Environmental Impact Assessment (EIA)

Myanma Shwe Nagar Agricultural Group Co., Ltd

Fertilizers Repackaging Factory

Prepared by

HRD Environmental Training and Services Co., Ltd.

Environmental Impact Assessment (EIA)

For

Fertilizer Repackaging Factory

(Myanma Shwe Nagar Agricultural Group Co., Ltd)

Prepared by

HRD Environmental Training and Services Company Limited

(June, 2022)

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ဝန်ခံကတိပြုလွှာ

(က) ဤပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းအစီအစဉ်ကို တိကျခိုင်မာမှုများနှင့် ပြည့်စုံစွာ ဆောင်ရွက် ထားပါသည်။

(ခ) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများအပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာလိုက်နာ၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီအစဉ်များကို ရေးဆွဲထား ပါသည်။

(ဂ) စီမံကိန်းသည် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီအစဉ်ပါ ကတိကဝတ်၊ ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများနှင့် အစီအစဉ်များကို အပြည့်အဝ အစဉ်အမြဲ လိုက်နာ ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြုပါသည်။

(ဃ) လုပ်ငန်းလည်ပတ်ဆောင်ရွက်နေသည့် ကာလအတွင်း အတည်ပြုထားသည့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်အား တိုးတက်နေသည့် နည်းပညာများ၊ စနစ်များနှင့် လုပ်ငန်းလိုအပ်ချက် အပေါ်မူတည်၍ ပိုမိုကောင်းမွန်သည့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် ဖြစ်စေရန် အတွက် ပြင်ဆင်ဖြည့်စွက်ရန် ညွှန်ကြားချက်များရှိလာပါက လိုက်နာဆောင်ရွက်မည် ဖြစ်ကြောင်းနှင့် လုပ်ငန်းဆောင်ရွက်သူမှ ပြင်ဆင်ဖြည့်စွက်ရန်လိုပါက တင်ပြ အတည် ပြုချက် ရယူ၍ ပြင်ဆင် ဆောင်ရွက်မည်ဖြစ်ပါသည်။

(င) စီမံကိန်းပိတ်သိမ်းချိန်တွင်လည်း ပတ်ဝန်းကျင်နှင့်လူမှုဝန်းကျင်အားထိခိုက်မှုအနည်းဆုံး ဖြစ်စေရန် စီမံဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။

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အကြံပေးအဖွဲ့အစည်း၏ဝန်ခံချက်

ဤပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းအစီအစဉ်သည် တိကျခိုင်မာ၍ ပြည့်စုံ မှန်ကန်ကြောင်းနှင့် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာ လိုက်နာ၍ မိမိတို့အကြံပေးအဖွဲ့အစည်း၏ လုပ်ငန်းဆိုင်ရာ နားလည်တတ်ကျွမ်းမှုနှင့် စုံစမ်းရရှိသော အချက်အလက်များကို အခြေခံ၍ တာဝန်ယူ ဆောင်ရွက်ထားပါကြောင်း ဝန်ခံပါသည်။

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ABBREVIATION & ACRONYMS

AOI	Area of Influence
AP	Affected Person
BOD	Biochemical Oxygen Demand
CBO	Community Based Organizations
CO	Carbon Monoxide
dBA	'A' weighted equivalent decibel
DDC	District Development Committee
DBO	Design, Build and Operate
EA	Environmental Assessment
ECC	Environmental Clearance Certificates
ED	Executive Director
EHSM	Environment health and safety manager
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMMP	environmental management and monitoring plan
EPA	Environmental Protection Act
EPM	Environment Protection Measures
EPR	Environmental Protection Rule
ESA	Environmental & Social Assessment
ESMF	Environment & Social Management Framework
EU	Environmental Unit
FSR	Feasibility Study Report
FGD	Focus Group Discussion
GIS	Geographic Information System
GPP	Guidelines for People's Participation
I&AP	Interested & Affected Party
IEE	Initial Environmental Examination
IFC	International Finance Corporation
Km	Kilometer
LGED	Local Government Engineering Department
LGI	Local Government Institutions
LRMP	Land Resource Management Project
MIC	Myanmar Investment Commission
MSNAG	Myanma Shwe Nagar Agricultural Group Co., Ltd
MSNRF	Myanma Shwe Nagar Repackaging Factory
NO2	Nitrogen Dioxid
NEMAP	National Environment Management Action Plan
NGO	Nongovernment Organization
NOC	No-objection-certificate
PAP	Project Affected Peoples
PM	Particulate Matter
PO	Project Office
WHO	World Health Organization

ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်းနှင့် ရောင်းချခြင်းလုပ်ငန်း

အတွက်

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ

အကျဉ်းချုပ်အစီရင်ခံစာ

ဇွန်၊ ၂၀၂၂

မြန်မာ့ရွှေနဂါးအဂရီကာချာရယ်ဂရုကုမ္ပဏီလီမိတက်

၁။ အကျဉ်းချုပ်အစီရင်ခံစာ

၁.၁။ နိဒါန်း

ဤပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာသည် Myanma Shwe Nagar Agricultural Group Co., Ltd. (MSNAG) မှ ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်းအတွက်ဖြစ်ပါသည်။ စီမံကိန်းအဆိုပြုတင်ပြသူ (MSNAG)သည် အဆိုပြု လုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) အစီရင်ခံစာရေးဆွဲဆောင်ရွက်ရန် HRD Environmental Training and Services Co.,ltd နှင့် သဘောတူစာချုပ် ချုပ်ဆိုခဲ့ပါသည်။ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကို ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဆိုင်ရာ လိုက်နာ ဆောင်ရွက်မှု သက်သေခံ လက်မှတ် (ECC) ကိုရရှိရန် ဆုံးဖြတ်ချက်များ ချမှတ်ရာ၌ ဆန်းစစ် လုပ်ဆောင်မှုအတွက် သက်ဆိုင်ရာ မြန်မာနိုင်ငံရှိ တာဝန်ရှိအဖွဲ့အစည်းများကို တင်ပြသွားမည် ဖြစ်ပါသည်။

၁.၂ မူဝါဒနှင့်ကြီးကြပ်ရေးမူဘောင်

စီမံကိန်းကို အမျိုးသားအဆင့်နှင့်ဒေသအဆင့် စံသတ်မှတ်ချက်များ၊ ဥပဒေနှင့် နည်းဥပဒေများ တို့နှင့်အညီ ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA)နှင့် စပ်လျဉ်း၍ ပြည်တွင်းစံချိန် စံညွှန်းများနှင့် ဥပဒေများမှာ-

- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေ (၂၀၁၄)၊
- အမျိုးသားပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်းများ (၂၀၁၅)၊ နှင့်
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း(၂၀၁၅)

ထို့အပြင် အောက်ပါအပြည်ပြည်ဆိုင်ရာစံချိန်စံညွှန်းများကိုလည်း ထည့်သွင်းစဉ်းစားသွားမည် ဖြစ်ပါသည်။

- သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုဘဝရေရှည်ဖွံ့ဖြိုးတိုးတက်ရေးနှင့်ပတ်သတ်၍ အပြည်ပြည် ဆိုင်ရာ ဘဏ္ဍာရေး ကော်ပိုးရေးရှင်း (IFC)၏ လုပ်ဆောင်မှုစံသတ်မှတ်ချက်များ (၂၀၁၂)၊
- အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေး ကော်ပိုးရေးရှင်း (IFC)၏ အထွေထွေပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေး(EHS)လမ်းညွှန်များ (၂၀၀၇)

၁.၃။ စီမံကိန်းအကြောင်းအရာ

Myanma Shwe Nagar Agricultural Group Co., Ltd. (MSNAG) သည် စက်တင်ဘာလ ၂၀၁၆ ခုနှစ်တွင် မှတ်ပုံတင်ထားသော ကုမ္ပဏီတစ်ခုဖြစ်သည်။ (ကုမ္ပဏီမှတ်ပုံတင်အမှတ်- ၁၀၃၀၀၉၉၉၉) အဆိုပြုစီမံကိန်းနေရာသည် တွံတေး-မအူပင်လမ်း၊ တွံတေးတူးမြောင်း ဘေး၊ ကုလားတန်းကျေးရွာ၊ အမှတ် (၁၂၄-က) တွံတေးမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး တွင်တည်ရှိပါသည်။

စီမံကိန်းနှင့်သက်ဆိုင်သည့် အကြောင်းအရာအကျဉ်းဖော်ပြချက်များမှာ အောက်ပါ အတိုင်း ဖြစ်ပါသည်။

စီမံကိန်းအကြောင်းအရာဖော်ပြချက်များ	
စီမံကိန်းအဆိုပြုသူ	Myanma Shwe Nagar Agricultural Group Co., Ltd
လုပ်ငန်းအမျိုးအစား	ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်း
စီမံကိန်းတည်နေရာ	အမှတ် (၁၂၄-က)၊ ကုလားတန်းကျေးရွာ၊ တွံတေး-မအူပင်လမ်း၊ တွံတေးမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။
လုပ်ငန်းဖော်ဆောင်သူ	Daw Kyin Htay (CEO) Daw Kyin Shwe (Director)
ရင်းနှီးမြှုပ်နှံမှုပမာဏ	USD သန်းပေါင်း (၂.၅၂)
ရင်းနှီးမြှုပ်နှံမည့်အချိန်	(၃၀) နှစ်
ထုတ်လုပ်နိုင်စွမ်း	စုစုပေါင်း အမျိုးအစား(၉)မျိုးအား တစ်နှစ်လျှင် ၁၅၀,၀၀၀ တန်ခန့်
လျှပ်စစ်ဓါတ်အားအရင်းအမြစ်	မြန်မာ့လျှပ်စစ်ဓါတ်အားလုပ်ငန်း (2000 KVA)
ရေလိုအပ်မှု	တစ်နှစ်လျှင် ၁,၄၀၀,၀၀၀ ဂါလံခန့်
လိုအပ်သောကုန်ကြမ်းပစ္စည်းများ	နိုင်ငံခြားမှတင်သွင်းသော Urea, Ammonium Sulphate, Ammonium Chloride, Muriate Potash, Diammonium Phosphate
စီမံကိန်း၏အကျယ်အဝန်း	(၂၇.၇၇ ဧက)
စီမံကိန်းလက်ရှိအခြေအနေ	လုပ်ငန်းလည်ပတ်နေသည့်အနေအထား
ရေစွန့်ထုတ်မှုစနစ်	စွန့်ပစ်ရေများကို ရေဆိုးပြန်လည်သန့်စင်နည်းစနစ်သုံး၍ သတ်မှတ်ချက် guidelineနှင့်အညီစွန့်ထုတ်သွားမည်။
အမှိုက်စွန့်ပစ်မှုစနစ်	စက်ရုံမှ ထွက်ရှိလာမည့် စွန့်ပစ်အမှိုက်များအား မြို့နယ် စည်ပင်သာယာရေး ကော်မတီချမှတ်ထားသော အမှိုက်စွန့်ပစ်ခြင်း ဆိုင်ရာ နည်းလမ်း များအတိုင်း စွန့်ပစ်သည်။
ဆက်သွယ်ရန်ပုဂ္ဂိုလ်	ဒေါ်သဇင်ညွန့် ၀၉၈၈၉၅၇၀၆၆၄၊ email. myanmashwenagaroffice@gmail.com
အလုပ်သမားဦးရေ	စုစုပေါင်း ၁၃၅ ဦး

စတင်တည်ဆောက်ခဲ့သည့် အချိန်ကာလနှင့် လည်ပတ်မှု/ထုတ်လုပ်မှုစတင်ခဲ့သည့်အချိန်ကာလ

စတင်တည်ဆောက်ခဲ့သည့် အချိန်ကာလ – 1.2.2018

ထုတ်လုပ်မှုစတင်ခဲ့သည့် အချိန်ကာလ – 10.9.2019(စမ်းသပ်)

စီမံကိန်း၏ အဆောက်အအုံအရေအတွက်

- ဂိုဒေါင် (၃၂၉′ x ၂၆၅′)၊ ၁ထပ်၊ ကွန်ကရစ်အဆောက်အဦ (၄)လုံး
- အလုပ်ရုံ (၁၀၈′ x ၂၆၅′)၊ ၁ထပ်၊ ကွန်ကရစ်အဆောက်အဦ (၂)လုံး
- ရုံးနှင့်လူနေဆောင် (၂၅′ x ၂၆၅′)၊ ၁ထပ်၊ အဆောက်အဦ (၄)လုံး

ထုတ်လုပ်မှုနည်းစဉ်အဆင့်ဆင့်

အဆိုပြုစက်ရုံမှ အရည်အသွေးမြင့် အစွမ်းထက်ဓာတ်မြေဩဇာအမျိုးမျိုးနှင့် ကုန်ကြမ်းများကို ပြည်ပနိုင်ငံများမှ မှာယူတင်သွင်းကာ နိုင်ငံခြားဖြစ်ခေတ်မီစက်ကိရိယာများကို အသုံးပြု၍ အဆင့်မြင့်သော ထုတ်လုပ်မှုများဖြင့် အရည်အသွေးမြင့်ရောစပ်ထုပ်ပိုးမှုပုံစံ ဓာတ်မြေဩဇာ အမျိုးအစား(၉)မျိုး (ရွှေနဂါးပင်တက်၊ Top One စပါးအထွက်တိုး၊ ဆင်ပျံ၊ 25:7:8 ကွန်ပေါင်း၊ 19:19:19 သီးနှံစုံသုံးကွန်ပေါင်း၊ 15:5:20 သီးနှံစုံသုံးကွန်ပေါင်း၊ 15:5:24 +5MgO+4S သီးနှံစုံသုံး ကွန်ပေါင်း၊ ပုလဲသာ၊ ဒေါင်းမင်း)စသည်တို့အား စုစုပေါင်း တန်ချိန် တစ်နှစ်လျှင် ၁၅၀,၀၀၀ တန်ခန့် ပြန်လည်ထုတ်ပိုးဖြန့်ဖြူးရောင်းချပေးသွားမည် ဖြစ်ပါသည်။

၎င်းဓာတ်မြေဩဇာ အမျိုးအစား(၉)မျိုး၏ ထုတ်လုပ်မှုနည်းလမ်းမှာအတူတူပင်ဖြစ်သည်။ ကုန်ကြမ်း အမျိုးအစား (ပါဝင်ပစ္စည်းများ)နှင့် ပါဝင်ပစ္စည်းများ၏ အချိုးအစားပေါ်မူတည်၍ အမျိုးအစား ထုတ်ကုန် ကိုးမျိုးကွဲပြားခြင်းဖြစ်ပါသည်။

အဆိုပြုစီမံကိန်း၏ ထုတ်လုပ်မှုနည်းစဉ်အဆင့်ဆင့်မှာအောက်ပါအတိုင်းဖြစ်ပါသည်-

၁.၄။ အနီးပတ်ဝန်းကျင်အကြောင်းအရာဖော်ပြချက်

အဆိုပြုစီမံကိန်းနေရာသည် တံတားမြို့-မအူပင်လမ်း၊ တံတားတူးမြောင်း ဘေးရပ်ကွက်လားတန်းကျေးရွာ၊ အမှတ် (၁၂၄-က) တံတားမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး တွင်တည်ရှိပါသည်။ စီမံကိန်းနေရာ အလည် တည့်တည့် ၏ ကိုဩဒိနိတ်များမှာ မြောက်လတ္တီတွဒ် ၁၆ ဒီဂရီ၊ ၄၃ မိနစ်၊ ၂၅.၆ စက္ကန့်၊ အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ၊ ၁၀ မိနစ်၊ ၄.၄ စက္ကန့်၊ ပင်လယ်ရေမျက်နှာပြင်အထက် ၂၀ ပေဖြစ်ပါသည်။ စက်ရုံ၏ အရှေ့နှင့် အနောက်ဘက်တွင် လယ်ကွင်းများတည်ရှိပြီး မြောက်ဘက်တွင် တံတား-မအူပင်ကားလမ်းရှိကာ တောင်ဘက်တွင် တံတားတူးမြောင်း တည်ရှိနေသည်။ အနီးဆုံးကျေးရွာမှာ ကန်ပတ်ရိုးကျေးရွာဖြစ်ပြီး အနောက်ဘက်တွင် တည်ရှိပါသည်။ စီမံကိန်းလုပ်ကွက်ဧရိယာ၏ အခြေပြုသဘာဝ မြေမျက်နှာသွင်ပြင်၊ ပတ်ဝန်းကျင်၊ လူမှုစီးပွားနှင့် မြင်ကွင်းဆိုင်ရာ လက္ခဏာ တို့ကို ဤပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ အခန်း(၅)တွင် ဖော်ပြထားပါသည်။ ဤအခန်းတွင် တင်ပြထားသည့် တဆင့်ခံ အချက် အလက်များ (secondary data)ကို ထုတ်ဝေပြီးသော သတင်းအချက်အလက်များ၊ လုပ်ငန်း ဖော်ဆောင်သူထံမှ ရရှိသော အချက်အလက်များနှင့် တံတားမြို့နယ် အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာနမှ ပြဌာန်း ထားသော မြို့နယ်ဆိုင်ရာ အချက်အလက်များမှ ရယူထားပါသည်။ မူလ လူမှုဆိုင်ရာ နှင့် ပတ်ဝန်းကျင် အခြေခံအချက်အလက်များ (primary data) ဖြစ်သည့် ဆူညံမှု တိုင်းတာခြင်း၊ လေ၊ ရေအရည်အသွေးတိုင်းတာခြင်းတို့ကိုမူ ကွင်းဆင်းဆောင်ရွက်ခဲ့ပါသည်။ ရရှိလာသော အရည်အသွေး ရလဒ်များသည် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ နှင့် နှိုင်းယှဉ်ချက်များအရ စံသတ်မှတ်ချက်အတွင်း တည်ရှိနေသည်ကို တွေ့ရှိရပါသည်။
(အသေးစိတ်ကို အခန်း ၅ တွင် ဖော်ပြထားပါသည်)

၁.၅။ အဓိကဖြစ်ပေါ်လာနိုင်သောထိခိုက်သက်ရောက်မှုနှင့် အဆိုပြုလျှော့ချမှု

အဆိုပြုစီမံကိန်းသည် တည်ဆောက်ခြင်းလုပ်ငန်းပြီးစီး၍ စတင်လည်ပတ်နေသောကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) သည် စီမံကိန်း၏ လုပ်ငန်းလည်ပတ်ခြင်းနှင့် လုပ်ငန်း ပိတ်သိမ်းခြင်းတို့နှင့် ဆက်နွယ်သည့် ဖြစ်ပေါ်လာနိုင်သော ထိခိုက်သက်ရောက်မှုများအပေါ် အလေးပေး ဖော်ပြထားပါသည်။ လုပ်ငန်းပိတ်သိမ်းခြင်းကာလအတွင်း ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်သက်ရောက်မှုများသည် လေ့လာမှုနယ်မြေဧရိယာ၌ ယာယီကွက်၍ ဖြစ်ပေါ်နိုင်ပါသည်။ လည်ပတ်ရေးကာလအတွင်း ဖြစ်ပေါ်လာနိုင်သောသက်ရောက်မှုများတွင် ဆူညံသံနှင့် ဆက်နွယ်သော အရာများ၊ အများပြည်သူကျန်းမာရေးနှင့် ဘေးကင်းရေး၊ လုပ်ငန်းခွင် ကျန်းမာရေးနှင့်ဘေးကင်းရေး စသည်တို့ပါဝင်ပါသည်။ ဆန်းစစ်ချက်များအရ အဓိက

ပတ်ဝန်းကျင်နှင့် လူမှုဝန်းကျင်တို့ အပေါ် ဆိုးကျိုးဖြစ်စေသည့် သက်ရောက်မှုများမှာ အနည်းငယ်မှ အလယ်အလတ် အဆင့်အထိရှိကြောင်း တွေ့ရှိရပါသည်။ ဖြစ်ပေါ်လာနိုင်သော ထိခိုက် သက်ရောက်မှုများ၊ ကြွင်းကျန် သက်ရောက်မှုများ နှင့် အဆိုပြု လျှော့ချရေး အစီအမံများကို ဇယား (၁.၁)တွင် အကျဉ်းဖော်ပြထားပါသည်။ အဆိုပြုစီမံကိန်း၏ အနီးပတ်ဝန်းကျင်တွင် အခြား စီမံကိန်းများနှင့် စပ်ဆက်လုပ်ငန်းများမရှိသောကြောင့် ပေါင်းစပ်ထိခိုက်မှုများအနေဖြင့် ဖြစ်ပေါ်မည် မဟုတ်ပေ သို့သော် ယာဉ်ကြောသွားလာမှုအနေဖြင့် တွံတေး-မအူပင်လမ်းပိုင်းတွင် အနည်းငယ် ပိုမိုလာမည်ဖြစ်ပါသည်။

၁.၆။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

အဆိုပြုစီမံကိန်း၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို စီမံကိန်းလုပ်ငန်းများ လုပ်ဆောင်သည့် ကာလအတွင်း တွေ့ရှိလာသော ဖြစ်နိုင်ခြေရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်နိုင်မှု အချက်အလက်များကို အသုံးပြုခြင်း၊ စီမံကိန်းအကြောင်းအရာများကို စီမံကိန်းအဆိုပြုသူတို့နှင့် ဆွေးနွေးခြင်း၊ စီမံကိန်းတည်နေရာ အနီးပတ်ဝန်းကျင်၏ လက်ရှိအခြေအနေနှင့် စီမံကိန်း တည်နေရာသို့ ကွင်းဆင်းလေ့လာခြင်းတို့ဖြင့် ပြင်ဆင် ရေးဆွဲခဲ့ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တွင် ဇယား ၁.၁ တွင်ဖော်ပြထားသည့် လျှော့ချရေး အစီအမံများ အကောင်အထည် ဖော်မှုနှင့် အဓိကလျှော့ချရေးအစီအမံများအကျဉ်းချုပ်တို့အတွက် တာဝန်သတ်မှတ်ခြင်းတို့ ပါဝင် ပါသည်။ ဖြစ်နိုင်ချေရှိသော သက်ရောက်မှုများကို လျော့ပါးစေရန်ရည်ရွယ်သည့် လုပ်ငန်းလည်ပတ်မှု ဆိုင်ရာ ထိန်းချုပ်မှုများနှင့် အခြားအစီအမံများ၏ ထိရောက်မှုကို အကဲဖြတ်ရန်နှင့် စည်းမျဉ်း စည်းကမ်းသတ်မှတ်ချက်များနှင့်အညီ လေးစားလိုက်နာစေရန် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှုကို ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်ကို Table 1.2 တွင် အကျဉ်းတင်ပြထားပြီးအသေးစိပ်အားအခန်း(၈)တွင်ဖော်ပြထားပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ် ကြည့်ရှုစစ်ဆေးမှု တွေ့ရှိချက်များနှင့် ပတ်ဝန်းကျင်နှင့် စီမံကိန်း၏လုပ်ဆောင်နိုင်မှုတို့ကို အစီရင်ခံတင်ပြရန် ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာကို စီမံကိန်း လည်ပတ်ရေး ကာလအတွင်း ခြောက်လ တစ်ကြိမ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ တင်ပြ ဆောင်ရွက် သွားမည် ဖြစ်ပါသည်။

ဇယား (၁.၁) ထိခိုက်မှုများနှင့် လျော့ချရေးအစီအမံများအကျဉ်း

ဖြစ်ပေါ်နိုင်သော သက်ရောက်မှုများ	စီမံခန့်ခွဲမှုအစီအစဉ်နှင့်လျော့ချရေးအစီအမံများအကျဉ်း	သက်ရောက် အရေးပါမှုအဆင့် (၁)	ကြွင်းကျန် သက်ရောက် အရေးပါမှုအဆင့် (၂)
လည်ပတ်ရေးကာလ			
လေထုအရည်အသွေး	- စက်ရုံတွင် ကောင်းမွန်သော လေဝင်လေထွက်စနစ်ပြုလုပ်ထားရန် - အမှုန်အမွှားကာကွယ်ရေး နှခေါင်းစည်းများ မျက်မှန်များ ထားပေးရန် - ကောင်းမွန်သည့်ယာဉ်နှင့်ယန္တရားများ အသုံးပြုခြင်းနှင့်ပုံမှန်စစ်ဆေးခြင်း	အတန်အသင့်အဆင့်	နည်း
ဆူညံသံနှင့် တုန်ခါမှု	- တက်နိုင်သမျှအသံဆူညံသောစက်များ အသုံးမပြုရန် - အသံဆူညံသောနေရာ၌လုပ်ငန်းများဆောင်ရွက်ရာတွင် သတ်မှတ်နာရီအတွင်းလုပ်ဆောင်ရန်နှင့် အကာကွယ် နားကြပ်တပ်၍ လုပ်ဆောင်ရန် - အသံထွက်သော မီးစက်များ၊ အင်ဂျင်များတွင် အသံထိန်းစနစ် (Silencer/Muffler) များ တပ်ဆင်အသုံးပြုရန်	အနည်းငယ်မှ အတန်အသင့်အဆင့်	မပြောပလောက်သော
ရေအရည်အသွေး	- ရေနုတ်မြောင်းများနှင့် အနည်ထိုင်စေမှုထိန်းချုပ်ခြင်းဆိုင်ရာ တည်ဆောက်ထားမှုများအား လုံးကို ပုံမှန်စစ်ဆေးခြင်းနှင့် ပြုပြင် ထိန်းသိမ်းမှုလုပ်ဆောင်ရန် - စက်ရုံနှင့်လူနေအဆောင်များအတွက် မိလ္လာစနစ်ကိုတည်ဆောက်သွားမည်ဖြစ်သည်။ မိလ္လာရေဆိုးများနှင့် စက်ရုံသုံးရေကို စက်ရုံရေနုတ်မြောင်းစနစ်သို့ မဖောက်ထုတ်မီ လုပ်ငန်းခွင်နေရာ မှစီးကျခြင်းနှင့် စွန့်ပစ်ပစ္စည်းစွန့်ထုတ်မှုများနှင့် ပတ်သတ်သော မြန်မာနိုင်ငံ NEQG နှင့်အညီ သန့်စင်ဆောင်ရွက်ရမည်။	အတန်အသင့်အဆင့်	နည်း
စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု	- စီမံကိန်း၏ စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုအစီအစဉ်ကို ရေးဆွဲပြီး၊ စွန့်ပစ်ပစ္စည်းထွက်ရှိမှု၊ သိုလှောင်မှု၊ ပြန်လည်အသုံးပြုမှု၊ သယ်ယူပို့ဆောင်မှုနှင့် စွန့်ထုတ်မှုစသည့် ကဏ္ဍများကိုထည့်သွင်း အကောင်အထည်ဖော်ဆောင်ရွက် သွားရန်	အနည်းငယ်မှ အတန်အသင့်အဆင့်	မပြောပလောက်သော

လူမှုစီးပွားရေး	- အလုပ်ခန့်ထားရန်၊ ခန့်အပ်ရန် လိုအပ်ပါက အလုပ်သမားဥပဒေပါ ပြဋ္ဌာန်းချက်များနှင့် အညီ အလုပ်သမား ခန့်ထားမှုဆိုင်ရာ စာချုပ်ချုပ်ဆိုခြင်းများ ပြုလုပ်ရန် - အလုပ်သမား အက်ဥပဒေ၊ တည်ဆဲဥပဒေများနှင့်အညီ လိုက်နာဆောင်ရွက်ရန် - လုပ်သားများ ကျန်းမာရေးနှင့်လုပ်ငန်းခွင်အန္တရာယ် ကင်းရှင်းစေရေးအတွက် စနစ်တကျ စီမံဆောင်ရွက်ထားရန်၊	အနည်းငယ်မှ အတန်အသင့်အဆင့်	မပြောပလောက်သော
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေး	- စီမံကိန်းလုပ်ငန်းများနှင့် ပတ်သတ်၍ ဓာတ်မြေဩဇာထုတ်လုပ်ခြင်း၊ ဖော်စပ်ခြင်းနှင့် ထုပ်ပိုးခြင်းအတွက် ကမ္ဘာ့ဘဏ်အုပ်စု၏ ပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေး (WBG-EHS) လမ်းညွှန်ချက်များ (၂၀၀၇)နှင့်အညီ ထိန်းချုပ်မှုများ နှင့် လျော့ချရေး အစီအမံများအတိုင်း အကောင်ထည်ဖော်ဆောင်ရွက်ရန် - လုပ်ထုံးလုပ်နည်းတင်ပြခြင်း၊ PPE နှင့် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး (OHS) စာရွက်စာတမ်းများပံ့ပိုးခြင်း (ဥပမာ-လုံခြုံရေး အစီအစဉ်၊ လုပ်ထုံးလုပ်နည်းများ၊ ဓာတုပစ္စည်းဆိုင်ရာအလုပ်ညွှန်ကြားချက်များ)	အနည်းငယ်မှ အတန်အသင့်အဆင့်	နည်း
ရပ်ရွာလူထု ကျန်းမာရေးနှင့် ဘေးကင်းရေး	- ကူးစက်လွယ်ရောဂါများ ရှိမရှိကို ကြိုတင်စိစစ်ရန် - လုပ်ငန်းခွင်နေရာတွင် အလုပ်သမားများအားလုံးကို ကျန်းမာရေးစစ်ဆေးမှုများ ပြုလုပ်ပေးရန် - (၁၉-၄-၂၀၂၀)ရက်စွဲပါ စက်ရုံ၊ အလုပ်ရုံလုပ်ငန်းခွင်များအတွက် ကျန်းမာရေးနှင့် အားကစားရေးရာဝန်ကြီးဌာန ထုတ်ပြန်ထားသော (COVID-19)ရောဂါ ကာကွယ်ရေးနှင့် ထိမ်းချုပ်ရေးနည်းလမ်းများအတိုင်း တိကျစွာ လိုက်နာဆောင်ရွက်သွားရန်	နည်း	နည်း
ပိတ်သိမ်းရေးကာလ			
လေထုအရည်အသွေး	- လုပ်ငန်းခွင်နေရာနှင့်လမ်းအားရှေဖြန်းပေးခြင်း - စွန့်ပစ်ပစ္စည်းများကို မီးရှို့ဖျက်ဆီးခြင်းကိုမပြုလုပ်ရန် - ကောင်းမွန်သည့်ယာဉ်နှင့်ယန္တရားများ အသုံးပြုခြင်းနှင့်ပုံမှန်စစ်ဆေးခြင်း	နည်း	မပြောပလောက်သော

ဆူညံသံနှင့် တုန်ခါမှု	- လုပ်ငန်းသုံးစက်ပစ္စည်းကရိယာများ တစ်ပြိုင်နက် ဆက်တိုက်အသုံးမပြုရန်နှင့် ညအချိန်တွင်ဖျက်သိမ်းခြင်းလုပ်ငန်းများ မလုပ်ရန် - ကောင်းမွန်သည့်ယာဉ်/စက်များ အသုံးပြုခြင်းနှင့်ပုံမှန်စစ်ဆေးခြင်း - စက်များကိုအလုပ်အချိန်အပိုင်းခြားအလိုက်စက်ရပ်နားခြင်းပြုလုပ်ပေးရန်	နည်း	မပြောပလောက်သော
စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု	- ပိတ်သိမ်းရေးလုပ်ငန်း၏ စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုအစီအစဉ်ကို ရေးဆွဲပြီး၊ စွန့်ပစ်ပစ္စည်းထွက်ရှိမှု၊ သိုလှောင်မှု၊ ပြန်လည်အသုံးပြုမှု၊ သယ်ယူပို့ဆောင်မှုနှင့် စွန့်ထုတ်မှုစသည့် ကဏ္ဍများကိုထည့်သွင်း အကောင်အထည်ဖော်ဆောင်ရွက် သွားရန်	နည်း	မပြောပလောက်သော
လူမှုစီးပွားရေး	- စီမံကိန်းပိတ်သိမ်းချိန်တွင် MSNAG သည် ဖြစ်နိုင်ပါက ကုမ္ပဏီပိုင် သို့မဟုတ် အခြားစက်ရုံများတွင် သက်ဆိုင်သည့်အလုပ်နေရာများတွင် မိမိတို့၏ ဝန်ထမ်းများအား ခန့်အပ်နိုင်ရန် ပံ့ပိုးပေးကာ အကြံပြုပေးရမည်ဖြစ်ပါသည်။ အခြားစက်ရုံများတွင် ခန့်အပ်ရန် မဖြစ်နိုင်ပါက အလုပ်သမားများအား အစားထိုး အသက်မွေးဝမ်းကြောင်းပြုရန် ကျယ်ကျယ်ပြန့်ပြန့် သတိပေးချက် စောလျင်စွာ ဆောင်ရွက်ရမည်ဖြစ်ပြီး အလုပ်သမား ဥပဒေစည်းမျဉ်းစည်းကမ်းများနှင့်အညီ လျော်ကြေးငွေ ပေးဆောင်မည် ဖြစ်သည်။	အနည်းငယ်မှ အတန်အသင့်အဆင့်	နည်း
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	- ပိတ်သိမ်းရေးလုပ်ငန်းများနှင့် ပတ်သတ်၍ ဆောက်လုပ်ရေးနှင့် ပြန်လည်ဖျက်သိမ်းခြင်းအတွက် ကမ္ဘာ့ဘဏ်အုပ်စု၏ ပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေး (WBG–EHS) လမ်းညွှန်ချက်များ (၂၀၀၇)နှင့်အညီ ထိန်းချုပ်မှုများ နှင့် လျော့ချရေး အစီအမံများအတိုင်း အကောင်ထည်ဖော်ဆောင်ရွက်ရန် - လုပ်ထုံးလုပ်နည်းတင်ပြခြင်း၊ PPE နှင့် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး (OHS) စာရွက်စာတမ်းများပံ့ပိုးခြင်း (ဥပမာ–လုံခြုံရေး အစီအစဉ်၊ လုပ်ထုံးလုပ်နည်းများ၊ အလုပ်ညွှန်ကြားချက်များ)	နည်း	မပြောပလောက်သော

(ခ) လျော့ချရေးနှင့် စီမံခန့်ခွဲရေးအစီအမံများ အကောင်အထည်ဖော်မဆောင်ရွက်မီအခြေအနေ

(ဂ) လျော့ချရေးနှင့် စီမံခန့်ခွဲရေးအစီအမံများ အကောင်အထည်ဖော်ဆောင်ရွက်ပြီးနောက်အခြေအနေ

၁.၇။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့်ထုတ်ဖော်တင်ပြခြင်း

အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း အစည်းအဝေးကို ပထမအကြိမ်အဖြစ် ၂၀၁၈ ခုနှစ် ဇူလိုင်လ ၁၃ ရက်ရက်နေ့တွင် တွံတေးမြို့နယ်၊ ကုလားတန်းကျေးရွာအနီးရှိ အမှတ် (၁၂၄-က)၊ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်၏ စက်ရုံအစည်းအဝေးခန်းမတွင် သက်ဆိုင်ရာ အကျိုးသက်ဆိုင်သူများနှင့်ကျင်းပခဲ့ပါသည်။ ထို့အပြင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ လမ်းညွှန် သဘောထားမှတ်ချက်အရ တိုင်ပင်ဆွေးနွေးခြင်းအား အချိန်နှင့်အညီ Update ဖြစ်ရန် လိုအပ်သောကြောင့် ဒုတိယအကြိမ် အစည်းအဝေးကို ၂၀၂၂ ခုနှစ် မေလ ၁ ရက်နေ့တွင် မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်၏ စက်ရုံအစည်းအဝေးခန်းမ၌ ထပ်မံကျင်းပခဲ့ပါသည်။ ထိုတွေ့ဆုံအစည်းအဝေးများမှ စီမံကိန်းလည်ပတ်မှုကြောင့် ဖြစ်ပေါ်လာနိုင်သော ထိခိုက်ခံစားရနိုင်သူများနှင့် ဖြစ်ပေါ်နိုင်သည့် အချက်အလက်ကွာဟမှုများနှင့် ထိုအချက်အလက်များအား ပတ်ဝန်းကျင်ထိခိုက်မှု အစီရင်ခံစာတွင် မည်သို့ထည့်သွင်းဆောင်ရွက် သွားနိုင်မည့် အကြောင်းတို့နှင့်ပတ်သတ်သော သတင်းအချက်အလက်များကို စုဆောင်းရရှိခဲ့ပါသည်။

အများပြည်သူနှင့် တိုင်ပင် ဆွေးနွေးမှုတွင် တွံတေးမြို့နယ်၊ သက်ဆိုင်ရာ အစိုးရဦးစီးဌာနများ၊ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ရပ်ကျေး အုပ်ချုပ်ရေးမှူးများ၊ ဒေသခံရပ်ရွာလူထုနှင့် ရပ်ရွာကိုယ်စာလှယ်များပါဝင်ပါသည်။ တက်ရောက်သူများ စာရင်းနှင့် တွေ့ဆုံမှု အစည်းအဝေးမှတ်တမ်းအား ဤအစီရင်ခံစာ၏ နောက်ဆက်တွဲတွင်ဖော်ပြထားပါသည်။

ဆောင်ရွက်ခဲ့သည့် ဆွေးနွေးမှုများ၏ နေ့စွဲ၊ နေရာ၊ သက်ဆိုင်သူများနှင့် ချိတ်ဆက်လုပ်ဆောင်မှုများအား ဇယား (၁.၃)တွင်ဖော်ပြထားပါသည်။

ဇယား (၁.၃) ဆောင်ရွက်ခဲ့သည့် ဆွေးနွေးမှု လုပ်ငန်းများ

နေရာ	**သက်ဆိုင်သူများနှင့် ချိတ်ဆက်လုပ်ဆောင်မှု**	**နေ့စွဲ**
တွံတေးမြို့နယ်၊ အထွေထွေအုပ်ချုပ်ရေးရုံး	စီမံကိန်းဆိုင်ရာအချက်အလက်များတင်ပြခြင်း အစည်းအဝေးအစီအစဉ်ချခြင်းနှင့် ခွင့်ပြုချက်တောင်းခံခြင်း	၂၀၁၈ ဧပြီလ ၂၀ ရက်
ကုလားတန်း ကျေးရွာအုပ်စု (အုပ်ချုပ်ရေးမှူးနေအိမ်)	အစည်းအဝေးအစီအစဉ်ချခြင်းနှင့် ခွင့်ပြုချက်တောင်းခံခြင်း လူမှုအခြေခံအချက်အလက်များကောက်ယူမှု ဆောင်ရွက်ခြင်း	၂၀၁၈ ဧပြီလ ၂၁ ရက်
သံဖြူရုံကျေးရွာ၊ကန်ပတ်ရိုးထန်းတစ်ပင်(ရွာသစ်)	စီမံကိန်းအကြောင်းအသိပေးခြင်း လူမှုအခြေခံအချက်အလက်များကောက်ယူမှု ဆောင်ရွက်ခြင်း	၂၀၁၈ ဧပြီလ ၂၂ ရက် နှင့် ၂၃ ရက်
မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေး	အစိုးရဦးစီးဌာနများ၊ ကျေးရွာအုပ်ချုပ်ရေးမှူးများ၊	၂၀၁၈ ဇူလိုင်လ ၁၃ရက်

စွမ်းအားစုကုမ္ပဏီလီမိတက် (စက်ရုံအစည်းအဝေးခန်းမ) (ပထမအကြိမ် လူထုတွေ့ဆုံပွဲ)	ဒေသခံရပ်ရွာလူထု နှင့် ရပ်ရွာကိုယ်စာလှယ်များ ထံသို့ စီမံကိန်းဆိုင်ရာ အချက်အလက်များ တင်ပြခြင်း၊ သက်ဆိုင်သူများထံမှ စိုးရိမ်မှု၊ လိုလားမှုများနှင့် အကြံပြုချက်များရယူခြင်း	
တွံတေးမြို့နယ်၊ အထွေထွေအုပ်ချုပ်ရေးရုံး	စီမံကိန်းဆိုင်ရာအစည်းအဝေးအစီအစဉ်ချခြင်းနှင့် ခွင့်ပြုချက်တောင်းခံခြင်း	၂၀၂၂ ဧပြီလ ၂၅ ရက်
မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေး စွမ်းအားစုကုမ္ပဏီလီမိတက် (စက်ရုံအစည်းအဝေးခန်းမ) (ဒုတိယအကြိမ် လူထုတွေ့ဆုံပွဲ)	အစိုးရဦးစီးဌာနများ၊ ကျေးရွာအုပ်ချုပ်ရေးမှူးများ၊ ဒေသခံရပ်ရွာလူထု နှင့် ရပ်ရွာကိုယ်စာလှယ်များ ထံသို့ စီမံကိန်းဆိုင်ရာ အချက်အလက်များ တင်ပြခြင်း၊ သက်ဆိုင်သူများထံမှ စိုးရိမ်မှု၊ လိုလားမှုများနှင့် အကြံဉာဏ်များရယူခြင်း	၂၀၂၂ မေလ ၁ ရက်

ဇယား (၁.၄) ဆွေးနွေးမှု ကာလအတွင်း ရရှိသော မှတ်ချက်များ အကျဉ်းချုပ်

တုံ့ပြန်လက်ခံရရှိသော အဓိကမှတ်ချက်များ	**ဖြေရှင်းချက်**
ပထမအကြိမ် လူထုတွေ့ ဆုံပွဲ	
အနှံနံကြောင်း အထူးသဖြင့် စက်ရုံရှေ့လမ်းမှဖြတ်သွား လျှင်အလွန်နံကြောင်း၊ ပြည်သူ့ ကျန်းမာရေးအတွက် သက်ဆိုင်သည့် အဓိကစိုးရိမ်ပူပန်မှုဖြစ်သည်။ အမှုန့်အမွှားပျံလွင့်မှုများ တစ်ခါတစ်ရံတွေ့ရကြောင်း၊ အလုပ်ကိုင်အခွင့်လမ်းများသိရှိလိုကြောင်း၊	အလုပ်ကိုင်အခွင့်လမ်းများရရှိမည်ဖြစ်၍ ဒေသခံများကိုစီစစ်ခန့်ထားမည် ဖြစ်ကြောင်း၊ အမှုန့်အမွှားနှင့်အနံ့ ထိန်းချုပ်မှုအတွက် နည်းပညာ၊ ပညာရှင်များဖြင့် တိုင်ပင်ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း၊ ဤ EIA အစီရင်ခံစာ တွင် လေထုနှင့် အနံ့ထုတ် လွှတ်မှု၊ ပြည်သူ့ကျန်းမာရေးနှင့် ဘေးကင်းရေး အပေါ် အကျိုးသက်ရောက်မှုကို အကဲဖြတ်မည်ဖြစ်သည်။ စစ်တမ်းရလဒ်များကိုလူထုအားထုတ်ဖော်မည် ဖြစ်သည်။
ဒုတိယအကြိမ် လူထုတွေ့ ဆုံပွဲ	
အနှံသိပ်မနံတော့ကြောင်း အနီးနားကျေးရွာများရှိ လယ်သမားများအတွက် ဓာတ်မြေဩဇာများ ဈေးလျော့ရောင်းပေးစေ လိုကြောင်း၊	ထုတ်လုပ်မှုနည်းစဉ်၌ ကုန်ကြမ်းအမျိုးအစားပြောင်းလဲလိုက်သောကြောင့် အနံ့ထွက်မှုသက်သာသွားကြောင်း၊ MSNAG ကုမ္ပဏီမှ ဓာတ်မြေဩဇာအား နယ်ခံလယ်သမားများ အတွက် ပိုမိုသက်သာသော ဈေးနှုန်းများဖြင့် ရောင်းချပေးမည်ဖြစ်ကြောင်း၊

စက်ရုံမှသတင်းအချက်အလက်ရရှိမှု၊ ပွင့်လင်းမြင်သာမှုတို့နှင့် သက်ဆိုင်သူများမှ ပေးထားသော အချက်အလက် များကို ရပ်ရွာလူထု နားလည်နိုင်စေရန် အရေးကြီးပါကြောင်း	လုပ်ထုံး စည်းမျဉ်းစည်းကမ်းအရ EIA အစီရင်ခံစာတွင် ဒေသဆိုင်ရာအသိုင်းအဝိုင်းများထံသတင်းအချက်အလက်များ လွယ်ကူစွာရရှိနိုင်စေရန်အတွက် မြန်မာဘာသာဖြင့် အစီရင်ခံစာအကျဉ်းချုပ် ပါရှိမည်ဖြစ်သည်။
လုပ်ငန်းဆောင်ရွက်မှုအတွင်းစောင့်ကြည့်စစ်ဆေးခြင်းနှင့် စာရင်းစစ်ခြင်းလုပ်ငန်းစဉ်၏ ပွင့်လင်းမြင်သာမှုသည် သက်ဆိုင် သူများအတွက် အဓိကအရေးကြီးကြောင်း	စီမံကိန်းအဆိုပြုသူသည် မကျေနပ်ချက်တိုင်ကြားခြင်း ယန္တရားအစီအစဉ်နှင့် EIA အစီရင်ခံစာ တွင် ပါဝင်ဖော်ပြထားသည့်အတိုင်း စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်ကိုလည်း လုပ်ဆောင် မည်ဖြစ်ပြီး စောင့်ကြည့်ရေး ရလဒ်များကို ဒေသခံ လူထုအား ထုတ်ဖော်မည်ဖြစ်သည်။

၁.၈။ နိဂုံး

ဤစီမံကိန်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) လုပ်ငန်းများကို ၂၀၁၈ ခုနှစ်၊ မတ်လတွင် စတင်ဆောင်ရွက်ခဲ့ပြီး လုပ်ငန်းများကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ ၂၀၁၂၊ ပတ်ဝန်းကျင် ထိန်းသိမ်ရေးနည်းဥပဒေ(၂၀၁၄)နှင့် ပတ်ဝန်းကျင်ထိခိုက်ဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်းပါ ပြဋ္ဌာန်းချက်များအတိုင်းလိုက်နာဆောင်ရွက်ထားပါသည်။ EIA အစီရင်ခံစာတွင် လေ့လာမှုသည် အဆိုပြုလုပ်ငန်းဖြစ်သော ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်းနှင့် ရောင်းချခြင်းလုပ်ငန်းစီမံကိန်း၏ လုပ်ငန်းလည်ပတ်ရေးကြောင့် ဖြစ်ပေါ်လာနိုင်သော သက်ရောက်မှုများ အပေါ်အလေးပေးဆောင်ရွက်ထားပါသည်။

နိဂုံးချုပ်အနေဖြင့် စီမံကိန်းအကောင်ထည် ဖော်ဆောင်ရွက်သူသည် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း အစီအရင်ခံစာတွင် ပါရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ စီခန့်ခွဲမှု အလေ့အကျင့်များ၊ ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့နည်းစေရေး အစီအမံအချက်များ၊ လိုက်နာဆောင်ရွက် ကျင့်သုံးရန် တာဝန်များနှင့် လုပ်ငန်းစဉ်များအတိုင်း အပြည့်အဝ လိုက်နာဆောင်ရွက် အကောင်အထည် ဖော်ဆောင်မည် ဖြစ်ကြောင်း၊ ဒေသတွင်း လူမှုစီးပွားရေး တိုးတက် ဖွံ့ဖြိုးစေမည်ဖြစ်ကြောင်းနှင့် နိုင်ငံတော်အတွက် အခွန်ဘဏ္ဍာများ တိုးတက်ရရှိစေမည်ဖြစ်ကြောင်း တင်ပြအပ်ပါသည်။

1. EXECUTIVE SUMMARY

1.1 Introduction

This is the Environmental Impact Assessment (EIA) of the repackaging, storage and sales of fertilizers Project (Fertilizers Repackaging Factory project) by Myanma Shwe Nagar Agricultural Group Co., Ltd (MSNAG). The project proponent, MSNAG has contracted the consultant company, HRD Environmental Training and Services Co., Ltd to conduct Environmental Impact Assessment (EIA) for the proposed project. The EIA Report will be submitted to relevant Myanmar authorities for assessment in order to inform the decision to award an Environmental Compliance Certificate (ECC).

1.2. Policy and Regulatory Framework

The Project will be undertaken in line with a number of national and local standards and laws. Local laws relating to EIA include but not limited to:

- Environmental Conservation Law (2012);
- Environmental Conservation Rules (2014);
- National Environmental Quality (Emission) Guidelines (2015); and
- Environmental Impact Assessment Procedure (2015)

In addition, International guidelines which will also be considered in preparing the EIA include:

- International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012);
- IFC General Environmental, Health and Safety (EHS) guidelines (2007); and
- IFC (EHS) Guidelines for Nitrogenous Fertilizer Production (2007)

1.3. Project Description

Myanma Shwe Nagar Agricultural Group Co., Ltd. (MSNAG) was registered as a private company limited by shares in September, 2016. (Company Registration No.103009898)
The proposed project site is on the Twantay -Maubin Road, at the bank of Twante Canal and located at Plot No. (124.A), Ku Lar TanVillage Tract, Twantay Township in Yangon Region.

The followings are the brief of project description.

Project Descriptions	
Project Developer	Myanma Shwe Nagar Agricultural Group Co., Ltd.
Type of Project	repackaging, storage and sales of fertilizers
Location	Plot No. (124.A), Ku Lar TanVillage Tract, Twantay Township in Yangon Region
Investment types/Investor	Local investment Daw Kyin Htay (CEO) Daw Kyin Shwe (Director)
Amount of investment	USD 2.52 Million
Investment Period	30 years
Capacity	Approx; (1,500,000 tons/year) 9 different types of fertilizers

Water Requirement	Approx- (1,400,000) gal/year
Source of Process Water	Underground (Tube Well), Depth; ~65m (200 ft-400ft)
Power Requirement	(2000 KVA)
Source of Electrical Power	MEPE
Raw materials	Urea, Ammonium Sulphate, Ammonium Chloride, Muriate Potash, Diammonium Phosphate (imported from foreign countries)
Land used	27.77 Acre
Effluent	Factory and Domestic effluent; Sewage treatment facilities will be provided for all sewage generated on site.
Solid waste management system	Recyclable domestic waste will be recycled. Other domestic waste will be disposed of in a domestic waste disposal site as directed by Township CDC.
Contact Person / Responsible person	Daw Thazin Nyunt 09889570664, Email. myanmashwenagaroffice@gmail.com
No. of Workers Used	135 employees

Construction and Operating Date

Construction start time	1.2.2016
Operating / production start time	10.9.2019

Factory Layout

The total area of land is 27.77 acres. The factory is constructed by six main buildings and four apartments. They are

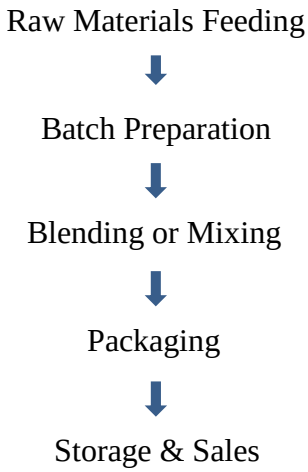
- 4 warehouse building (329 ft x 265 ft) (each)
- 2 workshop building (108 ft x 265 ft) (each)
- 4 apartment building include office (25 ft x 60 ft) (each)

Production Process

The company imports a wide range of high quality fertilizers and raw materials from abroad The MSNAG will formulate 9 different types of high quality packaging fertilizers (Shwe Nagar Pin Tat, Top One, Sin Phyan, 25:7:8 (Compound), 19:19:19 (Compound), 15-5-20 (Multi purpose), 15-5-24+5MgO+4S (Multi purpose), Pa Lae Thar, Daung Min) and will be repackaged and distributed to have total capacity of 1,500,000 tons per annum with advanced production using foreign modern equipment.

The production method of the nine fertilizers is the same. There are nine types depending on the type of raw materials (ingredients) and the ratio of ingredients.

The nine different types of compound fertilizer will be repackaged according to required ratio in order to distribute at the local markets that user can effort. The general flow stages of repackaging processes are show below.



Overview Operation steps in factory

1.4. Description of the Surrounding Environment

The proposed project is located at Plot No. (124.A), Ku Lar TanVillage Tract, Twantay Township in Yangon Region. It is located at the central coordinates of Latitude 16°43'25.6"N and Longitude 96° 00'04.4"E and 20 ft on above sea level. Vicinity around the farms is located in the east and west of the factory. To the north is Twantay-Maubin Road, and to the south is Twante Canal. The nearest community is Kan Pat Yoe Village and located in the west direction. The baseline components of the project area including physical, biological, socio-economic, cultural and visual are described in the Section-5 of this report. The information provided in this section is based on data collected from primary and secondary sources. Secondary sources include a desktop review of published information, supplemented with information provided by project proponent and township profiles from official township data of Twantay Township. Primary social data and environmental onsite measurements (noise, air, and water quality) were collected in June, 2022. Quality results are found the guideline in accordance with the NEQG. (See details in chapter 5)

1.5. Key Potential Impact and Proposed Mitigation

The proposed factory is already built and initials operation state, so the study focused on the potential impacts associated with the operation and decommissioning of the project. Potential environmental impacts during decommissioning are likely to be temporary and localised to the study area. Potential impacts during operation, include those related to noise, odour, community health and safety, and occupational health and safety. The EIA concluded with little evidence of adverse consequences on the majority of environmental or social receptors. These potential impacts, residual impact and the associated mitigation measures are summarised in Table 1.1. There will be low cumulative impacts because there will be no related projects in the vicinity of the proposed project, but traffic will be slightly increased on the Twantay-Maubin road.

1.6 Environmental Management Plan

The Environmental Management Plan (EMP) of proposed project was prepared by using the finding of potential environmental impacts during operation phase, the current condition of environmental baseline data and surround area of project site, site visit activities at project site and discussion of project status with the proponent. The EMP includes a schedule and designation of responsibility for the implementation of mitigation measures and a summary of key mitigation measures is presented in Table 1.1.

Monitoring will be conducted to ensure compliance with regulatory requirements as well as to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts. The Environmental Monitoring Plan is provided in Table 1.2. (See details in Chapter 8)

Summary of Impacts and Mitigation Measures

Potential Impacts	Summary of Mitigation Measures of EMP	Impact Significance[1]	Residual Impact Significance[2]
Operation Phase			
Air Quality	- Install exhaust ventilation system at emission / release points of factory room - Insignificant PPE shall be provided to workers such as facemasks with appropriate filters for dust removal and air purification - Regular maintenance of equipment and machines.	Medium	Low
Noise	- Avoid the use of noise producing machines, - Give the PPE for noise (earphone) working in noisy area - Give the sufficient time to rest for the workers working in noisy area. - Provide noise control measures for generator such as silencer and muffler	Low to Medium	Negligible
Water Quality	- All drainage facilities and sediment control structures should be inspected and maintained on a regular basis. - A sewage system will be constructed for the factory and dormitory building. Sewage should be treated to meet the Myanmar NEQG on Site Runoff and Waste Discharges before drained to the site drainage system.	Medium	Low
Waste Disposal	- A Waste Management Plan (WMP) for the Project should be developed and implemented covering different aspects of waste management including waste generation, storage, recycling, treatment, transport and disposal.	Low to Medium	Negligible
Socio-economic	- The local community must not be exploited. If they are employed, they should receive proper contracts in accordance to the Labour Act. - Ensure total compliance with national labor and employment laws; - Promote the fair treatment, non-discrimination and equal opportunity for workers; and - Promote safe and healthy working conditions.	Low to Medium	Negligible
Occupational Health and Safety	- Implement controls and mitigation measures according to World Bank Group Environmental, Health and Safety (WBG EHS) Guidelines for Nitrogenous Fertilizer Production (2007) for Process safety, Chemical Exposure and Fire and Explosions. - Submission of the procedure and supporting PPE and OHS documentation (e.g. safety plan, procedures, chemical safety data sheet, work instructions)	Low to Medium	Low

Community Health and Safety	- Ensuring health check-ups of all laborers employed at the project site to screen pre-existing communicable diseases - Follow the "Guideline for Prevention and Control of Coronavirus Disease 2019 (COVID-19), In factories, workplaces and construction sites" release date (19-4-2020) by the Ministry of Health and Sports - Prepare and implement a Traffic Management system through a combination of education and awareness-raising, and the adoption of Traffic Safety procedures with in order to reduce risk to the local communities.	Low	Low

Potential Impacts	**Summary of Mitigation Measures**	**Impact Significance[1]**	**Residual Impact Significance[2]**
Decommissioning Phase			
Air Quality	- Sprinkle water around the project site and roads. - Prohibiting the burning of waste or vegetation on site - Avoidance of intensive operation of demolition machineries	Low	Negligible
Noise	- Avoid running demolition machineries at the same time; and also to avoid working at night - Adoption of good site practices such as well-maintained equipment to be operated on-site, shut down or throttled down between work periods for machines and plant items (e.g. trucks) that may be in intermittent use, reduce the number of equipment operating simultaneously as far as practicable, etc.	Low	Negligible
Waste Disposal	- A Waste Management Plan (WMP) for the Project should be developed and implemented covering different aspects of waste management including waste generation, storage, recycling, treatment, transport and disposal.	Low	Negligible

Socio-economic	- MSNAG will provide and recommend their employees in applicable jobs at other factories in or near the industrial zone if feasible. If it is not feasible to appoint in other factories, extensive and comprehensive warning to employees to allow them to source alternative livelihood will be taken early and will pay compensation according to the national labour rules and regulations.	Low to Medium	Low
Occupational Health and Safety	- Implement controls and mitigation measures according to World Bank Group Environmental, Health and Safety (WBG EHS) Guidelines for Construction and Decommissioning (2007) for working at height, over-exertion and lifting operations. - Submission of the procedure and supporting PPE and OHS documentation (e.g. safety plan, procedures, work instructions) -	Low	Negligible
Community Health and Safety	- Ensuring health check-ups of all laborers employed at the project site to screen pre-existing communicable diseases - Follow the "Guideline for Prevention and Control of Coronavirus Disease 2019 (COVID-19), In factories, workplaces and construction sites" release date (19-4-2020) by the Ministry of Health and Sports	Low	Negligible

[1] before implementation of Mitigation and Management Measures
[2] after implementation of Mitigation and Management Measures

Table 1.1(A) Summery of Management Programme at Operation phase

Item	Potential Negative Impact/ Issue	Mitigation and Management Action	Frequency	Roughly estimated cost (USD)	Responsible Party
Air Quality	- Fugitive Dust Emissions - Vehicular Emission	- Insignificant PPE shall be provided to workers such as facemasks with appropriate filters for dust removal and air purification - Regular maintenance of equipment and machines. - Air Emissions in line with National Environmental Quality (Emissions) Guidelines	Daily	USD 500 / month for PPE	Project Management Team and Monthly report to MSNAG
		- Install exhaust ventilation system at emission / release points of factory room	Once	USD 30,500 included in construction cost	
		- Green barriers with tall growing thick foliage plants species will be developed around the project lease area towards noise transmission and dust dispersion	Weekly	USD 1,500 / yr for plantation & Gardening	
Noise	Noise due to factory operation activities	- The generators sets will be provided with silent type (acoustic enclosures)	Once	USD 500	Project Management Team and Monthly report to MSNAG
		- For safety of workers at noisy area in site, Personnel Protective Equipment (PPE) would be provided and ensured for using the same.	Daily	PPE cost included in above	
		- Regular monitoring for noise emissions in line with NEQEG	Monthly	included in monitoring cost	
		- Installation of natural barriers at facility boundaries, such as vegetation curtains or soil berms - Installation of proper sound barriers and / or noise containments, with enclosures and curtains at or near the source equipment	As necessary	included in construction cost	
Water Quality	Uncontrolled runoff, improper wastewater, solid waste and	Sewage from the operation workforce should be treated on-site by a septic tank and seepage field properly designed and maintained according to	Once	included in construction cost	Project Management Team and Monthly report to

	hazardous material management at the site, affecting surface water quality of watercourse. And office facilities; and - Clearing land for operational purposes;	WBG General EHS Standards (2007) as follows: • Installed in areas with sufficient soil percolation for the design wastewater loading rate; • Installed in areas of stable soils that arenearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters; • Grease trap should be installed at sources where oily water is expected; and • Residual sludge should be collected and disposed of properly.			MSNAG
		- All wastewater from Project Site will be fully collected and treated to comply with applicable standards at the proposed wastewater treatment plant.	On going in Operation Phase	-	
		- Measuring water quality	Every six months	included in monitoring cost	
Soil	Improper solid waste and hazardous material management at the factory	- implementing a waste management system to prevent spillages of wastes - Oils, fuels and chemicals should only be used and stored in designated area that has pollution prevention facilities.	On going in Operation Phase	Included in the operation costs	MSNAG coordinate with the Township CDC
Waste Management	Factory Process Wastes and Domestic Wastes	- Waste should be segregated at source by types of waste and systematically disposed into separate containers. - Waste disposal facilities shall be sited and signposted throughout the site; - Use marked bins to segregate hazardous and non-hazardous wastes. - 3R (reuse, refuse, recycle) should be promoted for employees by awareness-raising campaigns and environmental education program.	Monthly	Included in the operation costs	MSNAG coordinate with the Township CDC

Socio-Economic	Increase in Crime and Conflict with Local People	- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship, which is necessary for smooth functioning of the project as well as progress and welfare of the people in the sorrounding area.	On going in Operation Phase	included in CSR	Project Management Team and Monthly report to MSNAG
		- Projectworkers should be clearly identifiable. Overalls should have the logo of the MSNAG Company on it and should wear identification cards.	On going in Operation Phase	- included in operation cost	
		- Project site to be fenced and access to be controlled	As necessary	- included in construction cost	
Health and Safety	Occupational safety and health	- Signage in hazardous and risky areas, installations, materials, safety measures, emergency exits, and other such areas should be in accordance with international standards (including standards of cleanliness, visibility and reflectance in areas of potentially poor illumination or sources of dust and pollution), be known and easily understood by workers, visitors, and as appropriate the general public; - Ventilation systems and life and fire safety systems in all buildings.	Once	included in operation cost	Project Management Team and Monthly report to MSNAG
		- Implementation of specific personnel training on worksite health and safety management including a communication program with a clear message about corporate management's commitment to health and safety; - Adequate PPE and suction hoods will be used to collect vapours and other fugitive emissions. - Preparation of emergency response plans specifically applicable to exploration and production activities and sufficient number of first aid trained employees to respond to	On going in Operation Phase	included in operation cost	

		emergencies;			
	Community Health and Safety	- EHS Management Plan will be developed to reduce potential impacts of nearby communities. - Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community - The prevention and control of communicable and vector-borne diseases also applicable to project operation activities - prepare and implement a Traffic Management system through a combination of education and awareness-raising, and the adoption of Traffic Safety procedures with in order to reduce risk to the local communities.	On going in Operation Phase	included in operation cost	MSNAG coordinate with the Local Health Department
Accidental Events	Fire risk	- Fire protection / fighting system will be installed at the factory building, office and warehouse - Develop firefighting plan and evacuation plan including communications protocols and measures to control any fires that do arise - Conduct fire training and response drills	On going in Operation Phase	included in operation cost	MSNAG coordinate with the Local Fire Department
	Leaks and Spills	- Oils, fuels and chemicals should only be used and stored in designated areas, which have pollution prevention facilities. - Guidelines and procedures should be established for immediate clean up actions following any spillages of oil, fuel or chemicals.	On going in Operation Phase	included in operation cost	Project Management Team and Monthly report to MSNAG

Table 1.1(B) Summery of Management Programme at Decommissioning phase

Item	Potential Negative Impact/ Issue	Mitigation and Management Action	Frequency	Roughly estimated cost (USD)	Responsible Party
Air Quality	- Fugitive Dust from earthworks - Vehicular Emission	- Water spraying of demolition area - Establish and enforce speed limits of working vehicles - Prohibition of idling of vehicles	Daily	USD 1,000 / month for Water spraying	Contractor and MSNAG
		Avoiding demolition works during strong wind	As necessary		
Noise & vibration	Noise and vibration due to demolition and transportation activities	- Avoid running demolition machineries at the same time; and to avoid working at night. - No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. - regular inspection and maintenance of all vehicles and equipment working onsite	Daily	-	Contractor and MSNAG
Waste	Generation of solid waste from demolition works	- Keeping tidy in the demolition site - Setting up separate waste stock yard to promote the recycling and reuse the soil waste - Regular inspection of waste storage yard to check the status of segregation	Weekly	-	Contractor and MSNAG
Socio-Economic	Loss of Jobs and Revenues	- The project proponent, Myanma Shwe Nagar Agricultural Group Co., Ltd (MSNAG) will have a plan not to close the entire project totally and intend to use another business purposes to retain the loss of job for local people and to keep the revenues for the Government. - MSNAG will provide and recommend their employees in applicable jobs at other factories in or near the industrial zone if feasible. If it is not feasible to appoint in other factories,	As necessary	-	Contractor and MSNAG

		extensive and comprehensive warning to employees to allow them to source alternative livelihood will be taken early and will pay compensation according to the national labour rules and regulations.			
Health and Safety	Occupational safety and health	- Design an occupational health and safety management plan, which will be a subset of the overall ESMP, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors. - Submission of the procedure and supporting PPE and OHS documentation (e.g. safety plan, procedures, work instructions);	On going in Decommissioning Phase	included in project closure cost	Contractor and MSNAG
	Community Health and Safety	- A Contractor EHS Management Plan will be developed to reduce potential impacts of contractors‟ activities to nearby communities. - Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community - The prevention and control of communicable and vector-borne diseases	On going in Decommissioning Phase	included in project closure cost	Contractor and MSNAG coordinate with the Local Health Department

Table 1.2(A) Summary of Environmental Monitoring at Operation phase

Impact Source	Monitoring Item	Monitoring Means	Proposed Monitoring Locations	Frequency	Responsibility	Roughly estimated cost (USD)
Operation phase						
General	Monitoring of mitigation measures and aspects for monitoring in Environmental Management Programme at Operation phase (Table 1.1)	Visual inspection of all active work areas and inspection of records	Project activity areas	As per EMP Programme table	MSNAG	included in operation cost
Air Quality	NO_2, SO_2, PM_{10},$PM_{2.5}$, CO_2, H2S, VOC	Site Measurement	inside the factory compound	Every six months	MSNAG	USD 1,500 / survey
Noise	Noise level in dB(A)	Site Measurement	inside the factory	Every three months	MSNAG	USD 500 / survey
Water Quality (Domestic usage)	Turbidity, Chemical oxygen demand, pH, Temperature Total suspended solids	Site Measurement & analysis in Lab	(1 point) tube well water inside the factory compound	Every six months	MSNAG	USD 200 / survey
Water Quality (Treated effluent of factory)	Ammonia, Arsenic, Biochemical oxygen demand Chlorinated organics, Chemical oxygen demand, Chromium (hexavalent) Chromium (total) Copper, Mercury, Nitrorganics, pH, Oil and grease, Total phosphorus, Temperature Total suspended solids, Zinc	Site Measurement & analysis in Lab	(1 point) effluent of final factory outlet	Every six months	MSNAG	USD 250 / survey

Soil Quality	TOC, N, P, K, EC, Na, Mg, Ca, Pb, Zn,	Site Measurement & analysis in Lab	inside the factory compound	Every six months	MSNAG	USD 250 / survey
Accident	Record of information sharing of factory works for safety Record of hazardous material management, including handling, storage, and transport activities for safety Record of traffic accidents	Check records	at factory	Weekly	MSNAG	-
Utilities consumption	Record of water & fuel used	Check records	-	Monthly	MSNAG	-

Table 1.2(B) Summary of Environmental Monitoring at Decommissioning phase

Impact Source	Monitoring Item	Monitoring Means	Proposed Monitoring Locations	Frequency	Responsibility	Roughly estimated cost (USD)
Decommissioning phase						
General	Monitoring of mitigation measures and aspects for monitoring in Environmental Management Programme at Decommissioning Phase (Table 1.1)	Inspection and record to check	-	As per EMP Programme table	Contractor and MSNAG	included in project closure cost
Air Quality	NO_x, SO_2, PM, CO_2	Site Measurement	at demolition works	Every six months	Contractor and MSNAG	USD 1,500 / survey
Noise	Noise level in dB(A)	Site Measurement	at demolition works	Every six months	Contractor and MSNAG	USD 500 / survey
Water Quality	pH, BOD, COD, SS, TSS, TDS, Pb, Zn, Oil & Grease	Site Measurement & analysis in Lab	outlet of effluent demolition site	Every six months	Contractor and MSNAG	USD 200 / survey
Soil Quality	TOC, N, P, K, EC, Na, Mg, Ca, Pb, Zn,	Site Measurement & analysis in Lab	Soil in rehabilitation area (mine pit & TSF)	Every six months	Contractor and MSNAG	USD 200 / survey
Accident	Record of information sharing of demolition work for safety Record of awareness rising activities for safety Record of traffic accidents	Check records	at demolition workplace and along access road	Weekly	Contractor and MSNAG	-

1.7. Public Consultation and Disclosure

Public consultation meetings were held on July 13, 2018 with various relevant stakeholders at the factory meeting room of (MSNAG) in in Twantay Township, No. (124-A) near Ku Lar Tan Village Tract. In addition, the second meeting was held on 1 May 2022 at the meeting hall of MSNAG fertilizers repackaging factory as the consultation needs to be updated in time according to the guidance of the Department of Environmental Conservation. The consultation helped the project to gather information on potentially affected people, and on potential data gaps and how these can be closed out in the EIA report. These consultations involved public meetings with a range of stakeholders in Twantay Township including Township GADs, village administrators, CSOs/NGOs, related government departments and local communities and community representatives.

The date, time, location, stakeholder and purpose of each meeting is provided in Table 1.3.

Table 1.3 Consultation Activities

Location	Purpose of Engagement	Date, time
Twantay Township GAD Office	Inform project information Meeting arrangements and approvals	20th April, 2018
Ku Lar Tan Village Tract (Village administrator house)	Meeting arrangements and approvals Undertake socio-baseline data collection	21th April, 2018
Tan Phyu Yone Village, Kan Pat Yoe, Htantapin Village	Inform project information and Undertake socio-baseline data collection	22th to 23th April, 2018
First public meeting MSNAG (Factory Meeting Room)	Present Project information to local government, village administrator, local communities and other interested parties Gather concerns and suggestions from stakeholders	13th July, 2018
Twantay Township GAD Office	Meeting arrangements and approvals	25th April, 2022
Second public meeting MSNAG (Factory Meeting Room)	Present Project information to local government, village administrator, local communities and other interested parties Gather concerns and suggestions from stakeholders	1th May, 2022

Table 1.4 Summaries of Comments Received during Engagement

Key Comments Received	**Response**
First public meeting	
- Odor, especially when passing in front of the factory. The key concern related to public health and safety. - Dispersion of dust particles sometimes seen - I want to know about job opportunities.	- Job opportunities will be available and Locals will be screened and appointed - Technology for dust and odor control; We will consult with experts. - This Supplementary EIA will assess theimpact on Public Health and Safety from airand noise emissions. The baseline survey results from air,

	noise, soil, water and biodiversity will be disclosedto the community.
Second public meeting	
- Now it odor less - Farmers in nearby villages should be provided with discounted the price of fertilizers	Due to the change in the type of raw material during the production process, the odor is reduced. MSNAG will sell fertilizers at cheaper prices to local farmers.
Stakeholders wanted to emphasise that it is important to ensure the community can understand the information provided from the project.	The Regulatory EIA Report will have a Myanmar language executive summary to ensure information is easily available to local communities.
Transparency of the monitoring and auditing process during operation was of key importance to the stakeholders.	The grievance mechanism and future disclosure will be provided to all PAPs in the area.

1.8. Conclusion

The EIA study for the proposed project was started in March, 2018 and compliance with the Environmental Conservation Law (2012) and Environmental Impact Assessment Procedures (2015). The EIA Study focused on the potential impacts associated with the operation of the proposed fertilizers repackaging factory.

The Project Proponent will fully follow the environmental management practices, procedures and responsibilities, commitments, mitigation measures according to this EIA. Moreover, due to this project, the livelihood of the local community will be more developed as well as resulting in government revenues.

2. INTRODUCTION

2.1 Project Background

Myanma Shwe Nagar Agricultural Group Co., Ltd. proposes to conduct EIA for Fertilizers Repackaging Factory in Plot No. (124.A), Ku Lar TanVillage Tract, Twantay Township in Yangon Region. This company was founded in 2016 and mainly invested in Myanma agri-business sector. Not only by distribution fertilizers, insecticides, herbicides and plants growth regulators but also sharing and extension agricultural practices and techniques. The type of business of the proponent is a 100% local investment established under the Myanmar Companies Act. The Project is a factory that repackaging and distributing of the fertilizers. The necessary raw materials will be imported from China, India and other foreign countries. The MSNAG will formulate 9 different types of fertilizers and is expected to have an initial capacity of 1,500,000 tons per annum of high quality products.

2.2. The Aim of the Project

The aims and objectives of the proposed project are;

(a) To distribute good quality of fertilizers with reasonable product price,
(b) To knowledge sharing and extension agricultural practices and techniques
(c) To improve in local area by providing additional employment opportunities to the skilled as well as unskilled people, and
(d) To participate in upgrade of Myanmar Agricultural Sector

2.3. Brief of the Project Proponent

The followings are the brief of project proponent.

Company Name	Myanma Shwe Nagar Agricultural Group Co., Ltd
Company Registration No.	103009898 (Dated: 26.9.2016)
Project promoter	Daw Kyin Htay (CEO) Daw Kyin Shwe (Director)
Type of Project	repackaging, storage and sales of fertilizers
Company Address	No.402, U Phoe Hlaing Street Shwe Lin Ban Industrial Zone, Hlaing Thar Yar Tsp,Yangon, Myanmar.
Project Address	No. (124.A), Ku Lar TanVillage Tract, Twantay Township, Yangon Region.
Contact Person / Responsible person	Name : Daw Thazin Nyunt
	Phone : 09889570664
Email	myanmashwenagaroffice@gmail.com
Website	https://myanmashwenagar.com
Investment types	Local owned investment
Amount of investment	USD 2.52 Million
Investment Peroid	30 years

List of Shareholders

Sr. No.	Name	Designation	Share Ratio
1	Myanma Shwe Nagar Agricultural Group Co., Ltd		100%
	Daw Kyin Htay	CEO	
2	Daw Kyin Shwe	Director	

2.4. Brief of the Environmental Assessment Practitioner

Below is the background information on HRD Environmental Training and Service Co., Ltd., (Third party) who will conduct the ESIA.

HRD Environmental Training and Service Co., Ltd.	
Company Name	HRD Environmental Training and Service Co., Ltd.
[DICA] Company Registration No.	117441881 3633/2016-2017 (Ygn)
[ECD] Consultant Registration No.	00071
Contact Address	Room.3, Bdg.2, Quarter 3, Insein Road, Mayangon Township,Yangon
Telephone Number	+95 49201658, +95 9256036414
E-mail	hrd.environment2019@gmail.com, aunglaytin@gamil.com
Contact person	Prof. Dr. Aung Lay Tin Senior ESIA Team Leader 09256036414

2.5. Selected Consultants for Conducting EIA

This EIA for the Myanma Shwe Nagar Agricultural Group Co., Ltd. by HRD Environmental Training and Service Co., Ltd. The environmental study was carried out by the project listed below and following is a summary of team member's responsibilities during the study period. This EIA report represents the objectives, methodology and outcomes of in line with the Environmental Impact Assessment (EIA) Procedure. Below Table presents key team members for the preparation of this EIA.

Key Environmental and Social Consultants for the Project

Serial No.	Full Name	Education	Responsibility
1	Dr.Aung Lay Tin	BE,ME,Ph.D (Mining,YTU)	Management and Others
2	Dr.Khaing Zaw Naing	Ph.D(Chemical),Russia	Chemical Analysis
3	Daw Yin Mar Swe Hlaing	Dip.EIA/EMS,,	Management and Others
4	Daw Ohn Mar	B.Sc (Hons:), M.Sc. Zoology, M.S (Biotechnology)	Ecology and Biodiversity;
5	U Myo Thant Naing	BE(Mining),RIT,2002	Facilitation of meeting
6	Daw Swe Mar Kyaw	A.G.T.I (EP),Pyay, B.Sc (Phys;),2003, Dip.EIA/EMS,MS (EAM)	Socio-Economy
7	Daw Thet Hnin Hnin Su	BSc,(forest), Dip.EIA/EMS, MS (EAM)	,Social
8	Daw Thazin Htwe	BE(IT),Thanlyni,2009 Dip.EIA/EMS,MS (EAM)	Socio-Economy
9	U Thant Zin	Bsc(Forest), 2015, Dip. in EIA & EMS	Ecology and Biodiversity;
10	Daw Khin Than Sin Aye	BE(Civil),Magaway TU,2014 ,ME (CIVIL),YTU	Ground water and Hydrology;
11	Daw Thin Naing Aye	BE(Civil),Hmawbi,2013 ME (CIVIL),YTU	Ground water and Hydrology;
12	Daw Nilar lwin	BE(Civil),Hmawbi,2013 ME (CIVIL),YTU	Ground water and Hydrology;
13	Yuzana Moe Myint	Bsc(Forest), 2014, Dip. in EIA & EMS	Socio-Economy;
14	Nanda Nwe	BE(CEIT),Hmawbi, Dip.EIA/EMS,MS (EAM)	Socio-Economy;
15	U San Oo	Bsc(geology),Magway,2007, M.Eng(Gadjah mada University, Indonesia,2012	Geology and Soil
16	Dr.Myo Myint	Ph.D (Biotech)	Biodiversity
17	Dr.Zaw Khaing OO	Ph.D (Biotech)	Biodiversity
18	Dr.Yee Mon Tun	Ph.D (Biotech)	Biodiversity

2.6. Purpose of the Report and Process

This Environmental Impact Assessment (EIA) study focused for the operation of the proposed fertilizers repackaging factory. The report has been prepared according to Myanmar Environmental Impact Assessment Procedure which was notified on 29th December 2015 by the Ministry of Natural Resources and Environmental Conservation (MONREC) formerly known as Ministry of Environmental Conservation and Forestry (MOECAF). The project proponent is Myanma Shwe Nagar Agricultural Group Company Limited.

This report identify the location and characteristics of the proposed project, determine the study area and identify the likely significant impact on both physically and biological environments. This report will assist the MONREC providing formal advices and respect to the issues to be addressed and, subsequently to be included in the EIA report.

The field studies will be carried out by the HRD Environmental Training and Services Co., Ltd. with experience in conduction various kinds of environmental services including environmental impact assessment for various development projects in Myanmar. The team will conduct preliminary scoping, survey (social and environmental) and assessment activities and prepare the report. The significance and magnitude of impact from construction, operation and decommissioning processes will then be evaluated. However, the building for proposed project has constructed and so the impact from construction phase will be omitted. For those impacts requiring mitigation, suitable measures will be proposed in the final EIA report to reduced impacts to within acceptable limited.

2.6.1 The EIA Requirement

According to Myanmar Environmental Conservation Law 2012, the proponents of every development project in the country have to submit an Environmental Management Plan (EMP) or Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) to the Ministry of Natural Resources and Environmental Conservation (MONREC). On behalf of MONREC, the Environmental Conservation Department (ECD) which is responsible for implementing National Environmental Policy, strategy, framework, planning and action plan for the integration of environmental consideration into in the national sustainable development processes.

Environmental Impact Procedure (2015) includes. This categorization set out what type of investment requires IEE and EIA.

In addition, Myanmar Environmental Impact Assessment Procedure notified on 29th Dec 2015 includes some basic provisions on EIA, including the 'Project Categorization for Initial Environmental Examinations and Environmental Impact Assessments (IEE/EIAs)'. This categorization set out what type of investment requires IEE and EIA. Thus, in the procedure stated that for those projects related to fertilizer repackage and storage require to prepare EIA report and submit to ECD. Thus, the proponent commissioned with HRD Environmental Training and Services Co., Ltd. to study environmentally and socially so as to prepare the EIA report.

2.6.2. Scoping Objectives

The purpose of the scoping process is to identify key issues specific to the project or the receiving environment, which are to be addressed in detail in the EIA process. The determination of the significant issues to be assessed for potential significant impacts will be determined the primary and secondary data. Regarding the collection of primary data, baseline environmental data relating to physical, biological and socioeconomic sources will be gathered by direct observation, sample survey, and discussion with local people and relevant government departments. Data from State/Regional Government bodies, relevant

ministries and research institutions will be used as secondary data (reference material) in the preparation of the EIA report.

2.6.3 Objectives of The EIA Study

The aim of Environmental Impact Assessment for Myanma Shwe Naga Agriculture Group co.,ltd Project is to enable the approving authority and the developer to properly consider the potential environmental and social consequences of the project and to delineate an environmental management plan for the operation and maintenance of the project.
EIA study for Project is performed by HRD EIA Consulting Groups with the following specific objectives:
(a) to investigate the legality of the project;
(b) to study the background environmental and socioeconomic conditions of the area;
(c) to release project information for the general public acquiring public comments and suggestions;
(d) to study the environmental, social and socioeconomic issues likely to occur; and
(e) to devise mitigation and enhancement measures for key environmental and social impacts.

2.6.4 Scope of The EIA Study

The HRD Environmental Training and Services's EIA study focusing the project area and its vicinity area includes Twantay Township. General study scope of EIA team includes:

- Preliminary study – collecting and analyzing preliminary information such as project information, project location, maps and technical background;
- Scoping – carrying out field trip, identification of potential environmental impacts, and determination of what has to be covered in the EIA to which extent
- Public participation – acquiring public comments, suggestions and input for the project by means of public meetings and consultation works;
- Baseline environmental data survey – collecting baseline data relating to existing physical and biological environment of the project;
- Impact identification and assessment – identification of anticipated impacts and assessing them by using a conventional rating matrix system;
- EMP – delineation of MEMs for the anticipated negative and positive impacts;
- Report drafting – preparation of a draft report and a translated non-technical executive summary;
- Disclosure of draft report – delivering the translated non-technical summary report to stakeholders; and
- Finalizing the report – finalization of the report putting together all the information obtained.

2.6.5 ESIA Process

The ESIA process constitutes a systematic approach to the evaluation of a project and its associated activities throughout the project lifecycle. The process includes:

- Screening and Scoping;
- Project Alternatives and Base Case Design;
- Existing Environmental and Socio-Economic Conditions;
- Impact Significance Assessment;
- Mitigation and Monitoring;
- Residual Impacts; and
- Disclosure and Stakeholder Consultation.

The ESIA also includes stakeholder consultation that identifies the views and opinions of potentially affected people and other interested parties. Stakeholder feedback is used to focus the impact assessment and, where appropriate, influence project design and execution.

2.6.6 Screening and Categorization

The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories (ADB Safeguard Policy, 2009, Ministry of Natural Resources and Environmental Conservation).

(i) Category A. Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
(ii) Category B. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii) Category C. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv) Category F1. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

2.6.7 Public Consultation and Participation

EIA is intended to be a transparent process with the opportunity for public involvement from the earliest stages of project development. It is customary for the Terms of Reference to include requirements for the project proponent to engage the public and to document the results of this outreach process in the EIA document. Countries will usually provide a formal opportunity for a public hearing after the EIA document is reviewed by government staff and determined to be complete. The Model Terms of Reference included in this guideline emphasizes the importance of involving the public as early as possible to ensure that opportunities for reconciling economic, social and environmental concerns can be considered. A special section on Public Participation is included in this guideline under Section.

The public participation process included:

(i) Identifying interested and affected parties (stakeholders);
(ii) Informing and providing the stakeholders with sufficient background and technical information regarding the proposed development;
(iii) Creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and
(v) Ensuring compliance to process requirements with regards to the environmental and related legislation.

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.

2.6.8 Structure of EIA Report

The EIA Report include the key sections presented as follows:

- Executive Summary
- Introduction
- Policy, Legal and Institutional Framework
- Project Description and Alternative Selection
- Description of the Surrounding Environment
- Impact and Risk Assessment, and Mitigation Measures
- Cumulative Impact Assessment
- Environmental Management Plan
- Public Consultation and Disclosure
- Conclusion
- Statement of Commitments

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 project has to comply with, as well as the international standards that the project will follow.

3.1. Proponent's Environmental, Social and Health Policies

The main policy and commitment of Myanma Shwe Nagar Agricultural Group Co., Ltd. (MSNAG) will be identified in the following points:

- the protection of public safety, the health and safety of the workforce and the local communities;
- the protection of the environment and the conservation of biodiversity and ecosystems;
- the compliance with Myanmar laws, regulations and industrial standards regarding the environment, health, safety and hygiene at work in all of our operations;
- 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; and
- creating a culture in which MSNAG employees, Contractors and Visitors share these commitments and understand that working safely is a condition of employment.

Sustainability Policy

MSNAG'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." ----- 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."

3.2 Policy and Legal Framework in Myanmar

National Environmental Policy (1994) is the basis for the integration of environmental consideration into development in Myanmar which proclaims the Government's commitment to sustainable development. It highlights the integration of environmental considerations with development process for a better quality of life of all citizens. The

State has the responsibility to preserve its natural resources in the interest of present and future generations and that environmental protection should always be the primary objective in seeking development.

The ***Myanmar Agenda 21*** was developed in 1997 for all natural resource management and environmental conservation work in pursuit of activities relating to biodiversity conservation.

National Sustainable Development Strategy (NSDS) prepared in 2009 includes three goals: (i) sustainable management of natural resources; (ii) integrated economic development and (iii) sustainable social development. One of the Government's main priorities is to mainstream sustainable environmental considerations into the national development planning and to develop an effective safeguards system to prevent the social and environmental impacts associated with rapid economic growth.

Legal Framework

Environmental Conservation Law

Myanmar enacted the ***Environmental Conservation Law*** on 30th March, 2012 as Pyidaungsu Hluttaw Law No.9/2012. There are eight objectives of the law which stress on (i) implementation of Myanmar National Environmental Policy, (ii) integration of environmental conservation in sustainable development, (iii) emerging healthy and clean environment and conserving natural and cultural resources, (iv) reclaiming ecosystems, (v) sustainable and beneficial use of natural resources, (vi) promoting public awareness and cooperation, (vii) promoting international cooperation, (viii) and cooperation with government departments, INGOs, NGOs and individuals for the matters of environmental conservation.

There are 42 paragraphs in 14 sections of the law. Paragraph 14 of the law stipulates that "*a person causing a point source of pollution shall treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards*".

Moreover, paragraph 15 of the law says that "*the owner or occupier of any business, material or place which causes a point source of pollution shall install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods*". According to paragraph 39(b) of the law, if any terms and conditions of environmental conservation contained in the prior permission for a business is not complied with, the power to cancel the issued license, permit or register or suspend it for a limited period is granted for relevant government department, or government organization.

Citizens Investment Law

The objective of the Law is to promote environmentally and socially sustainable economic growth and diversification of the productive sector of the Union, providing Investors with a set of fundamental and enforceable legal rights and guarantees to ensure that the Investors and their Investments are protected and treated with transparency,

fairness and in strict accordance with the rule of law and accepted international standards and practice. Paragraph (3) of the law stated its objective as "*After exploiting abundant rich resources of the country, aiming at the people to enjoy sufficiently and to enable the surplus to export, causing to open up of more employment opportunities for the people as the business develop and expand, causing to develop human resources, causing to develop respective union regions including infrastructure, causing to rise economic enterprise and investment business, keeping abreast with the international norms.*"

Requirement of EIA in Myanmar

In Myanmar, Environmental Conservation Law was developed in 2012. According to this law, IEE , EIA or ESIA is required for all of the projects which can have adverse impacts on natural environmental and local communities. Moreover, Environmental Impact Assessment (EIA) regulations, which are promulgated in terms of the Environment Conservation Law, 2012, already established. To proceed the proposed project, IEE, EIA or ESIA report must be prepared and submitted to the Ministry of Natural Resources and Environmental Conservation for review.

Relevant Environmental Laws and Regulations in Myanmar

Myanmar has promulgated several laws and regulations concerning protection of the environment. The relevant laws that promote environmental management in Myanmar have been adequately reviewed and applied by the EIA team.

Environmental Conservation Rules

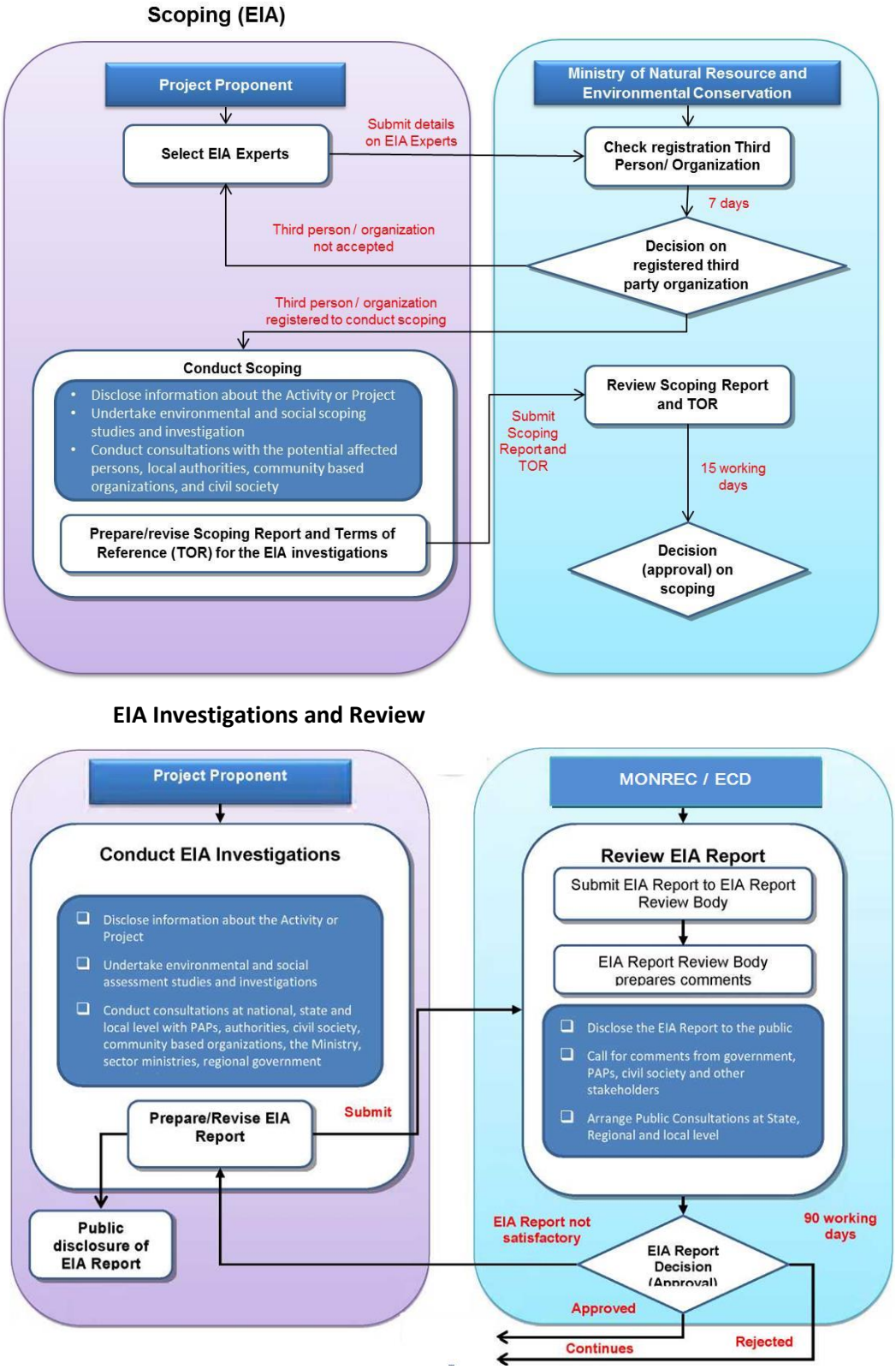
Environmental Conservation Rules are: (i) proposal for incentive mechanisms, terms and conditions for green initiatives for sustainable development to mainstream into the development sectors; (ii) establishment of the Integrated Environmental Monitoring System; (iii) conduct of Environmental and Social Impact Assessment; (iv) development of Environmental Quality Standards; (v) carrying out sustainable management and utilization of natural resources; (vi) waste management; and (vii) setting up of the Environmental Management Fund.

Environmental Impact Assessment Procedures

Former MOECAF developed the ***Environmental Impact Assessment Procedures*** which were approved in December 2015. MOECAF is already applying the main principles of EIA Procedures before their approval. Under the Foreign Investments Rules, the environmental impact assessment and social impact assessment reports are needed to be attached together with the investment proposal. Capital intensive investment projects and designated businesses need to be assessed by the MOECAF in terms of environmental impacts and compliance. Under the EIA procedures, all projects undertaken in Myanmar that can cause significant adverse impacts are required to undertake an EIA or ESIA and to obtain an Environmental Compliance Certificate (ECC).

Overview of the Scoping Procedure in Myanmar

Figure 3.1 outlines the scoping phase of the EIA Process according to the EIA Procedure (2015)



Source: EIA Procedure, 2015

Figure 3.1 EIA Process in Myanmar

3.2.1 Institutional Framework

Myanmar Regulatory Authorities

Key ministries, agencies, and state-owned enterprises that have jurisdiction or are typically involved in environmental and social impact assessment related to the Project include the following:

***Ministry of Natural Resources and Environmental Conservation (MONREC)*:** MONREC has ultimate responsibility in the environmental impact assessment process in Myanmar.

***Environmental Conservation Department (ECD)*:** The ECD of MONREC has responsibility to undertake the review of submissions under the EIA Procedure and provide recommendations to the Minister of MONREC

Ministry of Industry (MOI): Directorate of Industrial Supervision & Inspection is the responsible department for the inspection of the heavy industries and factories whether in compliance with the regulations.

Myanmar Investment Commission (MIC): MIC is a government agency responsible for coordinating with ministries (such as the MOEE) and other state entities to facilitate foreign investment in Myanmar. The MIC is also responsible for granting MIC permits which enable foreign investors to carry out business activities under the Myanmar Investment Law (2016)

A number of institutions will have a regulatory and monitoring mandate directly or indirectly under their respective pieces of legislation. However, the following will be the key institutions whose requirements will need to be complied with.

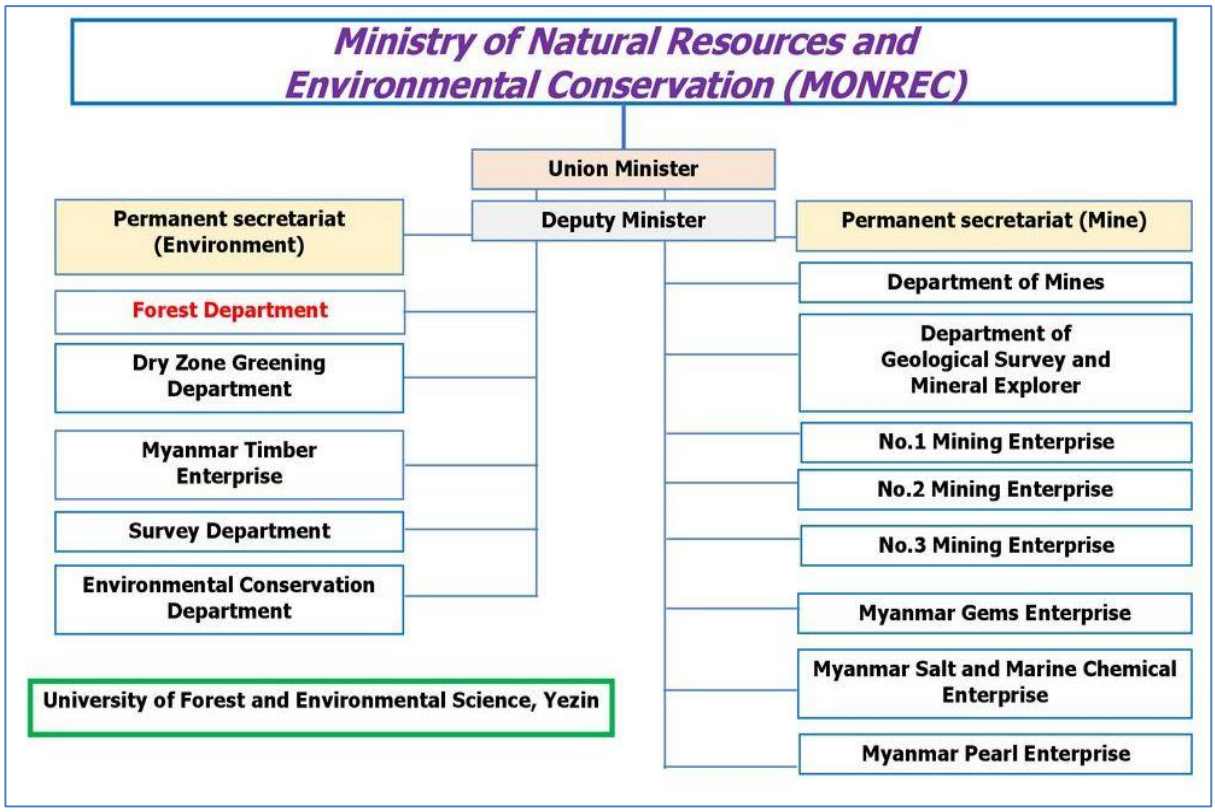


Figure 3.2 Institutional organization of MONREC

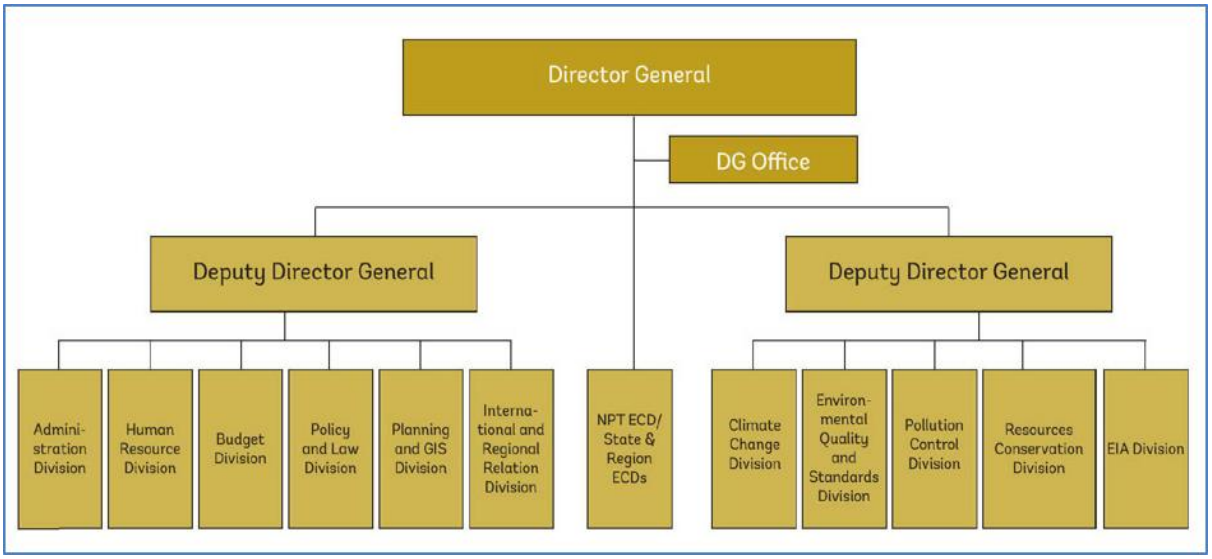


Figure 3.3 Organizational structure of ECD

Institutional Framework of Yangon Region (Relevant to the Project) as follows:

- Yangon Region Government
- Ministry of Natural Resources and Environmental Conservation
- Ministry of Municipal Affairs
- Ministry of Electricity, Energy and Construction
- Ministry of Planning and Finance
- Regional Advocate General's Office
- Regional General Administrative Office

3.2.1.1. Project Proponent

The project proponent, Myanma Shwe Nagar Agricultural Group Co., Ltd (MSNAG) consists of four divisions and the Organizational Structure of MSNAG is shown in Figure 3.2.

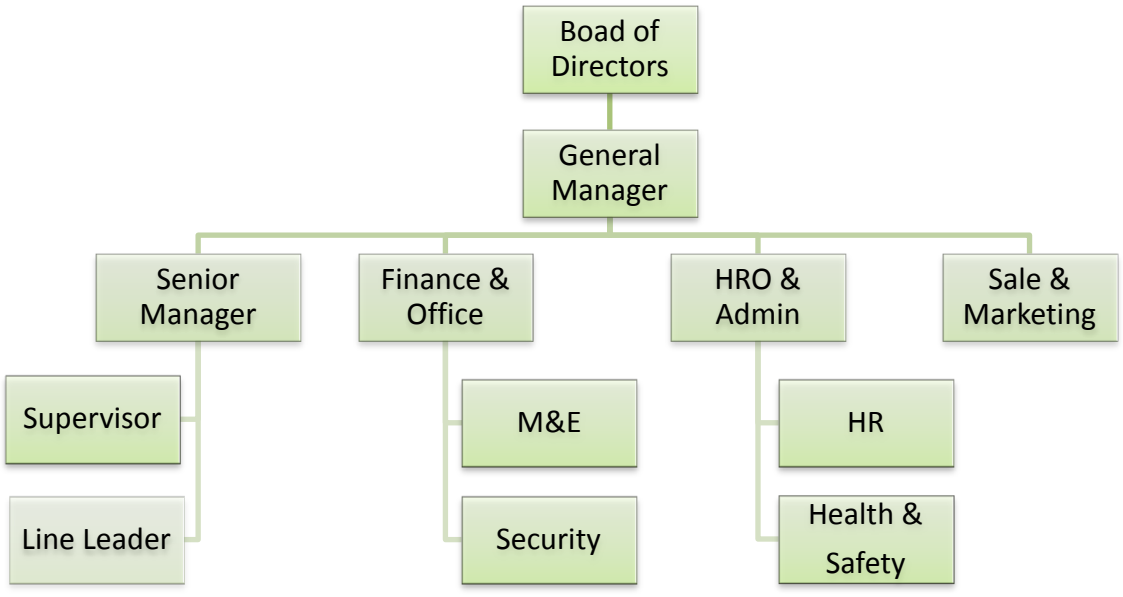


Figure 3.2. Proposed Organizational Structure of MSNAG

3.3 Myanmar Legislation Relevant to the Project

Laws relating to environmental and social issues related to the Project and hence their relevance to the EIA Study are included in Table 3.1. The project proponent commit to follow the laws and regulations stated in Table 3.1

Table 3.1. Myanmar Legislation and Relevance to Project

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), 14,15,24,32,29)	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	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 liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health.
Myanmar Investment Law (Law No. 50(d), 65(a)to(l)	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
Myanmar Investment Rules (Rule No.202,203,206,212)	2017	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

The Export and Import Law (Section 5,6)	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.
Labour Organization Law, (Law No. 1,7 to 11)	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 Labour Dispute Law, (Law No. 38, 39, 40, 51)	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, (Law No. 5, 14, 30(a,b))	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.
Minimum Wages Law (Law No. 12, 13 (a to g)	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,
Myanmar Fire Force Law,	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
Payment of Wages Act (Law No. 3,4, 5, 14, 8 with 7,10)	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 (Law No. 15, 16)	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 (Law No. 11(a), 15(a), 18(b), 48, 49, 75)	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.
Workman Compensation Act	1923	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 Workman Compensation Act
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.
Myanmar Public Health Law (Law No. 3, 5)	1972	To promote and safeguard public health and to take necessary measures in respect of environmental health.
Private Industrial Enterprise Law (No. 4, 13(b)(f)(g), 15(a)(b))	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	1992	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 Wildlife and Wild Plants and Conservation of Natural Areas Law	1994	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 (Law No. 13,15, 16)	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 (Law No. 3(a)(e), 4, 11)	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 (Law No. 9)	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;
Conservation of Water Resources and Rivers Law (Law No. 8(a), 11, 19, 21(b), 22,24(b))	2006	To conserve and protect the water resources and rivers system for beneficial utilization by the public; to prevent environmental impact.
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

(Law No. 8,15,16,17, 20, 22, 23, 27)		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 Protection of rights of National Race Law, (Law No. 5)	2015	Consists of four bills, as submitted to the legislature; Buddhist Women's Special Marriage Bill, Religious Conversion Bill, Monogamy Bill and Population Control Bill.
Myanmar Petroleum and Petroleum Products Law (No. 9(a)(e),10(e),11)	2017	▪ To carry out the petroleum and petroleum product businesses activities systematically in accordance with the provisions of the law, stipulated standards, procedures and conditions; ▪ To enable the petroleum and petroleum product business activities to carry out safely without environmental impact; ▪ To establish free and fair competition in carrying out petroleum and petroleum product business activities; To secure energy requirement and energy security of the Union;
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 (Law No. 20,24,25, 31(a), 34, 37)	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.
Trademark Law (Sec-34)	2019	- To seek protection for their products, companies can consider emphasizing trade mark protection in Myanmar to protect their brand reputation and goodwill from illegal action related to their business.
Inventive Patent Law (Sec-13, 14a Sub Sec1, 2, 8)	2019	- To protect the right of inventors for their new innovations.
Occupational Health and Safety Law (Law No. Ch6-a, Ch8-26a,30a)	2019	- To provide employment and a place of employment that is free from recognized hazards to health or safety.
Industrial Design Intellectual Property Right Law (section 42)	2019	- To protect rights over the external visual design of objects (i.e. the aesthetic design, rather than the practical). It will be implemented through administrative bodies (particularly the Intellectual Property Office) and enabling legislation that will be established and implemented in due course.
Consumer Protection Law	2019	- To promote and protect the interest of consumers over all goods and services. It will also help to clarify some of the uncertainties and ambiguities under the previous law. In the process of consumer protection, consumer's complaints are the first step of redressal. The guarantees and claimable rights are strongly vested to the consumer regarding goods and services under CPL.
Yangon City Development Committee Law	2018	It has stated that the committee has the right to: To corporate for the inspection with the concerning authority and To stipulate orders for the carriage, storage of chemical and related substances for not harming to public health and life To manage the waste regarding for the hazardous. There it has been prohibited for disposing chemical and its related substances in areas, which are not being allowed in the City Development area and mentioned offenses and penalties. - The Project Proponent commits to comply the stipulations and undertake the necessary proceeding as per this law and notification issued by the committee.

And addition . Law, By-law, Procedures,

- Yangon Region Fresh Water Fisheries Law
- Prevention of Hazard from Chemical and Related Substances law, 2013 (Law No. 15(a)(b), 16(b to j),17, 22, 27(a to d)
- The National Environment Policy, 1994
- The workman's Compensation Act, 1951
- Union Tax Law, 2019

- The Electricity Law, 2014
- The Tax Administration Law, 2019
- The Protection of Wild life and Wind Plants and Conservation of Natural Areas Law, 2018
- Conservation of Water Resources and Rivers Rule, 2013
- The Emergency Provision Act, 1950
- The Social Security Act, 1954
- The Sale of Goods Act, 1930
- Myanmar Companies Law, 2018
- Law protecting Ethnic Right, 2015
- The Underground Water Act, 1930 (Law No. 3,6)
- Occupational Health and Safety Law, 2018
- Aquaculture Law, 1989 (Law No. 29(b))
- Natural Disaster Management Law, 2013 (Law No. 13,17,19)

3.4. International Agreements and Conventions

In addition to the domestic laws listed above, Myanmar is also a signatory to the following international conventions, and these may have relevance to the proposed survey activities. Refer to the following table.

Table 3.2. 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 transboundary 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 environmentalmanagement in the country.
Relevant ILO Conventions in force in Myanmar • 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 • C52 Holidays with Pay		Sets out legal instruments drawn up by the ILO's constituents (governments, employers and workers) and setting out basic principles and rights for workers.
Workmen's Compensation (Accidents) Convention, 1925	1956	Entered in force 16 February 1956 The Project has risks to occupational health and safety.

Workmen's Compensation (Occupational Diseases) Convention 1925 and its Revision 1934	2016	Entered in force 30 Sept 1927; Revision entered in force 17 May 2016 The Project has risks to occupational health and safety.

3.5 International Policies, Guidelines and Standards

General EHS Guidelines (IFC)

The general Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general examples of Good International Industry Practice (GIIP). These General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. Use of multiple industry-sector guidelines may be necessary for complex projects. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

Environmental Assessment Guidelines (ADB)

Environmental assessment is mandated for all ADB initiatives in order to arrest environmental degradation so that the growth rates necessary to reduce poverty will be sustained and the millennium development goals will be achieved. The guidelines are to be used by ADB staff, its borrowers and consultants to provide guidance on how to fulfill ADB's environmental assessment requirements and to guide consultants who need to know ADB's policies and procedures in preparation of an EIA report. Guidance is also provided on more strategic tools such as country environmental analysis (CEA) and strategic environmental assessment (SEA). The guidelines may also be of use to NGOs and academic that are interested in ADB's environmental requirements and review processes.

National Environmental Quality (Emission) Guidelines

The guideline is stipulated by former MONREC by the provision of Paragraph (42), Sub-paragraph (b) of the Environmental Conservation Law 2012. The objective of the guidelines is to control noise and vibration, emissions and effluents in order to prevent the pollutions for the protection of human health and ecosystem.

In addition, the following guidelines and standards may be applicable:

- WHO Drinking Water Quality
- FAO Soil Bulletin 65 and Dutch Intervention Values for Soil Quality; and
- Occupational Health and Safety Administration (OHSA) standards – United States Department of Labor;
- World Bank Group & IFC- Environmental, Health, and Safety Guidelines for Nitrogenous Fertilizer Production
- Food and Agriculture Organization's Revised Guidelines on Good Labeling Practice for Fertilizers

3.6. Compliance with Environmental Quality Standards

A summary of National Environmental Quality (Emissions) Guidelines (NEQG) that are relevant to the Project for effluent discharges are shown in this section.

3.6.1. Water quality

The project proponent (MSNAG)) will follow the general National Environmental Quality Emission Guideline values (Code No. 1.2) for waste water and others, NEQEG Guidelines as prescribed by the Environmental Conservation Department (from Notification No. 615/2015, December 2015, by ECD**.**

The following standards apply to domestic wastewater, and discharges, drainage and runoff from work camps, sanitation facilities and landfills.

Table 3.3. Wastewater, Storm Water Runoff, Effluent and Sanitary Discharges (NEQG)

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 residual)	mg/l	0.2
Chromium (hexavalent)	mg/l	0.1
Chromium (total)	mg/l	0.5
Copper	mg/l	0.5
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	<3b
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.

3.6.2. Ambient Air Quality Standards

Air quality should not exceed the levels presented in Table below;

Table 3.4. NEQG Air Emissions Parameters

Parameter	Unit	Guideline Value µg/m^3
Nitrogen dioxide	1 year 1 hour	40 200
Ozone	8-hour daily Maximum	100
Particulate matter (PM_{10})[a]	1 year 24 hours	20 50
Particulate matter ($PM_{2.5}$)[b]	1 year 24 hours	10 25
Sulphur dioxide	24 hours 10 minutes	20 500

a Particulate matter in diameter = 10µm
b Particulate matter in diameter = 2.5µm

3.6.3. Ambient Noise Standards

Noise impacts should not exceed the levels presented in Table below, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.
Table 3.5. Ambient noise standards (NEQG)

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00-22:00	Nighttime 22:00-07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

3.6.4. Odour

NEQEG Standard Guideline for odorant unit is between 5 and 10.;

4. DESCRIPTION OF PROJECT AND ALTERNATIVES

4.1. Project Background

The proposed factory is the 100% local investment by Myanma Shwe Nagar Agricultural Group Co., Ltd. with an estimated capital US $ 2.52 Million. Myanma Shwe Nagar Agricultural Group Co., Ltd was founded in 2016 and mainly invested in Myanma agri-business sector. Not only by distribution fertilizers, insecticides, herbicides and plants growth regulators but also sharing and extension agricultural practices and techniques, they helped the farmer to get more yield of their crops than before. The project of the land area is 27.77 acres.

Category of Project and Background on EIA Writing

The Department of Environmental Conservation under the Ministry of Natural Resources and Environmental Conservation (MONREC) has categorized the industries based on the nature of the industry and the volume of the waste disposed into four categories:

1) No environmental assessment is required,
2) Only Environmental Management Plan (EMP) is required,
3) Initial Environmental Examination (IEE) and Environmental Management Plan (EMP) are required, and
4) Detailed Environmental Impact Assessment and Environmental Management Plan (EMP) are required.

So, That Project is Category No (4). According to the the ECD (Naypyidaw) with letter comments.

4.2 Proposed Schedule for Project Implementation

The proposed schedule of project implementation is as follows:

- Period of capital to be brought in: within one year as soon as approval from Yangon Region Investment Committee.
- Proposed Duration of Investment : 30 years
- Construction Period: completed.
- Operating / production start time 10.9.2019 (Initinal test run date)

4.3 Location of the Project

The proposed project located in Block No (124.A), Twntay-Maubin Road, Kulartan Village Tract, Twantay Township, Yangon Region. It is located at the central coordinates of Latitude 16°43'25.6"N and Longitude 96° 00'04.4"E. Myanmar Shwe Nagar Agricultural Group Co.Ltd has aimed to distribute the products by river transport and proposed to fertilizer repackaging factory at the bank of Twante Canal that connects the Ayeyarwady River and Yangon River. It is 35 Km long and heavily used short cut between the city of Yangon and the Irrawaddy Regions.

The location map of project area is shown in the following figure.

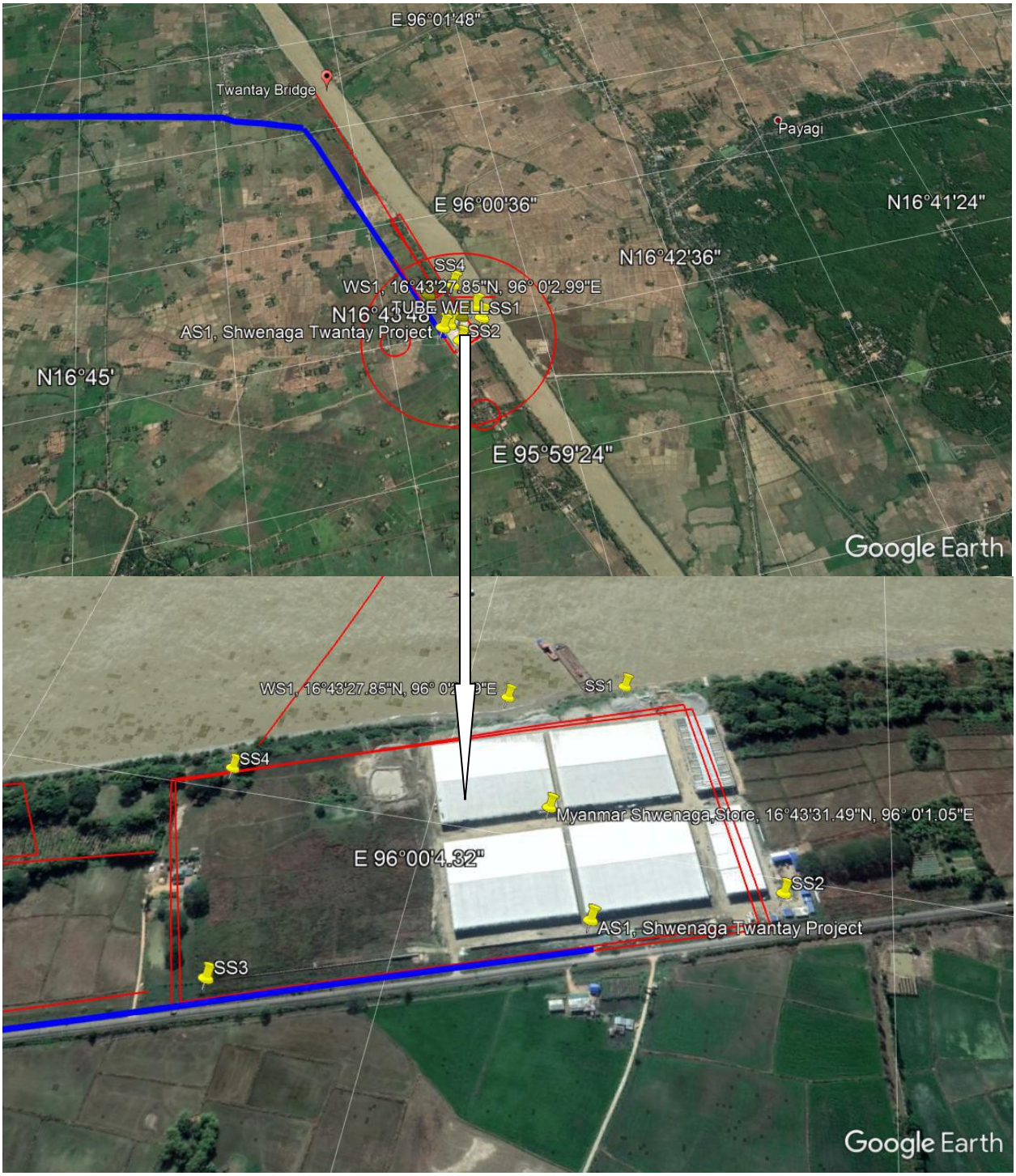


Figure 4.1 Location of the Proposed Project

Figure 4.2 Satellite Map of the Proposed Project

4.4. Proposed Project at a Glance

Project Descriptions	
Project Developer	Myanma Shwe Nagar Agricultural Group Co., Ltd.
Type of Project	repackaging, storage and sales of fertilizers
Location	Plot No. (124.A), Ku Lar TanVillage Tract, Twantay Township in Yangon Region
Investment types/Investor	Local investment Daw Kyin Htay (CEO) Daw Kyin Shwe (Director)
Amount of investment	USD 2.52 Million
Investment Period	30 years
Capacity	Approx; (1,500,000 tons/year) 9 different types of fertilizers
Water Requirement	Approx- (1,400,000) gal/year
Source of Process Water	Underground (Tube Well), Depth; ~65m (200 ft-400ft)
Source of Electrical Power	MEPE (2000 KVA)
Raw materials	Urea, Ammonium Sulphate, Ammonium Chloride, Muriate Potash, Diammonium Phosphate (imported from China)
Land used	27.77 Acre
Effluent	Factory and Domestic effluent; Sewage treatment facilities will be provided for all sewage generated on site.
Solid waste management system	Recyclable domestic waste will be recycled. Other domestic waste will be disposed of in a domestic waste disposal site as directed by Township CDC.
Contact Person / Responsible person	Daw Thazin Nyunt 09889570664, Email. myanmashwenagaroffice@gmail.com
No. of Workers Used	135 employees

4.5. Factory Layout

The total area of land is 27.77 acres. The factory is constructed by six main buildings and four apartments. They are

- 4 warehouse building (329 ft x 265 ft) (each)
- 2 workshop building (108 ft x 265 ft) (each)
- 4 apartment building include office (25 ft x 60 ft) (each)

The front of the factory has security gate. Transformer and generator house are situated at the southwest corner of the factory campus. The factory are providing domestic water tank, toilets, and water purification system. This factory layout plan is shown in Figure 4.4.

Figure 4.3 Perspective View of the Proposed Project

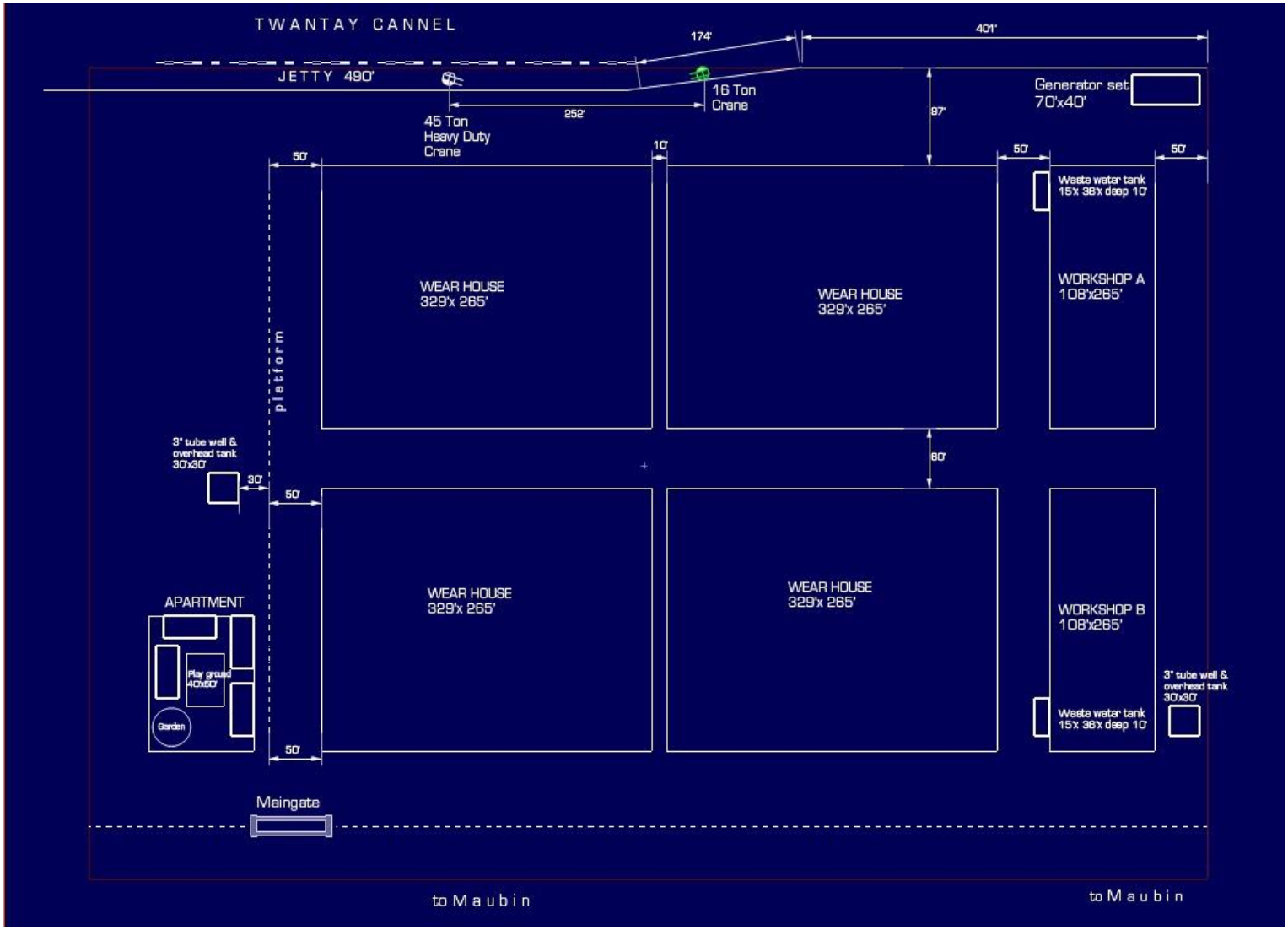


Figure 4.4 Layout Plan of the Proposed Project

4.6. Production Process

The production method of the nine fertilizers is the same. There are nine types depending on the type of raw materials (ingredients) and the ratio of ingredients.
The nine different types of compound fertilizer will be repackaged according to required ratio in order to distribute at the local markets that user can effort. Fertilizer repackaging or Bulk blending is defined as the physical mixing, without chemical reaction, of granular single nutrient and multi-nutrient materials to produce a dry fertilizer mixture.The general flow stages of repackaging processes are show below.

Raw Materials Feeding

⬇

Batch Preparation

⬇

Blending or Mixing

⬇

Packaging

⬇

Storage

Overview Operation steps in factory

Raw Materials Feeding
The required ratios of raw materials such as urea, ammonium sulphate, muriate of potash etc are fed to the hopper by loader.

Raw Materials Feeding

Batch Preparation Section

Starting from feeding of cluster hopper, weigh feeder discharges the measured quantity of ingredients to bucket elevator, which feeds the cluster hopper. Cluster hopper has separate compartments for each ingredient. Each compartment has a high and low level indicator governing the feeding necessity of the compartments. Individual Weigh batchers automatically weigh and discharge the selected ingredient in measured quantity as per the selected recipe to surge hopper. Surge hopper is having load cell to confirm whether the desired ingredient/batch quantity has been received or not. It is providing accurate and reliable blending of dry soluble fertilizers.

Cluster hopper

Blending Section

Material is then discharged to another hopper via automatic slide gate from where it is transferred to hopper before solid raw materials via belt feeder & bucket elevator. Hopper before blender accumulates and weighs the ingredients of the batch prior to discharge into the mixer. Mixer is engineered for highly accurate and efficient mixing and coating of materials. Mixer is ideal for bulk blending with micro- nutrients and adding liquid coatings. The ultimate in speed, blend quality and Shears are provided to lump while blending. A solid raw material rapidly and thoroughly blends the fertilizer ingredients including liquid additives if there is any such constituent. The blended batch is discharged instantly in a dust-proof manner. Instant discharge protects blend quality.

Rotary drum Mixer

Packing and Storage Section

From post blending hopper batch is transferred to packing hopper via belt feeder & bucket elevator. Automatic/semi-automatic bag filling & stitching machines packs the desired bag quantities. These bags are then transported to storage area by means of our material handling systems like truck loader, wagon loaders etc.

Packing Hopper

4.7 Raw Materials

The requirements of raw materials for the project are described at the following table. They are imported from China (mainly) and other foreign countries

Table 4.1 List of Raw Materials

No.	Name	Tons/Year
1.	Urea	12,000
2.	Ammonium chloride	80,000
3.	Diammonium phosphate	6,200
4.	Muriate of potash	18,000
5.	Magnesium oxide	1,800
6.	Ammonium sulphate	6,000

4.8 Products

The categories of repackaging fertilizer and estimated year output of the project are described at the following table.

Table 4.2 List of the Products per Year

No.	Name	Estimated Yearly Output (ton)
1.	27-0-0-18 (Shwe Na Ga Pin Tat)	10,000
2.	20-0-12 (Top One)	10,000
3.	25-0-0 (Sin Phyan)	10,000
4.	25-7-8 (Compound)	15,000
5.	19-19-19 (compound)	10,000
6.	15-5-20 (Multi purpose)	10,000
7.	15-5-24+5MgO+4S (Multi purpose)	10,000
8.	30-0-0 (Pa Lae Thar)	15,000
9.	30-0-0 (Daung Min)	15,000

4.9. Storage Conditions of Raw Materials and Finish Goods

The main raw materials (Urea, Ammonium Sulphate, Ammonium Chloride, Muriate Potash, Diammonium Phosphate are imported from China (mainly) and other foreign countries. Raw materials are transported by truck or ship to the factory by traders and then stored in a storage area of warehouse in the proper condition before sending to manufacturing section. The final fertilizers packaged products are stored in Finish Goods storage area and distributed to local market by truck, once every one or two weeks depending on production.

Figure 4.5. Raw Materials Storage Conditions

Figure 4.6 Finish Fertilizers Products and Storage Conditions

4.10. Machinery Used in Factory

Components of proposed factory operation are show follow:

Table 4.3- Machine and Equipment List

S.No.	Name of Machinery	QTY	HS Code	Source
1	Granulator complete with 10 HP Motor(MS) Mechanical unloading system	1	8537	Import
2	Ribbon Blender Mixture with 10 HP Motor	2	8537	Import
3	Automatic spray assembling	1	8537	Import
4	Conveyor line assembling	1	8538	Import
5	Mixing vessel	1	8537	Import
6	Dryer (Rotary drum)	1	8537	Import
7	Bucket Elevator	1	8538	Import
8	Weighing scales	1	8538	Import
9	Bag stiching Machine (FFS Stitching Machine) Pouch sealers	1	8539	Import
10	Compressor	2		Import
11	Hoist, Materal Hnadling Systems		8537	Import
12	Stiching Machines	15	8537	Import
13	D.G. Set	2		Import
14	Veccum Cleaner	2	8538	Import
15	Crane (45 tons)	1	8537	Import
16	Crane (16 tons)	1	8537	Import
17	Motor Pump	2		Import
18	Batch Numbering Machine	1	8537	Import

4.11. Employment

It is estimated that 135 persons will be employed during operation of the factory. The total operation days are 280 days per year. Employee statement of proposed factory is shown in following Table.

Table 4.4- Employee Statement of proposed factory

No.	Department Name	Number of Employees
1.	Department of Accountant	19
2.	Department of Admin and Management	3
3.	Department of Marketing and Operation	23
4.	Department of Production	68
5.	Department of Technology and Advertising	4
6.	Department of Delivery and Transport	18
Total		**135**

Working Hours and Assign	Monday to Saturday (Bi- Saturday off) 8:00 A.M. to 5:00 P.M. (Lunch Time 1 Hour)

4.12. Water Supply and Demand

The water requirement for the all operation activities and workers except drinking water will be supported from two tube wells; (3"ϕ, 68m deep). There are two overhead tanks each contain 2400 gallons. It is estimated that water consumption for the various usage is 1,400,000 gallons per year. Drinking water as purified water will be outsourced.

4.13. Power Requirement and Supply

The proposed project is intended to get required electricity supply form township main grid line and connects to own transformers (2000 kVA), which is situated within the factory compound. Two backup generators with the capacity of 1100 kVA is used when the electricity breaks down. The estimated consumption of fuel (diesel, petrol) is about 50,000 gallons per year. The estimated power load for the proposed project is approximately 50,923 KW per month. Fuel will be stored in Steel Tanks and constructed in accordance with the regulation issued by Ministry of Energy. Fire prevention activities must be arranged in accordance with instruction of Fire Fighting Department.

4.14. Waste Management

Types of Waste (Liquid/ Solid)	
For Solid waste	
Dumping methods (Landfill/ municipal)	Municipal
Domestic Waste Bags Per day	20~50kg/day
Operation Waste Bags Per day	100~500kg/day
Total Waste Bag per day	120~550kg/day
For Liquid Waste	
Septic Tank	Yes
Method of Treatment	1）Wastewater Pretreatment System 2）Wastewater Chemical Treatment System 3）Wastewater biological Treatment System 4）Sludge Treatment system
Capacity of Tank(length, width, depth)	4 Tanks： 3 pcs :2.8m*1.5m*1.5m 1 Pc : 1.25m*1m*1m
Amount of Wastewater Discharges per day	$30m^3$~ 50 m^3/day

4.14.1 Wastes

Fertilizers manufacturing, formulation and packaging processes generate both hazardous and non-hazardous solid and liquid wastes. Solid or semisolid wastes include residues and filtrates from chemical synthesis processes, contaminated with spent acids, bases, solvent, active fertilizer ingredients, cyanides and metals; off-specification products not accepted for packaging;

used air filter media (e.g. fabric filters, spent activated carbons); packaging waste; Decontamination of the solid-based fertilizer blending mills may generate a solid dilutant, consisting of clay or sand, contaminated with fertilizer. Measures to manage solid and liquid wastes include the following:

- Proper on-site management, including submerging pyrophoric spent catalysts in water during temporary storage and transport until they can reach the final point of treatment to avoid uncontrolled exothermic reactions;
- Return to the manufacturer for regeneration or recovery;
- Use of metering and control of quantities of active ingredients to minimize waste;
- Use of automated filling systems for , tanks and drums to minimize spills.
- Use of technologies and processes that reduce generation of waste, such as the scheduling of production in groups to reduce the number of changeovers, which reduces the required number of equipment cleanings;
- Re-use or recycle waste as raw material where and when possible, such as waste from cleaning of drums and shipping containers.

Detailed guidance on the storage, handling, treatment, and disposal of hazardous and non-hazardous wastes is provided in the General EHS Guidelines.

4.14.2 Hazardous Materials

Fertilizer manufacturing, formulation, and packaging facilities use and manufacture significant amounts of hazardous materials, including raw materials and intermediate/ final products. The handling, storage, and transportation of these materials should be managed properly to avoid or minimize the environmental and health impacts. Recommended practices for hazardous material management, including handling, storage, and transport, are presented in the NEQE Guidelines.

4.14.3 Wastewater

(1) Industrial process wastewater

Liquid effluent discharge from fertilizers manufacturing and formulation facilities include organic biodegradable compounds (e.g. oxygenated organic solvents, such as methanol, ethanol, acetone, isopropanol, and phenol; organic acids; and organic esters), recalcitrant organic compounds (e.g. chloro-derivatives and fluoro-derivatives), suspended solids, and certain inorganic material (including inorganic acids, ammonia, and cyanide). Trace amounts of active fertilizer ingredients may be of significant concern. Biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) and pH are the main water quality indicator parameters.

Recommended pollution prevention and mitigation measures include the following:

- Reuse and recycling of equipment wash down waters and other process water as makeup solutions for subsequent batches;
- Installation of equalization systems before the wastewater treatment units to manage flow and/ or concentration spikes;
- Solvent waste streams from different sources should be combined to optimize treatment;
- Fractioned distillation to remove low-boiling compounds from wastewater streamo Inert gas stripping and condensation to remove volatile compounds from wastewater stream
- Solvent extraction of organic compounds (e.g. high or refractory halogenated compounds and high COD loads)
- Installation of reverse osmosis or ultrafiltration systems to recover and concentrate active ingredients;
- Installation of pH adjustment and neutralization systems, as needed;
- Use of filtration and settling ponds to reduce TSS and BOD associated with particulate matter;
- Installation of biological treatments (e.g. activated sludge systems, trickling filters and/ or rotating biological contactors) to control BOD, COD, and TSS concentrations, and to degrade organic constituents;
- Installation of a pretreatment stage for wastewater with biodegradability less than 80 percent, such as:
- Cyanide destruction through alkaline chlorination, hydrogen peroxide oxidation and hydrolysis treatments, where cyanide based-reagent is generally used for fertilizer and/ or intermediate synthesis
- Active ingredient detoxification through oxidation, using ultraviolet systems or peroxide solutions
- Installation of granular activated carbon adsorption systems to treat BOD/ COD and organic compounds
- Steam and/ or air stripping to treat wastewater containing organics and ammonia, the latter through pH adjustment to values of 10-11
- For bio-fertilizer manufacturing, oxidation of residual products and potential pathogens through hypochlorite and/ or other disinfection/ sterilization methods
- Bio-monitoring and testing of effluents for toxicity to fish, daphnia, algae, etc., after biological treatment and before discharge;

(2) Process Wastewater Treatment

Techniques for treating industrial process wastewater in this sector include source segregation and pretreatment of concentrated wastewater streams, especially those associated with active ingredients. Typical wastewater treatment steps include: grease traps, skimmers, dissolved air floatation or oil water separators for separation of oils and floatable solids; filtration for separation of filterable solids; flow and load equalization; sedimentation for suspended solids reduction using clarifiers; biological treatment, typically aerobic treatment, for reduction of soluble organic matter (BOD); chemical or biological nutrient removal for reduction in nitrogen and phosphorus; chlorination of effluent when disinfection is required; dewatering and disposal of residuals in designated hazardous waste landfills.

Additional engineering controls may be required for

(i) containment and treatment of volatile organics stripped from various unit operations in the wastewater treatment system,
(ii) removal of recalcitrant organics and active ingredients using activated carbon or advanced chemical oxidation,
(iii) reduction in effluent toxicity using appropriate technology (such as reverse osmosis, ion exchange, activated carbon, etc.), and
(iv) containment and neutralization of nuisance odors.

Management of industrial wastewater and examples of treatment approaches are discussed in the NEQE Guidelines. Through use of these technologies and good practice techniques for wastewater management, facilities should meet the Guideline Values for wastewater discharge. Other Wastewater Streams and Water Consumption Guidance on the management of non-contaminated wastewater from utility operations, non-contaminated storm water, and sanitary sewage is provided in the NEQE Guidelines. Contaminated streams should be routed to the treatment system for industrial process wastewater. Recommendations to reduce water consumption, especially where it may be a limited natural resource, are provided in the NEQE Guidelines.

4.15. Analysis of Alternatives

This section describes land use or development alternatives, alternative means of carrying out the operation, and the consequences of not proceeding with the proposed project.
The main project alternatives to be considered include:-

- Property or locality;
- Type of activity;
- Design or layout;
- The "no-go" alternative.

4.15.1. Property or locality

The property on the actual manufacturing factory related activities takes place is dependent on the location of the rural area. The project area will be accessible by Twantay-Maubin road as well as waterway by the Twante canal. It follows that no alternatives could be considered for the project site.

4.15.2. Type of activity

The type of proposed project is repackaging and distribution of the fertilizers. The brief procedure of factory form of production on consignment, in which the raw materials are imported or bought from foreign countries, then will be repackaged of the agrochemical products according to formulation of 9 types of fertilizer and required sizes in order to distribute at the local markets that user can effort.

4.15.3. Design or layout

For the manufacturing factory, layout and orientation alternatives for the infrastructure complexes will be identified and considered during the EIA phase based on the outcomes of the public participation process and the findings of the various specialist studies.

The infrastructure associated with the proposed factory operations will be confirmed during the EIA phase of the project.

4.15.4 The no-go Alternative

The assessment of this option requires a comparison between the options of proceeding with the proposed project with that of not proceeding with the proposed project. Proceeding with the proposed project attracts potential economic benefits and potential negative environmental and social impacts. The study of the zero option is shown in Table 4.5 below. Not proceeding with the proposed project leaves the status quo of no additional negative social or environmental impacts than what is currently experienced.

Table 4.5 Study of the Zero Option

Aspect	**Condition with the Project**	**Condition without the Project**
Technical Aspect	The proposed factory would be developed efficiently in accordance with the Twantay Township Industrial development plan and will be distributed of the agrochemical products for Myanmar Agricultural Sector	No development might be implemented without any plan for overall area development.
Environment/ Social Consideration	- Impact on natural environment and pollution caused by the operation of proposed Project, and impact on social aspect such as inflow of migrant workers and population influx would occur. - Living environment for local residents would be improved due to the development of the project.	- Impact on natural and social environment that might be caused by the development of proposed project will not occur. - Living environment for local residents would be improved random developments condition.
Economical Aspect	- A series of infrastructure development and Economic development of the entire Twantay Township Industrial area would also be developed. - Job opportunities would increase for local residents. The 135 persons to be employed permanently during the long Operation Phase of fertilizer Repackaging Factory. - The direct investment of including US$ 2.52 Million by MSNAG Ltd will not materialize and this cannot contribute to the increase in the GDP of government revenues.	- Economic development of the entire Twantay Township Industrial area would be limited. - Job opportunity would not increase from the current situation. - loss of taxes, duties, revenues for the government

5. DESCRIPTION OF THE SURROUNDING ENVIRONMENT

This section describes the project sites baseline environmental and social conditions according to available sources of baseline information and qualitative assessments of the project site. The purpose of reviewing the baseline conditions is to present an understanding of the potential environmental and social sensitivities of the study area. Reviewing the baseline conditions allows MSNAG to make an informed judgement on the appropriate level of impact assessment for the project.

5.1. Setting the Study Limits and Area of Influence

The Project Area is defined as the location of proposed project site. It is located in Kulartan Village Tract, Twantay Township, Yangon Region. The project study area refers to the area that needs to be studied in order to adequately understand and describe the baseline conditions likely to be affected by the project. At a minimum, the project study area will encompass the project footprint and the Area of Influence (AOI), whereby the AOI includes the following:

- the primary project site(s) and related facilities that the project proponent develops or controls;
- associated facilities that are not developed and funded as part of the project but are essential for the project and without which the project cannot proceed;
- areas potentially affected by impacts from predictable (but unplanned) developments as a result of the project; and
- areas potentially affected by cumulative impacts resulting from other developments known at the time of the Environmental Impact Assessment (EIA), further planned phases of the Project or any other existing circumstances.

Based on the above, for this project, the project study area and its AOI is presented below.

Table 5.1.Area of Influence considered for the Environmental and Social Resource / Receptor

Environmental / Social Aspect	**Area of Influence (AOI)**	**Remarks**
Air Quality during operation phase	1km from Project siteboundary	Derived based on potential extent of impacts from operaation activities.
Noise during operation phase	1km from Project site boundary	Derived based on potential extent of impacts from operaation activities.
Water quality during operation phase	2km from Project site boundary	Derived based on potential extent of impacts from operaation activities.
Biodiversity for Project site Area	2km from Project site boundary	Derived based on potential extent of impacts from operaation activities.
Socio-economic conditions	Settlements that are within 2 km of the Project site as well as those areas where impacts may be experienced more broadly such as employment, economic development, in-migration and public services, often covering a wider spatial area. These included the Kan Pat Yoe, Tan Phyu Yone within 2 km from the project site as well as	Derived based on potential extent of impacts from operaation activities.

	Htantapin Village. Although Ku Lar Tan is outside 2 km of the Project Site, this village is a village tract of this area.	

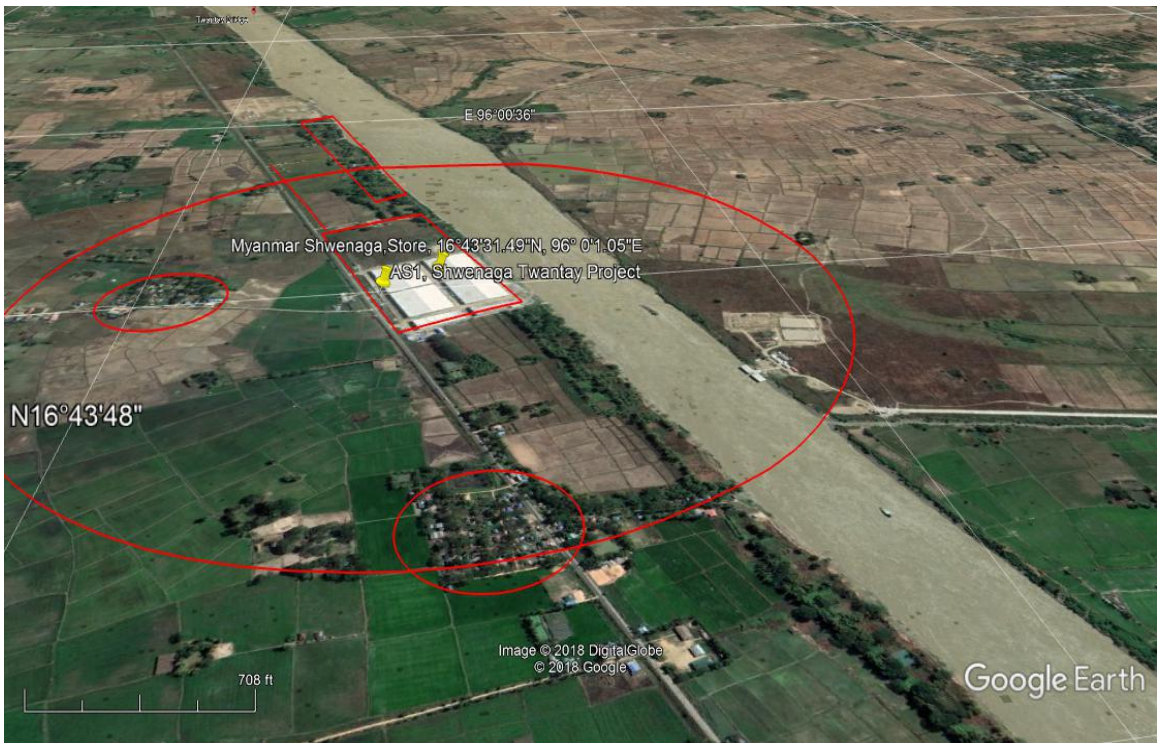


Figure 5.1 Study Area and Area of Influence

5.2. Methodology for Data Collection and Analysis

Secondary Data

Secondary data sources for information on environmental, social and health baseline conditions in this report include the following:

- Collection of available data from existing sources including:
  - Government agencies;
  - Published sources;
  - Research and academic organizations
- Review and analysis of aerial photographs and GIS satellite imagery;

Sources of information are cited as appropriate in the text, and included in the References section of this report.

Primary Data (Baseline Field Surveys)

HRD Environmental Training and Services Co., Ltd undertook baseline field surveys in order to gather additional baseline data for this Project. Summarizes the proposed scope of the study to be documented in the Environmental Impact Assessment, prepared to accompany the proposed project are shown in the following Table.

Table 5.2- Summary of Baseline Field Surveys Plan

Scope	**Summary of Details**	
Physical Characteristics		
Air Quality & Meteorology	Parameters	1) Nitrogen dioxide (NO_2) 2) Carbon monoxide (CO) 3) Particulate Matter less than 10 microns (PM10) 4) Particulate Matter less than 2.5 microns (PM2.5) 5) Sulphur Dioxide (SO_2) 6) Wind 7) Wind Direction Speed
	No. of Samples & Sampling Period	Two location, within three days.
	Location	Project area. and inside factory
Noise Level	Parameters	LAeq (A-weighted loudness equivalent)
	No. of Samples & Sampling Period	Two locations, one time within two days. Noise monitored for LAeq 1 hour (dBA) for required period of 48 hours. Monitoring also continued for an additional 24 hours.
	Location	In project site and Near residential area.
Soil Quality	Parameters	pH, Iron (Fe), Cadmium (Cd), Lead (Pb), Zinc (Zn), Copper (Cu), moisture content
	No. of Samples & Sampling Period	One season
	Location	In project site

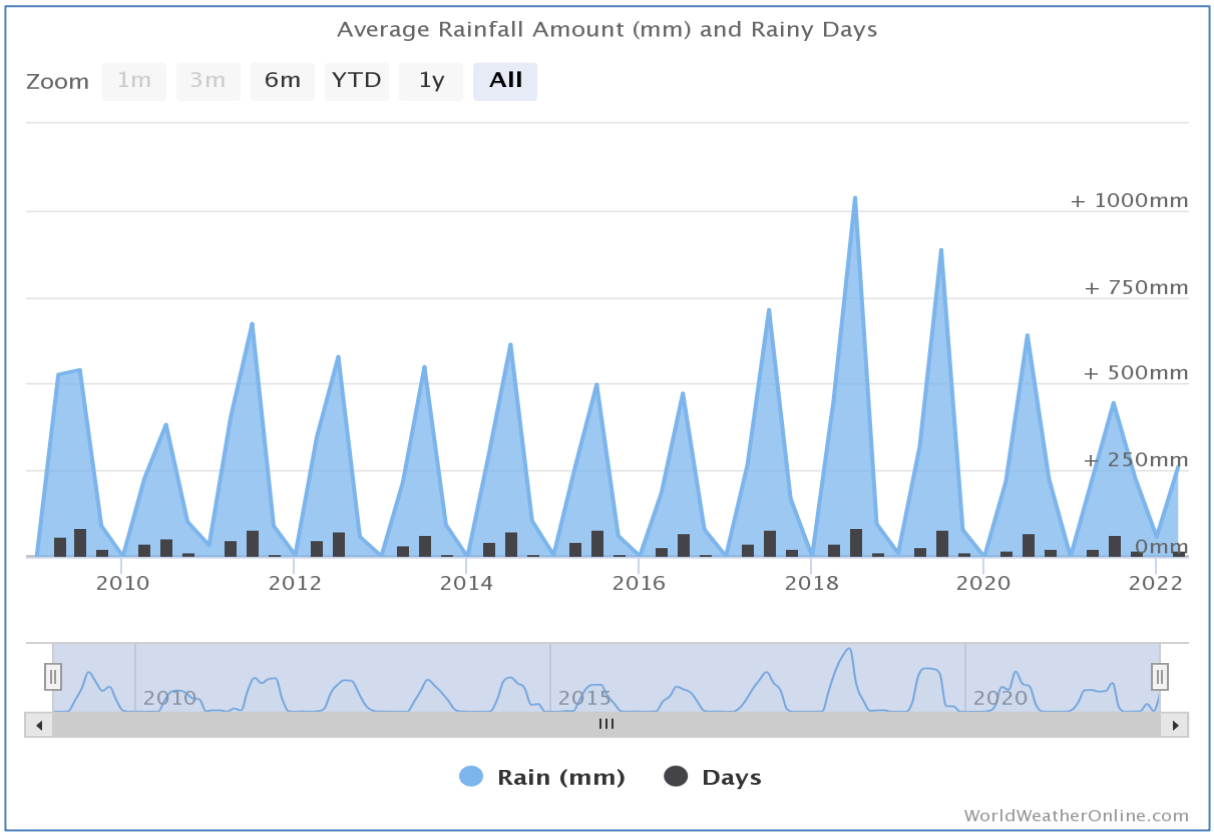
Surface Water Quality	Parameters	pH value, Temperature, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand(COD), Oil and Grease, Total Nitrogen, Total Phosphorus (TP), Total Suspended Solids (TSS), Total Phenols, Mercury (Hg), Arsenic (As), Zinc (Zn), Copper (Cu), Total Chromium (Cr), Ammonia, Chlorine, Sulphide, Nitrate, Fluoride, Total Coliform.
	No. of Samples	One time at 1 locations
	Location	Factory strom water effluent
Ground Water Quality	Parameters	pH value, Temperature, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand(COD), Oil and Grease, Total Nitrogen, Total Phosphorus (TP), Total Suspended Solids (TSS), Total Phenols, Mercury (Hg), Arsenic (As), Zinc (Zn), Copper (Cu), Total Chromium (Cr), Ammonia, Chlorine, Sulphide, Nitrate, Fluoride, Total Coliform.
	No. of Samples	One time at 1 locations
	Location	One season, in situ and lab analysis using existing tube well In project site
Biological Characteristics		
Biodiversity	Parameters	Survey was conducted for the following: • Habitat Identification • Direct Observation • Questionnaire Result
	Location, No. of Samples & Sampling Period	Survey was conducted continuously within the Project Study Area (2 km radius of Project site).
Socio-Economic Characteristics		
Socio-Economic Survey	Measured Parameters	• Key informant interviews with village leaders. Interviews were undertaken to better understand the profile of the population of each village (e.g. population size, leadership structure, ethnicity, religion, sources of income); In-depth Interview/ Focus groups with key groups within each village. Focus groups were conducted in each village with representatives from the following groups - women, youth, healthcare providers and those involved in utilising ecosystem services and cultural heritage. The types of information gathered included economic activities (e.g. industries of employment, income levels), provision of community infrastructure and services (e.g. access to education, water and sanitation services and healthcare, transportation), and health issues/ concerns; and •Household surveys, will completed to better understand the demographic profile of the villages. To the extent possible, 30% of each village was surveyed. The focus was on gathering information on economic activities, land uses,

		access to community services and key challenges within each village.
	Location,	Local community in Ku Lar Tan village tract, Kan Pat Yoe, Tan Phyu Yone, Htantapin Village

5.3. Description of the Physical Environment

5.3.1 Meteorology and Climatology

The study area of the proposed project is located in Twantay Township and so, secondary data collection was done for the township. The climate of this area is tropical. In rainy season, there is much more rainfall than in summer. According to the weather data of 2022, the average annual rainfall in Twantay is 2,276mm. The driest month is February with precipitation of 2 mm. Most precipitation falls in August with 630 mm. The difference in precipitation between the driest month and the wettest month is 628 mm.



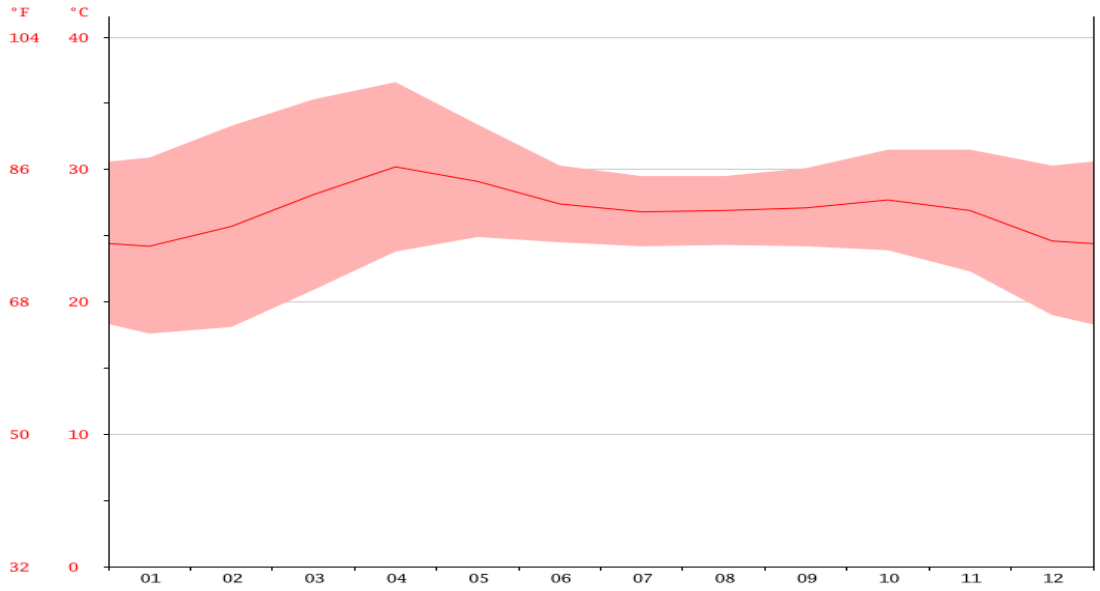
Source: worldweatheronline.com

Average Rainfall and Rainy Day over Project Area

Average annual temperature Twantay

April is the warmest month of the year. The temperature in April averages 30.2 °C. At 24.2 °C on average, January is the coldest month of the year.

The average annual temperature during 2018 in Twantay Township is 27.25°C. The following figure describes the monthly temperature of Twantay Township in 2022. According to the data, April is the warmest month of the year and January has the lowest average temperature.



Monthly Temperature of Twantay Township ***(Source:www.climatedata.org)***

Twante Weather by Monthly (Weather Averages)

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	24.2	25.7	28.1	30.2	29.1	27.4	26.8	26.9	27.1	27.7	26.9	24.6
Min. Temperature (°C)	17.6	18.1	20.9	23.8	24.9	24.5	24.2	24.3	24.2	23.9	22.3	19
Max. Temperature (°C)	30.9	33.3	35.3	36.6	33.4	30.3	29.5	29.5	30.1	31.5	31.5	30.3
Avg. Temperature (°F)	75.6	78.3	82.6	86.4	84.4	81.3	80.2	80.4	80.8	81.9	80.4	76.3
Min. Temperature (°F)	63.7	64.6	69.6	74.8	76.8	76.1	75.6	75.7	75.6	75.0	72.1	66.2
Max. Temperature (°F)	87.6	91.9	95.5	97.9	92.1	86.5	85.1	85.1	86.2	88.7	88.7	86.5
Precipitation / Rainfall (mm)	2	3	9	20	247	401	419	396	292	164	49	11

There is a difference of 417 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 6.0 °C.

5.3.2. Regional Geology and Tectonics

Yangon region [including project area] is underlain by alluvial deposits, the non-marine fluviatile sediments of Irrawady Formation, and hard, massive sandstone of Pegu Series. The alluvial deposits are composed of gravel, clay, silts, sand and laterite, which lies upon the eroded surface of Irrawady Formation at 4.6 m above mean sea level. The central part of

Yangon area is occupied by the anticlinal ridge as a backbone, 30 m above mean sea level and covered with sands, sand rock, soft sandstones, shale, clays, and lateritic of Irrawady Formation. The hard compact sandstone and shale of Pegu series can be found at the northwest corner of Hlawga Lake with NNW–SSE strike dipping to the east. Alluvial deposits are found in the surrounding areas of the ridge whereas lateritic soils can be found along the ridge (Figure 5.2). In the geological map, two anticlines can be seen trending NNW-SSE direction and are cut by NNE-SSW trending transverse fault (Aung, 2011). From the geological point of view, it can be concerned for the initial review of faster displacement possibility in some area such as in the eastern part of the city where the top soil is clays.

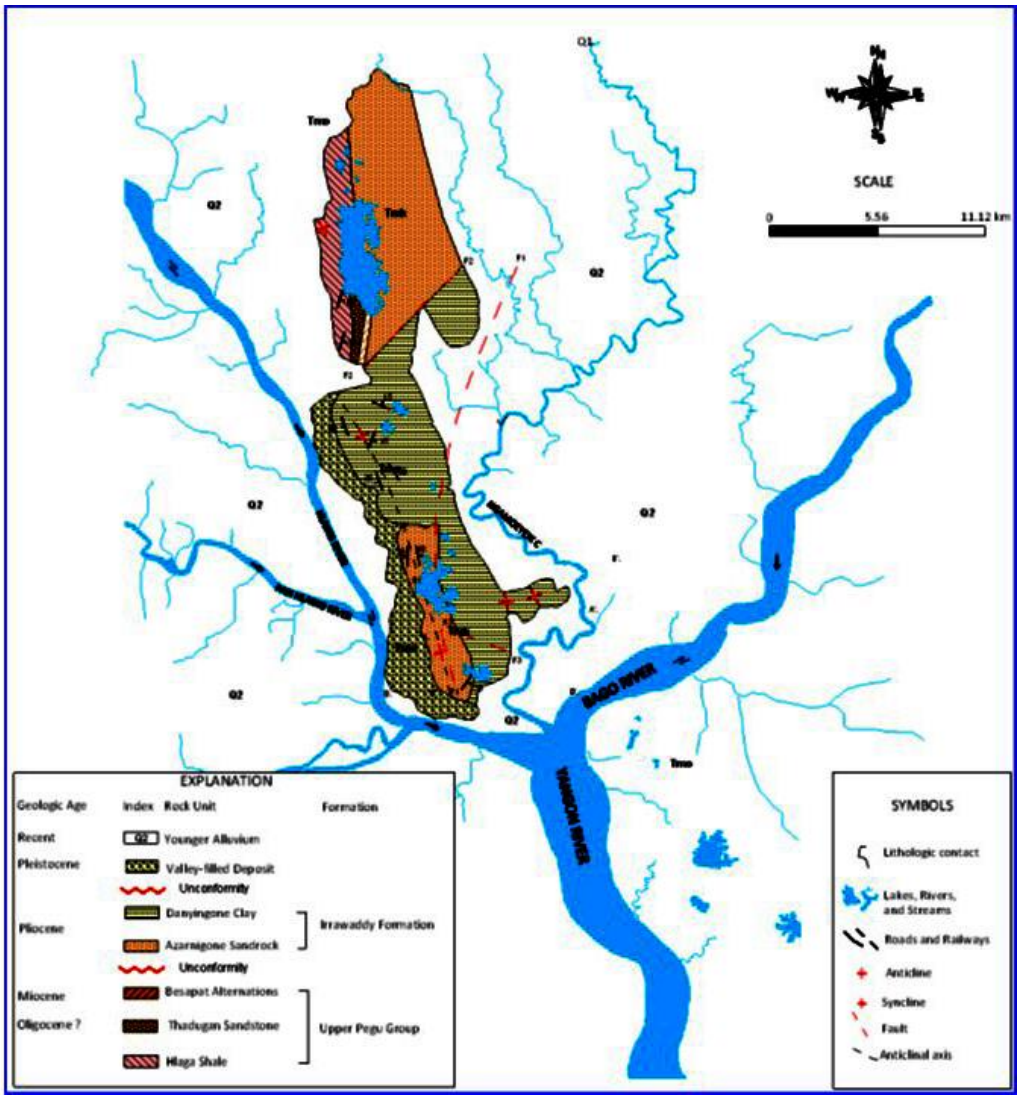


Figure 5.2 Geological Map of Yangon Area (Win Naing (1972)

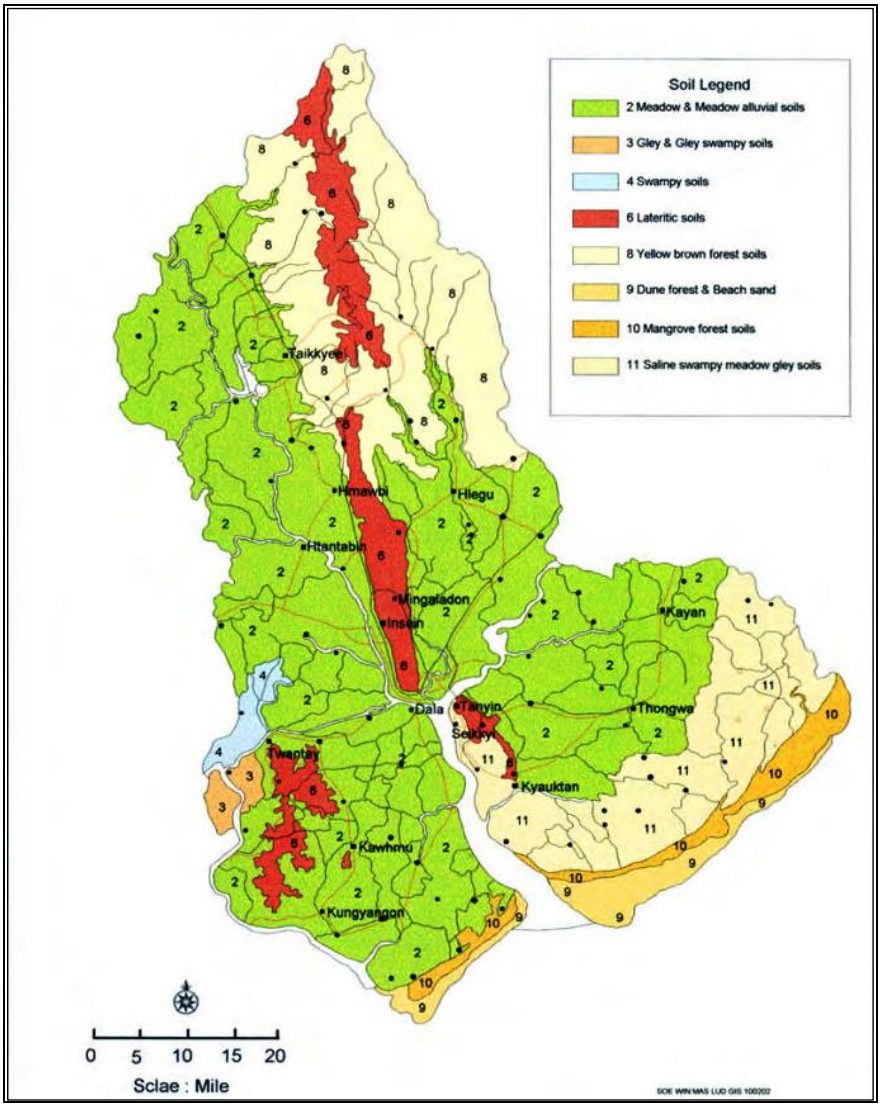
Tectonically, Yangon is situated in the southern part of the Central Lowland, which is one of the three major tectonic provinces of Myanmar. The Taungnio Range of the Gyophyu catchments area of Taikkyi District, north of Yangon, through the Thanlyin Ridge, south of Yangon forming a series of isolated 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 (Aung Lwin 2012).

5.3.3. Soil

The different varieties of the individual soil characteristics are Meadow and Meadow Alluvial Soil, Gley and Gley swampy soils, Swampy soils, Lateritic soils, Yellow brown forest soils, Dune forest & Beach sand, Mangrove forest soils and Salineswampy meadow gley soils. The meadow soils which occurnear the river plains with occasional tidal floods are noncarbonate.

They usually contain large amount of salts. Meadow Alluvial soils (fluvic Gleysols) can be found in the flood plains. They have the texture of silty clay loam and they have the neutral soil reaction and are rich in available plant nutrients. Meadow Gley soils (Gleysol) and Meadow swampy (Histic Gleysol) occur in the regions of lower depressions where the lands are inundated for more than 6 months in a year. The texture of these soils is clayey to clay and usually having very strong acid reaction, and contain large amount of iron.

The underlying soil type at the Project Site and its surroundings is characterized as Meadow and Meadow Alluvial Soil. Meadow Soil is soil which occurs near the river plains with occasional tidal floods, non-carbonate and usually contains large amounts of salt. Meadow Alluvial Soils are being found in the flood plain. Both materials mainly comprise silty clay loam and neutral soil where they are rich in available plant nutrient.



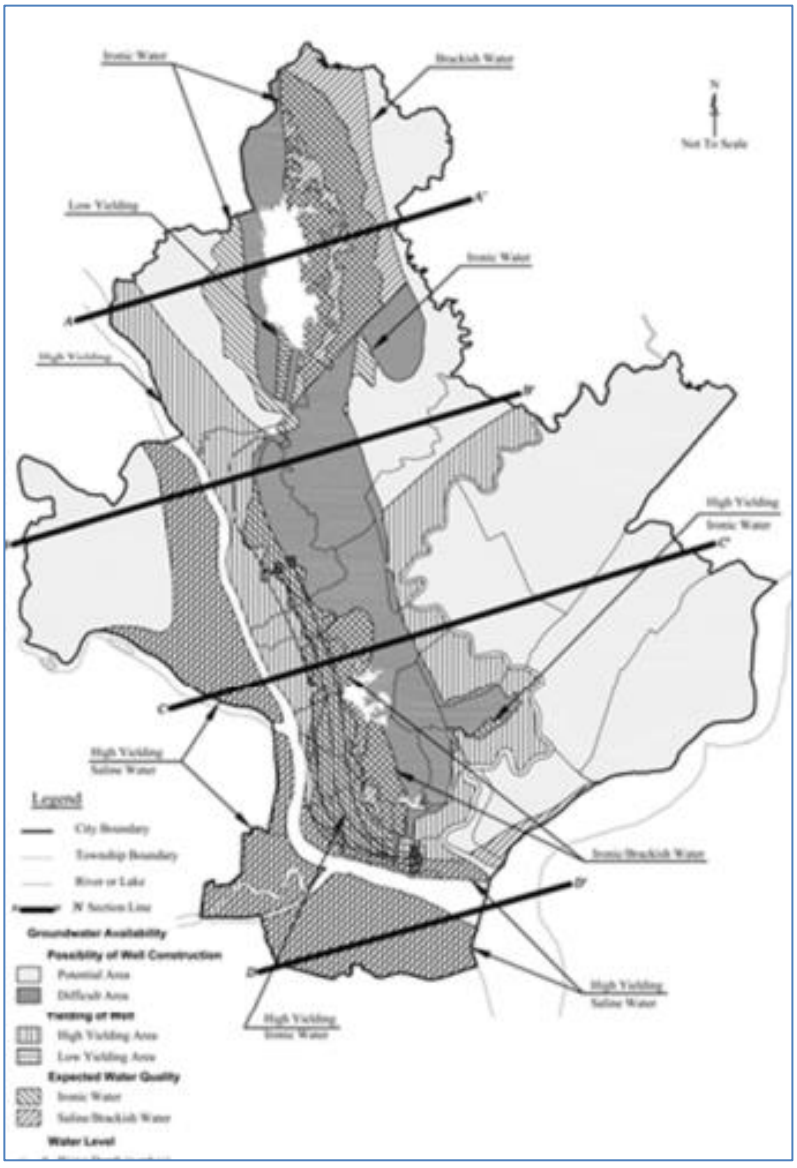
Source: Land Use Division, Myanmar Agriculture Service

Figure 5.3. Soil map of Yangon Division

5.3.4. Hydrogeology

Yangon is rich in groundwater resources conserved by unconsolidated Tertiary-Quaternary deposits. In Yangon, groundwater is mostly extracted from Valley filled deposits and Ayeyarwady sandstones. From the study on groundwater potential (see the following Figure) in 2002 JICA-M/P, the followings are concluded;

- Groundwater potential is low in the central hilly areas.
- Iron contents might be high in groundwater in areas adjacent to hilly areas.
- Groundwater potential is high in the remaining low land areas.
- Groundwater potential is very high along the rivers.
- Salinity might be high in groundwater in CBD area.

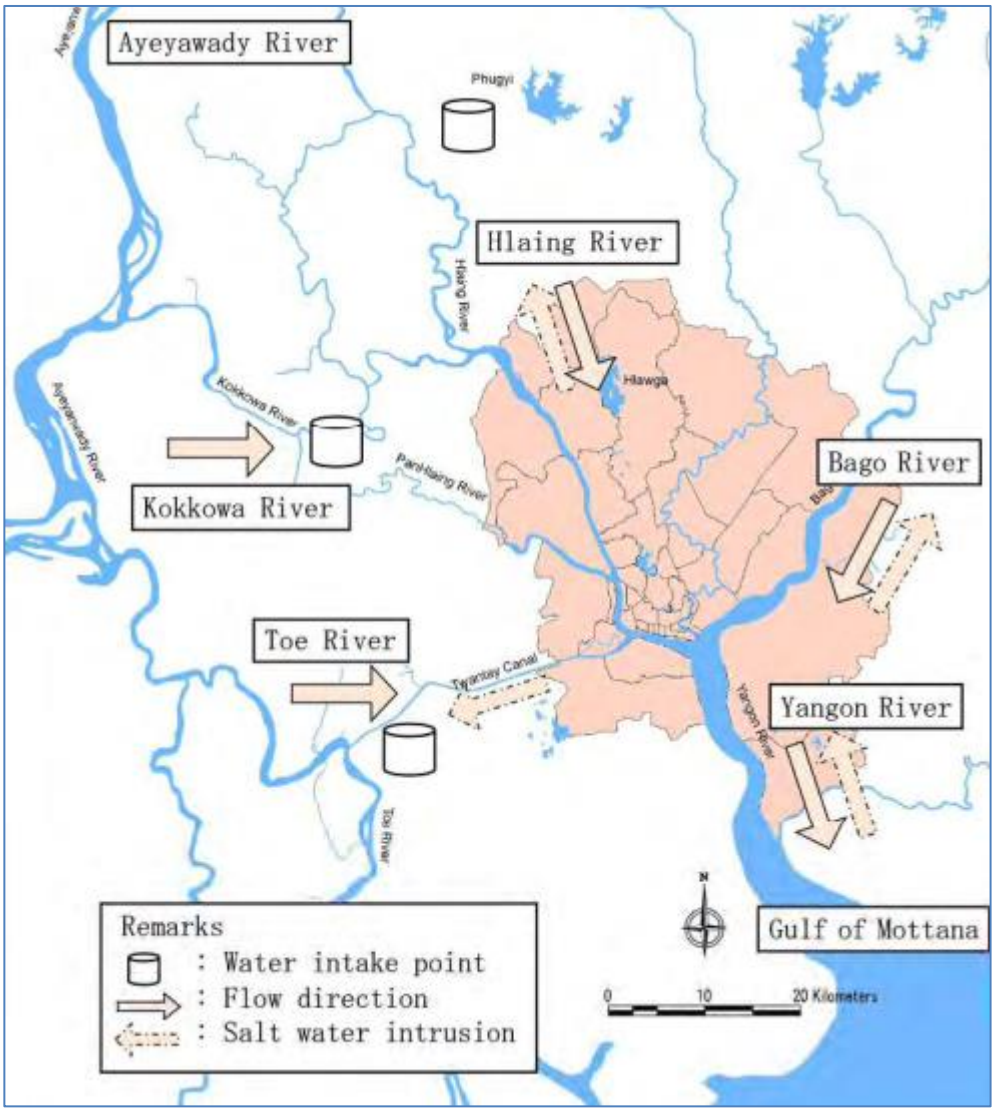


Source: 2014 JICA Water MP

Figure 5.4. Groundwater Potential in Yangon Region

5.3.5 Hydrology

The Twantay Canal and Pan Hlaing River, which converge and flow downstream the Yangon River, as well as the Kokkowa River which connects with the Hlaing River, all obtain its water from the Ayeyarwady River. Yangon City lies at the confluence of the Bago River and the Hlaing River. The two rivers downstream of the confluence is called as the Yangon River, which is connected to the Gulf of Mottama. Kokkowa, Pan Hlaing and Toe Rivers are candidate water sources for the expansion of Yangon City's water demand expected to increase in the future. The following Figure shows a map which contains the rivers surrounding Yangon City.



Source: 2014 JICA Water MP

Figure 5.5. The Rivers Surrounding Yangon Region

5.3.6 Natural Hazards

Myanmar is exposed to multiple natural hazards including cyclones, earthquakes, floods and fire. It has been periodically exposed by natural disasters. The Yangon District is in the vicinity of the southern section of the Sagaing Fault which has not been active in the past 50 to 75 years indicating that the faults may be under accumulating stress increasing the

potential for an earthquake tooccur. The Sagaing Fault is the most prominent active fault in Myanmar trending roughly north to south.

It has been the originator of a large proportion of destructive earthquakes in Myanmar. The Project Site is also located in an earthquake zone and therefore the building construction design needs to cater for this hazard with adequate planning on emergency response procedures.

Myanmar is exposed to cyclones and associated storm surges from the Bay of Bengal. Annually, there are approximately 10 tropical storms in the Bay of Bengal from April to December. Severe cyclones occur during the premonsoon period of April to May and post-monsoon period of October to December.

The threat of flooding usually occurs in three waves each year: June, August and late September to October.

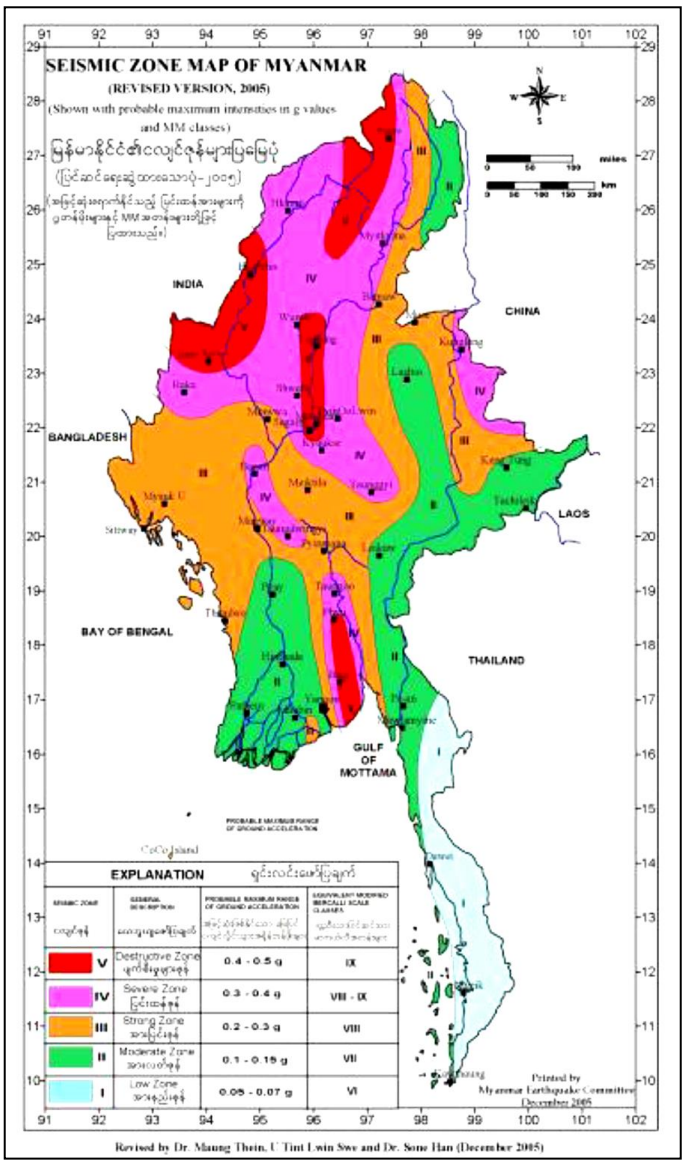


Figure 5.6 Seismic Zone Map of Myanmar

(source: Dr. Maung Then,, U Thin Lwin and Dr. Sone Han_2015)

5.4. Baseline Environmental Quality

5.4.1. Existing Air Quality

Survey Items

The parameters for air Quality surveys were atmospheric pressure, CO_2, H_2S, CH_4, NO_2, O_3, PMA, PMB, Relative Humidity, SO_2, solar radiation, Temperature, Wind direction, Wind speed, Power

Survey Location

No 124 , Near Kalartan Village, beside of Yangon-Maubin Road, Twante Township, Yangon, Myanmar.Detail sampling points are shown in Table.

Figure 5.7 Air Quality Monitoring

No	Location	Coordinates		Date
		Latitude	Longitude	
1	Air station point	16°54'11"	96°04'23"	23-4-2018

Sampling and Analysis Method for Air Quality

No	Parameter	Analysis Method
1	Atmospheric pressure	On site reading
2	Carbon Dioxide($Co_{2)}$	On site reading
3	Hydrogen Sulfide(H_2S)	On site reading
4	Methane($CH_{4)}$	On site reading
5	Nitrogen Dioxide(NO_2)	On site reading
6	Ozone(O_3	On site reading
7	PM(2.5)	On site reading
8	PM(10)	On site reading
9	Relative Humidity	On site reading
10	Sulphur Dioxide(SO_2)	On site reading
11	Solar Radiation	On site reading
12	Temperature	On site reading
13	Wind Direction	On site reading
14	Wind Speed	On site reading

(1)About Air Quality in the Atmosphere

The regional air quality within and surrounding project area is overwhelmingly dominated by industries and residential. As the proposed project is located in the industrial zone, there have a lot of industries emitting smoke around the site. The air quality assessment with the air quality parameters including particulates (PM_{10}, $PM_{2.5}$), and Gases (So_x, O_3, NO_x and VOCs) would be monitored. The air quality impact assessment will consider air emissions in accordance with ECD's National Environmental Quality (Emission) Guidelines, WHO air quality standards and IFC air emissions standards. To assist relevant authorities to improving baseline information, simple air quality sampling was conducted at three sites for 24 hours; two within the project area and another one outside of the project area.

Odor

Odor is one of the most significance impacts (especially occupational impact) for this project. The sources of odor in the vicinity of the project and of receptors likely to be affected by odor will be made using a description of the odor causing processes and locations.

Carbon Dioxide (CO_2)

Carbon dioxide is a colorless and odorless gas with a density higher than 60% higher than that of air. Its sources are volcanoes, hot springs and geysers. Because carbon dioxide is soluble in water, it occurs naturally in groundwater, rivers and lakes, ice caps, glaciers and seawater. It is present in deposits of petroleum and natural gas. Carbon dioxide (CO_2) is produced by all aerobic organisms when they metabolize carbohydrates and lipids to produce energy by respiration. Carbon dioxide is produced during the processes of decay of organic materials and the fermentation of sugars in bread, beer and winemaking. It is produced by combustion of wood and other organic materials and fossil fuels such as coal, peat, petroleum and natural gas. It is the most significant long-lived greenhouse gas in Earth's atmosphere. Carbon dioxide is an end product of cellular respiration in organisms that obtain energy by breaking down sugars, fats and amino acids with oxygen as part of their metabolism.

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless, and tasteless gas that is slightly less dense than air. Carbon monoxide is produced from the partial oxidation of carbon-containing compounds; it forms when there is not enough oxygen to produce carbon dioxide (CO_2), such as when operating a stove or an internal combustion engine in an enclosed space. In the presence of oxygen, including atmospheric concentrations, carbon monoxide burns with a blue flame, producing carbon dioxide. Although it is colorless, tasteless and odorless, it is very toxic. The most common symptoms of carbon monoxide poisoning may resemble other types of poisonings and infections, including symptoms such as headache, nausea, vomiting, dizziness, fatigue, and a feeling of weakness. Carbon monoxide is present in small amounts in the atmosphere, chiefly as a product of volcanic activity but also from natural and man-made fires. The burning of fossil fuels also contributes to carbon monoxide production. Carbon monoxide occurs dissolved in molten volcanic rock at high pressures in the Earth's mantle. Because natural sources of carbon monoxide are so variable from year to year, it is extremely difficult to accurately measure natural emissions of the gas.

Methane (CH_4)

Methane is the main constituent of natural gas. Natural methane is found both below ground and under the sea floor. At room temperature and standard pressure, methane is a colorless, odorless gas. The primary chemical reactions of methane are combustion, steam reforming to syngas, and halogenation. In general, methane reactions are difficult to control. Partial oxidation to methanol, for example, is challenging because the reaction typically progresses all the way to carbon dioxide and water even with an insufficient supply of oxygen. The enzyme methane mono oxygenize produces methanol from methane, but cannot be used for industrial-scale reactions. Methane is used in industrial chemical processes and may be transported as a refrigerated liquid. Methane is used as a fuel for ovens, homes, water heaters, kilns, automobiles, turbines, and other things. It combusts with oxygen to create heat. In a highly refined form, liquid methane is used as a rocket fuel. Methane is nontoxic, yet it is extremely flammable and may form explosive mixtures with air. Methane is violently reactive with oxidizers, halogen, and some halogen-containing compounds. Methane is also an asphyxiant and may displace oxygen in an enclosed space.

Hydrogen Sulfide (H_2S)

Hydrogen sulfide is a colorless gas with the characteristic foul odor of rotten eggs. It is very poisonous, corrosive, and flammable. Hydrogen sulfide often results from the

microbial breakdown of organic matter in the absence of oxygen gas. Hydrogen sulfide is slightly denser than air; a mixture of H2S and air can be explosive. Hydrogen sulfide and oxygen burn with a blue flame to form sulfur dioxide (SO_2) and water. It is slightly soluble in water and acts as a weak acid. Hydrogen sulfide reacts with metal ions to form metal sulfides, which are insoluble, often dark colored solids. The main use of hydrogen sulfide is as a precursor to elemental sulfur. Small amounts of hydrogen sulfide occur in crude petroleum, but natural gas can contain up to 90%. Volcanoes and some hot springs (as well as cold springs) emit some H_2S. Hydrogen sulfide is a highly toxic and flammable gas (flammable range: 4.3–46%). Being heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces.

Sulfur Dioxide (SO_2)

At standard atmosphere, sulfur dioxide is a toxic gas with a pungent, irritating smell. It is found on Earth and exists in very small concentrations and in the atmosphere at about 1 ppm. It is a key component of chemical reactions in the planet's atmosphere and contributes to global warming. Sulfur dioxide is primarily produced for sulfuric acid manufacture. Sulfur dioxide is sometimes used as a preservative for dried apricots, dried figs, and other dried fruits. Sulfur dioxide is still an important compound in winemaking. Sulfur dioxide is also a good reluctant. In the presence of water, sulfur dioxide is able to decolorize substances.

Ozone (O_3)

Ozone is a pale blue gas with a distinctively pungent smell. Ozone is formed from dioxygen by the action of ultraviolet light and also atmospheric electrical discharges, and is present in low concentrations throughout the Earth's atmosphere. Ozone is a powerful oxidant and has many industrial and consumer applications related to oxidation.Low level ozone (or tropospheric ozone) is an atmospheric pollutant. It is not emitted directly by car engines or by industrial operations, but formed by the reaction of sunlight on air containing hydrocarbons and nitrogen oxides that react to form ozone directly at the source of the pollution. The largest use of ozone is in the preparation of pharmaceuticals, synthetic lubricants, and many other commercially useful organic compound. It can also be used for bleaching substances and for killing microorganisms in air and water sources. Ozone is a reagent in many organic reactions in the laboratory and in industry.

Nitrogen Dioxide (NO_2)

At higher temperatures it is a reddish-brown gas that has a characteristic sharp, biting odor and is a prominent air pollutant. Nitrogen dioxide is a reddish-brown gas above 70 °F (21 °C; 294 K) with a pungent, acrid odor, becomes a yellowish-brown liquid below 70 °F (21 °C; 294 K), and converts to the colorless di nitrogen tetroxide. NO_2 is used as an intermediate in the manufacturing of nitric acid, as a nitrating agent in manufacturing of chemical explosives, as a polymerization inhibitor for acrylates, as a flour bleaching agent.[12]:223, and as a room temperature sterilization agent. It is also used as an oxidizer in rocket fuel. The most prominent sources of NO_2 are internal combustion engines burning fossil fuels. Indoors, exposure arises from cigarette smoke,[16] and butane and kerosene heaters and stoves

(2) Ambient Air Quality Results of the Myanmar Shwenaga Agricultural Co.,ltd 's Twante Project Area

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Environmental Report

Graphing Average Period 15

Record Cnt 14368
Start Date 4/23/2018 12:43:02 AM 96
End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
EPAS Header ?	982.911	0	122.552	0	-100	9.17910	105.537	9.28358	7.91044	93.3582	1.13432	99999.9	10.4029	200.477	.064179	13.4567
	983.9	0	282	0	-100	44	146	116	15	100	4	9999	23	354	.5	13.8
	981.1	0	80	0	-100	2	30	2	1	69	1	9999	0	115	0	13.2
Daily Mon, Apr 23, 2018	982.911	0	122.552	0	-100	9.17910	105.537	9.28358	7.91044	93.3582	1.13432	99999.9	10.4029	200.477	.064179	13.4567
	983.9	0	282	0	-100	44	146	116	15	100	4	9999	23	354	.5	13.8
	981.1	0	80	0	-100	2	30	2	1	69	1	9999	0	115	0	13.2
Ave Period 15 4/23/201 0:44:03	981.4	0	88	0	-100	41	30	2	2	69	1	99999.9	19	342	0	13.2
	981.4	0	88	0	-100	41	30	2	2	69	1	9999	19	342	0	13.2
	981.4	0	88	0	-100	41	30	2	2	69	1	9999	19	342	0	13.2
4/23/18	981.4	0	88	0	-100	41	30	2	2	69	1	?	19	342	0.0	13.2
Ave Period 15 4/23/201 0:45:03	981.4	0	88	0	-100	41	30	2	2	69	1	99999.9	19	342	0	13.2
	981.4	0	88	0	-100	41	30	2	2	69	1	9999	19	342	0	13.2
	981.4	0	88	0	-100	41	30	2	2	69	1	9999	19	342	0	13.2
4/23/18	981.4	0	88	0	-100	41	30	2	2	69	1	?	19	342	0.0	13.2
Ave Period 15 4/23/201 0:58:04	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.4
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.4
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.4
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.4
Ave Period 15 4/23/201 0:59:03	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.5
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.5
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.5
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.5

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Graphing Average Period 15

Record Cnt 14368
Start Date 4/23/2018 12:43:02 AM 96
End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15 4/23/201 1:00:04	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.4
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.4
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.4
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.4
Ave Period 15 4/23/201 1:01:04	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.2
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.2
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.2
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.2
Ave Period 15 4/23/201 1:02:04	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.5
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.5
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.5
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.5
Ave Period 15 4/23/201 1:03:02	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.8
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.8
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.8
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.8
Ave Period 15 4/23/201 1:04:04	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.7
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.7
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.7
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.7
Ave Period 15 4/23/201 1:05:03	981.1	0	89	0	-100	44	31	2	1	72	1	99999.9	23	344	0	13.2
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.2
	981.1	0	89	0	-100	44	31	2	1	72	1	9999	23	344	0	13.2
4/23/18	981.1	0	89	0	-100	44	31	2	1	72	1	?	23	344	0.0	13.2

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Graphing Average Period 15

Record Cnt 14368
Start Date 4/23/2018 12:43:02 AM 96
End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	982	0	88	0	-100	2	111	2	10	97	1	99999.9	9	354	0	13.4
4/23/201 2:03:03	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.4
	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.4
4/23/18	982.0	0	88	0	-100	2	111	2	10	97	1	?	9	354	0.0	13.4
Ave Period 15	982	0	88	0	-100	2	111	2	10	97	1	99999.9	9	354	0	13.5
4/23/201 2:04:04	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.5
	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.5
4/23/18	982.0	0	88	0	-100	2	111	2	10	97	1	?	9	354	0.0	13.5
Ave Period 15	982	0	88	0	-100	2	111	2	10	97	1	99999.9	9	354	0	13.4
4/23/201 2:05:03	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.4
	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.4
4/23/18	982.0	0	88	0	-100	2	111	2	10	97	1	?	9	354	0.0	13.4
Ave Period 15	982	0	88	0	-100	2	111	2	10	97	1	99999.9	9	354	0	13.5
4/23/201 2:06:03	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.5
	982	0	88	0	-100	2	111	2	10	97	1	9999	9	354	0	13.5
4/23/18	982.0	0	88	0	-100	2	111	2	10	97	1	?	9	354	0.0	13.5
Ave Period 15	982.1	0	117	0	-100	2	108	2	1	92	1	99999.9	14	217	.4	13.5
4/23/201 2:19:02	982.1	0	117	0	-100	2	108	2	1	92	1	9999	14	217	.4	13.5
	982.1	0	117	0	-100	2	108	2	1	92	1	9999	14	217	.4	13.5
4/23/18	982.1	0	117	0	-100	2	108	2	1	92	1	?	14	217	0.4	13.5
Ave Period 15	982.2	0	114	0	-100	2	124	2	10	97	1	99999.9	10	199	0	13.4
4/23/201 2:25:03	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.4
	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.4
4/23/18	982.2	0	114	0	-100	2	124	2	10	97	1	?	10	199	0.0	13.4

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Environmental Report

Graphing Average Period 15

Record Cnt 14368
Start Date 4/23/2018 12:43:02 AM 96
End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	982.2	0	114	0	-100	2	124	2	10	97	1	99999.9	10	199	0	13.5
4/23/201 2:26:04	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.5
	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.5
4/23/18	982.2	0	114	0	-100	2	124	2	10	97	1	?	10	199	0.0	13.5
Ave Period 15	982.2	0	114	0	-100	2	124	2	10	97	1	99999.9	10	199	0	13.5
4/23/201 2:27:04	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.5
	982.2	0	114	0	-100	2	124	2	10	97	1	9999	10	199	0	13.5
4/23/18	982.2	0	114	0	-100	2	124	2	10	97	1	?	10	199	0.0	13.5
Ave Period 15	982.5	0	80	0	-100	2	108	2	9	88	1	99999.9	14	199	.2	13.5
4/23/201 2:44:04	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	.2	13.5
	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	.2	13.5
4/23/18	982.5	0	80	0	-100	2	108	2	9	88	1	?	14	199	0.2	13.5
Ave Period 15	982.5	0	80	0	-100	2	108	2	9	88	1	99999.9	14	199	0	13.5
4/23/201 2:45:03	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	0	13.5
	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	0	13.5
4/23/18	982.5	0	80	0	-100	2	108	2	9	88	1	?	14	199	0.0	13.5
Ave Period 15	982.5	0	80	0	-100	2	108	2	9	88	1	99999.9	14	199	0	13.2
4/23/201 2:46:04	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	0	13.2
	982.5	0	80	0	-100	2	108	2	9	88	1	9999	14	199	0	13.2
4/23/18	982.5	0	80	0	-100	2	108	2	9	88	1	?	14	199	0.0	13.2
Ave Period 15	982.7	0	117	0	-100	2	111	2	10	96	1	99999.9	10	199	.1	13.2
4/23/201 2:57:04	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	.1	13.2
	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	.1	13.2
4/23/18	982.7	0	117	0	-100	2	111	2	10	96	1	?	10	199	0.1	13.2

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	**968.428**	**.916666**	**102.572**	**-2.0833**	**-97.875**	**22.375**	**101.239**	**8.84375**	**11.3229**	**91.4791**	**2084.40**	**93750.1**	**16.8333**	**220.016**	**.761458**	**12.5989**
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	**982.7**	**0**	**117**	**0**	**-100**	**2**	**111**	**2**	**10**	**96**	**1**	**99999.9**	**10**	**199**	**0**	**13.5**
4/23/201 2:58:04	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.5
	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.5
4/23/18	982.7	0	117	0	-100	2	111	2	10	96	1	?	10	199	0.0	13.5
Ave Period 15	**982.7**	**0**	**117**	**0**	**-100**	**2**	**111**	**2**	**10**	**96**	**1**	**99999.9**	**10**	**199**	**0**	**13.8**
4/23/201 2:59:03	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.8
	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.8
4/23/18	982.7	0	117	0	-100	2	111	2	10	96	1	?	10	199	0.0	13.8
Ave Period 15	**982.7**	**0**	**117**	**0**	**-100**	**2**	**111**	**2**	**10**	**96**	**1**	**99999.9**	**10**	**199**	**0**	**13.7**
4/23/201 3:00:04	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.7
	982.7	0	117	0	-100	2	111	2	10	96	1	9999	10	199	0	13.7
4/23/18	982.7	0	117	0	-100	2	111	2	10	96	1	?	10	199	0.0	13.7
Ave Period 15	**983**	**0**	**135**	**0**	**-100**	**2**	**112**	**3**	**10**	**97**	**1**	**99999.9**	**6**	**160**	**.2**	**13.5**
4/23/201 3:04:05	983	0	135	0	-100	2	112	3	10	97	1	9999	6	160	.2	13.5
	983	0	135	0	-100	2	112	3	10	97	1	9999	6	160	.2	13.5
4/23/18	983.0	0	135	0	-100	2	112	3	10	97	1	?	6	160	0.2	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**.2**	**13.5**
4/23/201 3:15:04	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.2	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**0**	**13.2**
4/23/201 3:16:04	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.2
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.2
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.0	13.2

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	**968.428**	**.916666**	**102.572**	**-2.0833**	**-97.875**	**22.375**	**101.239**	**8.84375**	**11.3229**	**91.4791**	**2084.40**	**93750.1**	**16.8333**	**220.016**	**.761458**	**12.5989**
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**0**	**13.5**
4/23/201 3:17:04	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.0	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**.2**	**13.5**
4/23/201 3:18:03	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.2	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**.1**	**13.5**
4/23/201 3:19:03	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.1	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.1	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.1	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**.2**	**13.7**
4/23/201 3:20:05	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.7
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.2	13.7
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.2	13.7
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**.1**	**13.5**
4/23/201 3:21:04	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.1	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	.1	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.1	13.5
Ave Period 15	**983.1**	**0**	**109**	**0**	**-100**	**2**	**125**	**2**	**7**	**96**	**1**	**99999.9**	**10**	**160**	**0**	**13.5**
4/23/201 3:22:04	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.5
	983.1	0	109	0	-100	2	125	2	7	96	1	9999	10	160	0	13.5
4/23/18	983.1	0	109	0	-100	2	125	2	7	96	1	?	10	160	0.0	13.5

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15 4/23/201 3:41:03	983.4	0	105	0	-100	6	108	2	11	100	1	99999.9	5	160	0	13.5
	983.4	0	105	0	-100	6	108	2	11	100	1	9999	5	160	0	13.5
	983.4	0	105	0	-100	6	108	2	11	100	1	9999	5	160	0	13.5
4/23/18	983.4	0	105	0	-100	6	108	2	11	100	1	?	5	160	0.0	13.5
Ave Period 15 4/23/201 4:10:04	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	160	0	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.5
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	160	0.0	13.5
Ave Period 15 4/23/201 4:11:04	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	160	0	13.4
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.4
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.4
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	160	0.0	13.4
Ave Period 15 4/23/201 4:12:04	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	160	.1	13.4
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	.1	13.4
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	.1	13.4
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	160	0.1	13.4
Ave Period 15 4/23/201 4:13:03	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	161	.2	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	161	.2	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	161	.2	13.5
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	161	0.2	13.5
Ave Period 15 4/23/201 4:14:03	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	160	0	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	160	0	13.5
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	160	0.0	13.5

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15 4/23/201 4:15:03	983.7	0	91	0	-100	2	106	10	13	100	1	99999.9	0	159	.1	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	159	.1	13.5
	983.7	0	91	0	-100	2	106	10	13	100	1	9999	0	159	.1	13.5
4/23/18	983.7	0	91	0	-100	2	106	10	13	100	1	?	-0	159	0.1	13.5
Ave Period 15 4/23/201 4:29:05	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.3	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.3	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.3	13.5
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.3	13.5
Ave Period 15 4/23/201 4:30:04	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.1	13.4
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.4
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.4
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.1	13.4
Ave Period 15 4/23/201 4:31:05	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.2	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.2	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.2	13.5
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.2	13.5
Ave Period 15 4/23/201 4:32:04	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.1	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.5
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.1	13.5
Ave Period 15 4/23/201 4:33:03	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.1	13.2
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.2
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.1	13.2
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.1	13.2

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15 4/23/201 4:34:04	983.8	0	155	0	-100	2	109	2	7	99	1	99999.9	5	159	.2	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.2	13.5
	983.8	0	155	0	-100	2	109	2	7	99	1	9999	5	159	.2	13.5
4/23/18	983.8	0	155	0	-100	2	109	2	7	99	1	?	5	159	0.2	13.5
Ave Period 15 4/23/201 4:43:03	983.7	0	282	0	-100	2	127	2	1	95	4	99999.9	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
4/23/18	983.7	0	282	0	-100	2	127	2	1	95	4	?	11	159	0.0	13.5
Ave Period 15 4/23/201 4:44:05	983.7	0	282	0	-100	2	127	2	1	95	4	99999.9	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
4/23/18	983.7	0	282	0	-100	2	127	2	1	95	4	?	11	159	0.0	13.5
Ave Period 15 4/23/201 4:45:03	983.7	0	282	0	-100	2	127	2	1	95	4	99999.9	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
	983.7	0	282	0	-100	2	127	2	1	95	4	9999	11	159	0	13.5
4/23/18	983.7	0	282	0	-100	2	127	2	1	95	4	?	11	159	0.0	13.5
Ave Period 15 4/23/201 4:49:04	983.8	0	140	0	-100	2	126	13	10	100	1	99999.9	3	159	0	13.5
	983.8	0	140	0	-100	2	126	13	10	100	1	9999	3	159	0	13.5
	983.8	0	140	0	-100	2	126	13	10	100	1	9999	3	159	0	13.5
4/23/18	983.8	0	140	0	-100	2	126	13	10	100	1	?	3	159	0.0	13.5
Ave Period 15 4/23/201 4:50:04	983.8	0	140	0	-100	2	126	13	10	100	1	99999.9	3	159	0	13.2
	983.8	0	140	0	-100	2	126	13	10	100	1	9999	3	159	0	13.2
	983.8	0	140	0	-100	2	126	13	10	100	1	9999	3	159	0	13.2
4/23/18	983.8	0	140	0	-100	2	126	13	10	100	1	?	3	159	0.0	13.2

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15 4/23/201 5:03:03	983.7	0	158	0	-100	2	113	2	7	98	1	99999.9	10	144	.2	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	.2	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	.2	13.5
4/23/18	983.7	0	158	0	-100	2	113	2	7	98	1	?	10	144	0.2	13.5
Ave Period 15 4/23/201 5:04:04	983.7	0	158	0	-100	2	113	2	7	98	1	99999.9	10	144	0	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	0	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	0	13.5
4/23/18	983.7	0	158	0	-100	2	113	2	7	98	1	?	10	144	0.0	13.5
Ave Period 15 4/23/201 5:05:03	983.7	0	158	0	-100	2	113	2	7	98	1	99999.9	10	144	0	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	0	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	0	13.5
4/23/18	983.7	0	158	0	-100	2	113	2	7	98	1	?	10	144	0.0	13.5
Ave Period 15 4/23/201 5:06:03	983.7	0	158	0	-100	2	113	2	7	98	1	99999.9	10	144	.2	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	.2	13.5
	983.7	0	158	0	-100	2	113	2	7	98	1	9999	10	144	.2	13.5
4/23/18	983.7	0	158	0	-100	2	113	2	7	98	1	?	10	144	0.2	13.5
Ave Period 15 4/23/201 5:19:03	983.7	0	206	0	-100	6	145	116	12	100	1	99999.9	12	143	0	13.5
	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	0	13.5
	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	0	13.5
4/23/18	983.7	0	206	0	-100	6	145	116	12	100	1	?	12	143	0.0	13.5
Ave Period 15 4/23/201 5:20:04	983.7	0	206	0	-100	6	145	116	12	100	1	99999.9	12	143	0	13.5
	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	0	13.5
	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	0	13.5
4/23/18	983.7	0	206	0	-100	6	145	116	12	100	1	?	12	143	0.0	13.5

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	983.7	0	206	0	-100	6	145	116	12	100	1	99999.9	12	143	.1	13.5
4/23/201 5:21:03	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	.1	13.5
	983.7	0	206	0	-100	6	145	116	12	100	1	9999	12	143	.1	13.5
4/23/18	983.7	0	206	0	-100	6	145	116	12	100	1	?	12	143	0.1	13.5
Ave Period 15	983.9	0	84	0	-100	19	146	26	15	97	1	99999.9	11	160	0	13.5
4/23/201 6:25:03	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.5
	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.5
4/23/18	983.9	0	84	0	-100	19	146	26	15	97	1	?	11	160	0.0	13.5
Ave Period 15	983.9	0	84	0	-100	19	146	26	15	97	1	99999.9	11	160	0	13.7
4/23/201 6:26:02	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.7
	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.7
4/23/18	983.9	0	84	0	-100	19	146	26	15	97	1	?	11	160	0.0	13.7
Ave Period 15	983.9	0	84	0	-100	19	146	26	15	97	1	99999.9	11	160	0	13.5
4/23/201 6:27:02	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.5
	983.9	0	84	0	-100	19	146	26	15	97	1	9999	11	160	0	13.5
4/23/18	983.9	0	84	0	-100	19	146	26	15	97	1	?	11	160	0.0	13.5
Ave Period 15	983.2	0	123	0	-100	2	121	2	11	100	1	99999.9	7	115	0	13.4
4/23/201 8:56:04	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	115	0	13.4
	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	115	0	13.4
4/23/18	983.2	0	123	0	-100	2	121	2	11	100	1	?	7	115	0.0	13.4
Ave Period 15	983.2	0	123	0	-100	2	121	2	11	100	1	99999.9	7	116	.5	13.5
4/23/201 8:57:03	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	.5	13.5
	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	.5	13.5
4/23/18	983.2	0	123	0	-100	2	121	2	11	100	1	?	7	116	0.5	13.5

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Graphing Average Period 15

Record Cnt 14368

Start Date 4/23/2018 12:43:02 AM 96

End Date ? 12:16:44 AM

	BarM mBar	CO2 ppm	CO ppb	H2S ppb	CH4 ppm	NO2 ppb	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	SLRR W/m2	TmpC Deg. C	WDir Deg.	WSpM kph	Pwr V
Ave	968.428	.916666	102.572	-2.0833	-97.875	22.375	101.239	8.84375	11.3229	91.4791	2084.40	93750.1	16.8333	220.016	.761458	12.5989
Max	1011.	88	282	0	2	250	164	116	100	100	9999	9999	354	354	13.5	13.8
Min	0	0	0	-100	-100	2	2	2	1	1	1	.9	-9	0	0	0
Ave Period 15	983.2	0	123	0	-100	2	121	2	11	100	1	99999.9	7	116	.2	13.4
4/23/201 8:58:03	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	.2	13.4
	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	.2	13.4
4/23/18	983.2	0	123	0	-100	2	121	2	11	100	1	?	7	116	0.2	13.4
Ave Period 15	983.2	0	123	0	-100	2	121	2	11	100	1	99999.9	7	116	0	13.2
4/23/201 8:59:02	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	0	13.2
	983.2	0	123	0	-100	2	121	2	11	100	1	9999	7	116	0	13.2
4/23/18	983.2	0	123	0	-100	2	121	2	11	100	1	?	7	116	0.0	13.2
Ave Period 15	983.2	0	96	0	-100	2	119	5	7	95	1	99999.9	16	116	0	13.2
4/23/201 9:16:05	983.2	0	96	0	-100	2	119	5	7	95	1	9999	16	116	0	13.2
	983.2	0	96	0	-100	2	119	5	7	95	1	9999	16	116	0	13.2
4/23/18	983.2	0	96	0	-100	2	119	5	7	95	1	?	16	116	0.0	13.2
EPAS	1005.01	0	35.4761	0	-100	11.0952	92.2380	8.04761	15.4285	95.8571	1	99999.9	8.57142	281.380	2.11428	10.8428
Header ?	1006.	0	77	0	-100	21	115	34	28	100	1	9999	17	353	5.3	11
	1004	0	0	0	-100	2	84	2	1	89	1	9999	-9	66	0	10.6
Daily	1005.01	0	35.4761	0	-100	11.0952	92.2380	8.04761	15.4285	95.8571	1	99999.9	8.57142	281.380	2.11428	10.8428
Mon, Apr 23, 2018	1006.	0	77	0	-100	21	115	34	28	100	1	9999	17	353	5.3	11
	1004	0	0	0	-100	2	84	2	1	89	1	9999	-9	66	0	10.6
Ave Period 15	1004.1	0	0	0	-100	2	105	2	8	100	1	99999.9	13	293	.8	10.9
4/23/201 0:49:05	1004.	0	0	0	-100	2	105	2	8	100	1	9999	13	293	.8	10.9
	1004.	0	0	0	-100	2	105	2	8	100	1	9999	13	293	.8	10.9
4/23/18	1004.1	0	0	0	-100	2	105	2	8	100	1	?	13	293	0.8	10.9

(3) Average Air Results in Proposed Project Site

DATE	TIME	BarM mBar	CO2 ppm	CO ppb	CO ppm	H2S ppb	CH4 ppm	NO2 ppb
04/23/2018	10:00:00							
04/23/2018	10:15:03	981.4	505	88	0.088	0	-100	41
04/23/2018	10:20:04	981.1	503	89	0.089	0	-100	44
04/23/2018	10:30:03	981.1	543	89	0.089	0	-100	44
04/23/2018	10:35:05	981.1	542	89	0.089	0	-100	44
04/23/2018	10:40:03	981.1	342	89	0.089	0	-100	44
04/23/2018	11:00:04	981.1	456	89	0.089	0	-100	44
04/23/2018	11:15:02	981.1	342	89	0.089	0	-100	44
04/23/2018	11:20:02	981.1	432	89	0.089	0	-100	44
04/23/2018	11:42:04	981.1	65	89	0.089	0	-100	44
04/23/2018	11:50:03	982	121	88	0.088	0	-100	2
04/23/2018	00:00:04	982	143	88	0.088	0	-100	2
04/23/2018	00:00:04	982	123	88	0.088	0	-100	2
04/23/2018	03:01:03	982	123	88	0.088	0	-100	2
04/23/2018	03:02:04	982.1	113	117	0.117	0	-100	2
04/23/2018	03:03:03	982.2	234	114	0.114	0	-100	2
04/23/2018	03:33:03	982.2	123	114	0.114	0	-100	2
04/23/2018	03:34:03	982.2	554	114	0.114	0	-100	2
04/23/2018	03:35:04	982.5	554	80	0.08	0	-100	2
04/23/2018	03:36:02	982.5	44	80	0.08	0	-100	2
04/23/2018	03:37:02	982.5	45	80	0.08	0	-100	2
04/23/2018	03:54:04	982.7	56	117	0.117	0	-100	2
04/23/2018	03:55:03	982.7	123	117	0.117	0	-100	2
04/23/2018	03:56:03	982.7	342	117	0.117	0	-100	2
04/23/2018	03:57:02	982.7	234	117	0.117	0	-100	2
04/23/2018	03:58:03	983	362	135	0.135	0	-100	2
04/23/2018	03:59:03	983.1	362	109	0.109	0	-100	2
04/23/2018	04:00:02	983.1	461	109	0.109	0	-100	2
04/23/2018	04:01:03	983.1	461	109	0.109	0	-100	2
04/23/2018	04:02:02	983.1	462	109	0.109	0	-100	2
04/23/2018	04:03:03	983.1	462	109	0.109	0	-100	2
04/23/2018	04:04:04	983.1	462	109	0.109	0	-100	2
04/23/2018	04:05:03	983.1	462	109	0.109	0	-100	2
04/23/2018	04:06:03	983.1	462	109	0.109	0	-100	2
04/23/2018	04:07:04	983.4	462	105	0.105	0	-100	6
04/23/2018	04:26:04	983.7	462	91	0.091	0	-100	2
04/23/2018	04:27:03	983.7	445	91	0.091	0	-100	2
04/23/2018	04:28:02	983.7	445	91	0.091	0	-100	2
04/23/2018	04:29:03	983.7	543	91	0.091	0	-100	2
04/23/2018	04:30:03	983.7	234	91	0.091	0	-100	2
04/23/2018	04:31:04	983.7	443	91	0.091	0	-100	2
04/23/2018	04:32:03	983.8	445	155	0.155	0	-100	2
04/23/2018	04:33:02	983.8	433	155	0.155	0	-100	2
04/23/2018	04:34:04	983.8	544	155	0.155	0	-100	2
04/23/2018	04:49:04	983.8	345	155	0.155	0	-100	2
04/23/2018	04:50:03	983.8	34	155	0.155	0	-100	2

04/23/2018	04:51:02	983.8	23	155	0.155	0	-100	2
04/23/2018	04:52:02	983.7	43	282	0.282	0	-100	2
04/23/2018	04:53:02	983.7	0	282	0.282	0	-100	2
04/23/2018	04:54:04	983.7	34	282	0.282	0	-100	2
04/23/2018	04:55:04	983.8	432	140	0.14	0	-100	2
04/23/2018	05:03:03	983.8	123	140	0.14	0	-100	2
04/23/2018	05:04:02	983.7	553	158	0.158	0	-100	2
04/23/2018	05:05:03	983.7	554	158	0.158	0	-100	2
04/23/2018	05:06:04	983.7	445	158	0.158	0	-100	2
04/23/2018	05:07:03	983.7	334	158	0.158	0	-100	2
04/23/2018	05:08:04	983.7	453	206	0.206	0	-100	6
04/23/2018	05:09:02	983.7	443	206	0.206	0	-100	6
04/23/2018	05:55:02	983.7	234	206	0.206	0	-100	6
04/23/2018	05:56:05	983.9	554	84	0.084	0	-100	19
04/23/2018	05:57:03	983.9	445	84	0.084	0	-100	19
04/23/2018	05:58:04	983.9	554	84	0.084	0	-100	19
04/23/2018	05:59:02	983.2	445	123	0.123	0	-100	2
04/23/2018	06:45:04	983.2	554	123	0.123	0	-100	2
04/23/2018	06:46:04	983.2	775	123	0.123	0	-100	2
04/23/2018	06:47:03	983.2	443	123	0.123	0	-100	2
04/23/2018	07:05:02	983.2	100	96	0.096	0	-100	2
04/23/2018	07:06:02	1004.1	342	0	0	0	-100	2
04/23/2018	07:07:04	1006.4	234	0	0	0	-100	12
04/23/2018	07:29:04	1006.4	100	0	0	0	-100	12
04/23/2018	07:30:03	1006.4	505	0	0	0	-100	12
04/23/2018	07:31:03	1006.4	503	0	0	0	-100	12
04/23/2018	07:32:04	1006.4	543	0	0	0	-100	12
04/23/2018	07:33:03	1004	542	70	0.07	0	-100	21
04/23/2018	07:34:03	1004	342	70	0.07	0	-100	21
04/23/2018	07:47:04	1004	456	70	0.07	0	-100	21
04/23/2018	07:48:03	1006.1	342	49	0.049	0	-100	12
04/23/2018	07:49:04	1006.1	432	49	0.049	0	-100	12
04/23/2018	08:15:03	1004.1	65	77	0.077	0	-100	2
04/23/2018	08:05:02	1004.1	121	77	0.077	0	-100	2
04/23/2018	08:06:02	1004.1	143	77	0.077	0	-100	2
04/23/2018	08:07:04	1004.1	123	77	0.077	0	-100	2
04/23/2018	08:29:04	1006.2	123	50	0.05	0	-100	2
04/23/2018	08:30:03	1004.1	113	15	0.015	0	-100	18
04/23/2018	08:31:03	1004.1	234	15	0.015	0	-100	18
04/23/2018	08:32:04	1004.1	123	15	0.015	0	-100	18
04/23/2018	08:33:03	1004.1	554	15	0.015	0	-100	18
04/23/2018	08:34:03	1006.1	554	19	0.019	0	-100	2
04/23/2018	08:47:04	1011.3	44	190	0.19	0	-100	250
04/23/2018	08:48:03	1011.3	45	190	0.19	0	-100	250
04/23/2018	08:49:04	1011.3	56	190	0.19	0	-100	250
04/23/2018	08:15:03	1011.3	123	190	0.19	0	-100	250
04/23/2018	08:15:03	982	342	43	0.043	0	-100	43
04/23/2018	08:15:03	981.4	234	88	0.088	0	-100	41

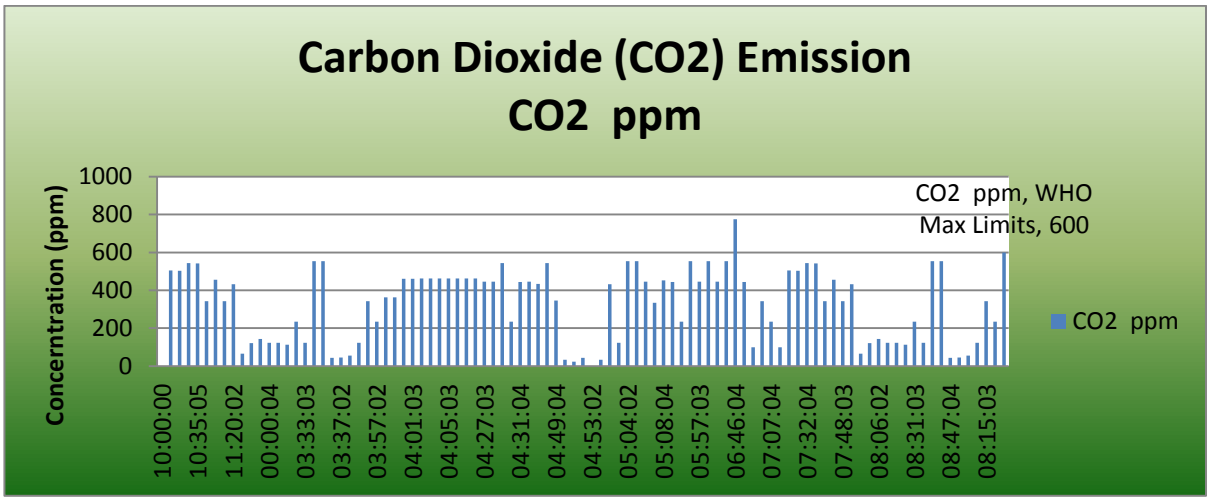
DATE	TIME	O3 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	WDir Deg.	WSpM mps
04/23/2018	10:00:00	30	2	2	69	1	19	342	0
04/23/2018	10:15:03	31	2	1	72	1	23	344	0
04/23/2018	10:20:04	31	2	1	72	1	23	344	0
04/23/2018	10:30:03	31	2	1	72	1	23	344	0
04/23/2018	10:35:05	31	2	1	72	1	23	344	0
04/23/2018	10:40:03	31	2	1	72	1	23	344	0
04/23/2018	11:00:04	31	2	1	72	1	23	344	0
04/23/2018	11:15:02	31	2	1	72	1	23	344	0
04/23/2018	11:20:02	31	2	1	72	1	23	344	0
04/23/2018	11:42:04	111	2	10	97	1	9	354	0
04/23/2018	11:50:03	111	2	10	97	1	9	354	0
04/23/2018	00:00:04	111	2	10	97	1	9	354	0
04/23/2018	00:00:04	111	2	10	97	1	9	354	0
04/23/2018	03:01:03	108	2	1	92	1	14	217	0.4
04/23/2018	03:02:04	124	2	10	97	1	10	199	0
04/23/2018	03:03:03	124	2	10	97	1	10	199	0
04/23/2018	03:33:03	124	2	10	97	1	10	199	0
04/23/2018	03:34:03	108	2	9	88	1	14	199	0.2
04/23/2018	03:35:04	108	2	9	88	1	14	199	0
04/23/2018	03:36:02	108	2	9	88	1	14	199	0
04/23/2018	03:37:02	111	2	10	96	1	10	199	0.1
04/23/2018	03:54:04	111	2	10	96	1	10	199	0
04/23/2018	03:55:03	111	2	10	96	1	10	199	0
04/23/2018	03:56:03	111	2	10	96	1	10	199	0
04/23/2018	03:57:02	112	3	10	97	1	6	160	0.2
04/23/2018	03:58:03	125	2	7	96	1	10	160	0.2
04/23/2018	03:59:03	125	2	7	96	1	10	160	0
04/23/2018	04:00:02	125	2	7	96	1	10	160	0
04/23/2018	04:01:03	125	2	7	96	1	10	160	0.2
04/23/2018	04:02:02	125	2	7	96	1	10	160	0.1
04/23/2018	04:03:03	125	2	7	96	1	10	160	0.2
04/23/2018	04:04:04	125	2	7	96	1	10	160	0.1
04/23/2018	04:05:03	125	2	7	96	1	10	160	0
04/23/2018	04:06:03	108	2	11	100	1	5	160	0
04/23/2018	04:07:04	106	10	13	100	1	0	160	0
04/23/2018	04:26:04	106	10	13	100	1	0	160	0
04/23/2018	04:27:03	106	10	13	100	1	0	160	0.1
04/23/2018	04:28:02	106	10	13	100	1	0	161	0.2
04/23/2018	04:29:03	106	10	13	100	1	0	160	0
04/23/2018	04:30:03	106	10	13	100	1	0	159	0.1
04/23/2018	04:31:04	109	2	7	99	1	5	159	0.3
04/23/2018	04:32:03	109	2	7	99	1	5	159	0.1
04/23/2018	04:33:02	109	2	7	99	1	5	159	0.2
04/23/2018	04:34:04	109	2	7	99	1	5	159	0.1
04/23/2018	04:49:04	109	2	7	99	1	5	159	0.1
04/23/2018	04:50:03	109	2	7	99	1	5	159	0.2
04/23/2018	04:51:02	127	2	1	95	4	11	159	0

04/23/2018	04:52:02	127	2	1	95	4	11	159	0
04/23/2018	04:53:02	127	2	1	95	4	11	159	0
04/23/2018	04:54:04	126	13	10	100	1	3	159	0
04/23/2018	04:55:04	126	13	10	100	1	3	159	0
04/23/2018	05:03:03	113	2	7	98	1	10	144	0.2
04/23/2018	05:04:02	113	2	7	98	1	10	144	0
04/23/2018	05:05:03	113	2	7	98	1	10	144	0
04/23/2018	05:06:04	113	2	7	98	1	10	144	0.2
04/23/2018	05:07:03	145	116	12	100	1	12	143	0
04/23/2018	05:08:04	145	116	12	100	1	12	143	0
04/23/2018	05:09:02	145	116	12	100	1	12	143	0.1
04/23/2018	05:55:02	146	26	15	97	1	11	160	0
04/23/2018	05:56:05	146	26	15	97	1	11	160	0
04/23/2018	05:57:03	146	26	15	97	1	11	160	0
04/23/2018	05:58:04	121	2	11	100	1	7	115	0
04/23/2018	05:59:02	121	2	11	100	1	7	116	0.5
04/23/2018	06:45:04	121	2	11	100	1	7	116	0.2
04/23/2018	06:46:04	121	2	11	100	1	7	116	0
04/23/2018	06:47:03	119	5	7	95	1	16	116	0
04/23/2018	07:05:02	105	2	8	100	1	13	293	0.8
04/23/2018	07:06:02	84	5	28	89	1	10	66	4.5
04/23/2018	07:07:04	84	5	28	89	1	10	327	5.3
04/23/2018	07:29:04	84	5	28	89	1	10	256	2.7
04/23/2018	07:30:03	84	5	28	89	1	10	216	2.9
04/23/2018	07:31:03	84	5	28	89	1	10	115	3.6
04/23/2018	07:32:04	97	2	6	100	1	9	322	1.1
04/23/2018	07:33:03	97	2	6	100	1	9	322	1.7
04/23/2018	07:34:03	97	2	6	100	1	9	337	1.7
04/23/2018	07:47:04	115	2	1	90	1	17	171	3.9
04/23/2018	07:48:03	115	2	1	90	1	17	262	3.2
04/23/2018	07:49:04	94	7	27	100	1	4	313	1.2
04/23/2018	08:15:03	94	7	27	100	1	4	328	0.8
04/23/2018	08:05:02	94	7	27	100	1	4	328	1.3
04/23/2018	08:06:02	94	7	27	100	1	4	328	0
04/23/2018	08:07:04	88	30	23	96	1	-3	314	0.6
04/23/2018	08:29:04	85	10	1	100	1	13	335	3.1
04/23/2018	08:30:03	85	10	1	100	1	13	309	2.1
04/23/2018	08:31:03	85	10	1	100	1	13	353	1.3
04/23/2018	08:32:04	85	10	1	100	1	13	349	1.1
04/23/2018	08:33:03	87	34	21	92	1	-9	265	1.5
04/23/2018	08:34:03	164	9	7	94	1	11	286	0
04/23/2018	08:47:04	164	9	7	94	1	11	286	0
04/23/2018	08:48:03	164	9	7	94	1	11	286	0
04/23/2018	08:49:04	164	9	7	94	1	11	286	0
04/23/2018	08:15:03	21	2	6	67	1	22	293	0
04/23/2018	08:15:03	30	2	2	69	1	19	342	0

(4) Comparison with National Environmental Air Quality Standard ,WHO and IFC Guidelines

(i) Average Concentration of CO_2

Figure below shows that the concentration of carbon dioxide (CO_2) measured in that sampling locations was between the ranges of 7ppm-554ppm.The concentration of CO_2 measured in most of the sampling stations was below the World Health Organization (WHO) Guidelines, which specifies 600ppm for the limitation of CO_2 concentration.sometime, The highest concentration of 554ppm was at the 6:45pm, near the storage of Building, while the lowest concentration of 7ppm was at the some time.



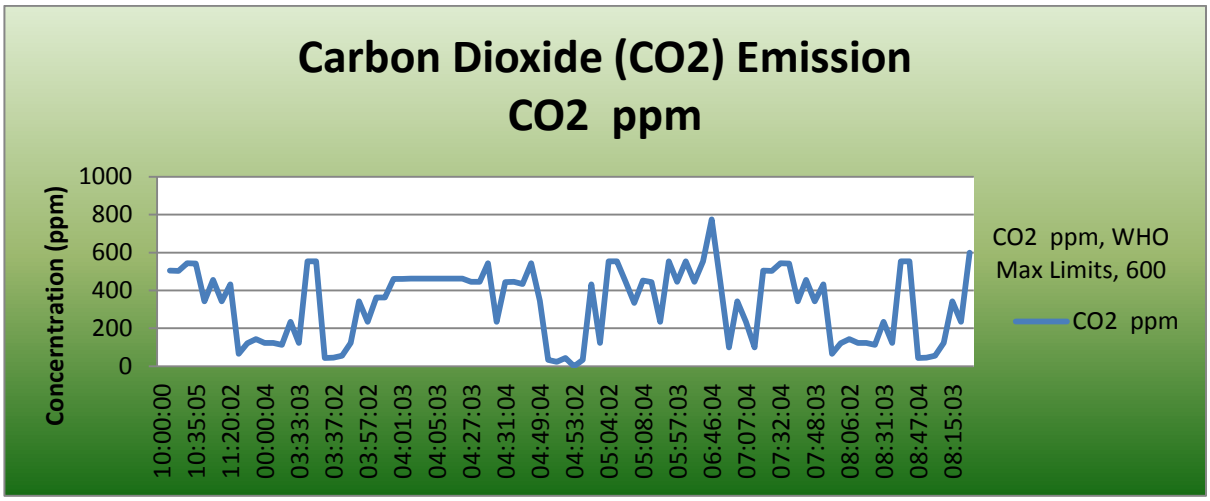


Figure 5.8 Average Concentration of CO_2

(ii) Average Concentration of CO

Figure 5.9 below shows that the concentration of carbon monoxide (CO) measured in all sampling locations was between the ranges of 0.001ppm-0.206ppm. The concentration of CO measured in all the sampling stations was below the National Ambient Air Quality Standards (NAAQS), which specifies 35ppm for the limitation of CO concentration. The highest concentration of 0.206ppm was at the location, near the building of proposed Building, while the lowest concentration of 0.001 ppm was at the location,

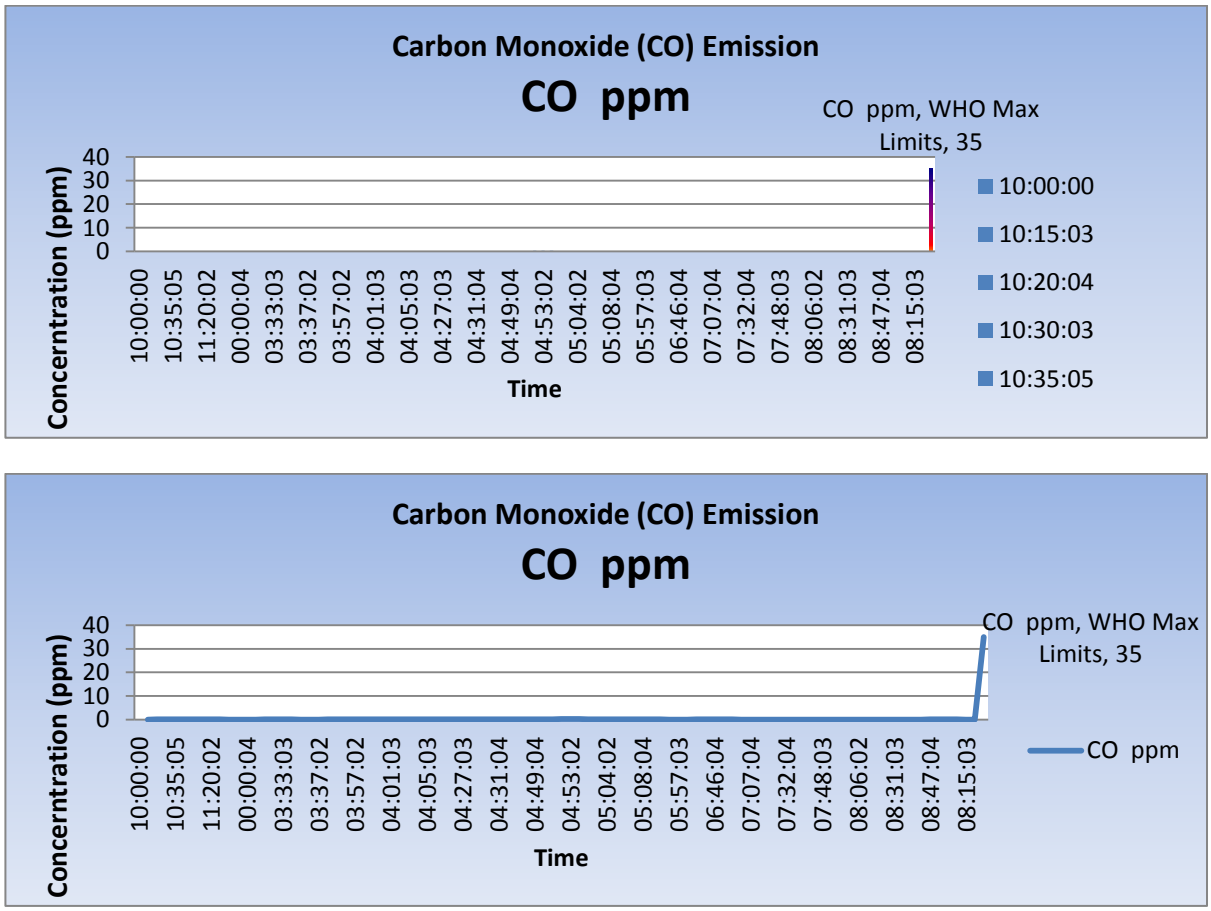


Figure 5.9 Average Concentration of CO

(iii) Average Concentration of NO_2

Figure 5.10 below shows that the concentration of nitrogen dioxide (NO_2) measured in all sampling locations was between the ranges of 2ppb-78ppb. The concentration of NO_2 measured in all the sampling stations was above the National Ambient Air Quality Standards (NAAQS), which specifies 100ppb for the limitation of NO_2 concentration. The highest concentration of 78ppb was at the location4, near the building of coal boiler, while the lowest concentration of 2ppb was at the location.

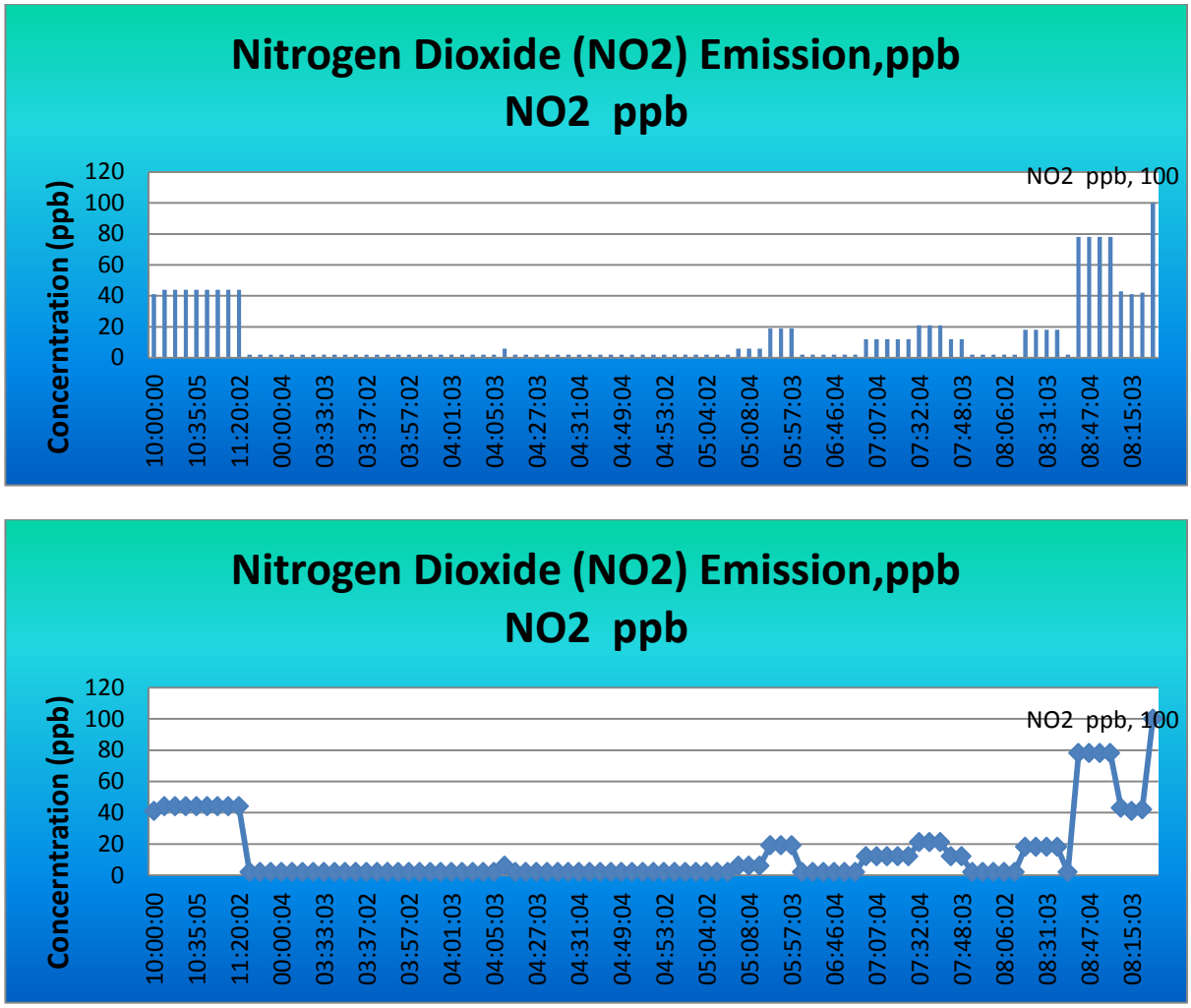


Figure 5.10 Average Concentration of NO_2

Figure 5.11 below shows that the concentration of sulfur dioxide (SO_2) measured in all sampling locations was between the ranges of 1. ppb-1ppb. The concentration of SO2 measured in all the sampling stations was below the National Ambient Air Quality Standards (NAAQS), which specifies 75ppb for the limitation of SO2 concentration.

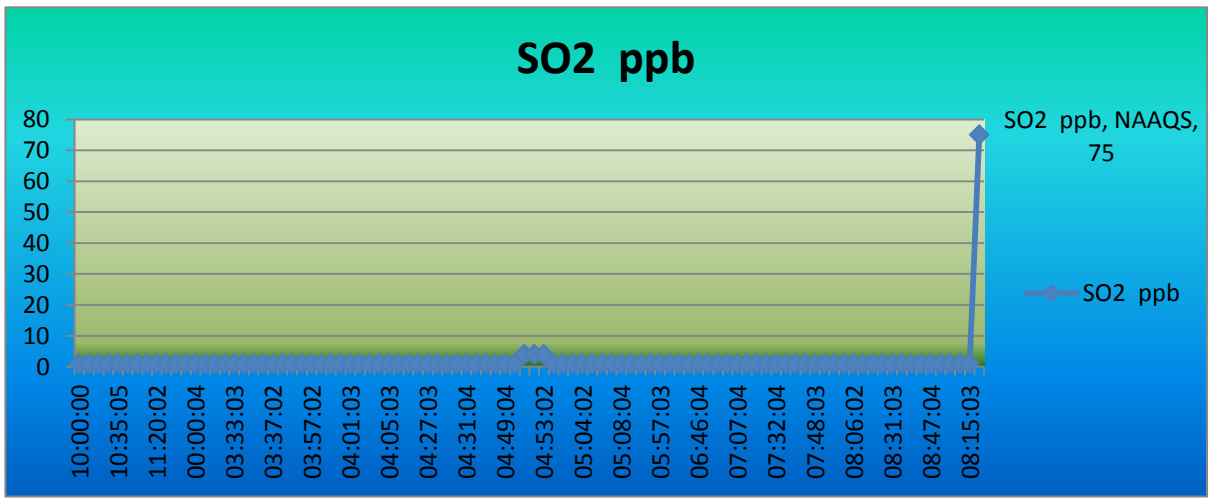


Figure 5.11 Average Concentration of SO_2

(iv) Concentration of particulate matter PM10 and PM2.5

Figure 5.12 below shows that the concentration of particulate matter (PM10) measured in all sampling locations was between the ranges of 2 g/m3-116 g/m3. The concentration of PM10 measured in all the sampling stations was below the National Ambient Air Quality Standards (NAAQS), which specifies 150 g/m3 for the limitation of PM10 concentration. The highest concentration of 116 g/m3 was at the location4, near the building, while the lowest concentration of 2 g/m3 was at the location.

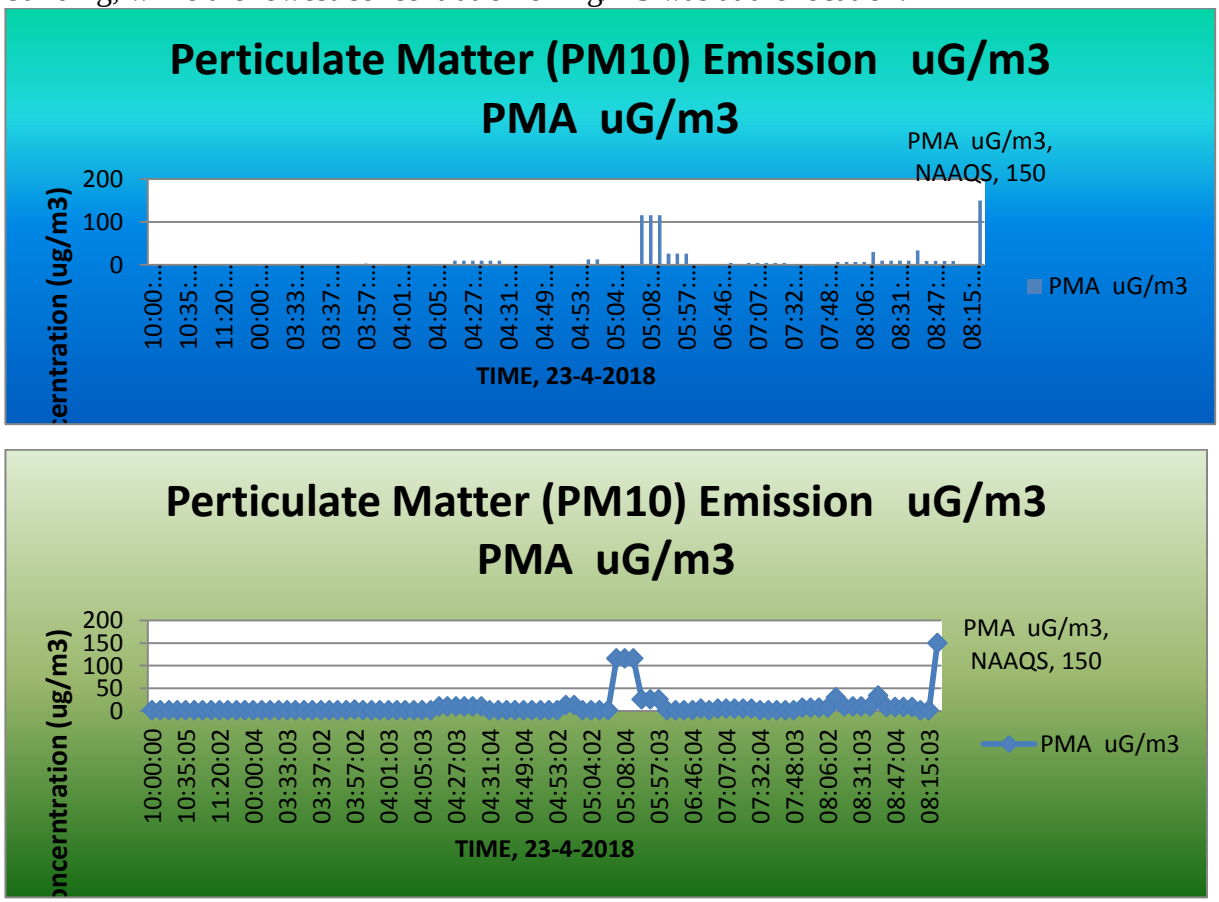
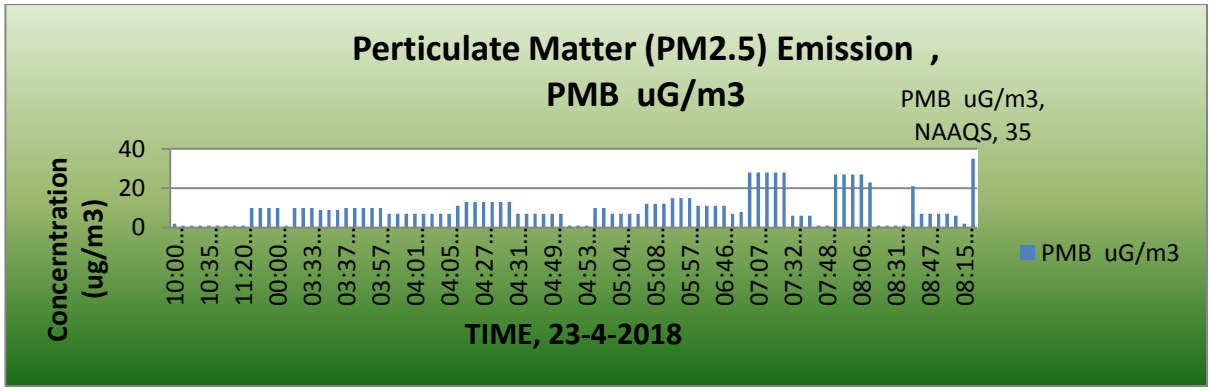


Figure 5.12 Average Concentration of PM_{10}

Figure 5.13 below shows that the concentration of particulate matter ($PM_{2.5}$) measured in all sampling locations was between the ranges of 1 g/m3-28 g/m3.The concentration of $PM_{2.5}$ measured in all the sampling stations was below the National Ambient Air Quality Standards (NAAQS), which specifies 35 g/m3 for the limitation of PM2.5 concentration. The highest concentration of 28 g/m3 was at the location, while the lowest concentration of 1 g/m3 was at the location.



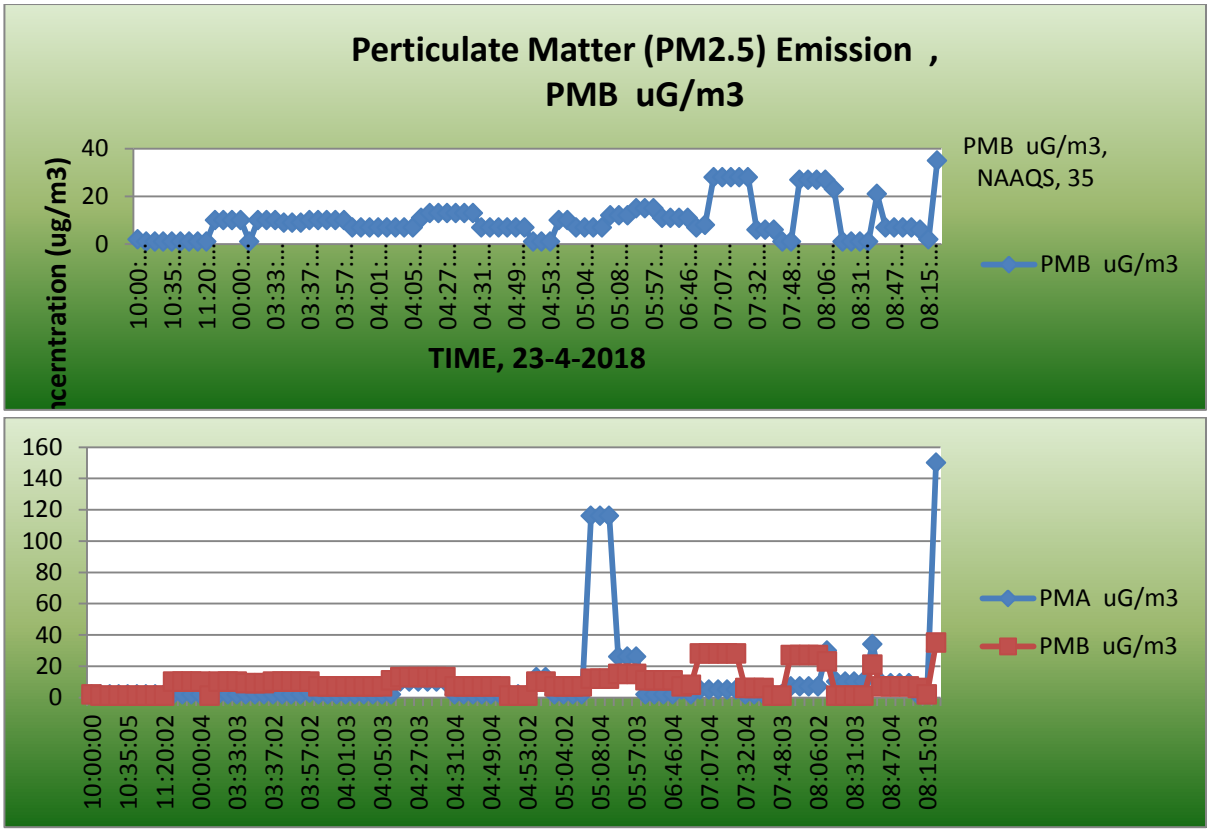


Figure 5.13 Average Concentration of $PM_{2.5}$

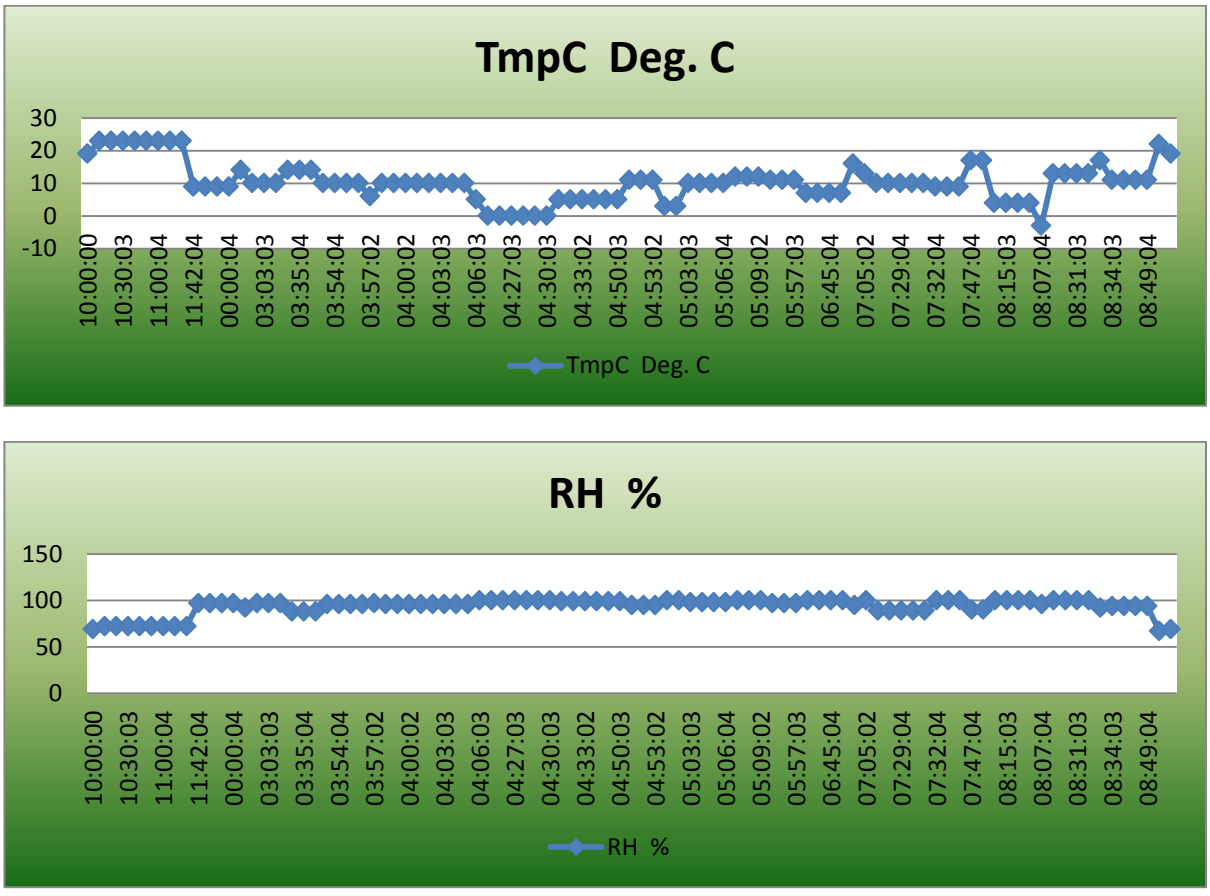


Figure 5.14 Average Temperature and Humidity

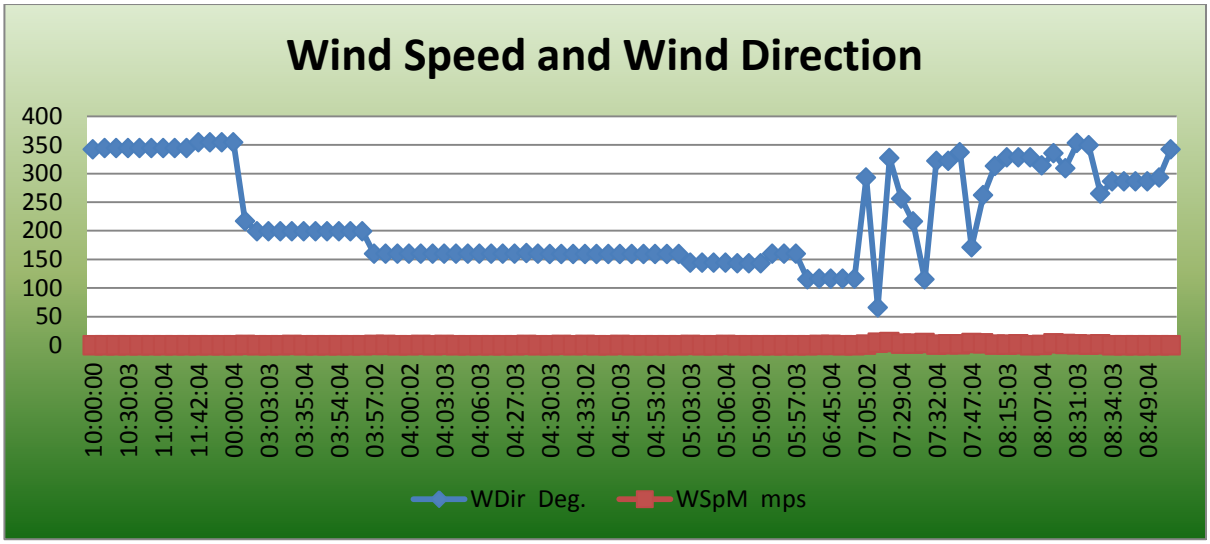
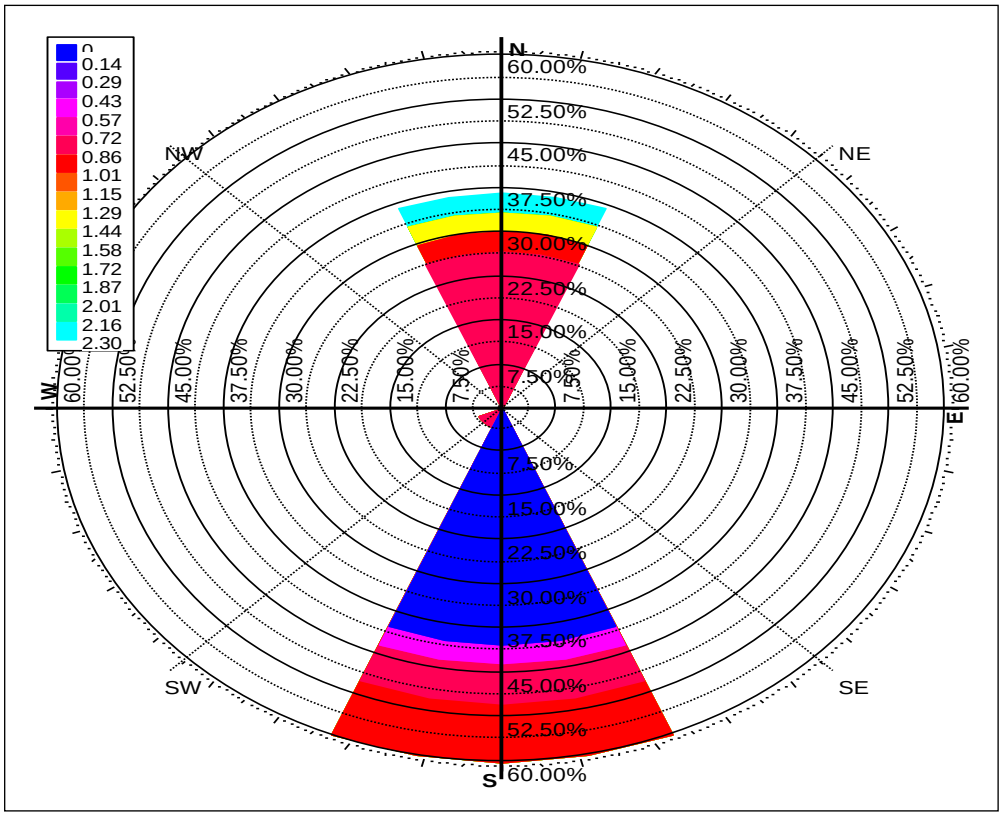


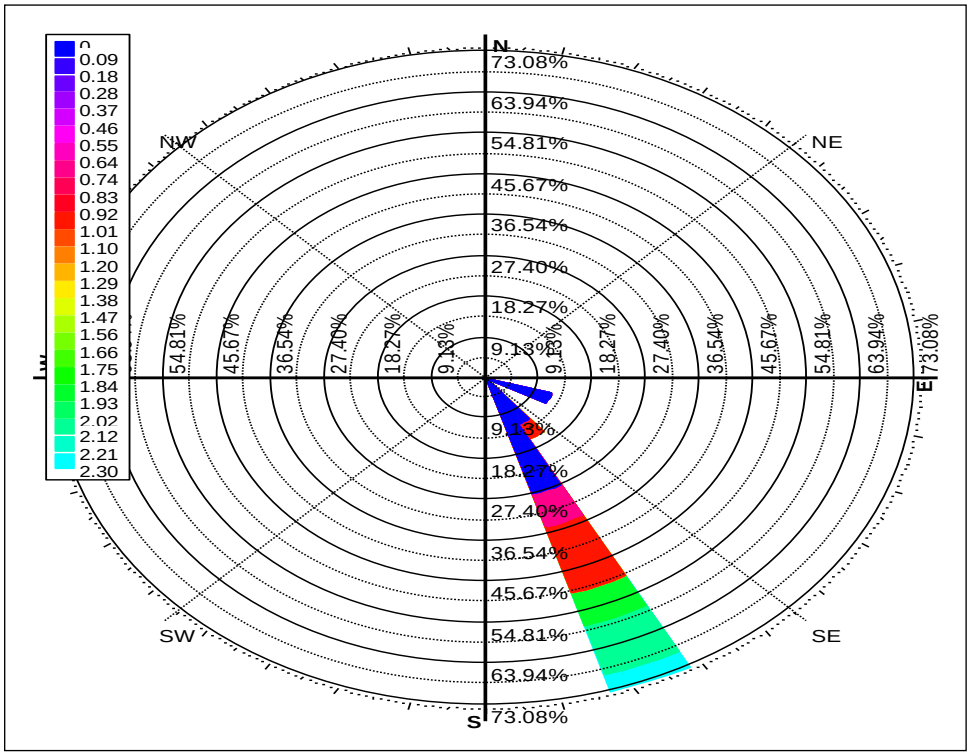
Figure 5.15 Wind Speed and Wind Direction

(5) Wind Rose Diagram of the Proposed Project Area

DATE	TIME	WDir Deg.	WSpM mps	TIME	WDir Deg.	WSpM mps	TIME	WDir Deg.	WSpM mps
04/23/2018	10:15:03	342	1.3	04:27:03	160	1.4	07:05:02	116	0.1
04/23/2018	10:20:04	344	1.3	04:28:02	160	1.4	07:06:02	293	0.1
04/23/2018	10:30:03	344	1.4	04:29:03	161	0.1	07:07:04	66	0.8
04/23/2018	10:35:05	344	1.3	04:30:03	160	0.2	07:29:04	327	4.5
04/23/2018	10:40:03	344	1.3	04:31:04	159	0	07:30:03	256	5.3
04/23/2018	11:00:04	344	1.6	04:32:03	159	0.1	07:31:03	216	2.7
04/23/2018	11:15:02	344	1.3	04:33:02	159	0.3	07:32:04	115	2.9
04/23/2018	11:20:02	344	1.3	04:34:04	159	0.1	07:33:03	322	3.6
04/23/2018	11:42:04	344	2.3	04:49:04	159	0.2	07:34:03	322	1.1
04/23/2018	11:50:03	354	1.3	04:50:03	159	0.1	07:47:04	337	1.7
04/23/2018	00:00:04	354	1.3	04:51:02	159	0.3	07:48:03	171	1.7
04/23/2018	00:00:04	354	1.3	04:52:02	159	0.3	07:49:04	262	3.9
04/23/2018	03:01:03	354	1.3	04:53:02	159	1.4	08:15:03	313	3.2
04/23/2018	03:02:04	217	1.3	04:54:04	159	1.4	08:05:02	328	1.2
04/23/2018	03:36:02	199	0.2	04:55:04	159	1.4	08:06:02	328	0.8
04/23/2018	03:37:02	199	0	05:03:03	159	1	08:07:04	328	1.3
04/23/2018	03:54:04	199	0	05:04:02	144	1	08:29:04	314	0
04/23/2018	03:55:03	199	0.1	05:05:03	144	0.3	08:30:03	335	0.6
04/23/2018	03:56:03	199	1.2	05:06:04	144	2	08:31:03	309	3.1
04/23/2018	03:57:02	199	0	05:07:03	144	2	08:32:04	353	2.1
04/23/2018	03:58:03	160	1.4	05:08:04	143	0.3	08:33:03	349	1.3
04/23/2018	03:59:03	160	0.2	05:09:02	143	0.3	08:34:03	265	1.1
04/23/2018	04:00:02	160	0.2	05:55:02	143	2.1	08:47:04	286	1.5
04/23/2018	04:02:02	160	0	05:56:05	160	2.1	08:48:03	286	1
04/23/2018	04:03:03	160	0.2	05:57:03	160	2.1	08:49:04	286	0.8
04/23/2018	04:04:04	160	0.1	05:58:04	160	2.1	08:15:03	286	0.6
04/23/2018	04:05:03	160	0.2	05:59:02	115	0.3	08:15:03	293	0.4
04/23/2018	04:06:03	160	0.1	06:45:04	116	0.3	08:15:03	342	0.2
04/23/2018	04:07:04	160	1.4	06:46:04	116	0.3			
04/23/2018	04:26:04	160	1.4	06:47:03	116	0.3			



Hourly Wind Rose Diagram of the Proposed Project area (Morning Section)



Hourly Wind Rose Diagram of the Proposed Project area (Afternoon Section),

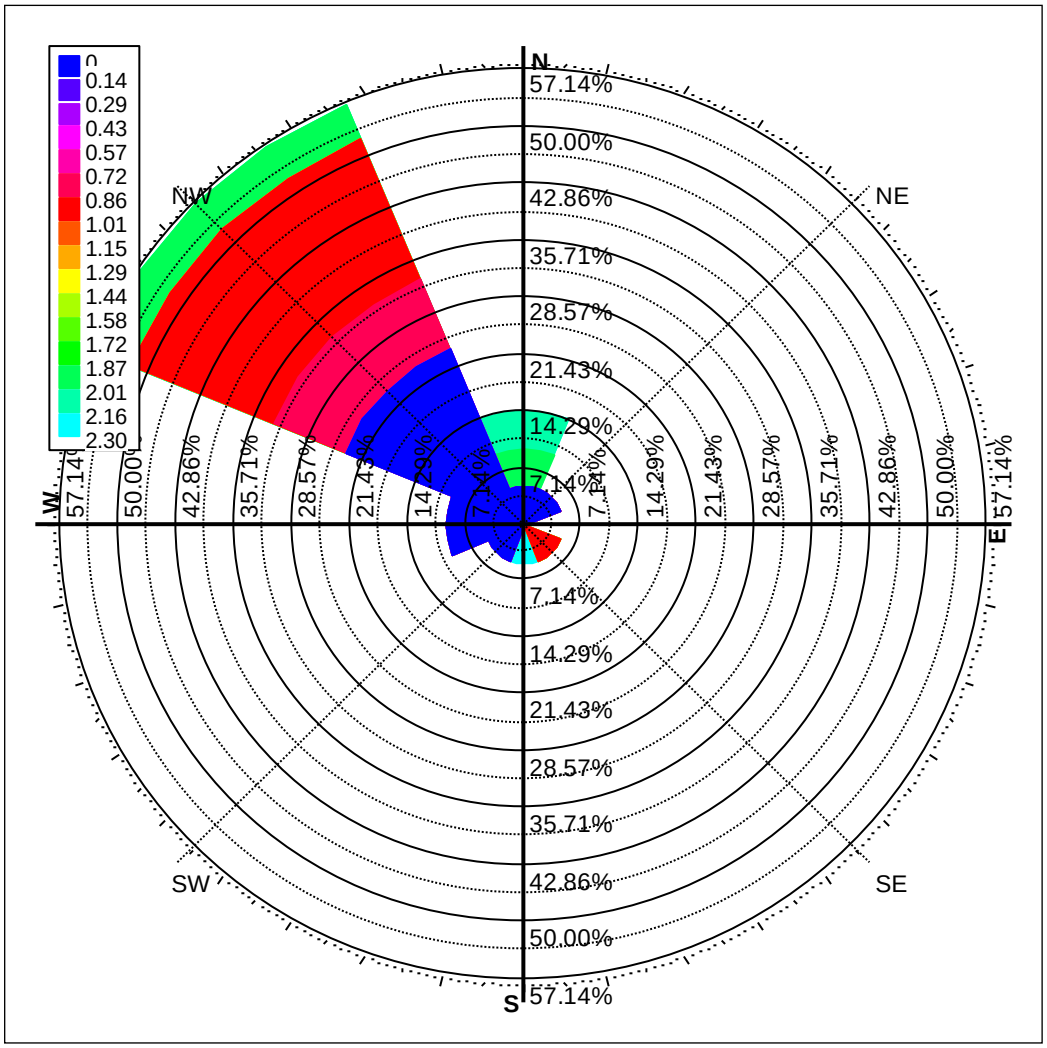


Figure 5.16 Hourly Wind Rose Diagram in of the Proposed Project area (Evening)

5.4.2 Noise and Vibration

According to the U.S. Occupational Safety and Healthy Administration OSHA (2006) exposure to high levels of noise for long durations may lead to hearing loss, create physical and psychological stress, reduce productivity, interfere with communication, and contribute to accidents and injuries by making it difficult to hear warning signals. Noise can also adversely affect wildlife. To analyze noise from a mining site, baseline monitoring and operational monitoring is necessary. This information can be analyzed using empirical or numerical modeling technique. Point source propagation can be analyzed using basic analytical equations; however, numerical modeling techniques have been developed for multi-sources. The results of the models are then compared to the appropriate standards. For instance, the maximum permissible occupational noise exposure limit is in the range of 90-85 dB(A) Leq for 8 hour per day (40 hour per week). The A-weighted decibel scale approximates the sensitivity of the human ear to various frequencies from 32 to 20,000 Hertz (Hz).

Most advanced models provide graphic outputs of noise impacts (isophons), which can then be overlaid on maps of critical receptors. Noise standards are typically expressed as dB(A); however, it is advisable to produce impacts based on octave bands as well, as dB(A) are based on a weighted summation of all bands, and knowledge of the octave band analysis for specific sources is useful in devising the proper noise control strategy. Octave band sound power level data are typically available

from manufacturers of most power plant equipment, e.g., turbines (gas, oil, steam, water and wind), generators, fans and blowers, and transformers.

(1) Noise Level Guidelines

Myanmar National Environmental Quality Guidelines are used for reference. The guidelines show the impacts should not exceed the levels presented in the following table,

Table 5.3 NEQG (Myanmar) Noise Level Guidelines

Receptor	**One Hour L_{Aeq} (dBA)**	
	Daytime 07:00-22:00	Nighttime 22:00-07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Table 5.4 Location of Noise measurement

Locations	Coordinates	
	Latitude	Longitude
NS1	16°54'13.02"N	96° 4'24.17"E
NS2	16°54'11.17"N	96° 4'23.29"E
NS3	16°54'9.59"N	96° 4'25.99"E
NS4	16°54'12.36"N	96° 4'20.72"E
NS5	16°54'8.85"N	96° 4'21.40"E

Figure 5.17 Noise Level Measurement

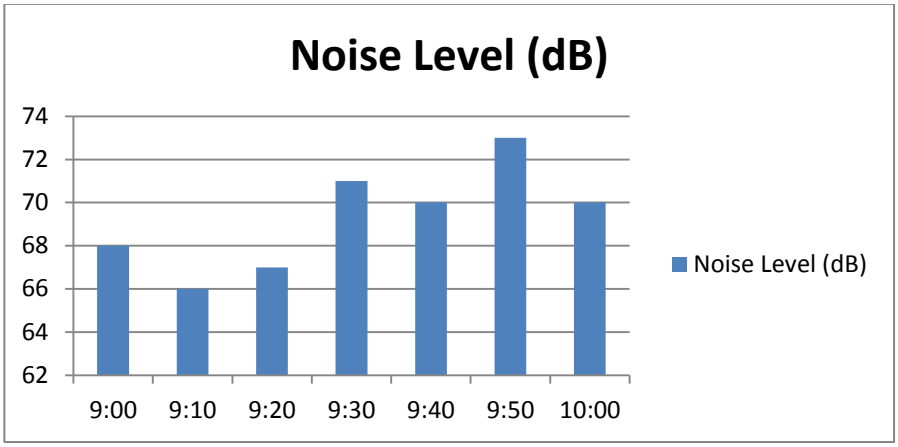
Table 5.5 Noise Level in the Proposed Project Area

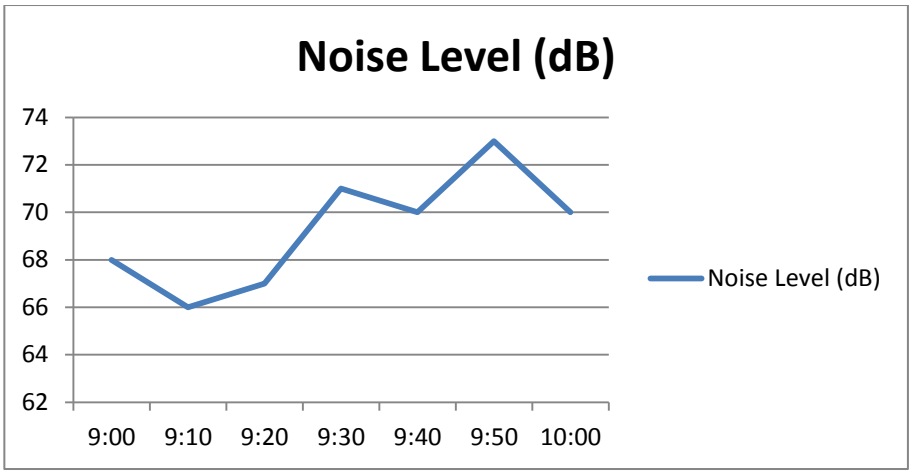
Coordinates		Coordinates	
Latitude (N)	Longitude (E)	Latitude (N)	Longitude (E)
16°54'13.02"N	96° 4'24.17"E	16°54'11.17"N	96° 4'23.29"E
NS-1		NS-2	
Time	Noise Level (dB)	Time	Noise Level (dB)
9:00	68	11:00	68
9:10	66	11:10	69
9:20	67	11:20	70
9:30	71	11:30	71
9:40	70	11:40	72
9:50	73	11:50	70
10:00	70	12:00	68

Coordinates		Coordinates		Coordinates	
Latitude (N)	Longitude (E)	Latitude (N)	Longitude (E)	Latitude (N)	Longitude (E)
16°54'9.59"N	96° 4'25.99"E	16°54'12.36"N	96° 4'20.72"E	16°54'8.85"N	96° 4'21.40"E
NS-3		NS-4		NS-5	
Time	Noise Level (dB)	Time	Noise Level (dB)	Time	Noise Level (dB)
1:00	67	3:00	71	4:00	71
1:10	68	3:10	73	4:10	68
1:20	68	3:20	69	4:20	72
1:30	69	3:30	69	4:30	69
1:40	70	3:40	70	4:40	69
1:50	69	3:50	70	4:50	68
02:00	70	3:00	71	5:00	69

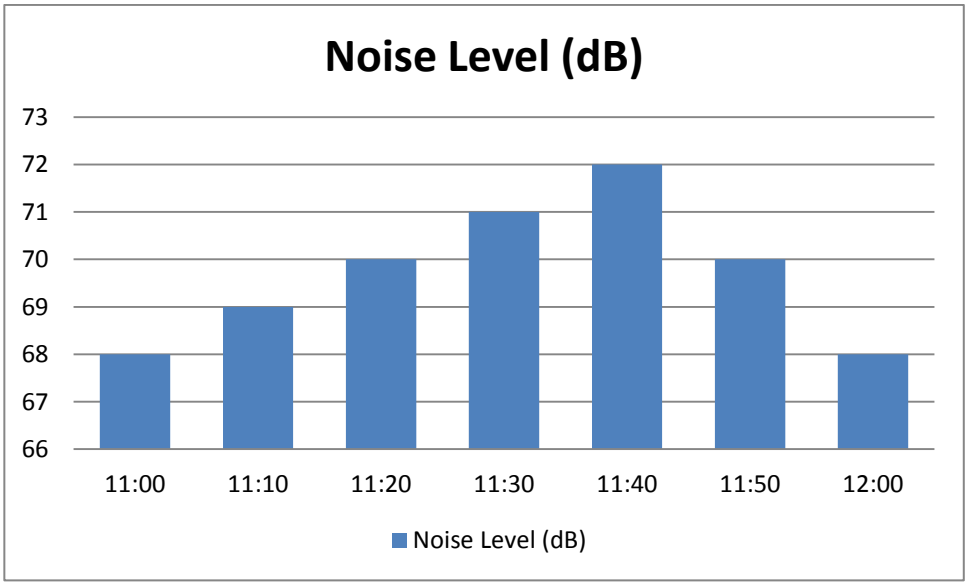
(2) Noise Measurement Results

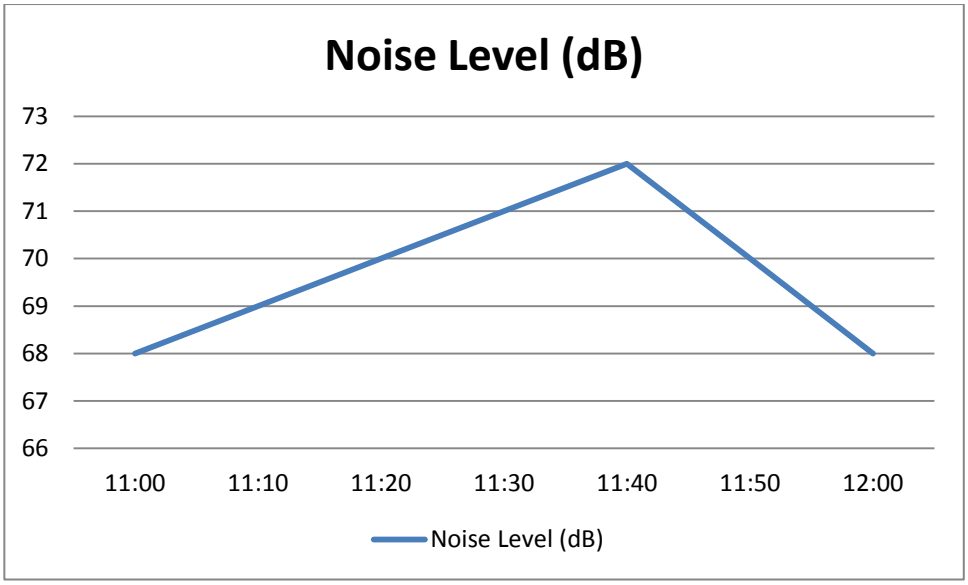
Noise Level in Location One, NS1



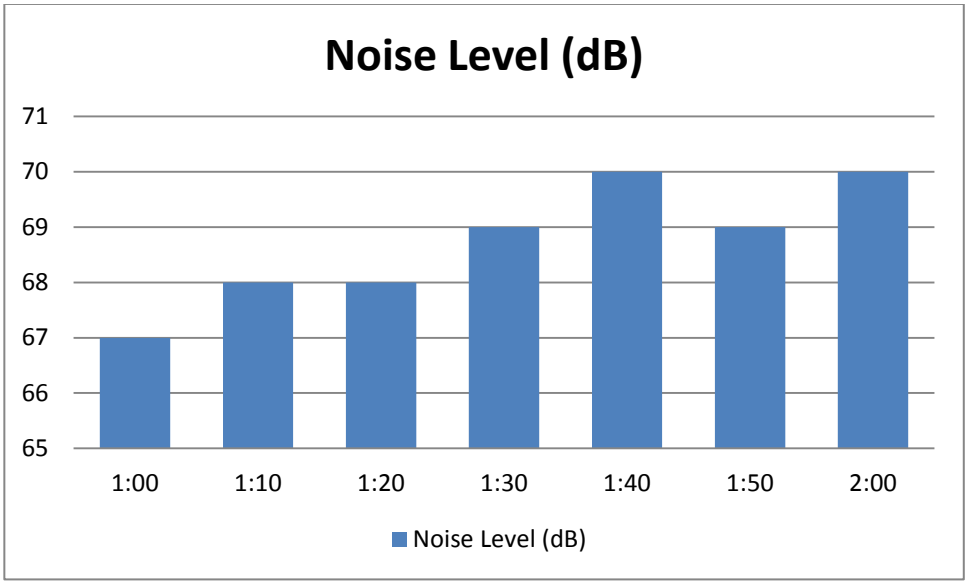


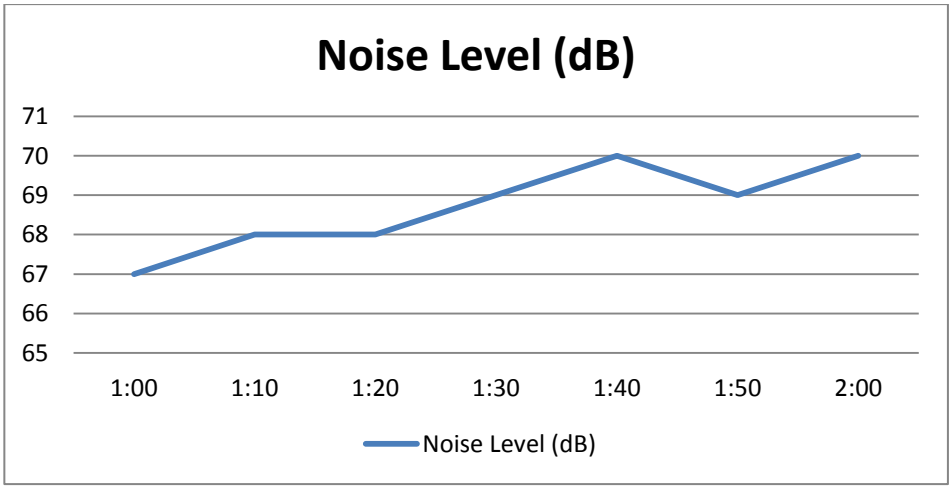
Noise level in Location 2,NS2



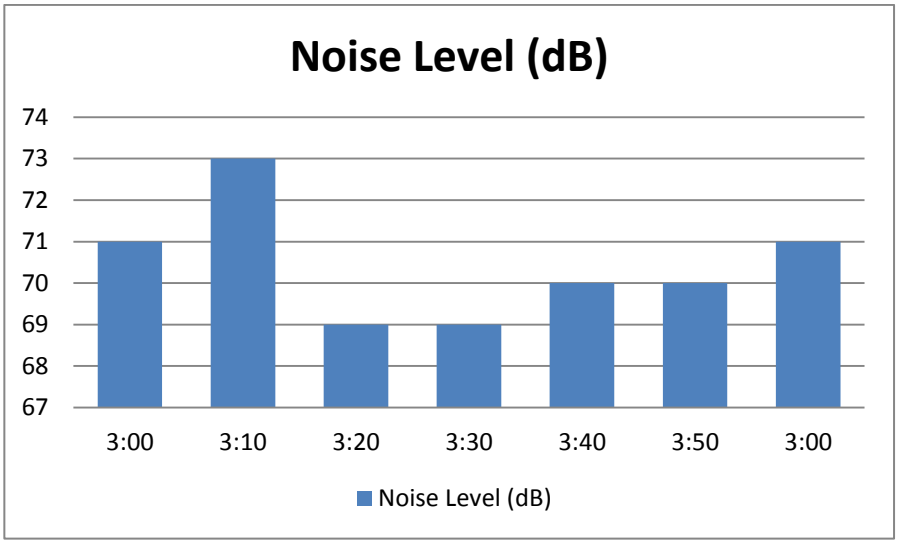


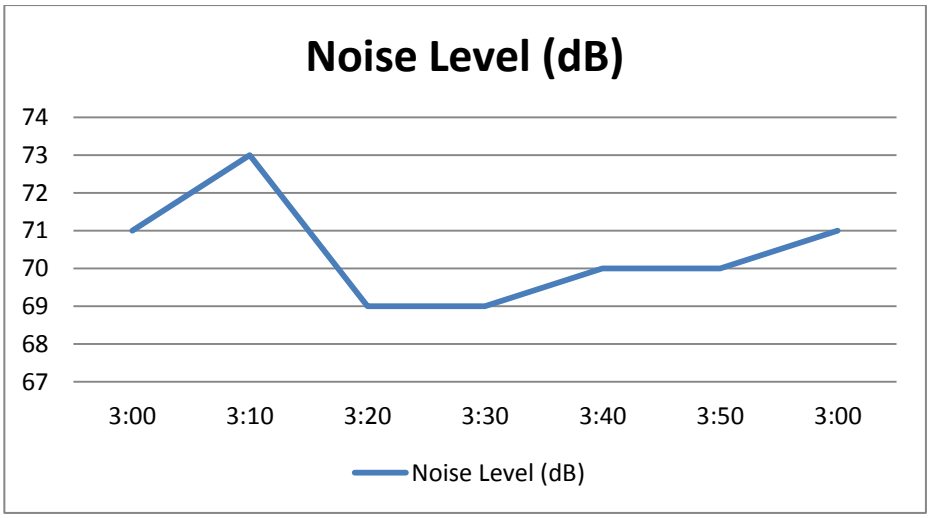
Noise level in Location 3, NS3



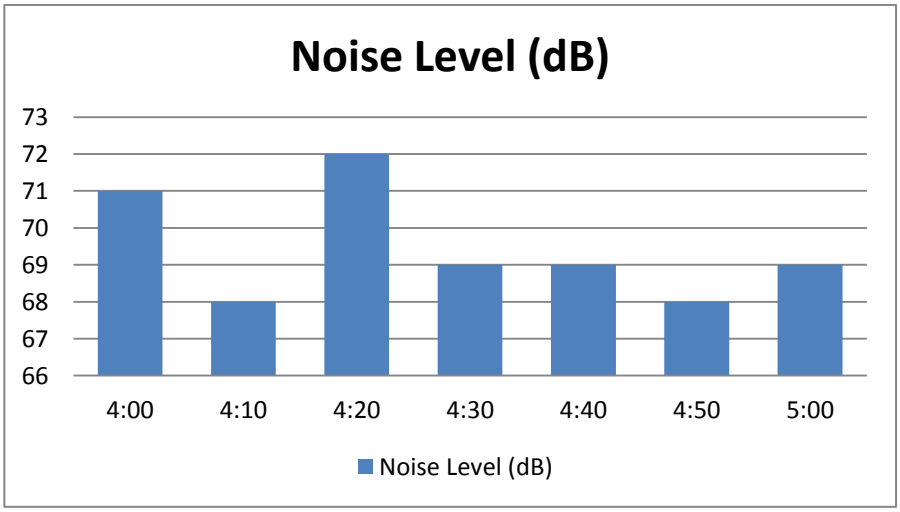


Noise level in Location 4. NS4





Noise level in Location 5,NS5



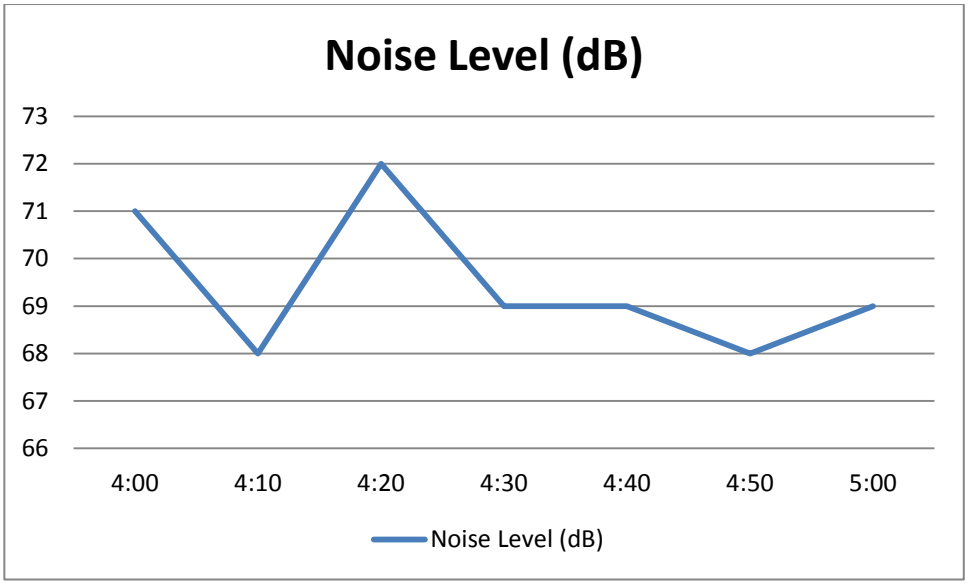


Table 5.6 Evaluation Criteria for Operational Noise affecting Residential Receptors

Operating Period	**Daytime, LAeq, 1hr dBA**				**Night time, LAeq, 1hr dBA**				**LAmax**
Significance	***Not Significant***	***Minor***	***Moderate***	***Major***	***Not Significant***	***Minor***	***Moderate***	***Major***	***Critical***
Specific Noise Level	<55	55-60	>60-65	>65	<45	45-50	>50-55	>55	> 85
Difference (LAeq, 1hr minus LA90)	>10	10-15	15-20	>20	>10	10-15	15-20	>20	

Source: IFC EHS guidelines

Table 5.7 Evaluation Criteria for Construction Noise affecting Residential Receptors

Operating Period	**Daytime Noise Level, dB LAeq, 1hr**				**Night time Noise Level, dB LAeq, 1hr**				**All Periods LAMax**
Significance	***Not Significant***	***Minor***	***Moderate***	***Major***	***Not Significant***	***Minor***	***Moderate***	***Major***	***Critical***
Short term exposure < 1 month	<70	70-75	>75-80	>80	<55	55-60	>60-65	>65	
Medium term exposure 1 to 6 months	<65	65-70	>70-75	>75	<45	45-55	>55-60	>60	> 85
Long term exposure > 6 months	<55	55-60	>60-65	>65	<45	45-50	50-55	>55	

Source: IFC EHS guidelines

5.4.3 Water Quality

(1) Surface Water

As per identified study area, Twantay Canal is found within the study area of 2 km radius from the center of the proposed project. Due to the topographic structure, the river is proposed to be the receiving water from the project site through the storm-water runoff during rainy season. In this report, the assessment of surface water quality (Twantay Canal's water quality) should be conducted in the vicinity of the site.

(2) Ground Water

The proposed development has a plan to design to minimize the risk of contamination of soil and groundwater. The proponent would require demonstrating that suitable plant design and management strategies are in place to ensure that no additional contamination of groundwater could occur. The groundwater quality was monitored as the baseline sampling with the following parameters. The sample was collected from the tube well located within the project area.

Table 5.8 Water Sampling Parameter

Sr.	Parameters
1.	pH
2.	Turbidity
3.	Conductivity
4.	Calcium Hardness
5.	Magnesium Hardness
6.	Total Alkalinity
7.	Carbonate
8.	Iron
9.	Chloride
10.	Sodium Chloride
11.	Sulphate
12.	Suspended Solid
13.	Phosphate
14.	Arsenic
15.	Ammonia
16.	Chemical Oxygen Demand
17.	Biological Oxygen Demand
18.	Zinc
19.	Copper

(3) Released Water

As per described above, the processes of the project will not use the water however there is still domestic water usage by the labors and other usages. The water is released to the normal drainage outside the factory after used it. Thus, the drainage water quality was monitored with the same (19) parameters mentioned in the above table as the base line sampling.

Figure 5.18 Ground Water Sampling

Figure 5.19 Surface Water Sampling

The location of Water sample point of the Project

No.	Sample Name	Coordinates		Date
		Latitude (N)	Longitude (E)	
1.	Tube well water	16°43'12.06"N	96° 02'22.14"E	22.4.2018
2.	Twantay canal water	16°43'96"N	96° 02'34.81"E	22.4.2018

Water Quality Results of Surface River Water

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Issue Date - 01-12-2012
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Issue No - 1.0/Page 2 of 2

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WATER QUALITY TEST RESULTS FORM

Client	Dr.Aung Lay Tin
Nature of Water	River Water
Location	Twantay Township
Date and Time of collection	22.4.2018
Date and Time of arrival at Laboratory	23.4.2018
Date and Time of commencing examination	24.4.2018
Date and Time of completing	29.4.2018

Results of Water Analysis			WHO Drinking Water Guideline (Geneva - 1993)
Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate ($N.NO_3$)	1.3	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)	6.2	mg/l	
Chemical Oxygen Demand (COD)	64	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	20	mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (Si)		mg/l	

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

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

Approved by
Signature:
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Water Quality Results of Surface River Water

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W0418 424

WATER QUALITY TEST RESULTS FORM

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Nature of Water	River Water
Location	Twantay Township
Date and Time of collection	22.4.2018
Date and Time of arrival at Laboratory	23.4.2018
Date and Time of commencing examination	24.4.2018
Date and Time of completing	29.4.2018

Results of Water Analysis			WHO Drinking Water Guideline (Geneva - 1993)
pH	7.6		6.5 - 8.5
Colour (True)	200	TCU	15 TCU
Turbidity	410	NTU	5 NTU
Conductivity	7860	micro S/cm	
Total Hardness	800	mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron	5.30	mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO_4)	210	mg/l	200 mg/l
Total Solids		mg/l	1500 mg/l
Suspended Solids	395	mg/l	
Dissolved Solids		mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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Water Quality Results of Tube Well Water

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WATER QUALITY TEST RESULTS FORM

Client	Dr.Aung Lay Tin
Nature of Water	Tube Well Water
Location	Twantay Township
Date and Time of collection	22.4.2018
Date and Time of arrival at Laboratory	23.4.2018
Date and Time of commencing examination	24.4.2018
Date and Time of completing	29.4.2018

Results of Water Analysis			**WHO Drinking Water Guideline (Geneva - 1993)**
Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate ($N.NO_3$)	0.5	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)	7.2	mg/l	
Chemical Oxygen Demand (COD)	32	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	2	mg/l	
Cyanide (CN)	Nil	mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (Si)		mg/l	

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Client	Dr.Aung Lay Tin
Nature of Water	Tube Well Water
Location	Twantay Township
Date and Time of collection	22.4.2018
Date and Time of arrival at Laboratory	23.4.2018
Date and Time of commencing examination	24.4.2018
Date and Time of completing	29.4.2018

Results of Water Analysis			WHO Drinking Water Guideline (Geneva - 1993)
pH	7.6		6.5 - 8.5
Colour (True)	Nil	TCU	15 TCU
Turbidity	4	NTU	5 NTU
Conductivity	1620	micro S/cm	
Total Hardness	60	mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron	0.22	mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO_4)	98	mg/l	200 mg/l
Total Solids		mg/l	1500 mg/l
Suspended Solids	7	mg/l	
Dissolved Solids		mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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5.4.4 Soil test result

Division - Yangon Sheet No - 1

Township - Twantay Sr No. - S 1-4/18-19

Sr No.	Sample plot	Moisture %	pH Soil:Water 1 : 2.5	EC Soil:Water 1 : 5	Texture				Organic Carbon %	Humus %	Total N %	ECE Meq / 100gm	Exchangeable Cations Meq/100gm						Available Nutrients	
					Sand %	Silt %	Clay %	Total %					Ca^{+}	Mg^{++}	Na^{+}	K^{+}	H^{+}	Al^{+++}	P ppm (Bray)	K_2O mg/100 gm
1.	S 1	1.79	5.65	0.10	31.04	13.36	55.60	100.00	0.65	1.15	0.09	19.58	16.97	1.36	0.93	0.27	0.05	Not detected	0.56	12.83
2.	S 2	1.36	5.50	0.10	33.04	13.36	53.60	100.00	0.87	1.52	0.11	19.14	15.55	2.70	0.62	0.22	0.05	Not detected	4.49	10.35
3.	S 3	1.46	5.99	0.15	43.04	28.36	28.60	100.00	0.58	1.02	0.11	25.46	19.63	4.06	1.46	0.27	0.03	0.03	0.39	12.79
4.	S 4	0.82	5.65	0.19	36.04	33.10	30.86	100.00	0.36	0.63	0.07	12.30	8.06	2.69	1.12	0.18	0.08	0.18	0.39	8.47

Division - Yangon Sheet No - 1
Township - Twantay Sr No. - S 1-4/18-19

Sr No.	Sample	ANIONS meq/100gm				CATIONS meq/100gm				pH	EC ms/cm	SAR	RSC meq/100gm	TDS %
		$CO_3^{=}$	HCO_3^{-}	CL^{-}	$SO_4^{=}$	Ca^{++}	Mg^{++}	Na^{+}	K^{+}					
1.	Soil Sample SS1	Not detected	0.3	0.194	0.1	0.1	0.1	0.176	0.015	5.65	0.1006	0.56	0.1	0.035
2.	Soil Sample SS2	Not detected	0.2	0.291	Not detected	0.1	0.1	0.173	0.016	5.5	0.1023	0.55	Not detected	0.035
3.	Soil Sample SS3	Not detected	0.3	0.582	Not detected	0.2	0.1	0.358	0.014	5.99	0.146	0.65	Not detected	0.051
4.	Soil Sample SS4	Not detected	0.2	0.192	0.2	0.1	0.1	0.391	0.02	5.65	0.1856	1.24	Not detected	0.065

Sr No.	Sample	pH	EC	TDS	SAR	RSC	Dominants Salts
1.	Soil Sample SS1	Moderately acid	Very Low	Low	Low	Low	$NaHCO_3$
2.	Soil Sample SS2	Moderately acid	Very Low	Low	Low	Not detected	NaCL
3.	Soil Sample SS3	Moderately acid	Very Low	Medium	Low	Not detected	NaCL
4.	Soil Sample SS4	Moderately acid	Low	Medium	Low	Not detected	$NaHCO_3$, Na_2SO_4

Figure 5.20 Soil sampling at the Project Area

5.5 Biological Components

(1) Executives Summary

The proposed project located in Twante Township in Yangon Region. Myanmar Shwe Nagar Agricultural Group Co.Ltd has aimed to distribute the products by river transport and proposed fertilizer repackaging factory at the bank of Twante Canal that connects the Irrawaddy River and Yangon River. It is 35 Km long and heavily used short cut between the city of Yangon and the Irrawaddy Regions. Myanmar Biotechnology Group (MBG) has focused on baseline study of biological environment, ecosystem and impact assessment for both direct and indirect area divided into 9 regions. Surveying period was from April, 2018 to July, 2018. According to the assessment of the EIA for the fauna survey, a total of 20 species of birds, 7 species of butterfly, 10 species of odonate, 6 species of herpetofauna and 21 species of fish were recorded. In case of flora survey, totally 27 species of trees in the direct and indirect area were observed and also 7 species of aquatics plants, 2 kinds of farming. The flora and fauna species were checked with the IUCN Red List (2012). All bird species are least concerned.

(2) Introduction

Biodiversity, or the variety of life and its process, is a basis property of nature that provides enormous ecological, economic, and aesthetic benefits its loss is recognized as a major national as well as global concern, with potentially profound ecological and economic consequences.

Factors contributing to the deadline of biodiversity include physical alterations to the geography due to resource exploitation and changing land usages; pollution; overharvesting; introduction of exotic (non-native) species and elimination of native species through predation, competition, genetic modification, and disease transmission; disruption of natural process; and global climate change.

Impact identification methods such as interaction matrices, networks, or simple and descriptive checklists can provide a systematic basis for qualitatively delineating potential impacts of concerns. This description of existing Flora and Fauna primarily focuses on community types (habitat types) which include identifying certain selected species for each community types.

In this study, MBG has focused "Biological Baseline Study and Impact Assessment of Construction of Two Workshops and Four Warehouse Buildings of Myanmar Shwe Nagar Agricultural Group Co.Ltd**.**". It will be considered to identify the biological impacts, existing biological condition, the biological impacts, and mitigation measure for environmental protection management.

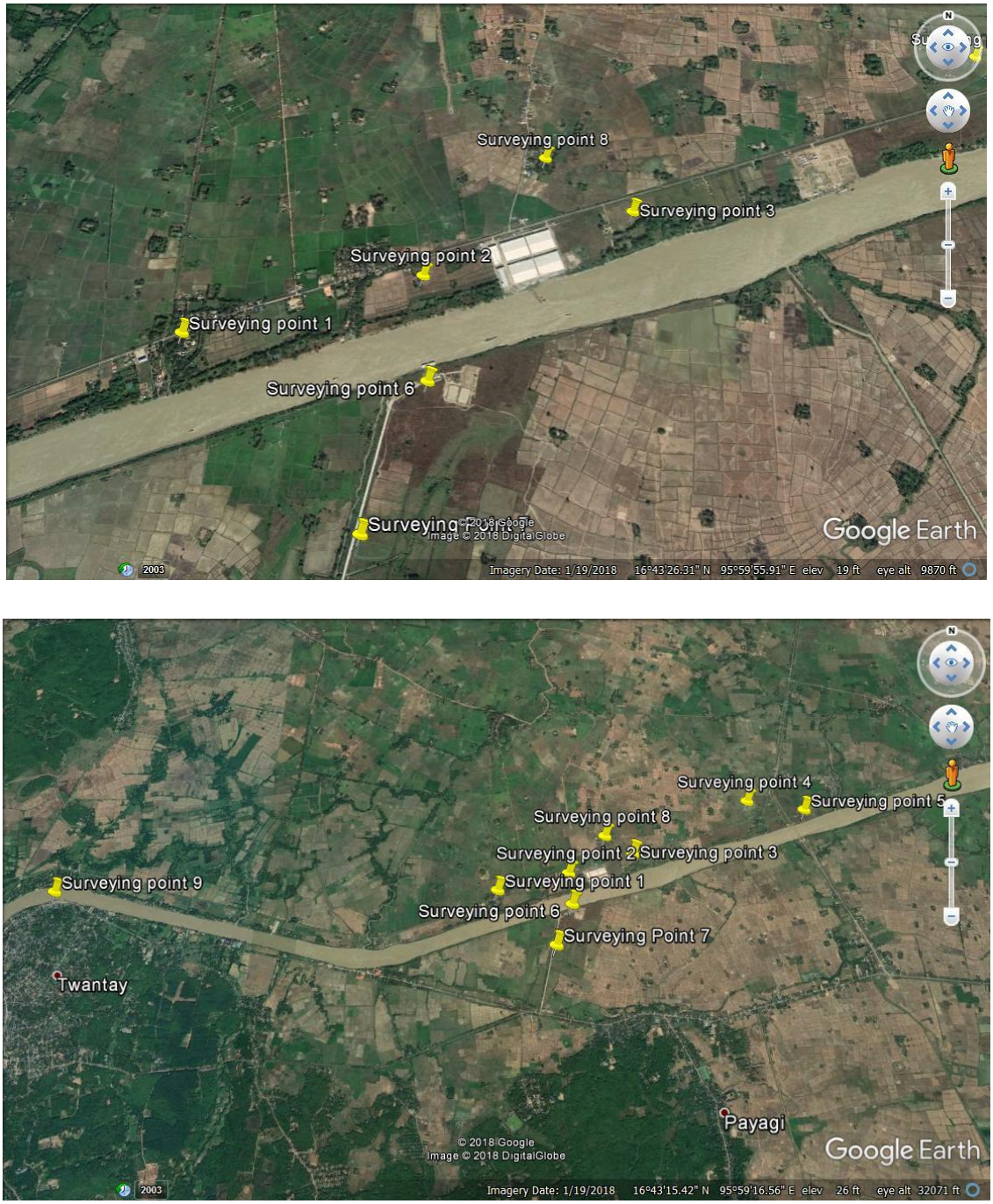


Figure-5.21: Biodiversity Study Area

(Totally 9 surveying points were used for baseline of Biodiversity. Transet points are along the Twante Canal. Among them surveying point 9 is used for the collection of fishes diversity especially Twante Canal.)

(3) Objectives of Study

1. To describe existing biological conditions and record endangered or threatened species and critical habitats
2. To identify the biological impacts of proposed project
3. To identify and incorporate the mitigation measures for the benefits of ecosystem service

(4) Methodology on Biodiversity Baseline Study

A Global Positioning System (GPS) was used to navigate and mark the coordinates of sample plots around the project area. In order to obtain essential ecological data and representative checklists of the flora and fauna species, data collection was also carried out by random transect lines within the direct impact zone and indirect impact zone of the project site. The families were identified by using key to families of flowering plants, issued by Department of Botany, Yangon University (1994), and Birds of Burma (2005). Specimen identification was performed with the use of literatures by Backer *et al*, and Kress *et al*. 2003.

After surveying in a specific site, the population of species in that area is very important to know the composition and the richness of various species and their survival. The density of a species is also needed to calculate the numbers of each species in the community. After field survey, diversity statistics applied to collected data were calculated using Microsoft Office 2010.

(5) Impact Assessment Method

To provide a basis for addressing biological environmental impacts, a six-step or six-activity model is used for the planning and conduction of impact studies. The six generic steps associated with biological environmental impacts are as follows:

(1) Identification of the potential biological impacts of the construction and/ or operation of the proposed project or activity, including habitat changes or loss, chemical cycling and toxic events, and disruptions to ecological succession.

(2) Description of the environmental setting in terms of habitat types, selected floral and faunal species, management practices, endangered or threatened species, and special features.

(3) Procurement of relevant laws, regulations, or criteria related to biological resources and protection of habitat or species

(4) Conduction of impact prediction activities, including the use of analogies (case studies), physical modeling, and/or mathematical modeling, based on judgment

(5) Use of pertinent information, along with professional judgment and public input, in access the significant or anticipated beneficial and detrimental impacts

(6) Identification, development, and incorporation of appropriate mitigation measures for the adverse impacts

(6) Data Assessment on existing biological conditions

Floral and faunal components are assessed and reported. Table (5-9) and Figure (5-22) are assessment data for proposed project. There is no species which is endangered or threaten species and also endemic species checked in IUCN Red List Category.

Table-5.9: List of Flora species in the Study Area

No.	Local Name	Scientific Name	Family Name	Habit
1.	Anya-kokko	*Albizia lebbek L.*	Mimosaceae	Tree
2.	Banda	*Terminalia catappa L.*	Combretaceae	Tree
3.	Bawdi-nyaung	*Ficus religiosa L.*	Moraceae	Tree
4.	Bawzagaing	*Leucaena leucocephala*	Mimosaceae	Tree
5.	Dan-da-lun	*Moringaoleifera Lam*	Moringaceae	Tree
6.	Dani	*Nypa fruticans*	Arecaceae	Small Tree
7.	Eu-ca-lit	*Eucalyptus ovataLabill.*	Myrtaceae	Tree
8.	Gwe	*Spondias mangifera*	Anacardiaceae	Tree
9.	Htan	*Borassus flabellifer*	Arecaceae	Tree
10.	Malaga	*Syzygium polyanthum*	Myrtaceae	Tree
11.	Htein	*Mitragyna parvifolia*	Rubiaceae	Tree
12.	Kathit	*Erythrina arborescens*	Fabaceae	Tree
13.	Kwe gaw	*Citrus maxima*	Rutaceae	
14.	Kyi	*Barringtonia acutangula*	Lecythidaceae	Tree
15.	Lamu	*Arytera littoralis*	Sapindaceae	Small Tree
16.	La-pan	*Beaumontia grandiflora*	Apocynaceae	Tree
17.	Ma-u	*Anthocephalus morindaefolius*		
18.	Mezali	*Cassia mimosoides*	Fabaceae	Tree
19.	Nget Pyaw	*Musa ornata*	Musaceae	Herb
20.	Ohn	*Cocos nucifera*	Arecaceae	Tree
21.	Padauk	*Pterocarpus marsupium*	Fabaceae	Tree
22.	Seinban	*Delonix regia*	Caesalpiniaceae	Tree
23.	Tha-phan	*Ficus chartacea*	Moraceae	
24.	Thayet	*Mangifera indica L.*	Anacardiaceae	Tree
25.	Thin Baw-kokko	*Albizia julibrissin*	Mimosaceae	Tree
26.	Zi	*Ziziphus jujube Lam.*	Rhamnaceae	Tree
27.	Thabye	*Eugenia syzygium*	Myrtaceae	Tree

Cocos nucifera

Syzygium polyanthum

Albizia lebbek L.

Moringaoleifera Lam

Terminalia catappa L.

Ficus religiosa L.

Ziziphus jujube Lam.

Cassia mimosoides

Figure 5.22:: Some of Flora Species Recorded in the Survey Area

Agricultural Farming in the Impact Zone

No.	Common Name	Scientific Name	Family Name
	Rice	*Oryza sativa*	Gramineae
	Betel palm	*Areca catechu*	Piperaceae

Oryza sativa

Figure-5.23: Agricultural Farming in the Impact Zone

Table-5.10: List of Aquatic Flora in the Study Area

	Local Name	Common Name	Scientific Name	Family Name
1.	Bay dar	Common water-hyacinth	*Eichhornia crassipes*	Pontederiaceae
2.	Be-Sar-Myet	-	*Urochloa reptans*	Poaceae
3.	Kaing	-	*Mnesithea striata*	Poaceae
4.	Kana phaw	-	*Enhydra fluctuans*	Asteraceae
5.	Kyu	Giant reed	*Arundo donax*	Poaceae
6.	Pait-Swal	Narrow-leaved cat-tail	*Typha angustifolia*	Typhaceae
7.	Ye Kazun	-	*Ipomaea aquatica*	Convolvulaceae

Ipomaea aquatic

Eichhornia crassipes

Enhydra fluctuans

Typha angustifolia

Figure-5.24: Some Aquatic Plants in the Survey Area

Table-5.11: List of Fish Species in the Study Area

No.	Common Name	Scientific Name	Family Name
1.	Ka-tha-poe	***Leptobarbus hoevenii***	Cyprinidae
2.	Nga-Bat	***Walla goattu***	Siluridae
3.	Nga-Gyin	***Cyprinus carpio***	Cyprinidae
4.	Nga-Khone-Ma	***Puntius gonionotus***	Ophiocephalidae
5.	Nga-Khu	***Cat Fish***	Clariasbatracus
6.	Nga-kye	***Heteropneustes fosilis***	Heteropneustidae
7.	Ngamwedoe	***Macrognathus sia mensis***	Mastacembelidae
8.	Ngamwenagar	***Mastocembelus erythrotaenia***	Mastacembelidae
9.	Nga Myit Chin	***Hampala macrolepidota***	Cyprinidae
10.	Nga-Nat-Pyar	***Morulius chrysophekadion***	Cyprinidae

11.	Nga-Phal	***Notopterus notopterus***	Notopteridae
12.	Nga-Phi-Ma	***Tilapia nilotica***	Cichlidae
13.	Nga-phyin-salat	***Helostoma temmincki***	Helostomatidae
14.	Nga-Pot-Thin	***Johniusgan geticus***	Bagridae
15.	Nga-pyay-ma	***Tilapia mossambica***	Cichlidae
16.	Ngathaledoe	***Lepidocephalus thermalis***	Cobitidae
17.	Nga-Yant	***Channa striatus***	Channidae
18.	Nga-Zin-Sat	***Chanda ranga***	Channidae
19.	Nga-zin-yine	***Arius truncates***	Ariidae
20.	Yinbaungzar	***Chela sardinella***	Clupeidae
21.	Sucker Fish	***Hypostomus sp***	Loricariidae

Macrognathus siamensis

Johniusgan geticus

Channa striatus

Tilapia mossambica

Leptobarbus hoevenii

Arius truncatus

Heteropneustes fosilis

Cyprinus carpio

Hampala macrolepidota

Walla goattu

Figure-5.25: Some of Fish Species in Survey Area

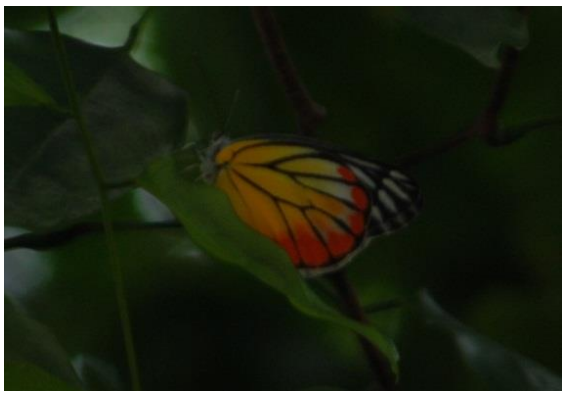
Table-5.12: List of Butterfly Species in the Study Area

No.	Scientific Name	Family Name
1.	Appias lalassis lalassis	Pieridae
2.	*Leptosia nina nina*	Pieridae
3.	*Eurema hecabe contubernails*	Pieridae
4.	*Danaus genutia genutia*	Daniadae
5.	Lethe philemon	Satyridae
6.	*Hypolimnas anomala*	Nymphalidae
7.	Hypolimnas bolina jacintha	Nymphalidae

Hypolimnas anomala

Leptosia nina nina

Eurema hecabe contubernails



Danaus genutia genutia

Figure-5.26: Some of Butterfly Species Recorded from the Survey Area

Table-5.13: List of Odonate in the Study Area

No.	Scientific Name	Family Name
1.	*Brachythemis contaminata*	Libellllulidae
2.	*Bradinopyga geminate*	Libellllulidae
3.	Bradinopyga geminate	Libellllulidae
4.	*Bradinopyga strachani*	Libellllulidae
5.	*Diplaodes trivalis*	Libellllulidae
6.	Neurothemis tullia	Libellllulidae
7.	*Orthetrum sabina*	Libellllulidae
8.	*Rhodothemis rufa*	Libellllulidae
9.	*Rhyothemis phyllis*	Libellllulidae
10.	*Trithemis Kirbyi*	Libellllulidae

Diplaodes trivalis

Rhodothemis rufa

Bradinopyga strachani

Diplaodes trivalis

Orthetrum sabina

Rhyothemis phyllis

Figure-5.27 : Some of dragonfly Species Recorded in the Survey Area

Table-5.14: List of Avifauna in the Study Area

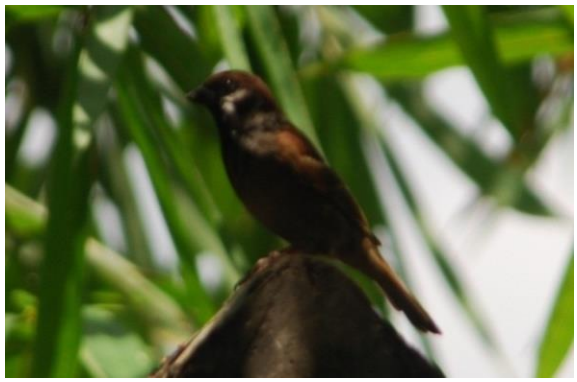
No.	Local Name	Common Name	Scientific Name	Family Name	IUCN Red List	
					Status	Status
1.	Din-gyi	Little Cormorant	*Phalacrocorax pygmaeits*	Phalacrocoracidae	-	-
2.	Eain-sar	House Sparrow	*Passer domesticus*	Passeridae	Least Concern	Decreasing
3.	Pan Ye Soat	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae	Least Concern	-
4.	Lin-mi-zwe	Black Drongo	*Dicrurus macrocercus*	Dicruridae	Least Concern	Unknown
5.	Lin-wet	Black-crowned Night Hero	*Nyctiorax nycticorax*	Ardeidae	-	-
6.	Lal -char	Pied Bushchat	*Saxicola caprata*	Turdidae	Least Concern	Stable
7.	Sar Wa Tee	Scaly-Breasted Munia	*Lonchura punctulata*	Estrildinae	Least Concern	Stable
8.	Pyan Hlwar	Red-rumped Swallow	*Hirundo striolata*	Hirundinidae	-	-
9.	Hnget hka	Indian Roller	*Coracias benghalensis*	Coraciidae	Least Concern	Increasing
10.	Jo-Le-	Spotted Dove	*Streptopelia*	Columbidae	-	-

	Pyauk		*chinensis*			
11.	Kho	Pigeon	*Columba livia*	Columbidae	Least Concern	Decreasing
12.	Kyi- kan	House Crow	*Corvus splendens*	Corvidae	Least Concern	Stable
13.	Kywe-Kyaung-byaing	Cattle egret	*Ardeola ibis*	Ardeidae	Least Concern	Increasing
14.	Son	Black Kite	*Milvus migrans*	Accipitridae	Least Concern	Unknown
15.	Thein-nget	Hawk	*Leptobarbus hoeveni*	Falconidae	-	-
16.	Za-yet	Common Myna	*Acridotheres tristis*	Sturnidae	Least Concern	Increasing
17.	Zi-gwet	Owl	*Athene brama*	Strigidae	Least Concern	Stable
18.	-	Littled-pied Flycatcher	*Ficedula westermanni*	Muscicapidae	Least Concern	Decreasing
19.	Byine-Ngan	Great Egret	*Casmerodius albus*	Ardeidae	Least Concern	Unknown
20.	Byine-ouk	Indian Pond hero	*Ardeola grayii*	Ardeidae	Least Concern	Unknown

Ardeola ibis

Phalacrocorax pygmaeits

Coracias benghalensis



Passer domesticus

Columba livia

Streptopelia chinensis

Acridotheres tristis

Corvus splendens

Figure-5.28: Some of Avifauna Species Recorded from the Survey Area

Table-5.15: List of Herpetofauna in the Study Area

No.	Local Name	Common Name	Scientific Name	Family Name
1.	Kin-late-shaw	Common sun skink	Mabuya multifasciata	Scincidae
2.	Mway pway	Viper	Daboia russelii	Viperidae
3.	Myaw Hout	Cobra	Ophiophagus hannah	Elapidae
4.	Poat thin nyo	Blue crested lizard	Calotes mystaceus	Agamidae
5.	Yal-myay	Chequered keel back	Xenochrophis piscator	Colubridae
6.	Lin-mway	Banded rat snake	Ptyas mucosus	Colubridae

Figure-5.29: Finding and Taking the Some Species Recorded in the Survey Area

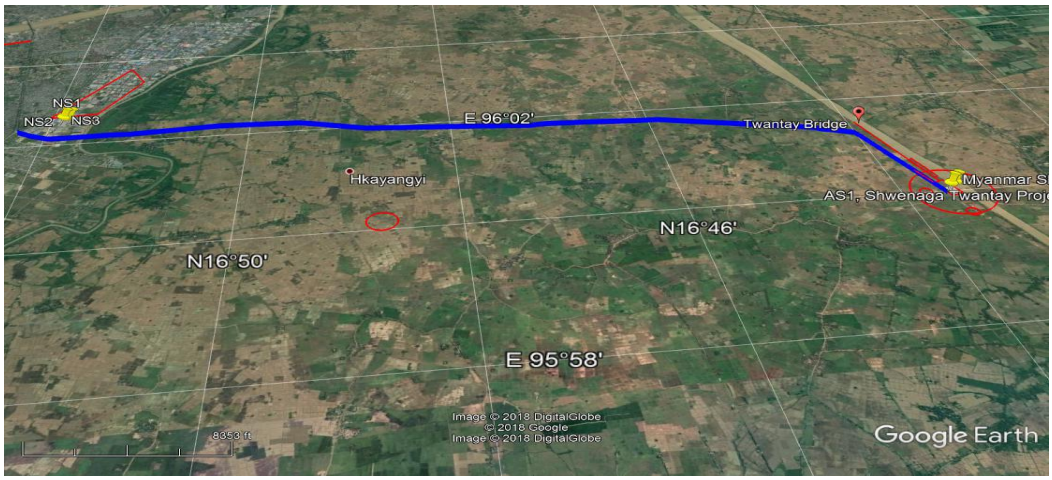
5.6. Socio-Economic Baseline

(a) Population and communities

In the Proposed Project Area, There are four village a round the Proposed project area. They are htantapin, Thanphyuyon, Kalartann and Kanpartyoe village. Total population of all these villages are more than 2000.Survey Team was made household survery to know the socio-economic conditions for one third of public on those area. Education level, Age level, Type of business and socio economics conditions can be seen in figure 5.11 to 5.17 .

(b) Land Use

Predominant land use near the project area is mainly Yangon-Twantay-Maupin Road, Total area of proposed Project is 27.77 acres.



(c)Transportation

The main mode of transportation within the project area is by road. Major roads running from east to west within the project area are: Yangon-Twantay-Maupin Road, Yangon-Nyaung Tone, Yangon-Pathein Road, Twantay Canal and Highway Main Road Number 5. Main connecting road to Yangon city is Yangon-Pathein highway crossing Hlaing River by Bayint Naung Bridge and Aung Zayya Bridge.

(d)Main Water Source

The main water source for the whole project is groundwater. Most of the households, factories and industries have their own tube wells for their own water supply. Due to salinity affect, river water cannot be used for households and industries.

(e) Electricity Supply

Within the Twantay Township, Yangon Electricity Supply Corporation (YESC) supplies electric power. Total demand of power in the Twantay Township exceeds 21 MW. (source: www.ubifrance.com). The project will also use the electricity distributed by YESC through its own transformer.

(f) Baseline Socioeconomic Survey

Even the proposed project located in beside the Twante cannel, it is located quite adjacent to that area too. Thus, the initial baseline socioeconomic survey for the (100) households near by was done by the study team in Kulartan, Thanphyuyon, Htantapin and Kanpatyoe villages

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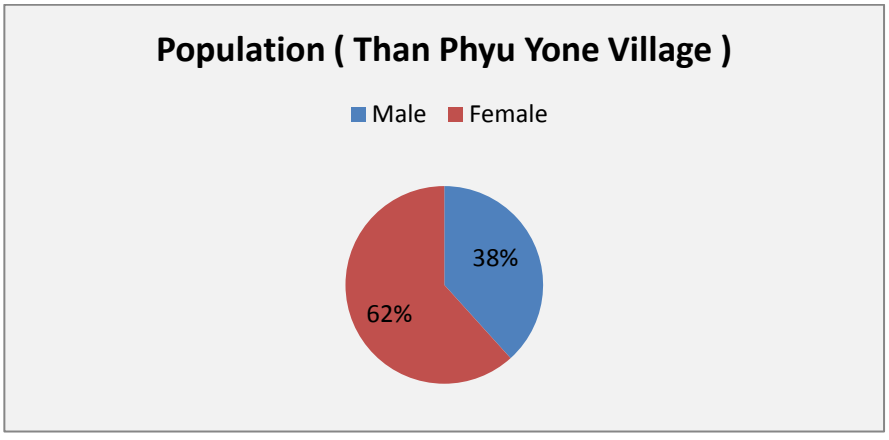
Figure 5.30. Some Photos of Social House Hold Survey



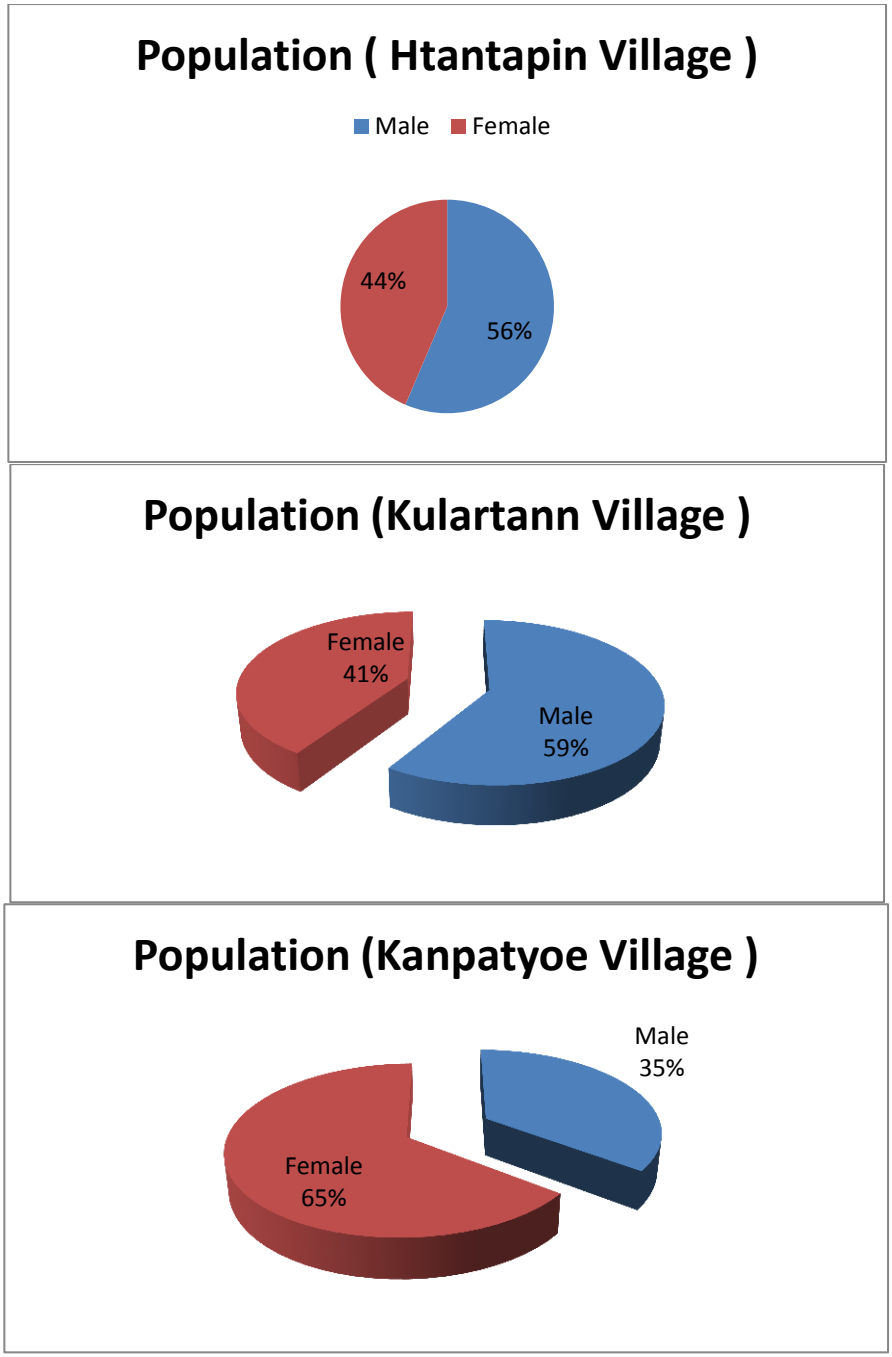
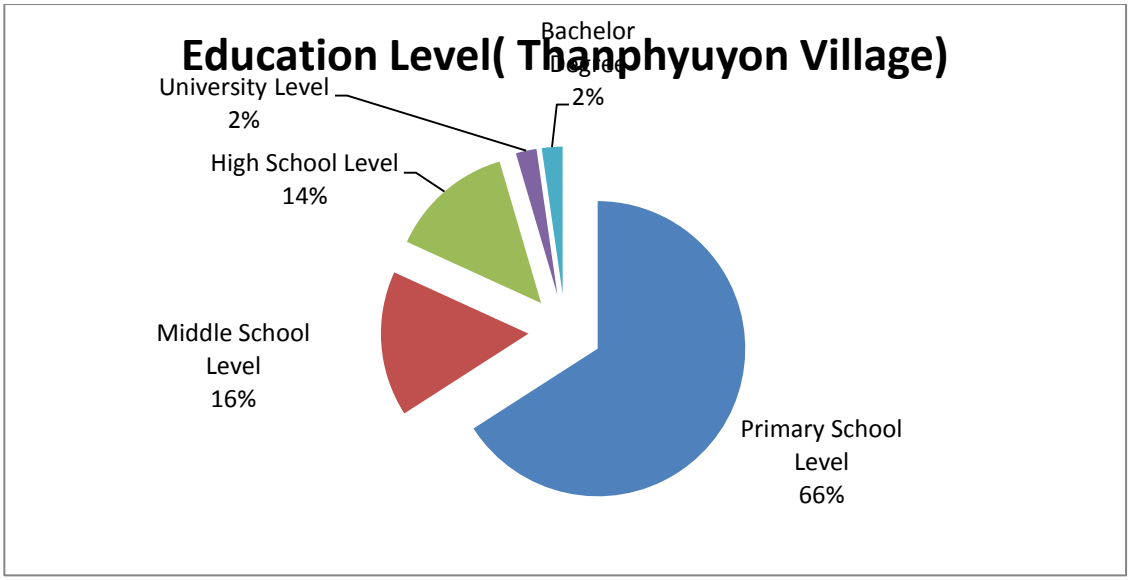
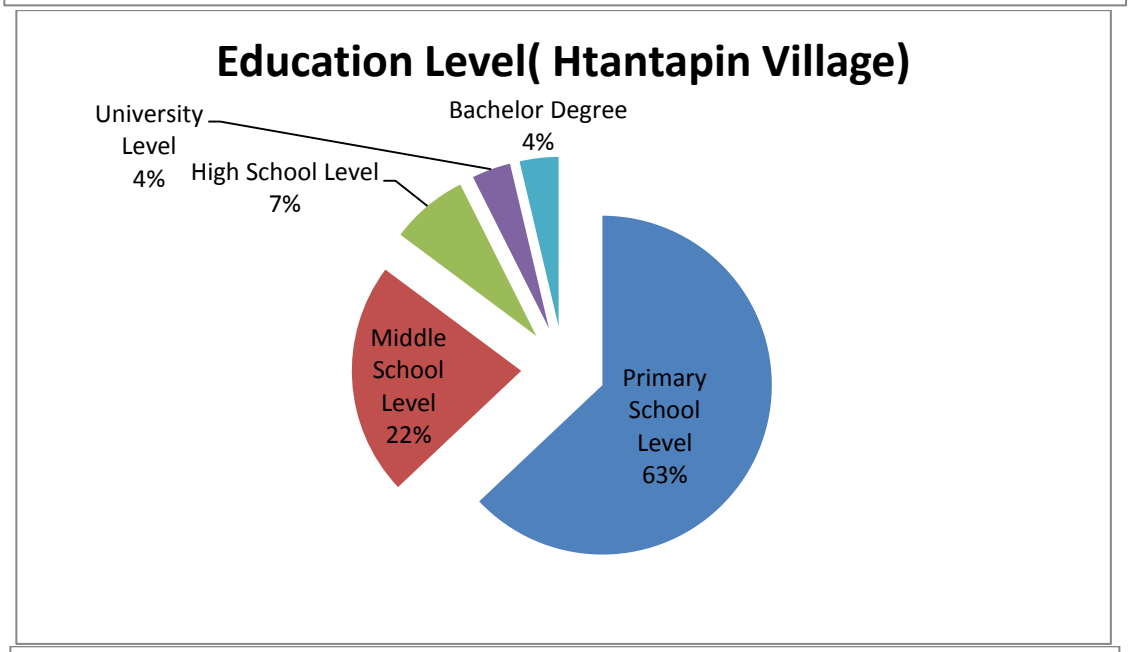
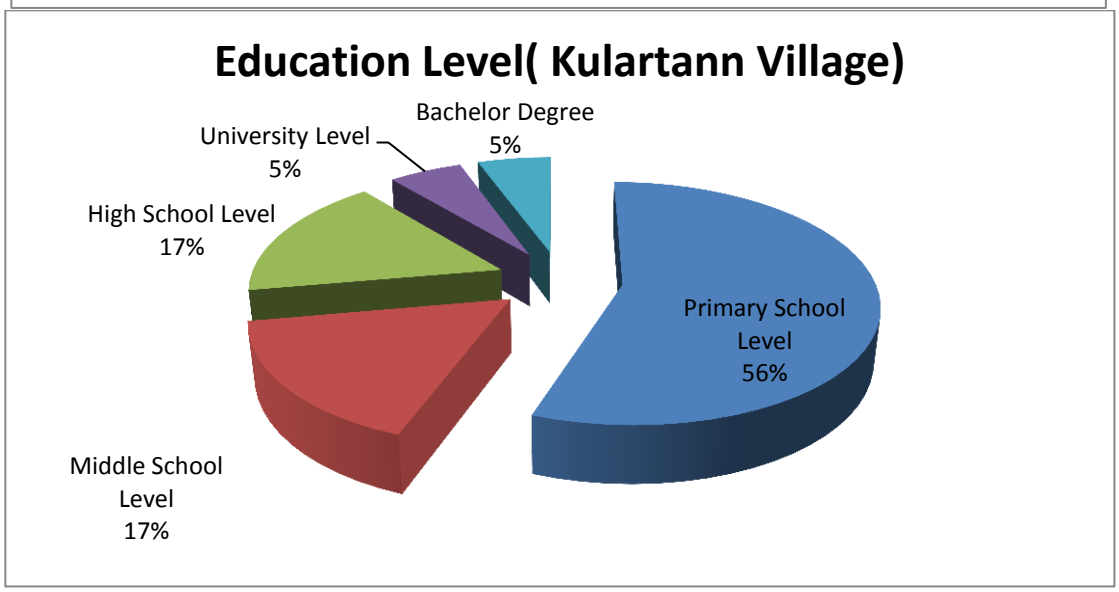


Figure 5.31. Population of Villages around the Project Area


Education Level(Thanphyuyon Village)
Bachelor Degree 2%
University Level 2%
High School Level 14%
Middle School Level 16%
Primary School Level 66%


Education Level(Htantapin Village)
University Level 4%
Bachelor Degree 4%
High School Level 7%
Middle School Level 22%
Primary School Level 63%


Education Level(Kulartann Village)
Bachelor Degree 5%
University Level 5%
High School Level 17%
Primary School Level 56%
Middle School Level 17%

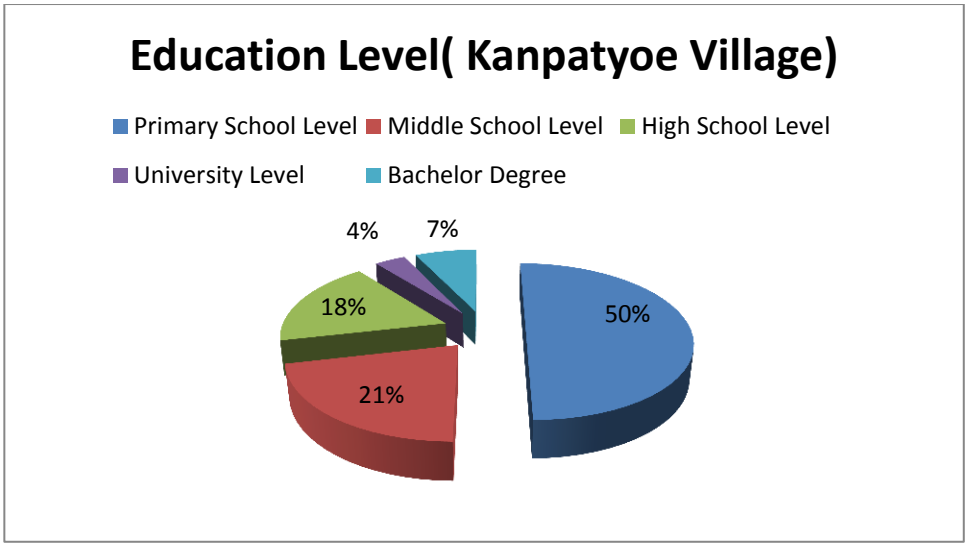
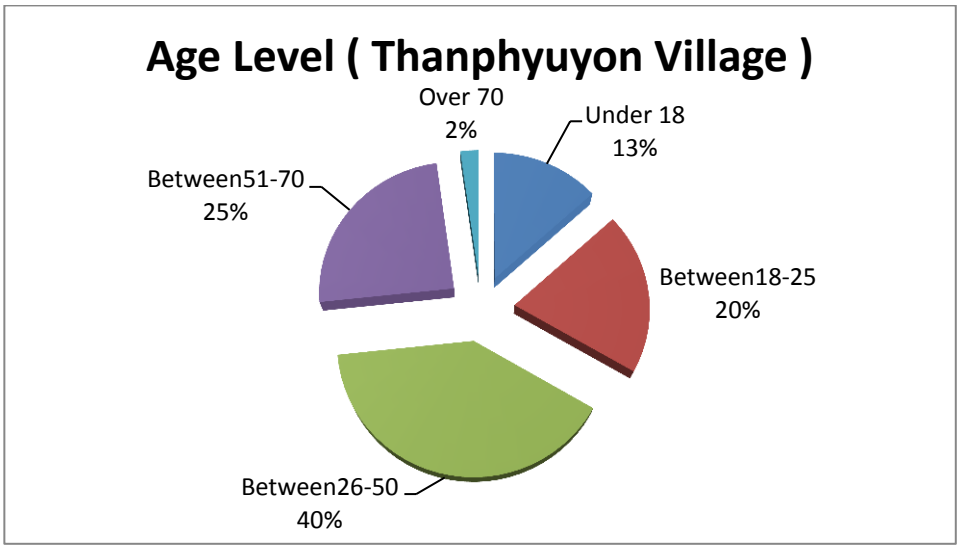
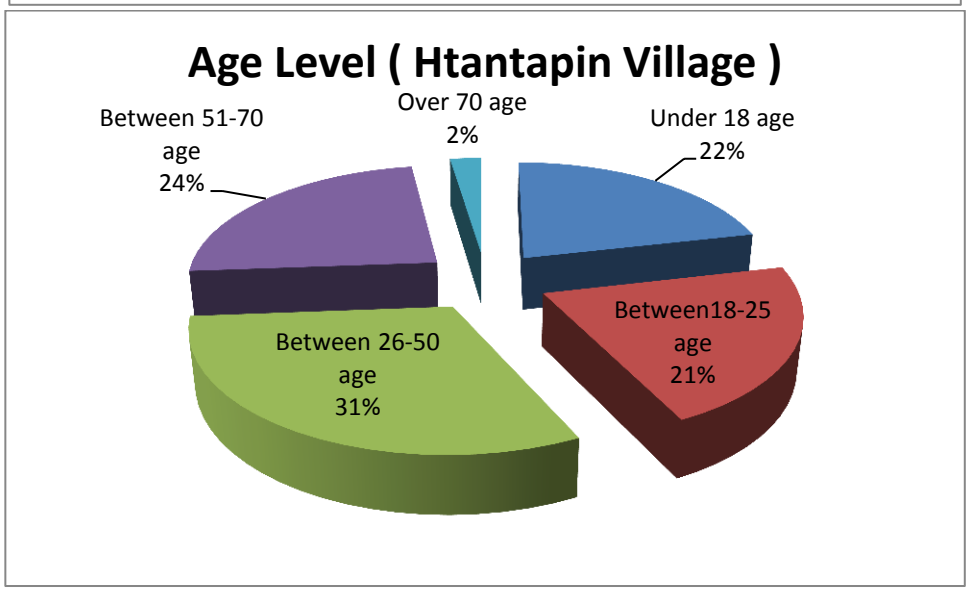
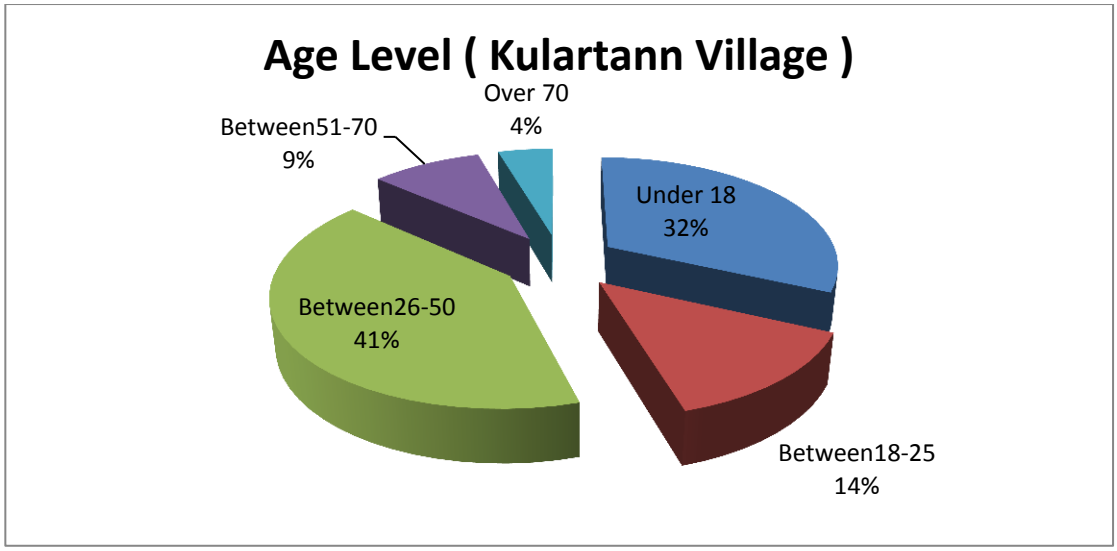


Figure 5.32 Educational levels of Villages around the Project Area







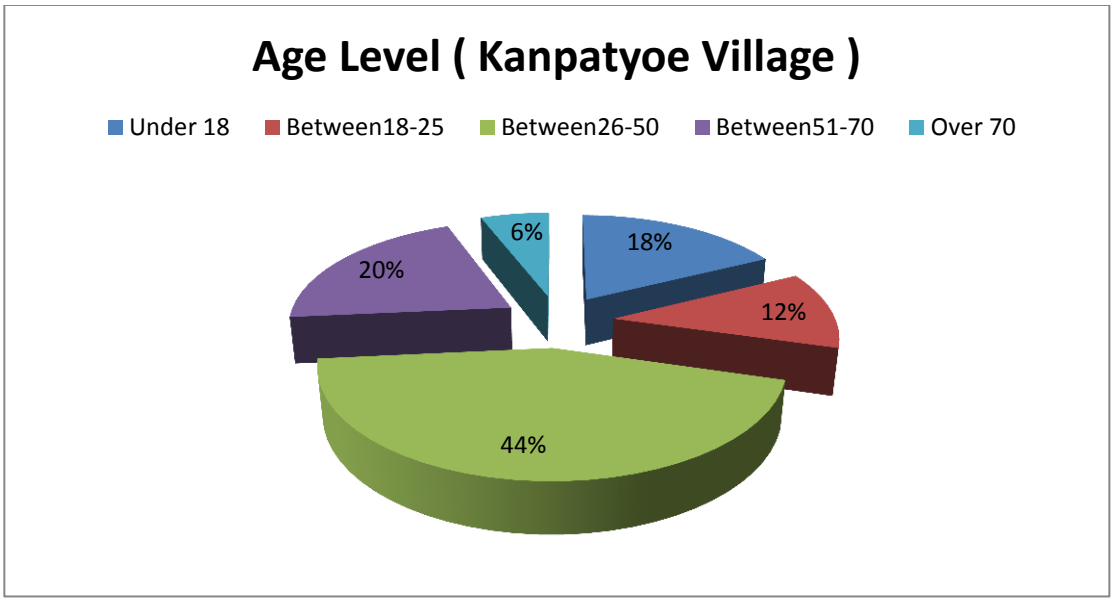
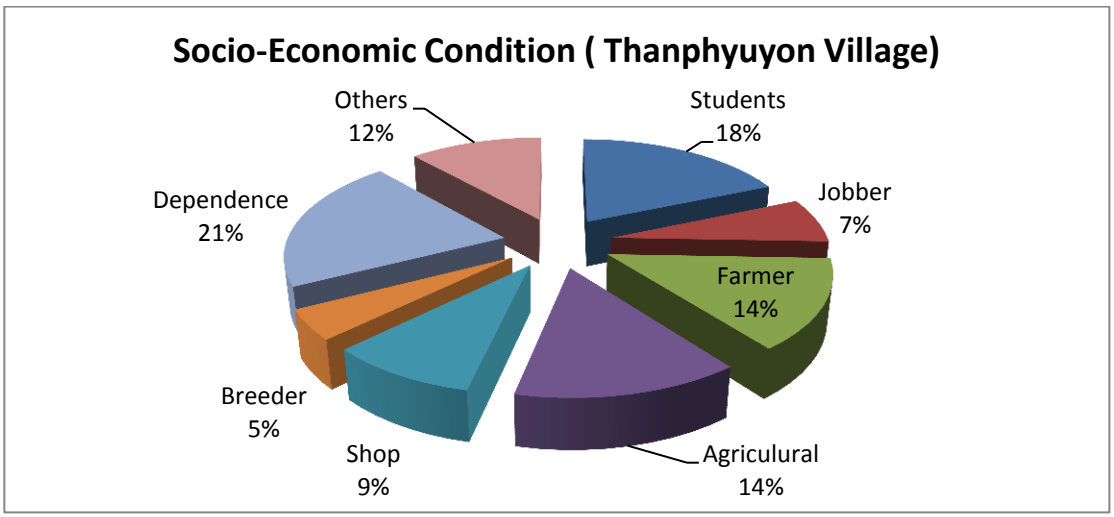
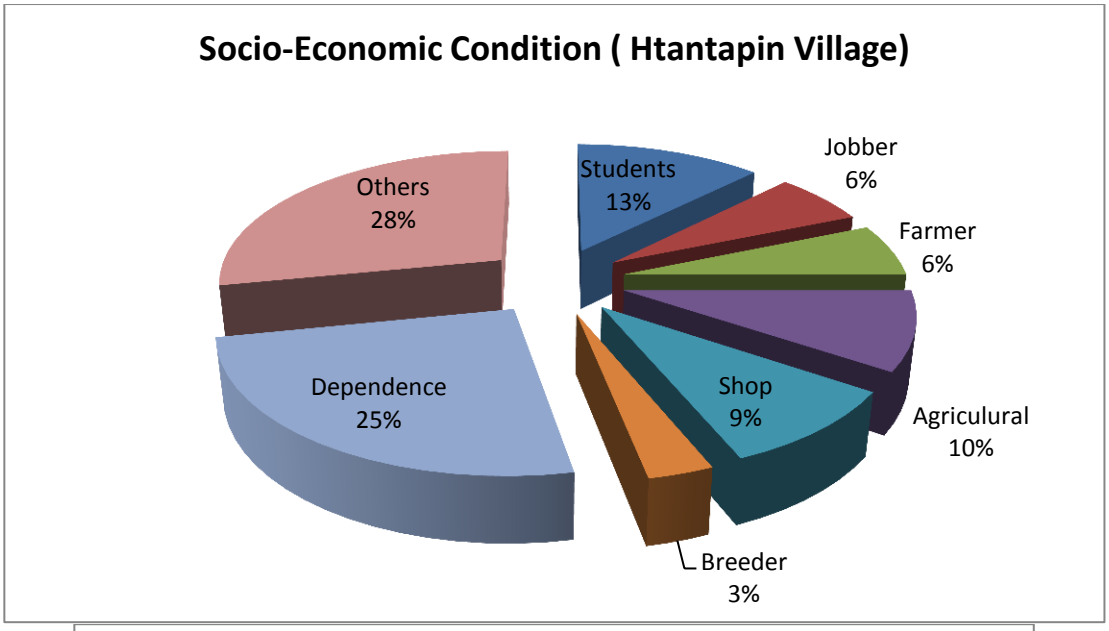
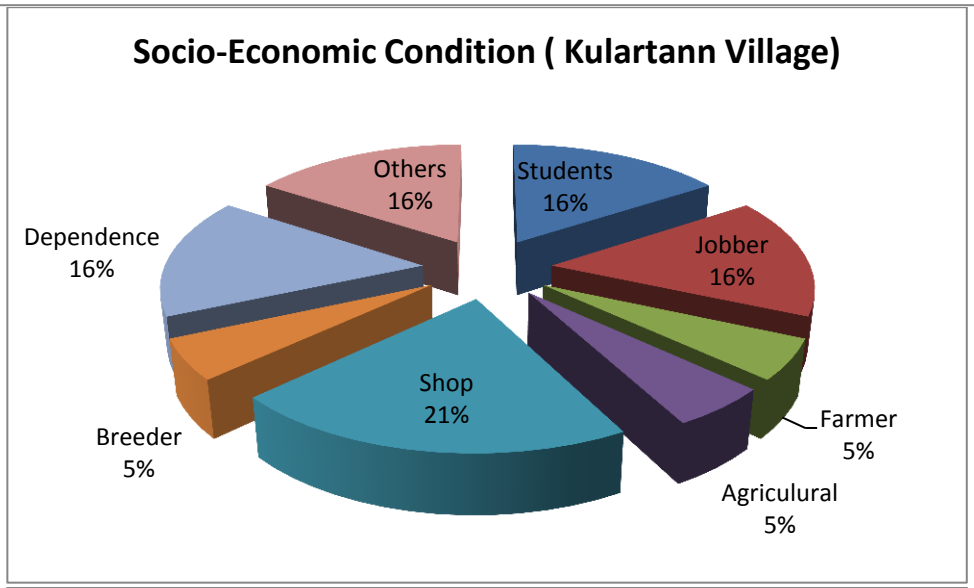


Figure 5.33 Age Level of Villages around the Project Area







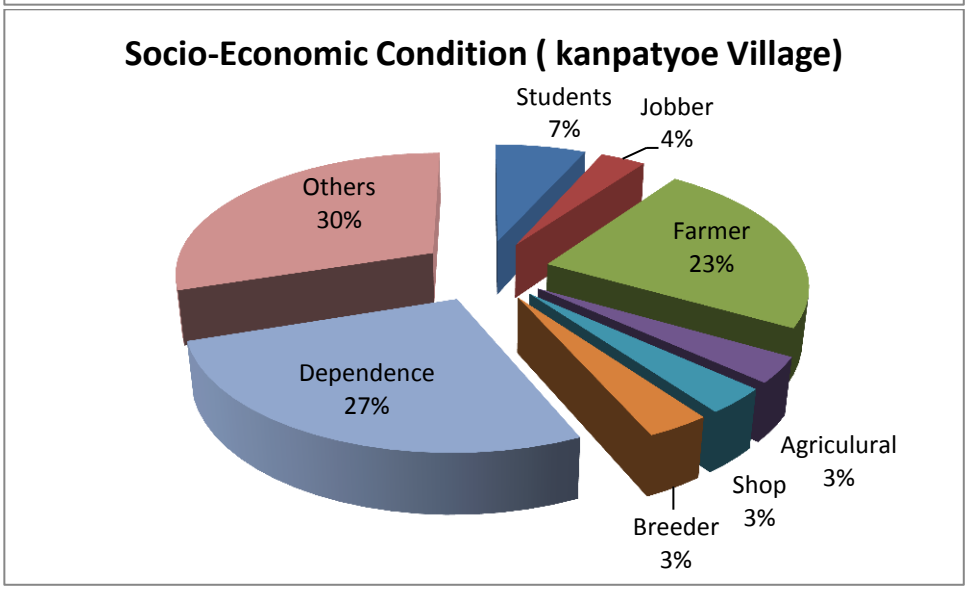
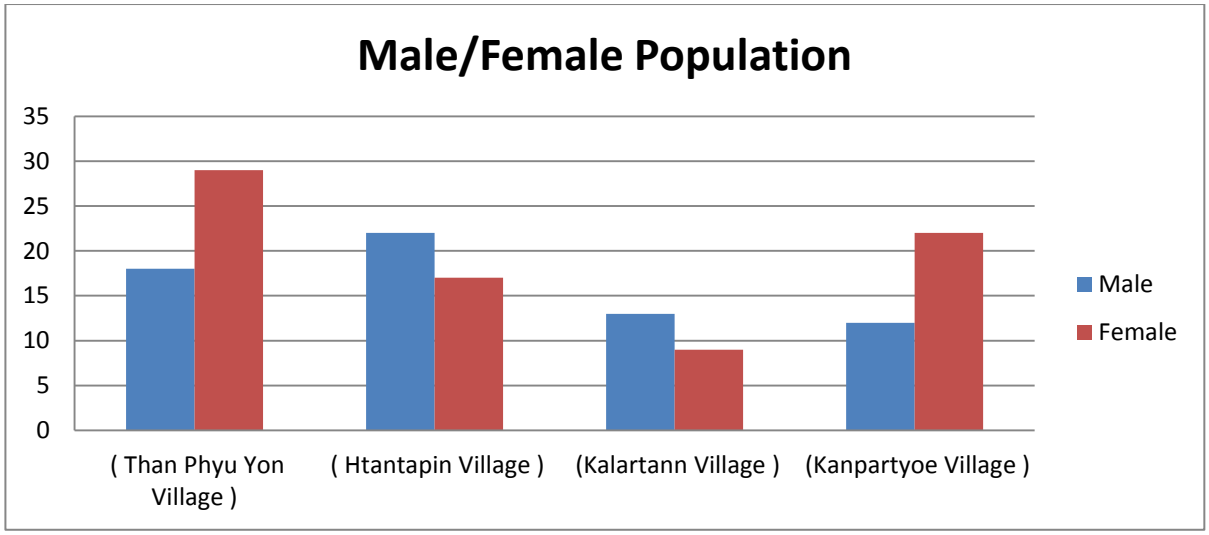
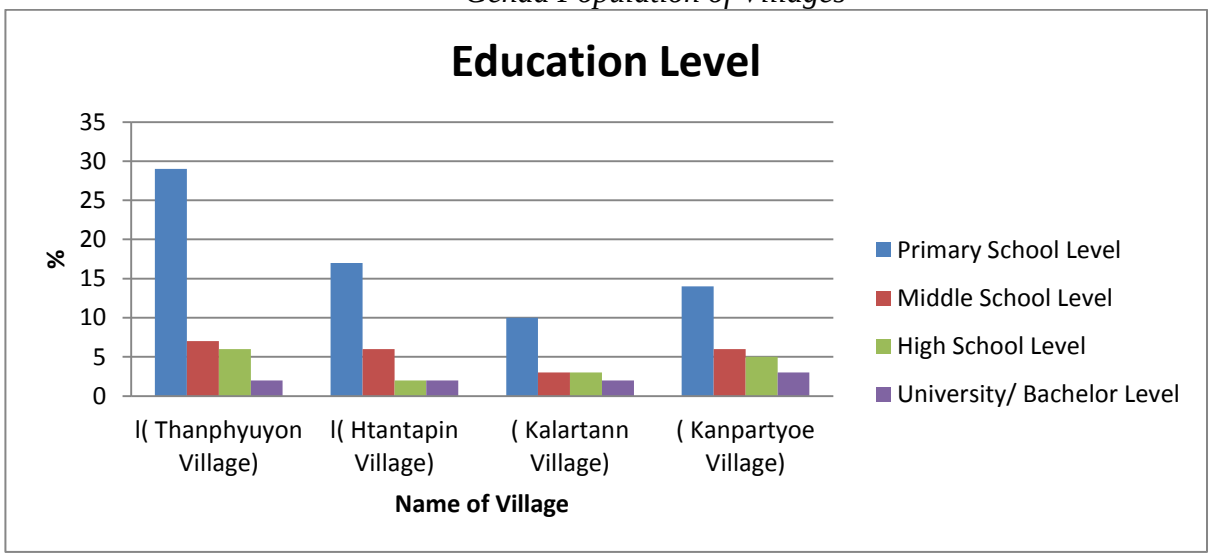


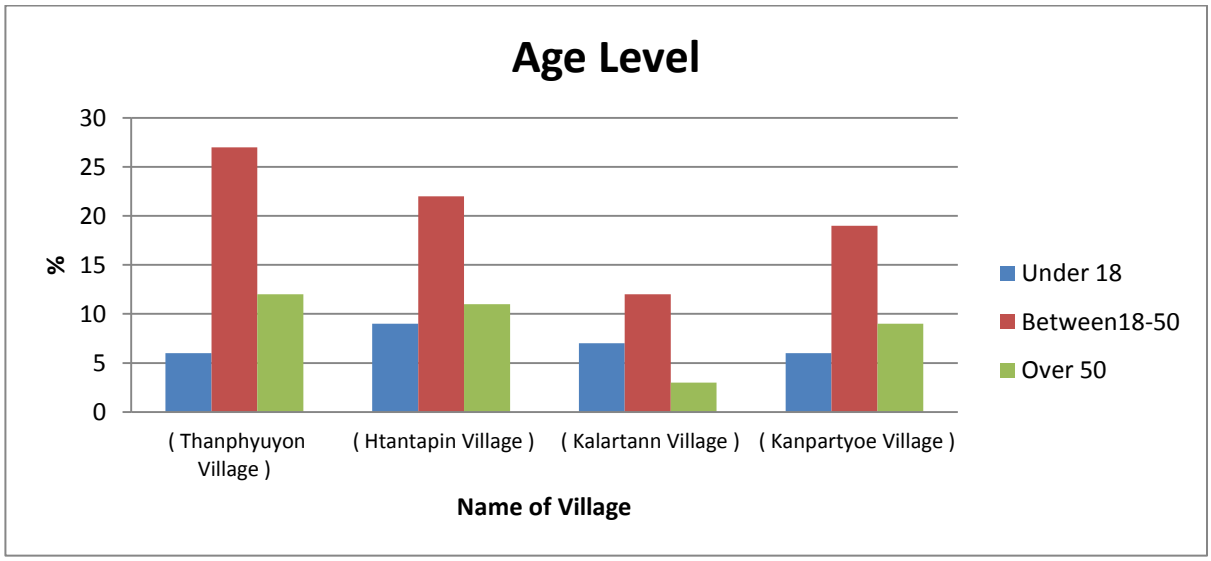
Figure 5.34-Socio-Economic Conditions of Villages



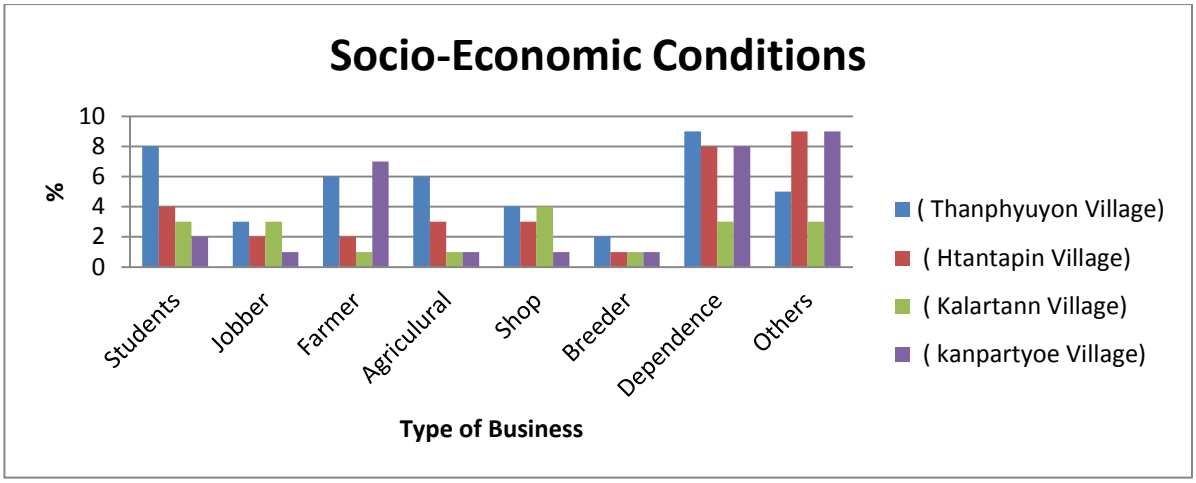
Genda Population of Villages



Education Level of Surveryed Villages



Age Level of Social Surveyed Villages



Socio-Economic Conditions of House Hold Surveyed Villages

6. IMPACT AND RISK ASSESSMENT AND MITIGATION MEASURES

6.1 Introduction

Identification and assessment of key environmental impacts of the project have to be based on the nature and scope of the project (Chapter 4), information on the Environment (Chapter 5), nature of project operation. Basically, the impacts have been assessed for 3 main phases: construction phase (impacts during construction), operation phase (operational related impacts) and decommissioning phase (foreseen impacts while demolishing). However, as per described in above chapters, the buildings required for operation had been constructed. Thus, this chapter has identified key potential environmental and social impacts for operation phase and decommissioning phase at the conceptual level.

6.1.1 Project Impacts scope

This section aims to identify the key environmental and social impacts of the project through a scoping process. Potential impacts have been identified through a systematic process whereby the activities (both planned and unplanned) associated with the project have been considered with respect to their potential to interact with environmental and social resources / receptors. A Scoping study has been developed to support this assessment and to enable the identification of interactions in a consistent way. Scoping also aims to identify key data gaps and ways to fill those gaps.

The following key activities were undertaken for this Scoping Study:

- Gathered information on project activities in the project area from Township level consultation meetings;
- Listed the potentially relevant environmental and socio-economic receptors in the Projects' Area of Influence;
- Mapped potential interactions between project activities and environmental and socio-economic receptors; and
- Taking into consideration the information gathered on the extent and nature of project activities and the existing condition/ sensitivities of the receptors, the potential interactions have been prioritized in terms of their potential to cause significant impacts.

6.2. Impact Identification

The proposed factory is already built and initials operation state, so the Scoping Report focused on the potential impacts associated with the operation and decommissioning of the Project. Potential environmental impacts during decommissioning are likely to be temporary and localised to the Study Area. Potential impacts during operation include those related to noise, traffic, community health and safety, and occupational health and safety. In the EIA Report, these impacts will be assessed in detail and appropriate mitigation measures will also be provided.

6.3 Methodology

6.3.1 Methods of Impact Identification, Prediction and Significance of Impacts

Impact identification was done with a logical and systematic approach. The aim of impact identification is to take account of all of the important environmental and social impacts and interactions which may be potentially significant. A conventional matrix method based on Leopold interaction matrix style is used for impact identification. In this method, impact factors are identified against project activities on the basic of a particular receptor environment. Detailed impact identification tables are described under each impact heading.

Introduction to the Significance of Impact and Alternatives

The assessment of determination of significance of impacts in EIA is considered to be the central point of EIA reports. It is helpful for a project to define and compare the alternatives arising, and to provide a clear basis of choice for decision-makers and the general public. In order to arrive at systematic choices among alternatives, it is desirable to use a form of trade-off analysis, which typically involves the comparison of set of alternatives relative to a series of decision factors. The following formal and informal approaches can be used to carry out an alternative analysis:

- **Qualitative approach:** in which descriptive information on each alternative is presented,
- **Quantitative approach:** in which quantitative information on each alternative is presented,
- **Ranking, rating or scaling approach**. in which the qualitative or quantitative information, on each alternative is summarized through the assignment of rank,

rating or scale values,

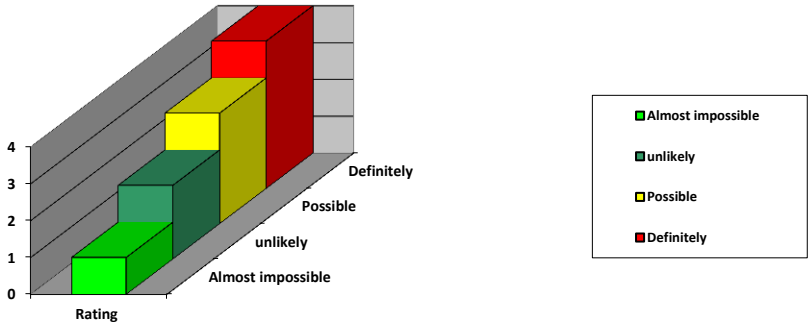
- **Weighting approach:** in which the importance in weight of each alternative is presented in view of the relative importance of the decisive factors, and
- **Weighting-ranking/rating/scaling approach:** in which the relative importance of either environmental factors or impacts are determined and numerical weights are assigned to each factor or impact. The important weight is multiplied by the ranking/rating of each alternative then the resulting products for each alternative are summed up to develop an overall composite index or score for each alternative. Decision-making, which involves the comparison of a set of alternatives, relative to a series of decision factors is not an unique approach to be considered in environmental impacts. This is a classic decision-making approach and is often referred to as multicriteria decision analysis. However, for the shake of simplicity and in order to provide a simple framework of impact prediction and evaluation, the Nepal National EIA Guidelines (1993) provides an Assessment Framework in the form of numerical scale.

6.3.2 Impact Assessment Method

After the identification of all the important impacts, their potential size and characteristics are predicted by using a conventional rating matrix method. The significance level of the identified environmental and social impacts of the Propose Project on its environment are assessed quantitatively. There are Five parameters considered for the activities of the projects and the consequences resulted from those activities. System of rating is described in detailed as follows.

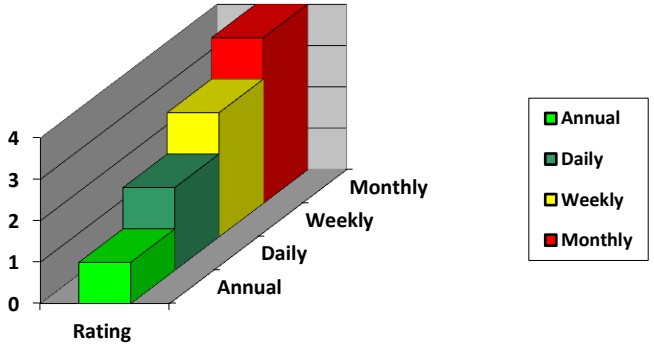
(i) Probability of the Project Activity

Probability of Activity	Rating
Almost impossible	1
unlikely	2
Possible	3
Definitely	4



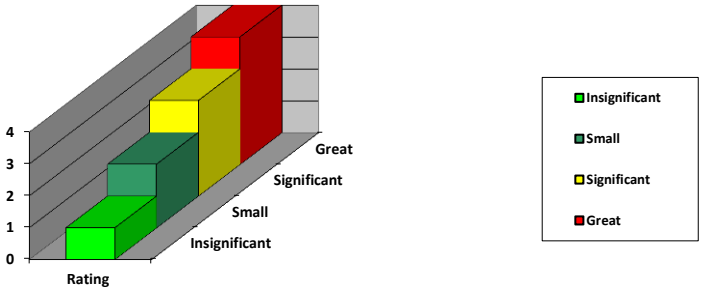
(ii) Frequency of the Project Activity

Frequency of Activity	Rating
Annual	1
Daily	2
Weekly	3
Monthly	4



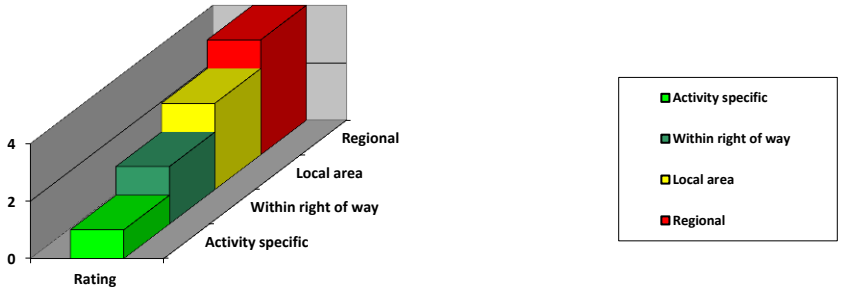
(iii) Severity of the Impact

Severity of Impact	Rating
Insignificant	1
Small	2
Significant	3
Great	4



(iv) Spatial Scope of the Impact

Spatial Scope of Impact	Rating
Activity specific	1
Within right of way	2
Local area	3
Regional	4



(v) Duration of the Impact

Duration of Impact	Rating
One day to one month	1
One month to one year	2
Life of operation	3
Permanent	4

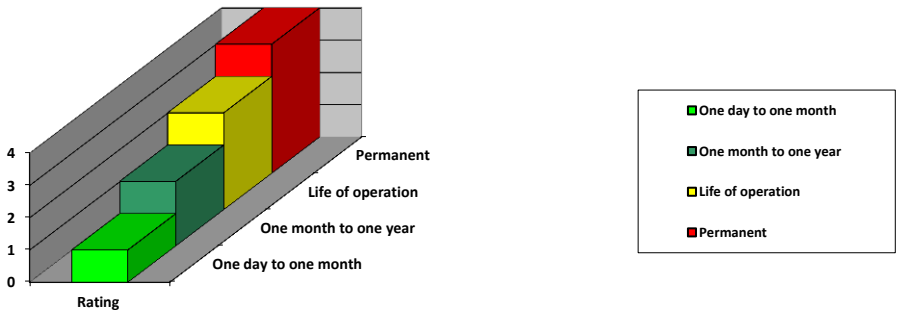


Table 6.1 Rating Matrix for Impact Significance

Activity (Frequency + Probability)	Consequence (Severity + Spatial Scope + Duration)									
	1	2	3	4	5	6	7	8	9	10
	2	4	6	8	10	12	14	16	18	20
	3	6	9	12	15	18	21	24	27	30
	4	8	12	16	20	24	28	32	36	40
	5	10	15	20	25	30	35	40	45	50
	6	12	18	24	30	36	42	48	54	60
	7	14	21	28	35	42	49	56	63	70
	8	16	24	32	40	48	56	64	72	80
	9	18	27	36	45	54	63	72	81	90
	10	20	30	40	50	60	70	80	90	100

Table 6.2 Significance Levels of Impacts

Sr.	Color Code	Value	Rating
1		1-25	Low
2		26-50	Low- Medium
3		51-75	Medium
4		76-100	High

6.3.3. Alternative Impact Assessment Methodology

Anticipated impact for proposed Project is predicted by using matrix method. The classification of likelihood, severity and consideration of impact by using matrix method are shown in Tables 6.4, 6.5 and 6.7.

Table 6.3 Likelihood Classification

Likelihood	Classification
Unlikely	Impact is unlikely to occur but may occur sometime during construction or operation.
Likely	Impact is likely to occur at sometime as there are some incidents experienced before in similar project.
Very Likely	Impact is very likely to occur several times during construction and operation phase of similar project.
Certainly	Impact will occur anytime during construction and operation phase. Incident has happen in similar project.

Table 6.4 Severity Classification

Likelihood	Classification
Minor	Impact is unlikely to be noticed.
Low	Localized impact occurs but only on small patch of affected environment/ communities with negligible damage.
Medium	Impact is suffered and only to the affected area/communities and unlikely to extend to the whole project area.
High	Impact is suffered and to the affected area/communities and can go beyond project.
Very High	Impact is suffered and affected to large environment or communities and extend to national scale.

Table 6.5 Impact Identification by Using Matrix Method

Impact Severity						
Impact Likelihood		Minor	Low	Medium	High	Very High
	Unlikely	Negligible	Negligible	Minor	Minor-Moderate	Moderate-Major
	Likely	Negligible	Negligible	Minor	Moderate	Major
	Very Likely	Negligible	Negligible	Minor-Moderate	Major	Major
	Certain	Negligible	Minor	Moderate	Major	Critical

Note : (1) Negligible does not require any additional mitigation.
(2) Minor may or may not require small quantity of additional mitigation.
(3) Minor-moderate will require small quantity of additional mitigation.
(3) Moderate and major require a number of additional mitigation measures.
(4) Critical cannot reduced by implementing mitigation measures and require alternative technology.

6.4. Anticipated Environmental Impacts and Mitigation Measures

Some impacts related to operation and decommissioning of the proposed factory include more or less:

(i) Impacts on air quality,
(ii) Impacts on water quality,
(iii) Impacts of waste disposal,
(iv) Impacts of acoustic and noise,
(v) Impacts on socio-economic,
(vi) Impacts on visual,
(vii) Impacts on biodiversity, and
(viii) Increase in traffic congestion.

6.4.1. Impacts on Air Quality

The potential issue is caused by pollutants from vehicles, and generators. However, the quantities of these pollutants will be very low as the proponent would use clean refrigerant for air conditioners and generators which is designed for low emission. Apart from that dusts can be generated from loading and unloading of the fertilizer. Process emissions consist mainly of odour and dust from conveyor, granulators, driers and coolers. Fugitive emissions of odour arise from storage tanks and process equipment.

Ambient Air Quality

As there is no formal air quality monitoring station within project area, there were no readily available existing baseline data on the project area. Background concentrations of CO_2, NO_2 and $SO_2$are expected to below NEQG, WHO and World Bank acceptable guidlines, reflecting the very low level of current emissions of these pollutants in the area around the proposed site. Overall, baseline air quality in the vicinity of the proposed site is predicted to be good.

Table - Significant of Impacts assessment on Air Quality

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Dust	Negative	Very Likely	Medium	Temporary during operation	√					√		
Gases Emissions	/	Very Likely	Medium	/	√						√	

Note : Ma = Major,Mo = Moderate, Mi – Mo= Minor to Moderate,Mi = Minor

Table - Impact Rating and Assessment for Air Quality

	Air Environment						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Negative		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	Possible	**3**	Vehicles Movements
	Frequency of Activity	annual	1	No Work	Daily	**2**	Repackaging,
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Local area	**3**	Repackaging,
	Duration of Impact	One day to one month	1	No Work	Life of Operation	**3**	All Activities
	Severity of Impact	insignificant	1	No Work	Significant	**3**	Far away from site
Impact identification		low	6	Rating value fall in 1-25 range	Low- Medium	**45**	Rating value fall in 26-50 range

Impact Mitigation

Operation phase

- Install exhaust ventilation system at emission / release points of factory room
- Insignificant PPE shall be provided to workers such as facemasks with appropriate filters for dust removal and air purification
- Regular maintenance of equipment and machines.
- Necessary dust suppression measures must be taken at the places of dust and particulate emission in the project.
- Green barriers with tall growing thick foliage plants species will be developed around the project lease area towards noise transmission and dust dispersion.

Decommissioning phase

- Water spraying of demolition area
- Establish and enforce speed limits of working vehicles
- Prohibition of idling of vehicles

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual air quality impact due to operation is expected to be of Low significance.

6.4.2 Impact on Existing Noise Levels

The monitoring results of the noise levels from various locations of around the project in A-Weighted Decibel, dB(A) are shown in Chapter 5. According to the baseline noise level monitoring, the noise levels in four monitoring stations are a little lower than the acceptable levels of WHO guidelines of daytime noise level 71 dB (A) for residential area because of the cumulative effect of noise from moving vehicles .

Table - Significant of Impacts assessment on Noise

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Sound	Negative	Likely	Moderate	Life of Operation	√						√	
Machines/ Vehicles	Negative	Likely	Moderate	/	√						√	

Note : Ma = Major,Mo = Moderate, Mi – Mo= Minor to Moderate,Mi = Minor

Table - Impact Rating and Assessment for Noise

	Noise						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Negative		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	possible	**3**	Vehicles Movements& Factory machines
	Frequency of Activity	annual	1	No Work	Daily	**2**	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Local area	**3**	
	Duration of Impact	One day to one month	1	No Work	Life of Operation	**3**	
	Severity of Impact	insignificant	1	No Work	Significant	**3**	
Impact identification		low	6	Rating value fall in 1-25 range	Low-Medium	45	Rating value fall in 26-50 range

Impact mitigation

The following specific mitigation measure to reduce noise: operation phase

- Plant should be positioned as far as possible from sensitive areas;
- Give the PPE for noise (earphone) working in noisy area
- Give the sufficient time to rest for the workers working in noisy area.
- Provide noise control measures for generator such as silencer and muffler

Decommissioning phase

- Avoid running construction machineries at the same time; and to avoid working at night.
- No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection.
- regular inspection and maintenance of all vehicles and equipment working onsite

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual noise impact due to operation is expected to be of Low significance.

6.4.3. Impacts on Water Quality

HED Environmental consulting group assess the water quality on This site by using ISO loboratory test results.Surface water and Ground water under ECD guidelines and WHO requirement levels . In addition, treated wastewater discharge from the wastewater treatment facilities could be a potential issue if not designed properly.

Table - Significant of Impacts on Water Quality

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Surface Water	Negative	Likely	Low	Life of Operation	√					√		
Ground water	/	unLikely	Low	/	√					√		

Table - Impact Rating and Assessment for water quality

	water quality Environment						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			**Negative**		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	unlikely	2	washing activities and domestic usage
	Frequency of Activity	annual	1	No Work	Weekly	3	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Local area	3	
	Duration of Impact	One day to one month	1	No Work	Life of Operation	3	
	Severity of Impact	insignificant	1	No Work	Small	2	All Activities
Impact identification		low	6	Rating value fall in 1-25 range	Low- Medium	40	Rating value fall in 26-50 range

Mitigation of Impact on Water Quality

The following management measures are suggested to protect the water quality during the operation phases of proposed project.

- All wastewater from Project Site will be fully collected and treated to comply with applicable standards at the proposed wastewater treatment plant.
- Sewage from the operation workforce should be treated on-site by a septic tank and seepage field properly designed and maintained
- To prevent surface and ground water contamination by chemical and oil/grease, leak proof containers should be used for storage and transportation of products.
  - The floors of chemical and oil/grease handling area should be kept effectively impervious.
  - Any wash off from the chemical and oil/grease handling area should be drained through impervious drains.
- All drainage facilities and sediment control structures should be inspected and maintained on a regular basis.

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual water quality impact due to operation is expected to be of Low significance.

6.4.4 Impacts of Waste Disposal

Wastes from the operation phase of the proposed factory will consist of factory process wastes and domestic wastes from workers. Fertilizer repackaging processes generate both hazardous and non-hazardous wastes. The most common non-hazardous wastes are nitrogen-containing dust particulates from granulators dust control systems. Solid wastes generated from the workers are plastic, paper, glass and food waste..Decontamination of the solid-based fertilizer blending mills may generate a solid dilutant, consisting of clay or sand, contaminated with fertilizers

Table- Impact Significance of Waste Disposal

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Soil &Surface Water Pollutions	Negative	Certain	Medium	Life of Operation	√					√		

Table - Impact Rating for waste disposal

	waste disposal						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Negative		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	Demolition wastes	unlikely	2	Repackaging process waste and domestic wastes
	Frequency of Activity	annual	1		Daily	2	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1		Activity Specific	1	
	Duration of Impact	One day to one month	1		Life of Operation	3	
	Severity of Impact	insignificant	1		Small	2	
Impact identification		low	6	Rating value fall in 1-25 range	low	24	Rating value fall in 1-25 range

Mitigation of Waste Disposal Impacts

(a) Recycling to their specific production units or to fertilizer mixing units in the manufacturing plant;
(b) Use marked bins to segregate hazardous and non-hazardous wastes..
(c) 3R (reuse, refuse, recycle) should be promoted for employees by awareness-raising campaigns and environmental education program.
(d) Waste should be segregated at source by types of waste and systematically disposed into separate containers..
(e) Waste disposal facilities shall be sited and signposted throughout the site.

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual waste disposal impact due to operation is expected to be of Low significance.

6.4.5. Impacts on Socio-economic

With regard to socio-economic, there will be both negative and positive impacts. The positive impact is increase in job opportunities for local people due to the operation of proposed project.

Table - Impact Significance of Socio-economic

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning			
					Mi	Mi-Mo	Mo	Ma
Conflict bet: migrant workers and local people	Negative impact	unLikely	Minor	One day to One Month	√			

Table - Impact Rating for Socio-economic

	Socio-economic						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Positive		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	impossible	1	To increase Job, Demand /Supply
	Frequency of Activity	annual	1	No Work	annual	1	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Activity Specific	1	
	Duration of Impact	One day to one month	1	No Work	One day to one month	1	
	Severity of Impact	insignificant	1	No Work	insignificant	1	
Impact identification		low	6	Rating value fall in 1-25 range	low	6	Rating value fall in 1-25 range

Mitigation in operation phase

- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship, which is necessary for smooth functioning of the project as well as progress and welfare of the people in the surrounding area
- Projectworkers should be clearly identifiable. Overalls should have the logo of the MSNAG Company on it and should wear identification cards.
- Project site to be fenced and access to be controlled

Decommissioning phase

MSNAG will provide and recommend their employees in applicable jobs at other factories in or near the industrial zone if feasible. If it is not feasible to appoint in other factories, extensive and comprehensive warning to employees to allow them to source alternative livelihood will be taken early and will pay compensation according to the national labour rules and regulations.

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual socio-economic impact due to operation is expected to be of Low significance.

6.4.6. Impacts on Biodiversity

Biodiversity impact assessment is made separately. Impact assessment methodology, significant of impact and mitigation measures are described in Section 5. According to biodiversity impact assessment, the proposed project has not affected directly on forest area and impact significance will be minor.

Table - Impact Significance of on Biodiversity

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
flora	Negative	Likely	small	Life of Operation	√				√			
funna	Negative	unLikely	small	Life of Operation	√					√		

Table - Impact Rating for Biodiversity

	Biodiversity						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			**Negative**		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	unlikely	2	Inadequate waste management system - -
	Frequency of Activity	annual	1	No Work	annual	1	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Activity Specific	1	
	Duration of Impact	One day to one month	1	No Work	Life of Operation	3	
	Severity of Impact	insignificant	1	No Work	Small	2	
Impact identification		low	6	Rating value fall in 1-25 range	low	18	Rating value fall in 1-25 range

Mitigation Measures

- To continue to provide air shed functions of purification it is recommended that verges be replanted with trees and shrubs where appropriate.
- Landscaping could result in the replacement of some habitat for selected species.
- Birds will relocate to adjacent suitable habitats.
- Encroachment by squatters could result in degradation of areas.

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual biodiversity impact due to operation is expected to be of Negligible significance.

6.4.7 Impact on Cultural Heritage

There is no stupas, temples, monasteries, and other heritage properties around the proposed project area with 1 km radious. EIA team recommend that the development proceed with no further heritage mitigation and have submitted this report in fulfilment of the requirements of the Protection and Preservation of Cultural Heritage Region Law. (State Peace and Development Council, 1998).

Table - Impact Significance of Cultural Heritage

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Historical temple	Negative impact	unLikely	small	none	√				√			
buildings,bagodas	Negative impact	unLikely	small	none	√				√			

Table -Impact Rating for Cultural Heritage

	Cultural Heritage						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Negative		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	impossible	1	Nil
	Frequency of Activity	annual	1	No Work	annual	1	Nil
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Activity Specific	1	Nil
	Duration of Impact	One day to one month	1	No Work	One day to one month	1	Nil
	Severity of Impact	insignificant	1	No Work	insignificant	1	Nil
Impact identification		low	6	Rating value fall in 1-25 range	low	6	Rating value fall in 1-25 range

On no account Mitigation Measures for Cultural Heritage

6.4.8 Increase in Traffic Congestion

Although the the proposed project will use motorcycles, cars, and trucks for transportation of raw materials and the workforce to and from the site. There will be proposed increase traffic congestion as low significance is under proposal.

Table - Impact Significance of Traffic Congestion

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Public access and movement	Negative impact	Likely	small	One day to one month	√						√	

Table - Impact Rating for Traffic Congestion

	Traffic Congestion						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			Negative		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	possible	3	Vehicles Movements
	Frequency of Activity	annual	1	No Work	Daily	2	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Within right of way	2	
	Duration of Impact	One day to one month	1	No Work	Life of operation	3	
	Severity of Impact	insignificant	1	No Work	Small	2	
Impact identification		low	6	Rating value fall in 1-25 range	low	45	Rating value fall in 26-50 range

Mitigation Measures

to indicate the traffic routes to be followed, speed limit to be complied with as well as restriction of traffic hours (e.g. avoid rush hour) in order to reduce pressure on road infrastructure.

Significance of Residual Impact

With after the implementation of management and mitigation measures, the residual traffic congestion impact due to operation is expected to be of Low significance.

6.4.9. Health and Safety

(i) Occupational Health and Safety

Physical injuries

Physical injuries may occur in workplaces such as fall on slippery floors, improper use of machines and tools and improper product loading and unloading in store. Potential accidents related to the operation works.

Chemical Exposure

Occupational health risks may derive from worker exposure to hazardous chemical substances, including active ingredients and fertilizer dusts, during all production phases. Workers may be exposed to airborne dusts during loading and mixing operations.

Fire and explosion hazards

Fires of fertilizer products or dust contaminated with oil or other combustible materials in the presence of a heat source Proposed project will be store, transfer, and use large quantities of chemicals; therefore, careful handling is necessary to mitigate fire and explosion risks.

Lighting and temperature

Factory will use light tubes for general lighting purposes. This includes space lighting and task lighting. Activities of the workers in the operating sector depend on the quality of light; thus, it is important to provide sufficient lighting to those areas.

The potential health risk may occur in workplaces for transmission of communicable diseases, e.g., Covid-19, respiratory and sexually transmitted infections resulting from the influx of factory labor.

(ii) Community Health and Safety

Increased incidence of communicable and vector-borne diseases attributable to factory operation activities represents a potentially serious health threat to factory workers and residents of local communities. The potential health risk may occur in workplaces for transmission of communicable diseases, e.g., Covid-19, respiratory and sexually transmitted infections resulting from the influx of factory labor.

These non-local workers may introduce communicable diseases that are not currently common in the local community. The lack of health care facilities may also contribute to the increased transmission of diseases, as people may be unable to access health care in a timely manner leading to worsening health outcomes. Any increase in demand on existing health services will also affect the ability of local community to seek and receive treatment. Moreover, these impacts may be caused by environmental impacts to air quality, noise, surface water quality and soil quality as discussed in Section above. Factory operation activities may result in a significant increase in movement of vehicles for the transport of raw materials and workers increasing the risk of traffic-related accidents and injuries to personnel and local communities.

Table - Impact Significance of Health and Safety

Possibility of Impact	Impact Type	Likelihood	Severity	Impact Duration	Impact Significance Decommissioning				Impact Significance Operation			
					Mi	Mi-Mo	Mo	Ma	Mi	Mi-Mo	Mo	Ma
Health and safety	Negative impact	Likely	moderate	Project life	√						√	

Table - Impact Rating for Health and Safety

	Health and Safety						
	Actions	**Decommissioning**			**Operation**		
	Type of Impact	**Negative**			**Negative**		
	Parameter	**Value**	**Rating**	**Reasoning**	**Value**	**Rating**	**Reasoning**
Activity (Frequency + Probability)	Probability of Activity	impossible	1	No Work	possible	3	-Potential accidents related to the operation works -transmission of communicable diseases
	Frequency of Activity	annual	1	No Work	Daily	2	
Consequence (Serverity+ Spacial + Duration)	Spatial Scope of Impact	Activity Specific	1	No Work	Within right of way	2	
	Duration of Impact	One day to one month	1	No Work	Life of operation	3	
	Severity of Impact	insignificant	1	No Work	Small	2	

Impact identification	low	6	Rating value fall in 1-25 range	Low –Moderate	45	Rating value fall in 26-50 range

Mitigation Measures

(i) Occupational Health and Safety

- Signage in hazardous and risky areas, installations, materials, safety measures, emergency exits, and other such areas should be in accordance with international standards (including standards of cleanliness, visibility and reflectance in areas of potentially poor illumination or sources of dust and pollution), be known and easily understood by workers, visitors, and as appropriate the general public;
- Ventilation systems and life and fire safety systems in all buildings
- Implementation of specific personnel training on worksite health and safety management including a communication program with a clear message about corporate management's commitment to health and safety;
- Adequate PPE and suction hoods will be used to collect vapours and other fugitive emissions.
- Preparation of emergency response plans specifically applicable to exploration and production activities and sufficient number of first aid trained employees to respond to emergencies;

(ii) Community Health and Safety

- EHS Management Plan will be developed to reduce potential impacts of nearby communities.
- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community
- The prevention and control of communicable and vector-borne diseases also applicable to project operation activities and Follow the "Guideline for Prevention and Control of Coronavirus Disease 2019 (COVID-19), In factories, workplaces and construction sites" release date (19-4-2020) by the Ministry of Health and Sports
- Prepare and implement a Traffic Management system through a combination of education and awareness-raising, and the adoption of Traffic Safety procedures with in order to reduce risk to the local communities.

6.4.10 Summary Impact of Proposed Project area

The anticipated environment impacts during operation and decommissioning phases can be summarized as in Table below.

Table 6.6 Summary Impact Ratings in Operation phase

Sr.	Impact	Severity	Duration	Spatial Scope	Frequency	Probability	Total Rating	Significance Level	Residual Impact Significance
1	Impact on Air Environment	3	3	3	2	3	45	Low –Medium	Low
2	Impact on Noise	3	3	3	2	3	45	Low –Medium	Low
3	Impact on water	2	3	3	3	2	40	Low –Medium	Low
4	Impact of waste disposal	2	3	1	2	2	24	Low –Medium	Low
5	Impact on socio-economices	1	1	1	1	1	6	Low-	Low
6	Impact on 177iodiversity	2	3	1	1	2	18	Low-	Negligible
7	Impact on Cultural Hetitage	1	1	1	1	1	6	Low	Negligible
8	Impact on Traffice	2	3	2	2	3	45	Low –Medium	Low
9	Health and Safety	2	3	2	2	3	45	Low –Medium	Low

Table 6.7 Summary of Impact Ratings in decommissioning Phase

Sr.	Impact	Severity	Duration	Spatial Scope	Frequency	Probability	Total Rating	Significance Level	Residual Impact Significance
1	Impact on Air Environment	1	1	1	1	1	6	Low	Negligible
2	Impact on Noise	1	1	1	1	1	6	Low	Negligible
3	Impact on water	1	1	1	1	1	6	Low	Negligible
4	Impact of waste disposal	1	1	1	1	1	6	Low	Negligible
5	Impact on socio-economices	1	1	1	1	1	6	Low	Low
6	Impact on Health and Safety	1	1	1	1	1	6	Low	Low

7. CUMULATIVE IMPACT ASSESSMENT

7.1. Methodology and Approach

Cumulative impacts are the successive, incremental and combined impacts from multiple projects or multiple activities located in the same region or affecting the same resource (e.g. a watershed or an airshed). Different projects or different phases of the same project contribute incremental impacts to other existing, planned, or reasonably predictable future projects and developments, leading to an accumulation of impacts. Cumulative impacts result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones.

The IFC (2012) defines cumulative impacts as those generally recognised as important on the basis of scientific concerns and or concerns from affected communities. Cumulative impacts in this section refer to the additional impacts that may be generated by other developments or activities in the vicinity of the project site, that when added to the impacts of the construction and operation of the proposed project combine to cause a greater impact.

7.2. Anticipated Cumulative Impacts

The existing activities and businesses around the proposed project site are mostly farmland and rural areas. Therefore the proposed project cumulative impact has not identified with other developments factories in the same regions of Twantay. Cumulative impacts will be increase at traffic on Twantay-Maubin road and Twante Canal due to the operation of the proposed project

7.3 Determining Valued Environmental and Social Components

The following Valued Environmental and Social Components (VECs) were identified for cumulative impacts of the above-mentioned projects in combination with the project being assessed. The affected community were also consulted to define the VECs to be assessed.

- Air
- Soil
- Receiving waterbody for disposing treated wastewater (Twante Canal)
- Social conditions like Community health and safety and infrastructure and facilities

7.4 Determining Spatial and Temporal Boundaries

The duration of impacts considered on VECs is the lifetime of the proposed project, including the operation phases. The potential effects of the proposed project cannot extend beyond the lifetime of project and hence this temporal boundary is the most conservative timeframe. The geographic boundaries for VECs (Air, Soil, and social conditions) for which cumulative impacts were assessed are 5 km radius of the project site. The spatial boundary was defined based on the facts that the area that will be directly affected by the project, potential VECs for cumulative impact assessment, and the distance an effect can travel.

7.5 Establishing Baseline Information of VECs

The baseline information of VECs are the existing information for ESIA because such information provided a sufficient basis for a complete assessment of cumulative impacts.

7.6 Assessment of Cumulative Impacts and their significance on VECs

The potential cumulative impacts are

- The incremental contribution of pollutant emissions in air;

- Increases in pollutant concentrations in waterbody (Twante Canal where treated wastewater is disposed);
- Increases in pollutant concentrations in soil;
- Induced social impacts like in-migration, more traffic congestion and accidents, community health problems.

In order to determine the significance of cumulative impacts, some limits of acceptable change in VEC condition are needed to which incremental effects can be compared. There is not always an objective technique for determining thresholds and professional judgement was relied upon. The significance of cumulative impacts was determined by the impact assessment methodology for determining potential environmental impacts for ESIA (Section. 6.3 Assessment of Impact Significance) in conjunction with professional judgement and based on the Environmental Management Plan of the project and appropriate mitigation measures for related impacts. It is also believed that the reasonably foreseeable projects will have and follow the sound Environmental Management Plans and appropriate mitigation measures for related impacts.

Table 7.1 Potential Cumulative Impacts during Operation Phase

Sr.	Impact	Score					Total Rating Significance Level
		Severity	Duration	Spatial Scope	Frequency	Probability	
1	Incremental contribution of air pollutants	1	3	1	1	1	10 insignificant
2	Increase in pollutant concentrations in soil	1	3	1	1	1	10 insignificant
3	Increase in pollutant concentrations in water body	1	3	1	2	2	20 Low Significance
4	Induced social impacts (more traffic congestion)	2	3	2	1	2	21 Low Significance

The cumulative impact assessment has not identified any cumulative impacts that are considered to be significant (i.e. high significance) and in need of mitigation measures, monitoring or management. The impacts are within the ability of the resource to absorb such changes.

7.7 Management of Cumulative Impacts

The significance of cumulative impacts are low, however, based on the review of potential impacts and mitigation measures mentioned in different phases, it is unlikely that the operation of the MSNAG repackaing factory and associated infrastructure will result in significant adverse environmental or soico-economic impacts, including cumulative impacts.
The Environmental Monitoring and Management plan for different phases of the project will also help minimize or avoid the cumulative impacts.
The cumulative impacts typically result from the actions of multiple stakeholders, it is necessary to engage with these stakeholders for effective collaboration and coordination.

8. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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 risks arising from the proposed project and take appropriate actions to properly manage that risk.

EMP also ensures the project implementation carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts during its life cycle. EMP for proposed project will include the following essential parts.

a. Environmental Management and Monitoring Plan;
b. Occupational Health and Safety Plan;
c. Emergency Response Plan; and
d. Corporate Social Responsibility (CSR) Plan

8.1 Environmental Management and Monitoring Plan

Environmental management and monitoring programs for this sector should be implemented to address all activities that have been identified to have potentially significant impacts on the environment. Environmental monitoring activities should be based on direct or indirect impacts of emissions, effluents, and resource use applicable to the particular project. Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken.

8.1.1. Proposed Environmental Management Team

As environmental monitoring have to conduct regularly within the project, a separate environmental management cell should be established to monitor and control the environmental quality. The cell should compose the members as shown in Table below.

Table 8.1 - Proposed Members for Environmental Management Team

Sr. No.	Description	Number of Working Person
1.	Project Manager	1
2.	Environmental Officer	1
3.	Occupational Health and Safety Officer	1
4.	Supervisor	1
5.	Supporting Staff	>2

(i) *Roles and Responsibilities of Environmental Officer (EO)*

The Environmental Officer (EO) of the proposed project should report directly to the Board of Members of MSNAG. The EO should also be a member of technical team of proposed project and should be responsible for all environmental matters pertaining to the day-to-day operation of the project. The main responsibilities and duties of the EO include:

(a) To implement the environmental management plan,
(b) To assure regulatory compliance with all relevant rules and regulations,
(c) To minimize environmental impacts of operations by strict adherence to the EMP.
(d) To initiate environmental monitoring as per approved schedule.
(e) To monitor and evaluate the effectiveness of mitigation or control measures in achieving environmental protection;

(f) To carry out and monitor environmental awareness within the plant personnel;
(g) To recommend amendments in procedures or remedial actions in the event that performance is unsatismine;
(h) To establish and promote good relations with local communities (industrial, residential, etc.) on matter pertaining to environmental protection; and
(i) Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
(j) Maintain documentation of good environmental practices and applicable environmental laws as ready reference.
(k) Maintain environmental related records.
(l) Coordination with regulatory agencies, external consultants, monitoring laboratories.
(m) Maintain of log of public inconvenience and the action taken.
(n) Ready to solve any complaints from local people about environmental and social issues.

(ii) Occupational Health and Safety Officer (OHS Officer)

The major duties and responsibilities of the OHS officer or person-in-charge for workplace occupational safety and health of proposed factory should be as given below:

(a) To prevent accidents, injuries and work-related illnesses in the workplace.
(b) To create and implement health and safety policies in accordance with the latest legislation and to ensure that these policies are implemented by management and employees.
(c) To draw health and safety policy in place and to create this document and ensure it's regularly updated to reflect any changes to the law.
(d) To ensure ensure that each member of staff is aware of and adheres to this policy.
(e) To ensure regular inspections and risk assessments, and ensuring that any hazards or defects are rectified immediately. They will also keep an accident book and must record and thoroughly investigate any accident, recommending any improvements in safety standards if required.
(f) To train all staff in safety issues, and advising them on protective clothing and equipment where necessary. They also act as a key point of contact for any member of staff who has a query or concern regarding the safety of the workplace.
(g) To safegurad machinery, fire safety, occupational health, noise, control of hazardous substances, manual handling, working with display screen equipment, and environmental health.

8.1.2 Environmental Management Programme

Table below contains a list of potential environmental issues and the appropriate mitigation measures that must be taken into account during the operation phase and decommisioning phase of the proposed project.

Table 8.2 Management Programme at Operation phase

Item	Potential Negative Impact/ Issue	Mitigation and Management Action	Frequency	Roughly estimated cost (USD)	Responsible Party
Air Quality	- Fugitive Dust Emissions, Odour - Vehicular Emission	- Insignificant PPE shall be provided to workers such as facemasks with appropriate filters for dust removal and air purification - Regular maintenance of equipment and machines. - Air Emissions in line with National Environmental Quality (Emissions) Guidelines	Daily	USD 500 / month for PPE	Project Management Team and Monthly report to MSNAG
		- Install exhaust ventilation system at emission / release points of factory room	Once	USD 30,500 included in construction cost	
		- Green barriers with tall growing thick foliage plants species will be developed around the project lease area towards noise transmission and dust dispersion	Weekly	USD 1,500 / yr for plantation & Gardening	
Noise	Noise due to factory operation activities	- The generators sets will be provided with silent type (acoustic enclosures)	Once	USD 500	Project Management Team and Monthly report to MSNAG
		- For safety of workers at noisy area in site, Personnel Protective Equipment (PPE) would be provided and ensured for using the same.	Daily	PPE cost included in above	
		- Regular monitoring for noise emissions in line with NEQEG	Monthly	included in monitoring cost	
		- Installation of natural barriers at facility boundaries, such as vegetation curtains or soil berms - Installation of proper sound barriers and / or noise containments, with enclosures and curtains at or near the source equipment	As necessary	included in construction cost	
Water Quality	Uncontrolled runoff, improper wastewater, solid waste and hazardous material	Sewage from the operation workforce should be treated on-site by a septic tank and seepage field properly designed and maintained according to WBG Genera EHS Standards (2007) as follows:	Once	included in construction cost	Project Management Team and Monthly report to MSNAG

	management at the site, affecting surface water quality of watercourse. And office facilities; and - Clearing land for operational purposes;	• Installed in areas with sufficient soil percolation for the design wastewater loading rate; • Installed in areas of stable soils that arenearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters; • Grease trap should be installed at sources where oily water is expected (e.g. kitchen); and • Residual sludge should be collected and disposed of properly.			
		- All wastewater from Project Site will be fully collected and treated to comply with applicable standards at the proposed wastewater treatment plant.	On going in Operation Phase	-	
		- Measuring water quality	Every six months	included in monitoring cost	
Soil	Improper solid waste and hazardous material management at the factory	- implementing a waste management system to prevent spillages of wastes - Oils, fuels and chemicals should only be used and stored in designated area that has pollution prevention facilities.	On going in Operation Phase	Included in the operation costs	MSNAG coordinate with the YCDC
Waste Management	Factory Process Wastes and Domestic Wastes	- Waste should be segregated at source by types of waste and systematically disposed into separate containers. - Waste disposal facilities shall be sited and signposted throughout the site; - Use marked bins to segregate hazardous and non-hazardous wastes. - 3R (reuse, refuse, recycle) should be promoted for employees by awareness-raising campaigns and environmental education program.	Monthly	Included in the operation costs	MSNAG coordinate with the YCDC

Socio-Economic	Increase in Crime and Conflict with Local People	- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship, which is necessary for smooth functioning of the project as well as progress and welfare of the people in the surrounding area.	On going in Operation Phase	included in CSR	Project Management Team and Monthly report to MSNAG
		- Project workers should be clearly identifiable. Overalls should have the logo of the MSNAG Company on it and should wear identification cards.	On going in Operation Phase	- included in operation cost	
		- Project site to be fenced and access to be controlled	As necessary	- included in construction cost	
Health and Safety	Occupational safety and health	- Signage in hazardous and risky areas, installations, materials, safety measures, emergency exits, and other such areas should be in accordance with international standards (including standards of cleanliness, visibility and reflectance in areas of potentially poor illumination or sources of dust and pollution), be known and easily understood by workers, visitors, and as appropriate the general public; - Ventilation systems and life and fire safety systems in all buildings.	Once	included in operation cost	Project Management Team and Monthly report to MSNAG
		- Implementation of specific personnel training on worksite health and safety management including a communication program with a clear message about corporate management's commitment to health and safety; - Adequate PPE and suction hoods will be used to collect vapours and other fugitive emissions. - Preparation of emergency response plans specifically applicable to exploration and production activities and sufficient number of first aid trained employees to respond to	On going in Operation Phase	included in operation cost	

		emergencies;			
	Community Health and Safety	- EHS Management Plan will be developed to reduce potential impacts of nearby communities. - Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community - The prevention and control of communicable and vector-borne diseases also applicable to project operation activities - prepare and implement a Traffic Management system through a combination of education and awareness-raising, and the adoption of Traffic Safety procedures with in order to reduce risk to the local communities.	On going in Operation Phase	included in operation cost	MSNAG coordinate with the Local Health Department
Accidental Events	Fire risk	- Fire protection / fighting system will be installed at the factory building, office and warehouse - Develop firefighting plan and evacuation plan including communications protocols and measures to control any fires that do arise - Conduct fire training and response drills	On going in Operation Phase	included in operation cost	MSNAG coordinate with the Local Fire Department
	Leaks and Spills	- Oils, fuels and chemicals should only be used and stored in designated areas, which have pollution prevention facilities. - Guidelines and procedures should be established for immediate clean up actions following any spillages of oil, fuel or chemicals.	On going in Operation Phase	included in operation cost	Project Management Team and Monthly report to MSNAG

Table 8.3 Management Programme at Decommissioning Phase

Item	Potential Negative Impact/ Issue	Mitigation and Management Action	Frequency	Roughly estimated cost (USD)	Responsible Party
Air Quality	- Fugitive Dust from earthworks - Vehicular Emission	- Water spraying of demolition area - Establish and enforce speed limits of working vehicles - Prohibition of idling of vehicles	Daily	USD 1,000 / month for Water spraying	Contractor and MSNAG
		Avoiding demolition works during strong wind	As necessary		
Noise & vibration	Noise and vibration due to demolition and transportation activities	- Avoid running demolition machineries at the same time; and to avoid working at night. - No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. - regular inspection and maintenance of all vehicles and equipment working onsite	Daily	-	Contractor and MSNAG
Waste	Generation of solid waste from demolition works	- Keeping tidy in the demolition site - Setting up separate waste stock yard to promote the recycling and reuse the soil waste - Regular inspection of waste storage yard to check the status of segregation	Weekly	-	Contractor and MSNAG
Socio-Economic	Loss of Jobs and Revenues	- The project proponent, Myanma Shwe Nagar Agricultural Group Co., Ltd (MSNAG) will have a plan not to close the entire project totally and intend to use another business purposes to retain the loss of job for local people and to keep the revenues for the Government. - MSNAG will provide and recommend their employees in applicable jobs at other factories in or near the industrial zone if feasible. If it is not feasible to appoint in other factories, extensive and comprehensive warning to	As necessary	-	Contractor and MSNAG

		employees to allow them to source alternative livelihood will be taken early and will pay compensation according to the national labour rules and regulations.			
Health and Safety	Occupational safety and health	- Design an occupational health and safety management plan, which will be a subset of the overall ESMP, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors. - Submission of the procedure and supporting PPE and OHS documentation (e.g. safety plan, procedures, work instructions);	On going in Decommissioning Phase	included in project closure cost	Contractor and MSNAG
	Community Health and Safety	- A Contractor EHS Management Plan will be developed to reduce potential impacts of contractors‟ activities to nearby communities. - Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community - The prevention and control of communicable and vector-borne diseases	On going in Decommissioning Phase	included in project closure cost	Contractor and MSNAG coordinate with the Local Health Department

8.1.3. Environmental Monitoring Team

An Environmental Monitoring Team must be established for successful implementation of the environmental management plan. The project proponent is responsible for complete implementation of the EMP. Proponent will carry out environmental monitoring programme which is part of the EMP and the monitoring report will be distributed to the participants of the monitoring team. Implementation of CSR programme will also be facilitated with the participation of the monitoring team. Local community could communicate with the project for environmental affairs through the monitoring team. The objectives of the Environmental Monitoring Team are as follows:

(a) To release information on the implementation of EMP for local community continuously

(b) To distribute information on environmental monitoring to local community

(c) To create a proper communication channel between the project and local community relating to environmental affairs

(d) To insert a check and balance action for the management of fund and aids provided by the CSR programme .The team mainly consists of representatives from government departments, the project and local communities. The representatives from local communities must be elected by respective local communities by themselves.

Table 8.4 Proposed Environmental Monitoring Team

Sr.	Representative	Number
Governmental Departments (will be included)		
1	Township General Administration Department	1
2	Township Environmental Conservation Department	1
3	Township Health Department	1
Project Management (shall be included)		
1	Director	1
2	Project Manager	1
3	Environmental Officer	1
4	Public Relation Officer	1
Local Community (shall be included)		
1	Quarter Administration Officer	1
2	Representative Persons from Local Community	1

Roles and Responsibilities

1. The team will act as a communication channel between the project and local community
2. Proponent will distribute notification for recruitment in local community widely with the help of local representatives
3. Proponent must disseminate monitoring report to local community through representatives from government departments and local communities
4. Proponent will provide aids from CSR programme through the local representatives from the team
5. The team will coordinate between local representatives and the project so that the project could participate in social, cultural and religious events of local community

6. Proponent must contact with the team within (7) days after summarization of annual net profit so that contribution could be made for CSR programme
7. General meeting of the team must be held at least once in (12) months to modify policy, roles and responsibilities of the Environmental Monitoring Team

8.1.4. Notifications for Environmental Monitoring

(i) Monitoring Agency

If third party monitoring agency is not available, monitoring should be conducted by proposed monitoring team (See Section 8.1.3) until the development of registered third party monitoring agencies in Myanmar. However, there will be technical, monitoring equipments and manpower requirements if monitoring is conducted by proposed monitoring team.

(ii) Monitoring Frequency

If monitoring results show constantly (3 consecutive years) and significantly (e.g. less than 75 percent) better than the required levels, frequency of monitoring can be reduced. (IFC, World Bank, 2007)

(iii) Monitoring Locations

By studying the metrological data shown in Section (5), the most dominant wind direction in each season can be predicted and monitoring station for dust, noise and gas emissions should be carried out at that dominant wind direction for each season more carefully.

(iv) Compliance with Environmental Quality Standards

MSNAG Co. Ltd, should follow in Myanmar National Environmental Quality (Emissions) Guidelines (NEQEG) and international guidelines such as World Bank and WHO, if they are trying to operate in accordance with international standards.

8.1.5. Environmental Monitoring Plan

Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken. The parameters to be monitored, location of the monitoring sites, frequency and duration of monitoring and responsibilities for each of the monitoring parameters are presented in the following Tables. The monitoring results will be submitted to MONREC. The period for submission of monitoring report is biannually during operation and Decommissioning phase.

Table 8.5. Environmental Monitoring Plan at Operation Phase for proposed project

Impact Source	Monitoring Item	Monitoring Means	Proposed Monitoring Locations	Frequency	Responsibility	Roughly estimated cost (USD)
Operation phase						
General	Monitoring of mitigation measures and aspects for monitoring in Environmental Management Programme at Operation phase (Ttable 8.2)	Visual inspection of all active work areas and inspection of records	Project activity areas	As per EMP Programme table	MSNAG	included in operation cost
Air Quality	NO_2, SO_2, PM_{10},$PM_{2.5}$, CO_2, H2S, VOC,	Site Measurement	inside the factory compound	Every six months	MSNAG	USD 1,500 / survey
Noise	Noise level in dB(A)	Site Measurement	inside the factory	Every three months	MSNAG	USD 500 / survey
Water Quality (Domestic usage)	Turbidity, Chemical oxygen demand, pH, Temperature Total suspended solids	Site Measurement & analysis in Lab	(1 point) tube well water inside the factory compound	Every six months	MSNAG	USD 200 / survey
Water Quality (Treated effluent of factory)	Ammonia, Arsenic, Biochemical oxygen demand Chlorinated organics, Chemical oxygen demand, Chromium (hexavalent) Chromium (total) Copper, Mercury, Nitrorganics, pH, Oil and grease, Total phosphorus, Temperature Total suspended solids, Zinc	Site Measurement & analysis in Lab	(1 point) effluent of final factory outlet	Every six months	MSNAG	USD 250 / survey

Soil Quality	TOC, N, P, K, EC, Na, Mg, Ca, Pb, Zn,	Site Measurement & analysis in Lab	inside the factory compound	Every six months	MSNAG	USD 250 / survey
Accident	Record of information sharing of factory works for safety Record of hazardous material management, including handling, storage, and transport activities for safety Record of traffic accidents	Check records	at factory	Weekly	MSNAG	-
Utilities consumption	Record of water & fuel used	Check records	-	Monthly	MSNAG	-

Table 8.6 Environmental Monitoring Plan at Decommissioning Phase for proposed project

Impact Source	Monitoring Item	Monitoring Means	Proposed Monitoring Locations	Frequency	Responsibility	Roughly estimated cost (USD)
Decommissioning phase						
General	Monitoring of mitigation measures and aspects for monitoring in Environmental Management Programme at Decommissioning Phase (Table 8.3)	Inspection and record to check	-	As per EMP Programme table	Contractor and MSNAG	included in project closure cost
Air Quality	NO_x, SO_2, PM, CO_2	Site Measurement	at demolition works	Every six months	Contractor and MSNAG	USD 1,500 / survey
Noise	Noise level in dB(A)	Site Measurement	at demolition works	Every six months	Contractor and MSNAG	USD 500 / survey
Water Quality	pH, BOD, COD, SS, TSS, TDS, Pb, Zn, Oil & Grease	Site Measurement & analysis in Lab	outlet of effluent demolition site	Every six months	Contractor and MSNAG	USD 200 / survey
Soil Quality	TOC, N, P, K, EC, Na, Mg, Ca, Pb, Zn,	Site Measurement & analysis in Lab	Soil in rehabilitation area (mine pit & TSF)	Every six months	Contractor and MSNAG	USD 200 / survey
Accident	Record of information sharing of demolition work for safety Record of awareness rising activities for safety Record of traffic accidents	Check records	at demolition workplace and along access road	Weekly	Contractor and MSNAG	-

Note : If monitoring results show constantly (3 consecutive years) and significantly (e.g. less than 75 percent) better than the guidelines, frequency of monitoring can be reduced. (IFC, World Bank, 2007)

8.1.6. Implementation Budget and Schedule

The project must implement the proposed management programme and monitoring plan for the proposed project. The estimated annual cost for mitigation measures are as follow;

Table 8.7 Implementation Budget for EMP

Item	Estimated Annual Cost (USD)
Management and Mitigation Measures	50,000 USD
Environmental Monitoring	10,000 USD
Emergency Disaster Prevention	10,000 USD
Total Estimated Cost	70,000 USD

The total estimated annual cost is 70,000 USD. If these budgets are not sufficient for the implementation of the EMP, MSNAG will supplement it.

8.1.7. Performance Indicators (PIs) for Environmental Monitoring

PIs are essential part to indicate the successful of environmental monitoring program. The required performance indicators for proposed project are shown in table below.

Table 8.8 Performance Indicators for Environmental Monitoring

Impact Source	Parameter	Performance Indicators
Air pollution	NO_x, SO_2, PM, CO_2	Monthly emission of gaseous pollutants are under the national (NEQG) or proposed World Bank guidelines
Noise	Noise level in L_{Aeq}	Noise levels are under the national NEQG guidelines
Surface water pollution	pH, BOD, COD, SS, TSS, TDS, Pb, Zn, Oil & Grease	Monitoring results at waste water discharge point are under the national or proposed World Bank guidelines
Ground water pollution	TOC, pH, EC, Pb, Zn, Arsenic	Monitoring results at ground water are changed/unchanged
Soil pollution	TOC, N, P, K, EC, Na, Mg, Ca, Sodicity	Monitoring results at existing lands are changed/unchanged
Solid waste	Project wastes (waste rock/ soil, tailing, and domestic waste	Reuse and recycle system for solid waste are improved
Fuel consumption	Fuel used	Monthly energy consumption are reduced and recorded
Water consumption	Water used	Monthly water consumption are reduced and recorded

8.1.8. Individual Review of Monitoring Data

Proposed project must develop a database to consolidate its monitoring data, and a trained employee must regularly review the monitoring data. The results and trends must be examined to determine:

(a) if waste generation patterns in the winery have changed
(b) if there are any characteristics of the wastewater that make it unsuitable for irrigation or management on site
(c) the organic carbon, nutrient and salt loads to the environment
(d) whether there are changes to the soil, including increased sodicity, alkalinity, acidity, etc.
(e) how wastewater management and irrigation affect soil and water (surface and groundwater) in comparison with control or reference sites
(f) whether there is an accumulation of heavy metals within or in the vicinity of the application area.

Specialist advice must be sought to develop an Environment Improvement Program to address suspected declines in environmental performance or if environmental impacts are evident.

8.1.9. Reporting Monitoring Results

According to the environmental impact assessment procedure, 2015, Article 108, the monitoring results of required parameters will be reported to Environmental Conservation Department (ECD) every six months, as provided in a schedule in the EMP, or periodically as prescribed by the Ministry. Results of sample measuring and analyzing will be recorded in files to monitor and audit.

8.1.10. Environmental Management Training Program

Training and human resource development is an important link to achieve sustainable operation of the facility and environmental management. In operation phase, all staff of the project should be trained on environment safety throughout training courses to be familiar with operation processes and guidelines, fire fighting exercises and practices. Project Management Board of proposed project 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 in house 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.

8.1.11. Record Keeping and Reporting

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 Table below.

Table 8.9 Record Keeping Requirements

Parameter	Particulars	Reporting
Resources Use	- monthly quantity of water consumption - monthly quantity of fuel consumption	To Board of Directors of MSNAG through project management group
Solid/liquid Waste Handling and Disposal	- weekly quantity of waste generated and sent for disposal	/
Monitoring and Survey	-Records of all monitoring carried out as per the finalized monitoring protocol.	/
Others	- Log book of compliance - Employee environmental, health and safety records - Equipment inspection and calibration records, where applicable - Vehicle maintenance and inspection records	/

8.1.12. Environmental Audits and Corrective Action Plans

To assess whether the implemented EMP is adequate, MSNAG, 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 this report 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.

8.2. Emergency Response Plan (ERP)

8.2.1. Emergency Preparedness and Response

Emergency incident response plan for project is proposed to mitigate harms on humans and environment in the project area and its vicinity in case of incident. An emergency is an unplanned event when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the facility or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. All projects should have an Emergency Preparedness and Response Plan that is commensurate with the risks of the facility and that includes the following basic elements:

(a) Communication systems
(b) Emergency resources
(c) Training and updating
(d) Business Continuity and Contingency

Additional information is provided for key components of the emergency plan, as follows:

(a) Worker Notification and Communication

Alarm bells, visual alarms, or other forms of communication should be used to reliably alert workers to an emergency. Related measures include:

(i) Testing warning systems at least annually (fire alarms monthly), and more frequently if required by local regulations, equipment, or other considerations; and
(ii) Installing a back-up system for communications on-site with off-site resources, such as fire departments, in the event that normal communication methods may be inoperable during an emergency.

(b) Community Notification

If a local community may be at risk from a potential emergency arising at the facility, the company should implement communication measures to alert the community, such as:

(i) Audible alarms, such as fire bells or sirens
(ii) Fan out telephone call lists
(iii) Vehicle mounted speakers
(iv) Communicating details of the nature of the emergency
(v) Communicating protection options (evacuation, quarantine)
(vi) Providing advise on selecting an appropriate protection option

(c) Media and Agency Relations

Emergency information should be communicated to the media through:

(i) A trained, local spokesperson able to interact with relevant stakeholders, and offer guidance to the company for speaking to the media, government, and other agencies.

(ii) Written press releases with accurate information, appropriate level of detail for the emergency, and for which accuracy can be guaranteed.

8.2.2. Emergency Resources

(a) Fire Services

MSNAG should consider the level of local fire fighting capacity and whether equipment is available for use at the facility in the event of a major emergency or natural disaster. If insufficient capacity is available, fire fighting capacity should be acquired that may include pumps, water supplies, trucks, and training for personnel.

(b) Medical Services

MSNAG should provide first aid attendants for the facility as well as medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital.

(c) Availability of Resources

Appropriate measures for managing the availability of resources in case of an emergency include:

- Maintaining a list of external equipment, personnel, facilities, funding, expert knowledge, and materials that may be required to respond to emergencies. The list should include personnel with specialized expertise for spill clean-up, flood control, engineering, water treatment, safety, environmental science, etc., or any of the functions required to adequately respond to the identified emergency.
- Providing personnel who can readily call up resources, as required.
- Tracking and managing the costs associated with emergency resources.
- Considering the quantity, response time, capability, limitations, and cost of these resources, for both site-specific emergencies, and community or regional emergencies.
- Considering if external resources are unable to provide sufficient capacity during a regional emergency and whether additional resources may need to be maintained on-site.

(d) Mutual Aid

Mutual aid agreements decrease administrative confusion and provide a clear basis for response by mutual aid providers. Where appropriate, mutual aid agreements should be maintained with other organizations to allow for sharing of personnel and specialized equipment.

(e) Contact List

The company should develop a list of contact information for all internal and external resources and personnel. The list should include the name, description, location, and contact details (telephone, email) for each of the resources, and be maintained annually. The contact list should include; Key Plant Management Team Members (MSNAG), General Administrative Office (Twantay), Myanmar Police Force (Twantay), Public Health and Medical Services (Twantay), Fire Services Department (Twantay), etc.

8.2.3 Proposed Organization for ERP Team

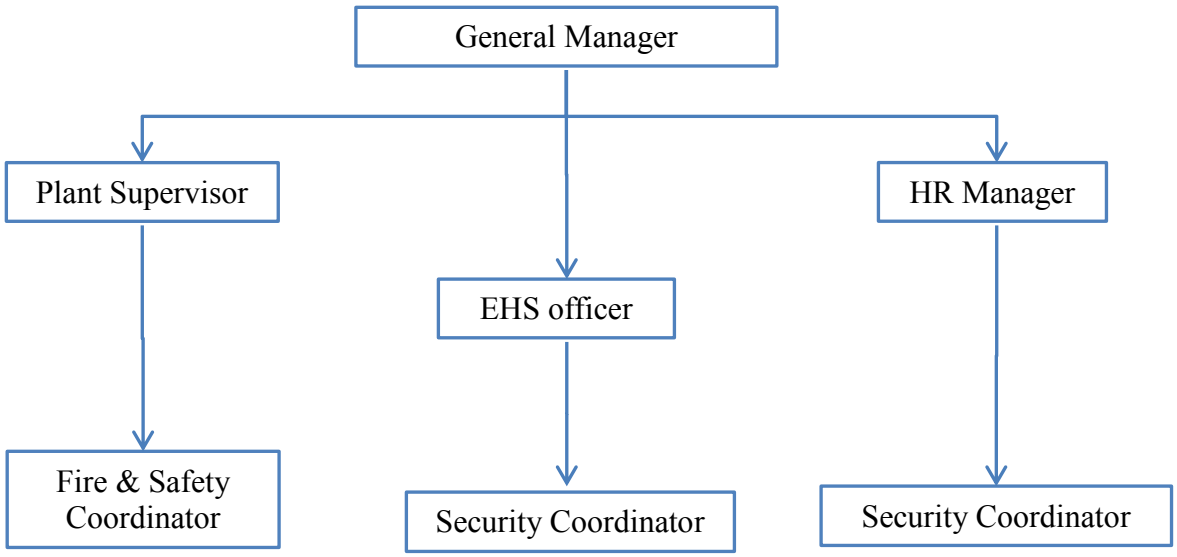


Figure 8.1 Proposed Organization for ERP Team

Proposed Duty Allocation for EPR Team

The followings are the proposed duty allocation for EPR team.

(a) Chief Emergency Controller (General Manager)

- Take control and declare emergency.
- Focal person for all team.
- Contact Authorities.

(b) Plant Supervisor

- Take steps. Make Emergency shut-down of activities. Put everything in Safe condition.
- Evacuate.
- Commence initial emergency case, till Fire Department or other agencies comes to take up.
- Dispatch necessary Supplies.
- Arrange Purchases.
- Providing equipment perform shutdown procedures, damage assessments, emergency repairs and equipment protection..

(c) EHS officer

- Establish Emergency Center, Treat affected persons,
- Transfer/Remove Patients.

- Assign and Deploy staff.
- Contact Authorities.

(d) Fire & Safety Coordinator

- Be Overall in-charge for Fire and Safety.
- Coordinate with Area Coordinator and Direct the Operations.
- Coordinate with City and Other Fire-tenderers.

(e) HR Manager & Security Coordinator

- Remove Crowd
- Arrange Gate security
- Contact Police
- Arrange evacuation
- Contact outside Agencies if asked.
- Handle news media
- Mobilise vehicles
- Arrange Food, clothings to Officers inside.

(f) Emergency Control Center

- Adequate Internal phones
- Adequate external phones
- Workers Tally

Map showing hazardous storages, Fire horns, Safety equipments, Gates and side gates, Assembly points, List of persons.

8.2.4. Training and Updating

The emergency preparedness facilities and emergency response plans require maintenance, review, and updating to account for changes in equipment, personnel, and facilities. Training programs and practice exercises provide for testing systems to ensure an adequate level of emergency preparedness. Programs should:

(i) Identify training needs based on the roles and responsibilities, capabilities and requirements of personnel in an emergency

(ii) Develop a training plan to address needs, particularly for fire fighting, spill response, and evacuation. Conduct annual training, at least, and perhaps more frequent training when the response includes specialized equipment, procedures, or hazards, or when otherwise mandated

(iii) Provide training exercises to allow personnel the opportunity to test emergency preparedness, including:

- Desktop exercises with only a few personnel, where the contact lists are tested and the facilities and communication assessed.
- Response exercises, typically involving drills that allow for testing of equipment and logistics.
- Debrief upon completion of a training exercise to assess what worked well and what aspects require improvement.
- Update the plan, as required, after each exercise. Elements of the plan subject to significant change (such as contact lists) should be replaced.

- Record training activities and the outcomes of the training.

8.2.5. Business Continuity and Contingency

Measures to address business continuity and contingency include:

(i) Identifying replacement supplies or facilities to allow business continuity following an emergency. For example, alternate sources of water, electricity, and fuel are commonly sought.

(ii) Using redundant or duplicate supply systems as part of facility operations to increase the likelihood of business continuity.

(iii) Maintaining back-ups of critical information in a secure location to expedite the return to normal operations following an emergency.

8.2.6. Incident Management

The following shall constitute key management interventions in response to each respective emergency situation.

(a) Accidents

In case of an accident in the workplace:

- The involved, if they are able to do so, should immediately report to their supervisor.
- The Shift Supervisor shall immediately go to the accident scene to assess its nature.
- If the accident is a major one, that is, resulting in serious personal injury, and or property damage, the Shift Superior shall mobilize the required emergency services, including first aiders and inform the EHS officer, Plant Manager, and others, accordingly.
- During any emergency, all communication on phones will be restricted to personnel handling the emergency.
- Information pertaining to the accident shall be released to the public through the Corporate Affairs Department or the Plant Manager.

(b) Road Traffic Accidents

In case of a Road Traffic Accident:

- Render assistance to any person injured, if practical.
- Report the accident to the nearby Police Station.
- Do not accept responsibility for the accident but cooperate with the Police who will investigate the accident.
- Obtain the particulars of the other involved parties, i.e. vehicle registration number, driver's name, witnesses etc.
- Inform immediate supervisor and Safety Manager.

(c) Hazardous Material Spills

In case of major hazardous material spills the following procedure will apply in order to minimize the impact on the environment:

1) Contain

The spilled oil shall be contained by constructing a bund around the affected area.

The trapped oil shall be pumped/ collected into suitable containers, such as sealed drums and kept in a bounded area while awaiting removal from site.

2) Notify
The spill incident shall be reported to the supervisor who shall assess the situation and notify the relevant senior officials as per Incident Reporting Procedure.
In all cases where the oil spill is on ore, that is, in the building or at the storage area, the senior officials will be consulted to recommend the best remedial action.
3) Dispose
Contaminated soil and absorbent material shall be disposed-off in accordance with the waste management procedure.
4) Maintain
The affected area shall, as soon as is reasonably practicable, be cleaned up and replaced with fresh soil.

(d) Fire
In the event of fire, the person discovering the fire should:

- Raise the alarm.
- Call the Central Control Room and or the Fire Brigade on.
- If safe to do so tackle the fire, if in doubt get out.
- Evacuate the premises and report to your designated assembly point.

(f) Responsibility
All supervisors are responsible for ensuring effective implementation of the Emergency Response Plan and will act as key respondents. Designated assistants will act in the absence of substantive supervisors and will act as key respondents in that case.

8.3 Fire Fighting Management Plan

There will be high potential to fire hazards in the factory process if they are not properly managed. Fire and explosion hazards may arise during solvent use, handling, and storage. Organic synthesis reactions may generate major process safety risks. The production formulation processes (e.g. granulation, mixing, and drying and / or packaging activities), may create a flammable atmosphere. Moreover, factory stores chemicals and fuel oil for diesel engine and vehicles. So, proposed project should be designed for operating safely to people and equipment from fire hazard. In order to achieve this target, fire and explosion fighting system should be designed in compliance with the American National Fire Fighting Association (NFFA) standards as shown in the following table.
Table 8.10- American National Fire Fighting Association (NFFA) Standards

No.	Parameters	Proposed Capacity	Remark
1.	Maximum water pressure	14 bar	
2.	Fire water flow	12.0 liters/m^2/min	
3.	Deluging rate	10.0 liters/m^2/min	
4.	Foam rate	190 liters/min	for Chemicals/oil storage area

8.3.1. Fire Fighting Equipments

The project should be equipped with the following fight fighting equipments for effective fire fighting system.

- Fire detector and alarm system
- Smoke, heat and gas leaking detectors
- Firewater system and posts
- Portable Fire extinguishers
- CO_2 /Inert Gas Extinguishing System
- Foam System

(a) Fire Detector and Alarm System

A computerized analogue, addressable type early warning system shall be provided to cover the complete project. Following types of fire detection shall be equipped.

- Ionization type smoke detection system
- Photo electric type smoke detection system
- Combination of both ionization and photoelectric smoke detection system.
- Linear heat sensing cable detector
- Quartzoid bulb heat detection system

Portable and mobile extinguishers, such as pressurized water type, carbon-oxide type, foam type, dry chemical powder type, will be located at strategic locations throughout the plant. Firewater pumps shall be installed in the pump house for hydrant and spray system and the same shall be driven by electric motor and diesel engines as per the regulations local fire fighting station. However, a backup supply to fill this tank from raw water system will be provided. For the above firewater pumping station, automatic pressurization system consisting of jockey pumps and air compressors shall be provided. Complete Instrumentation and control system for the entire fire detection and protection system shall be provided for safe operation of complete system.

(b)Smoke, Heat and Gas Leaking Detectors

Smoke detectors should equip with in electrical machine rooms. Heat detectors must install in the coal fired boiler, the transformer area, and the fuel oil storage area. Methane gas leaking detector has to install near the anaerobic lagoons.

(c) Firewater System and Posts

Firewater posts are equipped along the distribution system with the interval of 80 m. Tools and accessories are provided in box at each post. Fire-water posts are placed at coal storage area, diesel storage area and around the project building.

(d) Portable Fire Extinguishers

Fire Extinguishers of suitable type e.g. CO_2 and DCP extinguishers shall be provided in the project and shall be distributed in vulnerable areas. The extinguishers shall be checked/inspected at regular intervals for replenishment. Portable fire extinguishers are properly placed near the main process inside the buildings.

(e) CO_2 /Inert Gas Extinguishing System

A fixed CO_2 /Inert Gas Extinguishing System should be placed at electric instrument room, central control room and boiler control room etc.

(f) Foam System

As the proposed project will have to store diesel for diesel generator and gasoline for vehicles, foam systems should be placed at fuel storage area and near diesel engine.

8.3.2. Safety Equipment and Personal Protective Appliances for Fire Fighting

Safety and personal protective appliances shall be provided in adequate numbers and shall be distributed in different sections according to requirement. A list of such appliances that must be available in the plant is given in the following table.

Table 8.11 List of Safety Equipments for Fire Fighting

No.	Safety Equipments
1.	Gas Mask
2.	Compressed air breathing apparatus
3.	PVC hand gloves
4.	PVC white gum boots
5.	Electrical hand gloves
6.	PVC apron
7.	Dust respirator
8.	Face shield of different colour
9.	Goggles of different types
10.	Safety belt
11.	Safety helmet
12.	Leather hand gloves

8.3.3. Proposed Organization for Fire Fighting Team

Fire fighting organization is proposed for MSNAG as follow:

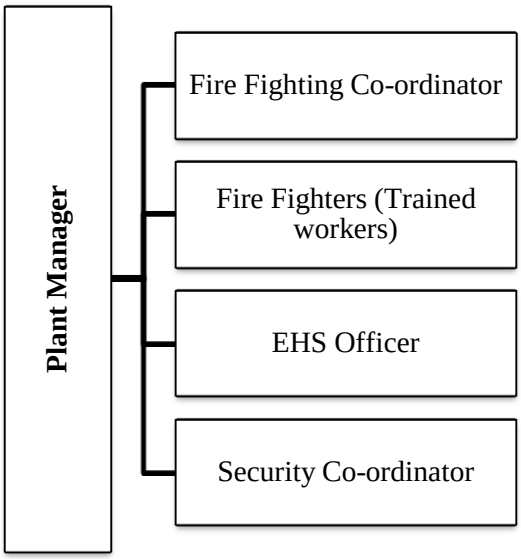


Figure 8.2 Proposed Organization for Fire Fighting Team

Role and Responsibilities of Fire Fighting Team

The following role and responsibilities for fire fighting team but not limited

Team Members	Role	Responsibilities
Plant Manager	Chief co-ordinator	• Make Emergency shut-down of activities. Put everything in Safe condition. • Commence initial emergency case, till fire fighting department comes to take up.
Fire fighting co-ordinator	Fire fighting leader	• Be Overall in-charge for Fire and Safety. • Coordinate with Local fire fighting station.
Trained workers and securities	Fire fighters	• Put off fire by using available equipments.
EHS officer	Safety officer	• Establish Emergency Center, Treat affected persons, Transfer/Remove Patients. • Workers Tally • Map showing hazardous storages, Fire horns, Safety equipments, Gates and side gates, Assembly points, List of persons.
Security co-ordinator	Security leader	• Remove Crowd • Arrange Gate security • Contact Police if necessary • Handle news media • Mobilise vehicles

8.3.4. Fire Prevention and Fighting Response Plan

Before Fire Breaks Cut

(a) Store flammable material in proper areas having adequate fire protection systems.
(b) Display sufficient warning signs.
(c) Train selected personnel to use these fire extinguishers.
(d) Inspect fire extinguishers regularly and replace as necessary.
(e) Fire escape route should be kept clear at all times and clearly indicated.
(f) Know the escape route and assembly point.
(g) Display escape route maps prominently on each floor.
(h) Carryout fire drill regularly. Designate fire officers.
(i) Install fire alarm wherever required and test regularly.
(j) Provide sufficient exit signs at prominent locations for directing people to the escape staircases and routes.

When Fire Breaks Out

(a) Alert all persons.

(b) Put off the fire with appropriate fire extinguishers only when you are sure that you are safe to do so.
(c) Escape if you are in danger through the fire escape route to assembly point.
(d) Fire officers to carryout head count at the assembly point.

8.4. Occupational Health and Safety Management Plan

This occupational health and safety management plan is prepared to ensure health and safety for workers/staff for this project during each project phase. This plan needs to be developed to promote occupational health and safety of project related activities, to ultimately contribute safe and efficient operation of the project.

(a) Objective

To manage the occupational health and safety during the operation and decommissioning phases of MSNAG project.

(b) Regulatory Requirement

Occupational Safety and Health Law (2019)

It stipulates that the employers or entrepreneurs shall be responsible to improve the productivity and health of workers by preventing the occurrence of occupational accidents and diseases by

- Providing the sufficient number of personal protective clothing, materials and facilities prescribed and approved by the department on free of charge basis and cause workers to wear them while working.
- Providing a clinic, appointing the registered doctors and nurses, and providing medicines and supporting equipment.
- Prescribing the precautionary plans for emergency and occupational safety and health instructions, danger signs, notices, posters and signage for directions in accordance with stipulations.
- Arranging to prevent any persons in the Workplace from occupational safety and health risks occurred due to materials and machines used and wastes generated in the workplace or process.

(c) Context

The context of this OHS Plan is for mining activities where the employees and workers are exposed to safety issues related to the physical, chemical, biological, and safety hazards. This is applicable in all stages of all phases of the project. Occupational health and safety issues occur during all phases of the project cycle and can be classified according to the following categories:

i. Operation Phase

The following table shows occupational health and safety risks during the Operation phase of the proposed project.

Table - Occupational Health and Safety Hazards during the Operation Phase

Hazard	Description
Accidents related to the operation works	Potential accidents related to the operation works include, but not limited to the followings: - Over-exertion, - Slips and falls on the same elevation, - Entanglement with machinery, - Struck by objects (Falling objects), - Explosion, - Contact with dangerous substances, - Electric shock, - Variable weather conditions, - Lifting excessive weights, and - Eye damage during welding work
Electrical hazards	Energized equipment and power lines can pose electrical hazards for workers at factory
Noise	Noise sources in factory process equipment such as air compressor, ribbon blender and generators operation
Chemical Exposure	Occupational health risks may derive from worker exposure to hazardous chemical substances, including active ingredients and fertilizer dusts, during all production phases. Workers may be exposed to airborne dusts during drying, milling and mixing operations.
Fire and explosion hazards	Proposed project will be store, transfer, and use large quantities of chemicals; therefore, careful handling is necessary to mitigate fire and explosion risks. Fire and explosion hazards may arise during solvent use, handling, and storage. Organic synthesis reactions may generate major process safety risks. Factory production processes (e.g. granulation, mixing, and drying and / or packaging activities), may create a flammable atmosphere.

ii. Decommissioning Phase

The following table shows occupational health and safety risks during the decommissioning phase of the proposed project.

Table - Occupational Health and Safety Hazards during the Decommissioning Phase

Hazard	Description
Accidents related to the demolition works	Potential accidents related to the construction works include, but not limited to the followings: - Over-exertion, - Slips and falls on the same elevation, - Entanglement with machinery, - Struck by objects (Falling objects),

	- Explosion, - Contact with dangerous substances, - Electric shock, - Variable weather conditions, - Lifting excessive weights, and - Eye damage during welding work

(d) OHS Management Plan

To secure the safety of workers, environmental, persons in charge of occupational health and safety should be assigned for each phase by the responsible organization.
Operation phase: MSNAG
Closure phase: Contractor, MSNAG

i. Operation Phase

During the operation phase, the following mitigation measures will be executed to reduce the hazard.

Table - Occupational Health and Safety Management during the Operation Phase

Hazard	Management Action
Accidents related to the demolition works	- Providing OHS training program and information of safe work practices and the emergency procedure - Submission of the procedure and Providing PPE and OHS documentation (e.g. safety plan, procedures, work instructions) - Providing adequate health care facilities and first aid within the factory - Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC.
Electrical hazards	- Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC for the health and safety impacts particular to operation of factory (Electrical Safety and Isolation).
Noise	- Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC for the management of occupational exposures to noise
Chemical Exposure	- Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC. - Comply with occupational health and safety guidelines presented in Section 1.2 of the EHS Guidelines for Nitrogenous Fertilizer Production, published by IFC intended for

	recommended hazard prevention and control measures for Chemical Exposure.
Fire and explosion hazards	- Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC. - Comply with occupational health and safety guidelines presented in Section 1.2 of the EHS Guidelines for Nitrogenous Fertilizer Production, published by IFC intended for recommended hazard prevention and control measures for Fire and explosion.

ii. Decommissioning Phase

During the Closure phase, the following mitigation measures will be executed to reduce the hazard.

Table - Occupational Health and Safety Management during the Decommissioning Phase

Hazard	Management Action
Accidents related to the demolition works	- Providing OHS training program and information of safe work practices and the emergency procedure - Submission of the procedure and Providing PPE and OHS documentation (e.g. safety plan, procedures, work instructions) - Providing adequate health care facilities and first aid within the construction site - Comply with occupational health and safety guidelines presented in Section 2.0 of the General EHS Guideline published by IFC.

(e) Monitoring Plan

The monitoring plan on occupational health and safety management is necessary to prevent the accidents related to the construction, operation and closure of the proposed project. The following table shows the responsible organizations and method of monitoring.

Table - Monitoring Plan on Occupational Health and Safety Management

Project Phase	Monitoring Method	Location	Frequency	Responsible organization
Operation	Check records of accidents in the project site	Project site	Weekly	MSNAG
Decommissioning	Check records of accidents in the closure site	Project site	Weekly	Contractor/ MSNAG

(f) Reference

- IFC Environmental, Health, and Safety Guidelines for Nitrogenous Fertilizer Production, April, 2007
- Environmental and Social Impact Assessment Report for August 2016 Kyaukse Gas Combined-Cycle Power Plant Construction Project in Myanmar [Draft] March 2020

8.4.1. Safety Management Program

Safety management program for project should include the following:

(a) Emergency and first-aid procedures;
(b) Medical precautionary measures;
(c) Maintenance and troubleshooting Precautions;
(d) House keeping;
(e) Safety awareness; and
(f) Safety training.

(a) Emergency and First-aid Procedures

First aid is immediate, temporary treatment given in the event of accident or illness.

Inhalation: Workers with symptoms of exposure to fumes and gases should go to an uncontaminated area and inhale fresh air or oxygen and call a physician. Administer oxygen by mask if the person is breathing. If breathing has stopped, administer cardiopulmonary resuscitation (CPR), preferably with simultaneous administration of oxygen. Call for emergency assistance.

Eye: Contact lenses, if worn, should be removed. Irrigate the eyes immediately with large amounts of water for 15 minutes. Occasionally hold the eyelids apart to insure complete irrigation. Apply a dry protective dressing. Call for emergency medical assistance. Don't remove dust from the eyes yourself. Get medical assistance.

For "flash burns" cover the eye with cold (preferably iced) compresses for 5 to 10 minutes; then repeat. Apply a dry protective dressing. Call a physician. Don't rub the eye. Don't use ointments or drops unless prescribed by a physician.

Skin: For skin contact with irritants, flush the areas with large amounts of water, and then wash with soap and water. Remove contaminated clothing. If mucous membranes are irritated, flush with water. Wash cuts and scrapes with mild soap and water. Avoid contamination. Apply a dry sterile dressing.

For thermal bums, cold water is an effective first aid measure. If skin is not broken, immerse bum part in clean cold water or apply clean ice to relieve pain. Do not disturb or open blisters. Prevent contamination. Bandage loosely with a clean dry dressing. Call for emergency medical assistance.

(b) Medical Precautionary Measures

The following medical precautionary measures are recommended for the project.

- Periodic health examinations are recommended with the cooperation with local Public Health Office.
- An effective educational, training, and industrial hygiene program should be instituted. The program should cover the following: (i) the nature and potential hazards; (ii) proper and safe use of equipment; and (iii) emergency and first aid procedures.
- Medical personnel should be available on-site or by phone for advice and consultation. Emergency phone numbers should be posted near the telephones.

- The following should be readily available: (i) first aid supplies approved by a physician; (ii) stretchers and blankets for transportation; (iii) oxygen inhalation equipment; and (iv) approved instant acting eye washes and showers.
- Good personal hygiene practices are very important. Employees should wash their face and hands before eating, and it is recommended they are not be permitted to eat, drink, or smoke in the work area. Food and beverages should not be stored in the work area. Contaminated clothing should be changed.
- Protection against skin conditions, such as chemical burns, rashes, and dermatitis can be provided by appropriate protective clothing and equipment, as well as the use of protective creams or lotions.
- Screening of workforce Blood Lead Levels at 6 months interval
- Reduction of Lead Blood Level by Chelation Therapy, if required
- Dosing of calcium tablets at regular intervals to the workers to avoid any harm due to Lead exposure.

(c) Maintenance and Troubleshooting Precautions

Faulty or improperly maintained equipment can cause property damage, physical injury, or possibly death by fire or electrical shock.

Here is a list of some important items to check when troubleshooting or maintaining equipment.

- Stop operating immediately if equipment is malfunctioning.
- Do not perform any maintenance unless you are qualified to perform such work.
- Make test readings carefully.
- Protect the equipment from heat, excessive wet conditions, oil or grease, corrosive atmospheres, and inclement weather.
- Replace parts only with manufacturer's recommended replacement parts.
- Keep all protective devices and covers in position.

(d) House Keeping

The following measures shall be practiced at the project.

- Regular cleaning of the floors with service water.
- Keeping all de-dusting systems in perfect working conditions to avoid dust accumulation inside and outside the plant.
- Avoid dumping of wastes, damaged equipment and items anywhere inside the plant affecting aesthetics and increasing risk of fire and other hazards.
- Keeping ventilation systems of premises in perfect working condition to avoid ingress of dust inside the pressurized room.
- Maintaining hygienic conditions in areas like canteens, near drinking water sources and toilets.
- Maintaining green belt along the project boundaries to suppress noise, fugitive dust and to improve the aesthetics.
- Developing a positive outlook in the employees for improving the working place, both in factory and office or laboratory clean and well maintained.

(e) Safety Awareness

Safety awareness must be promoted among project managers and employees by:

- Imparting regular training.
- Installing/displaying safety caution boards and safety posters mentioning Do's & Don'ts at different vulnerable locations.

- Arranging safety & housekeeping competition etc.
- To procure and maintain personal protective equipment in good working condition.

(f) Safety Training

Training programs in safety and accident prevention will be organized at all levels of employees with a view to familiarize them with the general safety rules, safety procedures in various operational activities and to update their knowledge in safety and accident prevention, industrial hygiene and emergency equipment. These training programmes will be conducted periodically in a planned manner to refresh their knowledge by safety officer. Training shall be imparted for:

- Safe working and maintenance practices.
- Use of proper tools and tackles.
- Use of personal protective equipment.
- Handling emergency situation.

8.4.2. Personal Protective Equipment

(a) General

- Consider the provision of personal protective equipment only after all measures for removing or controlling safety hazards have been provided reasonably impractical.
- Ensure that sufficient personal protective equipments are provided and that they are readily available for every person who may need to use them.
- The management should ensure that all persons make full and proper use of the personal protective equipment provided.
- Provide instruction and training in the proper use and care of any specific protective equipment where necessary
- Do not willfully misuse, interfere with or ill-treat any protective clothing and equipment provided.
- Ensure that the personal protective equipments are in good condition. Report immediately any damage to the management for replacement. Always keep the personal protective equipment as clean as possible.

(b) Eye Protection

- Issue eye protection equipment where there is a foreseeable risk of eye injury.
- Ensure an adequate supply of goggles/shields is available.
- Keep the goggles clean and make sure they are good fit.
- Do not watch welding operations unless your eyes are protected from the damaging effect of flash.

(c) Head Protection

a) No person shall enter a construction site unless he is wearing a suitable safety helmet

b) Wear a safety helmet:
   • When there is the risk of being hit by falling objects
   • While on or near a construction site
   • During adverse weather conditions
   • When in any area designated as a “hard hat” area.

c) Provide identification labels to all helmets in some way to prevent random exchange among wearers, with one helmet exclusive to each person.
d) Inspect helmets for cracks of sign of impact or rough treatment before each usage. Destroy, remove and replace all worn, defective or damaged helmets.

(d) Safety Footwear

- Wear suitable footwear for work.
- Use safety footwear on site or in other dangerous areas.
- Wear suitable safety shoes or ankle boots when working anywhere where there is high risk of foot injuries from slippery or uneven ground, sharp objects, falling objects, etc.
- All safety footwear, including safety shoes, ankle boots and rubber boots, should be fitted with steel toecaps.
- Avoid wearing flip flops, high heeled shoes, slippers, light sport shoes in situations where there is a risk of foot injury.
- Keep shoe lace knots tight.

(e) Hand Protection

- Wear suitable gloves for selected activities such as welding & cutting and manual handling of materials & equipment.
- Do not wear gloves where there is a risk of them becoming entangled in moving parts of machinery
- Wash hands properly with disinfectant soap and clean water before drinking, eating or smoking. Wash hands immediately after each operation on site when the situation warrants.

(f) Emergency prevention, preparedness and response

Emergency prevention, preparedness and response arrangements should be established and maintained. These arrangements should identify the potential for accidents and emergency situations, and address the prevention of OSH risks associated with them. Quick and effective action may help to ease the situation and reduce the consequences. However, in emergencies people are more likely to respond reliably if they:

- are well trained and competent;
- take part in regular and realistic practice;
- have clearly agreed, recorded and rehearsed plans, actions and responsibilities.

The arrangements should be made according to the size and nature of activity of the *organization*

The arrangements should:

- ensure that the necessary information, internal communication and coordination are provided to protect all people in the event of an emergency at the worksite;
- provide information to, and communication with, the relevant competent authorities, and the neighbourhood and emergency response services;
- address first-aid and medical assistance, firefighting and evacuation of all people at the worksite; and
- provide relevant information and training to all members of the *organization*, at all levels, including regular exercises in emergency prevention, preparedness and response procedures.

Emergency prevention, preparedness and response arrangements should be established in cooperation with Township hospital (Twantay), Regional Healthcare Center and other bodies where applicable.

8.5. Corporate Social Responsibility (CSR) Program

Contribution at random places with no records will have some social problem due to the lack of transparency. Therefore, MSNAG should have CSR program to contribute and manage CSR fund effectively.

8.5.1. CSR Fund

MSNAG should set up fixed CSR fund for local community development. MSNAG Co., Ltd. agrees to contribute about 2% of net profit as CSR fund and they granted annual environmental conservation and monitoring costs will not take account of in this CSR fund.
It is important that CSR activities should be accomplished not only by financial assistance but also by technical assistance and manpower in some donations to retain good relation with local communities. Allocated percent of CSR fund is based on local community needs according to the public survey. Proposed allocated percent of CSR budget are as follow:

No.	Activities	Proposed allocated per cent of CSR budget	Public Needs according to Public Consultation Processes
1.	Participating in Government Schemes; and Donation to NGOs and CBOs	20%	Yes
2.	Donation to education	25%	Yes
3.	Donation to health care facilities	25%	Yes
4.	Provide job training program for workers and local people	30%	Yes
Total		100%	

8.5.2. CSR Officer (or) Coordinator

MSNAG should assign CSR officer (or) CSR coordinator to closely relate with local people in order to manage the contributions of CSR fund effectively. HR manager can also be assigned as CSR officer. CSR officer should donate CSR fund after the discussion with representative people from nearest villages.

8.5.3. Proposed CSR Activities

The following are the proposed CSR activities and most of the CSR activities are according to the public needs during social survey and determination of SIA Team for local community development. All of the proposed activities will improve the socio-economic conditions of nearest villages significantly.

(a) Health Care Facilities;
(b) Education;
(c) Provide job training program for workers and local people;

(d) Participating in Government Schemes; and
(e) Funds for NGOs and INGOs.

(a) Health Care Facilities
Health care facilities of proposed project should be assessed to nearest local people with lowest or no charge as part of CSR program. Ambulance for emergency case should be provided for local people in nearest villages. Moreover MSNAG will contribute for the healthcare which includes medical checkup for the employees and providing health education to workers.

(b) Education
Distribution of education materials and financial aid or scholar grants to the students who are economically deprived in the nearest villages of the proposed project will have a great benefit for students. Upgrade and fulfillment of educational requirements and facilities for nearest schools are recommended to be included in CSR program.

(c) Participating Government Schemes for Social Welfare
MSNAG should actively participate in implementation of government schemes for welfare of the society of the Twantay region.
(d) Cooperation with Local NGOs
MSNAG should cooperate with local NGOs and CBOs in the activities to improve regional, religious, and all round developments in Twantay Region. Some percentage of CSR fund should provide regularly to NGOs and CBOs in nearest villages.

8.5.4. Declare the Contribution of CSR Fund

All of the CSR activities and contribution programs should 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 should be carried out together with environmental and social audits through independent external audit team for transparency.

9. PUBLIC CONSULTATION AND DISCLOSURE

9.1. Methodology and Approach

9.1.1. Overview

In order to acquire public opinion and to participate in the decision making process for project design, development, and implementation of the proposed Project, Public consultation meeting (PCM) and public disclosure (PD) works were done firstly disclosing relevant project information in local community. It provides a platform for project-affected persons and different stakeholders to express their views on possible impacts of the proposed intervention on environmental and social parameters.

9.1.2. Objectives

The primary objective of the PCM and PD is to incorporate the opinion and suggestions of the public and all other stakeholders at the project planning stage to ensure wider acceptability of the project. The key objectives are as follows:

- To provide information on the economic, environmental, and social benefits as well as potential negative impacts from the Project;
- To ensure that the potential PAPs, stakeholders, and local communities are engaged in a meaningful dialogue and are well informed prior to the decision of the project proponent as to the nature and extent of social and environmental impacts attributable to the proposed project with respect to planning;
- To ensure that the concerns of, and issues raised by the PAPs, stakeholders, and local communities are incorporated and adequately addressed in the EIA study;
- To engage in a participative exercise with PAPs, stakeholders, and local communities and obtain expertise and local, traditional wisdom and knowledge from them in order to plan the mitigation measures; and
- To facilitate periodic opportunities to the principal stakeholders to offer their inputs on all key components of the Project.

9.2 Stakeholder Engagement and Identification

The process of identifying potentially affected stakeholders started with scoping which is conducted to identify relevant issues and select the townships and villages potentially impacted. The scoping exercise involved both desk-based and preliminary consultation with a number of stakeholders including government authorities. Stakeholder engagement is an ongoing process and as such new stakeholders may emerge as the project progresses. This will be captured and inform ongoing stakeholder engagement activity that will be undertaken for the project.

Stakeholder engagement was conducted across administrative levels, subject to permissions of responsible authorities.

The involvement of the following groups or organisations 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 Organisations (NGO)s;
- Community Based Organisations;
- Academic/research Organisations;
- 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.

- Ministry of Natural Resources and Environmental Conservation (MONREC)
- Myanma Shwe Nagar Agricultural Group Co., Ltd.
- Local People (around the proposed project area)
- City Development Committee (Twantay);
- Environmental Conservation Department (Yangon Region)
- Local Administration Office (Twantay, Kulartan village tract);
- Department of Public Health (Twantay);
- Planning and Statistics Department (Twantay);
- Fire Fighting Force (Twantay);
- Department of Labour (Twantay);
- Myanmar Police Force (Twantay)
- Local Media, and NGOs and CBOs

9.3 Stakeholder Mapping and Analysis

The IFC's Stakeholder Engagement Handbook (IFC 2007) identifies stakeholders as persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively.

The stakeholder groups for the proposed project have been identified through an analysis of the project's geographic sphere of influence and impact zones. In addition, interest based analysis have been applied in order to identify stakeholders outside of the project area that are not directly or indirectly affected but who have an interest in the Project that determines them as stakeholders such as different central and local government ministries and departments.

Table 9.1 provides a brief profile of the various stakeholders identified with their key concerns in terms of the Project activities and their degree of influence.

Table 9.1 Stakeholder Mapping

Stakeholder	Role	Concern / Expectations	Interest	Influence
Union Government				
Ministry of Natural Resources and Environmental Conservation	Screens and decides on EIA study requirement Reviews and approves the EIA reports for the	Compliance with environmental regulations and capacity building for local	High	High

(MONREC)	Project	agencies		
Myanmar Investment Commission (MIC)	Permit and licensing of proposed project	Production sharing contract	High	High
State and Township Government				
Yangon Region Government: Natural Resources and Environment; Electricity, Energy and Technology; and Planning and Economy	Responsible for Industrial Supervision & Inspection infrastructure planning (roads and land used), local natural resource management	Increased economic activity and employment opportunities and opportunities for local businesses	High	High
Twantay Township	Participation in the consultation and public disclosure process Provides statistics and information on local conditions Participates in ESMP implementation	Increased economic activity and employment opportunities and opportunities for local businesses Increased tax incomes and revenue for the township government	High	Medium
Villages or Residential area				
Local community around the proposed project area	Residential population likely affected by changes in access to natural resources and changes in the social environment	Benefits to residents in the form of employment and market opportunities	High	Low
Other Stakeholders				
Local NGOs, INGOs and Civil Society Organisations	Represents interests of national civil society	Concerns about sustainability, benefits to impacted communities and implementation of international standards.	High	Medium
Local Media	Disclosure of information to communities	Disclosure and information dissemination	High	Medium
Local business and local dealer/shopper & customer	Offering services that will be required by the Project	Opportunities for providing services and supplies during operaiton	Medium	Low

9.4 Public Consultations / Site Visits

9.4.1 Methodology and Purpose

The Project developed a preliminary Stakeholder Engagement Plan (SEP) which contained an overview of the relevant stakeholder groups to be consulted and the estimate schedule for engagement activities. During the study, information was disclosed to various stakeholders, which included:

- Brief details about the Project;
- EIAs and ESA process, study and measures;
- Purpose of the consultations;
- Expectations from the local stakeholders in regards to the consultation etc.; and
- The likely adverse impacts to the public and/or environment.

7.4.2 Meeting Structure

The stakeholder consultation meetings were structured as followed:

- Introductions and information disclosure: Introduce Myanma Shwe Nagar Agricultural Group Company Limited, repackaging factory project, the EIA, the proposed stakeholder engagement process, the potential environmental and social impacts and mitigation to help the stakeholders understand the Project and MSNAG's intentions for engagement.
- Question and answer session for all stakeholders in the meeting to raise concerns, comments or ask questions to which MSNAG can directly respond.
- Data collection: Collection of more in-depth information through questionnaire with key stakeholder groups in the meeting and village/ ward.

All information was communicated through use of visual media (including posters and power point presentations) and was provided in local Myanmar language.

9.4.3 Stakeholder Engagement Plan

Potential relevant stakeholders and potentially affected communities were identified through a preliminary site visit, discussions with the Consortium and a review of google earth imagery. A top down approach was followed, firstly the national level stakeholder were consulted and contacted such as Regional GADs. These discussions allowed the survey team to gain permission to enter the villages and also helped to map out which villages were closets to the project area and could be potentially affected. The stakeholder engagement plan is provided in Table 9.2.

Table 9.2 Stakeholder Engagement Plan

Round	Method	Stakeholders
Round 1: Information sharing and issues identification	Village Meetings, Focus Group Discussions, Project affected people, and Interviews.	Village leaders and local people in project affected area, local non-government and community based organizations.
Round 2: Public consultation meeting (PCM I)	Invitation letters, handout, and report for current situation were distributed. Posters and presentations were used during the meeting.	Key stakeholders in Civil Society, Government officials, Supporting committees for Shan State Government, NGO's, INGO and CBO's, community leaders, and local people
Round 3: Public consultation meeting (PCM II)	Invitation letters, handout, and report for current situation were distributed. Posters and presentations were used during the meeting.	Key stakeholders in civil society, Government officials, supporting committees for Shan State Government, NGO's, INGO and CBO's, community leaders, and local people
Round 4: Public disclosure process	Distribution of executive summary and EIA report	Civil society, NGO's and CBO's, Government officials, community leaders

9.5. Summary of Meetings and Key Findings

For the consultation meetings were held on July 13, 2018 with various relevant stakeholders at the factory meeting room of (MSNAG) in in Twantay Township, No. (124-A) Ku Lar Tan Village Tract. In addition, the second meeting was held on 1 May 2022 at the meeting hall of MSNAG fertilizers repackaging factory as the consultation needs to be updated in time according to the guidance of the Department of Environmental Conservation (the letter No. EIA- 1/4-Sa (1773/2021) dated 23.11.2021). The consultation helped the project to gather information on potentially affected people, and on potential data gaps and how these can be closed out in the EIA report. Scoping consultation involved public meetings with a range of stakeholders in Twantay Township including Township GADs, village administrators, CSOs/NGOs, related government departments and local communities and community representatives. The minutes of the meetings and photos from the consultation are provided in Appendix Section.

The date, time, location, stakeholder and purpose of each meeting undertaken during the Scoping Phase engagement is provided in Table 9.3.

Table 9.3 Consultation Activities

Location	Purpose of Engagement	Date, time
Twantay Township GAD Office	Inform project information Meeting arrangements and approvals	20th April, 2018
Ku Lar Tan Village Tract (Village administrator house)	Meeting arrangements and approvals Undertake socio-baseline data collection	21th April, 2018
Tan Phyu Yone Village, Kan Pat Yoe, Htantapin Village	Inform project information and Undertake socio-baseline data collection	22th to 23th April, 2018
First public meeting MSNAG (Factory Meeting Room)	Present Project information to local government, village administrator, local communities and other interested parties Gather concerns and suggestions from stakeholders	13th July, 2018
Twantay Township GAD Office	Meeting arrangements and approvals	25th April, 2022
Second public meeting MSNAG (Factory Meeting Room)	Present Project information to local government, village administrator, local communities and other interested parties Gather concerns and suggestions from stakeholders	1th May, 2022

Table 9.4 Summaries of Comments Received during Engagement

Key Comments Received	**Response**
First public meeting	
- Odor, especially when passing in front of the factory. The key concern related to public health and safety.	- Job opportunities will be available and Locals will be screened and appointed - Technology for dust and odor control; We will

- Dispersion of dust particles sometimes seen - I want to know about job opportunities.	consult with experts. - This EIA will assess theimpact on Public Health and Safety from airand noise emissions. The baseline survey results from air, noise, soil, water and biodiversity will be disclosedto the community.
Second public meeting	
- Now it odor less - Farmers in nearby villages should be provided with discounted the price of fertilizers	Due to the change in the type of raw material during the production process, the odor is reduced. MSNAG will sell fertilizers at cheaper prices to local farmers.
Stakeholders wanted to emphasise that it is important to ensure the community can understand the information provided from the project.	The Regulatory EIA Report will have a Myanmar language executive summary to ensure information is easily available to local communities.
Transparency of the monitoring and auditing process during operation was of key importance to the stakeholders.	The grievance mechanism and future disclosure will be provided to all PAPs in the area.

9.6 Future Engagement and Disclosure

Future engagement activities will consist of the following

- Further disclosure of Project information and EIA Report, including opportunities to provide feedback;
- Engagement with relevant regional officials/authorities and government organisations on the outcomes of the EIA; and
- Ongoing communications with interested and potentially affected stakeholders during the operation. While impacts on local communities, ongoing project information will be provided to local areas.

A grievance mechanism will be in place, in line with the steps required under the EIA Procedure, as well as international good practice. If significant issues, concerns or impacts are identified, further stakeholder consultation with relevant, interested or affected stakeholders may be undertaken during operation.

Table 9.5 Stakeholder Notification and Communication

Purpose	**Stakeholder**	**Method of notification / communication**	**Scheduling**
Disclose EIA Report	- Relevant Government Organisations - Relevant regional officials / authorities - General public	- Publish Project information on signboards at the factory; - EIA (English) and executive summary (Myanmar and English) available on MSNAG website - Hardcopy EIA executive summary (Myanmar) made available in MSNAG factory office Twantay	Following lodgement of EIA for assessment
Address any community concerns	Implement the Grievance Mechanism	Grievance mechanism disclosed to local community and government	During the Project activities

9.7 Disclosure

As per the requirements of Article 50 of the EIA Procedure, MSNAG will disclose information on the project on hard copy handout and signboards will be posted at the site office and webside page of https://myanmashwenagar.com.

In compliance with potential lenders requirements to undertake meaningful consultations, information on the findings of the EIA, mitigation and beneficial measures in the EMP will be disclosed to the public and project affected people. Community meetings will be held in directly affected wards and villages to explain how the impacts and risks will be managed by the project.

9.8 Grievance Redress Mechanism

MSNAG will create a grievance mechanism for stakeholders can raise questions or concerns with the proposed project and have the concerns addressed in a prompt and respectful manner. Should a grievance or complaint be made, the complaint/grievance will be received by a Public Relation Officer or similar. The grievance will be recorded and investigated and responded to. Should the complainant not accept the response, a review will be carried out. Once resolved, the grievance will be closed out and recorded in the Grievance Register. detail Grievance Redress Mechanism for proposed project are presented in Appendix (C).

10. CONCLUSION

The Report is based on the initial environmental surveys and public stakeholder meetings with government and community in the vicinity of the project site. From the EIA study results, the following major conclusions may be drawn:

1) The project possesses good aims for the local users by providing their affordable sizes products and government by providing taxes and revenues.
2) Regarding with occupational health and safety during operation phase, it may have intensive supervision on health of the labors as the project emit offensive odor.
3) Limited amount of hazardous wastes generation will be occurred.
4) During decommissioning phase, there will be no major environmental impacts. All environmental issues could be readily addressed and transient.
5) There will be two stakeholder meetings, one after the scoping study of the project and the other after the results of field surveys and preparation of draft EIA report. During these stakeholder meetings, various opinions and exchange of information and discussions will be acquired from the participants that will be taken into consideration for the preparation of the final EIA report.

Base on this study, the Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) will be developed which will include cost for mitigation measures, cost for monitoring/implementation schedule and institutional arrangement.

In conclusion, the Project will have overall beneficial impacts in reducing air pollution, dust, and noise pollution and improving socioeconomic conditions along the project corridor, and will have insignificant negative impacts, which will be carefully monitored and adequately mitigated. The proposed project can be allowed to operate if the project proponent (MSNAG) will do all of the mitigation and enhancement measures described in this report.

11. STATEMENT OF COMMITMENTS

MSNAG and HRD hereby confirm that:

- The EIA Report is accurate, consolidated and complete;
- This report has been conducted in accordance with relevant laws, including the EIA Procedure (2015).
- The Project will fully follow the commitments, mitigation measures and plans set out in this EIA Report.

11.1 List of Commitments

A consolidated summary list of environmental and social impacts and mitigation measures commitments that Myanma Shwe Nagar Agricultural Group Co., Ltd shall be expected to adopt in order to manage and mitigate potential impacts associated with the project development is provided below in Table 11.1

Table 11.1 Project Key Commitments

Commitment	No.	Description	Source
Policy, Legal and Institutional Framework	1	Myanma Shwe Nagar Agricultural Group Co., Ltd shall follow applicable legislations, laws, rules and the legal framework of environmental issues past and present environmental legislation of Myanmar.	EIA Report, Chapter 3,
Project Description	2	MSNAG shall follow the content of the project including waste management and discharged.	EIA Report, Chapter 4,
implement mitigation measures	3	MSNAG shall implement mitigation measures for Potential Environmental Impacts and Risks during the project operation phase.	EIA Report, Chapter 6 &7
Environmental Management Plan	4	MSNAG shall develop Environmental Management Plan during the Project Life Cycle.	EIA Report, Chapter 8
Environmental Monitoring Plan	5	MSNAG shall develop Environmental Monitoring Plan and biannually monitoring report with monitoring data shall be submitted to the Environmental Conservation Department for renewing the Environmental Clearance Certificate	EIA Report, Chapter 8
Corporate Social Responsibility	6	MSNAG agrees to contribute about 2% of net profit as CSR fund for local community development.	EIA Report, Chapter 8

APPENDICES

APPENDIX A

First Public Meeting

ပထမအကြိမ်လူထုတွေ့ဆုံပွဲအခမ်းအနား အမေးအဖြေများ

ရန်ကုန်တိုင်းဒေသကြီး၊ တွံတေးမြို့နယ်၊ မြေကွက်အမှတ် (၁၂၄/က) ကုလားတန်းကျေးရွာအနီးတွင် လည်ပတ်လုပ်ကိုင်လျက်ရှိသည့် မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်းနှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းအတွက် ကျင်းပပြုလုပ်သည့် လူထုတွေ့ဆုံပွဲအခမ်းအနား

ရန်ကုန်တိုင်းဒေသကြီး၊ တွံတေးမြို့နယ်၊ မြေကွက်အမှတ် (၁၂၄/က) ကုလားတန်းကျေးရွာ၊ တွံတေးတူးမြေင်းဘေးရှိ မြေကွက်လပ်တွင် လယ်ယာစိုက်ပျိုးရေးနှင့်ဆည်မြောင်းဝန်ကြီးဌာနမှ ငှားရမ်းထားသော မြေကွက်တွင် မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ သီးနှံစုံသုံးနှင့် အထွက်တိုး ဓာတ်မြေဩဇာအမျိုးမျိုး ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်းနှင့် စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်း အတွက် သက်ဆိုင်ရာ အစိုးရဌာနများမှ တာဝန်ရှိသူများ၊ ရပ်ရွာဒေသခံများနှင့် ကျင်းပပြုလုပ်သည့် လူထုတွေ့ဆုံပွဲ အခမ်းအနားကို ၂၀၁၈ ခုနှစ် ဇူလိုင်လ ၁၃ ရက်ရက်နေ့တွင် ကုလားတန်းကျေးရွာ အနီးရှိ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေး စွမ်းအားစုကုမ္ပဏီလီမိတက်၏ စက်ရုံအဆောက်အဦးတွင် ကျင်းပပြုလုပ်ခဲ့ပါ သည်။ ဤလူထုတွေ့ဆုံပွဲ အခမ်းအနားကို အောက်ပါ အစီအစဉ်များအတိုင်း ကျင်းပပြုလုပ် ခဲ့ပါသည်။

၁။ အခမ်းအနားဖွင့်လှစ်ကြောင်းကြေငြာခြင်း

၂။ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ မန်နေဂျင်းဒါရိုက်တာ ကိုယ်စား သုတေသနဌာန မှ မန်နေဂျာ ဦးဝင်းထိန်မှ နှုတ်ခွန်းဆက်စကားပြောကြားခြင်း

၃။ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ နည်းပညာတာဝန်ခံ ဦးကျော်ဇေယျ မှ စီမံကိန်း နှင့် ပတ်သက်သည့် လုပ်ငန်းစဉ်များကို ရှင်းလင်း တင်ပြခြင်း

၄။ HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းစဉ်များကို ရှင်းလင်းဆွေးနွေးခြင်း

၅။ တက်ရောက်လာကြသူများမှ သိရှိလိုသည်များကို မေးမြန်းဆွေးနွေးခြင်းနှင့် တာဝန်ရှိသူ တို့မှ ပြန်လည်ဖြေကြားခြင်း

၆။ အခမ်းအနားပြီးစီးကြောင်း ကြေငြာခြင်း

၁။ နံနက် (၉ း ၅၀)နာရီအချိန်တွင် အခမ်းအနားဖွင့်လှစ်ကြောင်း ကြေညာပြီး အခမ်းအနားကို စတင်ကျင်းပခဲ့ပါသည်။

၂။ ဆက်လက်၍ အခမ်းအနားအစီအစဉ် အရ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ မန်နေဂျင်း ဒါရိုက်တာ ကိုယ်စား သုတေသနဌာန၏ မန်နေဂျာ ဦးဝင်းထိန်မှ နှုတ်ခွန်းဆက်စကား ပြောကြားရာတွင် သက်ဆိုင်ရာ အစိုးရဌာန၊အဖွဲ့အစည်းများမှ အကြီးအကဲများ၊ ဒေသခံရပ်မိရပ်ဖများနှင့် တက်ရောက်လာကြသူအားလုံးအား မင်္ဂလာနှုတ်ခွန်း ဆက်စကား ပြောကြားပါသည်။ လူထုတွေ့ဆုံပွဲ အခမ်းအနားတွင် ယခုလို နှုတ်ခွန်းဆက်စကား ပြောကြားခွင့်ရသည့် အတွက် ဝမ်းမြောက်ဝမ်းသာ ဖြစ်မိပါကြောင်း၊ ပထမဦးစွာ မိမိတို့မြန်မာ့ရွှေနဂါးကုမ္ပဏီလီမိတက်နှင့် ပတ်သက်၍ ကုမ္ပဏီ၏

ရာဇဝင်သမိုင်းကြောင်းအား အနည်းငယ်ရှင်းပြလိုပါကြောင်း၊ မိမိတို့ကုမ္ပဏီသည် ၂၀၁၃-၂၀၁၄ ခုနှစ် လောက်ကတည်းက ရွှေလင်ဗန်းစက်မှုဇုံအတွင်းရှိ ကနောင်မင်းသားကြီးလမ်း နှင့် ယောအတွင်းဝန် ဦးဖိုးလှိုင်လမ်းထောင့် တွင်ရှိသော ဂိုဒေါင်နှင့်မြေကွက်ကို အခြားသူတစ်ဦးထံမှ ငှားရမ်းပြီး ပိုးသတ်ဆေးတင်သွင်း၊ ဖြန့်ဖြူးခြင်းလုပ်ငန်းကို စတင်လုပ်ကိုင်ခဲ့ပါကြောင်း၊ နောက်ပိုင်းတွင် လုပ်ငန်းများကျယ်ကျယ်ပြန့်ပြန့် လုပ်ကိုင်နိုင်ရန် ယခုစက်ရုံတည်ရှိရာ တွံတေးမြို့နယ်၊ ကုလားတန်းကျေးရွာအနီးရှိ မြေကွက်အမှတ် (၁၂၄/က) သို့ ပြောင်းရွှေ့ကာ ဓာတ်မြေဩဇာ အမျိုးမျိုးကို ဆက်လက်၍ တင်သွင်း၊ ထုတ်လုပ်၊ ဖြန့်ဖြူး ရောင်းချမည် ဖြစ်ပါကြောင်း၊ မိမိတို့ကုမ္ပဏီအနေဖြင့် နိုင်ငံခြားမှ ကုန်ကြမ်းများ မှာယူတင်သွင်းခြင်း ဖြစ်ပါကြောင်း၊ နိုင်ငံခြားမှ ရောက်ရှိလာသော ဓာတ်မြေဩဇာနှင့်ကုန်ကြမ်းများကို လိုအပ်သည့် အချိုးအစားအလိုက် ပြန်လည်ထုပ်ပိုး (Repacking) ပြီး ဖြန့်ဖြူးခြင်းဖြစ်ပါကြောင်း၊ မိမိတို့ ကုမ္ပဏီအနေဖြင့် တောင်သူများ အသုံးပြုရန် သီးနှံစုံသုံးနှင့် အထွက်တိုး ဓာတ်မြေဩဇာအမျိုးမျိုး ဖြန့်ချိရောင်းချ နိုင်ရန်အတွက် လုပ်ငန်းလုပ်ကိုင်ခွင့်လိုင်စင် လျှောက်ထားရာတွင် လုပ်ငန်းစဉ်အရ ပတ်ဝန်းကျင်မှဒေသခံများ နှင့် စက်ရုံမှဝန်ထမ်းများ၊ အလုပ်သမားများ၏ ကျန်းမာရေး၊ ဘေးအန္တရာယ်ကင်းရှင်းရေး၊ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဘဝထိခိုက်နိုင်မှု အခြေအနေကို သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ အဖွဲ့အစည်းများ၊ ဒေသခံများ အားလုံးနှင့် တွေ့ဆုံဆွေးနွေးပြီး သဘောထား မှတ်ချက်ရယူ၍ ပြန်လည်လျှောက်ထား တင်ပြပါရန် စိုက်ပျိုးရေးဦးစီးဌာနမှ ညွှန်ကြားထားခြင်းကြောင့် ယခုကဲ့သို့ ဒေသခံများ၏ လူမှုစီးပွားဘဝနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ နယ်ပယ်တိုင်းတာ သတ်မှတ်ခြင်းနှင့် လူထုတွေ့ဆုံပွဲ အခမ်းအနား ပြုလုပ်ရခြင်းဖြစ်ပါကြောင်း၊ ယခုလည်း မိမိတို့စက်ရုံတွင် အလုပ်သမားများ ဘေးအန္တရာယ် ကင်းရှင်းရေးအတွက် သင်တန်းများ ပေးနေပြီဖြစ်ပါကြောင်း၊ မိမိတို့ကုမ္ပဏီ အနေဖြင့် ပတ်ဝန်းကျင်ကို ထိခိုက်မှုမရှိစေရေး၊ ဘေးအန္တရာယ်ကင်းရှင်းရေးကို အတတ်နိုင်ဆုံး လုပ်ဆောင်သွားမည် ဖြစ်သည့်အတွက် တက်ရောက်လာကြသော လူကြီးမင်းများအနေဖြင့် ဝိုင်းဝန်းပြီးအကြံပြု ဆွေးနွေးပေးကြစေလိုပါကြောင်း၊ မေတ္တာရပ်ခံအပ်ပါကြောင်း ပြောကြား ခဲ့ပါသည်။

မြန်မာရွှေနဂါးကုမ္ပဏီ လီမိတက်မှ သုတေသနဌာန၏ မန်နေဂျာ ဦးဝင်းထိန်မှ နှုတ်ခွန်းဆက်စကား ခြင်းနှင့် တွဲတေးမြို့နယ်ရှိ စက်ရုံတည်ဆောက်ခြင်းလုပ်ငန်းအတွက် ရှင်းလင်းတင်ပြစဉ် (၁၃-၇-၂၀၁၈)

၃။ ထို့နောက် အခမ်းအနား အစီအစဉ်အရ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ နည်းပညာ တာဝန်ခံ ဦးကျော်ဇေယျ မှ ကုမ္ပဏီနှင့်ပတ်သက်သည့် လုပ်ငန်းစဉ်များကို ရှင်းလင်းပြောကြား ပါသည်။ ယခုကဲ့သို့ လူထုတွေ့ဆုံပွဲပြုလုပ်ပေးရသည့် အကြောင်းရင်းမှာ နယ်မြေခံရပ်မိရပ်ဖများ၊ ဌာနဆိုင်ရာအသီးသီးမှ မြို့နယ်တာဝန်ခံများအား မိမိတို့ကုမ္ပဏီအနေဖြင့် "ဤနေရာတွင် ဤလုပ်ငန်း လုပ်ကိုင်နေပါကြောင်း" ပတ်ဝန်းကျင်ကို အသိပေးပြီး လိုအပ်သော အကြံဉာဏ်များ ရယူပူးပေါင်း ဆောင်ရွက်လိုသည့်အတွက်ကြောင့် ဤအခမ်းအနားကို ပြုလုပ်ရခြင်းဖြစ်ပါကြောင်း၊ ရပ်ရွာအတွက် မိမိတို့ကုမ္ပဏီဖက်မှ ကူညီနိုင်သည့် အကူအညီများရှိရင်လည်း ပေးအပ်ဖို့ အဆင်သင့်ရှိနေပါကြောင်း၊ စိုက်ပျိုးရေးဦးစီးဌာနသို့ ပြန်လည်ထုတ်ပိုးလိုင်စင် လျှောက်ထားရာတွင် အလုပ်သမားများနှင့် စက်ရုံပတ်ဝန်းကျင်မှ လူများအတွက် ထိခိုက်မှု ဆန်းစစ်ခြင်းပြုလုပ်ပြီးမှ သဘောထားမှတ်ချက်များနှင့်အတူ ပြန်လည်တင်ပြလျှောက်ထားပါရန် ညွှန်ကြားထားပါကြောင်း ပြောကြားပါသည်။ သို့ဖြစ်ပါ၍ သဘာဝ ပတ်ဝန်းကျင်၊ လူမှုစီးပွားဘဝ ထိခိုက်မှုဆန်းစစ်ခြင်း၊ အကဲဖြတ်ခြင်းလုပ်ငန်းကို HRD Environmental Training and Services Co., Ltd. တတိယအဖွဲ့အစည်းဖြင့် ဆောင်ရွက်လုပ်ကိုင်ခဲ့ပါကြောင်း၊ မိမိတို့ကုမ္ပဏီ၏ အဓိက ရည်ရွယ်ချက်မှာ သုံးစွဲသူ တောင်သူများအတွက် စျေးနှုန်းမှာလက်လှမ်းမီပြီး သုံးစွဲရလွယ်ကူစေရန်နှင့် စီးပွားရေး ပိုမိုတိုးတက်ကောင်းမွန်လာစေရန်ဖြစ်ပါကြောင်း၊ မိမိစက်ရုံမှ အလုပ်သမားများ အတွက်လည်း လုပ်ငန်းခွင်ကျန်းမာရေး၊ ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် အဓိကထား ဆောင်ရွက်ထားပါကြောင်း၊ ဝန်ထမ်းများကို လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ သင်တန်းများပေးနေကြောင်း၊ ကျန်းမာရေးအတွက်လည်း ဆရာဝန်များခေါ်၍ တစ်လတစ်ကြိမ် Medical Check-up ပြုလုပ်ပေးခြင်းများ ဆောင်ရွက်လျက်ရှိပါကြောင်း၊ စက်ရုံမှစွန့်ပစ်ပစ္စည်းများကိုလည်း

စည်ပင်နှင့်ညှိနှိုင်း၍ ၎င်းတို့ချမှတ်ထားသော စည်းမျဉ်း၊ စည်းကမ်းများအတိုင်း သတ်မှတ်သည့် နေရာများတွင်သာ စနစ်တကျစွန့်ပစ်ပါကြောင်း၊ တက်ရောက်လာကြသူများ အနေဖြင့်လည်း မိမိတို့စက်ရုံ၏ လုပ်ငန်းများကြောင့် ပတ်ဝန်းကျင်အပေါ် ထိခိုက်မှုမရှိစေရေး အတွက် လိုအပ်သည့် အကြံဉာဏ်များကို ပွင့်ပွင့်လင်းလင်း ဆွေးနွေးပြောကြား ပေးစေလိုပါ ကြောင်း ပြောကြားခဲ့ပါသည်။

၄။ ဆက်လက်ပြီး HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆိုင်ရာ လုပ်ငန်းစဉ် များကို Power Point ဖြင့် ရှင်းလင်းပြောကြားပါသည်။ ပထမဦးစွာ တက်ရောက်လာကြသော ဌာန ဆိုင်ရာ တာဝန်ရှိပုဂ္ဂိုလ်များ၊ ရပ်မိရပ်ဖများနှင့် Consultants အင်ဂျင်နီယာများအားလုံးအား မင်္ဂလာ နှုတ်ခွန်းဆက်စကားပြောကြားပြီး၊ မိမိအနေဖြင့် HRD Environmental Training and Services Co., Ltd. တတိယအဖွဲ့အစည်းအကြောင်း နှင့် ဖွံ့ဖြိုးရေးလုပ်ငန်းများနှင့် ပတ်သက်ပြီး လုပ်ဆောင်ရမည့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းစဉ်များအကြောင်း နှင့် ယင်းနှင့်ဆက်စပ်သည့် ဥပဒေ၊ လုပ်ထုံးလုပ်နည်း၊ စည်းမျဉ်း/ စည်းကမ်းများအကြောင်း၊ မည်သည့် ရည်ရွယ်ချက်ကြောင့် လုပ်ရသည်၊ မည်သည့်အကြောင်းအရာအတွက်လုပ်ရသည်ကို ရှင်းလင်းပြောကြားလိုပါကြောင်း၊ HRD Environmental Training and Services Co., Ltd. အကြောင်းကို အကျဉ်းချုပ်ရှင်းလင်း ပြောကြားလိုပါကြောင်း၊ မိမိတို့အဖွဲ့အစည်း၏ အဓိက ရည်ရွယ်ချက်မှာ ဖွံ့ဖြိုးတိုးတက်ရေး လုပ်ငန်းများ လုပ်ဆောင်ခြင်းနှင့်ပတ်သက်၍ စီမံကိန်း အကောင်အထည်ဖော်ဆောင်ရွက်သူ (Project Developer) များ၏ စီးပွားရေးကို ဖွံ့ဖြိုးတိုးတက် အောင်လုပ်ဆောင်သည့်နေရာတွင် သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှုအလျော့နည်းဆုံးဖြစ်စေရန် နှင့် ဒေသခံများ၏ လူမှုစီးပွားဘဝကိုလည်း ဖွံ့ဖြိုးတိုးတက်အောင် လုပ်ဆောင်ရမည်ဟူသော မျှော်မှန်းချက်ဖြင့် လေ့လာဆန်းစစ် အကဲဖြတ်ပေးသည့် တတိယအဖွဲ့အစည်းအနေဖြင့် အကူအညီပေးနိုင်ရန် ဖြစ်ပါကြောင်း၊ လေ့လာ ဆန်းစစ်မှု ပြုလုပ်သည့်နေရာတွင် သဘာဝပတ်ဝန်းကျင် နှင့် ဒေသခံများ၏ လူမှုစီးပွားဘဝအပေါ် သက်ရောက်လာနိုင်သည့် ဆိုးကျိုးများအား ရှာဖွေဖော် ထုတ်ပြီး၊ လျော့နည်းနိုင်သမျှ လျော့နည်းအောင် ပြန်လည်ကုစား နိုင်မည့်နည်းလမ်းများ ရှာဖွေဖော်ထုတ်ခြင်းနှင့် စောင့်ကြည့် စစ်ဆေးခြင်း လုပ်ငန်းများကို ဆောင်ရွက်ရပါကြောင်း၊ မိမိတို့ HRD အဖွဲ့မှ ယခု ရွေးနှုတ်စက်ရုံနှင့် ပတ်ဝန်းကျင်အပေါ် လေ့လာဆန်းစစ်ချက်များအရ ၎င်းစက်ရုံသည် တားမြစ်ဇရိယာများ (ဥပမာ- သစ်တောကြိုးဝိုင်းများ၊ ယဉ်ကျေးမှုအမွေအနှစ်များ ထိန်းသိမ်း စောင့်ရှောက်ထားသည့် ကန့်သတ်နယ်မြေများ စသည်ဖြင့်) အတွင်းတွင် တည်ရှိ မနေဘဲ လွတ်ကင်း တည်ရှိနေပါကြောင်း၊ ကုန်ကြမ်းများကို ပြည်ပမှ မှာယူတင်သွင်းပြီး ပြန်လည် ထုတ်ပိုးမှုလုပ်ငန်းသာ လုပ်ဆောင်သည့် အတွက် စွန့်ပစ်ရေထွက်ရှိမှု နည်းပါးပါကြောင်း၊ ဘေးပတ်ဝန်းကျင်တွင်လည်း လူနေအိမ်များ ထူထပ်စွာရှိမနေဘဲ မြေလွတ်များသာရှိနေသည်ကို တွေ့ရှိရပါကြောင်း၊ ပတ်ဝန်းကျင်တွင် နေထိုင်သောသူများထံသို့သွားရောက်ပြီး ၎င်းတို့၏ သဘောထားအမြင်များ၊ လူမှုစီးပွားဘဝ အခြေအနေများကို ကောက်ယူခြင်း၊ မေးမြန်း ဆွေးနွေးခြင်းများ ပြုလုပ်ခဲ့ပါကြောင်း၊ ရှင်းလင်းပြောကြားပါသည်။

HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆိုင်ရာ လုပ်ငန်းစဉ်များကို ရှင်းလင်းပြောကြားစဉ်

၁၃-၇-၂၀၁၈၊ စက်ရုံတည်နေရာ၊တွံတေးမြို့နယ်၊

၅။ အခမ်းအနားအစီအစဉ်အရ အခမ်းအနားသို့ တက်ရောက်လာကြသူများမှ သိရှိလို သည်များအား မေးမြန်းဆွေးနွေးခြင်းနှင့် တာဝန်ရှိသူတို့မှ ပြန်လည်ဖြေကြားခြင်း အစီအစဉ်ဖြစ် သည့်အတွက် ဆွေးနွေးမေးမြန်းခြင်းများပြုလုပ်ခဲ့ပါသည်။ ဆွေးနွေးမေးမြန်းမှု အကြောင်းအရာ အသေးစိတ်မှာ အောက်ဖော်ပြပါအတိုင်း ဖြစ်ပါသည်။

(၁) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည် -ဦးဝင်းရှိန်၊
ရပ်/ကျေးအုပ်ချုပ်ရေးမှူး (ကုလားတန်း)

အကြောင်းအရာ - ယခုလို ဆရာ ဒေါက်တာအောင်လေးတင်မှ ပြည့်ပြည့်စုံစုံ ရှင်းလင်းသွားသည့် အတွက် ကျေးဇူးတင်ပါကြောင်း၊ စီမံကိန်းနှင့်ပတ်သက်၍ ဆိုးကျိုးကောင်းကျိုးများကို အထူးအထွေ ပြောစရာမရှိကြောင်း ပြောကြားပါသည်။ ရပ်ရွာရှိ လူမှုအကျိုးပြု အသင်းများနှင့် ရပ်ရွာဖွံ့ဖြိုး တိုးတက်ရေးကိစ္စများတွင် Myanma Shwe Nagar Agricultural Group Co., Ltd. (MSNAG)မှ ပူးပေါင်းကူညီဆောင်ရွက်ပေးစေချင်ကြောင်း ဆွေးနွေးအကြံပြုခဲ့ပါသည်။

ရှင်းလင်းဖြေကြားသူ၏အမည် - ဦးဝင်းထိန်၊ မန်နေဂျာ (MSNAG)
စီမံကိန်းဆောင်ရွက်ခြင်းမှ ရရှိလာသောတစ်နှစ်စာအသက်တင်အမြတ်ငွေ၏ (၂)ရာခိုင်နှုန်းကို လူမှုရေးဆိုင်ရာ တာဝန်ယူမှု အစီအစဉ်များဖြစ်သော လူမှုအကျိုးပြု အသင်းများနှင့် ရပ်ရွာဖွံ့ဖြိုး တိုးတက်ရေးကိစ္စများတွင်အသုံးပြုမည်ဖြစ်ကြောင်း ပြန်လည် ဖြေကြားပါသည်။

(၂) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည် - ဦးအောင်မြင့်၊ ဒုဦးစီးမှူး (စိုက်ပျိုးရေးဦးစီးဌာန)

အကြောင်းအရာ - စက်ရုံရှိ ဓာတ်မြေဩဇာပြန်လည်ထုတ်ပိုးခြင်းလုပ်ငန်းခွင်တွင် အလုပ်သမားများအနေဖြင့် ကုန်းကြိမ်းများကိုင်တွယ်ရာတွင် အနှံ့ ပြင်းသည်အတွက် အလုပ်သမားများအတွက် အသက်ရှူလမ်းကြောင်းကို အန္တရာယ်ပေးနိုင်သောကြောင့် သင်တန်းတွေ ပေးသင့်ကြောင်း၊ စနစ်တကျ လုပ်ကိုင်ဆောင်ရွက်စေလိုကြောင်း တင်ပြဆွေးနွေးပါသည်။

စီးမံကိန်းအင်ဂျင်နီယာ ဦးကျော်ဇေယျမှ ပြန်လည်ဖြေကြားရာတွင် ယခုအခါ အလုပ်သမားများကြီးတင်ခေါ်ယူကာ ဓာတ်မြေဩဇာကုန်ကြမ်းများ စနစ်တကျ ပြန်လည် ထုပ်ပိုးနိုင်အောင်၊ လုပ်သားကျန်းမားရေးထိခိုက်မှု မရှိအောင် မည်ကဲ့သို့ကိုင်တွယ် ရမည်ကို ပညာရှင် အင်ဂျင်နီယာများ ခေါ်ယူ၍ သင်တန်းများ ကြီးတင်ပေးမည်ဖြစ်ပါကြောင်း၊ ပြန်လည် ဆွေးနွေးတင်ပြပါသည်။

(၃) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည်- ဦးလှသန်း၊ ရပ်မိ၊ရပ်ဖ (ကန်ပတ်ရိုး)
အကြောင်းအရာ - မိမိတို့ကျေးရွာမှာ စက်ရုံနှင့်အနီးဆုံး ဖြစ်ကြောင်း၊ အနံ့နံကြောင်း အထူးသဖြင့် စက်ရုံရှေ့လမ်းမှဖြတ်သွားလျှင် အလွန်နံကြောင်း၊ ကျေးရွာလူထု ရေရှည်တွင်ထိခိုက်လာနိုင်ကြောင်း၊ ကျန်းမာရေးအတွက်စိုးရိမ်ပါကြောင်း ဆွေးနွေးတင်ပြပါသည်။

စီးမံကိန်း မန်နေဂျာ ဦးကျော်ဇေယျမှ ပြန်လည်ဖြေကြားရာတွင် ဓာတ်မြေဩဇာများ ပြန်လည်ထုတ်ပိုးခြင်းလုပ်ငန်းစဉ်တွင် အနံ့ပြင်းနှင့် အမှုန်အနည်းငယ် ထွက်ရှိသည်ကို တွေ့ရပါကြောင်း၊ သို့ဖြစ်ပါ၍ ၎င်းတို့အား ထိန်းချုပ်ရန်အတွက် ထိန်းချုပ်မှု နည်းပညာ၊ ပညာရှင်များဖြင့် တိုင်ပင်ဆွေးနွေး၍ အမှုန့်အမွှားနှင့်အနံ့ ပပျောက်လျော့နည်းသွားရန် ဆောင်ရွက်သွားမည်ဖြစ်ကြောင်း၊ ပြန်လည် ဆွေးနွေးတင်ပြပါသည်။

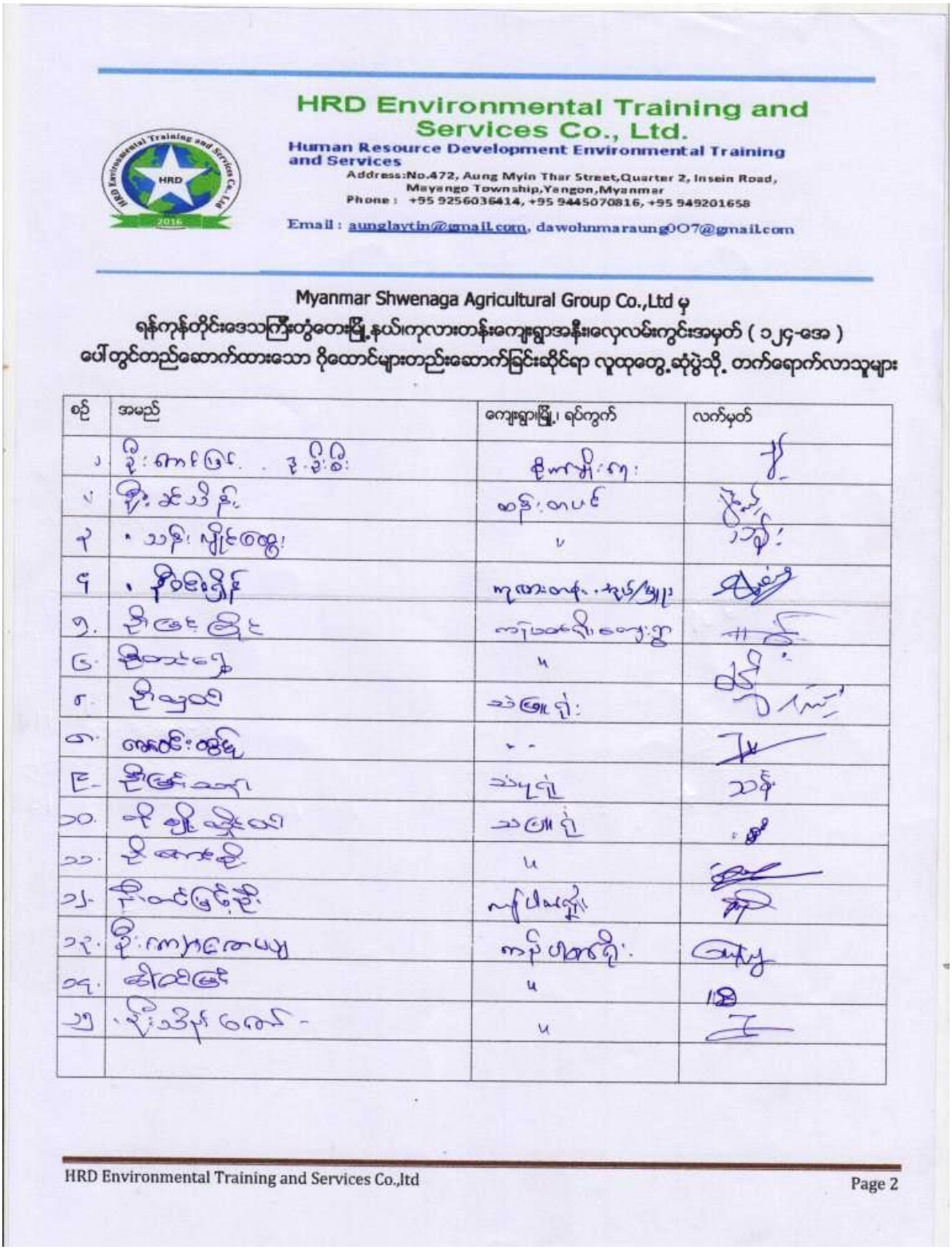
(၄) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည်- ဦးဇော်လိုင်ထွန်း၊ ရပ်မိ၊ရပ်ဖ (သံဖြူရုံ)
အကြောင်းအရာ - မိမိတို့ဒေသတွင်စက်ရုံအလုပ်ရုံများဖြစ်ပေါ်လာသည်ကို ကြိုဆိုပါကြောင်း၊ ပတ်ဝန်းကျင်အားထိခိုက်မှုမရှိစေလိုပါကြောင်း၊ စက်ရုံတွင် ဒေသခံလူငယ်များ အလုပ်အကိုင် ခန့်ထားပေးစေလိုကြောင်း ဆွေးနွေးပါသည်။

စီးမံကိန်း မန်နေဂျာ ဦးဝင်းထိန်မှ ပြန်လည်ဖြေကြားရာတွင် စက်ရုံ၌ အလုပ်ကိုင်အခွင့်လမ်းများလိုအပ်လာမည်ဖြစ်၍ ဒေသခံများကိုဦးစားပေးခန့်ထားမည် ဖြစ်ကြောင်း၊ ဒေသခံလူငယ်များအား ပညာအရည်အချင်းအလိုက် အလုပ်နေရာများ စီစစ်၍ခန့်ထားမည်ဖြစ်ကြောင်း၊ လိုအပ်ပါက သင်တန်းများလည်းပေး၍ ဆောင်ရွက်သွားမှာဖြစ်ကြောင်း ပြန်လည် ပြောကြားပါသည်။

ထို့နောက် စီးမံကိန်း မန်နေဂျာ ဦးဝင်းထိန်မှ ယခုဆွေးနွေးပွဲတက်ရောက်လာသူအားလုံးအား ကျေးဇူးတင် ပါကြောင်း၊ ဒေသခံ ရပ်မိရပ်ဖများအနေဖြင့် တစ်ဖက်တစ်လမ်းမှ ကုမ္ပဏီ၏ လိုအပ်ချက်များရှိခဲ့လျှင် အချိန် မရွေးဆက်သွယ် အကြံပြုပြောကြားနိုင်ကြောင်း နိဂုံးချုပ်အနေဖြင့်ပြောကြားခဲ့ပါသည်။
၆။ တွေ့ဆုံပွဲ အခမ်းအနားပြီးစီးကြောင်းပြောကြားပါသည်။

ပထမအကြိမ်လူထုတွေ့ဆုံပွဲဓာတ်ပုံမှတ်တမ်းများ (၁၃-၇-၂၀၁၈)

Meeting Attendance Lists for First Public Meeting



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Myanmar Shwenaga Agricultural Group Co.,Ltd မှ

ရန်ကုန်တိုင်းဒေသကြီးတွံတေးမြို့နယ်၊ကုလားတန်းကျေးရွာအနီးလှေလမ်းကွင်းအမှတ် (၁၂၄-အေ)

ပေါ်တွင်တည်ဆောက်ထားသော ဂိုထောင်များတည်ဆောက်ခြင်းဆိုင်ရာ လူထုတွေ့ဆုံပွဲသို့ တက်ရောက်လာသူများ

စဉ်	အမည်	ကျေးရွာမြို့၊ ရပ်ကွက်	လက်မှတ်
၁			
၂			
၃			
၄			
၅			
၆			
၇			
၈			
၉			
၁၀			
၁၁			
၁၂			
၁၃			
၁၄			
၁၅			

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ပေါ်တွင်တည်ဆောက်ထားသော ဂိုထောင်များတည်းဆောက်ခြင်းဆိုင်ရာ လူထုတွေ့ဆုံပွဲသို့ တက်ရောက်လာသူများ

စဉ်	အမည်	ကျေးရွာ၊မြို့၊ ရပ်ကွက်	လက်မှတ်
၁၆	[illegible]	[illegible]	[illegible]
၁၇	[illegible]	။	[illegible]
၁၈	[illegible]	[illegible]	[illegible]
၁၉	[illegible]	။	[illegible]
၂၀	[illegible]	။	[illegible]
၂၁	[illegible]	။	[illegible]
၂၂	[illegible]	။	[illegible]
၂၃	[illegible]	[illegible]	[illegible]
၂၄	ဦးမင်းမောင် (ကျန်းမာရေးမှူး)	မြို့နယ်ကျန်းမာရေးဦးစီးဌာန	[illegible]

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ပေါ်တွင်တည်ဆောက်ထားသော ဂိုထောင်များတည်ဆောက်ခြင်းဆိုင်ရာ လူထုတွေ့ဆုံပွဲသို့ တက်ရောက်လာသူများ

စဉ်	အမည်	ကျေးရွာ/မြို့၊ ရပ်ကွက်	လက်မှတ်
၁	[illegible]	[illegible]	[signature]
၂	[illegible]	"	[signature]
၃	[illegible]	"	[signature]
၄	[illegible] "	ကုလားတန်း [illegible]	[signature]
၅	[illegible] "	ကုလားတန်း [illegible]	[signature]
၆	[illegible] "	"	[signature]
၇	မြင့်ဦး "	[illegible]	မြင့်ဦး
၈	[illegible]		[signature]
၉	[illegible]	[illegible]	[signature]
၁၀	[illegible] "	[illegible]	[signature]
၁၁	[illegible] "	"	[signature]
၁၂	[illegible]	[illegible]	[signature]
၁၃	[illegible]	"	[signature]
၁၄	[illegible]	" "	[signature]

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ပေါ်တွင်တည်ဆောက်ထားသော ဂိုထောင်များတည်းဆောက်ခြင်းဆိုင်ရာ လူထုတွေ့ဆုံပွဲသို့ တက်ရောက်လာသူများ

စဉ်	အမည်	ကျေးရွာ၊မြို့၊ ရပ်ကွက်	လက်မှတ်
၁။	[illegible]	HRD	
၂။	[illegible]	HRD	
၃။	[illegible]	HRD	
၄။	[illegible]	HRD	
၅။	[illegible]	MBG	
၆။	ကောင်းဆက်	HRD	
၇။	[illegible]	HRD	

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Stakeholders Consultation Questionnire

အမည်..[illegible]........ စီမံကိန်းအမည်..............................

နေ့စွဲ...13.7.2018....

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ..............................

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ်ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		ဖြည့်စွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	No	
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား	NO	
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား	No	
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။	No	
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	Yes	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမို ပြွတ်သိပ် ကြပ်သွားနိုင်ပါသလား	No	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	No	
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	No	

Signature (လက်မှတ်)....[signature]....

Name (အမည်)....[illegible]....

Address (နေရပ်လိပ်စာ)....[illegible]....

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Stakeholders Consultation Questionnire

အမည်...[illegible]... စီမံကိန်းအမည်...

နေ့စွဲ...13-7-2018...

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ...

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ် ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	No	ခြင်းနှင့်အကြိုးမြတ်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	NO	
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား	No	
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား	No	
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။	No	
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	yes	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမို မြှတ်သိပ် ကြပ်သွားနိုင်ပါသလား	No	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	No	
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	No	

Signature (လက်မှတ်)...[signature]...

Name (အမည်)...[illegible]...

Address (နေရပ်လိပ်စာ)...[illegible]...

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Stakeholders Consultation Questionnire

အမည်...ဦး စိုးတင်... စီမံကိန်းအမည်...

နေ့စွဲ...13-7-2018...

မွေးမြူသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ...

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ် ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	ပေးဝင်ပါ	ဖြည့်စွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	ထိခိုက်နိုင်ပါ	
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား	ထိခိုက်နိုင်ပါ	
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား	ထိခိုက်နိုင်ပါ	
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။	ဖြစ်နိုင်ပါ	
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	ကောင်းနိုင်ပါသည်	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမိုမြှတ်သိပ် ကြပ်သွားနိုင်ပါသလား	မကျတ်နိုင်ပါ	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	ပေးပါ	
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	ဖြစ်စေ နိုင်ပါ	

Signature (လက်မှတ်)...[signature]...

Name (အမည်)...ဦး စိုး တင်...

Address (နေရပ်လိပ်စာ)...ကပေါက်ကြီး...

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Stakeholders Consultation Questionnire

အမည်.. စီမံကိန်းအမည်..

နေ့စွဲ..

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ..

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ် ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	မထင်ပါ	ပြည့်စွက်အကြိုးမြုပ်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	မထိခိုက်နိုင်ပါ	
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား	မထိခိုက်နိုင်ပါ	
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား	မထိခိုက်နိုင်ပါ	
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။	မဖြစ်နိုင်ပါ	
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	ကောင်းမွန်နိုင်ပါ	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမို မြှင့်တင်သိပ် ကြပ်သွားနိုင်ပါသလား	မဖြစ်နိုင်ပါ	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	မထင်ပါ	
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	မဖြစ်စေနိုင်ပါ	

Signature (လက်မှတ်)..

Name (အမည်)........[illegible]........................

Address (နေရပ်လိပ်စာ)..........[illegible]..

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Stakeholders Consultation Questionnire

အမည်.. စီမံကိန်းအမည်..

နေ့စွဲ 13/7/2018

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ..

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ် ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	No	ဖြည့်စွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	No	
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား		
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား		
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။		
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	Yes	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအထောက်အအုံများကို ပိုမိုဖြတ်သိပ် ကြပ်သွားနိုင်ပါသလား	Yes	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	No:	

Signature (လက်မှတ်)..

Name (အမည်) [illegible]

Address (နေရပ်လိပ်စာ) [illegible]

....

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Stakeholders Consultation Questionnire

အမည်.. စီမံကိန်းအမည်..

နေ့စွဲ 13.1.2018..................

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ [illegible]

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ်ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား	မဖြစ်နိုင်ပါ -	ဖြည့်စွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	မဖြစ်နိုင်ပါ	[illegible]
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား		
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား		
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား၊	မဖြစ်နိုင်ပါ	
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	[illegible]	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အဆောက်အအုံပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမိုပြတ်သိမ် ကြပ်သွားနိုင်ပါသလား	မဖြစ်နိုင်ပါ -	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	မဖြစ်နိုင်ပါ -	

Signature (လက်မှတ်)..

Name (အမည်)......Zaw Win Htut..................

Address (နေရပ်လိပ်စာ) [illegible]

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Stakeholders Consultation Questionnire

အမည်..... စီမံကိန်းအမည်.....

နေရပ်.....

မေမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ.....

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ် ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		မြင်ရွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား	NO	
၃	ယခုစီမံကိန်းကြောင့် ကျွန်ုပ်၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား		
၄	ယခုစီမံကိန်းကြောင့် ကျွန်ုပ်၏ သဘာဝ ပါဝင်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား		
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား။	NO	
၆	ယခုစီမံကိန်းကြောင့် ကျွန်ုပ်၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	yes	
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သိုမဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမို မြှင့်တင်ပေး ကြပ်သွားနိုင်ပါသလား	yes	
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား	NO	

Signature (လက်မှတ်).....

Name (အမည်).....

Address (နေရပ်လိပ်စာ).....

.....

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Stakeholders Consultation Questionnire

အမည်...ဦး [illegible]...... စီမံကိန်းအမည်...

နေ့စွဲ.................................

မေးမြန်းသည့်နေရာ (သို့) ဖြေဆိုသည့်နေရာ..

စဉ်	Environmental and Social Impacts ပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားရေးအပေါ်ထိခိုက်မှုများ	(Yes/ NO) ဖြစ်နိုင်/ မဖြစ်နိုင်	Comments on Project ထင်မြင်ချက်
၁	ယခုစီမံကိန်းသည် ပတ်ဝန်းကျင်နေထိုင်သူများအတွက် ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		ဖြည့်စွက်အကြံပြုချက်များ ရေးသားနိုင်ပါသည်
၂	ယခုစီမံကိန်းကြောင့် အနီးအနားပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်များကို ထိခိုက်နိုင်ပါသလား		
၃	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝအရင်းအမြစ်များကို ထိခိုက်နိုင်ပါသလား		
၄	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ သဘာဝ ပါတ်ဝန်းကျင်ကို ထိခိုက်နိုင်ပါသလား		
၅	ယခုစီမံကိန်းကြောင့် အသံဆူညံမှု၊ တုန်ခါမှု၊ များ ဖြစ်နိုင်ပါသလား၊		
၆	ယခုစီမံကိန်းကြောင့် ဤဒေသ၏ လူမှုစီးပွားရေး ပိုမိုကောင်းမွန်လာနိုင်ပါသလား	✓	[illegible]
၇	ယခုစီမံကိန်းကြောင့် သယ်ယူပို့ဆောင်ရေးလမ်းကြောင်း သို့မဟုတ် အထောက်အကူပြုလုပ်ငန်းအဆောက်အအုံများကို ပိုမို မြှတ်သိပ် ကြပ်သွားနိုင်ပါသလား		
၈	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများကို ကျန်းမာရေးဆိုင်ရာ ဆိုးကျိုးများပေးနိုင်သည်ဟု ထင်ပါသလား		
၉	ယခုစီမံကိန်းကြောင့် ပတ်ဝန်းကျင်နေထိုင်သူများ၏ အလုပ်အကိုင်အခွင့်အလမ်းများကို အနှောက်အယှက်ဖြစ်စေပါသလား		

Signature (လက်မှတ်)...

Name (အမည်)...

Address (နေရပ်လိပ်စာ)...

....

APPENDIX B

Second Public Meeting

ဒုတိယအကြိမ်လူထုတွေ့ဆုံပွဲအခမ်းအနား အမေးအဖြေများ

ရန်ကုန်တိုင်းဒေသကြီး၊ တွံတေးမြို့နယ်၊ မြေကွက်အမှတ် (၁၂၄/က) ကုလားတန်းကျေးရွာအနီးတွင် လည်ပတ်လုပ်ကိုင်လျက်ရှိသည့် မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်းနှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းအတွက် ကျင်းပပြုလုပ်သည့် လူထုတွေ့ဆုံပွဲအခမ်းအနား (၁.၅.၂၀၂၂)

မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိသော ရန်ကုန်တိုင်းဒေသကြီး တွံတေးမြို့နယ်၊ တွံတေး-မအူပင်လမ်း၊ တွံတေးတူးမြောင်း ဘေး၊ ကုလားတန်းကျေးရွာ၊ အမှတ် (၁၂၄-က) တွင် အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိသည့် ဓာတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်း နှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်း အတွက် သက်ဆိုင်ရာ အစိုးရဌာနများမှ တာဝန်ရှိသူများ၊ ရပ်ရွာဒေသခံများနှင့် ကျင်းပပြုလုပ်သည့် ဒုတိယအကြိမ်လူထုတွေ့ဆုံပွဲ အခမ်းအနားကို ၂၀၂၂ ခုနှစ် မေလ ၁ ရက်ရက်နေ့တွင် ကုလားတန်းကျေးရွာ အနီးရှိ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ စက်ရုံဆောက်အဦးအစည်းအဝေးခန်းမတွင် ကျင်းပပြုလုပ်ခဲ့ပါသည်။ ဤဒုတိယအကြိမ်လူထုတွေ့ဆုံပွဲ အခမ်းအနားကို အောက်ပါ အစီအစဉ်များအတိုင်း ကျင်းပပြုလုပ်ခဲ့ပါသည်။

၁။ အခမ်းအနားဖွင့်လှစ်ကြောင်းကြေငြာခြင်း

၂။ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်၏ မန်နေဂျင်းဒါရိုက်တာ ကိုယ်စား သုတေသနဌာန မှ စိုက်ပျိုးရေးပညာရှင် ဦးသန့်ဇင်မှ နှုတ်ခွန်းဆက်စကားပြောကြားခြင်း

၃။ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ နည်းပညာတာဝန်ခံ ဒေါ်သဇင်ညွှန့်မှ စီမံကိန်း နှင့် ပတ်သက်သည့် လုပ်ငန်းစဉ်များကို ရှင်းလင်း တင်ပြခြင်း

၄။ HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းစဉ်များကို ရှင်းလင်းဆွေးနွေးခြင်း

၅။ HRD Environmental Training and Services Co., Ltd. မှ အကြံပေးပညာရှင် ဒေါက်တာမြင့်အောင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းနှင့်ပတ်သက်၍ အကြံပြု ရှင်းလင်းဆွေးနွေးခြင်း

၆။ တက်ရောက်လာကြသူများမှ သိရှိလိုသည်များကို မေးမြန်းဆွေးနွေးခြင်းနှင့် တာဝန်ရှိသူ တို့မှ ပြန်လည်ဖြေကြားခြင်း

၇။ အခမ်းအနားပြီးစီးကြောင်း ကြေငြာခြင်း

၁။ နံနက် (၁၀ : ၀၀)နာရီအချိန်တွင် အခမ်းအနားဖွင့်လှစ်ကြောင်း ကြေညာပြီး အခမ်းအနားကို စတင်ကျင်းပခဲ့ပါသည်။

၂။ ဆက်လက်၍ အခမ်းအနားအစီအစဉ် အရ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ မန်နေဂျင်း ဒါရိုက်တာ ကိုယ်စား သုတေသနဌာန မှ စိုက်ပျိုးရေးပညာရှင် ဦးသန့်ဇင်မှ နှုတ်ခွန်းဆက်စကား

ပြောကြားရာတွင် သက်ဆိုင်ရာ အစိုးရဌာန၊အဖွဲ့အစည်းများမှ အကြီးအကဲများ၊ ဒေသခံရပ်မိရပ်ဖများနှင့် တက်ရောက်လာကြသူအားလုံးအား မင်္ဂလာနှုတ်ခွန်း ဆက်စကား ပြောကြားပါသည်။ ယခုလူထုတွေ့ဆုံပွဲ အခမ်းအနားမှာ ဒုတိယအကြိမ်ဖြစ်ပါကြောင်း၊ ပထမအကြိမ် လူထုတွေ့ဆုံပွဲ အခမ်းအနားကို (၁၃-၇-၂၀၁၈)နေ့ ဤစက်ရုံ၌ ကျင်းပပြီးစီးခဲ့ပါကြောင်း၊ ထိုစဉ်က တက်ရောက်ခဲ့သော ရပ်မိရပ်ဖများလည်း ယခုလူထုတွေ့ဆုံပွဲတွင် ပါဝင်မည်ဟုထင်ပါကြောင်း ပြောကြားပါသည်။ ယခုပွဲသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ ညွှန်ကြားရေးမှူးချုပ်ရုံး (နေပြည်တော်)၏ သဘောထားမှတ်ချက်အရ မိမိတို့စက်ရုံအနေဖြင့် ဒေသခံအများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်းတွင် အချိန်နှင့်တပြေးညီ Update ဖြစ်ရန်လိုအပ်ပါသောကြောင့် တက်ရောက်လာသော ရပ်မိရပ်ဖများအနေဖြင့် မိမိတို့စက်ရုံအပေါ် တွေ့ရှိချက်များအား ပွင့်ပွင့်လင်းလင်း ဝိုင်းဝန်းပြီးအကြံပြု ဆွေးနွေးပေးကြစေလိုပါကြောင်း၊ ပြောကြားခဲ့ပါသည်။

၃။ ဆက်လက်၍ မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစု ကုမ္ပဏီလီမိတက်မှ နည်းပညာတာဝန်ခံ ဒေါ်သဇင်ညွန့်မှ ဓါတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်းစဉ်နှင့် ပတ်သက်၍ အကျဉ်းချုပ် ရှင်းပြခဲ့ပါသည်။
အဆိုပြုလုပ်ငန်းဆိုင်ရာ အခြေခံဖော်ပြချက်များ၊ လက်ရှိလုပ်ငန်းအခြေအနေ၊ ဓါတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်၊ အဓိကလိုအပ်မည့် ကုန်ကြမ်း အရင်းအမြစ်၊ စက်ပစ္စည်း စာရင်းနှင့် လုပ်ငန်းလည်ပတ်ချိန်တွင် ခန့်ထားသည့် ဝန်ထမ်းအင်အား တို့ကို ရှင်းလင်းတင်ပြခဲ့ပါသည်။
ထို့နောက် လူမှုဖူလုံရေးအစီအစဉ် (ဘေးအန္တရာယ်ကင်းရှင်းရေးအစီအစဉ်၊ ကျန်းမာရေးစောင့်ရှောက်မှု၊ အရေးပေါ်အခြေအနေများကို တုန့်ပြန်ဆောင်ရွက်နိုင်ရန်အတွက် သင်တန်းများဖွင့်လှစ် သင်ကြားပေးခြင်းနှင့် ဝန်ထမ်းခန့်ထားခြင်း)၊ လူမှုစီးပွားဆိုင်ရာတာဝန်ယူမှုအစီအစဉ်နှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး အစီအစဉ်များကိုလည်း ဆောင်ရွက်သွားမည်ဖြစ်ကြောင်းပြောကြားသွားပါသည်။

၄။ HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းစဉ်များကို ရှင်းလင်းတင်ပြရာတွင်
ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ဆောင်မှု၏ ရည်ရွယ်ချက်များနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ် လုပ်ငန်းအဆင့်ဆင့်အား တင်ပြခဲ့ပါသည်။ စီမံကိန်းပတ်ဝန်းကျင်ရှိ လေအရည်အသွေး၊ ရေအရည်အသွေးနှင့် ဆူညံမှုတိုင်းတာမှုများကို ပြုလုပ်သွားပြီးဖြစ်ကြောင်း၊ စီမံကိန်းလည်ပတ်ဆောင်ရွက်ကာလနှင့် ပိတ်သိမ်းကာလတို့တွင် ဆိုးကျိုးသက်ရောက်ခြင်းမှ ကာကွယ်ရန်၊ ရှောင်လွဲရန်၊ လျော့နည်းစေရန်နည်းလမ်းနှင့် အစီအစဉ်များကို ရှင်းလင်းတင်ပြခဲ့ပါသည်။
ထိုအပြင် စောင့်ကြပ်ကြည့်ရှုရမည့် နည်းလမ်းများ၊ အရေးပေါ်ကိစ္စများအတွက် စီမံချက်နှင့် မကျေလည်မှုများကို ပြန်လည်ဖြေရှင်းပေးမည့် အစီအစဉ်များကို အဆင့်ဆင့်ရှင်းလင်းတင်ပြခဲ့ပါသည်။ အဓိကတွေ့ရှိရသော စက်ရုံမှ အနှံ့ထွက်ရှိမှုမှာလည်း စက်ရုံမှာ ထိန်းချုပ်ပြုပြင်ဆောင်ရွက်မှုကြောင့် အနှံ့နံခြင်းလျော့ပါးသွားသည်ကိုတွေ့ရကြောင်း၊ စီမံကိန်းဆောင်ရွက်ခြင်းမှ ရရှိလာသောတစ်နှစ်စာ

အမြတ်ငွေ၏ (၂)ရာခိုင်နှုန်းကို လူမှုရေးဆိုင်ရာ တာဝန်ယူမှု အစီအစဉ်များတွင်အသုံးပြုမည်ဖြစ်ကြောင်း ထည့်သွင်း ပြောကြားသွားပါသည်။

၅။ ဆက်လက်၍ HRD Environmental Training and Services Co., Ltd. မှ အကြံပေးပညာရှင် ဒေါက်တာမြင့်အောင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းနှင့်ပတ်သက်၍ အကြံပြု ရှင်းလင်းဆွေးနွေးရာ ယခုလက်ရှိ စက်ရုံအလုပ်ရုံ စီမံကိန်းများဖော်ဆောင်ရာတွင် စဉ်ဆက်မပြတ် ဖွံ့ဖြိုးတိုးတက်သော စီမံကိန်း အဖြစ်ဖော်ဆောင်ရန်အရေးကြီးပါကြောင်း၊ ထိုသို့ဖော်ဆောင်ရာတွင်စပ်နွယ်မှု သုံးခုဖြစ်သော စီမံကိန်း လုပ်ငန်း၊ သဘာဝပတ်ဝန်းကျင်၊ ဒေသခံလူထု ဟန်ချက်ညီရမည်ဖြစ်ကြောင်း၊ စီမံကိန်း လုပ်ငန်း တစ်ခုဘဲတိုးတက်ပြီး သဘာဝပတ်ဝန်းကျင်လည်းပျက်ဆီး ဒေသခံလူထုလည်းထိခိုက် နစ်နာမှုများရှိပါက ၎င်းစီမံကိန်းမှာ ရည်ရွယ်ရပ်တည်နိုင်မှာမဟုတ်ကြောင်း၊ အလျှင်အမြန်လုပ်ငန်း ရပ်ဆိုင်းသွား ရမည်သာဖြစ်ကြောင်း၊ ထိုကြောင့်လည်း စီမံကိန်းဖော်ဆောင်သူ ကုမ္ပဏီသည် သဘာဝ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ရန် မိမိတိုလို တတိယအဖွဲ့အစည်းပညာရှင်များနှင့် လုပ်ဆောင်ရပြီး တစ်ဖက်မှလည်း ဒေသခံလူထု ထိခိုက်နစ်နာမှုများ၊ စိုးရိမ်မှု၊ လိုလားမှုများ အမှန်ကန်သိရှိနိုင်ရန်အတွက် ယခုကဲ့သို့ လူထုတွေ့ဆုံပွဲများကျင်းပရခြင်းဖြစ်ကြောင်း၊ ထို့ကြောင့် ရပ်မိရပ်ဖများနှင့် တက်ရောက်လာ သူများမှာ အားမနာတမ်း ပွင့်ပွင့်လင်းလင်း ဆွေးနွေးအကြံပေးရန် အရေးကြီးကြောင်း၊ သို့မှသာ စီမံကိန်းဖော်ဆောင်သူအနေဖြင့်လည်း ဒေသခံတို့၏ ထိခိုက်နစ်နာမှုများ၊ စိုးရိမ်မှု၊ လိုလားမှုများကိုသိရှိပြီး လိုက်ပါပူးပေါင်းဆောင်ရွက်နိုင်မှာဖြစ်ကြောင်း၊ သို့ဖြစ်၍ ပတ်ဝန်းကျင်ထိခိုက်မှုအနည်းဆုံးနှင့် ဒေသခံများ၏ လူမှုစီးပွားရေး၊ ဒေသဖွံ့ဖြိုးတိုးတက်လာပြီး မိမိစီမံကိန်းလည်းကောင်းစွာလည်ပတ်နိုင်သည့် စဉ်ဆက်မပြတ် ဖွံ့ဖြိုးတိုးတက်သော စီမံကိန်းဖြစ်လာမည် ဖြစ်ကြောင်း အကြံပြုပြောကြားခဲ့ပါသည်။

၆။ အခမ်းအနားအစီအစဉ်အရ အခမ်းအနားသို့ တက်ရောက်လာကြသူများမှ သိရှိလို သည်များအား မေးမြန်းဆွေးနွေးခြင်းနှင့် တာဝန်ရှိသူတို့မှ ပြန်လည်ဖြေကြားခြင်း အစီအစဉ်ဖြစ် သည့်အတွက် ဆွေးနွေးမေးမြန်းခြင်းများပြုလုပ်ခဲ့ပါသည်။ ဆွေးနွေးမေးမြန်းမှု အကြောင်းအရာများမှာ အောက်ဖော်ပြပါ အတိုင်း ဖြစ်ပါသည်။

(၁) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည် -ဦးခင်သိန်း၊ ရာအိမ်မှူး (ထန်းပင်စု)

အကြောင်းအရာ - ယခင်က စက်ရုံတွင်းလုပ်ငန်းများဆောင်ရွက်ပါက အနံ့ဆိုးများထွက်ရှိသဖြင့် ပတ်ဝန်းကျင်ရှိရွာသားများ ကျန်းမာရေးထိခိုက်မှုရှိပါသည်။ သို့သော်ယခုပြန်လည်ပြင်ဆင်လိုက် သဖြင့် ယင်းအနံ့ဆိုးများ မထွက်တော့ပါ။ လိုအပ်ပါက ဒေသခံကျေးရွာလူထု၏ ကျန်းမာရေး၊ လူမှုရေးပြဿနာမရှိအောင် ကျေးရွာလူထုမှ တောင်းဆိုလာလျှင် ဆောင်ရွက်ပေးနိုင်ပါသလား။

ရှင်းလင်းဖြေကြားသူ၏အမည် - ဦးသန့်ဇင်၊ (MSNAG)

ထုတ်လုပ်မှုနည်းစနစ်သစ်အရ ကုန်ကြမ်းအမျိုးအစားပြောင်းလဲခြင်းနှင့် ခေတ်မီစက်ကရိယာများ တပ်ဆင်ခြင်းတို့ကြောင့် အနှံထွက်မှု တော့်ကြောင်းနှင့် ကျေးရွာလူထုမှ ကျန်းမာရေးနှင့် လူမှုပတ်ဝန်းကျင် ထိခိုက်မှုရှိသည်ဟု ဆိုလာပါက စီစစ်ပြီးအချိန်နှင့်တစ်ပြေးညီ ဆောင်ရွက်ပေးမည်ဖြစ်ကြောင်း ပြန်လည် ဖြေကြားပါသည်။

(၂) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည်- ဦးလှခိုင်၊ရပ်/ကျေးအုပ်ချုပ်ရေးမှူး (ကန်ပတ်ရိုး)

အကြောင်းအရာ - မိမိတို့ကျေးရွာရှိမိုးရေစုရေကန်မှ ရေမှာမကောင်းတောကြောင်း ထန်းတပင်ကျေးရွာရှိရေကန်မှ သွားရောက်ခပ်ယူနေရသဖြင့် မိမိတို့ရွာ၌ သောက်သုံးရေရှိရန်လုပ်ကိုင်ဆောင်ရွက်ပေးစေလိုကြောင်း တင်ပြဆွေးနွေးပါသည်။

နည်းပညာတာဝန်ခံ ဒေါ်သဇင်ညွန့်မှ ပြန်လည်ဖြေကြားရာတွင် မိမိတို့ အထက် ဒါရိုက်တာအဖွဲ့သို့ တင်ပြ၍ ဦးကြီးတို့ကျေးရွာ ရေရရှိရန် ဆောင်ရွက်ပေးမည်ဖြစ်ပါကြောင်း၊ ပြန်လည် ဆွေးနွေးတင်ပြပါသည်။

(၃) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည်- ဦးတင့်လွင်၊ ရပ်မိ၊ရပ်ဖ (ထန်းတစ်ပင်)

အကြောင်းအရာ - မိမိတို့နီးစပ်ကျေးရွာများမှ လယ်သမားများအား စက်ရုံမှ ဓာတ်မြေဩဇာထုတ်ကုန်များကို သက်သာသောလျော့ဈေးနှင့် ရောင်းချပေးစေလိုကြောင်း ဆွေးနွေးတင်ပြပါသည်။

နည်းပညာတာဝန်ခံ ဒေါ်သဇင်ညွန့်မှ ပြန်လည်ဖြေကြားရာတွင် မိမိတို့ စက်ရုံမှ ဓာတ်မြေဩဇာထုတ်ကုန်များကို သက်သာသောလျော့ဈေးနှင့် ဒေသခံတောင်သူ လယ်သမားများအား ရောင်းချပေးပါမည်ဟု ပြန်လည် ဆွေးနွေးတင်ပြပါသည်။

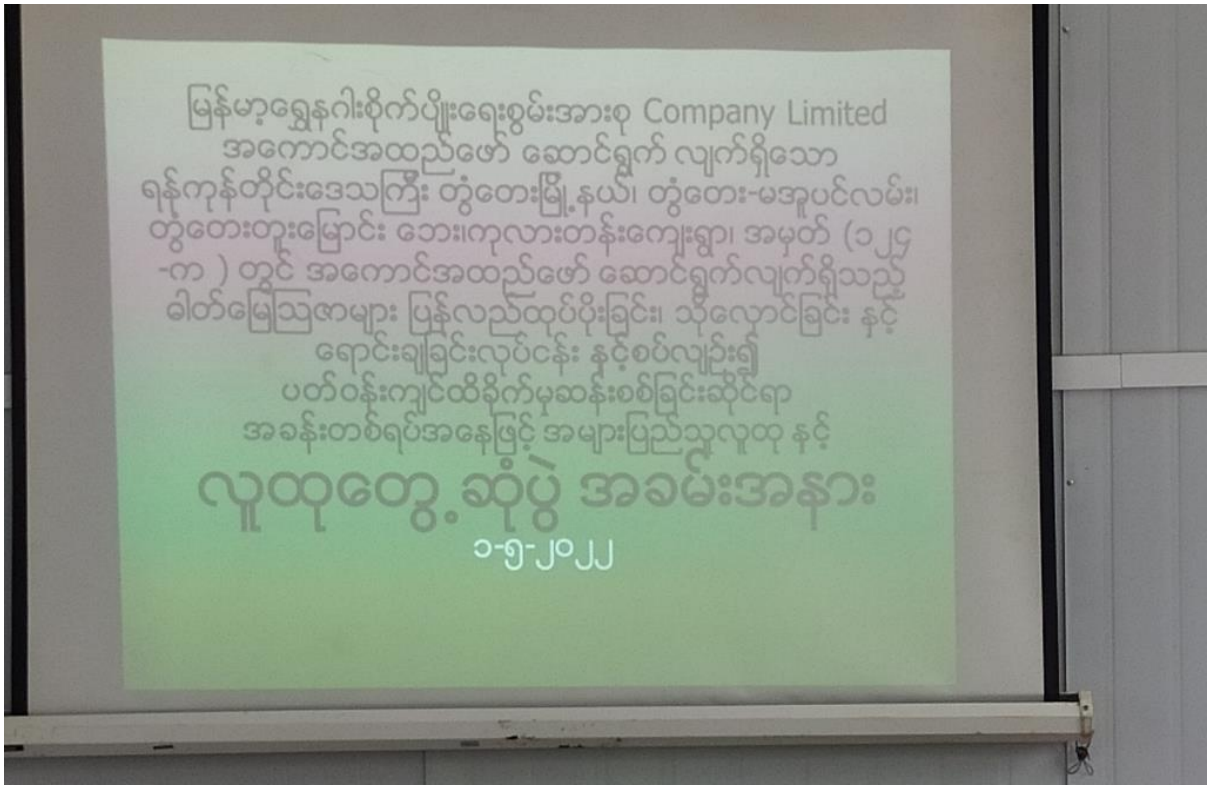
(၄) ပါဝင်ဆွေးနွေးမေးမြန်းသူ၏အမည်- ဦးထွန်းအေး၊ ကျေးအုပ်ချုပ်ရေးမှူး (ထန်းပင်စု)

အကြောင်းအရာ - မိမိတို့အနေဖြင့် စက်ရုံမှသတင်းအချက်အလက်ရရှိမှု၊ ပွင့်လင်း မြင်သာမှုတို့နှင့် သက်ဆိုင်သူများမှ ပေးထားသော အချက်အလက် များကို ရပ်ရွာလူထု နားလည် နိုင်စေရန် အရေးကြီးပါကြောင်း၊ မိမိတို့မှ ယခုပွဲတွင်မှမဟုတ်ဘဲ ကျန်အချိန် အကြံပြုခြင်ပါက မည်သို့ဆက်သွယ်ဆောင်ရွက်ရမည်ကို သိရှိလိုပါကြောင်း ဆွေးနွေးပါသည်။

နည်းပညာတာဝန်ခံ ဒေါ်သဇင်ညွန့်မှ ပြန်လည်ဖြေကြားရာတွင် စက်ရုံ၌ မကျေနပ်ချက် တိုင်ကြားခြင်း ယန္တရားအစီအစဉ် ဖော်ဆောင်ထားမည်ဖြစ်ပြီး လူထုဆက်သွယ်ရေး တာဝန်ခံခန့်အပ်ဆောင်ရွက်မည်ဖြစ်ကြောင်း၊ ဆက်သွယ်ရမည့် ဖုန်းနံပါတ်များနှင့် အကြံပြုစာများထည့်ရန် စက်ရုံရှေ့ဂိတ်တွင်စီစဉ်ထားပေးမည်ဖြစ်ကြောင်း ပြန်လည် ပြောကြားပါသည်။

ထို့နောက် ဦးသန့်ဇင်မှ မိမိတို့စက်ရုံမှ ထုတ်လုပ်မှုစနစ်ပြောင်းလဲလိုက်သဖြင့် အနံ့ဆိုးများ မထွက်တော့သည်ကို တက်ရောက်လာသည့် လူကြီးမင်းများအားလုံးလသည်း လေ့လာသိရှိပြီးဖြစ်သည့် အတွက် စက်ရုံလည်ပတ်မှုနှင့် ပတ်သက်၍ ကန့်ကွက်မည့်သူများ ရှိပါသလားဟု သုံးကြိမ်မေးမြန်းခဲ့ရာ တက်ရောက်လာသည့် လူကြီးမင်းများမှ မရှိပါဟုဖြေကြားပေးခဲ့သည့်အတွက် ကျေးဇူးတင်ရှိပါကြောင်း၊ ဒေသခံ ရပ်မိရပ်ဖများအနေဖြင့် တစ်ဖက်တစ်လှမ်းမှ ကုမ္ပဏီ၏ လိုအပ်ချက်များရှိခဲ့လျှင် အချိန်မရွေးဆက်သွယ် အကြံပြုပြောကြားနိုင်ကြောင်း နိဂုံးချုပ်အနေဖြင့်ပြောကြားခဲ့ပါသည်။

၇။ အခမ်းအနားအစီအစဉ်အရတွေ့ဆုံပွဲ အခမ်းအနားပြီးစီးကြောင်းပြောကြားပါသည်။



HRD Environmental Training and Services Co., Ltd. မှ EIA/SIA Team Leader ဖြစ်သူ
ဒေါက်တာအောင်လေးတင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆိုင်ရာ လုပ်ငန်းစဉ်များကို ရှင်းလင်းပြောကြားစဉ်

HRD Environmental Training and Services Co., Ltd. မှ အကြံပေးပညာရှင် ဒေါက်တာမြင့်အောင်မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းနှင့်ပတ်သက်၍ အကြံပြု ရှင်းလင်းပြောကြားစဉ်

ဒုတိယအကြိမ်လူထုတွေ့ဆုံပွဲဓာတ်ပုံမှတ်တမ်းများ (၁-၅-၂၀၂၂)

Meeting Attendance Lists for First Public Meeting

HRD Environmental Training and Services Co., Ltd.
Human Resource Development Environmental Training and Services
Register Address: Room.3, Bdg.2,Quarter 3, Insein Road, Mayangon Township,Yangon
Phone : +95 256036414, +95 969827026
Email :, aunglaytin@gmail.com , hrd.environment2019@gmail.com

မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော် ဆောင်ရွက် လျက်ရှိသော ရန်ကုန်တိုင်းဒေသကြီး တွံတေးမြို့နယ်၊ တွံတေး-မအူပင်လမ်း၊ တွံတေးတူးမြောင်း ဘေး၊ကုလားတန်းကျေးရွာ၊ အမှတ် (၁၂၄ -က) တွင် အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိသည့် ဓါတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်း နှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ အစမ်းတစ်ရပ်အနေဖြင့် အများပြည်သူလူထု နှင့်တိုင်ပင်ဆွေးနွေးလိုပါသောကြောင့် လူထုတွေ့ဆုံပွဲ တက်ရောက်လာသူများ

ရက်စွဲ။ ၂၀၂၂ ခုနှစ် မေလ (၁) ရက်

နေရာ။ အမှတ် (၁၂၄ -က)မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက် စက်ရုံဂိုထောင်

စဉ်	အမည်	ရာထူး၊ ဌာန၊	ကျေးရွာ
၁	ဦး ခင်သိန်း	[illegible]	[illegible]
၂	[illegible]	[illegible]	〃
၃	[illegible]	[illegible]	〃
၄	[illegible]	[illegible]	〃
၅	[illegible]	〃	〃
၆	မြင့်ကျော်	[illegible]	[illegible]
၇	[illegible]	[illegible]	〃
၈	[illegible]	[illegible]	〃
၉	[illegible]	〃	〃
၁၀	[illegible]	〃	〃
၁၁	[illegible]	[illegible]	〃
၁၂	[illegible]	〃	〃
၁၃	[illegible]	[illegible]	〃
			[illegible]
၁၄	[illegible]	[illegible]	[illegible]
၁၅	[illegible]	〃	〃
၁၆	[illegible]	〃	〃
၁၇	[illegible]	〃	〃
၁၈	[illegible]	〃	〃

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မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော် ဆောင်ရွက် လျက်ရှိသော ရန်ကုန်တိုင်းဒေသကြီး တွံတေးမြို့နယ်၊ တွံတေး-မအူပင်လမ်း၊ တွံတေးတူးမြောင်း ဘေးကုလားတန်းကျေးရွာ၊ အမှတ် (၁၂၄ -က) တွင် အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိသည့် ဓါတ်မြေဩဇာများ ပြန်လည်ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း နှင့် ရောင်းချခြင်းလုပ်ငန်း နှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ အခန်းတစ်ရပ်အနေဖြင့် အများပြည်သူလူထု နှင့်တိုင်ပင်ဆွေးနွေးလိုပါသောကြောင့် လူထုတွေ့ဆုံပွဲ တက်ရောက်လာသူများ

ရက်စွဲ၊ ၂၀၂၂ ခုနှစ် မေလ (၁) ရက်

နေရာ၊ အမှတ် (၁၂၄ -က)၊မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးစွမ်းအားစုကုမ္ပဏီလီမိတက် စက်ရုံရုံးဝင်း

စဉ်	အမည်	ရာထူး ဌာန၊	ကျေးရွာ [illegible]
၁၉ ၊	[illegible]	[illegible]	[illegible]
၂၀ ၊	[illegible]	[illegible]	,, [illegible]
၂၁ ၊			
၂၂ ၊			
၂၃ ၊			
၂၄ ၊			
၂၅ ၊			
၂၆ ၊			
၂၇ ၊			
၂၈ ၊			
၂၉ ၊			
၃၀ ၊			
၃၁ ၊			
၃၂ ၊			
၃၃ ၊			
၃၄ ၊			
၃၅ ၊			

APPENDIX C

Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM) is a system to deal with any grievance or complain related to the Project comprehensively. A Grievance Redress Mechanism (GRM) will be established at project effectiveness as a part of M&E, Safeguard and Citizen Engagement mechanism. This will capture grievances made by the direct and indirect project beneficiaries as well as nonproject beneficiaries who may be impacted by the project during implementation. The MSNAG considers the GRM experiences and describes GRM at each project stage to initiate the Project to solve environmental and social related grievances during operation and closing phases.

1. Objective of the GRM

- To implement grievance management procedures that are easy to comprehend, culturally appropriate, and readily available and accessible to all stakeholders;
- To address grievances promptly and effectively, in a transparent manner resulting in the outcomes that are seen as fair, effective and lasting;
- To provide effective monitoring and reporting of grievances through a modern means of communication and information technology.

2. Application Stage

Operation and closing phases of the project

3. Executing Institute

Operational phase: MSNAG

Construction and closing phases: MSNAG and Contractor

4. Publicize the GRM to Stakeholders

All stakeholders will be informed about the availability of the GRM system so as to enable them to use the system whenever they need it. During community engagement processes, local stakeholders will be informed about the system including various means available to lodge grievance. Information about the GRM system, including contact details, will be distributed at Public Consultation Meetings through brochures/pamphlets in local languages to the extent possible, posted at project offices, the village tract and on village notice boards. The project will also make sure the availability of grievance forms as shown in below and pre-addressed envelopes available in factory offices. Phone numbers will be placed on project locations. The complaint can also be lodged through the MSNAG follow by

Facebook Page https://m.facebook.com/myanmashwenagaroffice/

Email address < myanmashwenagaroffice @gmail.com>. and

Website address < https:// myanmashwenagar.com>.

Any stakeholder including customer, villagers, contractors, factory staff, authorities, and other involved parties may file a grievance if they consider that their right to information is interfered with; that inappropriate intervention by an outside party is found; that fraud or corruption has taken place; that the rights and entitlements granted in this EIA are violated; or that any of the project's principles and procedures have been violated.

5. Monitoring Plan

Provisional parameters and timing of monitoring are as follows:

Table 1 Parameters and Timing of Monitoring

Project Phase	Monitoring Method	Location	Frequency	Responsible organization
Operation	Checking records of grievances (date of reception, contents of the grievance/ complaint, status/ responses/ countermeasures) *Show Table 2*	Factory operation activities and facilities	Weekly	MSNAG
Closure	Ditto	Project Closure site	Weekly	Contractor/ MSNAG

6. Grievance Form

Instructions: (Attach any supporting documentation/letters as relevant).

Grievance Form

Grievance Registration No.
Date of Registration

Details of complainant

Anonymity (Yes/No)

Name: (information is optional and always treated as confidential)
Gender:
Address:

Contact Details:
Primary Mobile No.
Email:

Nature of the project impact on complainant:

☐Physically displaced ☐ Economically displaced ☐Others

Brief description of grievance: (Provide as much detail and facts as possible)

Mode of submission of grievance

☐ Phone ☐ Written ☐ Complaint Box ☐ Verbal
☐Email ☐ Facebook Page ☐ In person ☐ Other

_____ _____

Signature of Complainant **Signature of Officer**

Table 2: Grievance Registry

No.	Date of receiving incoming letter /form	Grievance Reference Number	Name of grievance originator	Type and detail of Grievance	Medium of commu-nication	Name of staff responsible for managing the grievance	Date of grievance acknowledge-ement	Date of feedback provision/ reference number	Present status	Remark

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်

Certificate of Incorporation

မြန်မာ့ရွှေနဂါးအဂရီကားချာရယ်ဂရု ကုမ္ပဏီ လီမိတက်

MYANMA SHWE NAGAR AGRICULTURAL GROUP COMPANY LIMITED

Company Registration No. 103009898

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ

မြန်မာ့ရွှေနဂါးအဂရီကားချာရယ်ဂရု ကုမ္ပဏီ လီမိတက်

အား ၂၀၁၆ ခုနှစ် စက်တင်ဘာလ ၂၆ ရက်နေ့တွင်

အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ

အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that

MYANMAR SHWE NAGAR AGRICULTURAL GROUP COMPANY LIMITED

was incorporated under the Myanmar Companies Act 1914 on 26 September 2016 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ

Registrar of Companies

ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

Directorate of Investment and Company Administration

Former Registration No. 549FC/2016-2017(YGN)

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

စက်မှုဝန်ကြီးဌာန

စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန

ပုဂ္ဂလိကစက်မှုလုပ်ငန်းမှတ်ပုံတင်လက်မှတ်

စက်မှုမှတ်ပုံတင်အမှတ် [illegible] ရက်စွဲ [illegible]. ၁၁. ၂၀၁၀

လုပ်ငန်းအရွယ်အစား အကြီးစား ပြည်ထောင်စုနယ်မြေ/တိုင်းဒေသကြီး/ပြည်နယ် ရန်ကုန်

အောက်ပါလုပ်ငန်းသည် ပုဂ္ဂလိကစက်မှုလုပ်ငန်း ဥပဒေ ပုဒ်မ ၇ ပုဒ်မခွဲ ([illegible])အရ မှတ်ပုံတင်ပြီး ဖြစ်ပါသည်။

၁။ လုပ်ငန်းအမည် မြန်မာ့ရွှေနဂါးစိုက်ပျိုးရေးအုပ်စု ကုမ္ပဏီလီမိတက်ရွှေနဂါးဓာတ်မြေဩဇာလုပ်ငန်း

၂။ လုပ်ငန်းအမျိုးအမည် ကုန်ကြမ်းပစ္စည်းလုပ်ငန်း

၃။ အဓိကကုန်ချောပစ္စည်းအမျိုးအမည် ရွှေနဂါး Top One[ဝပေါ်းသီးသန့်အားဆေးမြေဩဇာ(25 kg,50kg)] ရေပေါ်ကောင်းပေါင်းသေအားဆေးမြေဩဇာ(25 kg)] ရွှေနဂါး ရွှေပုလဲ[သီးနှံစုံအသီးအားဆေးမြေဩဇာ(25 kg)] သီးနှံစုံအပင်အားဆေးမြေဩဇာ(25 kg)] ရွှေနဂါး [illegible] ဓာတ်စပ်မြေဩဇာထူးအာနိသင်မြင့်ရွက်ဖျန်းအားဆေး ဗူးပါလည်တီးဆဲဗင်း(A.A.) "ရွှေနဂါး" အမည်ဖြင့်ထုတ်

၄။ တည်နေရာလိပ်စာ အမှတ်(၄၀၂)၊ ယောအဘွင်းဝန်ဦးဖိုးလှိုင်လမ်း၊ ရွှေလင်ပန်းစက်မှုဇုန်၊ လှိုင်သာယာမြို့နယ်၊ မြောက်ပိုင်းခရိုင်

၅။ ပိုင်ဆိုင်မှုအမျိုးအစား ကုမ္ပဏီပိုင်

၆။ လုပ်ငန်းရှင်အမည် ဒေါ်ကျင်ငွေး(M.D)

၇။ ကိုင်ဆောင်သည့်မှတ်ပုံတင်အမှတ် ၁၁/လရန(နိုင်)၀၀၂၀၄၀

၈။ ရင်းနှီးမြှုပ်နှံမှုတန်ဖိုး(ကျပ်) [illegible] သန်း တည်ထောင်သည့်ခုနှစ် ၂၀၁၁

၉။ အသုံးပြုသည့်အားအမျိုးအစား ထရန်စဖော်မာ/လျှပ်ထုတ်စက် မြင်းကောင်ရေ ၅၇၇ HP/ ၄၅ KVA

၁၀။ အလုပ်သမားဦးရေ ၁၁၁ ဦး

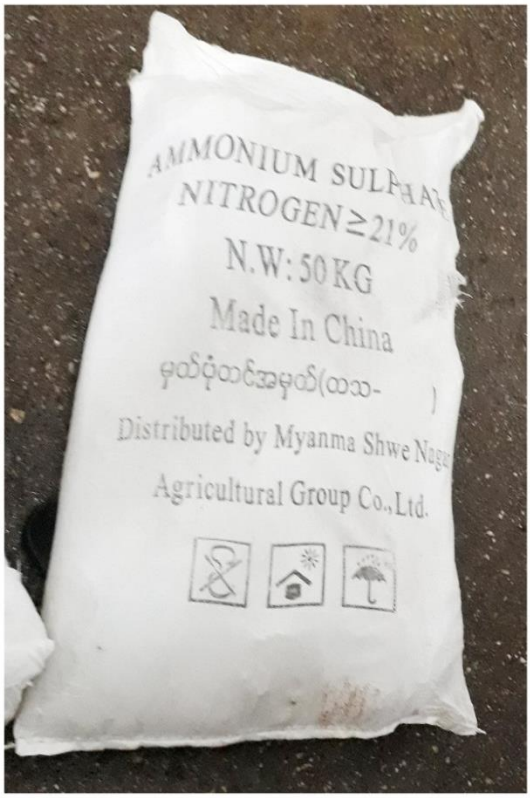
၁၁။ မှတ်ပုံတင်သက်တမ်းကုန်ဆုံးသည့်နေ့ရက် ၃၁. ၁၁. ၂၀၁၅

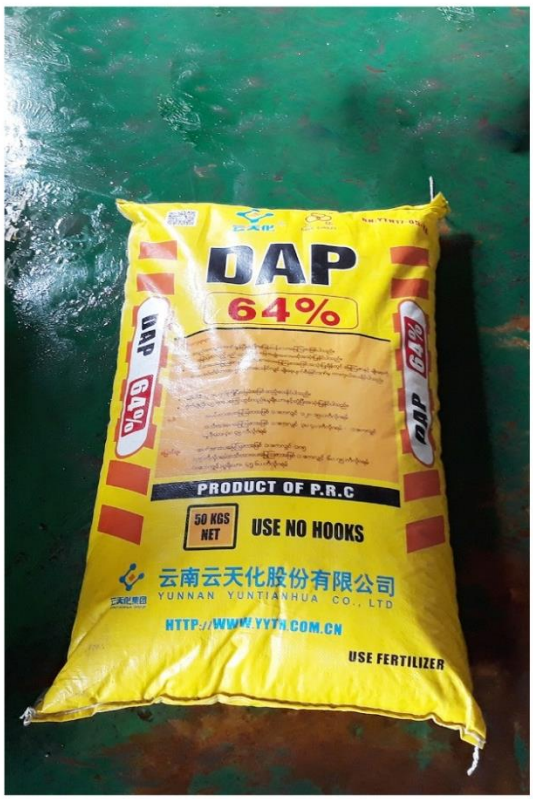
အေးအေးဝင်း

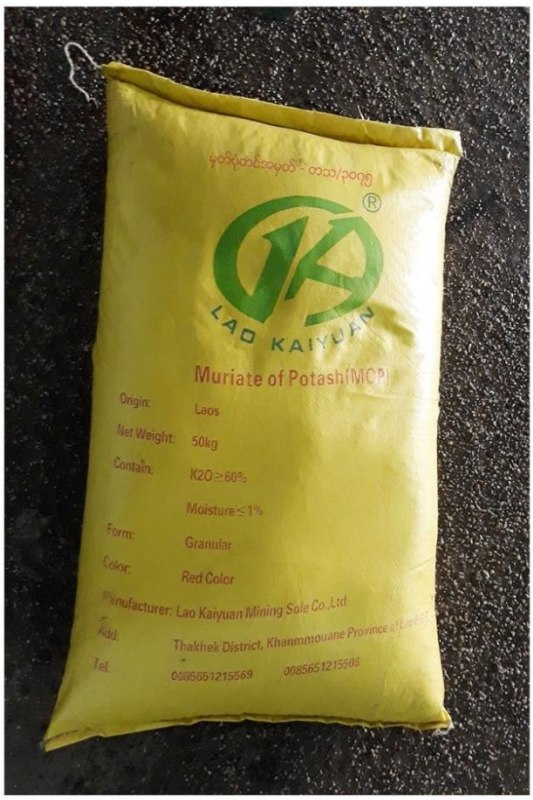
ညွှန်ကြားရေးမှူးချုပ်

ကုန်ကြမ်းပစ္စည်းများ


GRANULAR
AMMONIUM CHLORIDE
N:25%MIN
N.W:50.0KGS
G.W:50.1KGS
MADE IN CHINA
Distributed by Myanma Shwe Nagar
Agricultural Group Co.,Ltd.


AMMONIUM SULPHATE
NITROGEN≥21%
N.W: 50 KG
Made In China
Distributed by Myanma Shwe Nagar
Agricultural Group Co.,Ltd.


DAP
64%
PRODUCT OF P.R.C
50 KGS NET
USE NO HOOKS
云南云天化股份有限公司
YUNNAN YUNTIANHUA CO., LTD
HTTP://WWW.YYTH.COM.CN
USE FERTILIZER


LAO KAIYUAN
Muriate of Potash(MOP)
Origin: Laos
Net Weight: 50kg
Contain: K2O≥60%
Moisture≤1%
Form: Granular
Color: Red Color

သိုလှောင်ရုံပုံ

ကုန်ကြမ်းများ သိုလှောင်ထားရှိပုံ