawbi Township were forced to evacuate their inundated homes due to flood. So, it can be classified as "High".

After Mitigation Measures

After proper mitigation measures and flood control measures, consequences of flash floods can be reduced to "Minor".



Source: Myanmar Information Management Units

Figure – Cumulated Flooding (2008 – 2021)

Flood Risk Assessment Table

Region & flood type	Consequences	Probability	Initial Risk	Mitigation Measures	Consequences	Probability	reduced risk
Hmawbi (Flash Flood)	3	2	6 (Medium)	• Proper drainage system • Re-vegetation after cutting trees in the vicinity	1	2	2 (Low)

Control Measures for Flood Risk

(a) Before a flood

Prepare factory for a flood. Call local building department or office of emergency management for information.

- Purchase flood insurance.
- Keep all insurance policies and a list of valuable items in a safe place.
- Take photos or a videotape of the valuables you keep in your home.
- Listen to your radio or television for reports of flood danger.
- Keep your car filled with gas.

(b) During a flood

- Do not try to walk or drive through flooded areas. Water can be deeper than it appears and water levels rise quickly. Follow official emergency evacuation routes. If your car stalls in floodwater, get out quickly and move to higher ground.
- Stay away from moving water; moving water six inches deep can sweep you off your feet. Cars are easily swept away in just two feet of water.
- Stay away from disaster areas unless authorities ask for volunteers.
- Stay away from downed power lines.
- If your home is flooded, turn the utilities off until emergency officials tell you it
- is safe to turn them on. Do not pump the basement out until floodwater recedes. Avoid weakened floors, walls and rooftops.
- Wash your hands frequently with soap and clean water if you come in con-tact with floodwaters.

(c) After a flood

- Wear gloves and boots when cleaning up.
- Open all doors and windows. Use fans if possible to air out the building.

- Wash all clothes and linens in hot water.
- Discard mattresses and stuffed furniture that they can't be adequately cleaned.
- Wash dirt and mud from walls, counters and hard surfaced floors with soap and water. Then disinfect by wiping surfaces with a solution of one cup bleach per gallon of water.
- Discard all food that has come into contact with floodwater. Canned food is alright, but thoroughly wash the can before opening.
- If your well is flooded, your tap water is probably unsafe. If you have public water, the health department will let you know—through radio and television— if your water is not safe to drink. Until your water is safe, use clean bottled water.
- Learn how to purify water. If you have a well, learn how to decontaminate it.
- When floodwaters have receded watch out for weakened road surfaces.

Workers' Safety during Flood

The following factors should aware to all of the workers to safe during flood.

(a) Do not walk through flowing water. Six inches of moving water can knock you off your feet. Use a pole to test the depth of standing water before you proceed.

(b) Do not drive through a flooded area. Two feet of water will carry away most automobiles.

(c) Stay away from power lines and electrical wires.

(d) Turn off your all electricity if your building is flooded.

(e) Watch out for hiding animals.

(f) Look before you step. Mud can be very slippery to walk on. Broken glass, nails and other debris may be deposited by receding floodwaters.

(g) Be alert for gas leaks. Leave the area immediately if you smell gas fumes.

(c) Fire Risk

Fire Hazards

The chances of a fire starting will be low if the premises have few ignition sources and combustible materials are kept away from them. In general, fires start in one of three ways:

- Accidentally, such as when smoking materials are not properly extinguished or when lighting displays are knocked over;

- By act or omission, such as when electrical equipment is not properly maintained or when waste packaging is allowed to accumulate near a heat source, or by storing LPG next to an electric fire or other source of heat; or
- Deliberately, such as an arson attack involving setting fire to external rubbish bins placed too close to the building.

Electrical Fire Hazard

Electrical equipment is a significant cause of accidental fires in premises. The main causes are:

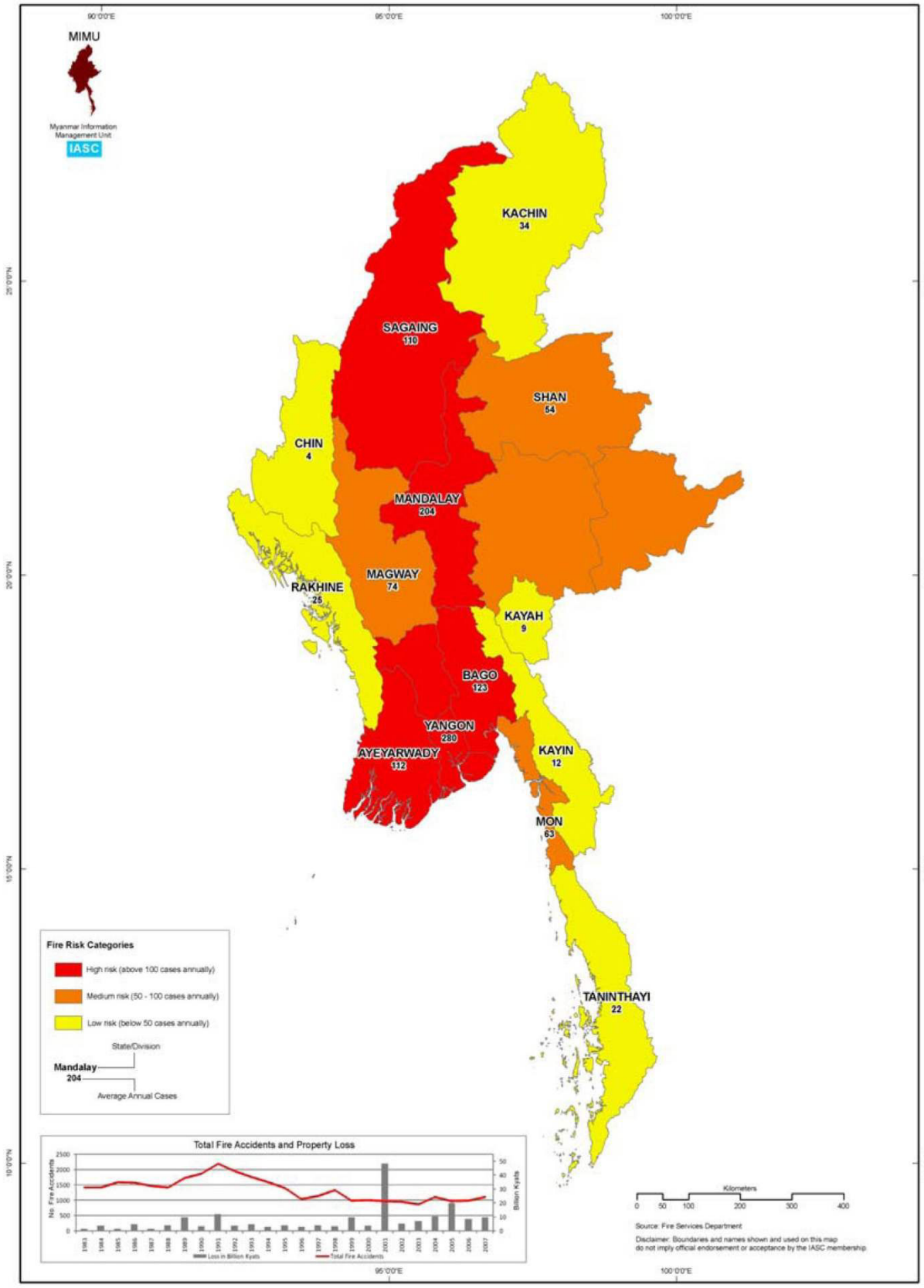
- Overheating cables and equipment, e.g., due to overloading circuits;
- Incorrect installation or use of equipment;
- Lack of maintenance or testing of equipment;
- Incorrect fuse rating;
- Damaged or inadequate insulation on cables or wiring; combustible materials being placed too close to electrical equipment which may give off heat even when operating normally or may become hot due to a fault;
- Arcing or sparking by electrical equipment; and
- Embrittlement and cracking of cable sheathing in cold environments.

Calculation of Probability

The proposed project area is located within the Myaung Dagar Industrial Zone so it can cause the electric fire or other fire hazard from the other industries. According to the data from the www.mdn.gov.mm, it caused the fire cases in other industries which is located in industrial zone (2) street in 2020. Result from the Fire Risk Map of Myanmar, Yangon occurred 280 annual fire causes and it is involved in “High Risk Zone”. However, it can have a large amount of flammable materials and chemical which can cause the explosion and fire burning in the industrial zone. So, the probability of fire cases in the industrial zone can be taken as “High”.

Calculation of Consequences

According to the following figures, the annual final loss for the Yangon region is between the 50 – 100 million kyats. So, the consequences can be calculated as “Low”.



Source: Hazard Profile of Myanmar

Figure – Fire Risk Map (Based on Fire Cases from 1983 to 2007)

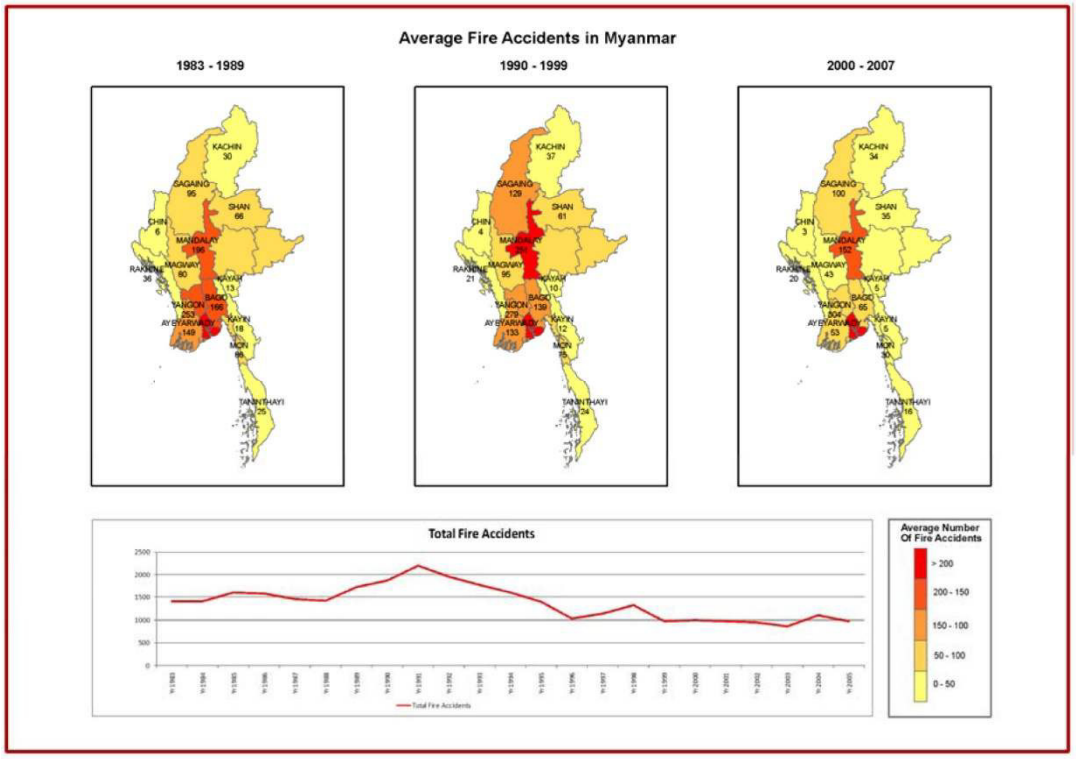


Figure – Annual Average Fire Cases (Sources: Hazard Profile of Myanmar)

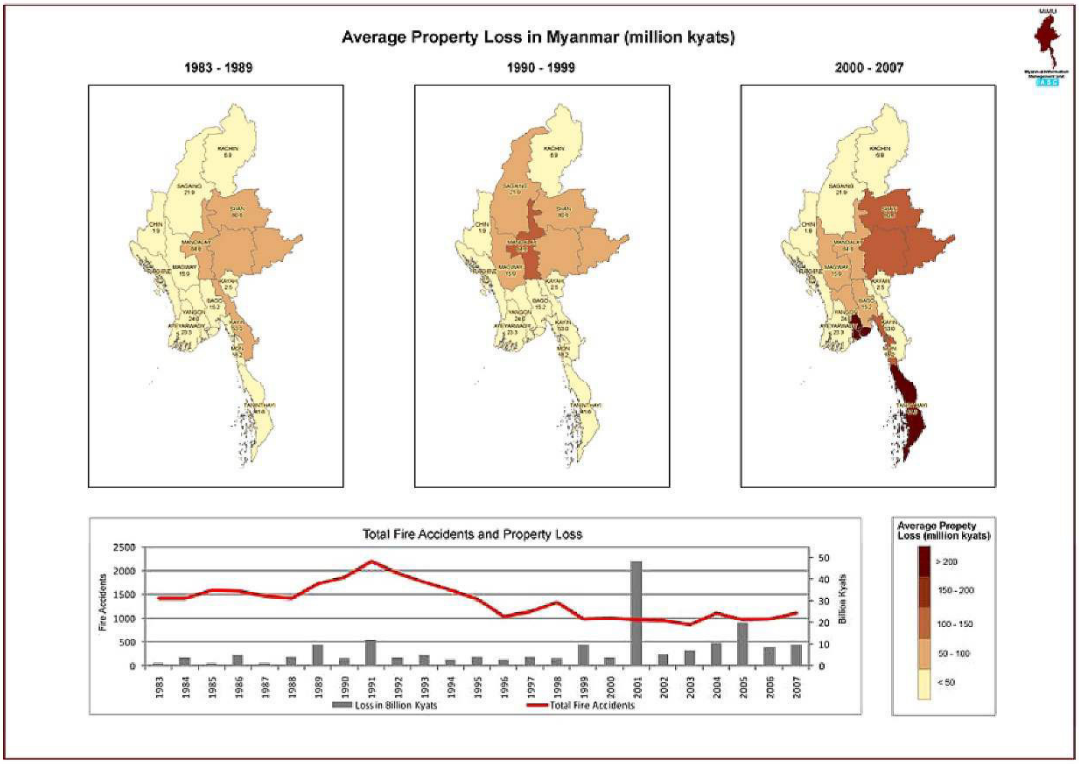


Figure – Average Annual Financial Losses due to Fire

((Sources: Hazard Profile of Myanmar)

Fire Risk Assessment Table (Based on 3x3 Matrix)

Region	Consequences	Probability	Initial Risk	Mitigation measures
Yangon	Low	High	Low	• Control fire properties of combustible items • Provide for the suppression of the fire • High voltages lines require much thicker insultation, therefore the conditions should be made that the higher the voltage, the thicker the insultation

Precaution Measures for Fire Hazards

The following basic precautions are recommended.

- Install only appliances that have the label of a recognized testing laboratory
- Switches and fuses conform to the correct rating of the circuit
- Use only surge protectors or power strips that have internal overload protection and have ISI or BEE label
- Trash/waste is properly stowed in trash/ recycling bins, not piled up in any area, especially doorways.
- Extension cords are not in permanent use; those that are should be industrial grade and grounded.
- All power strips are UL listed with built-in-circuit breakers
- Cigarette butts and containers are away from the building, shrubbery and flammable materials.
- Combustible materials/liquids are stored securely in approved cabinet per OSHA regulations.
- Electrical appliances are GFCI protected; nothing hot is on without someone in attendance.
- Nothing is hanging from fire sprinkler piping or sprinkler heads.
- Fire pump rooms/ riser rooms are 100% free of anything other than fire protection equipment.
- All supplies/stock/merchandise are at least 3 ft from heating units and ductwork.
- All fire extinguishers are fully charged, not damaged, and readily accessible; none are missing.

6.5. Anticipated Impacts and Mitigation Measures during Decommissioning Phase

All structures in the proposed site will be demolished and removed from the premise including the building and the drainage systems. The decommissioning of the proposed project will include (1) dismantling of equipment, (2) demolition of concrete structures, (3) decontamination activities and (4) disposal of demolishing materials.

6.5.1. Anticipated Impacts and Mitigation Measures on Air Environment during Decommissioning Phase

Impacts on air environment during decommissioning phase will be as follows:

(a) Fugitive dust generation from transportation and demolition activities;

(b) Vehicular emissions related to the transportation of personnel and solid construction wastes; and

(c) Noise from the machineries.

(a) Fugitive Dust and Gaseous Emissions

Dust will be generated from the vehicular movement. Vehicular emissions from the movement of trucks, vehicles and mototrcycles and dust from the ground can occur during the decommissioning phase. The operation of machinery and construction equipment is also likely to generate gaseous emissions. These activities will affect neighborhoods (especially for local residents beside the project site) though the decommissioning period is not a long term.

(b) Increased in Noise Level

Construction noise is expected to generate at the demolition site. The activities that are ear marked to generate noise are loaders, excavators and cranes among others.

Significance of Impacts on Air Environment during Decommissioning Phase

The significance of impacts on air environment during decommissioning phase will be as follow:

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Gaseous emission	Decommissioning activities	2	1	2	3	15	Low Impact (U)

Noise	Noise from construction equipment	2	1	1	4	16	Low Impact (U)

Consideration of Mitigation Measures Requirement for Air Environment during Decommissioning Phase

The requirement of mitigation measures for air environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Receptor	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by Impact Evaluation	Mitigation Scale	Responsibility
1.	Gaseous emissions	Local communities	Low Impact (U)	No	Yes	Minor	Construction service provider(s)
2.	Noise	Workers at site	Low Impact (U)	No	Yes	Minor	Construction service providers

Mitigation Measures for Air Environment

Da Hua will do the following mitigation measures of air environment during decommissioning phase.

(a) Mitigation Measures for Gaseous Emissions

Certain mitigation measures will be adopted to limit atmospheric impacts to as great an extent as possible during decommissioning phase. For instance, the transportation of personnel and materials will be scheduled such as to avoid periods of peak flow where congested conditions are more likely, and to reduce the overall number of vehicular movements. In addition to careful traffic management, close adherence to the recommended maintenance regime will be applied to both on-site and off-site vehicles.

Reduction of SO_2 and CO Emissions: Good engine condition vehicles with good quality fuel will be used.

(b) Mitigation Measures for Noise

For minor mitigation measures, it is necessary to avoid the following activities:

- running construction machineries at the same time; and
- working at night.

6.5.2. Anticipated Impacts and Mitigation Measures on Surface Water Environment during Decommissioning Phase

Waste generated from demolition activities will have potential to surface water pollution and will include construction debris and wastes from the workers. Drainage and seepage from construction waste dumping site during decommissioning phase will have impact on surface water pollution. Mobilization and transport of soil materials may result in impacts to the water quality in nearest sea water. It will be more evidence in rainy seasons (June to September).

(a) Wastes from Demolition

Waste materials (pallets, steel structure off-cuts, and concrete waste) will be produced during this decommissioning phase. If those wastes are not properly managed, there will have potential to imapcts on surface water pollutions.

(b) Oil and Lubricants

Fuel oil from trucks and cars, and lubricants and grease from machineries can leak during decommissioning phase. This leakage can cause surface water pollution for a while.

(c) Domestic Wastes from Workers

A small amount of domestic waste will be generated from demolition workforce. The establishment of labour camps will also affect on environment through improper waste (solid & garbage /sewage) disposal.

Significance of Impacts on Surface Water Environment during Decommissioning Phase

Impact on water environment during decommissioning phase will not be significant as follow:

Anticipated Impacts	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Surface Water Pollution	Construction Debris	2	1	2	2	10	No Impact (-)
	Oil and Lubricants	2	1	2	2	10	No Impact (-)
	Domestic Wastes	2	1	2	2	10	No Impact (-)

Consideration of Mitigation Measures Requirement for Surface Water Environment during Decommissioning Phase

The intensity of mitigation measures for surface water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by Impact Evaluation	Required Mitigation Scale	Responsibility
1.	Construction Debris	No Impact (-)	No	Yes	Minor	Construction Service Provider(s)
2.	Oil and Lubricants	No Impact (-)	No	Yes	Minor	Construction Service Provider(s)
3.	Domestic Wastes	No Impact (-)	No	Yes	Minor	Construction Service Provider(s)

Mitigation Measures for Impacts on Surface Water Environment

Although impact on water environment during decommissioning phase will not be significant, Da Hua will conduct the following measures to prevent surface water pollution during decommissioning.

(a) Wastes from Demolition

The demolition activities will not start during monsoon season. All stacking and loading area will be provided with proper drains to prevent run off from the site to enter any water body. The wastes must be disposed in accordance with the rules and regulations from CDC (Hmawbi).

(b) Oil and Lubricants

Any leakage of oil and lubricants from vehicles and machineries used in decommissioning phase should be avoided. Regular maintenance of those machineries should be conducted.

(c) Domestic Wastes from Workers

Waste water channels from the site should be connected to the septic tank during the decommissioning to prevent wastewater from entering the nearest water bodies.

6.5.3. Anticipated Impacts and Mitigation Measures on Soil and Ground Water Environment during Decommissioning Phase

Impact of soil and groundwater environment during decommissioning phase will be leakage of fuel oil, leakage of lubricants and disposal of wastes.

(a) Leakage of Fuel Oil and Lubricants

Potential contamination of soil and groundwater during decommissioning phase could possibly occur as a result of leaking of fuel and lubricants from machineries and/or temporary on-site storage facilities. Handling of fuel oil, other oil products, chemicals and lubricants may constitute a risk for pollution of soil and ground water.

(b) Demolition Wastes and Domestic Wastes

During decommissioning phase, there will have potential to soil contamination and ground water pollution if the solid wastes from demolition activities are not properly disposed. Moreover, seepage and drainage from waste dump site will also impact on soil and ground water qualities.

Significance of Impacts on Soil and Ground Water Environment before

Wastes produced from the demolition have potential to impacts on soil and groundwater in project site. This will be minor, temporary low possibility due to the decommissioning period, and the significance of impacts is shown in the following table:

Anticipated Impact	Sources	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Soil and Ground Water Pollution	Leakage of fuel oil and lubricants	2	1	1	2	8	No Impact (-)
	Demolition wastes and Domestic Wastes	2	1	2	2	10	No Impact (-)

Intensity of Mitigation Measures for Soil and Ground Water Quality

The requirement of mitigation measures for soil and ground water environment according to the consideration of impact rating and public concerns are as follow:

No.	Parameters	Impact Rating	Public Concern through Public Consultation Processes	Mitigation Requirement by impact evaluation	Required Mitigation Scale	Responsibility
1.	Leakage of fuel oil and lubricants	No Impact (-)	No	Yes	Minor	Construction Service Providers
2.	Demolition wastes and domestic wastes	No Impact (-)	No	Yes	Minor	Construction Service Providers

Mitigation Measures for Impacts on Soil and Ground Water Environment

Wastes produced from the demolition have potential to impacts on soil and groundwater in project site. There will be minor mitigation measures such as disposed of solid wastes according to the rules and regulations of CDC (Mhawbi) and/or rules to reduce impacts of solid wastes during decommissioning phase. Care should be taken not to leak during the handling of fuel oil and lubricants. All of the fuel tank and lubricants container have to store over concrete floor or impermeable pad. Every machinery used in construction phase will be in good conditions.

6.5.4. Anticipated Impacts on Socio-Economic Environment during Decommissioning Phase

Negative Socio-Economic Impacts

The negative socio-economic impacts during decommissioning phase are as follows;

(i) Loss of Jobs for Local People and Revenues for the Government

In the event of the project closure, there will be potential negative impacts resulting in loss of jobs and indirect employment depending on the operation of proposed and of associated services for tourism as well as loss of revenues for the government.

Being a developing country, loss of job opportunities and revenues for regional governments will be greatly affected by GDP. So, impact significantly will be considered as low to moderate for loss of jobs due to the insignificant number of workers appointed during the operation phase and moderate for loss of revenues due to the importance of income from the industrial sector.

Significance of Impacts on Loss of Jobs for Local Community and Revenues for Government before Mitigation

Being a developing country, loss of job opportunities and revenues for regional governments will be greatly affected by GDP. So, impact significantly will be considered as low to moderate for loss of jobs due to the insignificant number of workers appointed during the operation phase and moderate for loss of revenues due to the importance of income from the industrial sector.

Anticipated Impact	Magnitude	Duration	Extend (Area)	Probability	Total	Category
Loss of jobs	3	5	3	4	44	Moderate Significant (C)
Loss of revenues	3	5	4	5	60	Very High Significant (C)

Consideration of Mitigation Measures for loss of jobs for local community and revenues for government

The required mitigation measures for loss of jobs for local communities and revenues for government are as follow:

No.	Parameters	Impact Rating	Public Concern	Mitigation Requirement	Mitigation Scale	Responsibility
1.	Loss of job	Moderate Significant (C)	No	Yes	Sensible	Project developer
2.	Loss of revenue	Very High Significant (A)	No	Yes	Sensible	Project developer

Mitigation Measures for Loss of Jobs for Local People and Revenues for the Government

Extensive and comprehensive warning to employees to allow them to source alternative livelihood will be taken early. Project developers will prepare their employees for forced retirement by providing applicable jobs at other factories under the same developer, if feasible. Moreover, the developer will prepare a plan to reuse the workers in the proposed project with another partner company to retain the revenue for the government. This must be compatible with labour law when reusing the workers in other projects.

7.0. CUMULATIVE IMPACT ASSESSMENT

Cumulative Impact Assessment is the process of assessing potential effects on receptors from environmental and social impacts caused by the combined influence of more than one project. Evaluation of potential cumulative impacts is an integral element of an impact assessment.

7.1. Methodology and Approach

The cumulative environmental effects of the Project in combination with other projects or activities that have been or will be carried out are assessed. The assessment is carried out in the form to facilitate the evaluation, followed by a detailed discussion of how the Project may overlap with other projects or activities that have been or will be carried out and interact with the environment and mitigation measures.

The analysis of cumulative impacts in this section follows the processes recommended by EIA procedure (2015) and the regulations at Section 42 of the Environmental Conservation Law. Cumulative impacts in relation to an activity are defined in the EIA Regulations (Government Notice R543) as meaning "the impact of an activity that in it may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area". Cumulative impacts were assessed by taking into consideration of potential environmental impacts of the proposed project and other related activities that had happened in the past, currently is happening at present and likely to happen in the future.

7.2 Cumulative Impacts and Mitigation Measures

As the proposed project is situated within the industrial zone, the following are the anticipated cumulative impacts due to the present of many other industires within the industrial zone.

7.2.1. Traffic and Road Damage as Cumulative Impact

In an industrial zone, the cumulative impact of traffic and road damage is substantial and multifaceted. The high volume of vehicles moving in and out from the factories within the industrial zone including heavy trucks, delivery vehicles, and employee vehicles, leads to traffic congestion. The continuous movement of heavy-duty vehicles cause the road damage such cracks, rutting and structural damage.

Mitigation Measures for Traffic and Road Damage

- Implement weight restrictions for certain roads to prevent damage caused by excessively heavy vehicles
- Regular and timely road maintenance to address issues like potholes and cracks before the extensive repairs
- Restrict the vehicle speed not to cause the road damage inside the industrial zone.

7.2.2. Noise as Cumulative Impact

The continuous operation of machinery, heavy equipment and transportation vehicles from the PSF and PPPT factories and also from the various factories within the industrial zone generates significant noise levels and hearing impartment for workers and nearby residents.

Mitigation Measures for Noise

- Use sound proof system in generator
- Adjust work schedules to minimize noisy activities during sensitive hours, such as nights to reduce the impact on nearby residents.
- Replant the trees near the factories compound to reduce noise emission

7.2.3. Gaseous Emission as Cumulative Impact

The proposed PSF and PPPT factories used boilers for the operation purposes and it can emit gases to the surrounding environment. The other factories inside the industrial zone use boiler and other equipment that can cause the gaseous emission. The cumulative impact of gaseous emission from boiler, machineries and vehicles used in an industrial zone can have severe and wide-ranging consequences on the environment. The emission results in degraded air quality, smog formation as well as regional and downwind air pollution impacts.

Mitigation Measures for Gaseous Emission

- Install air pollution control technologies, such as scrubbers and catalytic converters to remove harmful pollutants from boiler emissions
- Maintain the machineries and vehicles regularly
- Use good quality coal
- Improve the energy efficiency of industrial processes to reduce the overall fuel consumption and consequently, the emission of greenhouse gases.

7.2.4. Surface Water Pollution as Cumulative Impact

Although there will have very little impact on surface water environment during operation phase (the volume of waste water compared to the volume of river water). Waste water from the PPPT and PSF factory in Hlaing river will be impact on surface water quality (river water quality) around the river. Not only the proposed factories but also the other factories within the industrial zone can discharge to the nearest Hlaing river. The discharge of wastewater from the industrial zone can cause detrimental effect to both the aquatic ecosystem and human communities relying on water resources.

Mitigation Measures for Wastewater

Da Hua will implement wastewater treatment plant for the PPPT and PSF factory located near the Hlaing River. The water quality monitoring for the effluent water from the wastewater treatment plant will be performed and take special care not to discharge the wastewater directly into the river.

- Implement efficient and adequate wastewater treatment system to remove pollutants from the factories before released into surface water bodies.
- Encourage industries to adopt pollution prevention strategies to minimize the generation of wastewater and pollutants at the source such as cleaner production methods, recycling water within processes
- Ensure that stormwater and wastewater are kept to prevent the accidental discharge of pollutants during heavy rainfalls events.

7.3. Anticipated Residual Impacts and Mitigation Measures

According to the impact examination, all of the environmental impacts related to pre-construction, construction, operation and decommissioning phases can be reduced by proper mitigation measures. However, gaseous emission and dust from coal fired boiler will still left as residual impacts inside acceptable levels after mitigation measures as follow:

(a) CO_2 as Residual Impact

Although Da Hua will control gaseous emissions from coal fired boiler, there will be still left residual impacts to existing air quality because gaseous emission from coal fired boiler cannot be controlled to zero emission.

Mitigation Measures for Residual Impacts

All of the residual impacts will be controlled by plantation (green belt development). Plants can serve as a sink for noise, gaseous pollutants and reduce the flow of dust and so green belt will be considered as compensatory plantation for residual impact of dust, noise and gaseous emissions. The following are the advantages of greenbelt development:

(a) Green belts insure a minimum distance between the industrial sources of pollution and the receptors/ residential areas, prone to the health hazards of industrial pollution.

(b) Green belts can absorb noise caused by the industry.

(c) Trees not only assimilate carbon dioxide and release oxygen but also play an important role in trapping some obnoxious gases and particulate matters in the air. Hence, green belt functions both as filter and sink for contaminants.

(d) Green belts can improve the local microclimate. These occur mainly through their influence on wind, temperature and humidity.

(e) Green belts provide picnic spot and recreation grounds.

(f) In the dryer part of the area, the trees reduce the effect of dryness, desiccate hot wind, and increase the availability of soil moisture.

Greenbelt Development for the Proposed Factory

(a) Plant Selection for Proposed Factory

Any particular species of plant which may be needed in that area from the point of view of soil conservation, moisture conservation, pollution control, dust control, wildlife habitat etc. may also be given preference while deciding the species to be included in the greenbelt. The following aspects are important while selecting the plant species:

(a) The species will be fast growing and having thick canopy cover,

(b) It will be perennial and evergreen and should have large area index,

(c) It will be indigenous and suitable to local climatic conditions,

(d) It will be efficient in absorbing pollutants without significant effects on plant growth, and

(e) It will be fruit yielding trees, if possible, especially in wasteland areas.

The plant that should be planted are listed in the table below.

Tree Species (Common Name)	Scientific Name
Eu-ca-lit	*Eucalpytus albens*
Thayet	*Mangifera indica*
Banda	*Terminalia catatta*
Neen Tree	

The reason why should plant these plants, Name Tree have the ability to absorb and neutralize pollutants from air, including harmful gases and particulate matter. Industrial zones often have high level of air pollution due to emissions from factories and vehicles. By planting Neem trees, can help improve air quality and create a healthier environment for workers and nearby residents. Moreover, Eucalyptus trees are rapid growth rates and high biomass production and they are efficient at sequestering carbon dioxide from the atmosphere. Therefore, planting Eucalyptus trees in an industrial zone can help offset carbon emissions from industrial activities, making it a potential part of climate change mitigation effort.

(b) Proposed Layout Plan for Greenbelt Development

Under plantation programme, it will be developed plantation all along the boundary of project area and all free space around the project site. Development of lawns, small ornamental flowering plants, seasonal plants etc. will not be counted as a part of greenbelt in the conservation plan. Plantations will be done at a spacing of 5 x 5 m of at least two rows in zip-zap shape. The efforts to improve the survival of the saplings and their healthy growth will be taken up like watering, fencing, keeping watch and ward and seeking guidance from the Forest Department and Environmental Conservation Department (Yangon). The detailed plan for greenbelt development for at least five years will be taken guidelines from Forest Department. The following figure shows the conceptual plan for green belt development.

8.0. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

In order to manage the physical, biological and sociological impacts identified in the impact assessment, Da Hua has committed to implement an environmental management plan of the project (EMP). This management plan will form the basis for the development of an integrated management system for environmental and community issues. EMP is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental impacts arising from the proposed project and take appropriate actions to properly manage that risk. EMP also ensures the project implementation is carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts during its life cycle.

8.1. Project Phases for Impact Assessment

Preconstruction Phase

As the proposed project is about 4 acres for old factory and 8.8 acres for the new factory, only a low number of workforce and machineries is used due to short period of time.

Construction phase

After minor site clearing activities is carried out in pre-construction phase, the project has begun constructing of buildings and factories. The construction phase lasts for about 1 year till September 2019.

Operation Phase

The operation processes include production of polyester staple fiber (PSF) which will be carried out in Factory 1 (PSF Factory) and the production of PET packing tape and PE/PP recycle pellets in Factory 2 (PPPT Factory) by using PET (Polyethylene Terephthalate) bottles as raw materials.

Decommission Phase

The decommission phase will include dismantling of equipment like pumps, filters and machines, disposal of resulting materials and filling of drains with mix of topsoil, sand and stone. The estimated time period for decommission phase is 1 year.

8.2. Project's Environmental and Socio-economic Legal Requirements and Guidelines Related to Impacts

Myanmar has a number of policies and regulations to safeguard the environment, listed below:

- Constitution of the Republic of the Union of Myanmar (2008)
- Environmental Conservation Law (2012)
- Environmental Conservation Rules (2014)
- EIA Procedures (2015)
- National Environmental Quality (Emission) Guidelines (2015)
- The Protection of rights of National Race Law (2015)
- Myanmar Investment Law (2016)
- Foreign Investment Law (2012)
- Myanmar Citizen Investment Law (2013)
- Labor Organization Law (2011)
- The Settlement of Labor Dispute Law (2012)
- Employment and Skill Development Law (2013)
- The Leave and Holiday Act, 1951 (Law Amended July, 2014)
- Minimum Wages Law (2013)
- Payment of Wages (2016)
- The Myanmar Insurance Law (1993)
- The Social Security Law (2012)
- Workmen Compensation Act (1951)
- Myanmar Fire Bridge Law (2015)
- Law Amending the Factories Act 1951 (Pyidaungsu Hluttaw Law No. 12/2016)
- Union of Myanmar Public Health Law (1972)
- Private Industrial Enterprise Law (1990)
- Forest Law (2018)
- Protection of Biodiversity and Protected Area Law (2018)
- Protection and Preservation of Cultural Heritage Regions Laws (1998)
- Prevention and Control of Communicable Diseases Law (1995)
- The Control of Smoking and Consumption of Tobacco Product Law (2006)
- Conservation of Water Resources and Rivers Law (2006)
- Conservation of Water Resources and Rivers Rules (2013)
- Farm Land Law (2012)

- The Protection and Preservation of Antique Objects Law (2015)
- The Protection and Preservation of Ancient Monuments Law (2015)
- The Prevention of Hazard from Chemical and Related Substances Rules (2013)
- The Freshwater Fisheries Law (1991)
- Automobile Law Pyidaungsu Hluttaw Law No. 55/2015
- The Myanmar Engineering Council Law (2013)
- The Petroleum Act (1937)
- The Factories Act (1951)
- Boiler Law (2015)
- Natural Disaster Management Law (2013)
- The Export and Import Law (2012)
- Occupational Safety and Health Law (Pyidaungsu Hluttaw Law No.8) (2019)

8.3. Environmental Management and Monitoring Plan

The purpose of environmental monitoring is to evaluate the effectiveness of implementation of Environmental Management Plan (EMP) by periodically monitoring the important environmental parameters within the impact area, so that any adverse effects are detected and timely action can be taken. Main objectives of environment monitoring plan include:

(1) Identify all environment changes which may cause adverse effects on environment by the project implementation;

(2) Monitor discharge sources (gas emission, waste water and solid waste) and operation of environmental protection equipment in order to ensure that these activities will comply with legislative requirements;

(3) Check monitoring process and inspect installation system and equipment in respect of pollution prevention and control;

(4) Prevent potential incidents;

(5) Propose appropriate environment protection measures based on results of environmental monitoring;

(6) Overcome and repair all weak-points based on results of environment monitoring program.

8.3.1. Environmental Management and Monitoring Team

Da Hua will organize a project Environmental Management and Monitoring Team (EMMT) in order to assist the implementation of the proposed project.

Table 8.1. Environmental Management and Monitoring Team

No.	Group Member	Quantity	Remark
1.	Environmental Officer (or) Coordinator	1	To be appointed
2.	Occupational Health and Safety Officer (or) Coordinator	1	To be appointed
3.	Factory Manager	1	Appointed
4.	Supervisor	1	Appointed
5.	Helpers	1	Appointed

According to the above table, Da Hua will organize EMMT as follow:

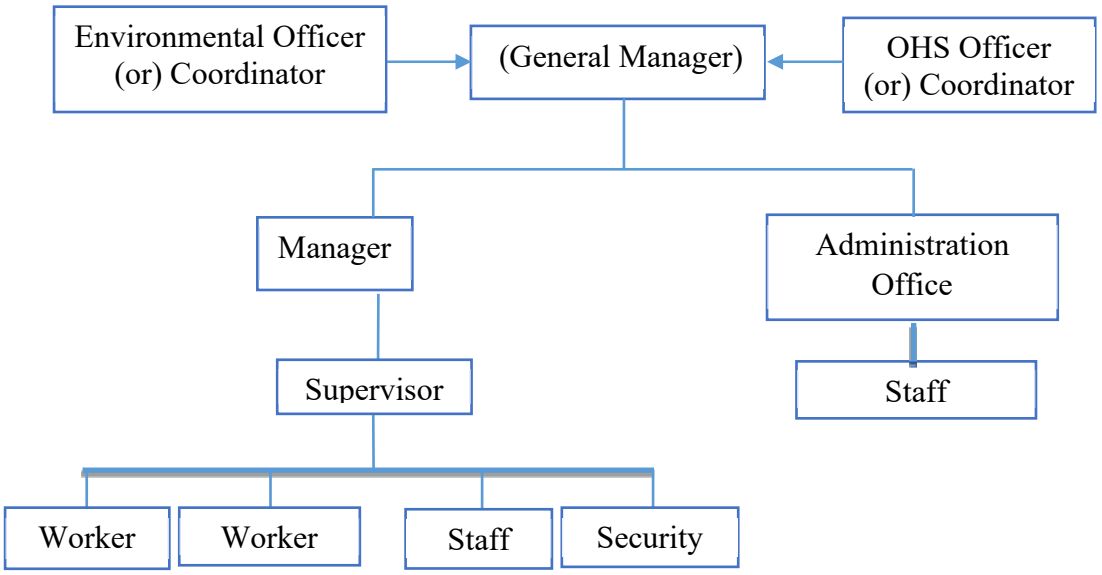


Figure 8.1 – Environmental Management and Monitoring Team

According to the above table, Da Hua will assign environmental officer (or) coordinator and occupational health and safety officer (or) coordinator as follow:

(a) Environmental Officer

Da Hua will be appointed environmental officer for proposed project The major duties and responsibilities of the environmental officer or person-in-charge for environmental monitoring of proposed factory will be as given below:

(a) To implement the environmental management plan,

(b) To assure regulatory compliance with all relevant rules and regulations,

(c) To ensure regular operation and maintenance of pollution control devices,

(d) To minimize environmental impacts of operations by strict adherence to the EMP.

(e) To initiate environmental monitoring as per approved schedule.

(f) Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit,

(g) Maintain documentation of good environmental practices and applicable environmental laws as ready reference,

(h) Maintain environmental related records,

(i) Coordination with regulatory agencies, external consultants, monitoring laboratories,

(j) Maintain of log of public inconvenience and the action taken,

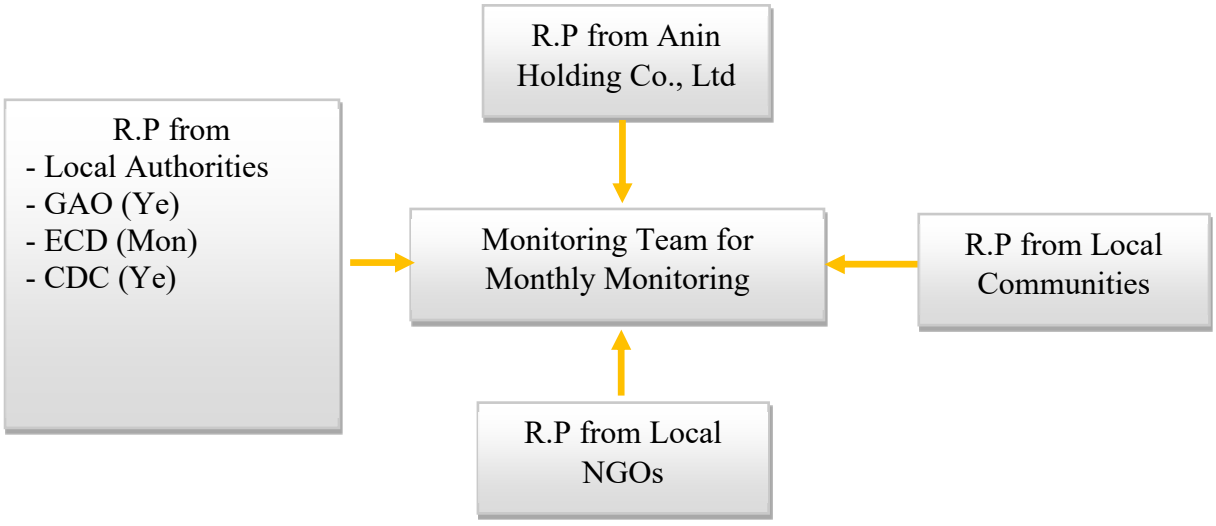
(k) Ready to solve any complaints from local people about environmental and social issues especially in waste water and traffic.

(b) OHS Coordinator

Factory manager will be assigned factory manager as OHS coordinator. Training program will be completed.

(2) Environmental Monitoring Team for Irregular Monitoring

Sometimes environmental monitoring will have to conduct uneven condition such as conflict with local people about the environmental issues during implementation and operation of the proposed project. Environmental monitoring team for irregular monitoring has to organize representatives from General Administrative Office (Ye), Environmental Conservation Department (ECD, Mon), City Development Committee (CDC, Ye), local communities and local NGOs as proposed as follow:



Note: should participate , R.P = Representative Persons

Figure 8.2 - Proposed Environmental Monitoring Team for Irregular Monitoring

(3) Parameters, Responsibilities, and Estimated Cost for Mitigation and Monitoring

Monitoring will be conducted daily by the regular environmental monitoring team of proposed factory. Moreover, monitoring will also be done monthly or quarterly by monitoring team for monthly or by the registered third-party monitoring agency. Monitoring frequency will be sufficient to provide representative data for the parameter being monitored. Monitoring data will be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken. Monitoring will be carried out throughout all project implementation phases and the responsibilities for monitoring for operation phases. The parameters based on EMP to be monitored; location of the monitoring sites; frequency and duration of monitoring, responsibilities and estimated cost for each of the monitoring parameters are presented in the following table. Various Emission from factory will be monitored with regular routine according to rules and regulation of national emission guidelines and international association guidelines.

Important Factors for Environmental Monitoring

The following issues will be considered during the environmental monitoring.

(a) Monitoring will be done by registered third party monitoring agency or proposed environmental monitoring team. At least three representatives from proposed monitoring team will be participated in every monitoring process.

(b) By studying the wind rose, the most dominant wind direction and wind speed for every season can be predicted and monitoring for dust, noise and gas emissions will be carried out at that wind direction.

(4) Environmental Management Training Program

Environmental management training program is an important part in EMP. Training and human resource development is an important link to achieve sustainable operation of the facility and environmental management.

Training Program for Construction Phase

During construction phase, construction contractor must ensure that project staffs are trained on labor safety and environment protection during construction phase.

Training Program for Operation Phase

In operation phase, all staff of proposed project must be trained on environment safety throughout training courses to be familiar with operation processes and guidelines, fire-

fighting exercises and practices, etc. Project Management Board should be established and maintain training programs that are regularly updated to help staff at all levels and related functional departments are aware of their responsibility on environment protection. For successful functioning of the project, relevant EMP's should be communicated to the following groups of people:

Employees

Employees must be made aware of the importance of safety, waste segregation and storage, and energy conservation. This awareness can be provided through leaflets and periodic inhouse meetings. They should be informed about their responsibilities for successful operation of various environmental management schemes inside the premises.

Site Staff

Relevant personnel at site must be trained for:

(a) Collection, segregation and storage of the solid and waste generated during operation,

(b) Operation and maintenance of sewage treatment plant and reclamation system,

(c) Requirements of the emergency response plan in case of an emergency,

(d) Techniques for waste minimization, water conservation and energy conservation,

(e) Applicable environmental, health and safety regulations and compliance requirements,

(f) Functioning of the environmental management system including environmental monitoring, reporting and documentation needs.

Record Keeping

Record keeping and reporting of performance is an important management tool for ensuring sustainable operation. Records should be maintained for regulatory, monitoring and operational issues. Typical record keeping requirements for the site is summarized in following table.

Table 8.2 - Record Keeping Requirements

Parameter	Particulars
Monitoring and Survey	-Records of all monitoring carried out as per the finalized monitoring protocol.
Employee Health and Safety Record	- Daily record for accidents at the workplace
Others	- Equipment inspection and calibration records, where applicable - Vehicle maintenance and inspection records

(5) Environmental Audits and Corrective Action Plans

To assess whether the implemented EMP is adequate, Anin Holding Co., Ltd will conduct periodic environmental audits. Environmental audit is an independent and objective oriented examination of whether the practice complies with expected standards. Broadly, environmental audit means a check on some aspects of environmental management, and implies some kind of testing and verification.

There are two levels of Environmental Audits, i.e. Environmental Impact Audit and Environmental Management Audit. Environmental Impact Audit involves comparing the impacts predicted in an EMP with those that actually occur after implementation of the project while Environmental Management Audit involves checks against adherence to plans, mitigation measures and general compliance of terms and conditions. These audits will be followed by Corrective Action Plans (CAP) to correct various issues identified during the audits.

(6) Reporting Monitoring Results

Results of recorded in files to monitor and audit monitoring will be carried out strictly as required by the related national regulations. According to the environmental impact assessment procedure, 2015, the monitoring results of required parameters will be reported to Environmental Conservation Department (ECD) every 6 months and copies to General Administrative Office (GAO, Ye). The monitoring reports will include the following:

(a) Workplace inspection and monitoring;
(b) Accidents and emergency cases;
(c) Monitoring results and criteria; and
(d) Training program.

8.4. Environmental Management and Monitoring Measures

Environmental management and monitoring measures will have to cover for both of the factories.

8.4.1. Environmental Management Measures

As pre-construction phase and construction phase of both of the Factory 1 and 2 have been complected, this management table will only describe the operation and decommissioning phase to avoid complexity as follow:

Table 8.3 – Environmental Management Measures
For Factory 1

Affected Environment	Impact Description	Receptors	Mitigation Measures	Responsibility	Estimated Cost
Operation Phase					
Impacts on Air Environment	Gaseous Emission from Boiler	Local Residents	• Installing of water Scraper Stystem	EO of EMMT	400 Lakhs for Water Scraper
	PM (Fly Ash) Emission from Boiler	Local Residents and Flora Diversity	• Installation of Bag Filter	EO of EMMT	200 Lakhs for Bag Filter
	Noise from Auxillary Generator	Local residents and Fauna Diversity	• Use sound proof generator • Avoid using noisy machines and generators at night • Regular maintenance for all machineries and vehicles	EO of EMMT	50 Lakhs for Sound Proof System
	Odour from Heating Process	Factory Workers	• Good ventilation system with exhaust fan	EO of EMMT	25 Lakhs for Exhaust Fan
Impacts Surface Water Environment	**Liquid Waste** Waste water from boilers and operation process	Surface water pollution	• Installation of wastewater treatment system	EO of EMMT	300 Lakhs for Wastewater Treatment System
Impacts on Soil and Groundwater Environment	**Solid Waste** Fly ash generated from boilers, residue from boiler furnace		• Residue from boiler will be used in land filling and concrete factory Ash will be reuse in brick making	EO of EMMT	No extra cost

Decommissioning Phase					
Air Environment	**Dust Generation** from Decommissioning Process	Local residents near the project	• Water Spraying	EO of EMMT	8000 kyat/day
	Noise from Decommissioning Process		• Avoid Working at Night	EO of EMMT	No extra cost
Water Environment	Effluent Water from Decommissioning Site	Nearest Surface Water Body	• Avoid Working in Rainy Seasons	EO of EMMT	No extra cost

For Factory 2

Affected Environment	Impact Description	Receptors	Mitigation Measures	Responsibility	Estimated Cost
Operation Phase					
	Gaseous Emission from Boiler	Local Residents	• Installing of water Scraper Stystem	EO of EMMT	400 Lakhs for Water Scraper
	PM (Fly Ash) Emission from Boiler	Local Residents and Flora Diversity	• Installation of Bag Filter	EO of EMMT	200 Lakhs for Bag Filter
	Noise from Auxillary Generator	Local residents and Fauna Diversity	• Use sound proof generator • Avoid using noisy machines and generators at night • Regular maintenance for all machineries and vehicles	EO of EMMT	50 Lakhs for Sound Proof System

	Odour from Heating Process	Factory Workers	• Good ventilation system with exhaust fan	EO of EMMT	25 Lakhs for Exhaust Fan
Impacts Surface Water Environment	**Liquid Waste** Waste water from boilers and operation process	Surface water pollution	• Installation of wastewater treatment system	EO of EMMT	300 Lakhs for Wastewater Treatment System
Impacts on Soil and Groundwater Environment	**Solid Waste** Fly ash generated from boilers, residue from boiler furnace		• Residue from boiler will be used in land filling and concrete factory • Ash will be reuse in brick making	EO of EMMT	No extra cost
Decommissioning Phase					
Air Environment	**Dust Generation** from Decommissioning Process	Local residents near the project	• Water Spraying	EO of EMMT	8000 kyat/day
	Noise from Decommissioning Process		• Avoid Working at Night	EO of EMMT	No extra cost
Water Environment	Effluent Water from Decommissioning Site	Nearest Surface Water Body	• Avoid Working in Rainy Seasons	EO of EMMT	No extra cost

8.4.2. Environmental Monitoring Measures

As the construction of the both of the factories have been completed since 2020, the monitoring table will only describe the operation phase to avoid the complication of the monitoring tables. The summary of the parameters to be monitored, estimated cost and responsibility on the project during operation phase and decommissioning phase for both factories 1 and 2 are shown in table below.

Table 8.4 – Environmental Monitoring Measures

For Factory 1

Item	Environmental Concerns	Parameters	Frequency	Locations	Responsibility	Methods	Estimated Cost/Frequency	Estimate Cost/Year	Available Third-Party
Operation Phase									
1	Ambient air quality	PM 10, PM2.5, CO, CO2, NO2, SO2, O3	Every 6 months	At Factory 1(near storage) 17°10'6.24"N, 95°58'39.22"E and At Factory 2 (near production workshop) 17°09'36.26"N, 95°59'01.79"E	EO of EMMT	Haz-Scanner (EPAS)	500,000 kyats per once	1000,000 kyats	Every Third-Party Monitoring Agency
2	Noise level	Equivalent noise level dB(A)	Every 6 months	At Factory 1(near storage) 17°10'6.24"N, 95°58'39.22"E and At Factory 2 (near production workshop)	EO of EMMT	Integrating Sound Level Meter	200,000 kyat per once	400,000 kyats	Every Third-Party Monitoring Agency
4	Wastewater	COD, BOD, TDS, DO, pH, TP, TN, color degree, dioxin, NH_4, adsorbable organic halogen	Every 6 months	Waste water Discharge point at Factory 1(17°10'2.84"N, 95°58'44.65"E) Waste water Treatment plant at factory 1(17°10'0.84"N, 95°58'44.02"E) Waste water Discharge point at factory 2(17° 9'30.77"N, 95°59'2.91"E) Waste water Treatment plant at factory 2(17° 9'31.00"N, 95°59'3.03"E)	EO of EMMT	Taking water samples and sending to the laboratory	80000 kyats per point	160,000 kyats	Every Third-Party Monitoring Agency

For Factory 2

Item	Environmental Concerns	Parameters	Frequency	Locations	Responsibility	Methods	Estimated Cost/Frequency	Estimate Cost/Year	Available Third-Party
Operation Phase									
1	Ambient air quality	PM 10, PM2.5, CO, CO_2, NO_2, SO_2, O_3	Every 6 months	At Factory 1(near storage) 17°10'6.24"N, 95°58'39.22"E and At Factory 2 (near production workshop) 17°09'36.26"N, 95°59'01.79"E	EO of EMMT	Haz-Scanner (EPAS)	500,000 kyats per once	1000,000 kyats	Every Third-Party Monitoring Agency
2	Noise level	Equivalent noise level dB(A)	Every 6 months	At Factory 1(near storage) 17°10'6.24"N, 95°58'39.22"E and At Factory 2 (near production workshop)	EO of EMMT	Integrating Sound Level Meter	200,000 kyat per once	400,000 kyats	Every Third-Party Monitoring Agency
3	Wastewater	COD, BOD, TDS, DO, pH, TP, TN, color degree, dioxin, NH_4, adsorbable organic halogen	Every 6 months	Waste water Discharge point at Factory 1(17°10'2.84"N, 95°58'44.65"E) Waste water Treatment plant at factory 1(17°10'0.84"N, 95°58'44.02"E) Waste water Discharge point at factory 2(17° 9'30.77"N, 95°59'2.91"E) Waste water Treatment plant at factory 2(17° 9'31.00"N, 95°59'3.03"E)	EO of EMMT	Taking water samples and sending to the laboratory	80000 kyats per point	160,000 kyats	Every Third-Party Monitoring Agency

8.5. Overall Budget for Implementation of the Environmental Management and Monitoring Plan

The specific location and number of sample points will be determined in the implementation stage. The following tables show the estimated cost and budget for environmental management and monitoring.

Table 8.5. Estimated Cost for Environmental Management Measures

The following table shows the total estimated costs for environmental management measures during operation and decommissioning phase.

For Factory 1

	Estimated Cost	Duration	Overall Estimated Cost
Operation Phase	975 Lakhs/Time	25 years	975 Lakhs
Decommissioning Phase	8000 Kyats/day	1 year	25 Lakhs

For Factory 2

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	975 Lakhs/Time	25 years	975 Lakhs
Decommissioning Phase	8000 Kyats/day	1 year	25 Lakhs

Table 8.6. Estimated Cost for Environmental Monitoring Measures

The following table shows the total estimated costs for environmental monitoring measures during operation and decommissioning phase.

For Factory 1

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	1,560,000 kyats	25 years	39,000,000 kyats

For Factory 2

	Estimated cost/ Year	Duration	Overall Estimated Cost
Operation Phase	1,560,000 kyats	25 years	39,000,000 kyats

8.6. Management and Monitoring Sub-Plans

Management and monitoring sub-plands will mainly based on key potential impacts as follow:

8.6.1. Waste Management Plan

(1) Objectives

The purpose of the waste management plan is the following:

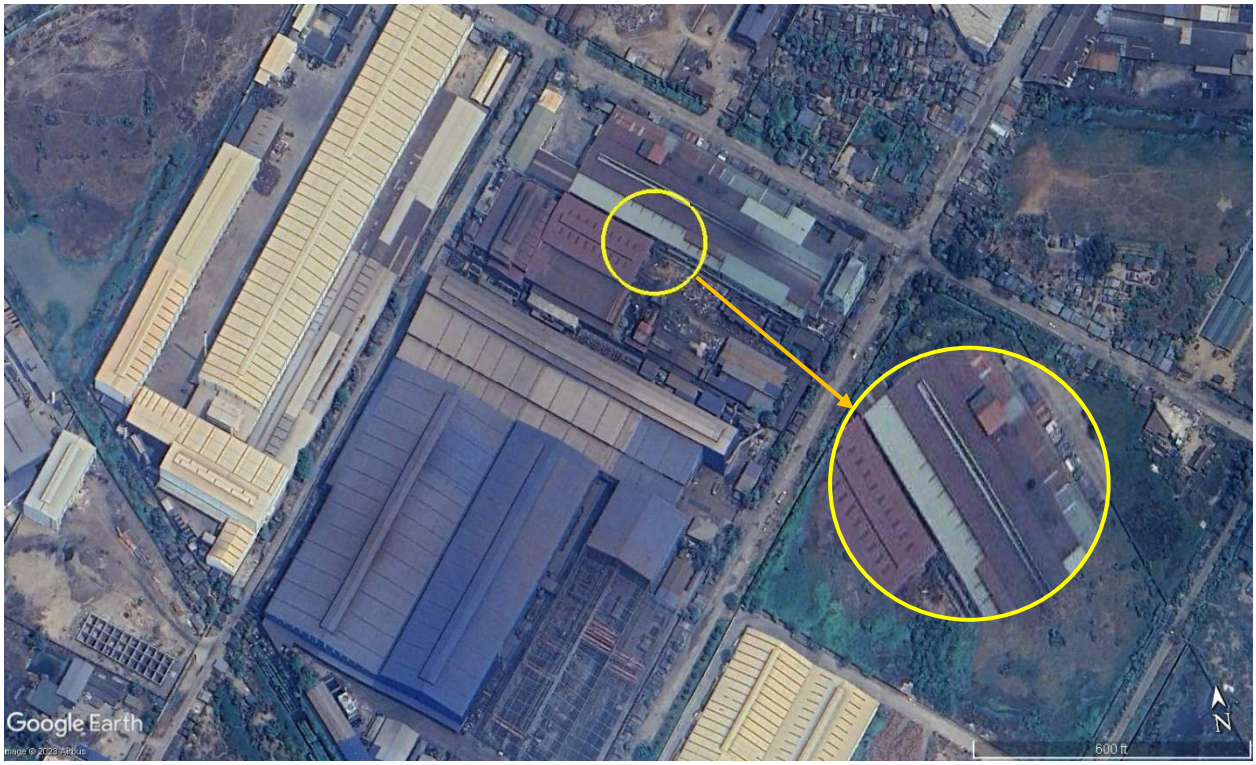
- To develop action plans for achieving the objectives of the waste management plan;
- Monitor discharge sources (waste water and solid waste) and operation of environmental protection equipment in order to ensure that these activities will comply with legislative requirements; and
- To provide guidance on how to minimize, handle, contain, control, re-use, recycle and dispose of all waste generated.

(2) Legal Requirements

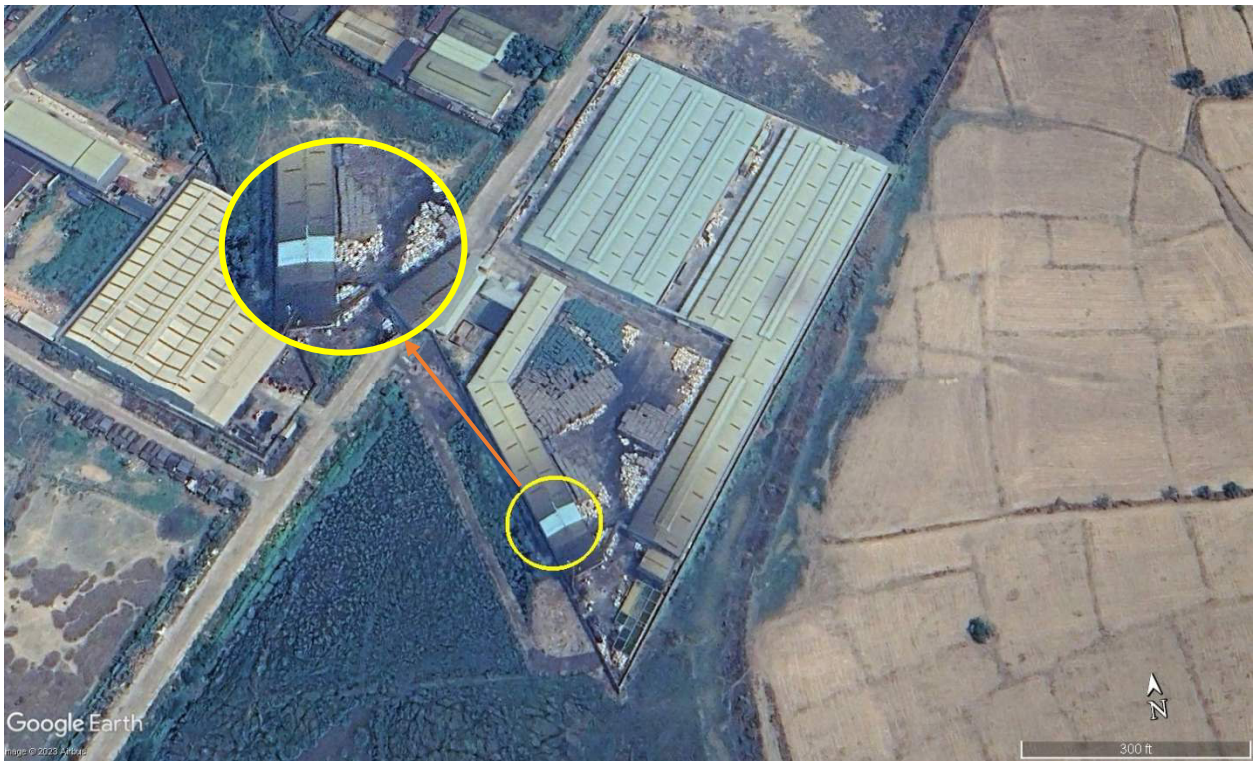
Law name and section	Legal Commitments
The Prevention of Hazard from Chemical and Related Substances Rules, 2013	
Section 15	The project proponent has to carry out inspection and training according to section 15 of Prevention of Hazard from Chemical and Related Substances Law.
Section 16	The project proponent has to comply Section 16 of Prevention of Hazard from Chemical and Related Substances Law.
Section 17	The project proponent has to put the insurance in accordance with the prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses.
Section 22	The project proponent has to abide the regulations consisted in the registration certificate furthermore shall also abide the order and instructions issued occasionally by the Central Supervisory Board.
Section 27	The project proponent has to control and decrease the hazard of the chemical and related substance according to section 27 of Prevention of Hazard from Chemical and Related Substances Law.
Section 30	The project proponent has to comply according to Section 30 of Prevention of Hazard from Chemical and Related Substances Law.

(3) Overview Map

The main source of the waste from the proposed factory will be solid waste from boiler and waste water from washing process. Domestic wastes will also produce from workers.



Boiler Location in Factory 1



Boiler Location in Factory 2

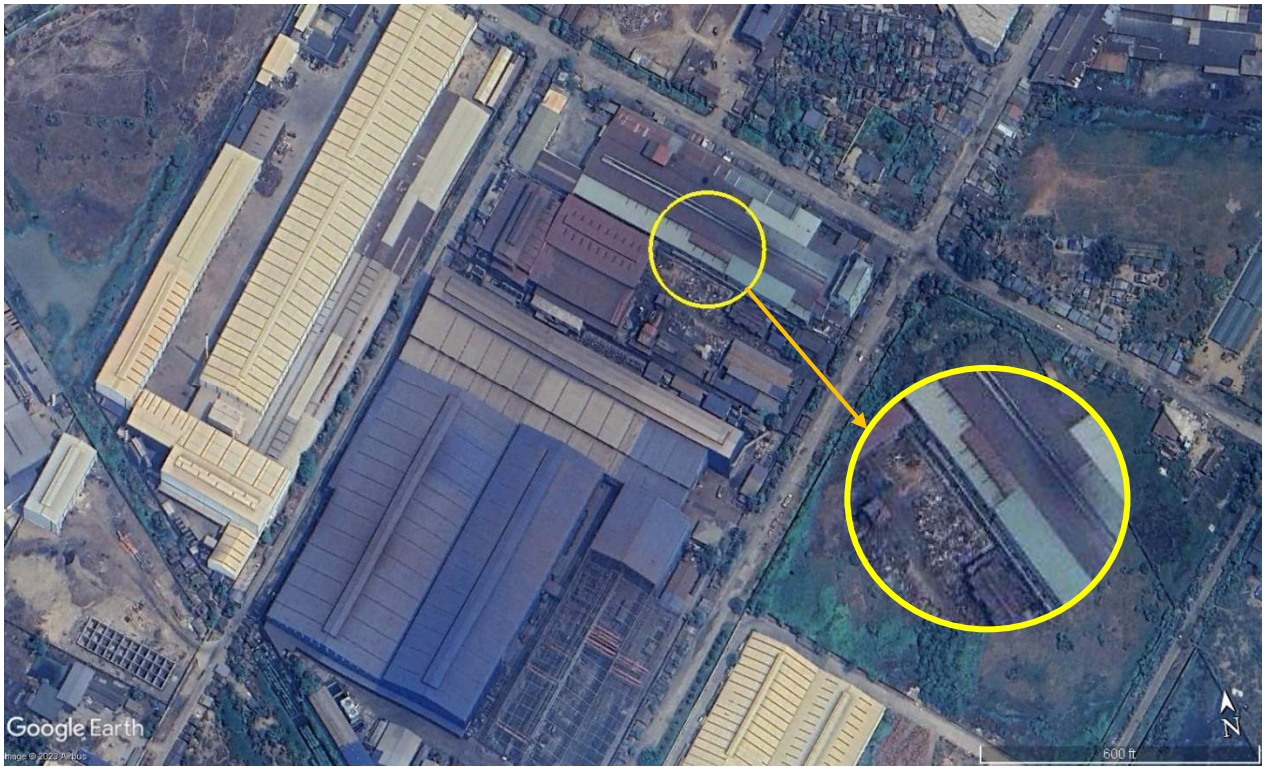


Figure – Washing Area in Factory 1

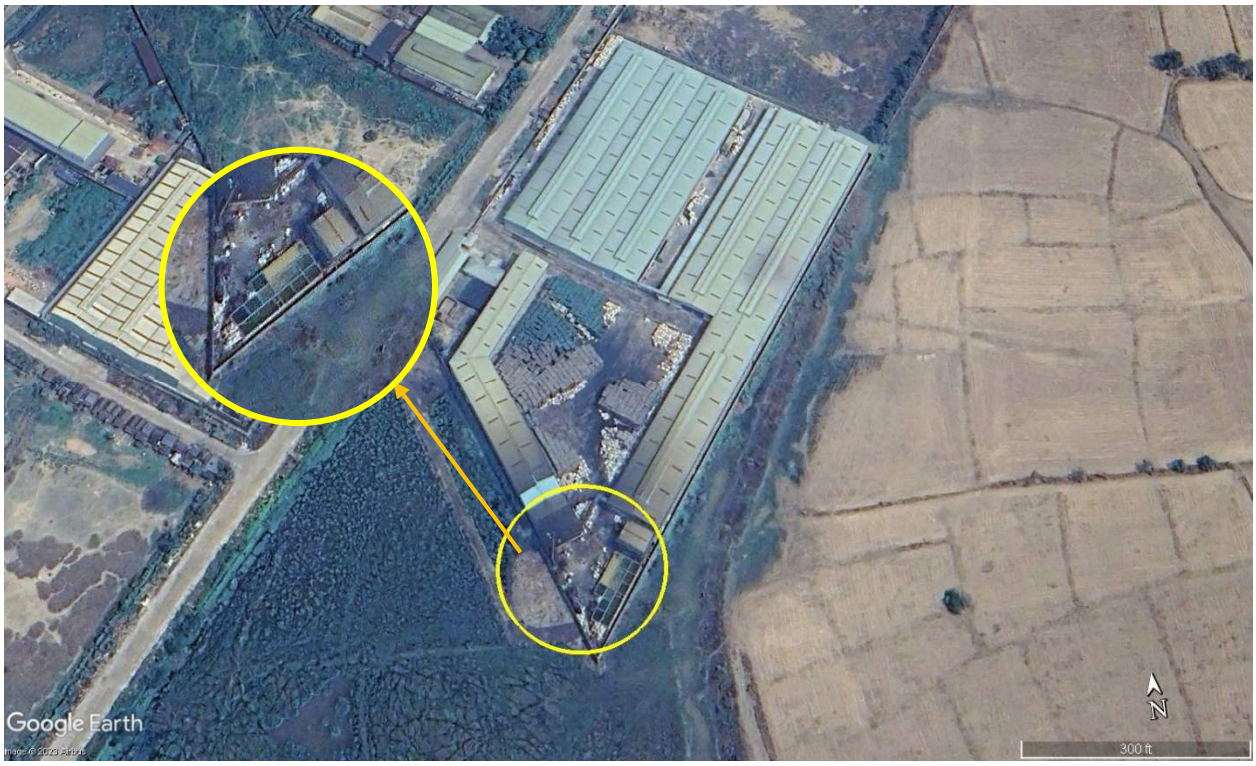


Figure – Washing Area in Factory 2

Figure – Main Sources of Waste Generation from Factory

(4) Waste Management and Monitoring

The following table shows the type of waste generated in each phase.

Operation	- Wastewater from the operation process - Dust and gaseous emission from the boiler - Ash from the boiler - Domestic wastes from the factory workers - Industrial waste such as packing bags, polyester chips - Leakage of fuel from the use of vehicles for transportation of raw material and final products
Decommissioning	- Demolition waste - Domestic wastes from workers - Leakage of fuel from use of vehicles and machineries

(a) Solid Waste Disposal

(i) Domestic Waste

The factory's workforce will generate a specific quantity of domestic waste. Improper disposal of solid waste, garbage and sewage from the labor camps and factory will also have an adverse impact on the environment. Management of domestic waste can be done by as follows:

- **Segregation**: Provide different bins or containers for different types of waste, such as recyclables, non-recyclables, organic waste and hazardous materials and clearly label each bin to avoid confusion.
- **Education and Awareness**: Conduct training or awareness programs for the workers to educate them about the important of waste segregation and the proper disposal methods.
- **Hazardous Waste**: Train workers to identify hazardous waste, such as batteries, electronic waste, chemicals or sharp objects. Collect hazardous waste separately and dispose of it according to rule and regulations.

Reduce and Reuse: Encourage workers to reduce waste generation and promote the reuse items whenever possible.

So, according to the above waste management procedures, domestic waste items such as drinking water bottle will be reused in factory process. Plastic garbage cans, coffee mugs and soft drinks bottles, which originate from people's daily activities will be sold to recycler. Other municipal waste from the workers will be disposed of at the Myaung Dagar Industrial Zone Waste Station on a daily basis.

Table – Regular Domestic Wastes Produced by Workers

Solid waste type	Jan	Feb	Mar	April	May	June	July	August	Sep	Oct	Nov	Dec	Total
Domestic Waste	16 kg	18 kg	20 kg	6 kg	18 kg	18 kg	17.5 kg	18 kg	19 kg	12 kg	18 kg	22 kg	0.18 ton

(ii) Processing Waste

From the production process, a certain amount of solid waste that may be in the form of packing bags, polyester chips. The recorded industrial waste types are shown in the following table.

Table – Regular Process Wastes

Solid waste type	Jan	Feb	Mar	April	May	June	July	August	Sep	Oct	Nov	Dec	Total ton
Industrial Waste													
Packing bags (ton)	1.8	2.3	2.4	1.4	1.9	2.7	3.3	3.7	2.3	2	1.5	1	26.3
Polyester chips (ton)	11	13	12	6	16	17	21	24	25	17	15	0.3	177.3
Boiler Ash	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	26 ton	312 ton

About yearly 25 tons of packing bags will be sold to recycler. Chips of polyester staple fiber (177 ton yearly) has been reused in the manufacturing process. Yearly 1ton boiler ash per day will dispose by free of charge to recycle- reused contractor (Government Brick factory located at Myaung Dagar Industrial Zone) daily with their arrangement. Ash will collect in the container inorder to perevent dispersing into the air before disposing.

Figure – Storage of Ash from the boiler

(iii) Hazardous Waste

The majority of the hazardous waste generated by the factory consists of empty chemical containers and used chemical bags. Each year, approximately 72 empty spinning oil drums are produced. These empty drums are stored temporarily in the warehouse and sold back to a recycling contractor on a weekly basis. Similarly, the used lubricants from generator engines are planned to be sold back to a reusing contractor, while the remaining used chemical containers and bags are sold to a chemical imported company. Considering that the proposed project utilizes a relatively small amount of chemicals and generates a reduced amount of waste, the current method of disposal and selling to recyclers can be deemed significant.

Storage of Chemical Containers in Warehouse

Disposing of electric bulbs and batteries waste from the factory requires proper handling to ensure environmental protection. Firstly, it is crucial to separate and segregate electric bulbs and batteries for appropriate disposal. Electric bulbs, such as fluorescent or LED bulbs, often contain small amounts of hazardous materials, so it will be handled as electronic waste (e-waste). These bulbs can be sent to specialized e-waste recycling facilities or collection points for safe dismantling and recycling of their components. On the other hand, batteries, including rechargeable and non-rechargeable varieties, contain toxic substances and should be treated as hazardous waste. It is advisable to work with licensed waste management companies to ensure batteries are collected, stored, and transported according to the rule and regulations. The following are the handling and storage procedures of hazardous wastes during operation phase.

Lubricants

Handling

- Prevent small spills and leakage to avoid slip hazard.
- Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

- When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations).
- Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.
- Consult local applicable standards for guidance.

Storage

- Do not store in open or unlabeled containers.
- Store in cool, dry, ventilated area, away from heat and ignition sources. Use good personal hygiene. Always keep the container close and the type of container used to store the material may affect static accumulation and dissipation.

Diesel Oil

Handling

- Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk. DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Do not breathe gas/vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment.
- If ingested, seek medical advice immediately. Avoid contact with skin and eyes. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
- Diesel is a flammable liquid and is dangerous unless handled and stored properly. Children and pets should have no access to the storage tanks to avoid accidents. Adult access to the tanks should be limited to only those who need access for refueling or maintenance of the tanks.
- The fuel should be stored in an isolated area away from residences. An above-ground container may be installed in a building or under a lean-to. This location helps prevent water from harming the tank and prevents radiant heat from evaporating the diesel.

Storage

- Store at cool, ventilated and specified place.
- Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles. Ground all equipment containing material.

- Keeping the fuel away from ignition sources is important. While diesel has a higher ignition point than gasoline, it is still flammable. Any electrical outlets nearby should be rated for explosions. No smoking should be allowed within 50 to 100 feet of the storage area.
- If a small amount of diesel fuel needs to be restored, keep it in portable 5-gallon gas cans that can take to the gas station. For larger amounts, store in special storage containers, such as 55-gallon drums or a stand-alone tank.
- Larger diesel tanks, made of metal or specially formulated polyethylene, can be installed above ground or below ground, depending on the site and local regulations. These tanks can also be mounted on the back of trucks when necessary. The exact size of the tank is, of course, dependent on how much fuel needs to be stored.

Disposal Considerations

- Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations. Consult local or regional authorities.
- On large scale absorb and landfill, allow for atmospheric evaporation.

Fuel Oil

Handling

- Precautions for safe handling: Provide adequate ventilation. Use personal protective equipment as required.
- Do not breathe vapor/aerosol. Avoid contact with skin, eyes and clothing. Take any precaution to avoid mixing with combustibles. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time).
- Do not allow to enter into surface water or drains. Obtain special instructions before use. (Do not handle until all safety precautions have been read and understood.).
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure equipment is adequately earthed. Use explosion-proof equipment. Use only non-sparking tools.
- Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank head spaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

- Hygiene measures: Keep good industrial hygiene. Wash hands immediately after handling the product. When using, do not eat, drink or smoke. Keep away from food, drink and animal feeding stuffs. Separate working clothes from town clothes. Take off contaminated clothing. Wash contaminated clothing before reuse.

Storage

- Conditions for safe storage, including any incompatibilities
- Technical measures: Store in a dry, cool and well-ventilated place. Bund storage facilities to prevent soil and water pollution in the event of spillage.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank head spaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.
- Packaging materials: Keep only in the original container. Suitable material: Carbon steel. Stainless steel.
- Unsuitable material: synthetic material.

Disposal Considerations

- Do not allow to enter into surface water or drains. Dispose of empty containers and wastes safely. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration.
- If recycling is not possible, eliminate in accordance with local valid waste disposal regulations.
- Additional information: Handle contaminated packages in the same way as the substance itself. Dispose of contaminated materials in accordance with current regulations. Do not pierce or burn, even after use. Never use pressure to empty container.

Transport and Disposal

Evidence presented that the transporter is a registered licensed professional driver. Transport to an approved treatment, storage, or disposal facility (TSDF) is required. Transported by truck should be over public highway. Highway shipment is the most common because road vehicles can gain access to most industrial sites and approved TSDFs.

Environmental Precautions

Keep out of drains, sewers, ditches, and waterways. Minimize use of water to prevent environmental contamination Do not flush to sewer or allow entering waterways. Use appropriate Personal Protective Equipment (PPE). Methods for Clean-Up: Scoop up material and place in a disposal container. Provide ventilation. Any concerns should be documented and fixed. If there are any spills, clean up and disposed of properly. Waste analysis and waste determination records should be kept. Among several options available for hazardous waste management, the most desirable method is to reduce the quantity of waste at its source or to recycle the materials for some other productive use.

(iv) Liquid and Sanitary Waste Disposal

Liquid waste can be from the raw material washing process and domestic waste water including both dissolved and suspended matter and a small amount of wastewater (blowdown water) from the boiler operation. The wastewater generated during the washing process has undergone recycling in the wastewater treatment plant and has subsequently been utilized in the production process. The discharge effluent from the sewage is disposed systematically under guideline and arranged and complied with the Hmawbi Township Municipal Department. The process description of wastewater treatment system and process have mentioned in Chapter 4 and the designation of the treated water quantity is shown in the following table.

No.	Pollutant species	Influent water quality (mg/L)	Effluent water quality (mg/L)
1	pH	5-7	6-9
2	Total Suspended Solids (TSS)	420	50
3	COD	1000	150
4	BOD5	280	30
5	Temperature	40°C	37°C

Wastewater Treatment System in Factory 1

Wastewater Treatment System in Factory 2

(5) Roles and Responsibilitys

Overall responsibility for the implementation of the waste management plan rests with project developer. All employees will meet the requirements of this management plan and associated procedures. Key project personnel including the project manager, environmental management representatives, and project developer will ensure that all management actions are undertaken to a satisfactory standard and that all personnel are aware of their responsibilities with respect to environmental matters. A general outline of responsibilities in relation to environmental is provided below.

Project Manager

- Overall accountability for the environmental management of the project
- Implementation of the environmental Policy with respect to the project
- Overall responsibility for development, implementation, maintenance and compliance with this management plan

Environmental Management Representative (EMR)

- Accountable for environmental matters on the project
- Provide support to the project developer as required to ensure this management plan is implemented and complied with
- Review effectiveness and implementation of this management plan
- Monitor the implementation of all required environmental management actions and compliance with legislation
- Undertake environmental auditing as required

All Personnel (Project Developer and the Employee)

- Comply with requirements of this management plan
- Report all environmental incidents as they occur
- Attend environmental inductions or any other training as required

(6) Budjet Requirement

Overall budjet of environment management and monitoring measures for this management plan will be as follow:

Budjet Requirement for Environment Management for Waste Management Sub Plan

Impact Description	Mitigation Measures	Responsibility	Estimated Cost
Liquid Waste Waste water from boilers and operation process	• Installation of wastewater treatment system	EO of EMMT	300 Lakhs for Wastewater Treatment System
Solid Waste Fly ash generated from boilers, residue from boiler furnace	• Residue from boiler will be used in land filling and concrete factory • Ash will be reuse in brick making	EO of EMMT	No extra cost

Budjet Requirement for Environment Monitoring for Waste Management Sub Plan

Item	Parameters	Frequency	Responsibility	Methods	Estimated Cost/Frequency	Estimate Cost/Year
1	COD, BOD, TDS, DO, pH, TP, TN, color degree, dioxin, NH_4, adsorbable organic halogen	Every 6 months	EO of EMMT	Taking water samples and sending to the laboratory	80000 kyats per point	160,000 kyats

The estimated cost will be double for two factories and detailed cost estimations were described in management and montoring tables above.

(7) Training Program for Waste Management Sub Plan

Adherence to the waste management plan will be exercised by all employees, contractors and service providers to ensure proper waste management is applied. This will be undertaken

when appointed and through regular auditing. Service providers and contractors are required to furnish evidence of proper waste management (i.e. classification, quantities and disposal).

(8) Reporting

- Monthly reporting by the operation manager to project developer on non-conformances (including complaints), incidents and site inspections about waste management
- Regular communication with community groups, councils, and individuals by listening to and discussing issues.

8.6.2. Air Quality Management Plan

(1) Objectives

The objectives of air quality management plan are to:

- Control emissions from the operation of factory.
- Control dust emission to reduce human health impact

(2) Legal Requirements

Law name and section	Legal Commitments
Environmental Conservation Law, 2012	
Section 14	The project proponent has to carry out treating of emitting substances which cause pollution in the environment in accord with stipulated environmental quality standards.
Section 15	The project proponent has to install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution.
Environmental Conservation Rules,2014	
Rule 69	The project proponent has to follow the rule of not to pollute the environment, not to cause damage to the ecosystem.
National Environmental Quality (Emission) Guidelines, 2015	
Section 1.1, 1.2, 1.3	The project proponent has to comply with the National Environmental Quality (Emission) Guidelines.

(3) Overview Map

The main sources of air pollution from the proposed factory will be gaseous emissions from boiler.

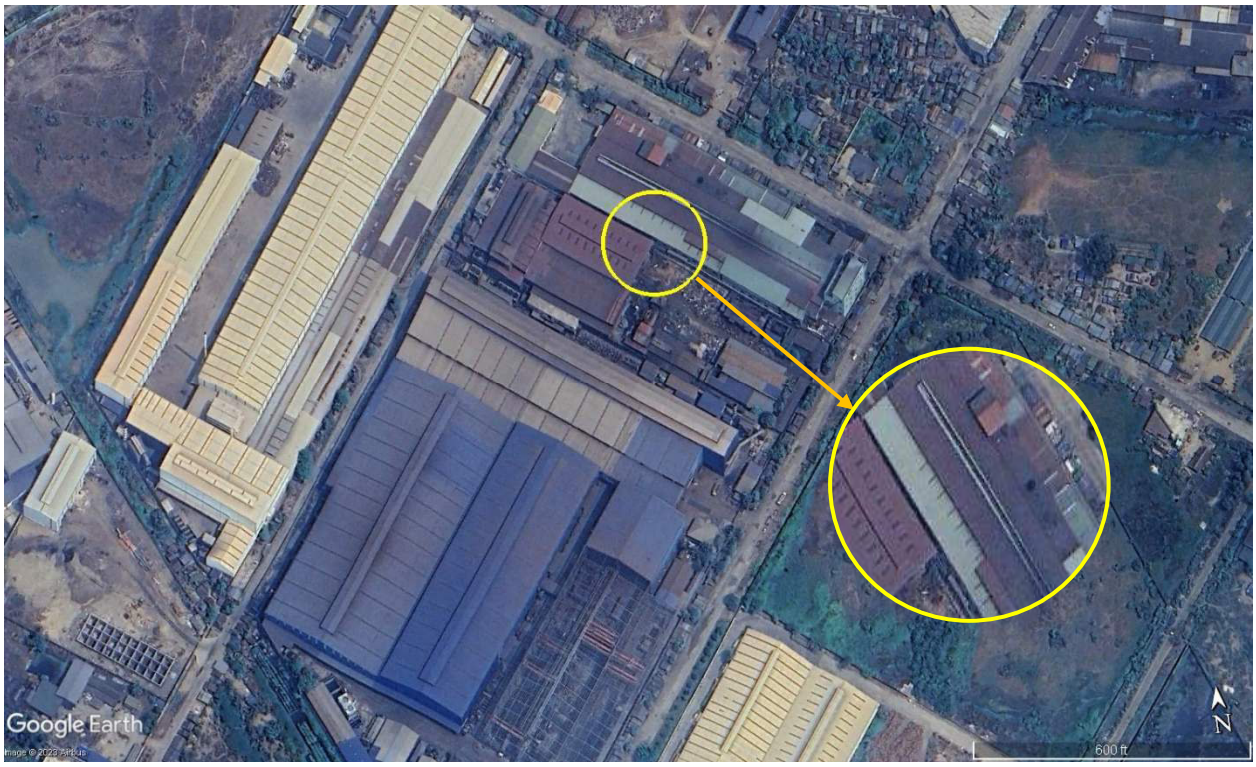


Figure – Boiler Location in Factory 1

Figure – Boiler Location in Factory 2

Figure – Main Sources of Waste Generation from Factory

(4) Management Action Plan

Impact on Air Quality	Mitigation Measures
Gaseous and dust emissions from boiler	- Install bag filters to reduce the stack emissions - Install lime water scraper in boiler
Odour emission from the process	- Install exhaust fan inside the factory
Gaseous emission from axuilary generator	- Use machineries with good engine with good quality fuel - Regular Maintenance

(5) Role and Responsibilities

Overall responsibility for the implementation of the air quality management plan rests with project developer. All employees will meet the requirements of this management plan and associated procedures. Management actions set out in this management plan may be delegated in writing by project developer to the specific contractor.

Key project personnel including the project manager, environmental management representatives, and project developer will ensure that all management actions are undertaken to a satisfactory standard and that all personnel are aware of their responsibilities with respect to environmental matters. A general outline of responsibilities in relation to environmental is provided below.

Project Manager

- Overall accountability for the environmental management of the project
- Implementation of the environmental Policy with respect to the project
- Overall responsibility for development, implementation, maintenance and compliance with this management plan

Environmental Management Representative (EMR)

- Accountable for environmental matters on the project
- Provide support to the project developer as required to ensure this management plan is implemented and complied with
- Review effectiveness and implementation of this management plan
- Monitor the implementation of all required environmental management actions and compliance with legislation
- Undertake environmental auditing as required

All Personnel (Project Developer and the Employee)

- Comply with requirements of this management plan
- Report all environmental incidents as they occur
- Attend environmental inductions or any other training as required

(6) Budjet Requirement

Overall budjet of environment management and monitoring measures for this management plan will be as follow:

Estimated Cost for Environmental Management Measures for Air Quality

Impact Description	Mitigation Measures	Responsibility	Estimated Cost
Gaseous Emission from Boiler	• Installing of water Scraper Stystem	EO of EMMT	400 Lakhs for Water Scraper
PM (Fly Ash) Emission from Boiler	• Installation of Bag Filter	EO of EMMT	200 Lakhs for Bag Filter
Noise from Auxillary Generator	• Use sound proof generator • Avoid using noisy machines and generators at night • Regular maintenance for all machineries and vehicles	EO of EMMT	50 Lakhs for Sound Proof System
Odour from Heating Process	• Good ventilation system with exhaust fan	EO of EMMT	25 Lakhs for Exhaust Fan

Estimated Cost for Environmental Monitoring Measures for Air Quality

Item	Parameters	Frequency	Responsibility	Methods	Estimated Cost/Frequency	Estimate Cost/Year
1	PM 10, PM2.5, CO, CO_2, NO_2, SO_2, O_3	Every 6 months	EO of EMMT	Haz-Scanner (EPAS)	500,000 kyats per once	1000,000 kyats

The estimated cost will be double for two factories and detailed cost estimations were described in management and montoring tables above.

(7) Training Program for Air Quality Management Sub-plan

Adherence to the air management plan will be exercised for all employee who are working in boiler and heating process. This will be undertaken when appointed and through regular auditing.

(8) Reporting

- Monthly reporting by the operation manager to project developer on non-conformances (including complaints), incidents and site inspections
- Regular communication with community groups, councils, and individuals by listening to and discussing issues.

8.6.3. Community Development Plan

1. Objectives

A community development plan aims to:

- Supporting people with disabilities to maximize their physical and mental abilities, to access regular services and opportunities, and to become active contributors to the community and society at large;
- Activating communities to promote and protect the human rights of people with disabilities for example by removing barriers to participation
- Facilitating capacity building, empowerment and community mobilization of people with disabilities and their families.

2. Legal Requirements

Law name and Section	Legal Requirements
Village Regional Development Law, 2019	
Section 11	Project proponent has to comply with the right of rural people in accordance with section 11 of village regional development law.

3. Overview Map

The community development plan will include (i) capacity building program and (ii) corporate social responsibility (CSR) program.

4. Capacity Building Program

Da Hua will conduct the following capacity building program for local community development.

(a) Training Program for Job Opportunities

All training programs for the locals will be based on the employment opportunities and the

training will be mainly associated with construction techniques and machinery works that should be done before the actual construction phase. Since the location of the project is in the industrial area and most nearby locals will be given more employment opportunities on construction site.

In the awareness of unemployment for local people, the training associated with construction techniques and heavy machinery driving will be done before the actual construction phase because the lack of the experienced can be submitted by the other experienced labor workers. Unskilled or semi-skilled men and women are hired from nearby villages and are trained to handle day-to-day work procedure. To become a certified-workers, there should be at least 12 weeks training program and 2-week practical work.

(b) Supporting to Educational Purposes

According to the group discussion with village administration groups within the project area, supporting to improve education for the villages is required as the socio-economic development program. Distribution of education materials and financial aid or scholar grants to the students who are economically deprived in the nearest villages in this region will have a great benefit for students. Educational facilities such as books, pencil case, bags and many more will be provided to the children and the remaining funds will go to the schools for its development.

(c) Supporting to Health Care Facilities and Social Welfare Society's Aid

Some amount of the CSR funds will support to health care facilities such as supporting medical aid to local health care departments and social welfare society's aid such as free funereal services, healthcare ambulance and so on.

(d) Improvement of Internal Village Roads

The village authorities initiated a road repair project, allocation funds and resources to restore the infrastructure. A team of skilled workers and engineers was mobilized to assess the extent the damage and develop an effective plan for the repairs. The restoration of the village roads not only enhanced connectivity within the community but also provide a much-needed boost to local transportation, allowing the factory to operate smoothly while fostering economic growth and improving the overall quality of life for the local people.

5. Corporate Social Responsibility (CSR) Program

Contribution at random places with no records will have some social problem due to the lack of transparency. Da Hua will have CSR program to contribute and manage CSR fund effectively. The list of donations that Da Hua has made are shown in the Appendix.

Developer's Policies for Socio-economic Development of Local People

The company's policies for local socio-economic development are shown in the following table.

No.	Description	Company's Policy
1.	Local Community Development Policy	Appoint local people with relevant skills as much as possible and at least 50% of local people will be appointed during operation phase.
2.	Corporate Social Responsibility (CSR) Policy	Contribute at least 2 percent of the annual net profit after tax as CSR fund.

(i) CSR Fund

Da Hua will set up fixed CSR fund for local community development. CSR activities will be accomplished not only by financial assistance but also by technical assistance and manpower in some donations to retain good relationship with local communities.

(ii) CSR Officer (or) Coordinator

Da Hua will assign CSR officer who is closely communicate with local people in order to manage the contributions of CSR fund effectively. CSR officer is not only intended for the proposed factories but also for the other factories inside the factory compound. HR manager may be assigned as CSR officer. CSR officer will donate CSR fund after the discussion with representative people from nearest villages, local authorities from the Myaung Dagar Township, local CBOs and NGOs.

(iii) Allocated CSR Budget

Allocated percent of CSR fund is based on local community needs and local needs are considered according to the public consultation process (social survey and public meetings). Some portion of CSR fund will be used in public road upgrading and some portion will be used in the development of education purpose, health care facilities and social welfare.

6. Declare the Contribution of CSR Fund

All of the CSR activities and contribution programs will be declared to public by means of local media, company annual report or company's website on a regular basis. Audit on contribution of CSR fund will be carried out together with environmental and social audits through independent external audit team for transparency.

9. PUBLIC CONSULTATION AND DISCLOSURE

Public participation is a process that is designed to enable all interested and affected parties (I&APs) to voice their opinion and/ or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximizing its benefits while minimizing its adverse effects. I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions. Public participation empowers local people so that they regard the development projects as their own. Public participation (community involvement) also reduces the impact of uncertainties and stress caused by the proposed project.

9.1. Methodology and Approach

9.1.1. Objectives of Public Participation in an ESIA

Public participation is an essential and regulatory requirement for EIA process according to the EIA Procedure, 2015. So, public participation is a process that is designed to enable all interested and affected parties (I&APs) to voice their opinion and/ or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximizing its benefits while minimizing its adverse effects. I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions. Public participation empowers local people so that they regard the development projects as their own. Public participation (community involvement) also reduces the impact of uncertainties and stress caused by the proposed project.

In this study, effective public consultation and participation approaches in the form of stakeholder identification, focus group discussions, public meetings and public disclosure process will be conducted.

9.1.2. Methodology Used in Public Consultation and Participation Process

Public participation has been conducting by the following procedures:

(a) Stakeholder engagement and identification;
(b) Household survey and focus group discussion;;
(c) Public consultation meetings; and
(d) Public disclosure process.

The EIA includes the activities undertaken during detailed design stage to engage the stakeholders, and planned information disclosure measures and processes for carrying out consultation with affected people and facilitating their participation during implementation stage. Five rounds of engagements have been undertaken as follow:

Table 9.1 - Public Consultation and Stakeholder Engagement Process

Round	Method	Stakeholders
Round 1: Information sharing and issues identification	Conduct house hold survey in local residents within the AOI	Village leaders and local people in project affected areas (nearest villages)
Round 2: Public consultation meeting for Scoping Proposal	(a) Invitation letter and handout, and were distributed. (b) PPT presentations were used during the meeting.	Government officials and local authorities , NGO's, INGO and CBO's, community leaders, and local communities
Round 2: Public consultation meeting for EIA Study	(a) Invitation letter and handout, and were distributed. (b) PPT presentations were used during the meeting.	Government officials and local authorities , NGO's, INGO and CBO's, community leaders, and local communities
Round 3: Public disclosure	Disclose final EIA report in Da Hua official website	All people who will interest about of EIA study of the proposed project

Round 1: Stakeholder Engagement and Identification

Ever Green Tech will develop a Stakeholder Engagement Plan (SEP) which will follow the framework provided by the International Finance Corporation (IFC) in Guidance Note (GN) 1, Annex B, in terms of Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts (www.ifc.org).

The purpose of stakeholder engagement is to:

"Establish and maintain a constructive relationship with a variety of external stakeholders over the life of the project .... An effective engagement process allows the views, interests and concerns of different stakeholders, particularly of the local communities directly affected by the project (Affected Communities), to be heard, understood, and taken into account in project decisions and creation of development benefits (GN6). Stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts (GN 90)."

The involvement of the following groups or organizations in the stakeholder engagement process will be considered to be particularly important:

- Relevant Government Departments at the National, Provincial and Local level;
- Directly affected communities in the project area;
- Representatives of the local industries;

- Environmental groups and Non-Governmental Organizations (NGO)s;
- Community Based Organizations;
- Academic/research Organizations;
- International donors/funders active in the project area;
- Local communities; and
- The media.

The following communities, authorities and NGOs will be considered as key stakeholders who are directly or indirectly related to the proposed project according to the above consideration.

(a) Local People (local residents around the proposed project area);
(b) Village Administrative Offices (around the proposed project area);
(c) Environmental Conservation Department (Yangon);
(d) Yangon City Development Committee;
(e) Department of Public Health (Myaungdaga);
(f) Planning and Statistics Department (Yangon);
(g) Department of Settlement and Land Record (Yangon);
(h) Department of Labor (Yangon);
(i) Myanmar Police Force (Maungdaga);
(j) Fire Fighting Force (Yangon);
(k) Local Media, and
(l) NGOs and CBOs.

Round 2: Information Sharing and Issues Identification

(a) Household Surveys and Focus Group Discussion

Household sample survey was conducted to evaluate primary socio-economic conditions of the project area and to understand the mood, perceptions and extent of preparedness of the people towards the proposed project. The household survey was carried out to tap the baseline socio-economic conditions of project area and to assess project perceptions and attitudes of the local people over a period of twenty days. To get the accurate data, primary data collection will be conducted by social specialist, social consultants, local authorities and local people. Focus group discussions were carried out with heads of village administration office and elders from almost all of the nearest villages during house hold survey. Through

these discussions, information will collect for consideration of PAPs (Project Affected Persons) and potential environmental and socio-economic impacts.

Sample Size Determination

i. Sample size

The sample size was determined using Yamane's formula. The sampling error was considered as 4 % as the confident level was set at 96%.

$$\mathbf{n} = \frac{N}{1+Ne^2}$$

Where,

n = sample size

N =total number of households in the study area

e = desired margin error

In order to have a clear understanding about the sampling error "e" value, the correlation between sample size and "e" value were presented in the following table.

Table - Correlation between Sample Size and Sampling Error

Size of Population	Sample Size (n) for Precision (e) of:			
	±3%	±5%	±7%	±10%
500	a	222	145	83
600	a	240	152	86
700	a	255	158	88
800	a	267	163	89
900	a	277	166	90
1,000	a	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99

Source: Updated from Glenn D. Israel, 2003

This formula is not applicable for small population below 500 sizes of population, so the small size population was calculated 30% of each population's size. Then sample size was

distributed according to the number of households in each village. However, the selection was done by the number of households located in the project affected part of the village. Thus, the sampled households were more or less differed from village to village. The following presented the sample households distributed in the survey.

ii. Sampling Method

The sampling unit was individual household in the study area. The sampling was carried out by stratified random sampling with the following steps.

- ***Step-1***, Households information were preliminary accessed during the pilot survey. The information includes baseline information of socio-economic activities and their concerns about the proposed projects.
- ***Step-2***, The households in each ward will be geographically classified sub-groups such as
  - households located nearby water sources by the proposed project
  - households located along the accessed roads to the proposed project site
  - households located beside the railway alignment of the proposed project
  - households located near the cultural and heritage site
- **Step**-3, The respondent households were randomly selected from each group according to the sample size.

The following table shows the list of household survey for proposed project. All of the villages are situated neat the proposed project.

Table 9.2 – Stratified Systematic Sample for Study Strata

Village	Date of Survey	Households	Sample Size
Kan Ka Lay village	14.6.2022	180	60
Kalar Kone (East, West and Industrial Zone (1) Street)	15.6.2022	554	228
Myaung Dagar (near industrial zone and industrial zone)	16.6.2022	3550	347

Figure 9.1. SIA Study Area for Polyester Staple Fiber Factory

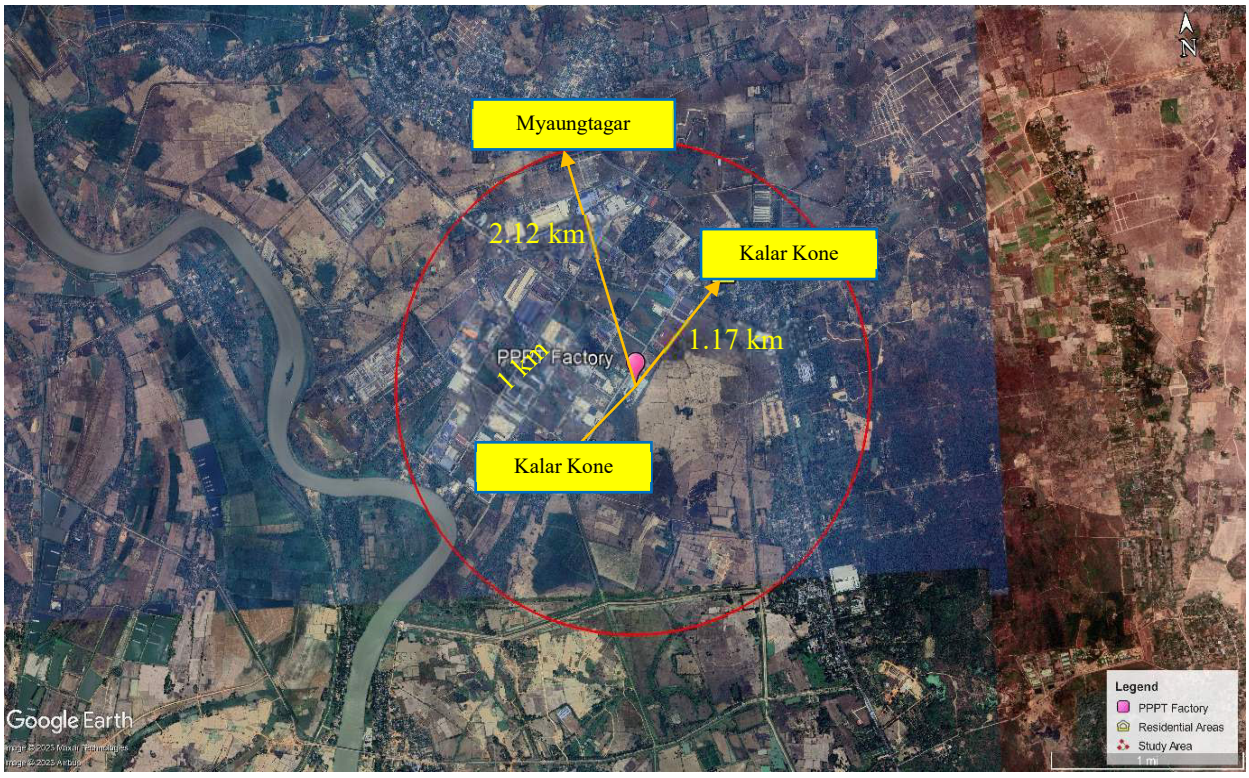


Figure 9.2. SIA Study Area for Plastic Pellets and Packing Tape Factory

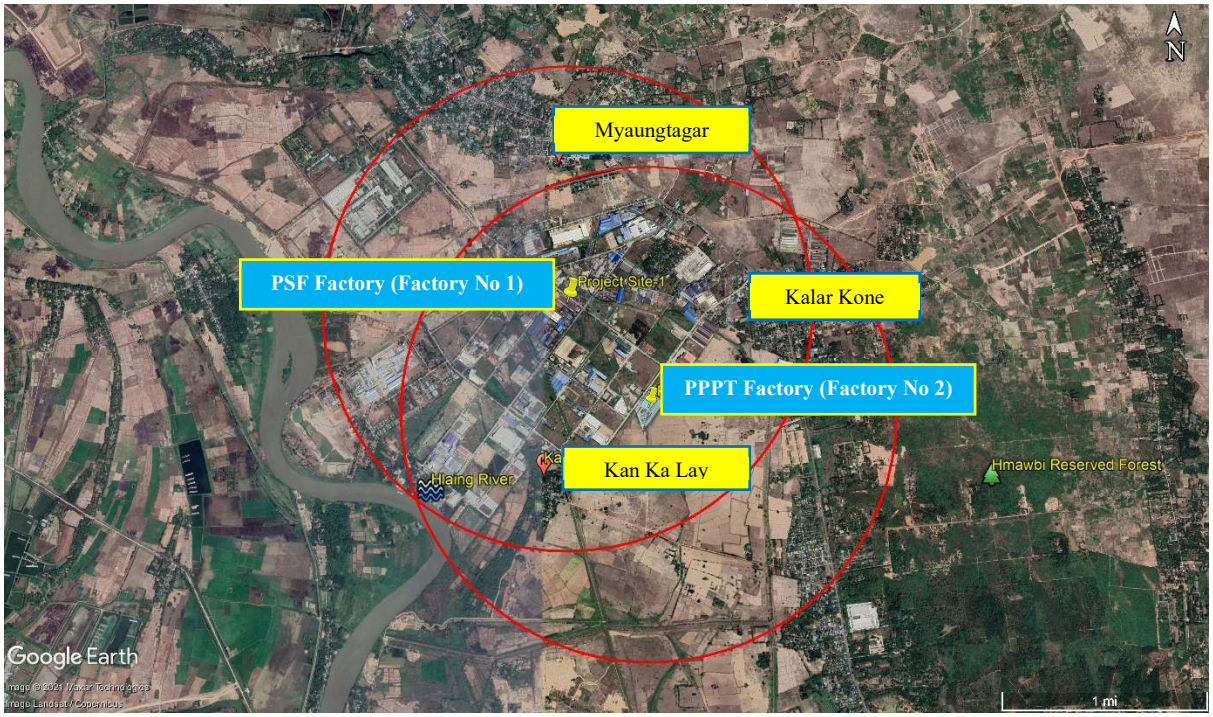


Figure 9.3. SIA Study Area for both PSF and PPPT Factories


Figure 9.4 - Some Recorded Photos in Kan Kalay Village during Household Survey






Figure9.5 – Some Recorded Photos in Kalar Kone (East & West) Village during Household Survey

Figure 9.6 – Some Recorded Photos in Kalar Kone (Sat Mu 1st street) Village during Household Survey






Figure 9.7 – Some Recorded Photos in Myaungtagar (Near Industrial Zone) Village during Household Survey






Figure 9.8 – Some Recorded Photos in Myaungtagar (Industrial Zone) Village during Household Survey

Table 9.3 – Summary of Households Concerns and Needs

Local Residents	Most Public Needs	Most Public Concerns
Local Residents at Kan Kalay Villages	- To provide part-time free clinic - To upgrade drainage system - To upgrade the village roads - To build library - To provide drinking water tank for the village	- Dispose of wastewater from industrial zone (not only the proposed factory)
Local Residents at Kalar Kone (East & West) Villages	- Upgrading of village road - Job opportunities for local people	- Impact of bad smell and smoke at night from industrial zone (not only the proposed factory) - Noise from industrial zone at night (not only the proposed factory)
Local Residents at Kalar Kone (Industrial Zone (1) street)	- To provide part-time free clinic - Upgrading of village roads - Training program for industrial workers - To provide drainage system	- Impact of wastes accumulated in village - Getting the smell from chicken farming (not from the proposed factories) - Noise from industrial zone at night (not only the proposed factory) - Impact of odour due to using boiler from garment factory (not from the proposed project) - Lack of discipline factory workers
Local Residents at Myaung Dagar (Near industrial zone)	- To provide part-time free clinic - Training program for industrial workers - Job opportunities for local people	- Impact of odour and gaseous emission from boiler
Local Residents at Myaung Dagar (within industrial zone)	- To provide cleaning the drainage within the industrial zone - To provide part-time free clinic - Job opportunities for local people	- Impact of odour and gaseous emission from boiler - Dust generation from road due to travelling of vehicles - Smell from wastewater disposing from factory - Noise from generator and running of machines at night

Note: Local residents within industrial zone do not have legal permit to stay inside the industrial zone.

Percentage of Most Public Concerns and Needs during Household Survey

As household survey was conducted 3 villages and so the results of household survey. The following are the most important public concerns resulted by the household survey for the proposed project.

Villages	Public Concerns	Percentage	Public Needs	Percentage
Kan Kalay	Impact of smell and smoke from industrial zone	40%	Healthcare facilities	20%
	Sediments and colour of water	60%	Drainage system	50%
			Road Repair	30%
Kalar Kone (East & West)	Impact of smell and smoke from industrial zone	50%	Job Opportunities	50%
			Donation for community development	10%
	Noise from operating machines	50%	Road Repair	15%
			Municipal	25%
Kalar Kone (Industrial Zone (1) street)	Impact of wastes accumulated	40%	Healthcare facilities	50%
	Impact of smell from chicken farm and boiler	20%	Road Repair	45%
	Noise from generator	40%	Training Programs for workers	5%
Myaung Dagar (Near industrial zone)	Impact of odour and gaseous emission from boiler	100%	Training Programs for workers	5%
			Electric supply	30%
			Job Opportunities	60%
			Healthcare facilities	5%
Myaung Dagar (In Industrial zone)	Impact of odour and gaseous emission from boiler	45%	Drainage system	50%
	Dust generation from road	10%	Healthcare facilities	20%
	Impact of wastewater	35%	Job Opportunities	25%
	Noise from operating of generator at night	10%	Road Repair	5%

Round 3: Public Consultation Meetings (PCMs)

Public meetings will be held as follows:

(a) PCM for Scoping Proposal

Public meeting for scoping proposal was completed in (10.9.2021) during Covid 19 period. Public meeting for scoping report was made as per the Covid Rules and Regulation. So, there were about 30 people from local communities who are directly or indirectly affected by the proposed project are attended in this meeting. The aim of this scoping meeting is –

- To announce the process and procedure of EIA;
- To discuss about the possible environmental and social impacts;
- To discuss the scope of anticipated impacts zone and
- To discuss about the alternative ways to avoid the possible impacts

The recorded photos during first public meeting for scoping proposal are as follows:

Figure 9.9 - Some Recorded Photos during Public Meeting for Scoping Proposal

Most Public Needs and Concerns during Public Meeting for Scoping Proposal

During public meeting for scoping proposal, the most important positive outcomes from the project expected by the local people and most of their concerns about proposed project are as follows:

Most Public Concerns

1. Impacts on air quality from the emission of PM from the boiler
2. Systematic discharge of waste water from the factory
3. Gaseous Emissions from the the boiler

No	Most Important Public Concern	% concerned
1	Discharge of sewage	8.30%
2	Gaseous emissions from the boiler	12.67%
3	PM emission from boiler	27.81%
4	Bed smell from drainage system	35.56%

Detailed discussion during the PCM for scoping proposal are described in Appendix.

(b) Public Meeting for EIA Stage

Public meeting for EIA Stage were made on (19.6.2022). The location of the meetings and list of participants are shown in the following table.

No.	Meeting	Location	Date	No. of Participants
1	Public Meeting for EIA Study	Committee Office Hall at Myaung Dagar Industrial Zone	19.6.2022	Local Authorities = 19
				Local People = 68

Summary of Public Meeting for EIA Stage

The public consultation meeting for EIA study was held at the Committee Office Hall of Myaung Dagar Industrial Zone, Myaung Dagar Township in 19.6.2022. Around 90 people from local authorities, local people and other stakeholders who are interested the project are attended. The key discussions are drainage system from the factory, job opportunities for the local people and CSR fund for the nearest village.








Figure 9.10. Some Recorded Photos during Public Meeting for EIA Study

The discussion about EIA were answered by EIA teams and discussion about the concerns during the scoping and EIA stages (both oral discussion during PCMs and suggestion letters) and discussed as follows:

Key Concern
To have a plan to control the gasous emissions from the factory
Waste must be disposed of in accordance with the prescribed rules
To have a certain height for the chimney for boiler
Getting bad smell from drainage system

Detailed discussions about during the public meeting for EIA stage are described in Appendix.

9.2. Further Public Consultation Meetings

Da Hua will make public consultation meeting at least one times per year. Moreover, intermittent consultation meeting will also make according to the necessarily. Da Hua will discuss the following factors in future public meeting.

SN	PCM	Responsibilities	Remarks
1	Air pollution due to the emission of PM and gaseous emissions from the boiler	Da Hua	Places where every affected people can attend
2	Discharge of wastewater from the factory		
3	Noise from the factory nearby		
4	The use of CSR fund		

9.3. Public Disclosure Process

Final EIA report will be disclosed at Da Hua Official Website www.dahua.com.

9.4. Grievance Redress Mechanism (GRM)

Objectives

The objectives of Grievance Redress Committee (GRC) are as follow:

1. To create an opportunity for the employee to communicate with management.
2. To create an opportunity for the any grievance person to communicate with management
3. To ensure that complaints are effectively dealt with by management.
4. To prevent disputes due to proposed project.

A grievance redress mechanism (GRM) will be made available to parties who have grievances or are not satisfied with any part of the development of proposed project and compensation process. A grievance redress mechanism (GRM), will be established to prevent and address community concerns, and reduce risks. The GRM is also an integral part of the monitoring and information system. It aims to ensure that feedback is received, that the voices from the poor and marginalized groups are heard, and that the issues raised are resolved effectively and expeditiously. It helps ensure that vulnerable households are treated equitably.

The GRM will be accessible to diverse members of the community and stakeholders. Multiple types of media, including face-to-face meetings, written forms, telephone conversations, or e-mail, will be available for raising issues, concerns and grievances.

The GRM aims to resolve concerns promptly, in an impartial and transparent process tailored to the specific community, and at no cost and without retribution to the complainant/s. The GRM will be communicated to different stakeholders. It is intended that information about the GRM be disseminated widely in meetings and through pamphlets and brochures in Myanmar language, and ethnic languages as needed/relevant. Specifically, information will be provided about how and where to lodge complaints/grievances. Villagers will be encouraged to seek clarification or remediation through the mechanism if they have any questions or complaints/ grievances.

Grievance Redress Monitoring Indicators

Grievance redress monitoring indicators will include:

- Number of complaints/ grievances registered.
- Percentage of grievances resolved.
- Percentage of grievances resolved within stipulated time period.
- Time required to resolve complaints.
- Percentage of complainants satisfied with response and grievance redress.
- Percentage of project beneficiaries that have access to the GRM.

9.4.1. Grievance Redress Committee (GRC)

In order to address grievances, a Grievance Redress Committee (GRM) will be formed for dealing with any grievances as they arise. This will include representatives from Da Hua, representatives from Village Administrative Office of nearest project sites, representatives from Industrial Zone Committee, representatives from Township Administrative Office (if necessary), and representative from PAPs.

9.4.2. Role and Responsibility of GRM Team

The GRM

The proposed GRM follows the existing approach taken for managing complaints about local issues by members of the public in Myanmar. Residents' complaints or concerns are generally taken to local government (village and township level) representatives for resolution; therefore, this system is integrated into the GRM.

In their capacity as implementing agencies, the Da Hua will establish a Public Complaints Unit (PCU) within the PMU early during project implementation prior to the start of planning and design of sub-projects and prior to negotiations for public complains. The PCU will deal with complaints from affected people and stakeholders throughout implementation of the project. This will include nearby residents, construction workers, and will involve village and township level government.

The PMU will be the key contact point for local government representatives who may require information about the project or who have an issue they would like to discuss. The PMU will issue public notices and leaflets in local languages early in the subproject design process to inform people and organizations within the project area of the GRM. The PCU's phone number, fax, address, email address will be disseminated. The following person will be appointed as contact person for Da Hua (Myanmar) Company Limited, Grievance Redress Committee (GRC).

Contact Person	Daw May Moe Da Hua (Myanmar) Co., Ltd 09-250064251

The PMU will maintain a complaints database which indicates the household making the grievance, the nature of the issue, the date the report was received and also dealt with and the result. Dispute receipt and resolution will be reported regularly in project quarterly reports.

9.4.3. Grievance Mechanism Procedures

The procedure for handling grievances will be as follows.

(i) The affected person will file his grievance in writing, to the Village Leader. The grievance note will be signed and dated by the aggrieved person. Where the affected person is unable to write, he will obtain assistance to write the note and emboss the letter with his/her thumbprint.

(ii) The Head of Village Administrative Office or Village Leader will notify the Grievance Committee and respond within 14 days during which any meetings and discussions to be held with the aggrieved person will be conducted. If the grievance relates to valuation of assets, an independent value will be requested to revalue the assets, and this may necessitate a longer period of time. In this case, the aggrieved person will be notified by the VOC's head or Village Leader that his/her complaint is being considered.

(iii) If the aggrieved person does not receive a response or is not satisfied with the outcome within the agreed time, he/she may lodge his/her grievance to the Local General Administration Department.

Table 9.4 - Township, District and State Level Committees for the Grievance Redress Mechanism

No	Committee Member	Member Role
Township Level Redress Committee (TRC)		
	A person elected from citizen	Chairperson
	A person elected from experts	Member
	A person elected from CSOs	Member
	Deputy admin officer – township level (General Administrative Department)	Member
	Township level officer	Member
District Level Redress Committee (DRC)		
	A person elected from citizen	Chairperson
	A person elected from experts	Member
	A person elected from CSOs	Member
	Deputy admin officer – district level (General Administrative Department)	Member
	District level officer	Member

State Level Redress Committee (SRC)		
	The president appointed mayor as a minister	Chairperson
	Each district can elect one representative	4 Members
	Appointed from government	4 Members

Grievance Redress Letter (Sample)

Date:

Sender Information	
Name	
Age	
Gender	
Occupation	
Address	
Contact no	
Email	

To

Grievance Redress Committee, ----------Co,Ltd,

Subject

Signature -

Name -

Date -

Figure: Grievance Redress Letter (Sample) (English)

နစ်နာမှုတိုင်ကြားချက်လျှောက်လွှာ (နမူနာ)

ရက်စွဲ၊

တိုင်ကြားသူ	
အမည်	
အသက်	
ကျား/မ	
အလုပ်အကိုင်	
လိပ်စာ	
ဖုန်း	
အီးမေးလ်	

သို့

နစ်နာမှုတိုင်ကြားချက်ဖြေရှင်းရေးကော်မတီ၊----------Co,Ltd,

အကြောင်းအရာ ၊

လက်မှတ် -

အမည် -

နေ့စွဲ -

Figure: Grievance Redress Letter (Sample) (Myanmar)

9.4.4. GRM Steps and Time Frame

Procedures and time frames for the grievance redress process are as follows:

Stage 1: Access to GRM. If a concern arises, the affected person will resolve the issue of concern directly with the contractor, or make his/her complaint known to either the PCU directly, or through the local village or township government, whichever level of authority he/she is most comfortable with;

Stage 2: Official Complaint to PCU. If a complaint is filed at local government level, the government representative will submit an oral or written complaint to the PCU. For an oral complaint the PCU must make a written record. For each complaint, the PCU must assess its eligibility. If the complaint is not eligible, for instance it is determined that the issue is outside the scope of the project, PCU will provide a clear reply within five working days to the affected person;

Stage 3: PCU Complaint Resolution. The PCU will register the complaints informing the respective local and district government, the PMU and contractors. The PCU, with support of the social specialist and other PICs depending on the issue will take steps to investigate and resolve the issue. This may involve instructing the contractor to take corrective actions. Within seven days of the redress solution being agreed upon, the contractor should implement the redress solution and convey the outcome to the PMU;

Stage 4: Stakeholder Meeting. If no solution can be identified by the PCU or if the affected person is not satisfied with the suggested solution under Stage 3, within two weeks of the end of Stage 3, the PCU will organize a multi-stakeholder meeting under the auspices of the head of local government, where all relevant stakeholders will be invited. The meeting will result in a solution acceptable to all, and identify responsibilities and an action plan. Da Hua will implement the agreed redress solution and convey the outcome to the PMU within seven working days. The invitees to this meeting will depend on the nature of the complaint. For example, if the complaints relate to health, land disputes, or labor issues, the appropriate specialist in this field will be invited to the stakeholder meeting. This may include officers from the Department of Agricultural Land Management and Statistics (land rights issues), Myanmar Chamber of Commerce (business/commercial issues), various non-government organizations (NGOs) (gender or equity issues), Ministry for Ethnic Affairs (if ethnic group household involved), Ministry of Health (health issues), Ministry of Environmental Conservation and Forestry (environmental issues), and Ministry of Labor (labor issues); and

Stage 5: District Administration Officer Resolution. If the multi-stakeholder meeting cannot resolve the problem, and the affected person remains unsatisfied, the PMU will set up a meeting with the District Administration Officer to identify a solution.

10.0 CONCLUSION

Generally, the proposed project will have low impact on natural environment due to the nature of recycling process. However, the project will use coal fired boiler and so most of the significant impacts will be from the operation of coal fired boiler. According to this EIA study, the key potential impacts will be gaseous and PM emissions from the operation of boiler, waste water from cleaning process, and noise from the operation of generator at night. The most public concerns about the proposed project are PM emission and noise from the factory. In this report, the key anticipated environmental and social impacts of the proposed project are described. Moreover, proper mitigation measures for all anticipated impacts and good environmental management practices are also described. According to the EIA Study all of the anticipated environmental and social impacts can be mitigated with proper mitigation measures described in this report. So, Da Hua will do all of the environmental management and monitoring measures described in this EIA report. Da Hua also knows and take care about the effect of cumulative impacts on as there have some other factories these can have gaseous emissions and odour. Da Hua will regularly use CSR fund for local community development. In conclusion, Da Hua will try to operate in order to become sustainable project development by creating environmentally and socially responsible project.

APPENDIX A

PERMISSION LETTERS

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်

Certificate of Incorporation

DA HUA(MYANMAR)COMPANY LIMITED
Company Registration No. 104879616

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ
DA HUA(MYANMAR)COMPANY LIMITED
အား ၂၀၁၈ ခုနှစ် ဇန်နဝါရီလ ၈ ရက်နေ့တွင်
အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that
DA HUA(MYANMAR)COMPANY LIMITED
was incorporated under the Myanmar Companies Act 1914 on 8 January 2018 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ
Registrar of Companies
ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန
Directorate of Investment and Company Administration

Former Registration No. 927FC/2017-2018(YGN).

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ် 002042

အမှတ် ....၃၁၁၃...../ ၂၀၁၃-၂၀၁၄

မြန်မာနိုင်ငံ ကုမ္ပဏီများ အက်ဥပဒေအရ ဒါဟူး ကုမ္ပဏီ လီမိတက် .....

..... အား ပေးရန်တာဝန် ကန့်သတ်ထားသော လီမိတက်

ကုမ္ပဏီအဖြစ် ၂၀၁၃ ခုနှစ်၊ စက်တင်ဘာလ၊ ၂၆ ရက်နေ့တွင် မှတ်ပုံတင်ခွင့်ပြုလိုက်သည်။

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)
(နန်းရီရီသန်း ၊ ညွှန်ကြားရေးမှူး)
ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF NATIONAL PLANNING AND ECONOMIC DEVELOPMENT

CERTIFICATE OF INCORPORATION

NO. 3113 of 2013-2014

I hereby certify that DA HUA COMPANY LIMITED
is this day incorporated under the Myanmar Companies Act and that the company is Limited.

Given under my hand at Nay Pyi Taw this TWENTY-SIXTH day of SEPTEMBER, TWO THOUSAND AND THIRTEEN

For Director General
(Nang Yi Yi Than, Director)
Directorate of Investment and Company Administration

[redacted]

THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

PERMIT

Permit No. 057/2018 Date 14 February 2018

This Permit is issued by the Myanmar Investment Commission according to the section 25, sub-section (c) of the Myanmar Investment Law:-

(1) Name of Investor MR. XU, JIANJUN

(2) Citizenship CHINESE

(3) Residence Address ROOM NO. 27-401 YUNGGUANG HUATING, TONGLU, HANGZHOU CITY, ZHEJIANG, PEOPLE'S REPUBLIC OF CHINA

(4) Name and Address of Principle Organization DA HUA ENVIRONMENTAL SCI-TECH (HK) LIMITED, FLAT 2, 7/F BLK A HUNG HONG COURT HUNG HOM BAY CTR 92 BAKER ST KLN, HONG KONG

(5) Place of Incorporation HONG KONG

(6) Type of Business MANUFACTURING OF POLYESTER STAPLE FIBRE ON CMP BASIS

(7) Place(s) at which investment is permitted PLOT NO. 209, 238, MYAUNG DAGAR STEEL INDUSTRIAL ZONE, HMAWBI TOWNSHIP, YANGON REGION

(8) Amount of Foreign Capital US$ 4.15 MILLION

(9) Period for Foreign Capital to be brought in WITHIN ONE YEAR FROM THE DATE OF ISSUANCE OF MIC PERMIT

(10) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF US$ 5.19 MILLION (INCLUDING US$ 4.15 MILLION)

(11) Construction Period 12 MONTHS

(12) Validity of investment permit 20 YEARS

(13) Form of investment JOINT VENTURE

(14) Name of Company incorporated in Myanmar DA HUA (MYANMAR) COMPANY LIMITED

14.2.18

Chairman
Myanmar Investment Commission

DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)	Company Name (Myanmar)
DA HUA(MYANMAR)COMPANY LIMITED	-

Company Information

Registration Number	Registration Date	Status
104879616	08/01/2018	Registered
Company Type	**Foreign Company**	**Small Company**
Private Company Limited by Shares	Yes	No
Principal Activity	**Date of Last Annual Return**	**Previous Registration Number**
32 - Other manufacturing 22 - Manufacture of rubber and plastics products	31/01/2023	927FC/2017-2018(YGN).

Addresses

Principal Place Of Business In Union	-, PLOT NO. 209,238 AND 375, 376, 377, 378, 379, 380, 381 MYAUNG DAGAR STEEL INDUSTRIAL ZONE, HMAWBI TOWNSHIP, YANGON REGION, MYANMAR
Registered Office In Union	-, PLOT NO. 209,238 AND 375, 376, 377, 378, 379, 380, 381 MYAUNG DAGAR STEEL INDUSTRIAL ZONE, HMAWBI TOWNSHIP, YANGON REGION, MYANMAR Email Address: win.thanthan@dahuafiber.com Telephone Number: 09251105109, 09250064251

Officers

Name:	HSU MON THANT	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	14/11/1989
Nationality:	MYANMAR	N.R.C./Passport:	14/MAMANA(N)198831
Gender:	FEMALE	Business Occupation:	-
Name:	XU JIANJUN	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	01/05/1983
Nationality:	CHINA	N.R.C./Passport:	EB4914269
Gender:	MALE	Business Occupation:	-

Ultimate Holding Company

Name of Ultimate Holding Company	Jurisdiction of Incorporation	Registration Number
Dahua Enviromental Sci-Tech (HK) Limited	Hong Kong	2631590

Share Capital Structure

Page 1 of 2
EXTRACT GENERATED ON 02/02/2023 AT 09:30

DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)	Company Name (Myanmar)
DA HUA(MYANMAR)COMPANY LIMITED	-

Total Shares Issued by Company	Currency of Share Capital
574,800	USD

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	574,800	574,800.00	0.00

Members

Name of Company: DAHUA ENVIRONMENTAL SCI-TECH (HK) LIMITED
Registration Number: 2631590 Jurisdiction of Incorporation: Hong Kong

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	459,840	459,840.00	0.00

Name: HSU MON THANT
Gender: Female Date of Birth: 14/11/1989
Nationality: Myanmar N.R.C./Passport: 14/MAMANA(N)198831

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	114,960	114,960.00	0.00

Mortgages and Charges

Form / Filing Type	Effective Date

No records available

Details about all mortgages and charges can be accessed from the Company Profile Filing History at no charge.

Filing History

Form / Filing Type	Effective Date
AR | Annual Return	31/01/2023
C-3 | Change to share capital or register of members	27/05/2022
C-4 | Notice of change of registered office or principal place of business	26/05/2022
AR | Annual Return	25/01/2022
AR | Annual Return	27/01/2021
C-3 | Change to share capital or register of members	04/08/2020
AR | Annual Return	15/02/2019
B-1 | Application for re-registration of a private company limited by shares	19/09/2018

Page 2 of 2
EXTRACT GENERATED ON 02/02/2023 AT 09:30

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

စက်မှုဝန်ကြီးဌာန

စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန

ပုဂ္ဂလိကစက်မှုလုပ်ငန်းမှတ်ပုံတင်လက်မှတ်

စက်မှုမှတ်ပုံတင်အမှတ် ရက/ကြီး/၆၅၃၅ ရက်စွဲ ၃၁ . ၁. ၂၀၂၃

လုပ်ငန်းအရွယ်အစား အကြီးစားပြည်ထောင်စုနယ်မြေ/တိုင်းဒေသကြီး/ပြည်နယ် ရန်ကုန်

အောက်ပါလုပ်ငန်းသည် ပုဂ္ဂလိကစက်မှုလုပ်ငန်း ဥပဒေ ပုဒ်မ ၇ ပုဒ်မခွဲ (ဂ)အရ မှတ်ပုံတင်ပြီး ဖြစ်ပါသည်။ Da Hua(Myanmar) Co.,Ltd FOB စနစ်ဖြင့် Polyester Staple Fibre, Pet Packing

၁။ လုပ်ငန်းအမည် Tape and All Kinds of Recycled Pallet များ ထုတ်လုပ်ရောင်းချခြင်းလုပ်ငန်း

၂။ လုပ်ငန်းအမျိုးအမည် အခြားကုန်ပစ္စည်းများ ထုတ်လုပ်ခြင်း

၃။ အဓိကကုန်ချောပစ္စည်းအမျိုးအမည် All Kinds of Recycled Plastic Pallet, PET Packing Tape

၄။ တည်နေရာလိပ်စာ မြေကွက်အမှတ်(၃၈၀၊ ၃၈၁)၊ စက်မှု(၁)လမ်း၊ မြောင်းတကာသံမဏိစက်မှုလုနယ်၊ မှော်ဘီမြို့နယ်၊ မှော်ဘီခရိုင်

၅။ ပိုင်ဆိုင်မှုအမျိုးအစား ကုမ္ပဏီပိုင်

၆။ လုပ်ငန်းရှင်အမည် Mr. Xu Jianjun (M.D)

၇။ ကိုင်ဆောင်သည့်မှတ်ပုံတင်အမှတ် PP No.EB- 4914269

၈။ ရင်းနှီးမြှုပ်နှံမှုတန်ဖိုး(ကျပ်) US$ ၁. ၃၅၉ သန်း တည်ထောင်သည့်ခုနှစ် ၂၀၂၃

၉။ အသုံးပြုသည့်အားအမျိုးအစား ထရန်စဖော်မာ/လျှပ်ထုတ်စက် မြင်းကောင်ရေ ၂၀၀၀ KVA/ ၈၀၀ KW

၁၀။ အလုပ်သမားဦးရေ ၁၅၃ ဦး

၁၁။ မှတ်ပုံတင်သက်တမ်းကုန်ဆုံးသည့်နေ့ရက် ၃၁. ၁. ၂၀၂၄

သိန်းဆွေ
ဦးစီးကြီးရေးမှူးချုပ်

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

စက်မှုဝန်ကြီးဌာန

စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန

ပုဂ္ဂလိကစက်မှုလုပ်ငန်းမှတ်ပုံတင်လက်မှတ်

စက်မှုမှတ်ပုံတင်အမှတ် ရက/ကြီး/ဝဂ္ဂစဝ ရက်စွဲ ၁၉ . ၃. ၂၀၁၈

လုပ်ငန်းအရွယ်အစား အကြီးစား ပြည်ထောင်စုနယ်မြေ/တိုင်းဒေသကြီး/ပြည်နယ် ရန်ကုန်

အောက်ပါလုပ်ငန်းသည် ပုဂ္ဂလိကစက်မှုလုပ်ငန်း ဥပဒေ ပုဒ်မ ၇ ပုဒ်မခွဲ (ဂ)အရ မှတ်ပုံတင်ပြီး ဖြစ်ပါသည်။

၁။ လုပ်ငန်းအမည် Da Hua (Myanmar) Co., Ltd. CMP စနစ်ဖြင့် Polyester Staple Fibre များထုတ်လုပ်ခြင်းလုပ်ငန်း

၂။ လုပ်ငန်းအမျိုးအမည် လူသုံးပစ္စည်းလုပ်ငန်း

၃။ အဓိကကုန်ချောပစ္စည်းအမျိုးအမည် Polyester Staple Fibre

၄။ တည်နေရာလိပ်စာ အမှတ်(၂၀၉၊ ၂၃၈) စစ်ကိုင်းမင်းလမ်းနှင့် စက်မှု(၂)လမ်းထောင့်၊ မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မော်ဘီမြို့နယ်၊ မြောက်ပိုင်းခရိုင်

၅။ ပိုင်ဆိုင်မှုအမျိုးအစား ကုမ္ပဏီပိုင်

၆။ လုပ်ငန်းရှင်အမည် Mr.Xu Jianjun (M.D)

၇။ ကိုင်ဆောင်သည့်မှတ်ပုံတင်အမှတ် PP No.EB-4914269

၈။ ရင်းနှီးမြှုပ်နှံမှုတန်ဖိုး(ကျပ်) ၄၅. ဝဝသန်း+US$၁၊ ၁၅ဝသန်း တည်ထောင်သည့်ခုနှစ် ၂၀၁၈

၉။ အသုံးပြုသည့်အားအမျိုးအစား ထရန်စဖော်မာ/လျှပ်ထုတ်စက် မြင်းကောင်ရေ ၂၄၅၅ HP/ ၁၀၀၀ KVA

၁၀။ အလုပ်သမားဦးရေ ၈၁ ဦး

၁၁။ မှတ်ပုံတင်သက်တမ်းကုန်ဆုံးသည့်နေ့ရက် ၃၁. ၃. ၂၀၃၃

အေးအေးဝင်း

ညွှန်ကြားရေးမှူးချုပ်

လုပ်ငန်းရှင်များလိုက်နာရန်စည်းကမ်းချက်များ

၁။ ဤမှတ်ပုံတင်လက်မှတ်ကို အများမြင်သာသည့်နေရာတွင် ချိတ်ဆွဲထားရမည်။
၂။ ဤမှတ်ပုံတင်လက်မှတ်ကို မသက်ဆိုင်သူအား လွှဲအပ်ခြင်း သို့မဟုတ် လွှဲပြောင်းပေးခြင်းမပြုရ။
၃။ ဤမှတ်ပုံတင်လက်မှတ်ပါ အချက်အလက်များကို ပြင်ဆင်ခြင်း သို့မဟုတ် ဖြည့်စွက်ခြင်းမပြုရ။
၄။ ဤမှတ်ပုံတင်လက်မှတ် ပျောက်ဆုံးလျှင် မှတ်ပုံတင်လက်မှတ်မိတ္တူကို ထုတ်ပေးရန် ပြည်ထောင်စုနယ်မြေ သို့မဟုတ် တိုင်းဒေသကြီး သို့မဟုတ် ပြည်နယ်ဦးစီးဌာနမှူးထံ ခိုင်လုံသော အထောက်အထားနှင့်အတူ လျှောက်ထားရမည်။
၅။ မှတ်ပုံတင်လက်မှတ်ပျက်စီးလျှင် သို့မဟုတ် မထင်မရှားဖြစ်လျှင် သို့မဟုတ် မှတ်ပုံတင်လက်မှတ် ပါ အချက်အလက်များ ပြောင်းလဲရန်လိုအပ်လျှင် ပြည်ထောင်စုနယ်မြေ သို့မဟုတ် တိုင်းဒေသကြီး သို့မဟုတ် ပြည်နယ်ဦးစီးဌာနမှူးထံ မှတ်ပုံတင်လက်မှတ်နှင့် ပူးတွဲတင်ပြလျှောက်ထားရမည်။
၆။ ဤမှတ်ပုံတင်လက်မှတ်ကို စက်မှုလုပ်ငန်းနှင့်စပ်လျဉ်းသည့်ကိစ္စမှအပ မည်သည့်ကိစ္စတွင်မျှ အသုံးမပြုရ။
၇။ မှတ်ပုံတင်သက်တမ်းမကုန်ဆုံးမီ သက်တမ်းတိုးမြှင့်ပေးရန် လျှောက်ထားရာတွင် ဤမှတ်ပုံတင်လက်မှတ်ကို ပူးတွဲတင်ပြရမည်။
၈။ သက်တမ်းကုန်ဆုံးပြီး ရက်ပေါင်း (၆၀)အတွင်း သက်တမ်းတိုးမြှင့်လျှောက်ထားပါက သတ်မှတ်သည့်ဒဏ်ကြေးကို ပေးဆောင်ရမည်။
၉။ သက်တမ်းတိုးမြှင့်ရန် လျှောက်ထားခြင်းမရှိပါက မှတ်ပုံတင်ပျက်ပြယ်ပြီးဖြစ်သည်။

မှတ်ပုံတင်သက်တမ်းတိုးမြှင့်ခြင်း

စဉ်	ချေးငှားအမှတ်/ရက်စွဲ	မှတ်ပုံတင်သက်တမ်းကုန်ဆုံးမည့်နေ့ရက်	ခွင့်ပြုသူလက်မှတ်
၁.	၆၈၊ ၄.၃. ၁၉	၃၁.၃.၂၀	
၂.	၄၅၀၊ ၃၂.၃.၂၀	၃၁.၃.၂၂	
၃.	၇/ရ/၂၂.၄.၂၁	၃၁.၃.၂၀၂၂	
၄	၁၀/ရ/ရ.၃.၂၂	၃၁.၃.၂၀၂၃	
၅.	၈၀/၂၀၊၂၂.၃.၂၀၂၃	၃၁.၃.၂၀၂၄	

ဘ(စမ)/0017

ရုံးတံဆိပ်

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
ရန်ကုန်တိုင်းဒေသကြီးအစိုးရအဖွဲ့
ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးဝန်ကြီးဌာန
(ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးအဖွဲ့)
မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

၂၀၂၃ - ၂၀၂၄ ခု ဘဏ္ဍာရေးနှစ် "ဘေးအန္တရာယ်လုပ်ငန်းလိုင်စင်" လုပ်ငန်းလိုင်စင်

၁။ စက်ရုံအမည် DA HUA Co;ltd

၂။ ကမကထပြုသူ၏အမည် Mr. Xu Tianyun

၃။ လုပ်ငန်းတည်ရှိသည့်နေရာ မြေကွက် - ၂၀၉၊ ၂၀၈ မြောင်းတကာ ...

၄။ လုပ်ကိုင်ခွင့်ပြုသည့်လုပ်ငန်းအမျိုးအစား ...

၅။ နှစ်စဉ်လိုင်စင်ကြေးငွေ ၃၀၀၀၀၀/-

၆။ ငွေပေးသွင်းသည့်ရက်စွဲ ၅. ၅. ၂၀၂၃

၇။ လိုင်စင်သက်တမ်းကုန်ဆုံးသည့်နေ့ ၁-၄-၂၀၂၃ မှ ၃၁-၃-၂၀၂၄ ထိ ၁နှစ်

လိုက်နာရန်စည်းကမ်းချက်များ

၁။ လုပ်ငန်းလိုင်စင်အား မြင်သာသောနေရာတွင် မှန်ဘောင်ဖြင့် ချိတ်ဆွဲထားရမည်။
လိုင်စင်အား တဆင့်လွှဲပြောင်းခြင်း၊ ငှားရမ်းခြင်း၊ ပေးကမ်းခြင်း လုံးဝမပြုလုပ်ရ။

၂။ လိုင်စင်ရရှိသူသည် အများပြည်သူအား ဘေးအန္တရာယ်ဖြစ်စေသည့် သို့မဟုတ် စက်ဆုပ်ရွံရှာဖွယ်ဖြစ်စေသည့် အလုပ်အကိုင်နှင့်ကုန်သန်းရောင်းဝယ်ခြင်းလုပ်ငန်းများ၊ စားသောက်ဖွယ်ရာများထုတ်လုပ်ခြင်း၊ တည်ခင်းရောင်းချခြင်းဆိုင်ရာ စည်းကမ်း(Bye-Laws)များနှင့် အခါအားလျော်စွာ ထုတ်ပြန်သည့်အမိန့် ညွှန်ကြားချက်များကို တိကျစွာ လိုက်နာရမည်။

၃။ လိုင်စင်ရရှိသူသည် လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းစေရန်နှင့် မီးဘေးကြိုတင်ကာကွယ်ရေးအတွက် ကြိုတင်တိကျစွာ လိုက်နာရမည်။

၄။ လိုင်စင်ရရှိသူသည် မိမိလုပ်ငန်းမှထွက်ရှိသည့် အမှိုက်သရိုက်၊ အညစ်အကြေးနှင့်ဓါတုဗေဒပစ္စည်းများအား အမှိုက်ကင်းမဲ့ စီမံချက်နှင့်အညီ စနစ်တကျစွန့်ပစ်ရမည်။ လိုအပ်ပါက မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့တွင် စီးပွားရေးအမှိုက်ခွန်ပေးသွင်း၍ အမှိုက်သိမ်းယာဉ်အကူအညီ တောင်းခံရမည်။

၅။ လိုင်စင်တွင် ရောင်းချခွင့်ပြုထားသည့် ကုန်ပစ္စည်းများကိုသာ ရောင်းချခွင့်ပြုသည်။ သက်ဆိုင်ရာအာဏာပိုင်များက တားမြစ်သည့် ကုန်ပစ္စည်းများကို ရောင်းချခြင်းမပြုရ။

၆။ နှစ်စဉ် အဖွဲ့မှသတ်မှတ်သည့်လိုင်စင်ခကို လုပ်ငန်းအမျိုးအစားအလိုက် သတ်မှတ်သည့်နှုန်းထားအတိုင်း ပေးဆောင်ရမည်။

၇။ လုပ်ငန်းရှင်များသည် ရှေ့လာမည့်ဘဏ္ဍာရေးနှစ်တွင် မိမိလုပ်ငန်းအား ဆက်လက်လုပ်ကိုင်လိုပါက အဖွဲ့ရုံးသို့ ကြိုတင်လျှောက်ထားရမည်။

၈။ လုပ်ငန်းရှင်များသည် မိမိလုပ်ငန်းအား ပိတ်သိမ်းသည့်အခါ အဖွဲ့ရုံးသို့ ကြိုတင်အကြောင်းကြားရမည်။

၉။ အထက်ပါစည်းကမ်းတစ်ရပ်ရပ်ကို လိုက်နာခြင်းမရှိပါက လိုင်စင်ကို ပြန်လည်ရုပ်သိမ်း၍ စည်ပင်သာယာရေးအဖွဲ့များဥပဒေအရ ထိရောက်စွာအရေးယူခြင်းခံရမည်။

9.5.2023

အမှုဆောင်အရာရှိ
မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

ရက်စွဲ၊ ၂၀၂၃ ခုနှစ်၊ ဧပြီ လ ၂၇ ရက်။

ဘ(စမ)/ 0012

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
ရန်ကုန်တိုင်းဒေသကြီးအစိုးရအဖွဲ့
ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးဝန်ကြီးဌာန
(ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးအဖွဲ့)
မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

၂၀၂၃ - ၂၀၂၄ ခု ဘဏ္ဍာရေးနှစ် "ဘေးအန္တရာယ်လုပ်ငန်းလိုင်စင်" လုပ်ငန်းလိုင်စင်

၁။ စက်ရုံအမည် DA HUA Myanmar Co., Ltd
၂။ ကမကထပြုသူ၏အမည် Mr. Xu Jian Jun
၃။ လုပ်ငန်းတည်ရှိသည့်နေရာ [illegible]
၄။ လုပ်ကိုင်ခွင့်ပြုသည့်လုပ်ငန်းအမျိုးအစား [illegible]
၅။ နှစ်စဉ်လိုင်စင်ကြေးငွေ ၈၀၀၀၀၀/-
၆။ ငွေပေးသွင်းသည့်ရက်စွဲ ၇.၅.၂၀၂၃
၇။ လိုင်စင်သက်တမ်းကုန်ဆုံးသည့်နေ့ ၁.၄.၂၀၂၃ မှ ၃၁.၃.၂၀၂၄ ထိ ၁နှစ်

လိုက်နာရန်စည်းကမ်းချက်များ

၁။ လုပ်ငန်းလိုင်စင်အား မြင်သာသောနေရာတွင် မှန်ဘောင်ဖြင့် ချိတ်ဆွဲထားရမည်။
လိုင်စင်အား တဆင့်လွှဲပြောင်းခြင်း၊ ငှားရမ်းခြင်း၊ ပေးကမ်းခြင်း လုံးဝမပြုလုပ်ရ။
၂။ လိုင်စင်ရရှိသူသည် အများပြည်သူအား ဘေးအန္တရာယ်ဖြစ်စေသည့် သို့မဟုတ် စက်ဆုပ်ရွံရှာဖွယ်ဖြစ်စေသည့် အလုပ်အကိုင်နှင့်ကုန်သန်းရောင်းဝယ်ခြင်းလုပ်ငန်းများ၊ စားသောက်ဖွယ်ရာများထုတ်လုပ်ခြင်း၊ တည်ခင်းရောင်းချခြင်းဆိုင်ရာ စည်းကမ်း(Bye-Laws)များနှင့် အခါအားလျော်စွာ ထုတ်ပြန်သည့်အမိန့် ညွှန်ကြားချက်များကို တိကျစွာ လိုက်နာရမည်။
၃။ လိုင်စင်ရရှိသူသည် လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းစေရန်နှင့် မီးဘေးကြိုတင်ကာကွယ်ရေးအတွက် ကြိုတင်တိကျစွာ လိုက်နာရမည်။
၄။ လိုင်စင်ရရှိသူသည် မိမိလုပ်ငန်းမှထွက်ရှိသည့် အမှိုက်သရိုက်၊ အညစ်အကြေးနှင့်ဓါတုဗေဒပစ္စည်းများအား အမှိုက်ကင်းမဲ့ စီမံချက်နှင့်အညီ စနစ်တကျစွန့်ပစ်ရမည်၊ လိုအပ်ပါက မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့တွင် စီးပွားရေးအမှိုက်ခွန်ပေးသွင်း၍ အမှိုက်သိမ်းယာဉ်အကူအညီ တောင်းခံရမည်။
၅။ လိုင်စင်တွင် ရောင်းချခွင့်ပြုထားသည့် ကုန်ပစ္စည်းများကိုသာ ရောင်းချခွင့်ပြုသည်။ သက်ဆိုင်ရာအာဏာပိုင်များက တားမြစ်သည့် ကုန်ပစ္စည်းများကို ရောင်းချခြင်းမပြုရ။
၆။ နှစ်စဉ် အဖွဲ့မှသတ်မှတ်သည့်လိုင်စင်ခကို လုပ်ငန်းအမျိုးအစားအလိုက် သတ်မှတ်သည့်နှုန်းထားအတိုင်း ပေးဆောင်ရမည်။
၇။ လုပ်ငန်းရှင်များသည် ရှေ့လာမည့်ဘဏ္ဍာရေးနှစ်တွင် မိမိလုပ်ငန်းအား ဆက်လက်လုပ်ကိုင်လိုပါက အဖွဲ့ရုံးသို့ ကြိုတင်လျှောက်ထားရမည်။
၈။ လုပ်ငန်းရှင်များသည် မိမိလုပ်ငန်းအား ပိတ်သိမ်းသည့်အခါ အဖွဲ့ရုံးသို့ ကြိုတင်အကြောင်းကြားရမည်။
၉။ အထက်ပါစည်းကမ်းတစ်ရပ်ရပ်ကို လိုက်နာခြင်းမရှိပါက လိုင်စင်ကို ပြန်လည်ရုပ်သိမ်း၍ စည်ပင်သာယာရေးအဖွဲ့များဥပဒေအရ ထိရောက်စွာအရေးယူခြင်းခံရမည်။

9. 5. 2023

အမှုဆောင်အရာရှိ
မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

ရက်စွဲ၊ ၂၀၂၃ ခုနှစ်၊ ဧပြီ လ ၂၇ ရက်။

6/2/22, 2:19 PM

လုပ်ငန်းရည်ရွယ်ချက်များမှာ

(1) စီအမ်ပီစနစ်ဖြင့် ပိုလီယက်စရာ စတောဘဲဖိုက်ဘာထုတ်လုပ်ခြင်း လုပ်ငန်း။

The Republic of The Union of Myanmar
Ministry of Planning, Finance and Industry
Customs Department

MACCS – MCIS

MACCS System ကိုအသုံးပြုမည့် ထုတ်ကုန်သွင်းကုန်လုပ်ငန်းရှင်များအတွက်
Importer/Exporter Code ထုတ်ပေးခြင်း

COMPANY NAME	DA HUA (MYANMAR) COMPANY LIMITED.
HTK NO	104879616
I/E CODE	C104879616000

OWNER
(ORIGINAL RECEIVED)

CUSTOMS IN CHARGE
(USER REGISTRATION)

စက်မှုဝန်ကြီးဌာန
ရန်ကုန်တိုင်းဒေသကြီး စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန
လျှပ်စစ်စစ်ဆေးရေးဌာန
၁၉၂၊ ကမ္ဘာအေးဘုရားလမ်း၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်မြို့

စာအမှတ် ၊ ၁၅၁၅(၇)ရက-လဆရ/၂၂/၂၀၂၃(မ၂၂၈)
ရက် ၆ ၊ ၂၀၂၃ ခုနှစ်၊ မေ လ ၂၁ ရက်

အကြောင်းအရာ။ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ စစ်ကိုင်းမင်းလမ်း၊ အမှတ် (၂၀၉၊ ၂၃၈) ရှိ Da Hua (Myanmar) Co.,Ltd ၏ ပလတ်စတစ်ချည်မျှင်နှန်းဆွဲလုပ်ငန်း အတွက် တပ်ဆင်ပြီးဖြစ်သော ၄၀၀ မို့၊ ၈၀၀ ကီလိုဝပ် ၁၀၀၀ ကေဗွီအေ နှင့် ၁၅၀၀ ကေဗွီအေ စုစုပေါင်း ဒီဇယ်အင်ဂျင် လျှပ်ထုတ်စက် (သုံး)လုံးဖြင့် လျှပ်စစ်ဓာတ်အားထုတ်လုပ်ခြင်းနှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ် ထုတ်ပေးခြင်း

ရည် ညွှန်း ချက်။ ဒေါ်သန်းသန်းဝင်း ၏ လျှောက်ထားချက်အရ

အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ စစ်ကိုင်းမင်းလမ်း၊ အမှတ် (၂၀၉၊ ၂၃၈) ရှိ Da Hua (Myanmar) Co.,Ltd ၏ ပလတ်စတစ်ချည်မျှင်နှန်းဆွဲလုပ်ငန်း အတွက် တပ်ဆင်ပြီးဖြစ်သော ၄၀၀ မို့၊ ၈၀၀ ကီလိုဝပ် ၁၀၀၀ ကေဗွီအေ နှင့် ၁၅၀၀ ကေဗွီအေ စုစုပေါင်း ဒီဇယ်အင်ဂျင် လျှပ်ထုတ်စက်(သုံး)လုံးဖြင့် လျှပ်စစ်ဓာတ်အားထုတ်လုပ်ခြင်းနှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်ကို ၂၀၂၃ ခုနှစ် မေ လ (၁၈) ရက်နေ့မှ စတင်၍ ထုတ်ပေးလိုက်သည်။

တိုင်းဒေသကြီးဦးစီးဌာနမှူး (ဂ)
နိုင်မြင့် - ဒုတိယညွှန်ကြားရေးမှူး
ရန်ကုန်တိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး

Mr Xu Jian Jun
အမှတ် (၂၀၉၊ ၂၃၈)၊ စစ်ကိုင်းမင်းလမ်း၊
မြောင်းတကာစက်မှုဇုန်၊ မှော်ဘီမြို့နယ်။

မိတ္တူ -
- ရုံးလက်ခံ၊
- မျှောစာတွဲ။

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
စက်မှုဝန်ကြီးဌာန
စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန
လျှပ်စစ်စစ်ဆေးရေးဌာန
လျှပ်စစ်ဓာတ်အား ထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်

ခွင့်ပြုမိန့် အမှတ်စဉ် - YD-G (N) ၀၅၄/ ၅-၂၀၂၃

၁။ ၂၀၁၄ ခုနှစ် လျှပ်စစ်ဥပဒေပုဒ်မ ၃၂ (c) နှင့် တည်ဆဲလျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံး လုပ်နည်းများအရ Da Hua (Myanmar) Co.,Ltd ၏ ပလတ်စတစ်ချည်မျှင်နှန်းဆွဲလုပ်ငန်း အတွက် တပ်ဆင်ပြီးဖြစ်သော ဒီဇယ်အင်ဂျင် လျှပ်ထုတ်စက်အား အောက်ဖော်ပြပါ နယ်မြေဒေသအတွင်း မှတ်ပုံတင်လက်မှတ်တွင်ပါရှိသော စည်းကမ်းချက် များနှင့်အညီ ၂၀၂၃ ခုနှစ် မေ လ (၁၈) ရက်နေ့မှ စတင်၍ လျှပ်စစ်ဓာတ်အားထုတ်လုပ်ခြင်းနှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်ကို ထုတ်ပေးလိုက်သည်-

(က)ခွင့်ပြုသည့်နယ်မြေဒေသ - အမှတ် (၂၀၉၊ ၂၃၈)၊ စစ်ကိုင်းမင်းလမ်း၊ မြောင်းတကာစက်မှုဇုန်၊
မြို့နယ် - မော်ဘီမြို့နယ်၊
တိုင်း - ရန်ကုန်တိုင်းဒေသကြီး။

(ခ) အများဆုံးထုတ်လုပ်သည့် ဓာတ်အားပမာဏ	-	800 kW
(ဂ) သတ်မှတ်ဗို့အား	-	400 V
(ဃ) လျှပ်ထုတ်စက်အမျိုးအစား	-	Y-JW-800-4
(c) လျှပ်ထုတ်စက်နံပါတ်	-	2111223A
(စ) အင်ဂျင်အမျိုးအစား	-	-
(ဆ) အင်ဂျင်မြင်းကောင်ရေ	-	880 kW
(ဇ) အင်ဂျင်နံပါတ်	-	-

၂။ ဓာတ်အားထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းတို့အတွက် အသုံးပြုသော လျှပ်စစ်ပစ္စည်း ကိရိယာတည်ဆောက်မှုဆိုင်ရာ နည်းစနစ်များသည် လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများပါ ပြဋ္ဌာန်းချက်များ အရဖြစ်ရမည့်အပြင် စစ်ဆေးရေးမှူး ၏ စစ်ဆေးစမ်းသပ်ခြင်းကို ခံယူရပါမည်။

၃။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းပါ ပြဋ္ဌာန်းချက်များကို တိကျစွာ လိုက်နာဆောင်ရွက်ရမည်။

၄။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့် ဤလက်မှတ်တွင်ပါရှိသော အကြောင်းအရာများ ကို လိုက်နာခြင်း မရှိပါက ထုတ်ပေးထားသော လက်မှတ်ကို ပြန်လည် ရုတ်သိမ်းမည်။

၅။ ဤမှတ်ပုံတင်လက်မှတ် သက်တမ်းသည် ခွင့်ပြုသည့်နေ့မှစတင်၍ (၄) နှစ် အချိန်ကာလ အတွင်းသာ အကျိုးသက်ရောက် စေရမည်။

စတင်ခွင့်ပြုသည့်နေ့ - ၁၈ . ၅ . ၂၀၂၃
ကုန်ဆုံးသည့်နေ့ - ၁၇ . ၅ . ၂၀၂၇

လျှပ်စစ်စစ်ဆေးရေးမှူးချုပ် (
ရန်ကုန်တိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
စက်မှုဝန်ကြီးဌာန
စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန
လျှပ်စစ်စစ်ဆေးရေးဌာန
လျှပ်စစ်ဓာတ်အား ထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်

ခွင့်ပြုမိန့် အမှတ်စဉ် - YD-G (N) ၀၅၅/ ၅-၂၀၂၃

၁။ ၂၀၁၄ ခုနှစ် လျှပ်စစ်ဥပဒေပုဒ်မ ၃၂ (c) နှင့် တည်ဆဲလျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံး လုပ်နည်းများအရ Da Hua (Myanmar) Co.,Ltd ၏ ပလတ်စတစ်ချည်မျှင်နှန်းဆွဲလုပ်ငန်း အတွက် တပ်ဆင်ပြီးဖြစ်သော ဒီဇယ်အင်ဂျင် လျှပ်ထုတ်စက်အား အောက်ဖော်ပြပါ နယ်မြေဒေသအတွင်း မှတ်ပုံတင်လက်မှတ်တွင်ပါရှိသော စည်းကမ်းချက် များနှင့်အညီ ၂၀၂၃ ခုနှစ် မေ လ (၁၈) ရက်နေ့မှ စတင်၍ လျှပ်စစ်ဓာတ်အားထုတ်လုပ်ခြင်းနှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်ကို ထုတ်ပေးလိုက်သည်-

(က)ခွင့်ပြုသည့်နယ်မြေဒေသ - အမှတ် (၂၀၉၊ ၂၃၈)၊ စစ်ကိုင်းမင်းလမ်း၊ မြောင်းတကာစက်မှုဇုန်၊ မြို့နယ် - မော်ဘီမြို့နယ်၊ တိုင်း - ရန်ကုန်တိုင်းဒေသကြီး။

(ခ) အများဆုံးထုတ်လုပ်သည့် ဓာတ်အားပမာဏ	-	1000 kVA
(ဂ) သတ်မှတ်ဗို့အား	-	400 V
(ဃ) လျှပ်ထုတ်စက်အမျိုးအစား	-	-
(c) လျှပ်ထုတ်စက်နံပါတ်	-	U13G1390
(စ) အင်ဂျင်အမျိုးအစား	-	KTA38-G5(Cummins)
(ဆ) အင်ဂျင်မြင်းကောင်ရေ	-	880 kW
(ဇ) အင်ဂျင်နံပါတ်	-	41092445

၂။ ဓာတ်အားထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းတို့အတွက် အသုံးပြုသော လျှပ်စစ်ပစ္စည်း ကိရိယာ တည်ဆောက်မှုဆိုင်ရာ နည်းစနစ်များသည် လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများပါ ပြဋ္ဌာန်းချက်များ အရဖြစ်ရမည့်အပြင် စစ်ဆေးရေးမှူး ၏ စစ်ဆေးစမ်းသပ်ခြင်းကို ခံယူရပါမည်။

၃။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းပါ ပြဋ္ဌာန်းချက်များကို တိကျစွာ လိုက်နာဆောင်ရွက်ရမည်။

၄။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့် ဤလက်မှတ်တွင်ပါရှိသော အကြောင်းအရာများ ကို လိုက်နာခြင်း မရှိပါက ထုတ်ပေးထားသော လက်မှတ်ကို ပြန်လည် ရုတ်သိမ်းမည်။

၅။ ဤမှတ်ပုံတင်လက်မှတ် သက်တမ်းသည် ခွင့်ပြုသည့်နေ့မှစတင်၍ (၄) နှစ် အချိန်ကာလ အတွင်းသာ အကျိုးသက်ရောက် စေရမည်။

စတင်ခွင့်ပြုသည့်နေ့ - ၁၈ . ၅ . ၂၀၂၃
ကုန်ဆုံးသည့်နေ့ - ၁၇ . ၅ . ၂၀၂၇

လျှပ်စစ်စစ်ဆေးရေးမှူးချုပ် (
ရန်ကုန်ဟိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
စက်မှုဝန်ကြီးဌာန
စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန
လျှပ်စစ်စစ်ဆေးရေးဌာန
လျှပ်စစ်ဓာတ်အား ထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်

ခွင့်ပြုမိန့် အမှတ်စဉ် - YD-G (N) ၀၅၆/ ၅-၂၀၂၃

၁။ ၂၀၁၄ ခုနှစ် လျှပ်စစ်ဥပဒေပုဒ်မ ၃၂ (c) နှင့် တည်ဆဲလျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံး လုပ်နည်းများအရ Da Hua (Myanmar) Co.,Ltd ၏ ပလတ်စတစ်ချည်မျှင်နှန်းဆွဲလုပ်ငန်း အတွက် တပ်ဆင်ပြီးဖြစ်သော ဒီဇယ်အင်ဂျင် လျှပ်ထုတ်စက်အား အောက်ဖော်ပြပါ နယ်မြေဒေသအတွင်း မှတ်ပုံတင်လက်မှတ်တွင်ပါရှိသော စည်းကမ်းချက် များနှင့်အညီ ၂၀၂၃ ခုနှစ် မေ လ (၁၈) ရက်နေ့မှ စတင်၍ လျှပ်စစ်ဓာတ်အားထုတ်လုပ်ခြင်းနှင့် အသုံးပြုခြင်းဆိုင်ရာ မှတ်ပုံတင်လက်မှတ်ကို ထုတ်ပေးလိုက်သည်-

(က)ခွင့်ပြုသည့်နယ်မြေဒေသ - အမှတ် (၂၀၉၊ ၂၃၈)၊ စစ်ကိုင်းမင်းလမ်း၊ မြောင်းတကာစက်မှုဇုန်၊ မြို့နယ် - မော်ဘီမြို့နယ်၊ တိုင်း - ရန်ကုန်တိုင်းဒေသကြီး။
(ခ) အများဆုံးထုတ်လုပ်သည့် ဓာတ်အားပမာဏ - 1500 kVA
(ဂ) သတ်မှတ်ဗို့အား - 400 V
(ဃ) လျှပ်ထုတ်စက်အမျိုးအစား - UKSTF
(c) လျှပ်ထုတ်စက်နံပါတ် - 202203078
(စ) အင်ဂျင်အမျိုးအစား - KTA50-GS8(Cummins)
(ဆ) အင်ဂျင်မြင်းကောင်ရေ - 1287 kW
(ဇ) အင်ဂျင်နံပါတ် - 41281921

၂။ ဓာတ်အားထုတ်လုပ်ခြင်း နှင့် အသုံးပြုခြင်းတို့အတွက် အသုံးပြုသော လျှပ်စစ်ပစ္စည်း ကိရိယာတည်ဆောက်မှုဆိုင်ရာ နည်းစနစ်များသည် လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများပါ ပြဋ္ဌာန်းချက်များ အရဖြစ်ရမည့်အပြင် စစ်ဆေးရေးမှူး ၏ စစ်ဆေးစမ်းသပ်ခြင်းကို ခံယူရပါမည်။

၃။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းပါ ပြဋ္ဌာန်းချက်များကို တိကျစွာ လိုက်နာဆောင်ရွက်ရမည်။

၄။ လျှပ်စစ်ဥပဒေဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများနှင့် ဤလက်မှတ်တွင်ပါရှိသော အကြောင်းအရာများ ကို လိုက်နာခြင်း မရှိပါက ထုတ်ပေးထားသော လက်မှတ်ကို ပြန်လည် ရုတ်သိမ်းမည်။

၅။ ဤမှတ်ပုံတင်လက်မှတ် သက်တမ်းသည် ခွင့်ပြုသည့်နေ့မှစတင်၍ (၄) နှစ် အချိန်ကာလ အတွင်းသာ အကျိုးသက်ရောက် စေရမည်။

စတင်ခွင့်ပြုသည့်နေ့ - ၁၈ . ၅ . ၂၀၂၃
ကုန်ဆုံးသည့်နေ့ - ၁၇ . ၅ . ၂၀၂၇

လျှပ်စစ်စစ်ဆေးရေးမှူးချုပ် (ရန်ကုန်တိုင်းဒေသကြီး)
ရန်ကုန်တိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
စက်မှုဝန်ကြီးဌာန
စက်မှုကြီးကြပ်ရေးနှင့် စစ်ဆေးရေးဦးစီးဌာန
လျှပ်စစ်စစ်ဆေးရေးဌာန
ဓာတ်လေ့ကားအသုံးပြုခွင့်လက်မှတ်

မှတ်ပုံတင်အမှတ်	-	ရက/EI- ၄၅၀၃	အမျိုးအစား	-	ကုန်တင်
ပိုင်ရှင်အမည်	-	DAHUA Co.,Ltd.	ခွင့်ပြုသောဦးရေ	-	-
စတင်မှတ်ပုံတင်သည့်ရက်စွဲ	-	၁၁.၅.၂၀၁၈	ဝန်ချိန်	-	၂၀၀၀ ကီလိုဂရမ်
အသုံးပြုခွင့်စတင်သည့်နေ့	-	၁၁.၅.၂၀၂၃	မော်တာဝန်အား	-	၄ ကီလိုဝပ်
အသုံးပြုခွင့်ကုန်ဆုံးသည့်နေ့	-	၁၀.၅.၂၀၂၄	အမြန်နှုန်း	-	၃၀ မီတာ/မိနစ်
တည်နေရာ	-	အမှတ်(၂၃၈/၂၀၉)၊ စက်မှု(၁)လမ်း၊ မြောင်းတကာစက်မှုဇုန်၊ မော်ဘီမြို့နယ်၊ ရန်ကုန်မြို့။			

စစ်ဆေးရေးမှူးချုပ်
လျှပ်စစ်စစ်ဆေးရေးဌာန

ပြည်ထောင်စုသမ္မတပြန်ကနိုင်ငံတော်အစိုးရ
သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
ညွှန်ကြားရေးမှူးချုပ်ရုံး

စာအမှတ်၊ အီးအိုင်အေ-၁/၄-ဆ (၅၀၁၉/၂၀၂၁)
ရက်စွဲ၊ ၂၀၂၁ ခုနှစ် မေလ ၄ ရက်

သို့

ပြည်လောင်စုဝန်ကြီးရုံး
သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ရုံးအမှတ် (၂၀)

ဆောင်ကြောင်းအရာ။ Da Hua (Myanmar) Co., Ltd. မှ CMP စနစ်ဖြင့် Polyester Staple Fiber များထုတ်လုပ်ခြင်းအတွက် သဘောထားမှတ်ချက် စီစစ်တင်ပြခြင်း

ရည်ညွှန်းချက်။ (၁) ပြည်ထောင်စုဝန်ကြီးရုံး၏ ၁၉-၁၀-၂၀၁၈ ရက်စွဲပါစာအမှတ်၊ (သစ်တော)၃(၂)/၁၆(ဃ)(၄၀၄၇/၂၀၁၈)

(၂) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၂၅-၃-၂၀၁၉ ရက်စွဲပါစာအမှတ်၊ အီးအိုင်အေ-၁/၄-ဆ(၆၈၃/၂၀၁၉)

(၃) Da Hua (Myanmar) Co., Ltd. ၏ ၁၉-၉-၂၀၁၉ ရက်စွဲပါတင်ပြစာ

(၄) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၁၈-၃-၂၀၂၀ ရက်စွဲပါစာအမှတ်၊ အီးအိုင်အေ-၂/၃(၁၀၇၀/၂၀၂၀)

(၅) Da Hua (Myanmar) Co., Ltd. ၏ ၁၅-၁၀-၂၀၂၀ ရက်စွဲပါတင်ပြစာ

(၆) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၁၁-၁-၂၀၂၁ ရက်စွဲပါစာအမှတ်၊ အီးအိုင်အေ-၁/၄(ဆ)(၄၀/၂၀၂၁)

(၇) ပြည်ထောင်စုဝန်ကြီးရုံး၏ ၂၅-၁-၂၀၂၁ ရက်စွဲပါစာအမှတ်၊ (သစ်တော)၃(၂)/၁၆(ဃ)(၃၃၃/၂၀၂၁)

၁။ အကြောင်းအရာပါကိစ္စနှင့်စပ်လျဉ်း၍ ရန်ကုန်တိုင်းဒေသကြီး မှော်ဘီမြို့နယ်၊ ပြေကွက်အမှတ်-၂၀၉ ၂၃၈ မြောင်းတကာ သမကီစက်မှုဇုန်တွင် CMP စနစ်ဖြင့် Polyester Staple Fibre များထုတ်လုပ်ခြင်းလုပ်ငန်းအတွက် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာကို ပြည်ထောင်စုဝန်ကြီးရုံးမှ ရည်ညွှန်း(၁) ပါစာဖြင့် အကြောင်းကြားလာခြင်းအပေါ် စီစဉ်ပြီး ကနဦးသဘောထားမှတ်ချက်အား ကုမ္ပဏီသို့ ရည်ညွှန်း(၂)ပါစာဖြင့် ပြန်ကြားခဲ့ပါသည်။ ပြင်ဆင်ထား သည့် Revised Scoping Report ကို ရည်ညွှန်း(၃)(၅) ပါစာများဖြင့် တင်ပြလာခြင်းအပေါ် သဘောထားမှတ်ချက်ထပ်မံလိုအပ်ကြောင်း ရည်ညွှန်း(၄)(၆) ပါစာများဖြင့် ကုမ္ပဏီသို့ ပြန်ကြား ထားပါသည်။

၂။ ကုမ္ပဏီအနေဖြင့် ရင်းနှီးမြှုပ်နှံမှုတိုးချဲ့ကာ polyester staple fiber, PET Packing Tape and all kines of recycle pallet များ ထုတ်လုပ်ရောင်းချခြင်းလုပ်ငန်းသို့ ပြောင်းလဲဆောင်ရွက်မည်ဖြစ်ကြောင်း၊ လုပ်ငန်းအတွက် လိုအပ်သောကုန်ကြမ်းများကို ထိုင်းနိုင်ငံ၊ ဗီယက်နမ်နိုင်ငံတို့မှ

J

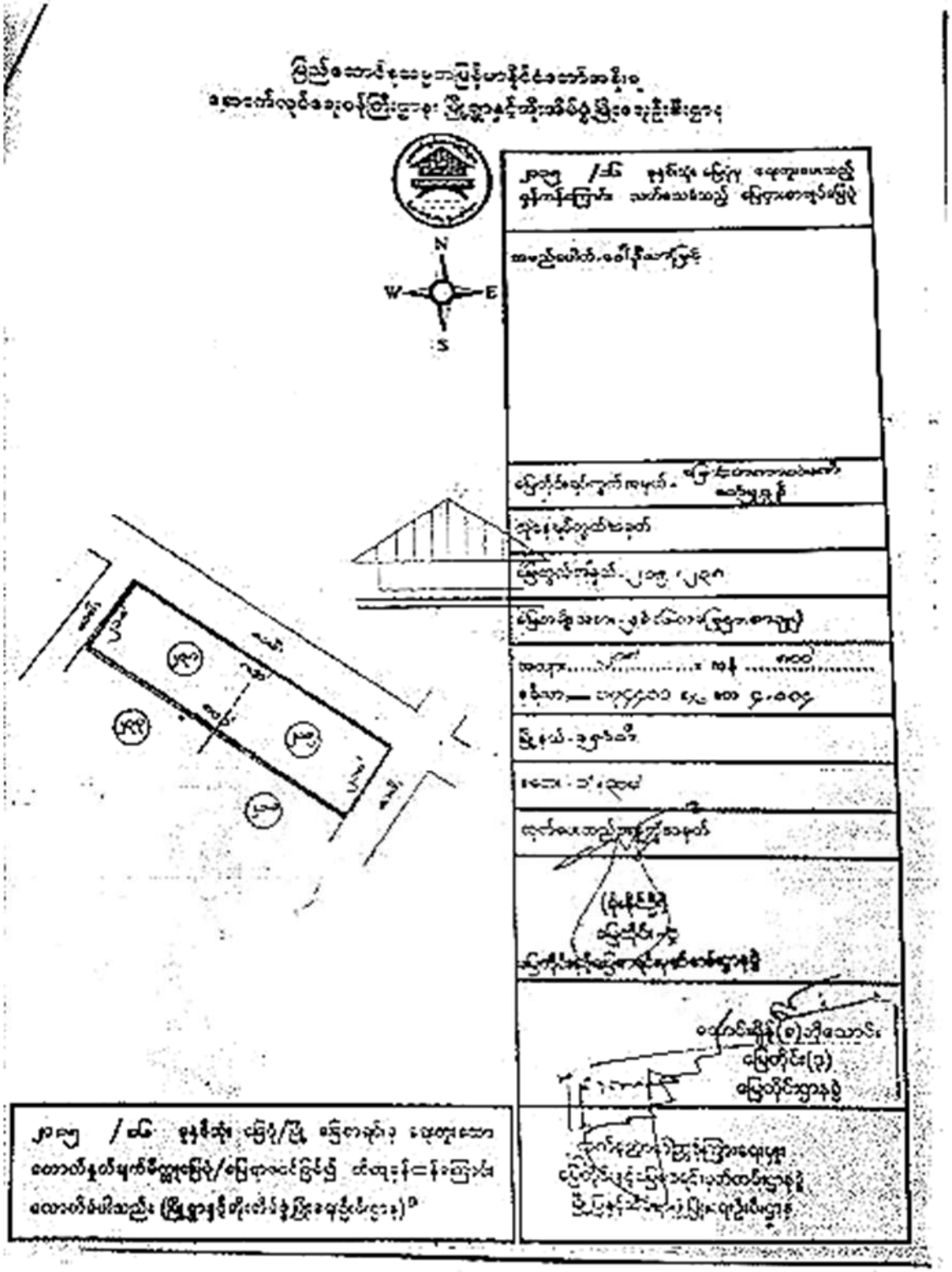
တင်သွင်းမည်ဖြစ်ပြီး PET Bottle, PP Bottle Cup ကုန်ကြမ်းအမျိုးအစား များကို ပြန်မာနိုင်ငံမှ ဝယ်ယူမည်ဖြစ်ကြောင်း၊ လုပ်ငန်းတိုးချဲ့ခြင်းအတွက် ပတ်ဝန်းကျင်ဆိုင်ရာ သဘောထားမှတ်ချက် ပြန်ကြားပေးနိုင်ရေးအတွက် စိစစ်ပြီး ပြန်လည်တင်ပြရန် ရည်ညွှန်း(၇) ပါစာဖြင့် ပြည်တောင်စု ဝန်ကြီးရုံးမှ အကြောင်း ကြားလာပါသည်။

၃။ ကုမ္ပဏီအနေဖြင့် ထုတ်လုပ်မှုတိုးချဲ့ဆောင်ရွက်ခြင်းပြုခဲ့သော်လည်း စီမံကိန်းဆောင်ရွက် မည့် နေရာ ပြောင်းလဲမှုမရှိခြင်း၊ စီမံကိန်းဆောင်ရွက်မည့် အဆိုပြုသူ တူညီခြင်း၊ ယခင်တုတ်လုပ် မည့်အမျိုးအစားမှာ Polyester Staple တစ်မျိုးတည်းသာ ထုတ်လုပ်ခြင်းဖြစ်ပြီး ယခုတိုးချဲ့ လုတ်လုပ်မည့် အမျိုးအစားအနေဖြင့် polyester staple fiber, PET Packing Tape and all kines of recycle pallet များ တိုးချဲ့ထုတ်လုပ်မည်ဖြစ်ကြောင်း စိစစ်တွေ့ရှိရပါသည်။ ကုမ္ပဏီ အနေဖြင့် CMP စနှစ်ဖြင့် Polyester Staple Fibre ထုတ်လုပ်ခြင်းအတွက် နယ်ပယ်အတိုင်း အတာသတ်မှတ်ခြင်းဆိုင်ရာခံစာကို တင်ပြထားပြီးဖြစ်သည့်အတွက် သီးခြားပတ်ဝန်းကျင် ဆန်းစစ်ခြင်းဆောင်ရွက်ရန် မလိုပါကြောင်း၊ အဆိုပါအဆိုရင်ခံစာ၌သာ ပတ်ဝန်းကျင်နှင့်လူမှုရေး ဆိုင်ရာ သက်ရောက်မှုများအား ဆန်းစစ်နိုင်ရန်အတွက် တိုးချဲ့မည့်ကုန်ကြမ်းအမျိုးအစား၊ ထုတ် လုပ်မည့် ထွက်ကုန်အမျိုးအစား၊ ထုတ်လုပ်မှုလုပ်ငန်းစဉ်တို့နှင့်စပ်လျဉ်းသည့် အချက်အလက်များ ကို ပြည့်စုံစွာ ပြည့်စွက်ပြီး တင်ပြရန် လိုအပ်ကြောင်း စိစစ်သုံးသပ်ရပါသည်။

၄။ သို့ဖြစ်ပါ၍ Da Hua (Myanmar) Co., Ltd. မှ polyester staple fiber, PET Packing Tape and all kines of recycle pallet များ တိုးချဲ့ထုတ်လုပ်မည့် လုပ်ငန်းအတွက် သီးခြား ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ရေးဆွဲရန် မလိုဘဲ ယခင်တင်ပြထားပြီး ဖြစ်သော နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းအစီရင်ခံစာတွင် ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများအား ဆန်းစစ်နိုင်ရန်အတွက် တိုးချဲ့မည့် ကုန်ကြမ်းအမျိုးအစား၊ ထုတ်လုပ်မည့် ထွက်ကုန်အမျိုးအစား၊ ထုတ်လုပ်မှုလုပ်ငန်းစဉ်တို့နှင့် စပ်လျဉ်းသည့် အချက်အလက်များကို ပြည့်စုံစွာဖြည့်စွက်ပြီး တင်ပြရန် လိုအပ်ကြောင်း လမ်းညွှန်မှုဖြစ်နိုင်ပါရန် တင်ပြအပ်ပါသည်။

(လှမောင်သိန်း)
ညွှန်ကြားရေးမှူးချုပ်

မိတ္တူကို
ရုံးလက်ခံ၊ မျှောစာတွဲ



ပြည်ထောင်စု သမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
ဆောက်လုပ်ရေးဝန်ကြီးဌာန
မြို့ရွာနှင့်အိုးအိမ်ဖွံ့ဖြိုးရေးဦးစီးဌာန
နေပြည်တော်

မူရင်း

" စက်မှုလက်မှုလုပ်ငန်းအတွက် မြေအသုံးပြုခွင့် "

တဆင့်လွှဲပြောင်း/ရောင်းချ/ပေါင်နှံ/ပေးကမ်းခွင့်မရှိရ

ရန်ကုန်မြို့ ဦးကျင်ပိန် ၏ သား / သမီး ဒေါ်မြင့်မြင့်ရီ ၊ နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် ၁၂ / လသန(နိုင်)၀၀၈၀၆၁ အား မှော်ဘီမြို့နယ် ၊ မြေတိုင်းရပ်ကွက် (မြောင်းတကာသမဏီစက်မှုဇုန်)မှ ဧရိယာခန့်မှန်းခြေ (၁၆.၆၆၇)ဧက ရှိ စက်မှု မြေကွက်အမှတ် (၃၇၅ မှ ၃၈၁ ထိ) ၊ မြေ(၁)ကွက်ကို အထွေထွေစက်မှု လက်မှု လုပ်ငန်းအတွက် အဆောက်အဦ ဆောက်လုပ်အသုံးပြုရန် အောက်ပါ စည်းကမ်းချက်များဖြင့် ပူးတွဲပါမြေပုံ အရ ၂၀၁၄ ခုနှစ် ၊ ဩဂုတ်လ (၁) ရက် နေ့မှစ၍ ခွင့်ပြုလိုက်သည် -

(၁) အထွေထွေစက်မှုလက်မှုလုပ်ငန်းအတွက် အသုံးပြုခွင့်ရသောမြေကွက်တွင် ရရှိပြီးသည့်နေ့မှ(၃)လအတွင်း အဆောက်အဦစတင်ဆောက်လုပ်အသုံးပြုရမည်။

(၂) စက်မှုလက်မှုမြေကွက်အတွင်း အထွေထွေစက်မှုလက်မှု အဆောက်အဦမှတပါးခွင့်ပြုထားသူ၏ကြိုတင်ခွင့်မရှိဘဲ အခြားလူနေအိမ်စသည်များကို ဆောက်လုပ်ခွင့် မပြုရ။

(၃) စက်မှုလက်မှု မြေအတွင်း စက်မှုလုပ်ငန်း မှတပါး အခြားလုပ်ငန်းများ အတွက် အသုံးမပြုရ၊ ပတ်ဝန်းကျင်အား အသံအားဖြင့်လည်းကောင်း ၊ အနံ့အားဖြင့် လည်းကောင်း ၊ အနှောင့်အယှက် မဖြစ်စေရန် နှင့် အန္တရာယ် ကင်းရှင်းရေး တာဝန်ယူ ဆောင်ရွက်ရပါမည်။

မူရင်း

စက်မှုလက်မှုလုပ်ငန်း

(၄) စက်မှုလက်မှုမြေကွက်ရသူသည် မြေကွက်ကိုခွဲစိတ်ခြင်း ၊တဆင့်လွှဲပြောင်း/ရောင်းချ / ပေါင်နှံ /ပေးကမ်းခြင်း လုံးဝမပြုလုပ်ရ။

(၅) သုံးလပတ်ကျသင့်မြေငှားခ ငွေ ၆၀၆၀၇°/-တိတိ ကို ကြိုတင်ပေးဆောင်ရမည် ။

(၆) စက်မှုလက်မှုမြေကွက်ရသူသည် သတ်မှတ်ထားသော မြေခွန်မြေခများကို မှန်ကန်စွာ ပေးဆောင်ရမည့်အပြင် အခြား အခါအားလျော်စွာ သတ်မှတ်ထားသောစည်းကမ်းများကို လိုက်နာရမည် ။

စက်ဟုဇုန်များစီမံခန့်ခွဲရေး
ညွှန်ကြားချက်အမှတ် ၁ / ၉၇ ကို
လိုက်နာရမည်။

၂ မူရင်း

(၇) စက်မှုလက်မှုလုပ်ငန်း အဆောက် အဦ ဆောက်လုပ်ခွင့်ပြုသော သက်တမ်း သည် ၂၀၁၇ ခုနှစ်၊ ဇူလိုင် လ(၃၁)ရက်နေ့ တွင် ကုန်ဆုံး မည်။ အသုံးပြုခွင့်ကာလကုန်ဆုံးသောအခါ အမြဲတမ်း ဆက်လက် အသုံးပြုခွင့်ရလို ပါက မြေငှားစာချုပ် လျှောက်ထားနိုင်ခွင့် ရှိသည်။

(၈) စက်မှုလက်မှုအသုံးပြုခွင့်ရသူသည်သတ်မှတ်ထားသော စည်းကမ်းများ ကိုလိုက်နာရန်ပျက်ကွက်ပါကခွင့်ပြုထားသော မြေကွက်ကို ဆောက်လုပ်ထားသော အဆောက်အဦနှင့်တကွ မြို့ရွာနှင့်အိုးအိမ်ဖွံ့ဖြိုးရေးဦးစီးဌာနမှ ပြန်လည်သိမ်းယူနိုင်ခွင့်ရှိသည်။

မူရင်း

(၉) စက်မှုလက်မှု အလုပ်ရုံများမဆောက်လုပ်မီ စနစ်တကျရှိစေရန် အဆောက် အဦ ပုံစံနှင့် မြေကွက်ပေါ်တွင် အဆောက်အဦ အနေအထားပြ ပုံစံ တို့ကို ရန်ကုန် မြို့တော် စည်ပင်သာယာရေးကော်မတီ ၏ အတည်ပြုချက်ကို ရယူရမည်။

(၁၀) စက်မှု လက်မှု မြေကွက်များ တွင် အောက်ပါ အတိုင်း ချန်လှပ်၍ အဆောက် အဦ ဆောက်လုပ်ရမည် -

(က) အလျား x အနံ .... ၁၅၀ပေ x ၁၀၀ ပေ ရှိ မြေကွက်တွင်
မျက်နှာစာ .... ၂၅ ပေ
နောက်ဖေး .... ၇ ပေ
ဘေးဘက် .... ၈ ပေ

(ခ) အလျား x အနံ .... ၆၀ပေ x ၄၀ ပေ ရှိ မြေကွက် တွင်
မျက်နှာစာ .... ၉ ပေ
နောက်ဖေး .... ၇ ပေ
ဘေးဘက် .... ၄ ပေ

၇/၈/၂၀၁၄

ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)
(သက်နိုင် / ဒုတိယညွှန်ကြားရေးမှူး)
မြေနှင့်အခွန်ဌာနခွဲ

ဒေါ်မြင့်မြင့်ရီ
ဝ/လသယ(နိုင်)၀၀၈၀၆၁
မြေအသုံးပြုခွင့်ရသူ၏လက်မှတ်

စာအမှတ်၊ နပတ / မှော်ဘီ (မြောင်းတကာစက်မှုဇုန်) / လိုင်စင် / ၉၃ / ၂၀၁၄

ရက်စွဲ ၊ ၂၀၁၄ ခုနှစ်၊ [illegible] လ ၇ ရက်

扫描全能王 创建

မိတ္တူကို

၃

မှာရင်း

(၁) မူရင်းမြေအသုံးပြုခွင့် အမိန့်ကိုမြေအသုံးပြုခွင့်ရသူ ဒေါ်မြင့်မြင့်ရီ ၊နိုင်ငံသားစိစစ်ရေးကဒ်ပြားအမှတ် ၁၂/လသန(နိုင်)၀၀၈၀၆၁ အား ထုတ်ပေးလိုက်သည်။

(၂) ဒုတိယညွှန်ကြားရေးမှူး၊ မြေတိုင်းဌာနခွဲသို့ မြို့မြေစာရင်းတွင် မှတ်သားရန်နှင့် မှီရာကွာတာမှစ၍သုံးလပတ်မြေဌားခနှုန်းထား ၆၀၆၀၇°/- (ကျပ် ခြောက်သောင်းခြောက်ရာခုနှစ် တိတိ) ဖြင့် စည်းကြပ်ကောက်ခံနိုင်ရန် ပေးပို့ပါ သည်။

(၃) ဦးစီးအရာရှိ၊ မှော်ဘီ မြို့နယ်မြေယာရုံးခွဲသို့ သိသာရန်နှင့်လိုအပ်သလို ဆောင်ရွက်နိုင်ရန် ပေးပို့ပါသည်။

(၄) ရန်ကုန်မြို့တော် စည်ပင်သာယာရေး ကော်မတီ၊ မှော်ဘီ မြို့နယ် သို့ သိသာရန် နှင့် လိုအပ်သလို ဆောင်ရွက်နိုင်ရန် ပေးပို့ပါသည်။

(၅) ရုံးလက်ခံ။

Central Leading Board	ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဗဟိုကြီးကြပ်ရေးအဖွဲ့	ပုံစံ	၈
		ဓာတုပစ္စည်း အရေအတွက်	၅ (မျိုး)
		သက်တမ်း	၂ နှစ်

ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများ မှတ်ပုံတင်လက်မှတ်

မှတ်ပုံတင်လက်မှတ်အမှတ်စဉ် ၀၀၂၄၈၆

(နည်းဥပဒေ ၂၃)

ရက်စွဲ၊ ၂၀၂၃ ခုနှစ်၊ မေလ ၃၁ ရက်

၁။ ၂၂-၅-၂၀၂၃ ရက်စွဲပါ လျှောက်လွှာအမှတ် ၀၀၂၈၆၆ ဖြင့် မှတ်ပုံတင်ခွင့်ပြုရန် လျှောက်ထားသော ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအား မြန်မာနိုင်ငံ အတွင်း အသုံးပြုရန် မှတ်ပုံတင်ပြီးဖြစ်သည်။

၂။	တာဝန်ခံလျှောက်ထားသူ၏အမည်	Mr. Xu Jian Jun
၃။	နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ် သို့မဟုတ် နိုင်ငံခြားသားမှတ်ပုံတင်အမှတ်	EB 4914269
၄။	အမြဲတမ်းနေရပ်လိပ်စာ	Plot No. 209, 238 Myaung Tager Steel Industrial Zone, Hmawbi T/S, Yangon.
၅။	ဆက်သွယ်ရန်ဖုန်းနံပါတ် သို့မဟုတ် ဖက်စ်(Fax)နံပါတ် သို့မဟုတ် e-mail လိပ်စာ	၀၉-၂၅၁၁၀၅၁၀၉
၆။	လုပ်ငန်းလိပ်စာ	No. (209, 238), Myaung Tager Steel, Industrial Zone, Hmawbi T/S, Yangon Region.
၇။	ဆက်သွယ်ရန်လုပ်ငန်းဖုန်းနံပါတ် သို့မဟုတ် ဖက်စ်(Fax)နံပါတ် သို့မဟုတ် e-mail လိပ်စာ	၀၉-၂၅၁၁၀၅၁၀၉
၈။	မှတ်ပုံတင်ခွင့်ပြုသောဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ (နောက်ဆက်တွဲစာရင်းအရ)	နောက်ဆက်တွဲပါအတိုင်းဖြစ်ပါသည်။
၉။	သက်တမ်းကုန်ဆုံးမည့် နေ့ရက်	၃၁-၅-၂၀၂၅

ဒုတိယ
ဗဟိုကြီးကြပ်ရေးအဖွဲ့.

Central Leading Board

ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ
ထားဆီးကာကွယ်ရေး
ဗဟိုကြီးကြပ်ရေးအဖွဲ့

ကုမ္ပဏီ/လုပ်ငန်းအမည် Da Hua (Myanmar) Co.,Ltd.

မှတ်ပုံတင်ခွင့်ပြုသည့် ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအမည်စာရင်း

စဉ်	ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းအမျိုးအမည်	တစ်နှစ်အသုံးပြုရန် ခန့်မှန်းပမာဏ (ကီလိုဂရမ် သို့မဟုတ် လီတာ)
1.	Silicone Oil (FCJ-1)	1,000,000 Kg
2.	Silicone Oil (FCJ-2)	1,000,000 Kg
3.	Silicone Oil (FCJ-3)	1,000,000 Kg
4.	Silicone Oil (Shuofin F1365)	1,000,000 Kg
5.	Silicone Oil (8901 N)	1,000,000 Kg

မှတ်ချက်။ လုပ်ငန်းလိုအပ်ချက်အရ တစ်နှစ်အသုံးပြုရန် ခန့်မှန်းပမာဏများပြောင်းလဲမှုရှိနိုင်ပါသည်။

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

ပြည်ထဲရေးဝန်ကြီးဌာန

မီးသတ်ဦးစီးဌာန

ပြည်ထဲရေးဝန်ကြီးဌာန
စာအမှတ် ၁၇၇
ရက်စွဲ ၅·၇·၂၀၂၁
မီးသတ်ဦးစီးဌာန

မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်

အမှတ်စဉ်(၁၇၇)

ရက်စွဲ၊ ၂၀၂၁ ခုနှစ်၊ ဇူလိုင်လ ၅ ရက်

၁။ ရန်ကုန် တိုင်းဒေသကြီး/ပြည်နယ်၊ မှော်ဘီ မြို့နယ်၊ ပြောင်းတကာစက်မှုဇုန် ရပ်ကွက်/ကျေးရွာ၊ စက်မှု(၁) လမ်း၊ အမှတ် (၃၈၀၊၃၈၁) ရှိ ပိုင်ရှင်ဦး/ဒေါ် ဒေါ်ဆုမွန်သန့်(DA HUA (Myanmar) Co.,Ltd.) ၏ Steel Structure(၁)ထပ်(ပလပ်စတစ်စက်ရုံ) (Building-1)၊ Steel Structure (၁)ထပ်(ပလပ်စတစ်စက်ရုံ) (Building-2)၊ Steel Structure (၁)ထပ် + Mezzanine (ပလပ်စတစ်စက်ရုံ) (Building-3) အဆောက်အဦအတွက် ဤဌာန၏ မီးဘေးလုံခြုံရေးဆိုင်ရာပြဋ္ဌာန်းချက်များအား (၂၆-၆-၂၀၂၁) ရက်နေ့တွင် စစ်ဆေးသည့်အခါ ပြည့်စုံစွာဆောင်ရွက်ထားကြောင်း စစ်ဆေးတွေ့ရှိရသည်။

၂။ ဤထောက်ခံချက်သည် စစ်ဆေးသည့်နေ့မှစ၍ (၃)နှစ်အထိသာ အကျုံးဝင်သည်။

၃။ ထို့ပြင် မီးသတ်ဦးစီးဌာနမှ အခါအားလျော်စွာ ထပ်မံစစ်ဆေးချိန်တွင် မီးဘေးလုံခြုံရေးဆိုင်ရာ ပြဋ္ဌာန်းချက်များကို လိုက်နာဆောင်ရွက်ခြင်းမရှိပါက ဤထောက်ခံချက်ကို ပြန်လည်ရုတ်သိမ်းသွားမည်ဖြစ်ပြီး အဆောက်အဦအားအသုံးပြုသူ(သို့မဟုတ်)ပိုင်ရှင်သည် မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေအရအရေးယူခြင်းခံရမည်။

မှတ်ချက်။ ဤထောက်ခံချက်အား လွှဲပြောင်းသုံးစွဲခြင်းမပြုရ။ အဆောက်အဦအား မူလရည်ရွယ်ချက်မှ ပြောင်းလဲအသုံးပြုပါက ထောက်ခံချက်အသစ် ထပ်မံလျှောက်ထားရမည်။

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)
(သိန်းထွန်းဦး၊ ညွှန်ကြားရေးမှူး)

F.S.C(Waylin)

Scanned with CamScanner

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
ပြည်ထဲရေးဝန်ကြီးဌာန
မီးသတ်ဦးစီးဌာန

မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်

အမှတ်စဉ်(ဘ၊၊၃)

ရက်စွဲ၊ ၂၀၁၈ ခုနှစ်၊ ဇူလိုင် လ ၅ ရက်

၁။ ရန်ကုန်တိုင်းဒေသကြီး/ပြည်နယ်၊ မော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်ရုံးကွက်/ကျေးရွာ၊ စက်မှု(၁) လမ်း၊ အမှတ် ၂၀၉/၂၃၀ ရှိ ပိုင်ရှင်ဦး/ဒေါ် Dahua(Myanmar) Co., Ltd. ၏ Steel Structure (၁)ထပ် (ပလပ်စတစ်စက်ရုံ) အဆောက်အဦအတွက် သတ်မှတ်ပေးထားသည့် မီးဘေးလုံခြုံရေးဆိုင်ရာပြဋ္ဌာန်းချက်များအား (၂၃ - ၆ - ၂၀၁၈)ရက်နေ့တွင် စစ်ဆေးသည့်အခါပြည့်စုံစွာဆောင်ရွက်ထားကြောင်းစစ်ဆေးတွေ့ရှိရသည်။

၂။ ဤထောက်ခံချက်သည် စစ်ဆေးသည့်နေ့မစ၍ (၃)နှစ်အထိသာ အကျုံးဝင်သည်။

၃။ ထို့ပြင် မီးသတ်ဦးစီးဌာနမှ အခါအားလျော်စွာ ထပ်မံစစ်ဆေးချိန်တွင် မီးဘေးလုံခြုံရေးဆိုင်ရာပြဋ္ဌာန်းချက်များကို လိုက်နာဆောင်ရွက်ခြင်းမရှိပါက ဤထောက်ခံချက်ကို ပြန်လည်ရုတ်သိမ်းသွားမည်ဖြစ်ပြီး အဆောက်အဦအား အသုံးပြုသူ(သို့မဟုတ်) ပိုင်ရှင်သည် မြန်မာနိုင်ငံမီးသတ်ဝတ်ဖွဲ့ ဥပဒေအရ အရေးယူခြင်းခံရမည်။

မှတ်ချက်။ ။ ဤထောက်ခံချက်အား လွဲမှောင်းသုံးစွဲခြင်းမပြုရ။ အဆောက်အဦအား မူလရည်ရွယ်ချက်မှ ပြောင်းလဲအသုံးပြုပါက ထောက်ခံချက်အသစ် ထပ်မံလျှောက်ထားရမည်။

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)
(ကျော်သူရ၊ ညွှန်ကြားရေးမှူး)

ည်ထောင်စုသမ္မတမြန်မာနိုင်ငံ
ုန်စက်မှုလက်မှုလုပ်ငန်းရှင်များအသင်းချုပ်
nmar Federation of Chambers of Commerce and Industry
war Road, Lanmadaw Township, Yangon, Myanmar.
Established In1919

အသင်းဝင်လက်မှတ်
Certificate of Membership

Membership No. & Date
38955(7-3-2018)

အောက်ဖော်ပြပါနိုင်ငံခြားကုမ္ပဏီ သည်ဤကုန်သည်စက်မှုအသင်းချုပ်တွင် ၂၀၁၈ ခုနှစ်၊ မတ်လ (၇) ရက်နေ့မှစ၍ အသင်းဝင်တစ်ဦး ဖြစ်ပါကြောင်း။

The under - mentioned **Foreign Company** is a member of the UMFCCI with effect from **38955 (7-3-2018)**

အသင်းဝင်အမည်နှင့် လိပ်စာ **ဒါဟွာ(မြန်မာ)ကုမ္ပဏီလီမိတက်**
ကွင်းအမှတ်(၂၀၉/၂၃၈)၊ နှင့်၃၇၅၊၃၇၆၊၃၇၇၊၃၇၈၊၃၇၉၊၃၈၀၊၃၈၁ မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

Member's Name & Address **Da Hua (Myanmar)Company Limited**
Plot No.(209,238), And 375,376,377,378,379,380,381 Myaung Dagar Steel Industrial Zone, Hmawbi Township, Yangon Region.

လုပ်ငန်းမှတ်ပုံတင်အမှတ်နှင့်ရက်စွဲ ၁၀၄၈၇၉၆၁၆(၈.၁.၂၀၁၈)
Business Registration No. and Date **104879616(8.1.2018)**

Tel 09-420782637 **Fax** - **e-mail** moemoe91132O@gmail.com

Secretary General **President**

Signature of Member (or) Representative
Name & NRC No. **Mr.Xu Jianjun (PP.No.EB4914269)**
Designation **Managing Director**

Extended Period				Extended Registration No.	Authorized Signature
(1) From	1-1-2021	to	31-12-2024	(00997)	Joint Secretary General
(2) From		to			

အချက်အလက်ပြောင်းလဲမှုရှိပါက သတင်းပို့၍ အသင်းဝင်လက်မှတ်အသစ် လဲလှယ်ထုတ်ယူပါရန်၊ ပလတ်စတစ်မစလောင်းရန်၊ 47656

Scanned with CamScanner

ဘွိုင်လာယာယီအသုံးပြုခွင့်လက်မှတ်

(လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆ အပိုဒ်ခွဲ (ဆ))

စာအမှတ် ၉၇ / ၂၀၂၂-၂၃ / ဘကဝ/ယဥ-၃၃၀

......Mr. Xu Jianjun, Da Hua (Myanmar) Co., Ltd. ပေးသွင်းလာသော..................
......အမှတ် (၃၀၀), (၁၀၃), ဆင်မြှ (၁) လမ်း ရွှေလင်ပန်းစက်မှုဇုန်..................
......လှိုင်သာယာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး..................
..................အား......Zhejiang Haile Boiler Co., Ltd..................
..................ကုမ္ပဏီ၊..................China.................. နိုင်ငံ

ထုတ်လုပ်သည့်ဘွိုင်လာအမှတ်.....ZZG 1-0.8-S, 131121..................ပါသော
သို့မဟုတ်ဘွိုင်လာမှတ်ပုံတင်အမှတ် မ.စ. မှတ်ပုံတင်.....ဖြစ်သော အလျားလိုက်.....ဘွိုင်လာကို
ခွင့်ပြုဖိအား....0.5 MCC..........ဖြင့်လက်မှတ်ထုတ်ပေးသည့်နေ့မှ (၆)လအသုံးပြုခွင့်ရှိသည်။
ယင်းကာလအပိုင်းအခြား ကျော်လွန်သည့်အခါ ထုတ်ပေးထားသည့် ဤယာယီအသုံးပြုခွင့်
လက်မှတ်ပျက်ပြယ်စေရမည်။

(လှိုင်မင်း)
မှတ်ပုံတင်ကြီးကြပ်ရေးမှူး
(ဘွိုင်လာစစ်ဆေးရေး)
ရန်ကုန်တိုင်းဒေသကြီး

(အောင်ကျော်ဇော)
ဘွိုင်လာစစ်ဆေးရေးမှူး
၆၁၂၃ မှ
(ဘွိုင်လာစစ်ဆေးရေး)
ရန်ကုန်တိုင်းဒေသကြီး

ရက်စွဲ။ ....၃၂.. ၁. ၂၀၂၃............

မှတ်ချက် ။ ။ ဘွိုင်လာဥပဒေပုဒ်မ ၁၅ ပါပြဋ္ဌာန်းထားသည့် သက်ဆိုင်ရာအစိုးရဌာန အဖွဲ့ အစည်းက လိုအပ်၍တောင်းဆိုသည့်အခါ ဤလက်မှတ်ကို တင်ပြရမည်။

ဘွိုင်လာယာယီအသုံးပြုခွင့်လက်မှတ်

(လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆ အပိုဒ်ခွဲ (ဆ))

စာအမှတ် [illegible] / ၂၀၂၂-၂၃ / [illegible]

....Mr. Xu Tianjun, Da Hua (Myanmar) Co., Ltd. [illegible]....................

....[illegible]....................

....[illegible] ရန်ကုန်တိုင်းဒေသကြီး....................

....................အား............Zhejiang Haite Boiler Co., Ltd....................

....................ကုမ္ပဏီ၊..............China.............................. နိုင်

ထုတ်လုပ်သည့်ဘွိုင်လာအမှတ်....[illegible]................................ပါသော

သို့မဟုတ်ဘွိုင်လာမှတ်ပုံတင်အမှတ် မ.စ.[illegible]......ဖြစ်သော [illegible]......ဘွိုင်လာကို

ခွင့်ပြုဖိအား....0.5 MPa..........ဖြင့်လက်မှတ်ထုတ်ပေးသည့်နေ့မှ (၆)လအသုံးပြုခွင့်ရှိသည်။ ယင်းကာလအပိုင်းအခြား ကျော်လွန်သည့်အခါ ထုတ်ပေးထားသည့် ဤယာယီအသုံးပြုခွင့် လက်မှတ်ပျက်ပြယ်စေရမည်။

([illegible])
ဒုတိယညွှန်ကြားရေးမှူး
(ဘွိုင်လာစစ်ဆေးရေး)
ရန်ကုန်တိုင်းဒေသကြီး

([illegible])
ဘွိုင်လာစစ်ဆေးရေးမှူး
[illegible]
(ဘွိုင်လာစစ်ဆေးရေး)
ရန်ကုန်တိုင်းဒေသကြီး

ရက်စွဲ။ ....၁၂..၁..၂၀၂၃............

မှတ်ချက် ။ ။ ဘွိုင်လာဥပဒေပုဒ်မ ၁၅ ပါပြဋ္ဌာန်းထားသည့် သက်ဆိုင်ရာအစိုးရဌာန အဖွဲ့အစည်းက လိုအပ်၍တောင်းဆိုသည့်အခါ ဤလက်မှတ်ကို တင်ပြရမည်။

APPENDIX B

TEST RESULTS

Air Quality Monitoring Results

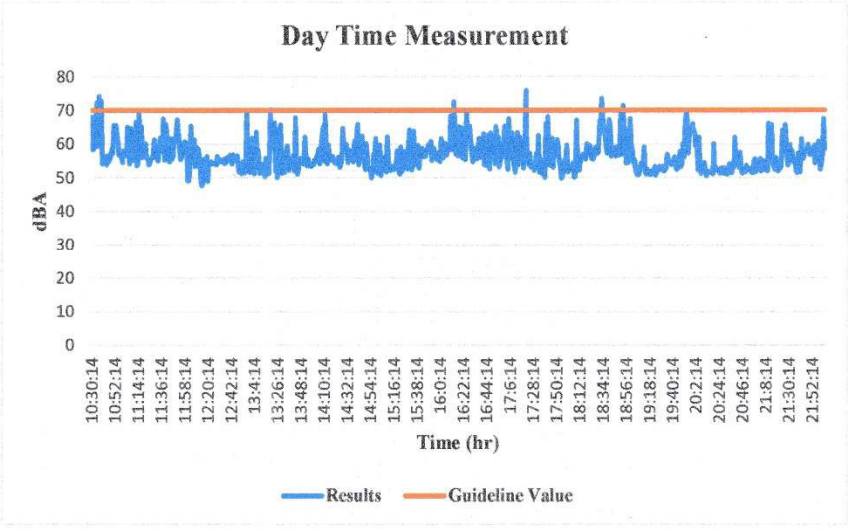
Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

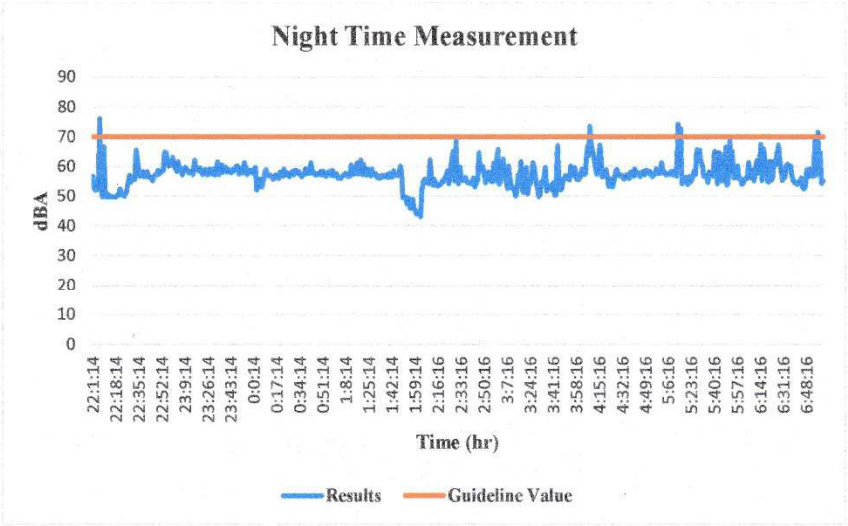
Haz-Scanner Measurement Record

Date	Time	NH_3	CO_2	CO	NO_2	O_2	O_3	PM 10	PM 2.5	SO_2	VOCS
Date	Time	ppm	ppm	ppm	ug/m³	%	ppb	ug/m³	ug/m³	ppb	ppb
7/15/2021	10:52 - 11:52	0.00	389.45	0.02	72.19	20.16	82.83	2.70	1.12	0.00	0.00
7/15/2021	11:52 - 12:52	0.00	397.23	0.00	60.79	20.20	81.62	2.00	1.03	0.00	0.00
7/15/2021	12:52 - 13:52	0.00	414.73	0.00	3.85	20.32	81.20	2.00	1.02	0.00	0.00
7/15/2021	13:52 - 14:52	0.00	445.40	0.00	3.76	20.40	81.65	54.35	30.88	0.00	0.00
7/15/2021	14:52 - 15:52	0.00	432.57	0.00	3.76	20.40	82.00	28.77	14.88	0.00	0.00
7/15/2021	15:52 - 16:52	0.00	439.37	0.00	3.76	20.40	81.98	57.18	26.97	0.00	0.00
7/15/2021	16:52 - 17:52	0.00	423.37	0.00	3.76	20.33	82.00	42.10	21.60	0.00	0.00
7/15/2021	17:52 - 18:52	0.00	398.63	0.00	12.16	20.23	81.98	18.92	9.78	0.00	0.00
7/15/2021	18:52 - 19:52	0.00	389.30	0.00	48.88	20.13	82.00	5.90	3.30	0.00	0.00
7/15/2021	19:52 - 20:52	0.00	384.77	0.00	84.98	20.10	82.00	6.17	2.00	0.00	0.00
7/15/2021	20:52 - 21:52	0.00	380.05	0.00	99.80	20.08	81.98	12.00	5.00	0.00	0.00
7/15/2021	21:52 - 22:52	0.00	386.80	0.00	111.48	20.00	81.97	2.00	1.00	0.00	0.00
7/15/2021	22:52 - 23:52	0.00	398.97	0.00	141.78	20.00	82.00	2.00	1.08	0.00	0.00
7/16/2021	23:52 - 00:52	0.00	425.53	0.01	134.95	20.00	82.00	10.00	6.10	0.00	0.00
7/16/2021	00:52 - 1:52	0.00	408.63	0.00	142.97	20.00	81.60	2.00	1.02	0.00	0.00
7/16/2021	1:52 - 2:52	0.00	407.93	0.00	145.39	20.00	82.00	5.02	3.08	0.00	0.00
7/16/2021	2:52 - 3:52	0.00	408.72	0.00	154.13	20.00	81.95	2.97	1.68	0.00	0.00
7/16/2021	3:52 - 4:52	0.00	437.80	0.14	154.63	20.00	81.87	3.10	1.70	0.00	0.00
7/16/2021	4:52 - 5:52	0.00	449.87	0.00	130.22	20.03	81.93	74.13	40.30	0.00	0.00
7/16/2021	5:52 - 6:52	0.00	447.12	0.00	117.66	20.10	81.62	25.77	13.62	0.00	0.00
7/16/2021	6:52 - 7:52	0.00	436.37	0.02	107.69	20.10	81.97	30.72	18.83	0.00	0.00
7/16/2021	7:52 - 8:52	0.00	404.23	0.00	104.56	20.10	81.78	10.67	5.43	0.00	0.00
7/16/2021	8:52 - 9:52	0.00	390.03	0.00	97.70	20.10	81.97	2.28	2.15	0.00	0.00
7/16/2021	9:52 - 10:52	0.00	390.55	0.00	74.79	20.20	82.00	2.50	1.22	0.00	0.00
AVG		**0.00**	**411.98**	**0.01**	**83.99**	**20.14**	**81.91**	**16.88**	**8.95**	**0.00**	**0.00**

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

Ambient Noise Measurement Record

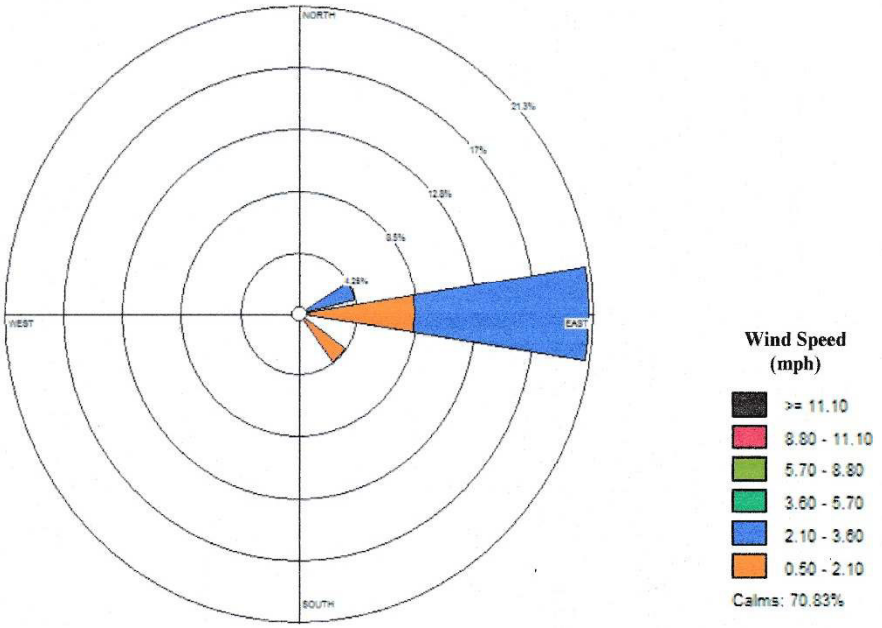




Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

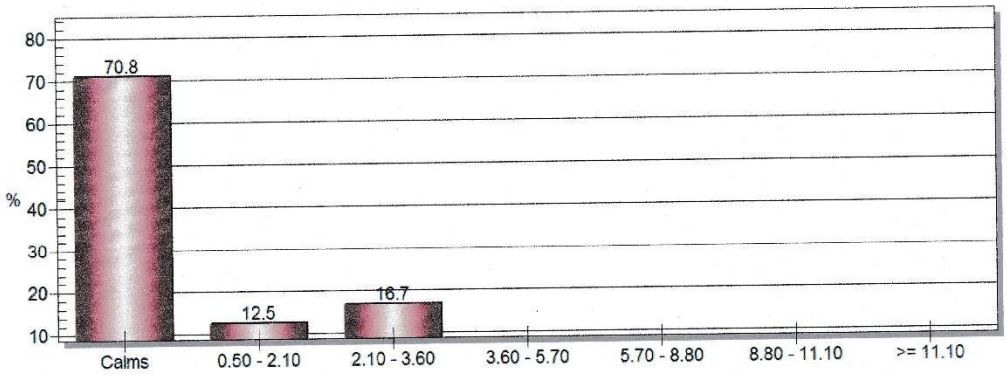
Wind Rose Map

Wind Speed & Wind Direction (15.7.21 – 16.7.21 Blowing from)



Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

Wind Class Frequency Distribution



Measurement Record Photo

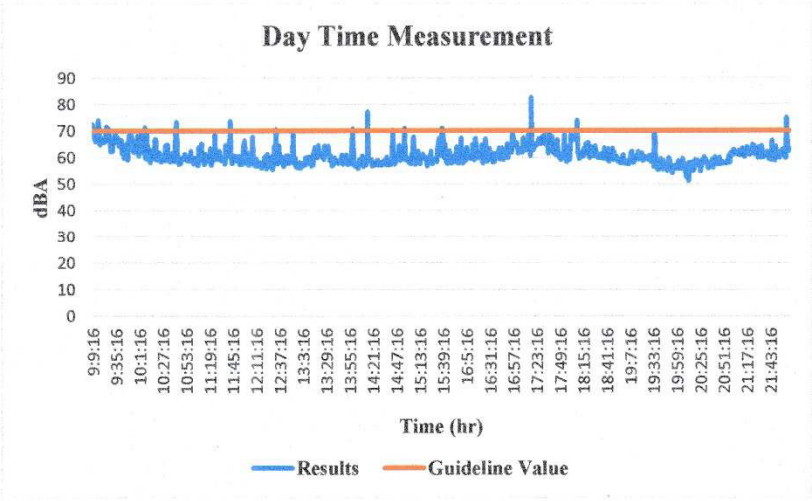
Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

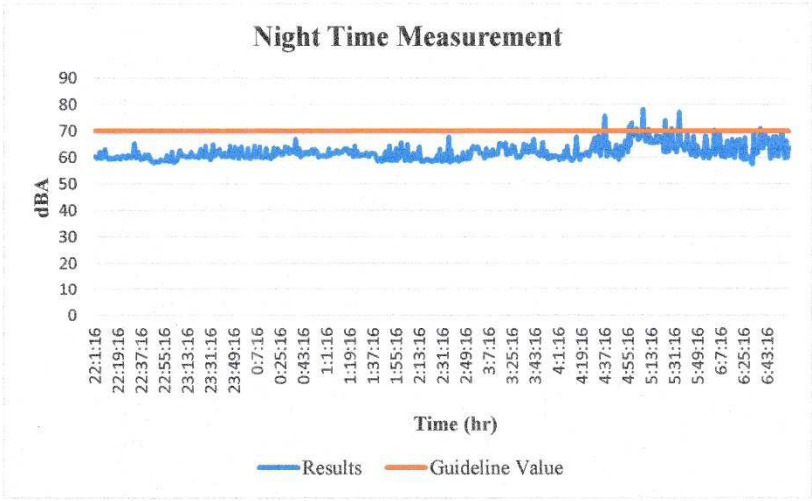
Haz-Scanner Measurement Record

Date	Time	NH_3	CO_2	CO	NO_2	O_2	O_3	PM 10	PM 2.5	SO_2	VOCS
Date	Time	ppm	ppm	ppm	ug/m^3	%	ppb	ug/m3	ug/m^3	ppb	ppb
7/14/2021	9:13 - 10:13	0.00	374.70	0.01	41.23	20.14	82.73	2.00	1.00	0.00	0.00
7/14/2021	10:13 - 11:13	0.00	389.32	0.00	3.76	20.41	81.55	21.00	10.00	0.00	0.00
7/14/2021	11:13 - 12:13	0.00	422.63	0.00	3.76	20.50	81.72	24.83	12.00	0.00	0.00
7/14/2021	12:13 - 13:13	0.00	448.13	0.00	3.76	20.50	81.93	13.77	8.03	0.00	0.00
7/14/2021	13:13 - 14:13	0.00	454.97	0.00	3.76	20.50	82.00	43.02	22.00	0.00	0.00
7/14/2021	14:13 - 15:13	0.00	454.62	0.00	3.76	20.50	82.00	41.60	20.27	0.00	0.00
7/14/2021	15:13 - 16:13	0.00	459.97	0.00	3.76	20.50	82.00	67.95	32.68	0.00	0.00
7/14/2021	16:13 - 17:13	0.00	451.30	0.00	3.76	20.47	81.98	33.88	17.83	0.00	0.00
7/14/2021	17:13 - 18:13	0.00	419.15	0.00	3.76	20.37	82.00	65.40	38.47	0.00	0.00
7/14/2021	18:13 - 19:13	0.00	403.57	0.00	3.76	20.28	82.00	51.88	23.17	0.00	0.00
7/14/2021	19:13 - 20:13	0.00	396.87	0.00	9.81	20.20	81.98	80.78	46.77	0.00	0.00
7/14/2021	20:13 - 21:13	0.00	390.48	0.00	41.83	20.15	81.67	58.23	22.73	0.00	0.00
7/14/2021	21:13 - 22:13	0.00	393.08	0.00	76.92	20.10	81.43	137.65	66.17	0.00	0.00
7/14/2021	22:13 - 23:13	0.00	418.15	0.00	105.19	20.10	81.77	41.23	20.63	0.00	0.00
7/15/2021	23:13 - 00:13	0.00	389.17	0.00	124.30	20.10	81.93	106.70	52.77	0.00	0.00
7/15/2021	00:13 - 1:13	0.00	395.78	0.10	128.22	20.10	81.88	117.52	76.42	0.00	0.00
7/15/2021	1:13 - 2:13	0.00	401.90	0.00	126.74	20.10	82.00	2.02	1.00	0.00	0.00
7/15/2021	2:13 - 3:13	0.00	394.65	0.00	120.76	20.09	81.50	2.12	1.07	0.00	0.00
7/15/2021	3:13 - 4:13	0.00	405.15	0.00	134.26	20.01	81.75	32.82	22.38	0.00	0.00
7/15/2021	4:13 - 5:13	0.00	445.45	0.00	164.88	20.00	81.95	116.17	59.23	0.00	0.00
7/15/2021	5:13 - 6:13	0.00	471.08	0.00	182.02	20.00	84.35	103.00	42.70	0.00	0.00
7/15/2021	6:13 - 7:13	0.00	460.22	0.00	187.15	20.00	99.18	58.78	25.05	2.32	0.00
7/15/2021	7:13 - 8:13	0.00	413.00	0.00	170.33	20.00	77.67	56.30	24.38	0.00	0.00
7/15/2021	8:13 - 9:13	0.00	408.62	0.00	150.56	20.08	80.63	64.62	32.95	0.00	0.00
AVG		**0.00**	**419.25**	**0.00**	**74.92**	**20.22**	**82.48**	**55.97**	**28.32**	**0.10**	**0.00**

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

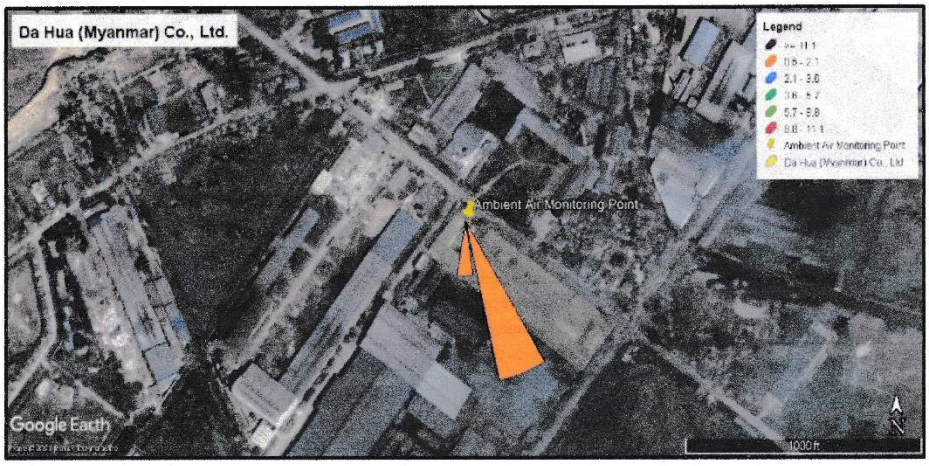
Ambient Noise Measurement Record

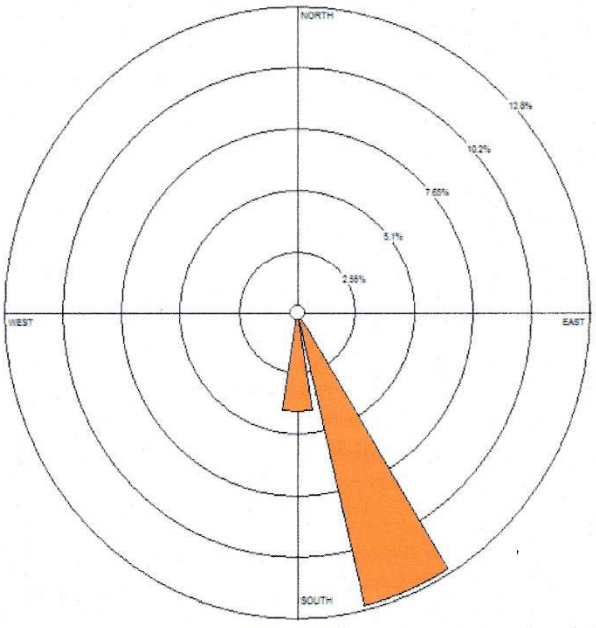




Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

Wind Rose Map
Wind Speed & Wind Direction (14.7.21 – 15.7.21 Blowing from)





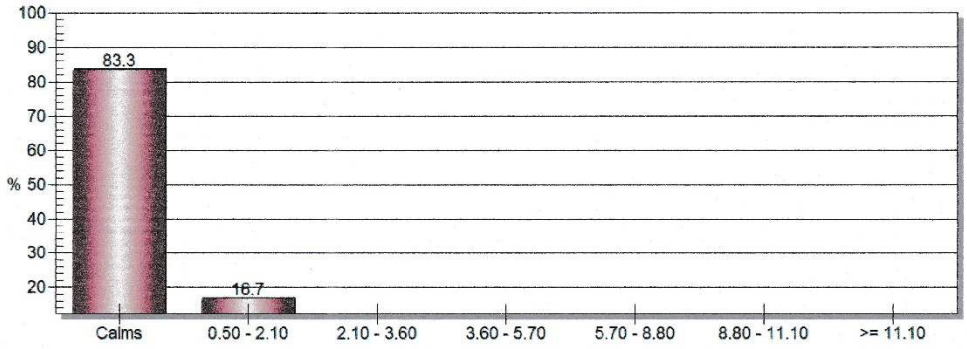
Wind Speed (mph)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 83.33%

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296, 09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

Wind Class Frequency Distribution



Measurement Record Photo

Water Quality Results

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Name of Person:

Contact:

Date of Sample Collection: -

Date of Sample Arrival to Lab: 1.7.2021

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 1		
1.	5-day Biochemical Oxygen Demand	mg/l	388	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	700	**30**	**250**
3.	Oil and Grease	mg/l	12	**5**	**10**
4.	pH	-	5.51	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	560.	**1**	**-**
6.	Total Suspended Solids	mg/l	80	**1**	**50**
7.	Turbidity	NTU	68	**0.01**	**-**

ND – Not Detected

Analyzed By

Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Date of Sample Collection: -

Name of Person:

Date of Sample Arrival to Lab: 1.7.2021

Contact:

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 2		
1.	5-day Biochemical Oxygen Demand	mg/l	74	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	160	**30**	**250**
3.	Oil and Grease	mg/l	6	**5**	**10**
4.	pH	-	5.64	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	280	**1**	**-**
6.	Total Suspended Solids	mg/l	48	**1**	**50**
7.	Turbidity	NTU	24.6	**0.01**	**-**

ND – Not Detected

Analyzed By

Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Date of Sample Collection: -

Name of Person:

Date of Sample Arrival to Lab: 1.7.2021

Contact:

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 3		
1.	5-day Biochemical Oxygen Demand	mg/l	ND	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	ND	**30**	**250**
3.	Oil and Grease	mg/l	ND	**5**	**10**
4.	pH	-	5.69	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	120	**1**	-
6.	Total Suspended Solids	mg/l	38	**1**	**50**
7.	Turbidity	NTU	21.8	**0.01**	-

ND – Not Detected

Analyzed By

Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Date of Sample Collection: -

Name of Person:

Date of Sample Arrival to Lab: 1.7.2021

Contact:

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 4		
1.	5-day Biochemical Oxygen Demand	mg/l	ND	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	ND	**30**	**250**
3.	Oil and Grease	mg/l	ND	**5**	**10**
4.	pH	-	6.55	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	220	**1**	**-**
6.	Total Suspended Solids	mg/l	20	**1**	**50**
7.	Turbidity	NTU	9.29	**0.01**	**-**

ND – Not Detected

Analyzed By

Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Name of Person:

Contact:

Date of Sample Collection: -

Date of Sample Arrival to Lab: 1.7.2021

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 5		
1.	5-day Biochemical Oxygen Demand	mg/l	ND	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	ND	**30**	**250**
3.	Oil and Grease	mg/l	ND	**5**	**10**
4.	pH	-	9.08	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	200	**1**	**-**
6.	Total Suspended Solids	mg/l	20	**1**	**50**
7.	Turbidity	NTU	9.78	**0.01**	**-**

ND – Not Detected

Analyzed By

Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

Green Myanmar
Environmental Services Co., Ltd
No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar
Tel: 09 897 978 296,09-5081451 E-mail: gmescompany@gmail.com, info@gmes-mm.com

WATER QUALITY TEST RESULT FORM

Name of Customer: Ever Green Tech Environmental Services and Training Co., Ltd.

Date of Sample Collection: -

Name of Person:

Date of Sample Arrival to Lab: 1.7.2021

Contact:

Date of Issued of Result: 13.7.2021

WATER QUALITY ANALYSIS RESULT

Sr. No.	Parameters	Unit	Analysis Value	Minimum Measurement Range of Methods	National Environmental Quality (Emission) Guidelines General Application
			W - 6		
1.	5-day Biochemical Oxygen Demand	mg/l	ND	**30**	**50**
2.	Chemical Oxygen Demand	mg/l	ND	**30**	**250**
3.	Oil and Grease	mg/l	ND	**5**	**10**
4.	pH	-	6.43	**0.1**	**6 ~ 9**
5.	Total Dissolved Solids	mg/l	160	**1**	**-**
6.	Total Suspended Solids	mg/l	20	**1**	**50**
7.	Turbidity	NTU	9.36	**0.01**	**-**

ND – Not Detected

Analyzed By

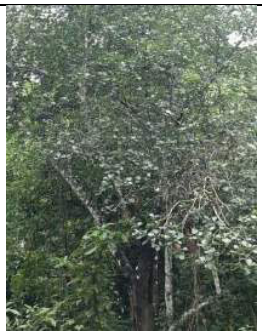
Daw Tun Eaindra Soe
Technician (Laboratory)

Approved By

U Thet Min Paing
In-Charge (Laboratory)

APPENDIX C

BIODIVERSITY ENVIRONMENT

		
Acacia auriculiformis	*Albizia lebbek*	*Aloe vera*
		
Alternanthera sessilis	*Artocarpus heterophyllus*	*Cassia siamea*
		
Carica papaya	*Chromolaena odorata*	*Commelina benghalensis*
		
Cyperus difformis	*Cyperus tegetum*	*Eugenia Oleina*

		
Mangifera indica	*Mimosa diplotricha*	*Mimosa pudica*
		
Oldenlandia diffusa	*Persicaria hydropiper*	*Psidium guajava*
		
Saccharum spontaneum	*Tabernaemontana divaricata*	*Tectona grandis*
		
Terminalia catappa	*Urena labata*	*Ziziphus jujuba*

Figure - Some recorded photos of the observed fauna species from the surrounding project areas

	
A. *Pomacea canliculata*	B. *Dyspanopeus saya*
	
C. *Litopenaeus vannamei*	D. *Calotes mystaceus*

Figure - Some Mollusks, Crustaceans and Reptile Species Recorded

	
E. *Pieris canidia*	F. *Papilio demoleus*
	
G. *Oecophylla smaragdina*	H. *Formica rufa*

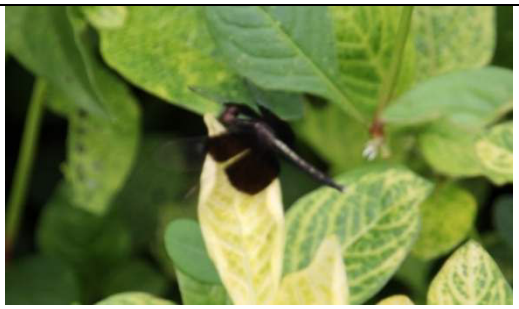
	
A. *Crocothemis servilia*	B. *Acisoma panorpoides*
	
C. *Orthetrum sabina*	D. *Neurothemis tullia*

Figure - Some Insect Species Recorded

	
A. *Tenualosa ilisha*	B. *Hisha elongata*
	
C. *Glossogobius giuris*	D. *Cynoglossus lingua*

	
E. *Xenentodon cancila*	F. *Monopterus uchia*

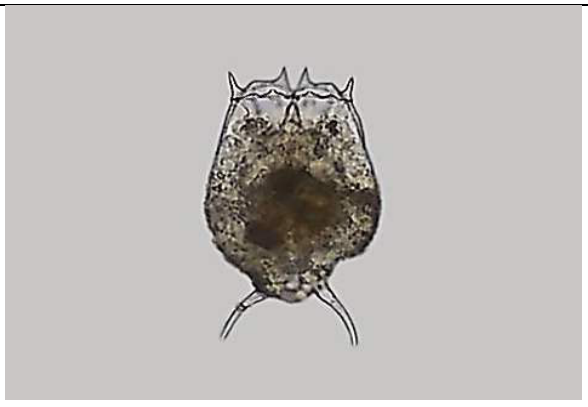
Figure - Some Fish Species Recorded

	
A. *Phalarcrocorax niger*	B. *Ardeol bacchus*
	
C. *Ardea agrayii*	D. *Mesophoyx intermedia*
	
E. *Egretta falcinellus*	F. *Gallinula chloropus*

	
G. *Amaurornis phoenicurus*	H. *Spilopelia chinensis*
	
A. *Merops orientalis*	B. *Dicrurus macrocerus*
	
C. *Corvus splendens*	D. *Passer domesticus*
	
E. *Passer montanus*	F. *Acridotheres tristis*

	
G. *Prinia inornata*	H. *Merops orientalis*

Figure - Some Bird Species Recorded

	
A. *Asplanchna priodonta*	B. *Brachinous angularis*
	
C. *B. caudatus*	D. *B. quadridentata*

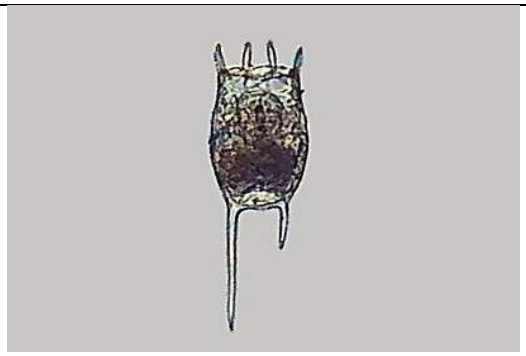
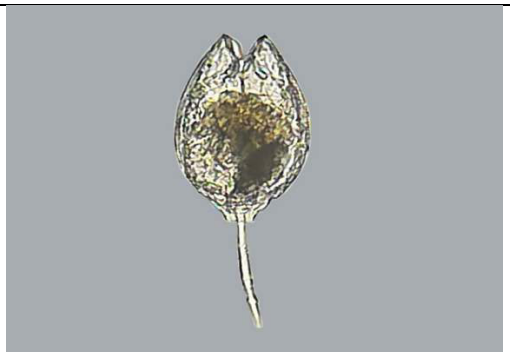
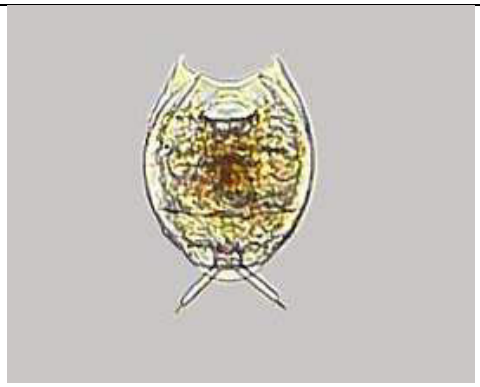
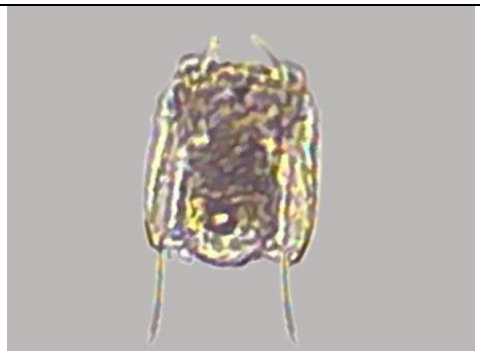
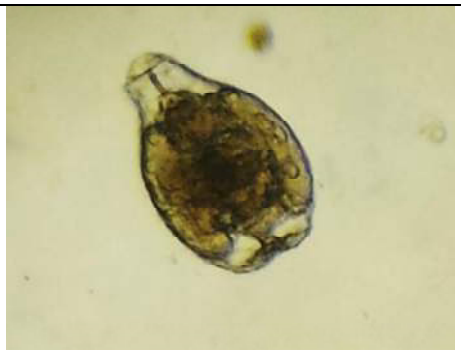
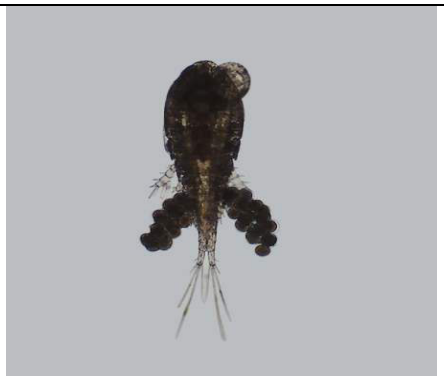
	
E. *Keratella tropica*	F. *Lecane bulla*
	
A. *L.luna*	B. *L.lunaris*
	
C. *Polyarthra vulgaris*	D. *Horaella brehmi*
	
E. *Microcyclops* sp.	F. *Mesocyclop leckurti*

Figure - Zooplankton Species Recorded

APPENDIX D

PUBLIC MEETING

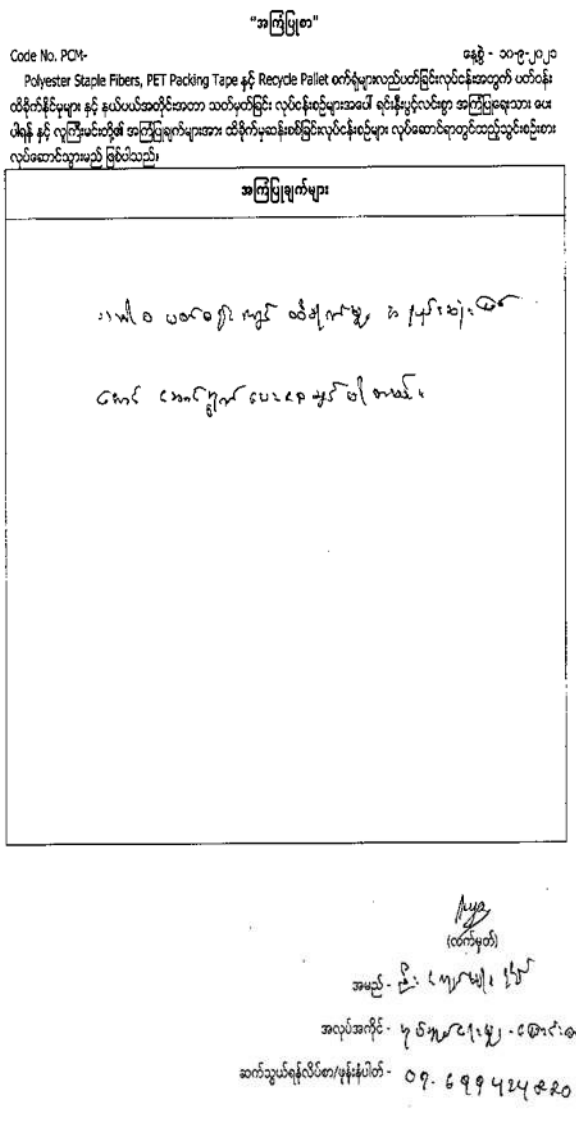
Attendance List for the Public Meeting of the Scoping Stage

Da Hua Myanmar Co., Ltd. ၏ Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများတည်ဆောက်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းလူထုတွေ့ဆုံပွဲ တက်ရောက်သူများစာရင်း

နေရာ - Da Hua Myanmar စီမံကိန်းဝင်း၊ မြောင်းတကာစက်မှုဇုန် နေ့စွဲ - ၁၀-၉-၂၀၂၃

စဉ်	အမည်	ရာထူး/ကိုယ်စားပြုအဖွဲ့အစည်း	ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်	လက်မှတ်
1	ဦးကျော်ဌေး	[illegible]	09 5059798	
2	[illegible]	[illegible]	09-420126202	
3	[illegible]	[illegible]	09 775016700	
4	[illegible]	Manager.	09-457385700	
5	[illegible]	[illegible]	09 5400988	
6	[illegible]	[illegible]	09 762026389	
7	[illegible]	[illegible]	09. 699424800	
8	[illegible]	[illegible]	09. 769788186	
9	[illegible]	[illegible]	09. 304899988.	
10	[illegible]	[illegible]	09 250170186	
11.	[illegible]	[illegible]	09 - 422371445	
12.	[illegible]	[illegible]	09 - 400461226	
13.	[illegible]		09 - 449605043	
11	[illegible]	H.R.	09-264273633	
12	[illegible]	[illegible]	09-788959770	
13	[illegible]	[illegible]	09- 977510919	
14	[illegible]		09-409195510	
15	[illegible]			
1.	[illegible]	HR.	09-783964649.	
2.	[illegible]	AGM	09420009356.	
3	Mr Luo Baunjun	ZHONG LIAN FENG	09-457385700.	
4	Zaw Zaw Hlaing	[illegible]	09-420241224	
5.	Han Lin Zaw	[illegible]	09-421339350	
6.	Phat [illegible]	[illegible]		
7.	[illegible]			
8.	[illegible]			
9.	NayChunOO			
10	[illegible]			

Suggestion Letters during Public Meeting for Scoping Proposal



"အကြံပြုစာ"

Code No. PCM-

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နည်းလမ်းအတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမှုလင်းစွာ အကြံပြုရေးသား ပေးပို့ရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

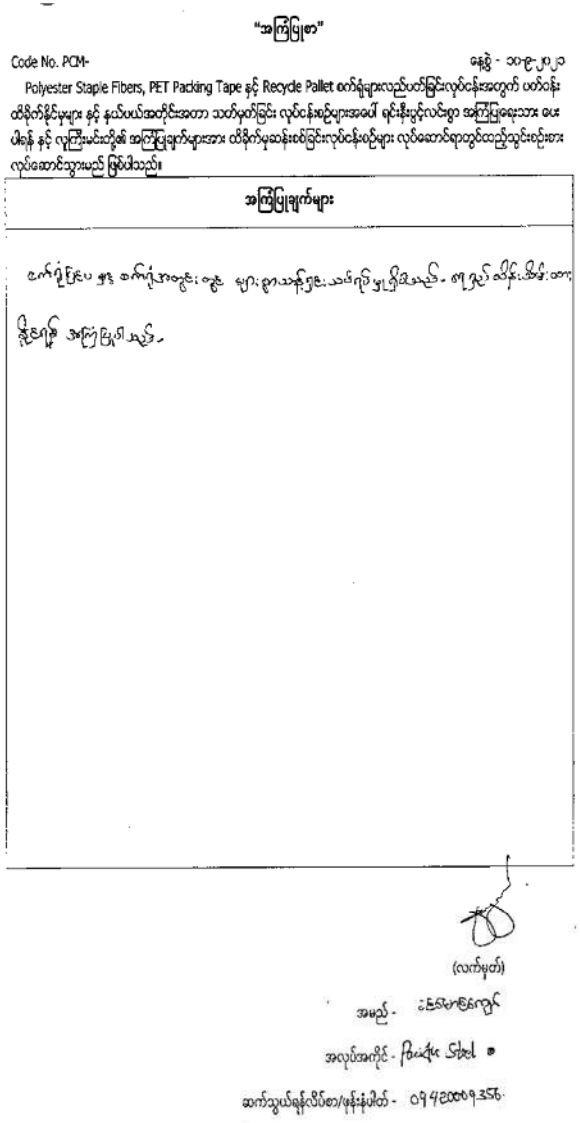
အကြံပြုချက်များ

(လက်မှတ်)

အမည် -

အလုပ်အကိုင် -

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09-699424820



"အကြံပြုစာ"

Code No. PCM-

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နည်းလမ်းအတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမှုလင်းစွာ အကြံပြုရေးသား ပေးပို့ရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

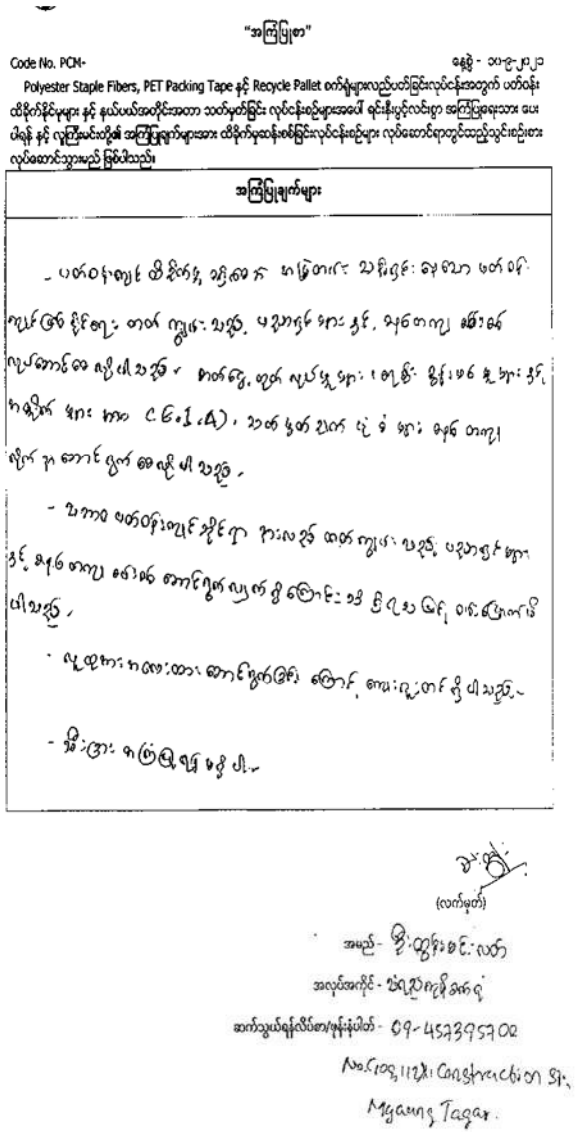
အကြံပြုချက်များ

(လက်မှတ်)

အမည် -

အလုပ်အကိုင် -

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09420006913356



"အကြံပြုစာ"

Code No. PCM-

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နည်းလမ်းအတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမှုလင်းစွာ အကြံပြုရေးသား ပေးပို့ရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ

(လက်မှတ်)

အမည် -

အလုပ်အကိုင် -

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09-453739570Z

Myaung Taga.

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
- [illegible] ဆောင်ရွက်စေလိုပါသည်။
- [illegible] ဆောင်ရွက်ပေးစေလိုပါသည်။
- [illegible] ဆောင်ရွက်စေလိုပါသည်။
- [illegible]
- [illegible]

(လက်မှတ်)

အမည် - Ma Lun Bawng Jun

အလုပ်အကိုင် - ZHONG LIAN FENG CO.,LTD.

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09-457395700
(No-107,112), Construction Street,
Myaung Tagar Industrial Zone,
Hmawbi Tps.

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
- [illegible]
- [illegible]

(လက်မှတ်)

အမည် - [illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09 775016700

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
- [illegible]
- [illegible]

(လက်မှတ်)

အမည် - [illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09-420126202

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမွှင့်လင်းစွာ အကြံပြုပေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစားလုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
[illegible]

(လက်မှတ်) [illegible]

အမည် - [illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - ၀၉ - 422374445

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမွှင့်လင်းစွာ အကြံပြုပေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစားလုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
[illegible]

(လက်မှတ်)

အမည် - Nang Chan[illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် -

"အကြံပြုစာ"

Code No. PCM- နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးမွှင့်လင်းစွာ အကြံပြုပေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစားလုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
Polyester staple fibers, PET Packing Tape နှင့် Recycle Pallet [illegible]

(လက်မှတ်)

အမည် - [illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - [illegible]

"အကြံပြုစာ"

Code No. PCM-

နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
၁။ စက်ရုံ [illegible] သန့်ရှင်းရေး [illegible] အတွက် စက်ရုံ အား [illegible] ပါသည်။

(လက်မှတ်)

အမည် - ဦးဇော်ဇော်ကြိုင်

အလုပ်အကိုင် - [illegible] (ရုံးစာရေး)

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - ၀၉ 420241224

"အကြံပြုစာ"

Code No. PCM-

နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
① [illegible]
② ရေဆိုး ၊ [illegible] ၊ [illegible]

(လက်မှတ်)

အမည် - [illegible]

အလုပ်အကိုင် - [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - ၂၁၁ ၊ [illegible]

"အကြံပြုစာ"

Code No. PCM-

နေ့စွဲ - ၁၀-၉-၂၀၂၃

Polyester Staple Fibers, PET Packing Tape နှင့် Recycle Pallet စက်ရုံများလည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းထိခိုက်နိုင်မှုများ နှင့် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း လုပ်ငန်းစဉ်များအပေါ် ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသား ပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းစဉ်များ လုပ်ဆောင်ရာတွင်ထည့်သွင်းစဉ်းစား လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

အကြံပြုချက်များ
① [illegible] အသံ/ အနံ့/ အညစ်/ အငွေ့ များထွက်ရှိသည့် လုပ်ငန်းများ လုပ်ကိုင်ရန် [illegible] ဖြစ်ပါသည်။
② ဖော်ပြပါ သဘာဝ ပါတ်ဝန်းကျင် ထိခိုက်စေသော လုပ်ငန်းများ ဖြစ်သည့်အတွက် [illegible] / အနည်းဆုံး ဖြစ်စေရန် စီမံဆောင်ရွက်ကြရမည် ဖြစ်ပါသည်။
③ စက်ရုံများ အားလုံး [illegible] EIA ဆောင်ရွက်ခြင်း အား ဆောင်ရွက်ပိုင်ခွင့် [illegible] ပါသည်။
④ သို့မှသာ သဘာဝ ပါတ်ဝန်းကျင် ထိခိုက်မှု အနည်းဆုံးဖြင့် လုပ်ငန်းများ ကောင်းမွန်စွာ ဆက်လက်ဆောင်ရွက် နိုင်မည်ဖြစ်ကြောင်း တင်ပြအပ်ပါသည်။

(လက်မှတ်)

အမည် - ဦး[illegible]အောင်

အလုပ်အကိုင် - [illegible]
MYANMAR NEW POWER RECYCLE CO.,LTD
MANAJAR

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ် - 09 250170186 , 09 767020693

Attendance List for the Public Meeting for the EIA Stage

Da Hua (Myanmar) Co., Ltd. မှတည်ဆောက်မည့်စက်ရုံများအတွက် လူထုတွေ့ဆုံပွဲအခမ်းအနားတက်ရောက်သူများစာရင်း

နေ့ရက် - ၁၉-၆-၂၀၂၂

နေရာ - စက်မှုဇုန်စီမံခန့်ခွဲရေးကော်မတီအစည်းအဝေးခန်းမ

စဉ်	အမည်	ရာထူး/ကိုယ်စားပြုအဖွဲ့အစည်း	ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်	လက်မှတ်
	[illegible]		[illegible] 09448241741	
	Pacific		Pacific [illegible] 09 420009366	
	[illegible]	[illegible]	09 50 54798	
	[illegible]	[illegible]	09420198177	
	[illegible]		09 795669138	
	[illegible]			
	[illegible]	[illegible]	09 . 699424000	
	[illegible]			
	[illegible]		[illegible] 09787941691	
	[illegible]		[illegible] 09661705650	
	[illegible]		[illegible]	
	[illegible]		[illegible] 09 679482996	
	[illegible]	[illegible]	09 48135123	
	[illegible]	[illegible]	09 752193761	
	[illegible]	HR	09254059261	
	Naw Ni Aung	Manager	No. (19/20/21) 999 09 767620234	
	Hung Rong Ding	[illegible]	6666 893131689 -	
	[illegible]	Computer [illegible]	09- 424428263	
	[illegible]	[illegible] / ECD Ygn	09 - 420904775	
	[illegible]	AD / ECD Ygn	09 - 957013479	
	[illegible]	DD / ECD Ygn	09 - 979480944	
	[illegible]	[illegible]	09-886972491	
	[illegible]	[illegible]	09. 68347655	
	[illegible]	[illegible]	[illegible] 09-77501670	
	[illegible]		09-694773382	
	[illegible]		09-690955482	

1				
2				
3				
4				
5				
6				
7				

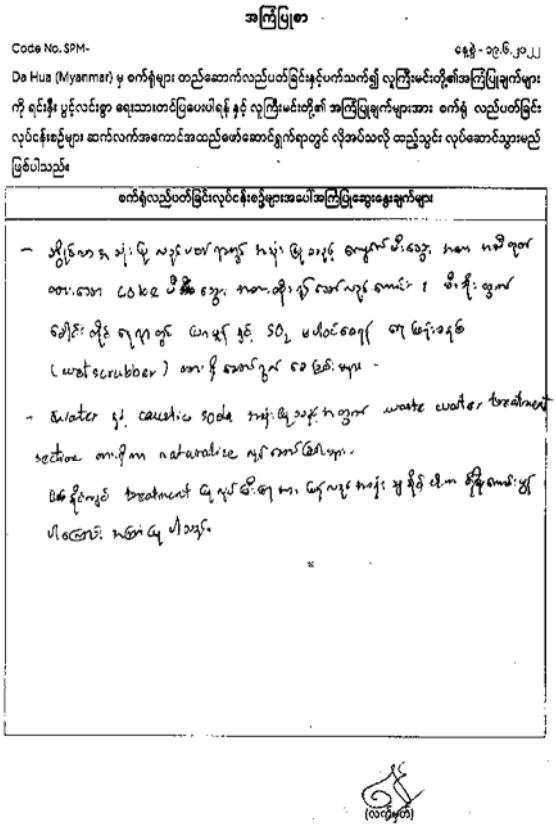
1	[illegible]	[illegible]	09-458700309	[signature]
2	[illegible]	"	09-893708765	[signature]
3	[illegible]	"	09-959814967	[signature]
4	[illegible]	"	"	[signature]
5	[illegible]	"	09-768438197	[signature]
6	[illegible]	"		[signature]
7	[illegible]	"		[signature]
8	[illegible]	"	983954493	[signature]

1	[illegible]	Myint Daung	09762184571	[signature]
	[illegible]	[illegible]	0966896527	[signature]
	[illegible]	[illegible]		
	[illegible]		09794318023	
	[illegible]		09697026517	
	[illegible]	[illegible]		[signature]
	[illegible]	[illegible]	09 674230074	[signature]
	[illegible]	[illegible]	09,788555234	[signature]
	[illegible]	[illegible]	09-408871383	[signature]
	[illegible]			[signature]

	[illegible]		09250045418	[signature]
	Pyae Sone Oo		0953994591	[signature]
	[illegible]		09220502.	[signature]
	[illegible]		09691546870	[signature]
	[illegible]		09-692943172	[signature]
	[illegible]			
	[illegible]		Nyt 09693681148	[signature]
	[illegible]		09-691538606.	[signature]
	[illegible]		09.763640085	[signature]
	[illegible]		09-667353579	[signature]

	[illegible]	[illegible]	09-420241224	[signature]
	[illegible]	[illegible]	09.422428263	[signature]
	[illegible]	[illegible]	09-778421590	[signature]

Suggestion Letters during Public Meeting (EIA)


အကြံပြုစာ

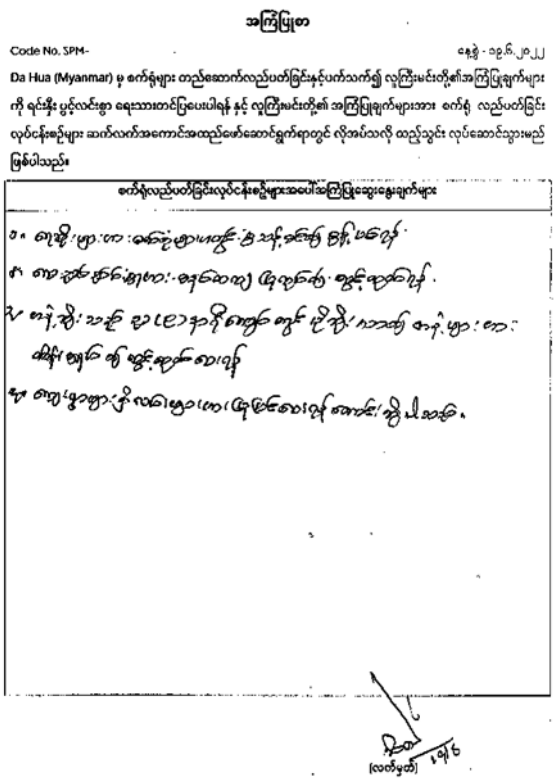
Code No. SPM-

Da Hua (Myanmar) မှ စက်ရုံများ တည်ဆောက်လည်ပတ်ခြင်းနှင့်ပတ်သက်၍ လူကြီးမင်းတို့၏အကြံပြုချက်များကို ရင်းနှီး မှုဝန်းလင်းစွာ ရေးသားတင်ပြပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား စက်ရုံ လည်ပတ်ခြင်း လုပ်ငန်းစဉ်များ ဆက်လက်အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် လိုအပ်သလို ထည့်သွင်း လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

(လက်မှတ်)

အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-


အကြံပြုစာ

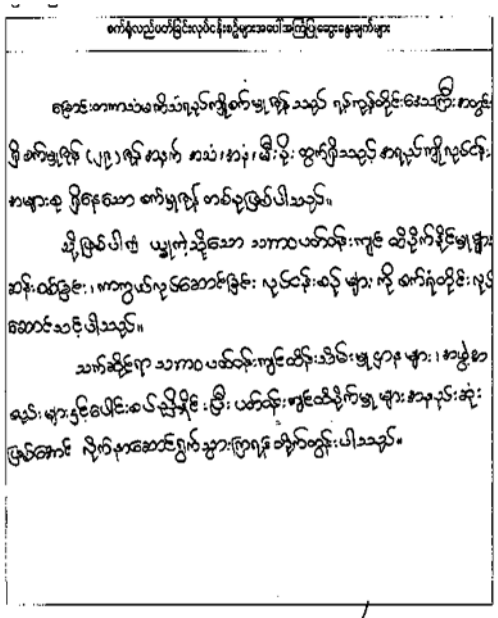
Code No. SPM-

Da Hua (Myanmar) မှ စက်ရုံများ တည်ဆောက်လည်ပတ်ခြင်းနှင့်ပတ်သက်၍ လူကြီးမင်းတို့၏အကြံပြုချက်များကို ရင်းနှီး မှုဝန်းလင်းစွာ ရေးသားတင်ပြပေးပါရန် နှင့် လူကြီးမင်းတို့၏ အကြံပြုချက်များအား စက်ရုံ လည်ပတ်ခြင်း လုပ်ငန်းစဉ်များ ဆက်လက်အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် လိုအပ်သလို ထည့်သွင်း လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

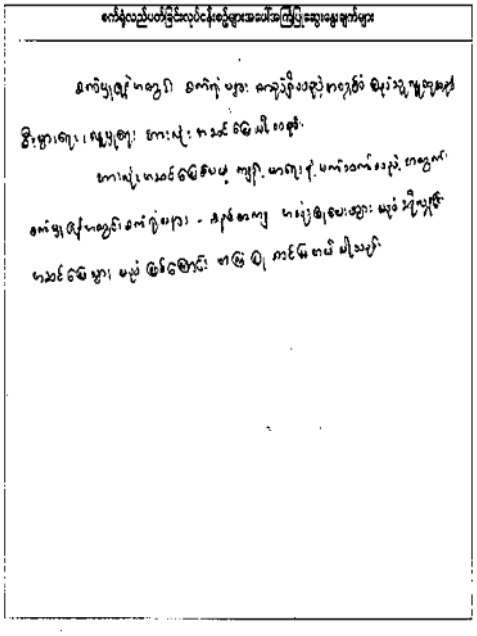
(လက်မှတ်)

အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09 420 198177


စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

(လက်မှတ်)

အမည်-
အလုပ်အကိုင်- MYANMAR NEW POWER RECYCLE Co,LTD
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09 250 170 186


စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

(လက်မှတ်)

အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်-

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- ၀၉-420318961 [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
၁။ [illegible] ၂။ [illegible] ၃။ [illegible] ၄။ [illegible] ၅။ [illegible] ၆။ [illegible] ၇။ [illegible] ၈။ [illegible] ၉။ [illegible] ၁၀။ [illegible] ၁၁။ [illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- ၀၉-264964565

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09,654554166 [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- ၀၉-651483031

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- Myint Da chan

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09762184521

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]

အလုပ်အကိုင်- [illegible]

ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
① [illegible] ② [illegible] ③ [illegible] ④ [illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09-431351[illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
[illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09-403371363

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
公司精细化管理，设备先进，工艺精致，环境，合法到位，非常标准

(လက်မှတ်)

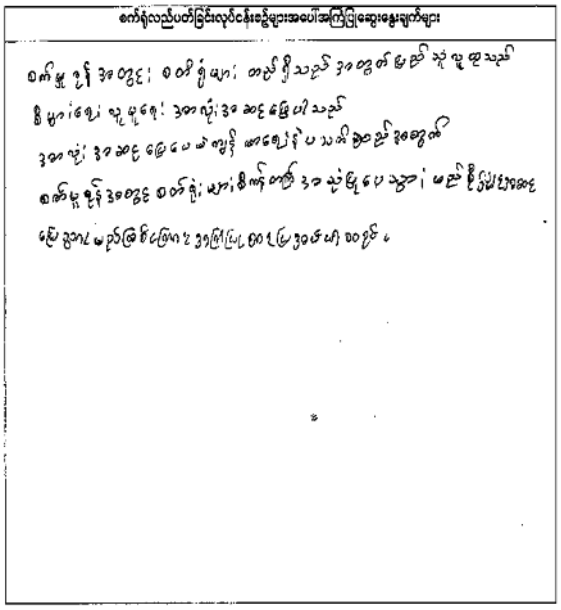
အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

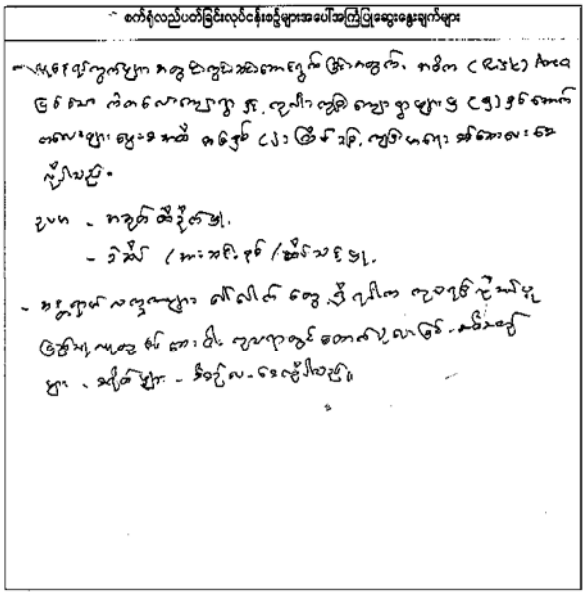
စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ
设备先进，工艺先进，达到环境标准佳。

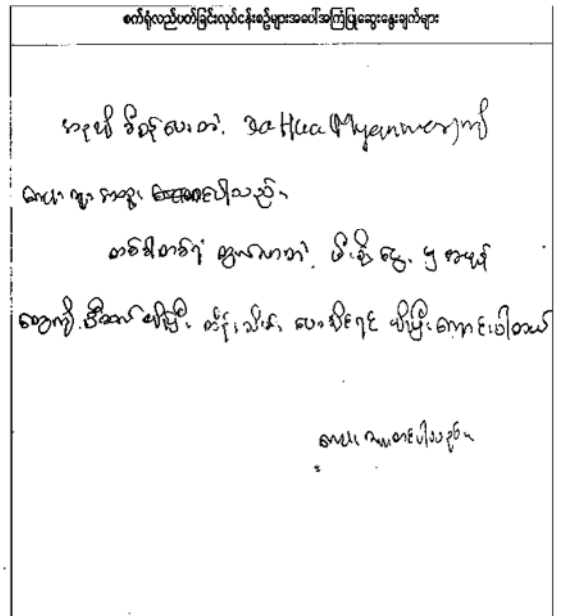
太平洋

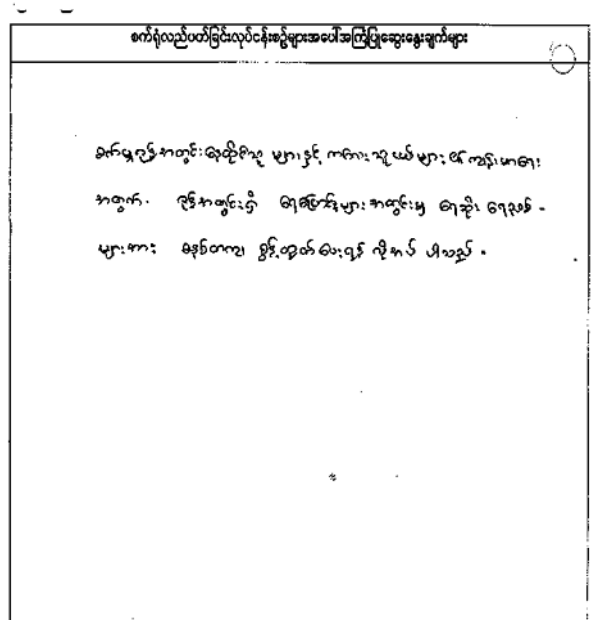
(လက်မှတ်)

အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-


စကိုရိုလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

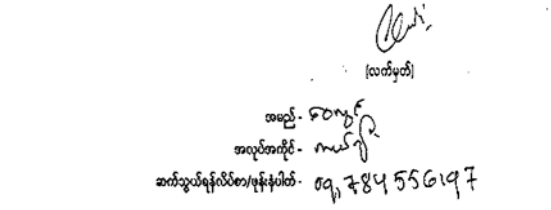

စကိုရိုလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

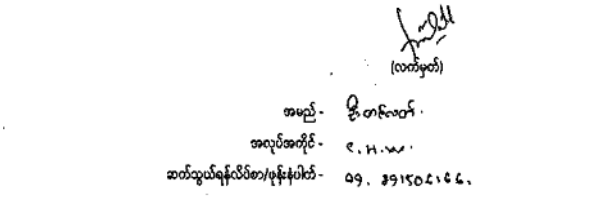

(လက်မှတ်)
အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-


(လက်မှတ်)
အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

စကိုရိုလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

စကိုရိုလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ


(လက်မှတ်)
အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-


(လက်မှတ်)
အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

- စက်ရုံမှ ဆိုးကျိုးများကို ထိန်းသိမ်းကာကွယ်ရန်
- သဘာဝပတ်ဝန်းကျင် ထိခိုက် ညစ်ညမ်းမှု ကာကွယ်ရန်
- ၎င်းတို့ကို မိမိဖြင့်လုပ်ကျင့် [illegible] ဒေသခံများကိုလည်း အများအပြားထားရန် အကြံပြုလိုပါသည်။

(လက်မှတ်)

အမည်- မောင်စန့်ဘိုဘိုအောင်
အလုပ်အကိုင်- အရှင်မီးသတ်အဖွဲ့ဝင်
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09-695911007

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

- သဘာဝ ပတ်ဝန်းကျင်ကို ဆိုးကျိုးများ မဖြစ်စေရန် ပြုလုပ်ချင်း
- လေထုညစ်ညမ်းမှုကို ကာကွယ်ပေးချင်း
- ၎င်း စက်ရုံရှိသည့်အတွက် မိသားစု စားဝတ်နေရေးများ ပြေလည်ချင်း
- ၎င်း စက်ရုံသည် ကောင်းကျိုးရှိသလို ဆိုးကျိုးများလည်း ရှိနိုင်ပါသည်
- ကောင်းကျိုးများမှာ စားဝတ်နေရေးများ ပြေလည်မည့် အခြေအနေများလည်း ရှိနိုင်ပါသည်

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09666758[illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

- [illegible]
- [illegible]
- [illegible]
- [illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- ဦး[illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- [illegible]

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- C.H.W. [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- [illegible] 09.780769945

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09970828149

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

[illegible]

(လက်မှတ်)

အမည်- [illegible]
အလုပ်အကိုင်- [illegible]
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်- 09, 895708765

စက်ရုံလည်ပတ်ခြင်းလုပ်ငန်းစဉ်များအပေါ်အကြံပြုဆွေးနွေးချက်များ

Da Hua [illegible] caustic soda [illegible]
caustic soda [illegible]
Da Hua [illegible]
[illegible]

(လက်မှတ်)

အမည်-
အလုပ်အကိုင်-
ဆက်သွယ်ရန်လိပ်စာ/ဖုန်းနံပါတ်-

KEY DISCUSSIONS DURING PUBLIC MEETING FOR FIRST PUBLIC MEETING

Da Hua (Myanmar) ကုမ္ပဏီလိမိတက် Polyester Staple Fiber ထုတ်လုပ်ရေးလုပ်ငန်း
နယ်ပယ်သတ်မှတ်ခြင်းဆိုင်ရာလူထုတွေ့ဆုံပွဲအကြံပြုဆွေးနွေးချက်များ

နေ့ရက် - ၁၉.၆.၂၀၂၂ **နေရာ - မြောင်းတကာစက်မှုဇုန်ကော်မတီရုံးခန်းမ၊ မြောင်းတကာမြို့နယ်။**

Mr. Xu Jianjun (မန်နေဂျင်းဒါရိုက်တာ၊ Da Hua (Myanmar))

ကြွရောက်လာသော ဌာနဆိုင်ရာမှ လူကြီးမင်းများ၊ ရပ်ရွာလူကြီးများအားလုံးကို ကျေးဇူးတင်ရှိကြောင်း၊ ကိုဗစ် ကာလအတွင်းဖြစ်သဖြင့် ကိုဗစ်စည်းကမ်းများနှင့်အညီ ဆွေးနွေးပွဲအားကျင်းပ ရခြင်းဖြစ်ကြောင်း ပြောကြားခဲ့ ပါသည်။

ဦးသန်းရှိန် (ဒုတိယစက်ရုံမှူး၊ ရန်ကုန်ခရောင်းစက်ရုံ)

ကြွရောက်လာကြသော လူကြီးမင်းများအား မိတ်ဆက်ပြောကြားပြီး စက်မှုမြို့တော်အဆင့်မဖြစ်လိုက်ဘဲ စက် မှု ဇုန်ဖြစ်လာကြောင်း၊ စက်မှုဇုန်ကထွက်ရှိလာသောဓာတ်ငွေ့များသည်အနီးအနားကျေးရွာများအားထိခိုက်နိုင် သော်လည်း သက်ဆိုင်ရာဌာနများမှလိုက်လံစစ်ဆေးမှုများ ဆောင်ရွက်သောကြောင့် ဓာတ်ငွေ့များ နည်းပါး လာကြောင်း နှင့် လူထုနှင့်ဆွေးနွေးပြီး သဘာဝပတ်ဝန်းကျင်အားထိန်းသိမ်းကြရန် ပြောကြားခဲ့ပါသည်။

Dr.ကျော်စွာတင့် (Ever Green Tech)

သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်း ရေးအဖွဲ့၏ လုပ်ငန်းတာဝန်များ၊ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းလုပ်ဆောင်ရခြင်း း၏ရည်ရွယ်ချက်၊စက်ရုံမှထုတ်လုပ်သောထုတ်ကုန်အမျိုးအစားများ၊စီမံကိန်းလုပ်ငန်းစဉ်အဆင့်ဆင့်၊စီမံကိန်း လုပ် ငန်းစဉ်များကြောင့် ဖြစ်ပေါ်နိုင်သည့်ပတ်ဝန်းကျင်ထိခိုက်မှုများ၊အနီးအနားပတ်ဝန်းကျင်ရှိဒေသခံပြည်သူ များနှင့်လည်း သဟဇာတဖြစ်အောင် ဆောင်ရွက်ရန် လိုအပ်ကြောင်း နှင့် စီမံကိန်းဆောင်ရွက်ရင်းသဘာဝပတ် ဝန်းကျင်ထိန်းသိမ်းရေးလုပ်ငန်းများဆောင်ရွက်ခြင်းဖြင့်ကောင်းမွန်သောစီမံကိန်းတစ်ခုဖြစ်စေလိုကြောင်းပြော ကြားခဲ့ပါသည်။

ဦးကျော်ဌေး(မြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မော်ဘီမြို့နယ်)

စက်မှုဇုန်အတွင်းရှိ ပျက်စီးမှုများအားပူးပေါင်း၍ ကူညီဆောင်ရွက်ပေးစေလိုကြောင်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှု နည်း ပါးအောင် ဆောင်ရွက်သည့်စက်ရုံများနည်းပါးကြောင်း၊စက်မှုဇုန်အတွင်းရှိစက်ရုံများအားလုံးတစ်ပြေးညီ ဆောင် ရွက်ပါက ဆိုးကျိုးများခံရနိုင်မည်မဟုတ်ကြောင်း၊ အလုပ်အကိုင်အခွင့်အလမ်းများ ဆောင်ရွက်ပေး စေ

လို ကြောင်း၊ စက်မှုဇုန်အတွင်းမှ ထွက်ရှိသော ရေဆိုးများ ကံကလေးကျေးရွာအတွင်း ရောက်ရှိကြောင်း၊ ရေ နှင့်ပတ်သတ် ၍ အထူးအလေးထားစေလိုကြောင်းနှင့် စက်ရုံများမှ CSR ကိစ္စများ တွင်ကူညီဆောင်ရွက်ပေးစေ လိုကြောင်း ဆွေးနွေးပြောကြားခဲ့ပါသည်။

Dr.ကျော်စွာတင့် (Ever Green Tech)

အလုပ်အကိုင်အခွင့်အလမ်းရရှိရေးသည် အရေးကြီးသောအချက်တစ်ချက်ဖြစ်ကြောင်း၊ ကုမ္ပဏီများမှလည်း အလုပ် အကိုင်ခန့်အပ်ရာတွင် စက်ရုံဝန်ထမ်းများ၏ ၃၀ ရာခိုင်နှုန်း သို့မဟုတ် ၅၀ရာခိုင်နှုန်းအား ဒေသခံပြည် သူ များအား ခန့်အပ်စေရေးမူဝါဒများချမှတ်ထားရန် လိုအပ်ကြောင်း၊ပြောကြားခဲ့ပါသည်။

ဦးကျော်ဆန်းနိုင် (ညွှန်ကြားရေးမှူး၊ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ ရန်ကုန်တိုင်းဒေသကြီး)

ပြည်သူလူထုနှင့် တိုင်ပင်ဆွေးနွေးသည့်စနစ်ထည့်သွင်းဆောင်ရွက်ရခြင်းဖြစ်ကြောင်း၊တစ်ဖက်တွင်လည်းအနီး အနားပတ်ဝန်းကျင်ရှိပြည်သူများ၏ သဘောတူညီမှုရယူရကြောင်း၊သက်ဆိုင်ရာဒေသခံတွေရဲ့စိုးရိမ်ပူပန်မှုများ အား ညှိနှိုင်းဆောင်ရွက်ပေးရန် လာရောက်ရခြင်းဖြစ်ကြောင်း၊ ပြည်သူလူထုမှလည်းပွင့်ပွင့်လင်းလင်းဆွေးနွေး အကြံပြု စေလိုကြောင်း၊ စက်ရုံများမှလည်းအကောင်အထည်ဖော်ဆောင်ရွက်ပေးစေလိုကြောင်း၊ပြည်သူလူထု မှဆွေးနွေးပေးခြင်းဖြင့်ညှိနှိုင်းဆောင်ရွက်ရာတွင်ပိုမိုလွယ်ကူကြောင်း၊စက်မှုဇုန်ကော်မတီရှိတာဝန်ခံများမှဒေ သခံပြည်သူ များအတွက်လုပ်ဆောင်ပေးစေလိုကြောင်း၊စီမံကိန်းနဲ့ပတ်သတ်၍ဒေသခံများ၏အကြံပြုဆွေးနွေး ချက်များသည် အရေးကြီးကြောင်း ပြောကြားခဲ့ပါသည်။

Dr.ကျော်စွာတင့် (Ever Green Tech)

အကြံပြုဆွေးနွေးလိုသည့်အချက်များအား အကြံပြုစာတွင် ထည့်သွင်းရေးပေးစေလိုကြောင်း၊ အကြံပြုစာ များအား အစည်းအဝေးပွဲအပြီးတွင် ပြန်လည်ပေးအပ်သွားပါရန်နှင့်အကြံပြုစာတွင်အမည်နှင့်ဆက်သွယ်ရမည့် ဖုန်းနံပါတ်များရေးသားပေးကြပါရန်မေတ္တာရပ်ခံပြောကြားခဲ့ပါသည်။ဆက်လက်၍ကြွရောက်လာကြသောလူ ကြီးမင်းများနှင့် ဝိုင်းဝန်းဆွေးနွေးပေးကြသည့်အတွက် အထူးပင် ကျေးဇူးတင်ရှိပါကြောင်းပြောကြားခဲ့ပါသည်။

PPT Presentation during Public Meeting for Scoping Proposal

EVER GREEN TECH

Da Hua (Myanmar) Polyester Staple Fibers လုပ်ငန်းအတွက်
ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်လေ့လာခြင်း
(Environmental Impact Assessment – EIA) ဆောင်ရွက်နိုင်ရန်
ထိခိုက်မှုနှုန်းခန့်မှန်းသတ်မှတ်ခြင်း (Scoping Report) ဆိုင်ရာ
လူထုတွေ့ဆုံပွဲ

တင်ပြသူ
ဒေါက်တာမော့ကွာတင်
အဖဲကအဖြဲ့အစည်း EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

Date – 10.9.2021 (Friday)

EVER GREEN TECH

ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ဆောင်မည့်တတိယအဖွဲ့အစည်းမိတ်ဆက်

- Ever Green Tech Environmental Services Co., Ltd.
- ကုမ္ပဏီများမှတ်ပုံတင်ရေးဦးစီးဌာနမှတ်ပုံတင်အမှတ် ၃၃၄၄/ ၂၀၁၅-၂၀၁၆ (ရန်က)
- သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနတတိယအဖွဲ့အစည်းမှတ်ပုံတင်အမှတ် ၀၇၄
- ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းပေါင်း (၅၂) ခုကျော်လုပ်ဆောင်ခဲ့ပြီးဖြစ်

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

ပါဝင်သည့်အကြံပေးပညာရှင်များ

(၁) ဒေါက်တာကျော်စွာတင့်	Ph.D. (Mining)	(၈) ကိုဝင်းမိုးလွင်	M.Sc. (Zoology)
(၂) ဒေါက်တာသိန်းဆွန်း	Ph.D. (Metallurgy)	(၉) မနန္ဒာနွယ်	B.E. (IT); M.S. in EIA/EMS
(၃) ဒေါက်တာကျော်မိုး	Ph.D. (Metallurgy)	(၁၀) မသဇင်ထွေး	B.E. (IT); M.S. in EIA/EMS
(၄) ဦးမင်းအောင်	M.Sc. (Chemistry)	(၁၁) ဒေါက်တာဝင်းဆွေ	Ph.D. (Geography)
(၅) မနင်းအွာလီ	B.E. (Chemical)	(၁၂) ဒေါက်တာတင်အောင်မြင့်	Ph.D. (Geology)
(၆) ဒေါက်တာညွှန့်လွင်	Ph.D. (Zoology)	(၁၃) ဒေါက်တာခွန်အောင်	M.B.B.S (Ygn)
(၇) မဟေမာန်နင်း	M.Sc. (Botany)	(၁၄) မမေသော်တေ	M.E. (Civil)

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

ဆွေးနွေးတင်ပြသွားမည့်အကြောင်းအရာများ

(၁) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ဆောင်ရသည့်ရည်ရွယ်ချက်၊
(၂) စီမံကိန်းလုပ်ငန်းစဉ်အဆင့်ဆင့်၊
(၃) စီမံကိန်းလုပ်ငန်းစဉ်များကြောင့်ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ
(၄) ထိခိုက်မှုနှုန်းခန့်မှန်းသတ်မှတ်ခြင်း
(၅) လူထုပူးပေါင်းပါဝင်ခြင်းလုပ်ငန်းစဉ်များ
(၆) နိဂုံး

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

(၁) ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းလုပ်ဆောင်ရသည့်ရည်ရွယ်ချက်

- စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် ထိခိုက်မှုများနှင့် လျော့နည်းသက်သာစေရန် လုပ်ဆောင်ရမည့် နည်းလမ်းများကို ရှာဖွေပေးရန်

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

သက်ရောက်မှုနှုန်းခန့်မှန်းဆတွင်း ကွင်းဆင်းစိုင်းစာများများ



EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

သက်ရောက်မှုခန့်မှန်းခြင်းအတွင်း ကွင်းဆင်းတိုင်းတာမှုများ

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

သက်ရောက်မှုခန့်မှန်းခြင်းအတွင်း ကွင်းဆင်းတိုင်းတာမှုများ

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

စက်ရုံအတွင်း ကွင်းဆင်းလေ့လာမှုများ

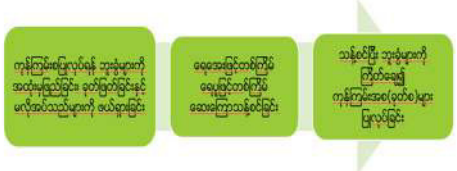
EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

(၂) Polyester Fiber ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

EVER GREEN TECH

(၂) Polyester Fiber ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

ကုန်ကြမ်းထုတ်လုပ်ပုံ



EVER GREEN TECH ENVIRONMENTAL SERVICES CO., LTD.

EVER GREEN TECH

Polyester Fiber ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

ကုန်ချော့ရရှိပုံ

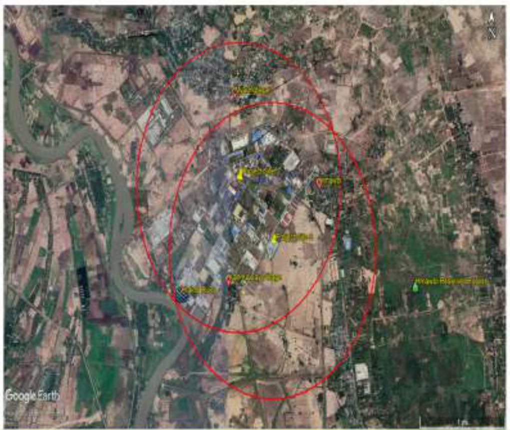
EVER GREEN TECH ENVIRONMENTAL SERVICES CO., LTD.

သက်ရောက်မှုရှိနိုင်သည့်အနီးအနားပတ်ဝန်းကျင်

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

သက်ရောက်မှုရှိနိုင်သည့်အနီးအနားပတ်ဝန်းကျင်

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.



EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

ထိခိုက်မှုနယ်နိမိတ်သတ်မှတ်ခြင်း

- လှိုင်မြစ်
- မှော်ဘီကာကွယ်တော
- အနီးရှိစိုက်ခင်းများနှင့်လူနေအိမ်များ
- အနီးအနားကျေးရွာ(မှော်ဘီ၊ ကန်ကလေး၊ မြောင်းတကာ) ရှိ လူနေအိမ်များ
- ဇိနမာန်အောင်ဘုရား၊ ချမ်းအေးရိပ်သာ ဘုန်းတော်ကြီးကျောင်း

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

ပတ်ဝန်းကျင်အပေါ်သက်ရောက်မှု

- လေထုညစ်ညမ်းခြင်း (ကျောက်မီးသွေးဘွိုင်လာ၊ ယာဉ်သွားလာမှု)
- မြေထုညစ်ညမ်းခြင်း (လောင်စာများစုပုံခြင်း နှင့် စွန့်ပစ်ပစ္စည်းများ)
- ရေထုညစ်ညမ်းခြင်း (စွန့်ပစ်ရေ နှင့် စွန့်ပစ်ပစ္စည်းများ)

သက်ရောက်မှုရှိနိုင်သည့်အနီးအနားပတ်ဝန်းကျင်

- အနီးရှိစိုက်ခင်းများ၊ ချောင်းများ
- အနီးအနားကျေးရွာ(မှော်ဘီ၊ ကန်ကလေး၊ မြောင်းတကာ) ရှိ လူနေအိမ်များ

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

လူထုပူးပေါင်းပါဝင်မှုလုပ်ငန်းစဉ်များ

- လူနေရပ်ကွက်များအတွင်းသို့ ကွင်းဆင်းဆောင်ရွက်ခြင်း
- လူထုတွေ့ဆုံပွဲများပြုလုပ်ခြင်း

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

PPT Presentation during Public Meeting for EIA Study

၁။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းရည်ရွယ်ချက်

EVER GREEN TECH

(၁) ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းလုပ်ဆောင်ရသည့်ရည်ရွယ်ချက်

- စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် ထိခိုက်မှုများနှင့် လျော့နည်းသက်သာစေရန် လုပ်ဆောင်ရမည့် နည်းလမ်းများကို ရှာဖွေပေးရန်
- လျော့နည်းသက်သာစေရန်လုပ်ဆောင်ပြီး ဆက်လက်စောင့်ကြည့် လေ့လာမည့်အစီအစဉ်များနှင့် တာဝန်ဝတ္တရားများ သတ်မှတ်ပေးရန်
- ပတ်ဝန်းကျင်ကာကွယ်စောင့်ရှောက်ရာတွင် ဒေသခံပြည်သူလူထု ပူးပေါင်းပါဝင်မှုရရှိစေရန်

၂။ စီမံကိန်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

Polyester Staple Fiber (PSF) ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

ကုန်ကြမ်းအဆင့်

အဆင့် ၁ : ပလတ်စတစ်ဘူးခွံများမှ တံဆိပ်များခွာခြင်းနှင့် မလိုအပ်သော အရာဝတ္ထုများဖယ်ထုတ်ခြင်း။

အဆင့် ၂ : ပလတ်စတစ်ဘူးခွံများကို ရေနှင့် Caustic Soda အသုံးပြု၍ ဆေးကြောသန့်စင်ခြင်း။

အဆင့် ၃ : ပလတ်စတစ်ဘူးခွံများကို ကြိတ်ချေခြင်းနှင့် ဘူးအဖုံးများကို ခွဲထုတ်ခြင်း

Polyester Staple Fiber (PSF) ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

ကုန်ချောထုတ်လုပ်ခြင်းအဆင့်

အဆင့် ၁ : ကုန်ကြမ်းစက်ရုံမှရရှိသည့် သန့်စင်ကြိတ်ချေပြီးသော ပလတ်စတစ်အပိုင်းအစများကို အပူချိန် 169°C ဖြင့် ဆယ်နာရီကြာ အခြောက်ခံခြင်း။

အဆင့် ၂ : အခြောက်ခံပြီးသည့် ပလတ်စတစ် အပိုင်းအစများကို Spinner တွင်အည်ပျော်စေ၍ တန်ဆက်တည်ရှိသော polymer ကြိုးမျှင်များ ဖြစ်စေရန် ပြုလုပ်ခြင်း။

အဆင့် ၃ : ရရှိလာသောကြိုးမျှင်များကို အေးညှိလိုက် ဆေးခြင်း။

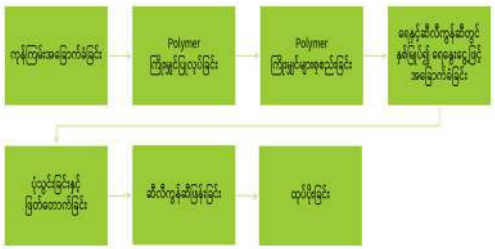
အဆင့် ၄ : ထို polymer ကြိုးမျှင်များကို ပထမဆင့်ရေတွင်နှစ်မြှုပ်ပြီးနောက် ဆီလိမ်းနှစ်ဆီထဲတွင် ထပ်မံနှစ်မြှုပ်ဖြတ်သန်းစေကာ သို့ဝင်လာမှ ရေနွေးငွေ့ဖြင့် အခြောက်ခံခြင်း။

အဆင့် ၅ : လိုအပ်သောအရှည်အစားအလိုက် ကြိုးမျှင်များကို ပုံသွင်းဖြတ်ထုတ်ခြင်း။

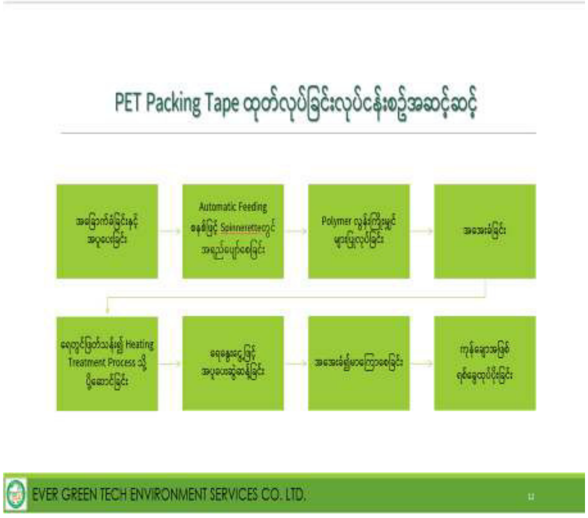
အဆင့် ၆ : ကြိုးမျှင်များချောမွေ့ပျော့ပြောင်းစေရန် ဆီလိမ်းနှစ်ဆီဖြင့် ဖြန်းပေးခြင်း။

အဆင့် ၇ : ကုန်ချောထုပ်ပိုးခြင်း။

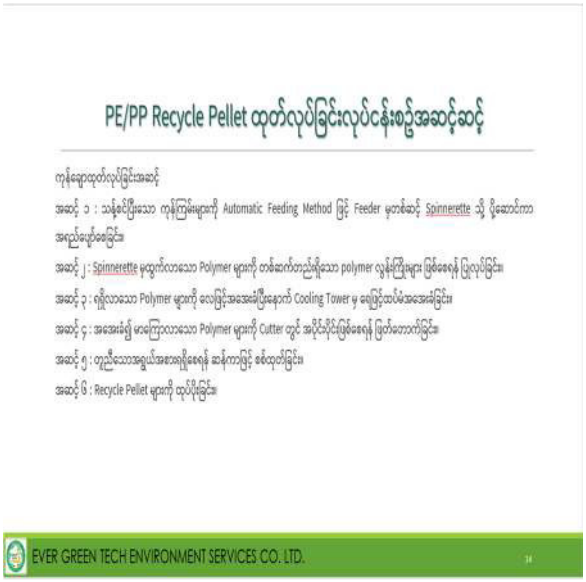
Polyester Staple Fiber (PSF) ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

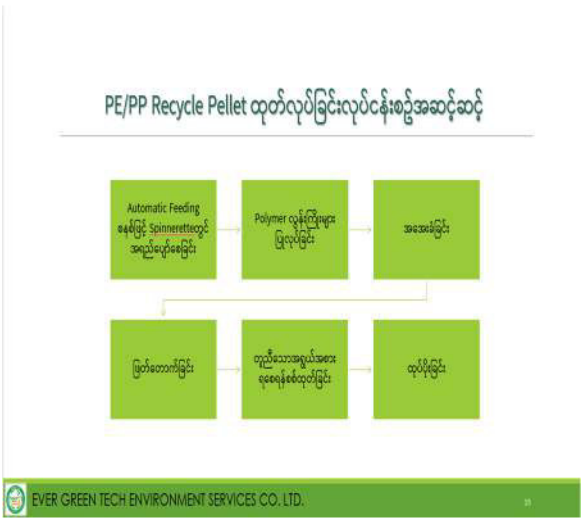



PET Packing Tape ထုတ်လုပ်ခြင်းလုပ်ငန်းစဥ်အဆင့်ဆင့်
အဆင့် ၁ : ကုန်ကြမ်းစက်ရုံမှရရှိသည့် သန့်စင်ကြိတ်ချေပြီးသော ပလတ်စတစ်ဘူးအပိုင်းအစများကို အခြောက်ခံ၍အပူပေးခြင်း။
အဆင့် ၂ : အခြောက်ခံပြီးသည့် အပိုင်းအစများကို Spinnerette သို့ automatic feeding process ဖြင့်ထည့်သွင်း၍ အရည်ပျော်စေခြင်း။
အဆင့် ၃ : Spinnerette မှထွက်လာသော Polymer များကို တစ်ဆက်တည်းရှိသော polymer လွန်းကြိုးမျှင်များ ဖြစ်စေရန် ပြုလုပ်ခြင်း။
အဆင့် ၄ : ရရှိလာသောအမျှင်များကို လေဖြင့်အအေးခံပြီးနောက် Cooling Tower မှ ရေဖြင့်ထပ်မံအအေးခံခြင်း။
အဆင့် ၅ : အအေးခံပြီးသော polymer လွန်းကြိုးမျှင်များကို ရေတွင်နစ်မြှုပ်ဖြတ်သန်းစေ၍ Heating Treatment Process သို့ ပို့ဆောင်ခြင်း။
အဆင့် ၆ : ဘွိုင်လာမှ ရေနွေးငွေ့ဖြင့် အခြောက်ခံ၍ ဆွဲဆန့်ခြင်း။
အဆင့် ၇ : ဆွဲဆန့်အခြောက်ခံပြီးသော Polymer ကြိုးများကို အအေးခံ၍မာကျောစေခြင်း။
အဆင့် ၈ : ရစ်ခွေ၍ကုန်ချောအဖြစ်ထုပ်ပိုးခြင်း။
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


PET Packing Tape ထုတ်လုပ်ခြင်းလုပ်ငန်းစဥ်အဆင့်ဆင့်
အခြောက်ခံခြင်းနှင့် အပူပေးခြင်း
Automatic Feeding စနစ်ဖြင့် Spinnerette တွင် အရည်ပျော်စေခြင်း
Polymer လွန်းကြိုးမျှင်များပြုလုပ်ခြင်း
အအေးခံခြင်း
ရေတွင်ဖြတ်သန်း၍ Heating Treatment Process သို့ ပို့ဆောင်ခြင်း
ရေနွေးငွေ့ဖြင့် အပူပေးဆွဲဆန့်ခြင်း
အအေးခံ၍မာကျောစေခြင်း
ကုန်ချောအဖြစ် ရစ်ခွေထုပ်ပိုးခြင်း
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


PE/PP Recycle Pellet ထုတ်လုပ်ခြင်းလုပ်ငန်းစဥ်အဆင့်ဆင့်
ကုန်ကြမ်းပြင်ဆင်ခြင်းအဆင့်
အဆင့် ၁ : ကြိတ်ချေပြီးသော ပလတ်စတစ်ဘူးအခွံများကို သန့်စင်စေရန် ရေဖြင့်ဆေးကြောပြီးနောက် Caustic Soda ဖြင့် ထပ်မံဆေးကြောခြင်း။
အဆင့် ၂ : ဘွိုင်လာမှရရှိသည့် ပူနွေးသောရေဖြင့် Caustic Soda များကို အရည်ပျော်စေသောနည်းဖြင့် ဆေးကြောဖယ်ရှားခြင်း။
ကြိတ်ချေပြီးသော ဘူးအခွံများကို ဆေးကြောခြင်း
Caustic Soda များကို ဆေးကြောခြင်း
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


PE/PP Recycle Pellet ထုတ်လုပ်ခြင်းလုပ်ငန်းစဥ်အဆင့်ဆင့်
ကုန်ချောထုတ်လုပ်ခြင်းအဆင့်
အဆင့် ၁ : သန့်စင်ပြီးသော ကုန်ကြမ်းများကို Automatic Feeding Method ဖြင့် Feeder မှတစ်ဆင့် Spinnerette သို့ ပို့ဆောင်ကာ အရည်ပျော်စေခြင်း။
အဆင့် ၂ : Spinnerette မှထွက်လာသော Polymer များကို တစ်ဆက်တည်းရှိသော polymer လွန်းကြိုးများ ဖြစ်စေရန် ပြုလုပ်ခြင်း။
အဆင့် ၃ : ရရှိလာသော Polymer များကို လေဖြင့်အအေးခံပြီးနောက် Cooling Tower မှ ရေဖြင့်ထပ်မံအအေးခံခြင်း။
အဆင့် ၄ : အအေးခံ၍ မာကျောလာသော Polymer များကို Cutter တွင် အပိုင်းပိုင်းဖြစ်စေရန် ဖြတ်တောက်ခြင်း။
အဆင့် ၅ : တူညီသောအရွယ်အစားရရှိစေရန် ဆန်ကာဖြင့် စစ်ထုတ်ခြင်း။
အဆင့် ၆ : Recycle Pellet များကို ထုပ်ပိုးခြင်း။
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


PE/PP Recycle Pellet ထုတ်လုပ်ခြင်းလုပ်ငန်းစဥ်အဆင့်ဆင့်
Automatic Feeding စနစ်ဖြင့် Spinnerette တွင် အရည်ပျော်စေခြင်း
Polymer လွန်းကြိုးများ ပြုလုပ်ခြင်း
အအေးခံခြင်း
ဖြတ်တောက်ခြင်း
တူညီသောအရွယ်အစား ရစေရန်စစ်ထုတ်ခြင်း
ထုပ်ပိုးခြင်း
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


၃။ စီမံကိန်းလုပ်ငန်းစဥ်များကြောင့်ပတ်ဝန်းကျင်ထိခိုက်မှုများ
နှင့် ထိခိုက်မှုရှိနိုင်သည့်နေရာများ

သက်ရောက်မှုရှိနိုင်သည့်အနီးအနားပတ်ဝန်းကျင် (စက်ရုံ ၁)

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

သက်ရောက်မှုရှိနိုင်သည့်အနီးအနားပတ်ဝန်းကျင် (စက်ရုံ ၂)

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

EVER GREEN TECH

ထိခိုက်မှုနယ်နိမိတ်သတ်မှတ်ခြင်း

- လိုင်မြစ်
- မော်ဘီကာကွယ်တော
- အနီးအနားကျေးရွာ(မော်ဘီ၊ ကန်ကလေး၊ မြောင်းတာကာ) ရှိ လူနေအိမ်များ
- ဂိန်မန်အောင်ဘုရား ချမ်းအေရိပ်သာ ဘုန်းတော်ကြီးကျောင်း

ဇီဝမျိုးစုံမျိုးကွဲ

လူမှုဗီဇပွား

ယဉ်ကျေးမှု

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

EVER GREEN TECH

ဇီဝမျိုးစုံမျိုးကွဲများ ကွင်းဆင်းလေ့လာခြင်း

စီမံကိန်းဧရိယာသည် အဓိကဇီဝမျိုးစုံမျိုးကွဲဧရိယာ (KBA) နှင့် သဘာဝထိန်းသိမ်းရေး နယ်မြေ(PA)များနှင့် ကွာဝေးပါသည်။ ဇီဝမျိုးစုံမျိုးကွဲများအား စီမံကိန်းအနီးနေရာ (၇)နေရာမှ ကောက်ယူခဲ့ရာ မျိုးဘုံးရန် နီးကပ်နေသော မျိုးစိတ်များ မတွေ့ရှိရပါ။

EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

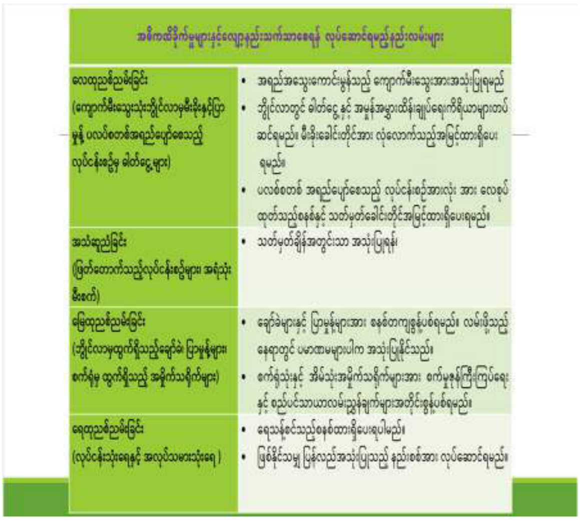
ဇီဝမျိုးစုံမျိုးကွဲများကွင်းဆင်းလေ့လာသည့်တည်နေရာများ


ရေအရည်အသွေး တိုင်းတာမှုရလဒ်များ
ရေနမူနာများအားဖြင့်နေရာကောက်ယူခဲ့ရာတွင် တိုင်းတာမှုရလဒ်များအရ ရေနမူနာ၁ နှင့် ၂ သည် စက်မှုဇုန်အတွင်းရှိ ချောင်းများနှင့်ရေနုတ်မြောင်း များမှ ကောက်ယူခဲ့သည့်အတွက် BOD နှင့် COD ပါဝင်မှုသည် မြင့်မားနေသည်ကို တွေ့ရှိ၍ ရေနမူနာ ၁တွင် အနည်ပါဝင်မှုများသည်ကိုတွေ့ရှိရပါသည်။ ရေနမူနာ ၅သည် pH ပါဝင်မှုမြင့်မားနေသည်ကိုတွေ့ရပါသည်။ အခြားရေနမူနာစမ်းသပ်ချက်များသည် သတ်မှတ်ထားသော စံချိန်စံညွှန်းထက်နည်းပါးသည်ကိုတွေ့ရပါသည်။


လေထုအရည်အသွေးတိုင်းတာခြင်း (စက်ရုံ ၁)
EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.
24


လေထုအရည်အသွေးတိုင်းတာခြင်း (စက်ရုံ ၂)
PM 10 နှင့် PM 2.5
EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.
25


စက်ရုံအတွင်း ကွင်းဆင်းလေ့လာမှုများ
EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.
26


အဓိကထိခိုက်မှုများနှင့်လျော့နည်းသက်သာစေရန် လုပ်ဆောင်ရမည့်နည်းလမ်းများ
လေထုညစ်ညမ်းခြင်း
အသံဆူညံခြင်း
မြေထုညစ်ညမ်းခြင်း
ရေထုညစ်ညမ်းခြင်း


သက်ရောက်နိုင်မှုရှိသည့် အနီးပတ်ဝန်းကျင်များ
Da Hua
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

လူထုပူးပေါင်းပါဝင်ခြင်းလုပ်ငန်းစဥ်များ

- လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်း
- လူထုတွေ့ဆုံပွဲများပြုလုပ်ခြင်း

စစ်တမ်းကောက်ယူခဲ့သော စီမံကိန်းအနီးရှိကျေးရွာများ (၃ကီလိုမီတာအတွင်း)

- ကံကလေးကျေးရွာ
- ကုလားကုန်းကျေးရွာ (အရှေ့နှင့်အနောက်)
- ကုလားကုန်းကျေးရွာ (စက်မှုဇုန်အနီး)
- မြောင်းတကာရွာ (စက်မှုဇုန်အနီး)
- မြောင်းတကာစက်မှုဇုန်အတွင်းရှိလူနေအိမ်အချို့

လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်း

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်း

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်း

EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.

လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်းမှ တွေ့ရှိချက်များ

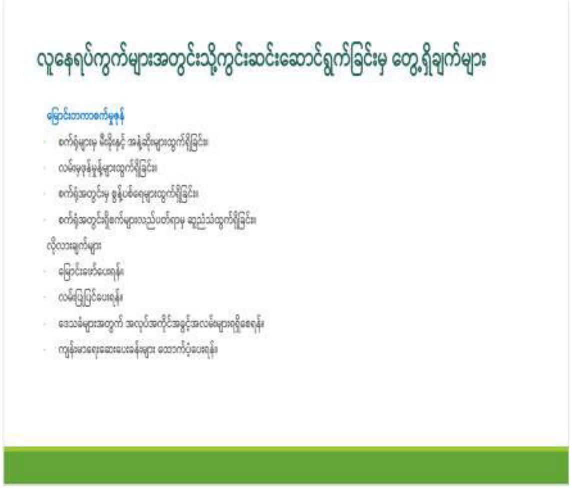
ကံကလေးကျေးရွာ
- အနီးအနားရှိစက်ရုံများမှ အနံ့ဆိုးခြင်းနှင့် မီးခိုးများထွက်ခြင်း
- ကျေးရွာအတွင်းရှိ ရေတွင်းများ၌ အနည်ပါခြင်းနှင့်အရောင်ရှိခြင်း

လိုလားချက်များ
- ကျန်းမာရေးဆောက်ပံ့ပေးရန်
- လမ်းပြုပြင်ပေးရန်
- ကျေးရွာအတွင်းရှိမြောင်းဖော်ပေးရန်

ကုလားကုန်းကျေးရွာ (အရှေ့နှင့်အနောက်)
- အနီးအနားရှိစက်ရုံမှ အနံ့ဆိုးခြင်းနှင့် မီးခိုးများထွက်ခြင်း
- အနီးအနားရှိစက်ရုံမှ ဆူညံသံများ

လိုလားချက်များ
- ဒေသခံများအတွက် အလုပ်အကိုင်အခွင့်အလမ်းများရရှိစေရန်
- ရပ်ရွာဖွံ့ဖြိုးတိုးတက်စေရန်အတွက် ရန်ပုံငွေများထောက်ပံ့ပေးရန်
- လမ်းပြုပြင်ပေးရန်
- ကျေးရွာအတွင်းအမှိုက်သိမ်းစနစ်များထားရှိပေးရန်


လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်းမှ တွေ့ရှိချက်များ
လိုလားချက်များ
လိုလားချက်များ


လူနေရပ်ကွက်များအတွင်းသို့ကွင်းဆင်းဆောင်ရွက်ခြင်းမှ တွေ့ရှိချက်များ
လိုလားချက်များ


EVER GREEN TECH
ဆင့်ပွားသက်ရောက်မှုများ
လေထုညစ်ညမ်းခြင်း (စက်ရုံများအားလုံးထိန်းချုပ်ရန်လိုအပ်)
အသံဆူညံခြင်း (အချိန်သတ်မှတ်ချက်ဖြင့် သတ်မှတ်လုပ်ဆောင်ရန်လိုအပ်)
ရေထုညစ်ညမ်းခြင်း (သန့်စင်စနစ်ရေထုတ်လွှတ်မှုရှိသည့်စက်ရုံတိုင်းတပ်ဆင်ရန်နှင့် ဘုံရေသန့်စင်စနစ် ပြုလုပ်ရန်)
EVER GREEN TECH ENVIRONMENT SERVICES CO. LTD.


EVER GREEN TECH
နိဂုံး
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် စောင့်ကြည့်လေ့လာရေးအစီအစဉ်များ ပုံမှန်လုပ်ဆောင်သွားရန်
လူမှုဖွံ့ဖြိုးရေးရံပုံငွေ သတ်မှတ်သုံးစွဲရန်
စဉ်ဆက်မပြတ်ဖွံ့ဖြိုးသည့် စီမံကိန်းများ ဖြစ်ရန်လိုအပ်
EVER GREEN TECH ENVIRONMENTAL SERVICES CO. LTD.

APPENDIX E

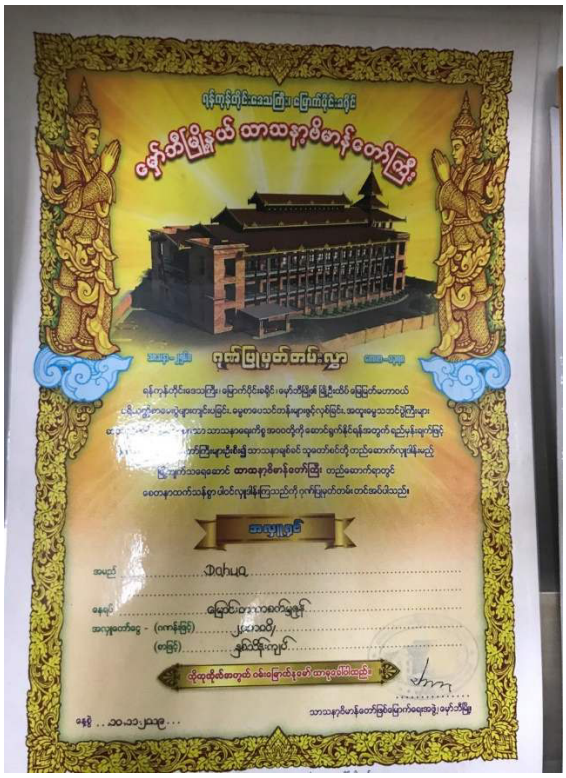
CSR Activities


"ဂုဏ်ပြုမှတ်တမ်းလွှာ"
DA HUA


"ဂုဏ်ပြုမှတ်တမ်းလွှာ"
Da Hua


ဂုဏ်ပြုမှတ်တမ်းလွှာ


ဂုဏ်ပြုမှတ်တမ်းလွှာ
Coronavirus Disease 2019 (COVID-19)
Mr. Xu Jian Jun Da
"Huo Factory"


ဂုဏ်ပြုမှတ်တမ်းလွှာ


"ဂုဏ်ပြုမှတ်တမ်းလွှာ"


ဂုဏ်ပြုမှတ်တမ်းလွှာ


ဂုဏ်ပြုမှတ်တမ်းလွှာ


အခြေခံပညာမူလတန်းကျောင်း (အင်ကြင်းပင်)
ရန်ကုန်တိုင်းဒေသကြီးမော်ဘီမြို့နယ်
အ.ဝ.က(အင်ကြင်းပင်)
မော်ဘီမြို့နယ်
ဂုဏ်ပြုမှတ်တမ်းလွှာ
DaHua စက်ရုံ မိသားစုအား


အုပ်ချုပ်ရေးဦးစီးဌာန
INSTITUTE OF DEVELOPMENT ADMINISTRATION
အုပ်ချုပ်ရေးပညာဖွံ့ဖြိုးမှုသင်တန်းကျောင်း
မြို့နယ်အုပ်ချုပ်ရေးမှူးများ
လုပ်ငန်းစွမ်းဆောင်ရည်မြင့်မားရေးသင်တန်း
အမှတ်စဉ် (၁/၂၀၂၀)
အမှတ်တရလက်ဆောင်
၂၈-၁-၂၀၂၀