



ENVIRONMENTAL MANAGEMENT PLAN
for
Limestone Mining
at
Taung Philar Mountain Block (150 Acres), Taung
Philar Area, Lewei Township, Nay Pyi Taw Council
Area
by
Naypyitaw City Development Committee
(AMENDED)



Prepared by U Myint Kyaw Thura & teams

December, 2024



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ACRONYMS AND ABBREVIATION

ADB	Asian Development Bank
ASEAN	Association of South-East Asian Nations
BOD	Biochemical Oxygen Demand
BTA	Best Technology Available
CGM	Complaints and Grievances Mechanism
COD	Chemical Oxygen Demand
CSR	Corporate Social Responsibility
dBA	Decibel A- weighting
DM	Department of Mines
ECD	Environmental Conservation Department
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EITI	Extractive Industry Transparency Initiative
EMP	Environmental Management Plan
EU	European Union
FGD	Focal Group Discussion
GDP	Gross Domestic Products
ID	Identity Card
IFC	International Finance Corporation
KII	Key Informant Interview
MESC	Myanmar Environment Sustainable Conservation
MOECAF	Ministry of Environmental Conservation and Forestry
MONREC	Ministry of Natural Resources and Environmental Conservation
MP	Monitoring Plan

NCDC	Naypyitaw City Development Committee
NGO	Non-Government Organization
PEB	Payment for Ecosystem Benefits
PES	Payment for Ecosystem Services
PPE	Personnel Protection Equipment
4Rs	Reduce, reuse, recover and recycle
SS	Secondary Source
STD	Sexually Transmitted Diseases
TDS	Total Dissolved Salts
TSS	Total Suspended Solid
NCDC	Nay Pyi Taw City Development Council
MT	Metri Ton

အကျဉ်းချုပ်အစီရင်ခံစာ

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်သည် တောင်ဖီလာဒေသ၊ လယ်ဝေးမြို့နယ်၊ နေပြည်တော် ကောင်စီ ဧရိယာ တွင် Max Myanmar Manufacturing ကုမ္ပဏီလီမိတက်မှ နှစ်ရှည်ငှားရမ်းလုပ်ကိုင်ခွင့် ရရှိထားသော ထုံးကျောက်လုပ်ကွက် ဧက ၁၅၀ မှ ထုံးကျောက်ထုတ်လုပ်ခြင်း လုပ်ငန်းအတွက် ဖြစ်သည်။

Max Myanmar Manufacturing ကုမ္ပဏီလီမိတက်သည် ထုံးကျောက်ထုတ်လုပ်ခြင်း/ ကျောက်မိုင်း ထုတ်လုပ်ခြင်းအတွက် တောင်ဖီလာဒေသ၊ လယ်ဝေးမြို့နယ်၊ နေပြည်တော် ကောင်စီဧရိယာ တွင် အဆိုပြုထားပါသည်။ အမှန်တကယ်မှာ ၎င်းစီမံကိန်းသည် နေပြည်တော်စည်ပင်သာယာရေး ကော်မတီ (NCDC) အပိုင် ဖြစ်ပါသည်။ Max Myanmar Manufacturing ကုမ္ပဏီလီမိတက်သည် နေပြည်တော်စည်ပင်သာယာရေး ကော်မတီ (NCDC) မှ ဇန်နဝါရီ ၆ ရက် ၂၀၂၃ ခုနှစ်တွင် ငှားရမ်းထားခြင်း ဖြစ်ပါသည်။ တင်ပြထားသော စီမံကိန်းသည် တူးဖော်လက်စ မိုင်းလုပ်ငန်း ဖြစ်ပါသည်။ မိုင်းလုပ်ငန်း ပြင်ဆင်ခြင်းနှင့် ဖွံ့ဖြိုးခြင်း လုပ်ငန်းစဉ် သည် နေပြည်တော်စည်ပင်သာယာရေး ကော်မတီ (NCDC) လက်ထက်တွင် လုပ်ဆောင်ထားပြီးဖြစ်ပါသည်။

Max Myanmar Manufacturing ကုမ္ပဏီလီမိတက်သည် ၂၀၀၉ ဒီဇင်ဘာတွင် တရားဝင်မှတ်ပုံ တင်ထားသော ကုမ္ပဏီဖြစ်ပါသည်။ (စာအမှတ်- ၁၂၃၀/၂၀၀၇-၂၀၀၈၊ ရက်စွဲ- ၁၇-၁၂-၂၀၀၉)။ ကုမ္ပဏီ မှတ်ပုံတင် နံပါတ်မှာ ၁၄၁၆၉၂၅၃၄ ဖြစ်ပါသည်။ ခန့်မှန်း ဘတ်ဂျက်မှာ- ၃၀၀,၀၀၀,၀၀၀ ဖြစ်ပါသည်။

- စီမံကိန်း လုပ်ဆောင်သူ အမည် : Max Myanmar Manufacturing Co., Ltd, Nay Pyi Taw City Development Committee (NCDC)
- လိပ်စာ : အမှတ်-၁၂၃ အလံပြ ဘုရားလမ်း၊ ဒဂုံ မြို့နယ်၊ ရန်ကုန်တိုင်း၊ မြန်မာ
- ဆက်သွယ်ရန် ဖုန်းနံပါတ် : ၀၉၅၀၀၉၉၈၈
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လုပ်ဆောင်မည့် အဖွဲ့အစည်း: Ltd (MESC)
အသေးစိတ်ကို အခန်း-၁ တွင် ဖော်ပြထားပါသည်။

မူဝါဒ၊ ဥပဒေရေးရာ နှင့် ဖွဲ့စည်းမှု မူဘောင်

ထုံးကျောက်တူးဖော်ခြင်း လုပ်ငန်း ကို လုပ်ဆောင်ရာတွင် စီမံကိန်း အဆိုပြုသူသည် အောက်ဖော်ပြပါ ဥပဒေ၊ နည်းဥပဒေများကို လိုက်နာပါမည်။

- ၁။ မြန်မာ့သတ္တုတွင်း ဥပဒေ (၂၀၁၅)
- ၂။ မြန်မာ့သတ္တုတွင်း နည်းဥပဒေ (၂၀၁၈)
- ၃။ ဇီဝမျိုးစုံမျိုးကွဲနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ဥပဒေ (၂၀၁၈)
- ၄။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ (၂၀၁၂)
- ၅။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေ (၂၀၁၄)
- ၆။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း စာအမှတ် ၆၁၆/၂၀၁၅
- ၇။ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်သွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅)
- ၈။ ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၀၆)
- ၉။ ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၁၃)
- ၁၀။ မြန်မာ့သစ်တောမူဝါဒ (၂၀၁၈)
- ၁၁။ ပေါက်ကွဲစေတတ်သော ပစ္စည်းအက် ဥပဒေ (၂၀၀၁)
- ၁၂။ ယဉ်ကျေးအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းရေး ဥပဒေ (၂၀၁၉)
- ၁၃။ မြန်မာ အဝေးပြေးလမ်းမ ဥပဒေ (၂၀၀၀)
- ၁၄။ မြန်မာ့အာမခံဥပဒေ (၁၉၉၃)
- ၁၅။ မြန်မာနိုင်ငံ မီးသတ်ဥပဒေ ၂၀၁၅
- ၁၆။ လူမှုဖူလုံရေးဥပဒေ (၂၀၁၂)
- ၁၇။ မြန်မာနိုင်ငံ ကုမ္ပဏီများ ဥပဒေ (၂၀၁၇)
- ၁၈။ အလုပ်သမားအဖွဲ့အစည်း ဥပဒေ (၂၀၁၁)
- ၁၉။ အလုပ်သမားရေးရာ အငြင်းပွားမှု ဖြေရှင်းရေး ဥပဒေ (၂၀၁၂)

- ၂၀။ အလုပ်အကိုင်နှင့် ဖွံ့ဖြိုးတိုးတက်ရေး ဥပဒေ (၂၀၁၃)
- ၂၁။ လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေး နှင့် ကျန်းမာရေးဆိုင်ရာ ဥပဒေ (၂၀၁၉)
- ၂၂။ ခွင့် နှင့် အလုပ်ပိတ်ရက် အက်ဥပဒေ (၁၉၅၁)
- ၂၃။ အလုပ်သမား လျော်ကြေးအက်ဥပဒေ ၁၉၂၃
- ၂၄။ အနည်းဆုံး အခကြေးငွေ ဥပဒေ (၂၀၁၃)
- ၂၅။ ပြည်သူ့ကျန်းမာရေးဆိုင်ရာ ဥပဒေ (၁၉၇၂)
- ၂၆။ ကူးစက်ရောဂါ ကာကွယ်နှိမ်နင်းရေး ဥပဒေ (၁၉၉၅)
- ၂၇။ ဆေးလိပ်နှင့် ဆေးရွက်ကြီးထွက် ပစ္စည်း သောက်သုံးမှု ထိန်းချုပ်ရေး ဥပဒေ (၂၀၁၆)

စီမံကိန်း အကောင်အထည်ဖော်သူသည် အထက်ပါတွင် ဖော်ပြထားသော ဥပဒေ၊ နည်းဥပဒေ နှင့် စည်းမျဉ်းစည်းကမ်းများကို လိုက်နာမည် ဟု ကတိကဝတ် ပြုပါသည်။

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီရင်ခံစာ EMP ကို ကွင်းဆင်းရရှိခဲ့သော လက်ရှိ ပတ်ဝန်းကျင် အခြေအနေ နှင့် ဒေသဆိုင်ရာ အချက်များ၊ KII အင်တာဗျူး မေးမြန်းခြင်း၊ လယ်ဝေးဒေသဆိုင်ရာ အချက်အလက်များကို အခြေခံ၍ ပြင်ဆင်ခဲ့ပါသည်။ ထို့အပြင် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဦးစီးဌာနမှ ပြုစုထားသော ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း စာအမှတ် ၆၁၆/၂၀၁၅ ရက်စွဲ ၂၉-၁၁-၂၀၁၅ နှင့် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်သွေးထုတ်လွှတ်မှု လမ်းညွှန်ချက် (၂၀၁၅) စာအမှတ် ၆၁၅/၂၀၁၅ ရက်စွဲ ၂၉-၁၁-၂၀၁၅ ကို လိုက်နာ၍ ပြင်ဆင်ထားပါသည်။

ဥပဒေ၊ နည်းဥပဒေ နှင့် စည်းမျဉ်းစည်းကမ်းများအကြောင်း အသေးစိတ်အား အခန်း-၂ တွင် ဖော်ပြထားပါသည်။

စီမံကိန်း အကြောင်း ရှင်းလင်းဖော်ပြချက်

Max Myanmar Manufacturing ကုမ္ပဏီလီမိတက်သည် ဖေဖော်ဝါရီ ၂၀၁၀ တွင် Portland ဘိလ်မြေကို စတင်ထုတ်လုပ်ခဲ့ပါသည်။ ဦးဆုံးထုတ်လုပ်မှုမှာ တစ်ရက်လျှင် ၅၀၀ တန် ဖြစ်ပါသည်။ သို့သော် ထုတ်လုပ်မှုကို အဆင့်မြှင့်တင်ပြီး တစ်ရက်လျှင် ၂၀၀၀ တန် ထုတ်လုပ်ခဲ့ပါသည်။ အစမှာ "the wet process" နည်းစနစ်ကို အသုံးပြုပြီး နောက်ပိုင်းတွင် နည်းပညာကို ကြီးကြီးမားမား ပြောင်းလဲပြီး ပြုပြင်မွန်းမံမှု ပြုလုပ်ပြီးနောက် "the dry process" ကို အသုံးပြုခဲ့ပါသည်။

တောင်ဖီလာ လုပ်ကွက် ၁၅၀ ဧကတွင် ထုတ်လုပ်ခွင့် ခွင့်ပြုချက်ကို နေပြည်တော် စည်ပင်သာယာရေး ကောင်စီ ထံမှ ဇန်နဝါရီ ၂၀၂၃ တွင် ငှားရမ်းခဲ့ပါသည်။ တင်ပြထားသော စီမံကိန်းသည် တူးဖော်လက်စ မိုင်းလုပ်ငန်း ဖြစ်ပါသည်။ မိုင်းလုပ်ငန်းပြင်ဆင်ခြင်းနှင့် ဖွံ့ဖြိုးခြင်းလုပ်ငန်းစဉ်သည်

နေပြည်တော် စည်ပင်သာယာရေးကော်မတီ (NCDC) လက်ထက်တွင် လုပ်ဆောင်ထားပြီးဖြစ်ပါသည်။ တစ်နှစ်စာ ထုတ်လုပ်မည့် နှုန်းမှာ တစ်နှစ်လျှင် ၂၄,၀၀၀ မက်ထရစ် တန် (MT) ချိန်ကို ထုတ်ယူပါမည်။ စီမံကိန်း လည်ပတ်မည့် ကာလမှာ ၂၅ နှစ် (၅ နှစ် ၂ ကြိမ် သက်တန်းတိုးခြင်း) ဖြစ်ပါသည်။ ပိတ်သိမ်းခြင်း ကာလမှာ ၁ နှစ် ဖြစ်ပါသည်။

ထုံးကျောက် မိုင်းတွင်း လုပ်ကွက်သည် တောင်ဖီလာတောင်၏ အနောက်ဘက်ခြမ်း နေပြည်တော် ကောင်စီ ဧရိယာ ဖြစ်ပါသည်။ စီမံကိန်းသည် နေပြည်တော်၊ လယ်ဝေးမြို့နယ် အတွင်း တွင် တည်ရှိပါသည်။ စီမံကိန်းနေရာသည် လယ်ဝေးမြို့၏ အရှေ့တောင်ဘက် ၂၂ မိုင် အကွာ နှင့် ရေနီ- ဆတ်ဖြူ တောင်ပတက် ချောင်းလမ်းမှ အရှေ့ဘက် ၃ မိုင် အကွာ နှင့် အောင်နန်းချို ကျေးရွာ အနီးတွင် တည်ရှိပါသည်။ မယ်ဟော်ထိန်းသိမ်းသစ်တောအတွင်းတွင် တည်ရှိပါသည်။

မိုင်းလုပ်ကွက်သည် ၁၅၀ ဧက ရှိပါသည်။ စီမံကိန်း လုပ်ကွက်သည် မြောက်လတ္တီတွဒ် ၁၉ ဒီဂရီ ၃၁ မိနစ်၊ ၃၄.၉၆ စက္ကန့်၊ အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ ၂၄ မိနစ်၊ ၁၈.၀၀ စက္ကန့် ဖြစ်သည်။ အမြင့်ပေမှာ ပင်လယ်ရေ မျက်နှာပြင်ထက် ၅၀၀ မီတာ ဖြစ်ပါသည်။ လယ်ဝေးမြို့နယ် အောင်နန်းချို ကျေးရွာ၏ မြောက်ဘက် မိုင်ဝက်ခန့်နှင့် တောင်ဖီလာတောင်ခြေနှင့် နီးပါသည်။

လုပ်ကွက်သည် ရန်ကုန်- မန္တလေး အဝေးပြေးလမ်းမကြီး၏ အရှေ့ဘက် ၁၀ မိုင်၊ နေပြည်တော် ကောင်စီ ဧရိယာ၏ အရှေ့တောင်ဘက် ၂၅.၅ မိုင် နှင့် ရန်ကုန်မှ မြောက်ဘက် ၁၇၈ မိုင် အကွာ တွင် တည်ရှိပါသည်။

အနီးနားရှိ ကျေးရွာများမှာ အောင်နန်းချို ၊ တဲကြီးကုန်းကျေးရွာ တို့ဖြစ်ပါသည်။

အဆောက်အဦများ (အသေးစား အဆောက်အဦများ အပါအဝင်)-

- ၁။ ရုံးအဆောက်အဦး (geologists၊ mining engineers၊ demolition experts နှင့် general staff များ အတွက်)
- ၂။ လောင်စာဆီ သိုလှောင်ရာ နေရာ
- ၃။ စတိုးဆိုင်
- ၄။ ယာဉ်ပြုပြင်သည့် နေရာ
- ၅။ ပေါက်ကွဲစေသော ပစ္စည်းများသိမ်းဆည်းသည့်နေရာ Magazine
- ၆။ ပျိုးပင်စိုက်ခင်း

အခြားအဓိက အစိတ်အပိုင်းများ

၁။ စက်ပစ္စည်းကြီးများ နှင့် ယာဉ်များ ရပ်နားနေရာ

၂။ ကြိတ်ခွဲစက်ပစ္စည်းများ

၃။ ကြိတ်ခွဲစက်

၄။ ထုံးကျောက်တုံးကြီးများ စုပုံထားရာနေရာ

၅။ အမှုန့်ကြိတ်ထားသော ထုံးကျောက်များ သိုလှောင်ရာ နေရာ

၆။ မြေစာများစုပုံထားရာ နေရာ

၇။ မြေဆီလွှာများ စုပုံထားရာ နေရာ

၈။ Blast shelter

ထုတ်လုပ်မည့် နည်းစနစ်

ထုံးကျောက်ထုတ်လုပ်ခြင်းအတွက် ဟင်းလင်းပွင့် တူးဖော်ခြင်း ဒီဇိုင်းကို အသုံးပြုပါမည်။ ထုတ်ယူခြင်းအတွက် ဖောက်ခွဲခြင်းကို တစ်ပတ်လျှင် ၂ ရက် လုပ်ဆောင်ပါမည်။ ဖောက်ခွဲခြင်းကို (ညနေ ၄:၃၀-၅:၀၀) တွင် လုပ်ဆောင်ပါမည်။ ထို့နောက် တူးခြင်း နှင့် ထုတ်လုပ်ခြင်းကို excavatorများ ဘူဒိုဇာများကို အသုံးပြု၍ လုပ်ဆောင်ပါမည်။

တူးဖော်/ထုတ်ယူထားသော ထုံးကျောက်များကို သိုလှောင်သည့် နေရာနှင့် ကပ်လျက် နေရာ တွင် ရှိသော ကျောက်ခွဲစက်မှ ကျောက်ကြိတ်ခွဲသည့် နေရာများသို့ excavator နှင့် super dumper များ အသုံးပြု၍ သယ်ယူ ပို့ဆောင်ပါမည်။

တူးဖော်/ထုတ်ယူထားသော ထုံးကျောက်များကို ကြိတ်ခွဲသည့် နေရာ တွင် Jaw Crusher (primary crusher) နှင့် Hammer Crusher (secondary crusher) ကို အသုံးပြု၍ ကြိတ်ခွဲပါမည်။ ထုံးကျောက်ကို ၀-၂၅ မီလီမီတာ အရွယ်ထိရောက်အောင် ကြိတ်ခွဲပါမည်။

ကြိတ်ခွဲထားသော ထုံးကျောက်ကို ထုံးကျောက်သိုလှောင်ရာ နေရာတွင် သိမ်းဆည်းပါမည်။ ၎င်းထုံးကျောက်ကို Portland ဘိလပ်မြေ ထုတ်လုပ်ခြင်း အတွက် ကုန်ကြမ်းအနေဖြင့် အသုံးပြုပါမည်။

စီမံကိန်းသည် ကား ၉ စီး၊ ကုန်တင်ကား ၃ စီး နှင့် ရေသယ်ကား ၁ စီး ကို အသုံးပြုပါသည်။

လျှပ်စစ်ကို ဘိလပ်မြေစက်ရုံမှ ရယူသုံးစွဲပါသည်။ (၁၃ မိုင် အကွာ သဲဖြူကျေးရွာရှိ လျှပ်စစ်ဓာတ်အားလိုင်း (၃၃ ကေစီ) သည် အရင်းအမြစ်လိုင်း ဖြစ်ပါသည်။)

ဘိလပ်မြေစက်ရုံသည် မိုင်းလုပ်ကွက် အနီးနားတွင် တည်ရှိပါသည်။ ထို့ကြောင့် ရုံးအဆောက်အအုံ၊ ရွက်ဖျင်တဲများ၊ အဆောက်အအုံများ၊ စားသောက်ကုန်များနှင့် အခြား အဆောက်အအုံ များသည် ဘိလပ်မြေစက်ရုံဝင်း အတွင်းတွင် တည်ရှိပါသည်။ လုပ်ကွက်တွင် ယာယီနားနေခန်းအဖြစ် အသုံးပြုသော အဆောက်အအုံသာ ရှိပါသည်။ ကြိတ်ခွဲသည့် နေရာသည် မိုင်းလုပ်ကွက်၏ နယ်နိမိတ် အနားတွင်သာ တည်ရှိပါသည်။

အမှန်တကယ်အားဖြင့် ထုံးကျောက်တူးဖော်ခြင်းအတွက် ရေ မလိုအပ်ပါ။ နေ့စဉ် ရေလိုအပ်ချက်မှာ ၂၀၀၀ ဂါလန်ထက် နည်းပါသည်။ ဖုန်ထခြင်းကို နည်းပါးစေရန်နှင့် ရံဖန်ရံခါ drill တူးဖော်ခြင်း အတွက် ရေလိုအပ်ချက် နည်းပါးပါသည်။ စက်ရုံရှိ ဘုံကန် (ပင်မ သိုလှောင်ကန်) (ရေဂါလံ ၂၅၀,၀၀၀) မှ ရေ ကို အသုံးပြုပါမည်။ စီမံကိန်း တစ်ခုလုံး အတွက် (ဘိလပ်မြေစက်ရုံ စီမံကိန်း) ရေပူချောင်းမှ ရယူသုံးစွဲပါမည်။

လစဉ် လောင်စာဆီ တစ်နှစ် လိုအပ်ချက် : ဒီဇယ်/ ဓာတ်ဆီ ၁၅,၀၀၀ ဂါလန်
 Lubricant oil/ Grease/ ၄၀၀ ဂါလန်
 Hydraulic oil


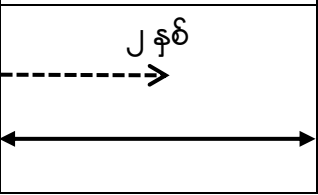
လျှပ်စစ် : လျှပ်စစ်ကို ဘိလပ်မြေစက်ရုံမှ ရယူသုံးစွဲပါသည်။ (၁၃ မိုင် အကွာ သဲဖြူကျေးရွာရှိ လျှပ်စစ်ဓာတ်အားလိုင်း (၃၃ ကေစီ) သည် အရင်းအမြစ်လိုင်း ဖြစ်ပါသည်။) လျှပ်စစ်မီး ပြတ်တောက်သည့် အချိန်တွင် အရံ အနေဖြင့် မီးစက်ကို ထားရှိထားပါသည်။

အလုပ်ခန့်အပ်ထားရှိမှု၊ ဒေသတွင်း ခန့်အပ်ထားရှိမှု နှင့် ဝယ်ယူထားရှိမှု

အလုပ်ချိန် : တစ်ရက်လျှင် ၈ နာရီ စီမံကိန်းသည် နေ့အချိန်တွင် သာ အများဆုံး လုပ်ဆောင်ပါသည်။

လုပ်ခ လစာ နှုန်းထား : ၂၀၀,၀၀၀ကျပ် မှ ၆၅၀,၀၀၀ ကျပ်

ဆောက်လုပ်ခြင်း နှင့် ဖွံ့ဖြိုးခြင်း လုပ်ငန်းစဉ် သည် နေပြည်တော်စည်ပင်သာယာရေး ကော်မတီ (NCDC) မှ Max Myanmar Manufacturing Co., Ltd သို့ မလွှဲပြောင်းခင် အချိန်တွင် လုပ်ဆောင်ထားပြီးဖြစ်ပါသည်။ မိုင်းထုတ်လုပ်ခြင်း အတွက် ထုတ်လုပ်ခွင့်ပြုချက်မှာ ၂၅ နှစ် (၅ နှစ် သက်တမ်း တိုး ၂ ကြိမ်) ဖြစ်ပါသည်။ မိုင်းဖျက်သိမ်းခြင်း / ဖျက်သိမ်းခြင်း လုပ်ငန်းစဉ် အတွက် ၁ နှစ် နှင့် ပြန်လည်ထူထောင်ရေး လုပ်ငန်းစဉ်များအတွက် ၁ နှစ် ဖြစ်ပါသည်။

မိုင်း ဖွံ့ဖြိုးခြင်း ကာလ	မိုင်း လည်ပတ်ခြင်း ကာလ	မိုင်း ပိတ်သိမ်းခြင်း/ ပြန်လည်ထူထောင်ခြင်း ကာလ
၁ နှစ် 	၂၅ နှစ် (၅ နှစ် သက်တန်းတိုး ၂ ကြိမ်)	၂ နှစ် 

စီမံကိန်း ဖော်ပြချက် နှင့် သက်ဆိုင်သော အသေးစိတ် အချက်အလက်များကို အခန်း-၃ တွင် ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင် နှင့် လူမှု ပတ်ဝန်းကျင် အကြောင်း ဖော်ပြချက်

လေ့လာမည့် နေရာ အပိုင်းအခြား သတ်မှတ်ခြင်း

သတ်မှတ်ထားသော EMP လေ့လာမည့် ဧရိယာသည် အဆိုပြုထားသော ထုံးကျောက်တူးဖော်ရေး ဧရိယာ ဧက ၁၅၀ နှင့် အနီးတဝိုက် ၁ မိုင် ပတ်လည် အတွင်း နေရာများပါဝင်ပါသည်။

အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာများသည် သတ်မှတ်ထားသော ဧရိယာအတွင်း ပါဝင်ပါသည်။

၁ မိုင် အချင်းဝက်သည် သက်ရောက်မှုများကို မိုင်ဝက် အချင်းဝက် အတွင်း မြင်သာပြီး အပြင် မိုင်ဝက်ကို ကြားခံရန် အဖြစ် သတ်မှတ်ပါမည်။

မိုးလေဝသ နှင့် ရာသီဥတု

ပျဉ်းမနားခရိုင်၏ မိုးလေဝသ အချက်အလက်များကို သတ္တုတွင်း ဧရိယာ၏ ရာသီဥတုကို ပိုင်းခြားစိတ်ဖြာရန် အသုံးပြုပါမည်။ ရာသီဥတုမှာ အပူပိုင်းမှတ်သုံးရာသီဖြစ်ပြီး ပူပြင်းခြောက်သွေ့သော ရာသီ (မှတ်သုံးကြို)၊ အလယ်အလတ် မိုးရွာသွန်းသော မိုးရာသီ (မှတ်သုံး ရာသီ) နှင့် အေးမြသော ရာသီ (မှတ်သုံးလွန် ရာသီ) တို့ဖြစ်သည်။ ထိုဒေသသည် မြန်မာနိုင်ငံ၏ အပူပိုင်းရန် ရာသီဥတု တစ်စိတ်တစ်ပိုင်း အတွင်းတွင် ဖြစ်ပါသည်။

မြေမျက်နှာသွင်ပြင်

ဧရိယာ တစ်ခုလုံးသည် တစ်စိတ်တစ်ပိုင်း ပျက်စီးသွားသော သစ်တောများနှင့် ညီညာသော မြေပြန့်ဖြစ်ပြီး မဲဟော် သစ်တောထိန်းသိမ်း ဧရိယာ အတွင်းတွင် ရှိပါသည်။ သတ္တုတွင်း/ကျောက်မိုင်း နေရာသည် တောင်ဖီလာတောင်ကြော၏ အနောက်ဘက်ခြမ်း ဖြစ်ပါသည်။ စက်ရုံ နှင့် အနီး နားတစ်ဝိုက်ရှိ လွင်ပြင် အမြင့်ပေမှာ ပင်လယ်ရေ မျက်နှာပြင်အထက် ၅၀၀ မီတာ ခန့်ဖြစ်ပါသည်။

အခြေခံ ဘူမိဗေဒ နှင့် မြေဆီလွှာ နှင့် ဇလဗေဒ

(ကုမ္ပဏီ၏ ဘူမိဗေဒ ပညာရှင်များထံမှ ထပ်ဆင့် အချက်အလက်များ ၂၀၀၆)

ဒေသဆိုင်ရာ ဘူမိဗေဒသည် ၂၀၀၆ ခုနှစ်တွင် နယ်မြေ စစ်တမ်းလုပ်ဆောင်ခဲ့သည့် ဘူမိဗေဒ ပညာရှင်များ၏ တွေ့ရှိချက်များမှ ထံမှ ရရှိသော ထပ်ဆင့် အချက်အလက်များအပေါ်တွင် အခြေခံထားပါသည်။ အသေးစိတ်ကို အခန်း-၄ တွင် ကြည့်ရှု နိုင်ပါသည်။

မြေဆီလွှာ

မြေနမူနာကို အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်းကျေးရွာ နှင့် စီမံကိန်း လုပ်ကွက်နေရာများမှ ရယူထားပါသည်။ မြေနမူကောက်ယူထားသည့် ကိုဩဒီနိတ်မှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်-

- စီမံကိန်း လုပ်ကွက်နေရာ မြောက်လတ္တီတွဒ် ၁၉ ဒီဂရီ၊ ၃၁ မိနစ်၊ ၂၇.၆၀ စက္ကန့်၊ အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ၊ ၂၄ မိနစ်၊ ၁၇.၉၀ စက္ကန့်)
- တဲကြီးကုန်း ကျေးရွာ မြောက်လတ္တီတွဒ် ၁၉ ဒီဂရီ၊ ၃၁ မိနစ်၊ ၄၉.၄၀ စက္ကန့်၊ အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ၊ ၂၄ မိနစ်၊ ၄.၉၀ စက္ကန့်)
- အောင်နန်းချိုကျေးရွာ မြောက်လတ္တီတွဒ် ၁၉ ဒီဂရီ၊ ၃၀ မိနစ်၊ ၅၈.၃၀ စက္ကန့်၊ အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ၊ ၂၄ မိနစ်၊ ၂၅.၇၀ စက္ကန့်)

တိုက်စားခြင်းနှင့် အနည်ကျခြင်း

KII အင်တာဗျူးမှ အချက်အလက်များအရ စီမံကိန်းနေရာတွင် တိုက်စားခြင်းနှင့် အနည်ကျခြင်းများ မရှိပါ။

သဘာဝဘေးအန္တရာယ်များ

လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များ (၂၀၁၉) အရ လယ်ဝေးဒေသတွင်ဖြစ်ပွားခဲ့သော သဘာဝ ဘေးအန္တရာယ်များမှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်။

လယ်ဝေးဒေသတွင်ဖြစ်ပွားခဲ့သော သဘာဝ ဘေးအန္တရာယ်များစာရင်း

စဉ်	သဘာဝ ဘေးအန္တရာယ်အမျိုးအစား	အကြိမ်ရေ	အဆောက်အအုံ ဆုံးရှုံးမှု
၁	ဆူနာမီ	၃၇	၂၄၈
၂	ရေကြီးခြင်း	၂၁	၃၃၁
၃	မီးလောင်မှု		၂၁

အရင်းမြစ်- လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များ (၂၀၁၉)

သို့သော် စီမံကိန်း ဧရိယာတွင် ကြီးမားသော ငလျင် လှုပ်ခတ်မှု မရှိကြောင်း သိရှိရပါသည်။

ဇလဗေဒ

မြေပေါ်ရေ

ရေပူချောင်း၊ ဇလီချောင်းနှင့် ကျောက်ဖြူချောင်းစသည့် စမ်းချောင်းငယ် ၃ သွယ်ရှိပြီး အရှေ့ဘက်မှ အနောက်ဘက်သို့ စီးဆင်းနေပြီး မဲဟော်ချောင်း အတွင်းသို့ စီးဝင်ပါသည်။ ၎င်းချောင်းသည် အနောက်မြောက်မှ ပေါင်းလောင်းမြစ်ထဲသို့ စီးဝင်ပါသည်။

မြေအောက်ရေ

မြေအောက်ရေကို စမ်းသပ်မှု မှာ အခုအချိန်ထိ မအောင်မြင်သေးပါ။ မြေအောက်ရေသည် မျှော်လင့်ထားသည့် နက်ပါသည်။

လက်ရှိ ပတ်ဝန်းကျင်အခြေအနေ အကျဉ်းချုပ်

<p>ရေ အရည်အသွေး</p>	<p>ရေနမူနာ ကောက်ယူသည့် နေရာ အရေအတွက်</p>	<p>နမူနာ နေရာ ၄ နေရာ- ရေပူချောင်း၏ စီမံကိန်း အပေါ်ပိုင်း နှင့် အောက်ပိုင်း၊ အောင်နန်းချို ကျေးရွာ နှင့် မဲဟော်ချောင်း (တဲကြီးကုန်း ကျေးရွာ)</p>
	<p>တိုင်းတာသည့် Parameters</p>	<p>Total Coliform Count, Thermotolerant (fecal) Coliform Count, pH, Turbidity, Colour (True), Free Chlorine, Total Chlorine, Arsenic, Nitrate (N.NO₃)</p>
	<p>ရလဒ်များ</p>	<ul style="list-style-type: none"> - ရေပူချောင်း၏ စီမံကိန်း အပေါ်ပိုင်း၏ လက်ရှိ Parameters များသည် turbidity နှင့် အရောင်မှ လွဲ၍ ကျန်သည့် Parameters များသည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။ - ရေပူချောင်း၏ စီမံကိန်း အောက်ပိုင်း၏ လက်ရှိ Parameters များသည် turbidity နှင့် အရောင်မှ လွဲ၍ ကျန်သည့် Parameters များသည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။

		<ul style="list-style-type: none"> - အောင်နန်းချို ကျေးရွာတွင် တိုင်းတာသည့် Parameters များ အားလုံး၏ လက်ရှိ တန်ဖိုးသည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။ - မဲဟော်ချောင်း (တဲကြီးကုန်း ကျေးရွာ)တွင် တိုင်းတာသည့် Parameters များ အားလုံး၏ လက်ရှိ တန်ဖိုးသည် turbidityမှ လွဲ၍ ကျန်သည့် Parameters များသည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။
ဆူညံသံ နှင့် တုန်ခါမှု	တိုင်းတာသည့် နေရာ အရေအတွက်	နမူနာ နေရာ ၃ နေရာ- စီမံကိန်းလုပ်ကွက်၊ အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာ
	ရလဒ်များ	- တိုင်းတာသည့် Parameters များအားလုံး သည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။
လေ အရည်အသွေး	တိုင်းတာသည့် နေရာ အရေအတွက်	နမူနာ နေရာ ၃ နေရာ- စီမံကိန်းလုပ်ကွက်၊ အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာ
	တိုင်းတာသည့် Parameters	Nitrogen dioxide (NO ₂) 1-hour, Nitrogen dioxide (NO ₂) 24-hour, Sulfur dioxide (SO ₂) 24-hour, Particulate matter PM ₁₀ ^a (24-hour), Particulate matter PM _{2.5} ^b (24-hour), Ozone (O ₃) 8-hour daily maximum, Ozone (O ₃) 24-hour, Ammonia (24 hrs), Carbon Dioxide (CO ₂) (24 hrs), Carbon Monoxide CO (24 hrs), VOC (24 hrs), Oxygen (24 hrs),
	ရလဒ်များ	တိုင်းတာသည့် Parameters များအားလုံး သည် NEQEG လမ်းညွှန်ချက်တန်ဖိုးများ အောက်တွင်သာ ရှိပါသည်။

ဇီဝဗေဒဆိုင်ရာ အစိတ်အပိုင်းများ

အပင်များ

အပင်အမျိုးအစား ပေါင်း ၂၀၀ ကို တွေ့ရှိ ဖော်ထုတ်ပြီး မှတ်တမ်းတင်ခဲ့ပါသည်။ အပင်မျိုးစိတ် စာရင်းကို အခန်း-၄ တွင် ကြည့်ရှုနိုင်ပါသည်။

သတ္တဝါများ

စစ်တမ်းကောက်ယူခြင်း အတွက် သတ်မှတ်ထားသော ဧရိယာ တစ်ခုလုံး (၁၆ စတုရန်းမိုင်) သည် လုံလောက်မှု ရှိပါသည်။ ၎င်းဧရိယာသည် စက်ရုံ၏ အရှေ့၊ အနောက်၊ တောင်၊ မြောက်ဒေသများ ဖြစ်ပါသည်။ စက်ရုံ၏ အရှေ့တောင်ဘက် အရပ်ကိုလည်း အလေးထား၍လေ့လာခဲ့ပါသည်။

စုစုပေါင်း ၄၇ မျိုးစိတ် ၅၄ ကောင်အား တွေ့ရှိ ဖော်ထုတ်ပြီး မှတ်တမ်းတင်ခဲ့ပါသည်။

စုစုပေါင်း တိရစ္ဆာန်မျိုးစိတ် ၁၉ မျိုးကို တွေ့ရှိ ဖော်ထုတ်ပြီး မှတ်တမ်းတင်ခဲ့ပါသည်။ မျိုးစိတ် ၁၀ မျိုးမှာ တွားသွားသတ္တဝါများ ဖြစ်ကြပြီး ၉ မျိုးမှာ ကုန်းနေရေနေ သတ္တဝါများ ဖြစ်ကြပါသည်။

ကွင်းဆင်းလေ့လာခဲ့သည့် အချက်အလက်များ နှင့် (ထပ်ဆင့် သတင်းအချက်အလက်များ) မှ စုဆောင်းထားသော သတင်းအချက်အလက်များအရ နို့တိုက်သတ္တဝါ စုစုပေါင်း ၁၃ မျိုးကို တွေ့ရှိ မှတ်တမ်း တင်ခဲ့ပါသည်။

လူမှုစီးပွားရေး ဆိုင်ရာ အစိတ်အပိုင်းများ

လူမှု စီးပွားရေး ဆိုင်ရာကွင်းဆင်းလေ့လာခြင်းကို MESC အဖွဲ့အစည်း၏ အဖွဲ့ဝင်များက လုပ်ဆောင်ခဲ့ကြပါသည်။ ရရှိသော အချက်အလက်များမှာ အင်တာဗျူး မေးမြန်းမှုမှ ရရှိထားသော ထပ်ဆင့် သတင်းအချက်အလက်များ (secondary data) ဖြစ်ပါသည်။

အုပ်ချုပ်မှု အဖွဲ့အစည်း နှင့် နယ်နိမိတ် အကန့်အသတ်

အောင်နန်းချိုကျေးရွာသည် နေပြည်တောင်ကောင်စီ နယ်မြေ၊ လယ်ဝေးမြို့နယ်၊ ဇလီငှက်ကြီး တောင်ကျေးရွာအုပ်စု အောက်တွင် တည်ရှိပါသည်။ ဇလီငှက်ကြီးတောင်ကျေးရွာ အုပ်စုသည် ဇလီငှက်ကြီးတောင်၊ တဲကြီးကုန်း၊ အောင်နန်းချို၊ အောင်ချမ်းသာ၊ အောင်သာယာ နှင့် အောင်စည်လာ ကျေးရွာများဖြင့် ဖွဲ့စည်းထားပါသည်။

လူမှုရေး

စဉ်	လူမှု စီးပွားရေး ကဏ္ဍများ / parametersများ	အချက်အလက်များနှင့် ကိန်းဂဏန်းများ	
		အောင်နန်းချို	တဲကြီးကုန်း
၁	လူဦးရေ	၇၄၄	၂၄၄
	ကျား	၃၆၉	၁၂၅
	မ	၃၇၅	၁၁၉
၂	ကိုးကွယ်ယုံကြည်မှု (%)		
	ဗုဒ္ဓဘာသာ	၃၀%	၈၀%
	ခရစ်ယာန်ဘာသာ	၇၀%	၂၀%
	အခြား	-	-
၃	လူမျိုး (%)		
	ဗမာ	၂၅%	၇၀%
	ကရင်	၆၃%	၃၀%
	ကယန်း	၁၀%	-
	အခြား (ရှမ်း၊ ရခိုင်၊ ချင်း)	၂%	-
၄	ပညာရေး အခြေအနေ (%)		
	စာတတ်မြောက်နှုန်း (အရွယ်ရောက်ပြီးသူ)	၈၅%	၇၀%
	(များသောအားဖြင့် အခြေခံ ပညာရေး နှင့် ဘက ပညာရေး)		
၅	နေထိုင်မှု အခြေအနေ (Material life style)		
	(%)		
	သစ်သားအိမ်	၆၀%	၈၀%
	ဝါးအိမ်	၁၀%	
	အုတ်အိမ်	၃၀%	၂၀%
၆	အိမ်ထောင်စု တစ်ခု ချင်းစီ အလိုက်		
	ပစ္စည်းပိုင်ဆိုင်မှု (%)		
	ကား (စီး)	၁ ဆလွန်း	၃ ဆလွန်း
	ထရပ်ကား ၂ စီး		-
	မော်တော်ဆိုင်ကယ် (%)	၈၀%	၈၀%
	တီဗွီ (%)	၂၀%	၇၀%
	လက်ကိုင်ဖုန်း (%)	၈၀%	၉၀%

စီးပွားရေး

စဉ်	အသက်မွေး ဝမ်းကြောင်း နှင့် ဝင်ငွေ	ကျေးရွာများ	
		အောင်နန်းချို	တဲကြီးကုန်း
၁	<u>လယ်သမားများ</u> (အိမ်ထောင်စု ရာခိုင်နှုန်း)	၈၀%	-
	<u>အဓိက စိုက်ပျိုးသီးနှံ</u>		
	နှမ်း	✓	✓
	ပဲ	✓	✓
	ကြံ	✓	✓
	မြေပဲ	-	-
	ပြောင်း	-	✓
	ဆန်စပါး (minor)	-	-
၂	<u>ရာသီအလိုက် အလုပ်များ/</u> <u>ကြံရာကျပန်း</u> <u>အလုပ်အကိုင်များ</u> (အိမ်ထောင်စု ရာခိုင်နှုန်း)	၂၀%	၁၀၀ % နီးပါး (လယ်သမား များ မရှိပါ။)

အလုပ်အကိုင်

တဲကြီးကုန်း ကျေးရွာ၏ ၈၀ % သည် စက်ရုံတွင် အလုပ်လုပ်ကိုင်ပြီး ကျန်သော ၂၀ % မှာ အချိန်ပြည့် လယ်သမား (သို့မဟုတ်) အချိန်ပိုင်း လယ်သမားများ ဖြစ်ကြပါသည်။ အောင်နန်းချို ကျေးရွာ၏ ၁၀ % မှာ စက်ရုံတွင် အလုပ်လုပ်ကိုင်ပြီး ကျန်သော ၉၀ % မှာ အချိန်ပြည့် လယ်သမား (သို့မဟုတ်) အချိန်ပိုင်း လယ်သမားများ ဖြစ်ကြပါသည်။ အဓိက စိုက်ပျိုးသီးနှံမှာ မြေပဲ၊ နှမ်း၊ ပြောင်း နှင့် ပဲစိမ်း များ ဖြစ်ကြပါသည်။

အိမ်ထောင်စု ဝင်ငွေ

အိမ်ထောင်စု တစ်စုချင်းစီ၏ ဝင်ငွေကို တွက်ချက်ရန်မှာ ခက်ခဲပါသည်။ ကျေးရွာအုပ်ချုပ်ရေးမှူးများ၊ ရပ်မိရပ်ဖများနှင့် တတ်သိနားလည်သူများမှ ရရှိသော အကြမ်းဖျင်း ခန့်မှန်းချက်များအရ အိမ်ထောင်စုများ၏ ဝင်ငွေမှာ ၁၀၀,၀၀၀ ကျပ် မှ ၅၀၀,၀၀၀ ကျပ်ကျော်ထိ ဖြစ်ပါသည်။ .

ဒေသစီးပွားရေးများ

<p>စိုက်ပျိုးရေး</p>	<p>ဒေသစီးပွားရေးသည် ယေဘုယျအားဖြင့် စိုက်ပျိုးရေး လုပ်ငန်း ဖြစ်ပြီး ကြံ၊ ပဲ နှင့် နမ်း တို့သည် အဓိက သီးနှံများ ဖြစ်ပါသည်။ သို့သော် အကြီးစား ကြံ၊ ပဲ နှင့် နမ်း စိုက်ပျိုးခြင်းများ မရှိပါ။ အသေးစားနှင့် အလတ်စားများသာ ရှိပါသည်။ တိရစ္ဆာန် မွေးမြူရေး ခြံလုပ်ငန်းများလည်း မရှိပါ။</p>
<p>သစ်တော</p>	<p>မဲဟော်ထိန်းသိမ်းရေး သစ်တောသည် ဧရိယာ တစ်ခုလုံးအား လွှမ်းမိုးထား ပါသည်။ သစ်တောသည် တစ်စိတ်တစ်ပိုင်း ပျက်စီးပြီး ဖြစ်သော်လည်း လောင်စာ ထင်းနှင့် မီးသွေး ထုတ်ယူမှုများ ရှိနေဆဲ ဖြစ်ပါသည်။ သစ်သား နှင့် ဝါးများကို ယခု အချိန်အထိ ဆောက်လုပ်ရေး ပစ္စည်းများ အဖြစ် အသုံးပြုနေဆဲ ဖြစ်ပါသည်။</p>
<p>ရေလုပ်ငန်းနှင့် ငါးမွေးမြူရေး</p>	<p>ချောင်းငယ် ၃ ချောင်းနှင့် ချောင်းကြီး ၁ ချောင်း ရှိပါသည်။ ၎င်းဧရိယာတွင် မဲဟော်ချောင်းလည်း ရှိပါသည်။ ရွာသား အနည်းငယ်သာလျှင် အိမ်ထောင်စု စားသုံးရန် အတွက် ငါးဖမ်းခြင်းများ ရှိပါသည်။ ဤဒေသတွင် တံငါသည် အဖြစ် အသက်မွေးဝမ်းကြောင်း ပြုလုပ်၍ မရပါ။ ငါးများသည် တစ်နှစ်ထက် တစ်နှစ် ရှားပါးလာပါသည်။</p>
<p>စက်ရုံ</p>	<p>၎င်းဧရိယာတွင် စက်ရုံကြီး ၂ ခု သာ ရှိပါသည်။ တစ်ခုမှာ Max Myanmar Company အပိုင်ဖြစ်ပြီး ကျန်တစ်ခုမှာ NCDC အပိုင် ဖြစ်ပါသည်။ Asia World Co., Ltd မှ လုပ်ကိုင်နေသော ထုံးကျောက်နှင့် အခြား ကျောက်မိုင်း နေရာ များလည်း ရှိပါသည်။ အနီးနားဝန်းကျင်တွင် အခြားသော ကုမ္ပဏီငယ်များနှင့် ဒေသခံများ လုပ်ကိုင်သည့် ကျောက်မိုင်းအသေးစား များလည်း ရှိပါသည်။</p>
<p>ဓာတ်သတ္တု ဖွံ့ဖြိုးတိုးတက်ရေး လုပ်ငန်း</p>	<p>၎င်းဧရိယာတွင် ဓာတ်သတ္တု ဖွံ့ဖြိုးတိုးတက်ရေး လုပ်ငန်းမရှိပါ။</p>
<p>ခရီးသွား လုပ်ငန်း</p>	<p>၎င်းဧရိယာတွင် ခရီးသွား လုပ်ငန်း မရှိပါ။</p>

ကျန်းမာရေး

<p>The Max Myanmar Manufacturing Co., Ltd တွင် စက်ရုံ အတွင်း ဆေးပေးခန်း ရှိပါသည်။ စက်ရုံ အတွင်း ဆေးပေးခန်း၏ ၂၀၂၀ အချက်အလက်များအရ ကူးစက်ရောဂါ ဖြစ်ပွားမှု မရှိပါ။</p>	
<p>ကျန်းမာရေး ဝန်ဆောင်မှု ရရှိမှု</p>	<p>လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များအရ အောင်သာယာ ကျေးရွာတွင် ကျေးလက်ဆေးပေးခန်း ၁ ခု၊ အောင်စည်လာ ကျေးရွာ တွင်ကျေးလက် ဆေးပေးခန်း ၁ ခု ရှိပါသည်။ အခြားသော ကျေးရွာများ တွင် ကျေးလက် ဆေးပေးခန်း မရှိသော်လည်း လယ်ဝေး၊ သစ်ပုပ်ပင်၊ အေလာနှင့် သာဝတီ တွင် ဆေးရုံ ရှိပါသည်။ အောင်နန်းချို ကျေးရွာ တွင် Max Myanmar Manufacturing Company Limited မှ ထောက်ပံ့ပေးထားသော စက်ရုံတွင်း ဆေးပေးခန်း တစ်ရုံ ရှိပါသည်။</p>
<p>ရေထောက်ပံ့မှု ရရှိမှု</p>	<p>အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာ အတွက် ရေကို ရေပူချောင်းမှ ရယူ သုံးစွဲပါသည်။ ရေကို သိုလှောင်ကန် တွင် သိုလှောင်ထားပါသည်။</p>
<p>ဖြစ်ပွားနှုန်း နှင့် သေဆုံးနှုန်း</p>	<p>လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များ အရ လယ်ဝေး ဒေသ၏ ဝမ်းပျက်ဝမ်းလျော ရောဂါ ဖြစ်ပွားနှုန်း မှာ (၁၇၂၅ ဦး) နှင့် TB ရောဂါကြောင့် သေဆုံးနှုန်းမှာ (၂၅ ဦး) ဖြစ်ပါသည်။</p>
<p>အစာအာဟာရ အဆင့်</p>	<p>အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာ၏ အဓိက အစားအသောက်မှာ ထမင်းဖြစ်ပါသည်။ ထမင်းအပြင် ပြောင်း၊ ပဲ၊ နမ်း နှင့် ကြံများလဲ ရရှိပါသည်။ လတ်ဆတ်သော အရွက်များနှင့် စားစရာများကို ရရှိသောကြောင့် ရွာသားများ၏ အာဟာရ အဆင့်မှာ မြင့်ပါသည်။</p>
<p>ကူးစပ်စေနိုင်သော ရောဂါ</p>	<p>လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များ နှင့် Max Myanmar Manufacturing စက်ရုံ အတွင်း ဆေးပေးခန်း၏ ၂၀၂၀ အချက်အလက်များအရ ကူးစက်ရောဂါ ဖြစ်ပွားမှု မရှိပါ။</p>

ယဉ်ကျေးမှု ဆိုင်ရာ အစိတ်အပိုင်းများ

<p>ရှေးဟောင်းသုတေသန အဆောက်အဦများ</p>	<p>လယ်ဝေး ဒေသဆိုင်ရာ အချက်အလက်များအရ လယ်ဝေးမြို့အတွင်း ဖောင်တော်ချက်မ ဘုရား၊ စမတောင် ဘုရား (ကမ္ဘာ့ကပ်ကျော်စေတီ) နှင့် ယက္ကန်းစင်တောင်ဘုရားများ တည်ရှိပါသည်။ အောင်နန်းချို ကျေးရွာ နှင့် တဲကြီးကုန်း ကျေးရွာများတွင် ရှေးဟောင်းသုတေသန ဆိုင်ရာ အဆောက်အအုံများ မရှိပါ။</p>
<p>ဘုရားကျောင်းများနှင့် အထိမ်းအမှတ် နေရာများ</p>	<p>အောင်နန်းချို ကျေးရွာတွင် Max Myanmar Manufacturing Co., Ltd မှ ဆောက်လုပ်ပေးထားသော ဘုန်းကြီးကျောင်း တစ်ကျောင်းနှင့် ဘုရားတစ်ဆူ ရှိပါသည်။</p> <p>အောင်နန်းချို ကျေးရွာတွင် ခရစ်ယာန် ဘုရားရှိခိုးကျောင်း ၂ ကျောင်း ရှိပါသည်။ တဲကြီးကုန်း ကျေးရွာတွင် ဘုန်းကြီးကျောင်း မရှိပါ။ သို့သော် ခရစ်ယာန် ဘုရားရှိခိုးကျောင်း ၁ ကျောင်း ရှိပါသည်။</p>

မြင်ကွင်းဆိုင်ရာ အစိတ်အပိုင်းများ

<p>Aesthetic</p>	<p>ခရီးသွားများကို ဆွဲဆောင်ရန် Aesthetic ရှုခင်းများ မရှိပါ။</p>
<p>ရှုခင်းနှင့် ပင်လယ် ရှုခင်းများ</p>	<p>ခရီးသွားများကို ဆွဲဆောင်ရန် ရှုခင်းနှင့် ပင်လယ် ရှုခင်းများ မရှိပါ။</p>
<p>ယဉ်ကျေးမှု ဆိုင်ရာ အထင်ကရ နေရာများ</p>	<p>ယဉ်ကျေးမှု ဆိုင်ရာ အထင်ကရ နေရာများ မရှိပါ။</p>

သက်ရောက်မှုများကို ဆန်းစစ်ခြင်းနှင့် လျော့ပါးစေသော နည်းလမ်းများ

<p>သက်ရောက်မှုများ / ဖြစ်နိုင်ခြေ ရှိသော သက်ရောက်မှုများ</p>	<p>လျော့ပါးစေသော / ပြင်ဆင်ခြင်း နည်းလမ်းများ</p>
<p>မြေအရည်အသွေးနှင့် မြေ မျက်နှာသွင်ပြင် အပေါ် သက်ရောက်မှု (မြေတိုက် စားခြင်းနှင့် နှုန်းအနည် ကျခြင်း၊မြေဆီလွှာသွင်ပြင်</p>	<p><u>မိုင်းလည်ပတ်ခြင်း ကာလ</u></p> <ul style="list-style-type: none"> - လျော့စောက်၏ အရှည်နှင့် မတ်ဆောက်မှုကို လျော့ချခြင်း (မြေဖြတ်ခြင်း၊ မြေဖြည့်ခြင်း နှင့် မြေတည်ဆောက်ခြင်း) - ထိတွေ့မှု ရှိသော မြေလွတ် မြေလပ်ဧရိယာကို တတ်နိုင်သမျှ လျော့ချခြင်း (မြေလွတ် မြေလပ်ဧရိယာကြီးကို ချန်လှပ် ထားရှိရန် အတွက် အပင်များ ကိုလိုအပ်သည်ထက်ပို၍ ရှင်းလင်းခြင်းများ မပြုလုပ်ခြင်း)

<p>ကိုအနှောက်အယှက်၊ မြေဆီလွှာ ညစ်ညမ်းနိုင်ခြေ)</p>	<ul style="list-style-type: none"> - မိုးရာသီတွင် တိုက်စားမှု ဖြစ်ခြင်းကို ကာကွယ်ရန်အတွက် မြေဆီလွှာ ထိန်းသိမ်းခြင်း နည်းလမ်းကို အသုံးပြုခြင်း - ထိတွေ့မှု ရှိသော မြေလွတ် မြေလပ်ဧရိယာအားလုံးကို လျှော့ချခြင်းနှင့် ပေါက်ရောက်နေသော အပင်များကို တတ်နိုင်သမျှ ထိန်းသိမ်းခြင်း - လုပ်ကွက်၏ အနီးတဝိုက်မှ စီးဆင်းရေများသည် ထိတွေ့မှု ဖြစ်စေနိုင်သောဧရိယာပတ်လည်သို့ စီးဆင်းသွားစေခြင်း (ရေမြောင်း ငယ်/ ရေနုတ်မြောင်းများ ဖောက်လုပ်ခြင်း) - အနည်ကျခြင်းများကို ထိန်းချုပ်ခြင်း (လိုအပ်သည့် နေရာများတွင် လွှဲတူးမြောင်းများနှင့် နှုန်းအနည်နှစ်များ ဖမ်းထိန်းခြင်းများ တည်ဆောက်ခြင်း၊) - ထုံးကျောက်၊ အပေါ်ယံမြေဆီလွှာ၊ စွန့်ပစ်မြေစာများကို ခွဲခြား၍ စုပုံထားခြင်း - စွန့်ပစ်မြေစာပုံများ နှင့် အပေါ်ယံမြေဆီလွှာ မြေစာပုံများမှ ပြိုကျခြင်း၊ တိုက်စားခံရခြင်းများကို တတ်နိုင်သမျှ ကာကွယ်ခြင်း- မြေစာပုံတည်ငြိမ်နေစေရန်အတွက် မြေစာပုံများ ပေါ်တွင် မြက်များ အပင်များ စိုက်ပျိုးခြင်း - မြေစာပုံတည်ငြိမ်မှု ရှိကြောင်းသေချာစေခြင်း (လျှော့စောက်တွင် အပေါ်ယံမြေဆီလွှာ၊ စွန့်ပစ်မြေစာများကို ဝန်ပို စွန့်ပစ်ခြင်းမှ ရှောင်ကြဉ်ခြင်း၊ စုပုံမည့် မြေကို မြေညှိခြင်း) - မြေစာပုံ၏ လျှော့စောက်သည် ၄၅ ဒီဂရီ ထက် မပိုစေရန် သေချာစေခြင်း - စွန့်ပစ်မြေစာများ / အပေါ်ယံမြေဆီလွှာ နှင့်အခြားသော မြေစာပုံများကို ပတ်လည်ထိန်းချုပ်မှု နှင့် ကာကွယ်ထားမည်။ ဥပမာအားဖြင့်- retaining wallများ၊ ခြံစည်းရိုးများ (retaining wall များသည် ရေထွက်ရန်အတွက် ရေထွက်ပေါက်များဖြင့် ပြုလုပ်ထားခြင်း) - လုပ်ကွက်မှ စီးဆင်းရေများသည် တိုက်စားခြင်း မရှိနိုင်သော အလျင်ဖြင့် စီးဆင်းစေရန် သေချာစေခြင်း - စွန့်ထုတ်မှုသည် သဘာဝရေလမ်းကြောင်း (ချောင်း) ကို မထိခိုက်စေမည့် နေရာ - မြေဖြတ်ခြင်းကို တတ်နိုင်သမျှ ရှောင်ရန်အတွက် လိုအပ်သည်ထက်ပို၍ မြေဖြတ်ခြင်းကို ရှောင်ကြဉ်ခြင်း - အပေါက်များ၊ တွင်းပေါက်များ၊ ချိုင့်များကို မြေစာများဖြင့် ပြန်လည်ဖြည့်တင်းခြင်း။
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	<ul style="list-style-type: none"> - မြေတိုက်စားခြင်းနှင့် မြေဆီလွှာသွင်ပြင်ကို အနှောက်အယှက် ဖြစ်စေခြင်းကိုသေချာ စီမံခန့်ခွဲမှုရှိကြောင်း သေချာစေရန်ပုံမှန် စစ်ဆေးမှုများကို လုပ်ဆောင်ခြင်း - မြေဆီလွှာညစ်ညမ်းမှုကို တတ်နိုင်သမျှ ကာကွယ်ခြင်း - လောင်စာဆီ ယိုဖိတ်မှုကို ရှောင်ကြဉ်ခြင်း။ ဖိတ်စင်မှုများ ဖြစ်ပေါ်ပါက ရေဖြင့် ဆေးကြောခြင်းများ မပြုလုပ်ဘဲ စုပ်ယူစေနိုင်သော ပစ္စည်းများ အသုံးပြု၍ ရှင်းလင်းခြင်း။ - လောင်စာဆီ ယိုဖိတ်မှုကို ကာကွယ်ရန် အတွက် ယာဉ်များ၊ စက်ပစ္စည်းများကို ထိန်းသိမ်းခြင်း - လောင်စာဆီပြန်ကျမှုကို ကာကွယ်ရန် လောင်စာဆီ သိုလှောင်သည့်နေရာ ပတ်လည် ခြံစည်ရိုးများ ခတ်ထားခြင်း
<p>လေထု အရည်အသွေးနှင့် ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု (ပစ္စည်းကိရိယာများမှ ထုတ်လွှတ်မှု နှင့် ဖုန်မှုန်များ)</p>	<ul style="list-style-type: none"> - အပင်များကို လိုအပ်သည်ထက်ပို၍ ရှင်းလင်းခြင်းများ မပြုလုပ်ခြင်း (မြေလွတ်မြေရိုင်းများ ချန်လှပ်ထားရှိခြင်း) - လေပြင်းထန်သည့် အချိန်တွင် ဖောက်ခွဲမှုများကို မလုပ်ဆောင်ခြင်း/ မိုးလေဝသ အချက်အလက်များကို ထည့်သွင်း စဉ်းစားခြင်း (ဥပမာ- မိုးရွာသွန်းနှုန်း၊ အပူချိန် နှင့် လေတိုက်ရာ အရပ်) - ပစ္စည်းသယ်ယူခြင်း အတွက် ရိုးရှင်းသော linear layout ကို စီစဉ်ထားခြင်း (စက်ရုံ/ လုပ်ကွက်သည် မိုင်းဧရိယာ အတွင်း သို့မဟုတ် အနီးနားတွင် တတ်နိုင်သမျှ ထားရှိခြင်း) - လေပြင်းထန်သည့် အချိန်တွင် တူးဖော်ခြင်း၊ သယ်ယူခြင်း ပစ္စည်းများ အတင်အချ ပြုလုပ်ခြင်း များကို ရပ်နားထားခြင်း - မြေတူးစက်၊ ဝန်တင်စက် နှင့် dump truck မှ အမှုန်လွင့်ထွက်ခြင်း ကို အမှုန်ဖမ်းကိရိယာများနှင့် ရေဖြန်းခြင်းများဖြင့် လုံလောက်စွာ ထိန်းချုပ်ထားခြင်း။ - ပစ္စည်း အတင်အချ လုပ်ဆောင်နေစဉ် အတွင်း ပစ္စည်းချသည့် အမြင့်ကိုကန့်သတ်ထားခြင်း။ - ဖြစ်နိုင်လျှင် ပစ္စည်းများကို ကုန်တင်များနှင့် သယ်ဆောင်ခြင်းထက် conveyors များ၊ ရွေ့လျားနိုင်သော belt transportများ၊ အသေတပ်ဆင်ထားသော belt transport များကို အသုံးပြုခြင်း (enclosed rubber-belt conveyors ကို အသုံးပြုခြင်း) - ယာဉ်သွားလာခြင်းကြောင့် ဖုန်ထခြင်းကို လျှော့ချရန်အတွက် အတွင်းလမ်းများကို သိပ်သည်းမှုရှိအောင် ထိန်းသိမ်းထားခြင်း

	<ul style="list-style-type: none"> - ဖုန်မှုန့်ထုတ်လွှတ်မှုကို လျှော့ချရန်အတွက် ကုန်တင်ကားများ၏ အရှိန်များကို ကန့်သတ်ခြင်း (အရှိန်အနှေး) (၃၀ km/hr မှ ၁၅ km/hr သို့ အရှိန် လျှော့ချခြင်းသည် ဖုန်မှုန့်ထုတ်လွှတ်မှု၏ ၅၀% ကို လျှော့ချနိုင်ပါသည်။) - ခြောက်သွေ့သောရာသီများအတွင်း လမ်းမခင်းထားသော လမ်းများပေါ်တွင် ရေဖြန်းခြင်း (ရေဖြန်းခြင်းသည် ဖုန်မှုန့်ထုတ်လွှတ်မှု၏ ၇၀% အထိ လျှော့ချနိုင်ပါသည်။) - သယ်ယူပို့ဆောင်နေစဉ် အတွင်း မြေစာပုံနှင့် အပေါ်ယံ မြေဆီလွှာ ဖိတ်စင်ခြင်းကို ကာကွယ်ခြင်း - ဖြစ်နိုင်လျှင် လမ်းမခင်းထားသော လမ်း များမှ ရွံများ ဖုန်မှုန့်များ ထွက်ခြင်းကို လျှော့ချရန်အတွက် ရေဖြန်းခြင်း - ယာဉ်များမှ ထုတ်လွှတ်သော particulate matter (PM)၊ SO₂ ၊ NO₂ ၊ hydrocarbons များကို ယာဉ်များနှင့် အခြား လောင်စာဆီသုံးစက်ပစ္စည်းများကို စနစ်တကျ ထိန်းသိမ်းခြင်း လည်ပတ်ခြင်း နှင့် လေ့ကျင့်ပေးခြင်းဖြင့် လျှော့ချခြင်း။ - မြေစာပုံ၏ အရှည်နှင့် မတ်ဆောက်မှုကို ကန့်သတ်ခြင်း (လျှော့စောက် ၄၅ ဒီဂရီ နှင့် အမြင့် ၂၀ ပေ ထက် မပိုစေခြင်း)၊ ပြားထားသော မြေစာပုံသည် ရှည်လျားပြီး ကန့်တော့ပုံစံ မြေစာပုံထက် လေတိုက်စားနှုန်း နည်းသည်။ - လုပ်သားများကို လုံလောက်သော PPE များ (masks, mouth covers) များ ထောက်ပံ့ပေးခြင်း။ - ယာဉ်များ စက်ပစ္စည်းများ အားလုံး၏ အင်ဂျင်ကို ပုံမှန် စစ်ဆေးခြင်း၊ ကောင်းစွာ ထိန်းသိမ်းခြင်း၊ ကောင်းစွာ lubricated ဖြစ်ခြင်း၊ ကောင်းစွာ လည်ပတ်ခြင်းသည် မီးခိုးထွက်မှုကို လျှော့ချနိုင်ပါသည်။ - Sulphur ပါဝင်မှုနည်းသော လောင်စာဆီများကို အသုံးပြုခြင်း (ဖြစ်နိုင်လျှင်) - ဖြစ်နိုင်လျှင် ပတ်ဝန်းကျင်အတွက် သင့်တော်သော ပစ္စည်းကိရိယာများ နှင့် စက်ပစ္စည်းများကို အသုံးပြုခြင်း (လောင်စာ စွမ်းအင်မြင့်သော အင်ဂျင်များ၊ ဆူညံသံ ထုတ်လွှတ်မှု နိမ့်သော စက်ပစ္စည်းများကို အသုံးပြုခြင်း) - လောင်စာဆီ ချွေတာရန်နှင့် မလိုအပ်ဘဲ ဓာတ်ငွေ့ (မီးခိုး) ထုတ်လွှတ်ခြင်းကို ကာကွယ်ရန်အတွက် ယာဉ်များ နှင့် ပစ္စည်းကိရိယာများကို မလိုအပ်ဘဲ လည်ပတ်မနေစေခြင်း။ - အစိုင်အခဲ အမှိုက်အမျိုးအစားအားလုံးကို ဟင်းလင်းပွင့် လောင်ကျွမ်းစေခြင်းမှ ရှောင်ကြဉ်ခြင်း၊ တတ်နိုင်သမျှ ပြန်လည် အသုံးပြုခြင်း၊ recycle
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	<p>လုပ်ခြင်းနှင့် နောက်ဆုံးတွင် သတ်မှတ်ထားသော အမှိုက်ပုံတွင် စွန့်ပစ်ခြင်း။</p> <ul style="list-style-type: none"> - စိမ်းလန်းဧရိယာ green zone ဖန်တီးခြင်း၊အပင်များ စိုက်ခြင်း၊ သစ်ပင်များသည် မီးခိုးများတွင် CO₂ ထိရောက်စွာ စုပ်ယူနိုင်ပါသည်။ (ဖယ်ရှားခြင်း သို့မဟုတ် စုပ်ယူခြင်း) - မီးခိုးများ (ဓာတ်ငွေ့ထုတ်လွှတ်မှု) နှင့် ထိတွေ့ရသော လုပ်သားများကို လုံလောက်သော PPE များ (masks, နှင့် mouth covers) များ ထောက်ပံ့ပေးခြင်း။ - စက်ပစ္စည်းများကို စနစ်တကျ ထိန်းသိမ်းခြင်း လည်ပတ်ခြင်း နှင့် လေ့ကျင့်ပေးခြင်းသည် ဓာတ်ငွေ့ ထုတ်လွှတ်မှုကို လျော့ချနိုင်ပါသည်။
<p>သက်ရောက်မှု- ဆူညံသံ နှင့်တုန်ခါမှု(ဖောက်ခွဲခြင်း၊ စက်ပစ္စည်းများ၊ ယာဉ်များ လည်ပတ်ခြင်းမှ ဆူညံသံ နှင့် တုန်ခါမှု)</p>	<ul style="list-style-type: none"> - ဆူညံသံ အဆင့်ကို လျော့ချရန်အတွက် သင့်လျော်သော ပေါက်ကွဲ စေနိုင်သော ပစ္စည်း နှင့် သင့်တော် ပမာဏကို (စစ်တပ်သုံး ဖောက်ခွဲရေး ပစ္စည်းမဟုတ်) ရွေးချယ်ခြင်း - ဖောက်ခွဲရေးသုံး ပစ္စည်းများ အသုံးပြုခြင်းကို တတ်နိုင်သမျှ လျော့ချရန် သို့မဟုတ် ရှောင်ကြဉ်ရန် အတွက် mechanical ripping ကို အသုံးပြုခြင်း (ဥပမာ- ဒုတိယ ဖောက်ခွဲခြင်း အစား hydraulic hammers များကို အသုံးပြုခြင်း) - တိကျသော ဖောက်ခွဲရေး အစီအစဉ်များကို အသုံးပြုခြင်း - ဖောက်ခွဲရေး တွင် ပါဝင်သော လုပ်သားများကို ear muffs သို့မဟုတ် ear protectors ကဲ့သို့သော တစ်ကိုယ်ရေသုံး ကာကွယ်ရေး ပစ္စည်းများ လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း - Excavator ၊ bulldozers ကဲ့သို့သော စက်ပစ္စည်းကြီးများ မှလည်း ကျယ်လောင်သော ဆူညံသံ ထုတ်လွှတ်နိုင်ပါသည်- - ဆူညံသံ ထုတ်လွှတ်မှု စက်အသစ်များကို ဦးစားပေး ရွေးချယ်ခြင်း - ကုန်တင်ကားကြီးများသည်လည်း ကျယ်လောင်သော ဆူညံသံနှင့် တုန်ခါမှု ကို ထုတ်လွှတ်နိုင်ပါသည်- - ယာဉ်များကို ဝယ်ယူသည့်အခါ ယာဉ်၏ ဆူညံသံ သတ်မှတ်ချက်ကို ထည့်သွင်း စဉ်းစားခြင်း- ဆူညံမှုကို လျော့ချသည့် အရာများ တပ်ဆင် ထားခြင်း - ဆူညံသံကို လျော့ချရန်အတွက် ယာဉ် အဟောင်းများ (စက်ပစ္စည်းများ နှင့် စက်ပစ္စည်းကိရိယာများလည်း) မွမ်းမံခြင်း

	<ul style="list-style-type: none"> - ဆူညံသံ အဆင့်ကို ၅၀% အထက် လျော့ချရန်အတွက် ထိရောက်မှု ရှိသော ယာဉ်များ (စက်ပစ္စည်းကြီးများ နှင့် စက်ပစ္စည်းကိရိယာများလည်း) ထိန်းသိမ်းခြင်း လုပ်ဆောင်ခြင်း - တုန်ခါမှုကို လျော့ချရန်အတွက် ယာဉ်ကြီးများနှင့် dumpers များ၏ အရှိန်ကို လျော့ချခြင်း - လမ်းများမှ ယာဉ်ကြီးများနှင့် dumpers များကြောင့် ဖြစ်ပေါ်သော တုန်ခါမှုကို လမ်းမျက်နှာပြင် ချောမွေ့စေခြင်းဖြင့် တတ်နိုင်သမျှ လျော့ချနိုင်ပါသည်။ - ပုံမှန် စောင့်ကြပ်ကြည့်ရှုခြင်း/ စစ်ဆေးခြင်းများကို လုပ်ဆောင်ခြင်း
<p>ရေထု အရည်အသွေးနှင့် ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု (ရေအရည်အသွေး ပျက်စီးခြင်းနှင့် ရေစီးဆင်းမှုကိုလျော့နည်းစေနိုင်ခြင်းနှင့် ရေထု ညစ်ညမ်းစေသော ဖြစ်နိုင်ခြေ)</p>	<ul style="list-style-type: none"> - ရေမြောင်းအားလုံးကို စီမံဆောင်ရွက်ခြင်း- မိုင်းလုပ်ငန်း မစတင်ခင် အခြေအနေကို ထိန်းသိမ်းခြင်း (တစ်နည်းအားဖြင့် မြေစာပုံများ နှင့် မြေဆီလွှာပုံ ပေါ်တွင် ရေမြောင်းများ၏ သက်ရောက်မှုကို ရှောင်ကြဉ်ရန် အတွက် သဘာဝရေနုတ်မြောင်းများကို အနှောက်ယှက် မဖြစ်အောင် ချန်လှပ်ထားခြင်း) - လူလုပ်ရေမြောင်းများကို လိုအပ်လျှင် တူးဖော်ပေးခြင်း - တတ်နိုင်သမျှ တူးဖော်ထားသော လုပ်ကွက်/ တွင်းများထဲသို့ ရေများ ရုတ်တရက် ဝင်ရောက်ခြင်းကို အတတ်နိုင်ဆုံး ကာကွယ်ရမည်။ - အထက်တွင် ဖော်ပြထားသည့် အတိုင်း မြေစာပုံများ နှင့် မြေဆီလွှာပုံများကို သင့်တော်သော နေရာများတွင် သိုလှောင်ထားခြင်း။ မြေစာပုံများ နှင့် မြေဆီလွှာပုံ များကို တတ်နိုင်သမျှ တည်ငြိမ်အောင် ထိန်းသိမ်းထားခြင်း၊ ထုံးကျောက်ပုံများကို သီးသန့်နေရာခွဲ၍ သိုလှောင်ထားခြင်း - ချောင်းများ အတွင်းသို့ စွန့်ပစ်ပစ္စည်းများ (အစိုင်အခဲ၊ အရည်) စွန့်ပစ်ခြင်းမှ ရှောင်ကြဉ်ခြင်း။ - ချောင်းများထဲသို့ ဆီများ၊ ဓာတုပစ္စည်းများ ဝင်ရောက်ခြင်းမှ ရှောင်ကြဉ်ခြင်း။ - ရေများကို ညစ်ညမ်းခြင်းကို အတတ်နိုင်ဆုံး ရှောင်ကြဉ်ခြင်း။ - မြေအောက်ရေထဲ စိမ့်ဝင်ခြင်းကို ကာကွယ်ရန် မြေများကို ညစ်ညမ်းစေခြင်းကို ရှောင်ကြဉ်ခြင်း။

	<ul style="list-style-type: none"> - ရေများကို တတ်နိုင်သမျှ ထိန်းသိမ်းခြင်း၊ လုပ်သားများကို ရေများကို ထိန်းသိမ်းခြင်း အတွက် ပညာပေးခြင်း - ရေကန်များ၊ ပိုက်များ၊ ရေပိုက်များ၊ အဆက်နေရာများကို ယိုစိမ့်မှုများကို ပုံမှန် စစ်ဆေးခြင်း၊ ယိုစိမ့်မှုများကို ချက်ချင်းပြင်ဆင်ခြင်း - စိမ်းလန်းခြင်းအတွက် ရေစားနည်းသော အပင်များကို စိုက်ပျိုးခြင်း။
<p>ဇီဝမျိုးစိတ်များ အပေါ် သက်ရောက်မှုများ (သစ်တောပြုန်းတီးခြင်းနှင့် ကျက်စားရာနေရာ ပျက်စီးခြင်း၊ ရွှေ့ပြောင်းရာလမ်းကြောင်း၊ အသိုက်/ မွေးမြူခြင်းများ ပျက်စီးခြင်း၊ လောင်စာ သစ်သားများ ခုတ်ထွင်ခြင်း)</p>	<ul style="list-style-type: none"> - ပတ်ဝန်းကျင်၏ ဇီဝမျိုးစိတ် အစိတ်အပိုင်းများ၏ ကာကွယ်ခြင်း နှင့် ထိန်းသိမ်းခြင်း အတွက် အစီစဉ်ဆွဲခြင်း နှင့် စီမံခန့်ခွဲခြင်း - ဥပဒေ၊ နည်းဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများကို လိုက်နာခြင်း (ဇီဝမျိုးစုံမျိုးကွဲနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ဥပဒေ (၂၀၁၈)၊ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဥပဒေ (၂၀၁၂)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေ (၂၀၁၄)) - တတ်နိုင်သမျှ သစ်ပင်များကို ကာကွယ်ရန် နှင့် ထိန်းသိမ်းခြင်း အတွက် အစီစဉ်ဆွဲခြင်း (လုပ်ကွက်သည် မယ်ဟော် သစ်တောဧရိယာထဲတွင် ရှိပါသည်။ သစ်တောသည် တစ်စိတ်တစ်ပိုင်း ပြုန်းတီးပြီး နေပြီး ဖြစ်ပါသည်။ အလုပ်ကို ကောင်းစွာ စီမံခန့်ခွဲမှု မရှိပါက သက်ရောက်မှုသည် သိသာနိုင်ပါသည်။ - သတ္တုတူးဖော်ခြင်း/ကျောက်မိုင်းလုပ်ငန်းများလုပ်ဆောင်ချိန်တွင် သစ်ပင်များ ထိခိုက်မှု အနည်းဆုံး ဖြစ်စေရန် ဆောင်ရွက်ခြင်း - လမ်းများ၊ မိုင်းတွင်း နှင့် တူးဖော်ခြင်း လုပ်ကွက်များ ပြုလုပ်ခြင်း အတွက် လိုအပ်သည်ထက်ပို၍ အပင်များရှင်းလင်းမှု မပြုလုပ်ခြင်း။ အပင်များကို ဖယ်ရှားခြင်းကို ကန့်သတ်ခြင်း၊ အပင်ကြီးများကို ခုတ်လှဲခြင်းကို တတ်နိုင်သမျှ ရှောင်ကြဉ်ခြင်း - သစ်ပင်၏ အစာချက်စနစ်ကို ဟန့်တားနိုင်သည့် အပင်များ၏ အရွက်များ အပေါ် ဖုန်များ တင်ခြင်းကို တတ်နိုင်သမျှ လျော့ချခြင်း နှင့် ထိန်းချုပ်ခြင်း - သစ်ပင်များအပေါ် အထူးသဖြင့် အမြစ် စနစ် အပေါ် ဆိုးကျိုးသက်ရောက်မှု ဖြစ်စေနိုင်သော hydrocarbons ဖိတ်စင်ခြင်းကို ကာကွယ်ခြင်း - အပင်များကို hydrocarbons မှ ကာကွယ်ရန် အတွက် သတ်မှတ်ထားသော နေရာများ နှင့် Drip trays များကို အသုံးပြုခြင်း - လောင်စာဆီ သိုလှောင်ခြင်း ကို သတ်မှတ်ထားသော နေရာများတွင်သာ သိုလှောင်ခြင်း

	<ul style="list-style-type: none"> - ထင်း စုဆောင်းမှုကို ကန့်သတ်ခြင်း၊ ထင်းအတွက် အပင်များကို မခုတ်ခြင်း။ သို့သော် လဲကျနေသော သစ်ပင်များ၊ သစ်ပင်ခြောက် သစ်ကိုင်းခြောက်များမှ အပင်များ၊ လောင်စာထင်းများကို စုဆောင်းခြင်း သို့မဟုတ် မီးသွေးများကို အသုံးပြုခြင်း - ချက်ပြုတ်ခြင်းကို သစ်ပင်များ ရှင်းလင်းသည့် သတ်မှတ်ထားသော နေရာများတွင်သာ ချက်ပြုတ်ခြင်း - ဟင်းလင်းပွင့် မီးရှို့ခြင်းကို ရှောင်ကြဉ်ခြင်း - မီးဘေးအန္တရာယ် အသိပေး နှင့် ကာကွယ်ခြင်း အတွက် လုပ်သားများကို ပညာပေးခြင်း၊ လောင်ကျွမ်းနေသော စီးကရက် အပိုင်းအစများကို စည်းကမ်းမဲ့ စွန့်ပစ်ခြင်းကို တားမြစ်ခြင်း၊ မီးလောင်ကျွမ်းမှု ဖြစ်စေသော အမှိုက်များ အားလုံးကို ရှင်းလင်းထားခြင်း။ - လုပ်သားအချို့ကို အခြေခံ မီးသတ် သင်တန်းများပေးခြင်း - အထိခိုက်မခံသော မျိုးစိတ်များနှင့် နေထိုင်ရာ နေရာများကို သတ်မှတ်ပြီး ၎င်း နေရာများကို တတ်နိုင်သမျှ ရှောင်ရှားခြင်း။ - လုပ်သားများကို ပတ်ဝန်းကျင်ဆိုင်ရာ အသိပညာပေးခြင်း။ - တရားမဝင် သစ်ခိုးထုတ်ခြင်းကို ရပ်တန့်ရန် ကြိုးစားခြင်း၊ ရှိခဲ့ပါက သက်ဆိုင်ရာ ကို အကြောင်းကြားခြင်း - လုပ်ကွက်တွင် ထူးဖော်ခြင်း များ ပြီးစီးပြီးနောက် သဘာဝ အပင်များ ပြန်လည်ထူထောင်ခြင်း အတွက် လုပ်ဆောင်ခြင်း - တောရိုင်းတိရစ္ဆာန်များအား တတ်နိုင်သမျှ ကာကွယ်ခြင်း နှင့် ထိန်းသိမ်းခြင်း ကို လုပ်ဆောင်ခြင်း (သစ်တောများကို ကာကွယ်ခြင်း နှင့် ထိန်းသိမ်းခြင်း သည် တောရိုင်းတိရစ္ဆာန်များအား ကာကွယ်ခြင်း နှင့် ထိန်းသိမ်းခြင်း နှင့် အလားတူပါသည်။) - တူးဖော်ခြင်း/ကျောက်မိုင်း လုပ်ငန်းများသည် တောရိုင်းတိရစ္ဆာန်များ အပေါ်တွင် သက်ရောက်မှု အနည်းဆုံး ဖြစ်ကြောင်းသေချာစေခြင်း - လုပ်သားများ ကြွက်များ၊ ငှက်များ၊ ကုန်းနေရေနေ သတ္တဝါများ အပါအဝင် သားရဲ တိရစ္ဆာန် အကြီး အငယ်များကို အမဲလိုက်ခြင်း နှင့် / သို့မဟုတ် ထောင်ခြောက်ဆင်ဖမ်းခြင်းကို တားမြစ်ခြင်း - ယာဉ်များ သွားလာမှုကြောင့် အထူးသဖြင့် ညအချိန်တွင် သားရဲ တိရစ္ဆာန် များ ဒဏ်ရာ ရခြင်း သို့မဟုတ် သေဆုံးခြင်း ဖြစ်နိုင်ခြေကို ကာကွယ်ခြင်း
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	<ul style="list-style-type: none"> - Hydrocarbons၊ drill fluids နှင့် chemicals များ ဖိတ်စင်ခြင်းကြောင့် သားရဲ တိရစ္ဆာန် များ ဒဏ်ရာ ရခြင်း သို့မဟုတ် သေဆုံးခြင်း ဖြစ်နိုင်ခြေကို ကာကွယ်ခြင်း - အင်းဆက်ပိုးမွှားများ စုစည်းခြင်း နှင့် တဖြည်းဖြည်း သေဆုံးခြင်းကို ကာကွယ်ရန် ညအချိန်တွင် အလင်းရောင် အလွန်အကျွံ နှင့် အချိန်ကြာအသုံးပြုခြင်းကို ရှောင်ကြဉ်ခြင်း (ညအချိန်တွင် စူးရှသော အလင်းရောင် သည် တောရိုင်း သတ္တဝါများကို ၎င်း တို့၏ ကျက်စားရာ သို့မဟုတ် မျိုးပွားရာ နေရာများ ကြောက်လန့် ပြေးစေနိုင်ပါသည်။) - ရှောင်ရှားရမည့် အထိခိုက်မခံသော မျိုးစိတ်များနှင့် နေထိုင်ရာ နေရာများကို သတ်မှတ်ခြင်း။ အသိုက်၊ မျိုးပွားရာ နေရာများ ကဲ့သို့သော တိရစ္ဆာန်များ၏ သဘာဝကို အနှောင့်အယှက် ဖြစ်စေနိုင်သော နေရာများကို တတ်နိုင်သမျှ ရှောင်ရှားခြင်း။
<p>လူမှုစီးပွားအပေါ် သက်ရောက်မှုများ (ဒေသခံများကို ဖိအားပေး ရွှေ့ပြောင်းနေထိုင်စေ ခြင်း၊ အငြင်းပွားမှုများ၊ အရင်းမြစ်များ အပေါ်တွင် ဖိအား၊ အမြဲတမ်း အလုပ် အကိုင်၊ ဒေသတွင်း စီးပွား ရေးတိုးတက်စေခြင်း၊ အခြေခံ အဆောက်အအုံ များနှင့် လူမှုရေး တိုးတက် မှုများ)</p>	<ul style="list-style-type: none"> - ဒေသခံများနှင့်ကုမ္ပဏီမှလုပ်သားများ၏ လူမှုစီးပွားအပေါ် သက်ရောက်မှုများ ဆိုးကျိုးသက်ရောက်မှုများကို လျော့ချရန် သို့မဟုတ် ရှောင်ရှားရန် လုပ်ဆောင်ခြင်း - ယာဉ်များသွားလာမှု သို့မဟုတ် မိုင်းလုပ်ငန်းများမှ ဖုန်မှုန့်များ ထွက်ရှိခြင်း ရှိခဲ့လျှင် ဖုန်မှုန့်များကို တတ်နိုင်သမျှ မထအောင် လုပ်ဆောင်ခြင်း (ရေဖြန်းခြင်း)၊ ကျေးရွာများကို ယာဉ်များ ဖြတ်သန်းသွားသည့် အခါ ယာဉ် အရှိန်ကို လျော့ချခြင်း။ - ဒေသခံများနှင့် အိမ်မွေးတိရစ္ဆာန်များ လုံခြုံရေး အတွက် ယာဉ်မောင်း များအား မတော်တဆ မှု မရှိအောင် ထိန်းသိမ်းရန် နှင့် မောင်းနှင်ခြင်း အတွက် ပညာပေးခြင်း။ - ဒေသခံများ၏ သောက်ရေ အရင်းအမြစ်ကို ညစ်ညမ်းစေခြင်းမှ ရှောင်ရှားခြင်း။ - လူထုနှင့် ကောင်းမွန်သော ဆက်ဆံရေးကို တည်ဆောက်ခြင်း။ - စီမံကိန်းအပေါ် ကောင်းမွန်သော အမြင်များ ရရှိစေရန် လူထုတွေ့ဆုံပွဲများ ကျင်းပခြင်း - ဒေသခံများ နှင့် ဆွေးနွေးသည့် အခါ ၎င်းတို့၏ ယဉ်ကျေးမှု နှင့် ဓလေ့ထုံးတမ်းများကို လေးစားရန် သင့်တော်သော အမှုအကျင့်များကို လုပ်သားများကို အသိပညာပေးခြင်း။ - အာဏာပိုင်များနှင့် ကုမ္ပဏီ၏ လုပ်သားများသည် မြေယာနှင့် ပိုင်ဆိုင်မှု ဈေးကစားခြင်းလုပ်ငန်းများရှိပါက ၎င်းလုပ်ငန်းများတွင်ပါဝင်မပတ်သက်ခြင်း။

	<ul style="list-style-type: none"> - အမှန်တကယ် မိုင်းတူးဖော်ခြင်း ကာလတွင် CSR လုပ်ငန်းစဉ်များ လုပ်ဆောင်မှုကို ထည့်သွင်းစဉ်းစားခြင်း - ဒေသခံများအား ဦးစားပေး အလုပ်ခန့်အပ်ခြင်း - ဒေသတွင်း ဈေးများမှ ဦးစားပေး ဝယ်ယူခြင်း - ရပ်ရွာလူထု ပူးပေါင်းဆောင်ရွက်မှု၊ ရပ်ရွာ အကူအညီ နှင့် ရပ်ရွာဖွံ့ဖြိုးရေး အတွက် တတ်နိုင်သမျှ လုပ်ဆောင်ခြင်း။ - (လူမှုရေးအလေ့အကျင့်ဆိုးများ- ကိုယ်ကျင့်တရားဖောက်ပြန်ခြင်း၊ များကို စီမံခန့်ခွဲရန် လုပ်ဆောင်ခြင်း။ - လုပ်သားများကို စည်းကမ်းနှင့် အကျင့်စာရိတ္တ ကောင်းမွန်ရန် အသိပညာပေးခြင်း၊ - မှားယွင်းမှု ကျူးလွန်သူများကို ဆိုင်းငံ့ခြင်း ကဲ့သို့သော ပြစ်ဒဏ်များ ချမှတ်ခြင်း - အလုပ်ချိန်အတွင်း အရက်သေစာ သောက်သုံးခြင်းကို တင်းကြပ်စွာ တားမြစ်ခြင်း နှင့် ဆေးလိပ်ဆေးရွက်ကြီး နှင့် မူးယစ်စေနိုင်သော စိတ်ကြွဆေးများ သုံးစွဲခြင်းကို တားမြစ်ခြင်း - အလုပ်သမားများကို မျှမျှတတ ဆက်ဆံခြင်း - လုပ်သားများနှင့် အဆင်မပြေသော ဆက်ဆံရေးများကို ရှောင်ရှားခြင်း- အလုပ်အလွန်အကျွံခိုင်းခြင်း နှင့် လုပ်ခ လစာ မပေးခြင်း။
<p>ယဉ်ကျေးမှု အစိတ်အပိုင်း များအပေါ် သက်ရောက်မှုများ (ယဉ်ကျေးမှုအစိတ်အပိုင်းများ၊ သာသာရေး အမွေအနှစ်များ အပေါ် ဖြစ်နိုင်ခြေ ရှိသော အနှောက်အယှက် များ)</p>	<ul style="list-style-type: none"> - ထိခိုက်မှု မရှိသောကြောင့် လျော့ချရန် မလိုအပ်ပါ။ ရွှေဘုန်းပွင့် ဘုရားသည် အတော်တန် ဝေးပြီး မသက်ရောက်နိုင်ပါ။ သို့သော် ဘုရားများ နှင့် အခြားသော အစိတ်အပိုင်းများအပေါ် တွင် အပျက်သဘောဆောင်သော သက်ရောက်မှုများ ဖြစ်ပေါ်လာခဲ့သည် ရှိသော် ၎င်းတို့ကို ရှောင်ရှားရန် အစီအစဉ်များ ဆွဲခြင်း - လုပ်ကွက် နှင့် ၂၅ မီတာ အတွင်းတွင် ဘာသာရေး၊ ယဉ်ကျေးမှု၊ ရှေးဟောင်းသုတေသန ဆိုင်ရာ နေရာ တစ်ခုခု ရှိခဲ့လျှင် မတော်တဆ ထိခိုက်မှု မဖြစ်ပေါ်စေရန် ရှင်းလင်းစွာ မှတ်သားထားသင့်သည်။ - ကျောက်မိုင်းလုပ်ငန်းများ ပြုလုပ်စဉ်အတွင်း မြှုပ်နှံထားသော ရှေးဟောင်းသုတေသန ဆိုင်ရာ နေရာ သို့မဟုတ် မြှုပ်နှံထားသော ရှေးဟောင်း ပစ္စည်းများ တွေ့ရှိပါက သက်ဆိုင်ရာ သို့ အချိန်မှီ အကြောင်းကြားပေးရပါမည်။ - ဘုန်းကြီးကျောင်း၊ ခရစ်ယာန်ကျောင်းများ ကို ဘာသာရေးနေ့များ၊ ဘာသာရေးပွဲများတွင် လှူဒါန်းမှုများ ကို လုပ်ဆောင်ပေးခြင်း

	<ul style="list-style-type: none"> - ဘုန်းကြီးကျောင်း၊ ခရစ်ယာန်ကျောင်းများ ကို အလှူငွေများ လှူဒါန်းပေးခြင်း နှင့် အလှူဒါနပြုခြင်း - ဘုရား နှင့် ဘုန်းကြီးကျောင်း၊ ခရစ်ယာန်ကျောင်းများကို လိုအပ်လျှင် ပြုပြင်မွမ်းမံပေးရန် ထည့်သွင်းစဉ်းစားခြင်း။
<p>မြင်ကွင်းပဒေသများ အပေါ် သက်ရောက်မှုများ (ဗေဒသက်ရောက်မှု ထုတ်ယူသည့် လုပ်ကွက်များ၊ မြေစာပုံ၊ ရှုခင်းများ၊ အမြင့်အနေအထား များ ပြောင်းလဲခြင်း)</p>	<ul style="list-style-type: none"> - သတ္တုတူးဖော်ခြင်း/ကျောက်မိုင်းများကို မြင်ကွင်းပဒေသများအပေါ် အလေးထား၍ လုပ်ဆောင်စေခြင်း (ကျပ်နန်း တူးဖော်ခြင်းသည် အကျည်းတန်သော ချိုင့်များ၊ တွင်းများ၊ အပေါက်များ သည် ဟိုနားသည်နား လျှောစောက်များအပေါ်တွင် ပြန်ကျကျန်ခဲ့နိုင်သည်။) - စနစ်ကျသော တူးဖော်ခြင်း နှင့် ဖောက်ခွဲခြင်းများကို လုပ်ဆောင်ခြင်း နှင့် လုပ်ကွက်ကို ဂရုတစိုက်ရွေးချယ်ခြင်း၊ ကျပ်နန်း တူးဖော်ခြင်း နှင့် ဖောက်ခွဲခြင်းများကို လုပ်ဆောင်ခြင်းထက် အချိန်တစ်ခုတွင် တစ်ပိုင်းချင်း သို့မဟုတ် အပိုင်း တစ်ပိုင်းစီ လုပ်ဆောင်ခြင်း - တူးဖော်ခြင်း မလုပ်ဆောင်မှီ လိုအပ်သည်ထက်ပို၍ အပင်များရှင်းလင်းမှု မပြုလုပ်ခြင်း၊ (ဥပမာ မိုင်းလုပ်ကွက် အတွက် ပြင်ဆင်ခြင်း ကာလ အတွင်း) - လုပ်ကွက် အလုပ် လုပ်ဆောင်ပြီးသော အခါ ချိုင့်များ၊ တွင်းများ၊ အပေါက်များ ကို မြေစာများ ပြန်လည်ဖြည့်တင်းခြင်း (အပင်များ စိုက်ပျိုးခြင်း) - ရရှိသော နေရာများတွင် တတ်နိုင်သလောက် စိမ်းလန်းဧရိယာများ ဆက်လက် ဖန်တီးခြင်း - အဆောက်အဦများ ကို မြင်ကွင်းပဒေသ ဖြစ်စေသော အရောင်များ နှင့် ကာလာဆေးများ အသုံးပြု၍ ဆေးသုတ်ခြင်း (ဥပမာ- ရုံးခန်း၊ သိုလှောင်ရုံ၊ အလုပ်ရုံ၊ အရောင်းဌာန အစရှိသည်ဖြင့်) - လုံခြုံရေး အကြောင်းပြချက်အတွက်သာ သင့်တင့်သော အလင်းကိုသာ အသုံးပြုခြင်း ညအချိန်တွင် အလင်းရောင် အထူးသဖြင့် မျက်စိစူးစေသော အလင်းများ အလွန်အကျွံ ဖြစ်စေခြင်းမှ ရှောင်ကြဉ်ခြင်း။ - အင်းဆက်များကို မထိခိုက်စေရန် အဖြူရောင် အလင်းများ အစား အဝါရောင် အလင်းများကို အစားထိုး အသုံးပြုခြင်း အင်းဆက်များ စုပုံလာပါက မီးကို ခဏ ပိတ်ထားခြင်း။
<p>ကျန်းမာရေး နှင့် လုံခြုံရေး အစိတ်အပိုင်း(လုပ်ငန်းခွင် အတွင်းဖြစ်နိုင်ခြေ ရှိသော</p>	<ul style="list-style-type: none"> - လုံခြုံသော အလုပ်နေရာ (တူးဖော်ခြင်း / ကျောက်မိုင်း လုပ်ကွက်) နှင့် ဆက်စပ်ဧရိယာများ ဖန်တီးပေးခြင်း ဥပမာအားဖြင့် မိုင်းလုပ်ကွက် နှင့် မြေစာပုံထားသော လုပ်ကွက်နေရာများ

မတော်တဆမှု၊ လုံခြုံစိတ်ချရသော လုပ်ငန်းခွင်လေထုအခြေအနေ မရှိခြင်း၊ အာဟာရ ရှိသော အစားအစာများ၊ သောက်သုံးနိုင်သော ရေများနှင့် အိမ်သာ အစရှိသည်တို့ မရှိခြင်း)

- ကောင်းမွန်သော လုပ်ငန်းခွင် အလေ့အကျင့်၊ ကောင်းမွန်သော အင်ဂျင်နီယာ အလေ့အကျင့်၊ ကောင်းမွန်သော လုံခြုံရေး အလေ့အကျင့်၊ ကောင်းမွန်သော နေထိုင်မှု အလေ့အကျင့်များကို လေ့ကျင့်သင်ကြားပေးပြီး ၎င်း အလေ့အကျင့်များကို လုပ်သားများ၏ စိတ်တွင် အကျင့်ဖြစ်လာမည် ဖြစ်ပါသည်။
- လုပ်ငန်းခွင်တွင် မတော်တဆမှု မရှိစေရန် ကြိုးပမ်းခြင်းနှင့် မတော်တဆမှုကို ကာကွယ်ခြင်း နှင့် ရှောင်ကြဉ်ခြင်း။
- ကျန်းမာရေး အသိပညာနှင့် တစ်ကိုယ်ရေသန့်ရှင်းရေး အတွက် လုပ်သားများကို လေ့ကျင့် အသိပညာပေးခြင်း။
- ရှေးဦးသူနာပြု သင်တန်းတွင် လုပ်သား အနည်းငယ်ကို လေ့ကျင့်ပေးခြင်း
- ငှက်ဖျားရောဂါ၊ ပိုးသတ်ဆေး၊ အဆိပ်ဖြေဆေး နှင့် အန္တရာယ်ရှိသော အင်းဆက်များနှင့် မြွေကိုက်ခံရခြင်း အတွက် အဆိပ်ဖြေဆေးများ ပါဝင်သော ဆေးဝါးများ ပါရှိသော ရှေးဦးသူနာပြု ပစ္စည်းများကို သိုလှောင်ထားခြင်း။
- လုပ်သားများအတွက် helmets၊ earplugs၊ masks၊ hand gloves၊ outfit နှင့် boots အစရှိသော တစ်ကိုယ်ရေသုံး ကာကွယ်ရေး ပစ္စည်းများကို လုံလောက်စွာ ထောက်ပံ့ပေးထားခြင်း။
- ကျန်းမာရေးနှင့် ညီညွတ်ပြီး အာဟာရပြည့်ဝသော အစားအစား၊ သောက်သုံးရေ များကို ထောက်ပံ့ပေးခြင်း
- လုံလောက်သော မိလ္လာစနစ် ဥပမာအားဖြင့် အိမ်သာ၊ ရေချိုးခန်းများ ထောက်ပံ့ပေးခြင်း

ဖောက်ခွဲခြင်းအတွက် တိကျသော လျော့ပါးစေရေး

- စနစ်တကျ နှင့် ဘေးကင်းသော ဖောက်ခွဲခြင်းများကို လုပ်ဆောင်ခြင်း- အကောင်းဆုံးသော ဖောက်ခွဲခြင်း ဒီဇိုင်းကို ရွေးချယ်ခြင်း။
- ဧရိယာအတွင်း ကလေးငယ်များ တိရစ္ဆာန်များ ဝင်ရောက်ခြင်းကို ကာကွယ်ရန် အတွက် ဖြစ်နိုင်လျှင် ဖောက်ခွဲမည့် ဧရိယာကို ခြံစည်းရိုး ခတ်ခြင်း။
- လက်ခံနိုင်သော ဖောက်ခွဲခြင်း အလေ့အကျင့် ကို လိုက်နာခြင်း ဥပမာအားဖြင့် ကျောက်ကွဲ အပိုင်းအစများ ပိုများပြီး တုန်ခါမှု နိမ့်သည့် အလေ့အကျင့် (ဥပမာအားဖြင့် relatively shallow slanting drill holes method)
- သင့်တော်သော ဖောက်ခွဲရေး ပစ္စည်းများကို ရွေးချယ်ခြင်း ဥပမာအားဖြင့် emulsion အမျိုးအစားကို အသုံးပြုခြင်း
- လုံခြုံရေး မြင့်မားသည့် magazine တွင် ဖောက်ခွဲရေး ပစ္စည်းများကို သိုလှောင်ခြင်း

	<ul style="list-style-type: none"> - စံချိန်မှီ detonation fuses နှင့် ပစ္စည်းကိရိယာများကို အသုံးပြုခြင်း၊ detonators များနှင့် ဖောက်ခွဲရေး ပစ္စည်းများကို သီးသန့်သိုလှောင်ထားခြင်း၊ ရက်လွန်နေသော ဖောက်ခွဲရေး ပစ္စည်းများကို အသုံးမပြုခြင်း - ဖောက်ခွဲရေးအား မြင့်သည့်အခါ ကျောက်များ လွင့်စင်ခြင်း ဖြစ်ပေါ်တတ်သောကြောင့် ဖောက်ခွဲအား ကို လျော့ချခြင်း။ - တူးဖော်ခြင်းနှင့်ဖောက်ခွဲခြင်း လုပ်ငန်းစဉ် အားလုံးကို ကျွမ်းကျင်သော demolition ကျွမ်းကျင်ပညာရှင်မှ တင်းကြပ်စွာ ကြီးကြပ်ခြင်း - ဖောက်ခွဲရေး ပစ္စည်းများကို ဘေးကင်းစွာ ကိုင်တွယ် သိမ်းဆည်းခြင်း အတွက်နှင့် အသုံးပြုခြင်း အတွက် လုံလောက်သော သင်တန်းများ ထောက်ပံ့ပေးခြင်း - လုပ်သားများကို တူးဖော်ခြင်း/ကျောက်မိုင်း လုပ်ငန်းစဉ် လမ်းညွှန်ချက်များကို ဖြန့်ဝေခြင်း။ - ဖောက်ခွဲခြင်းကို သတ်မှတ် အချိန်ဇယား ဥပမာအားဖြင့် ညနေ ၄:၃၀ မှ ၅:၃၀ တွင် လုပ်ဆောင်ခြင်း - မ ဖောက်ခွဲခင် ၅ မိနစ် အလိုတွင် ဥဩသံများဖြင့် အချက်ပေးခြင်း - ဖောက်ခွဲခြင်းအတွက် အချိန်ဇယားကို နီးစပ်ရာ ဒေသခံများထံသို့ ကြိုတင် အကြောင်းကြားခြင်း - လုပ်သားများကို လုံလောက်သော ear muffs၊ ear protectors၊ safety goggles ကဲ့သို့သော တစ်ကိုယ်ရေသုံး ပစ္စည်းများ နှင့် ရှေးဦးသူနာပြုပစ္စည်းများ ထောက်ပံ့ပေးခြင်း။ - တူးဖော်ခြင်း နှင့် ထုတ်လုပ်ခြင်း၊ ဘေးကင်းစွာ သယ်ယူပို့ဆောင်ခြင်း နှင့် ထွက်ရှိသော ထုံးကျောက်များ၊ အပေါ်ယံ မြေဆီလွှာ နှင့် မြေစာများကို စုပုံခြင် ကဲ့သို့သော အခြား တူးဖော်ခြင်း / ကျောက်မိုင်း လုပ်ငန်းစဉ် များအတွက် လုံလောက်သော လေ့ကျင့်သင်ကြားခြင်းများကို ထောက်ပံ့ ပေးခြင်း
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အရေးပေါ်အခြေအနေ တုန့်ပြန်ရေးအစီအစဉ်

အရေးပေါ်အခြေအနေ လုပ်ငန်းစဉ်များ (ယေဘုယျအားဖြင့်)

- ဦးစွာ မီးမတော်တဆမှု အတွက် ကာကွယ်ခြင်း/ လျော့ပါးစေရေး နည်းလမ်းများ ရေးဆွဲခြင်း
- လုပ်သား အချို့အတွက် မီးသတ်သင်တန်းများ ထောက်ပံ့ပေးခြင်း

- မီးငြိမ်းသတ်ရေး အဆောင်အယောင်များ မီးသတ်ရေကန်၊ hydrants၊ water jet pumps နှင့် မီးသတ်ဆေးဘူးများ လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း။ ဖြစ်နိုင်လျှင် မီးသတ်ဝတ်စုံ ကဲ့သို့သော PPEs လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း။ (ကုမ္ပဏီတွင် မီးသတ် အင်ဂျင် ၂ လုံး နှင့် မီးသတ်ကားများ ရှိပါသည်။)
- မီးငြိမ်းသတ်ရေး အဆောင်အယောင်များကို ပုံမှန် စစ်ဆေးခြင်း ရေကန်တွင် ရေများကို အမြဲတမ်း ရေဖြည့်ထားခြင်း
- မီးသတ်တပ်ဖွဲ့ကို ဖွဲ့စည်းပြီး ၎င်း အဖွဲ့၏ မီးငြိမ်းသတ်ခြင်း နှင့် သင်တန်း၏ ထိရောက်မှုကို အကဲဖြတ်ခြင်း၊ အဆင်သင့်ဖြစ်မှုကို အကဲဖြတ်ခြင်း၊ လျှင်မြန်စွာ တုန့်ပြန်မှု နှင့် လျှင်မြန်စွာ ရွေ့ပြောင်းသော လုပ်ငန်းစဉ်များကို အကဲဖြတ်ခြင်း၊
- လုပ်သားအချို့ကို ရှေးဦးသူနာပြုသင်တန်းများ ထောက်ပံ့ပေးခြင်း
- ဆေးပိဝင်သော ရှေးဦးသူနာပြုဆေးသေတ္တာများ၊ ပစ္စည်းကိရိယာများ နှင့် stretchers များ ကဲ့သို့သော ရှေးဦးသူနာပြုပစ္စည်းများကို လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း၊ ရှေးဦးသူနာပြု ပစ္စည်းများ၏ အခြေအနေကို ပုံမှန် စစ်ဆေးခြင်း
- မီးသတ်၊ အရေးပေါ်ယာဉ် နှင့် ဆေးရုံများ၏ အရေးပေါ်ဌာန၊ ရဲစခန်းများ၏ လိပ်စာ၊ ဖုန်းနံပါတ် များကို ဝန်ထမ်းများအားလုံး မြင်သာသည့်နေရာတွင် ကပ်ထားပေးခြင်း။
- အချက်ပေးစနစ် နှင့် ထိန်းချုပ်မှု စနစ်ကို တပ်ဆင်ထားခြင်း။
- ကုမ္ပဏီအတွက် အာမခံ ထားရှိခြင်း မီးဘေး နှင့် သဘာဝဘေးများအတွက်လည်း အာမခံ ထားရှိခြင်း
- မိုးကြိုးဖမ်းများ မိုးကြိုးလွဲများနှင့် မြေပြင်လျှပ်ကူးပစ္စည်းများ ကို ထိရောက်စွာ တပ်ဆင်ထားခြင်း
- လုံခြုံရေးကို တင်းကြပ်စွာ ချမှတ်ထားခြင်း

လူထုပူးပေါင်းပါဝင်မှု နှင့် လူထု ဖွံ့ဖြိုးတိုးတက်မှု

ဂျူလိုင် ၁၄ ၂၀၂၃ ခုနှစ် (၀၉:၀၀ - ၁၀:၀၀) တွင် တောင်ဖီလာ တောင်လုပ်ကွက်၏ ထုံးကျောက် သတ္တုတွင်း/ကျောက်မိုင်းများအတွက် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်အတွက် လူထုတွေ့ဆုံ ဆွေးနွေးပွဲအား လူ အယောက် (၃၀) ဦးဖြင့် ပြုလုပ်ခဲ့ပါသည်။

လူထုတွေ့ဆုံဆွေးနွေးပွဲ၏ အကျဉ်းချုပ်မှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်-

တတိယ အဖွဲ့အစည်းဖြစ်သော MESC၏ မန်နေဂျင်း ဒါရိုက်တာမှ စီမံကိန်း အကြောင်း ရှင်းလင်းပြောဆိုခဲ့ပါသည်။

NCDC မှတာဝန်ခံသည် ၎င်းတို့လည်း EMP အစီရင်ခံစာကို ပြင်ဆင်ရာ တွင် ပါဝင်ကြောင်း ပြောကြားခဲ့ပါသည်။ စီမံကိန်းကြောင်ပတ်ဝန်းကျင်အပေါ် သက်ရောက်နိုင်သော ကောင်းကျိုးဆိုးကျိုးများကို တွက်ဆပြီး တင်ပြရပါသည်။ စီမံကိန်းတစ်ခု ပေါ်ပေါက်လာလျှင် ကောင်းကျိုးဆိုးကျိုး တွဲနေသော်လည်း ဆိုးကျိုးထက်ကောင်းကျိုးက ပိုများနေရမည်။

တဲကြီးကုန်းကျေးရွာ အုပ်ချုပ်ရေးမှူး ဦးဘိုသိန်းမှ ကျွန်တော်တို့အနေဖြင့် အထူးတလည် ဆွေးနွေးတင်ပြရန်မရှိပါ။ စီမံကိန်းမှ သက်ရောက်မှုများသည် ကောင်းကျိုးများရှိသကဲ့သို့ ဆိုးကျိုးများလည်း ရှိပါသည်။ အလွန်အကျွံ ဆိုးကျိုးများ ကိုမမြင်မိပါ။ အခက်အခဲအနေဖြင့် တစ်ခုတောင်းဆိုချင်ပါသည်။ အိမ်ထောင်စု တစ်ခုချင်းစီအတွက် ရေသိုလှောင်မှုမှာ မလုံလောက်ပါ။ ပေအနက်ကြီး တူးရမည်ဖြစ်သည့် အတွက် ကျေးရွာအနေဖြင့် မတက်နိုင်ကြပေ။ ထို့ကြောင့် စီမံကိန်းမှ တာဝန်ရှိသူများအား အကူအညီ ပေးနိုင်ရန် တောင်းဆိုချင်ကြောင်း ပြောကြားခဲ့ပါသည်။

အောင်နန်းချိုကျေးရွာ အုပ်ချုပ်ရေးမှူး ဦးအေးမြင့်ထွန်း သည် ကျွန်တော်တို့အနေဖြင့်လည်း သောက်သုံးရေကို ချောင်းရေနှင့်တွင်းရေမှ အဓိက သုံးစွဲရယူပါသည်။ မိုးအခါတွင် သောက်သုံးရေ ပေါသော်လည်း နွေအခါတွင် အနည်းငယ်ရှားပါသည်။ ပတ်ပတ်လည်တွင် ထုံးကျောက် တောင်များရှိသည့် အတွက် ရေထဲတွင် ထုံးဓာတ်များ ပါဝင်နေသည့်အတွက် သောက်သုံးရေအခက်အခဲသည် ရေရှည်တွင် ပေါ်ပေါက်လာနိုင်ပါသည်။ ကျွန်တော်တို့ကျေးရွာတွင် အရင်က စာကြည့်တိုက်ကို ယာယီဖွင့်ခဲ့ပါသည်။ ယခုအခါ စာကြည့်တိုက်ကို စာကြည့်တိုက်အင်္ဂါရပ်နှင့်ပြည့်စုံအောင် ပြန်လည်ပြင်ဆင်လုပ်ဆောင်ချင်သည့် အတွက် စီမံကိန်းတာဝန်ရှိသူ များမှ ကူညီဆောင်ရွက်ပေးပါရန် တောင်းဆိုချင်ပါသည်။

ယခင်က စက်ရုံမှ ကျေးရွာအတွင်းသို့ လမ်းမီးများပေးထားသော်လည်း ယခုအခါလမ်းမီးများ မပေးတော့သည့်အတွက် ကျေးရွာလုံခြုံရေးအရ လိုအပ်သည့်အတွက် လမ်းမီးများပြန်လည်ပေးပါရန် တောင်းဆိုချင်ကြောင်း ပြောကြားခဲ့ပါသည်။

စက်ရုံမှူးမှ ကျွန်တော်အနေဖြင့် လမ်းမီးကို အမြန်ဆုံးပြန်ရရန်အတွက် ဆောင်ရွက်ပေးပါမည်။ စက်ရုံမှ ဘာသာရေး ကျောင်းများ၊ စာသင်ကျောင်းများနှင့် လမ်းမီးများကိုပေးထားသော်လည်း အိမ်ထဲသို့ သွယ်တန်းမှုများ ရှိနေသည့်အတွက် ကျေးရွာလူကြီးများမှ လိုက်လံကြည့်ရှုစစ်ဆေးပေးစေချင်ပါသည်။

စာကြည့်တိုက်ကိုလည်း ပြန်လည်မွမ်းမံရန်အတွက် လိုအပ်သည်များနှင့် အလုပ်သမားများ လွှတ်ပေး လိုက်ပါမည်။ သေသေချာချာသပ်သပ်ရပ်ရပ် ဖြစ်အောင် ပြန်လည်ပြုပြင်ပေးပါမည်။

သောက်သုံးရေနှင့်ပတ်သက်၍ ကျွန်တော်တို့လည်း အခက်အခဲကြုံရပါသည်။ ရေတွင်းတူးသည့် ကန်ထရိုက် အဖွဲ့များကို ငှားရမ်းတူးသော်လည်း ရေကြောသည် အလွန်ဝေးသောကြောင့် အရှုံးပေါ်သည့်အတွက် အဆင်မပြေပေ။ သောက်သုံးရေအတွက် ရေသန့်ဘူးကို သောက်သုံးကြပြီး

သုံးရေများကို ချောင်းမှ ရယူသုံးစွဲနေရသည်။ သောက်သုံးရေနှင့်ပတ်သက်ပြီး ကျွန်တော်တို့ တာဝန်ရှိသူများနှင့် ပြန်တိုင်ပင်ပြီး ဆောင်ရွက်ပေးပါမည်။

ကျေးရွာလူကြီးများမှ ရေတွင်းတူးရန် ကုန်ကျစရိတ်၊ တူးမည့်နေရာနှင့်အစီအစဉ်များကို ကုမ္ပဏီသို့တင်ပြပြီး ကျွန်တော်တို့ဘက်မှလည်း ပညာရှင်များလွှတ်ပြီး အကောင်းဆုံးဖြစ်အောင် ဆောင်ရွက်ပေးပါမည်။ သုံးရေအတွက် ရေစုကန်ကိုလည်း ပြုပြင်ပေးပါမည်။

ဒေသခံ တစ်ဦးဖြစ်သော ဦးဇော်ဆိုင်းမှ ကျွန်တော့်အနေဖြင့် တစ်ခုလောက် ထပ်တောင်းဆို ချင်ပါသည်။ ကျေးရွာသို့ဆက်သွယ် ထားသည့် စက်ရုံပတ်လမ်းသည် မိုးတွင်း မိုးတအားရွာလျှင် သွားလာရ ခက်ခဲပါသည်။ ကျောင်းသူကျောင်းသား များလည်း အသုံးပြုကြသည့်အတွက် ကလေးများအတွက်လည်း သွားလာရ ခက်ခဲပါသည်။ တောင်ကုန်းအနေအထားဖြစ်ပြီး ရေနုတ်မြောင်းမရှိသည့်အတွက် မိုးတအားရွာလျှင် အပေါ်မှ ရေများ စီးကြလာသည့်အတွက် သွားလာရ ခက်ခဲပါသည်။

စက်ရုံမှူးမှ ကျွန်တော်အနေနှင့် ကုမ္ပဏီမှ အကြီးအကဲများနှင့်တိုင်ပင်ပြီး အမြန်ဆုံး တက်နိုင်သလောက် ဆောင်ရွက် ပေးပါမည် ဟု ပြောကြားခဲ့ပါသည်။

လူထု ဖွံ့ဖြိုးတိုးတက်မှုဆိုင်ရာ လုပ်ဆောင်မှုများ အကျဉ်းချုပ်

ယခင် CSR အစီအစဉ် လုပ်ဆောင်ခြင်း အတွက် ရွာ ၂ ရွာကို တိုက်ရိုက် အကျိုးပြုစေသော ၁၀ မိုင်ရှည်သော လမ်းကို ဖောက်လုပ်ပေးခြင်း၊ မဲဟော်ချောင်းကို ဖြတ်၍ တံတား တစ်စီး ဆောက်လုပ်ခြင်း၊ စာသင်ကျောင်း ၂ ကျောင်း၊ ဆေးခန်း ၁ ခန်း နှင့် စာကြည့်တိုက် ၁ ခု ဆောက်လုပ်ပေးခြင်း၊ ဘုရား ၁ ဆူ (ရွှေဘုန်းပွင့် စေတီ) နှင့် ဘုန်းကြီးကျောင်း ၂ ကျောင်း ဆောက်လုပ်ခြင်းနှင့် လှူဒါန်းခြင်း၊ ဘုန်းကြီးကျောင်း၊ စာသင်ကျောင်းများ နှင့် ကျေးရွာများ (ကျေးရွာလမ်းမီးတိုင်များအားလုံး သို့သော် အိမ်ထောင်စုတိုင်းအတွက် မဟုတ်ပါ)ကို လျှပ်စစ်မီးပေးခြင်း

ကုမ္ပဏီသည် CSR ရန်ပုံငွေကို ၂၀၂၀ ခုနှစ်အတွင်း မြန်မာငွေကျပ် ၅၁,၄၀၀,၀၀၀ ကျပ်၊ ၂၀၂၁ ခုနှစ်အတွင်း မြန်မာငွေကျပ် ၁၈၁,၀၀၀,၀၀၀ ကျပ်၊ ၂၀၂၂ ခုနှစ်အတွင်း မြန်မာငွေကျပ် ၂၈,၆၀၀,၀၀၀ ကျပ် နှင့် ၂၀၂၃ ခုနှစ်အတွင်း မြန်မာငွေကျပ် ၂၃၇,၃၀၀,၀၀၀ ကျပ် အသုံးပြုခဲ့ပါသည်။

မိုင်းပိတ်သိမ်းခြင်း

မိုင်းပိတ်သိမ်းခြင်းသည် သတ္တုတွင်းလုပ်ငန်း ကာလ တစ်လျှောက်နှင့် မိုင်းပိတ်သိမ်းခြင်း/ ကျောက်မိုင်းပိတ်သိမ်းခြင်းကာလအတွက် ကိုင်တွယ်ဖြေရှင်းရန် လိုအပ်သည့် EMP အစီရင်ခံစာ အတွက် အရေးပါသော အစိတ်အပိုင်းဖြစ်ပါသည်။

ကာလရှည် လည်ပတ်ခြင်း ကာလ (၂၅ နှစ် သက်တမ်းတိုးနိုင်) ပြီးစီးပြီးနောက် မိုင်းပိတ်သိမ်းခြင်း ကိုစတင်လုပ်ဆောင်ပါမည်။

ကုမ္ပဏီသည် လည်ပတ်ခြင်း ကာလ အဆုံးတွင် လုပ်သားများကို ထုတ်ပယ်ရန် အစီအစဉ် မရှိသော်လည်း ၎င်းတို့ကို မိုင်းပိတ်သိမ်းခြင်း လုပ်ငန်းများ လုပ်ဆောင်ရန် ၆ လ ကြာ ဆက်လက် ခန့်အပ်ထားရှိပါမည်။ မိုင်းပိတ်သိမ်းခြင်း လုပ်ငန်းသည် ၆ လ ကြာမြင့် မည်ဖြစ်ကြောင်း ခန့်မှန်းထား ပါသည်။

EMP ရန်ပုံငွေ၏ ၂၀% (၁၀,၀၀၀,၀၀၀ ကျပ်) ကို ဖျက်သိမ်းခြင်း နှင့် ပြန်လည်ထူထောင်ခြင်း ကာလအတွက် ခွဲဝေသုံးစွဲပါမည်။

ဖျက်သိမ်းခြင်း နှင့် ပြန်လည်ထူထောင်ခြင်းအတွက် ရန်ပုံငွေသည် လက်ရှိကာလ ပေါက်ဈေးကို အခြေခံပါသည်။ အဘယ်ကြောင့်ဆိုသော် စီမံကိန်းသည် နှစ်ပေါင်းများစွာ (၁၀ နှစ် နှင့် အထက်) လုပ်ဆောင်မည် ဖြစ်သောကြောင့် ဈေးနှုန်း အတက်အကျနှင့် ငွေကြေးဖောင်းပွမှုကို ရှောင်လွှဲ၍ မရပါ။ နောင်တွင် ရှောင်လွှဲ၍ မရနိုင်သော ကိစ္စရပ်များ အတွက် အရေးပေါ် ပမာဏကိုလည်း ပြင်ဆင်ထားပါမည်။

သဘာဝ ပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (ESMP)

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်(EMP) အစီရင်ခံစာတွင် ထုံးကျောက် တူးဖော်ထုတ်လုပ်ခြင်း၏ သက်ရောက်မှုများ၊ လျော့ပါးစေရေး နည်းလမ်းများ နှင့် သဘာဝ ပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် နှင့် စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်များ ပါဝင်ပါသည်။

စီမံကိန်း အဆိုပြုသူသည် အောက်ဖော်ပြပါ အစီအစဉ်များကို လိုက်နာရန် လိုအပ်ပါသည်-

- ✓ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်
- ✓ ပတ်ဝန်းကျင် ကာကွယ်ခြင်း နှင့် လက်တွေ့လုပ်ဆောင်ခြင်းများ အတွက် စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်များ
- ✓ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး
- ✓ အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ်
- ✓ စွမ်းဆောင်ရည်မြှင့်သင်တန်းပေးခြင်း အစီအစဉ်
- ✓ လူထုပူးပေါင်းပါဝင်မှု နှင့် လူထု ဖွံ့ဖြိုးတိုးတက်မှု
- ✓ နစ်နာမှု ဖြေရှင်းပေးခြင်း အစီအစဉ်

စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းနှင့် အစီရင်ခံစာတင်ပြခြင်း

ပတ်ဝန်းကျင်၏ ရုပ်ပိုင်းဆိုင်ရာ၊ ဇီဝပိုင်းဆိုင်ရာနှင့် လူမှုစီးပွားရေးဆိုင်ရာများအား စောင့်ကြပ် ကြည့်ရှုလေ့လာခြင်းသည် အောင်မြင်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) ဆောင်ရွက် ခြင်းအတွက် မရှိမဖြစ်အရေးပါ ပါသည်။

လုပ်ငန်းလုပ်နေစဉ်အတွင်းတွင် အစအဆုံး၌ လုပ်ငန်းခွင်ဆိုင်ရာဘေးအန္တရာယ်များကို စောင့်ကြပ်ကြည့်ရှု လေ့လာရမည်။ သို့ပေမယ့် အမှန်တကယ်တွင် ဆောင်ရွက်မှုအားလုံးသည် စီမံကိန်းနေရာတွင် စောင့်ကြပ်ကြည့်ရှုလေ့လာရန် ပုံမှန် လိုအပ်သည်။ ဖြေလျော့နိုင်မည့်နည်းလမ်းများကို အကျိုးသက်ရောက်စေရန် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း အစီအစဉ်(MP)သည် မရှိမဖြစ် လိုအပ်သည်။ စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းကို အထူးသင်တန်းပေးထားသောသူများဖြင့် အစီအစဉ်ချ၊ ဒီဇိုင်းဆွဲပြီး ဆောင်ရွက်ပါမည်။ (ဥပမာအားဖြင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အဖွဲ့ဝင်များ ဖြစ်ပါသည်။)

စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ်၏ အနှစ်ချုပ်တွင် စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့် ပါရာမီတာများဖြစ်သော စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့်နေရာ၊ စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့် အကြိမ်ရေအတွက်၊ ဆောင်ရွက်ရမည့် တာဝန်ရှိပုဂ္ဂိုလ်များနှင့် ကုန်ကျစရိတ်များကို ဇယားဖြင့်ရေးဆွဲ၍ အခန်း(၉)တွင် ဖော်ပြထားပါသည်။

အစီရင်ခံစာတင်ပြခြင်းအတွက် လိုအပ်ချက်

အစီရင်ခံစာတင်ပြခြင်းသည် အကျိုးသက်ရောက်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အစီရင်ခံစာတင်ပြခြင်း အစီအစဉ်အတွက် မရှိမဖြစ်လိုအပ် ပါသည်။ အစီရင်ခံစာတင်ပြခြင်း အစီအစဉ်သည် အောက်ပါ အစီအစဉ်တို့အတွက် လုံလောက်ပါသည်-

- အတွင်းပိုင်းနှင့်ဆိုင်သော စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းနှင့် စစ်ဆေးခြင်းအား အစီရင်ခံတင်ပြခြင်း၊
- ဖြစ်ပျက်ပုံများ၊ မတော်တဆမှုများနှင့် အရေးပေါ်အခြေအနေတို့ကို အစီရင်ခံတင်ပြခြင်း၊
- လုပ်ဆောင်ခြင်းများကို အစီရင်ခံတင်ပြခြင်းနှင့်
- သင်တန်းပေးခြင်းနှင့် ဖြေလျော့နိုင်မည့်နည်းလမ်းများကို အစီရင်ခံတင်ပြခြင်းတို့ ပါဝင်ပါသည်။

ဤအကြောင်းအရာများကို အခန်း(၉)တွင် အသေးစိတ်ဖော်ပြ ထားပါသည်။

လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး (OSH)

လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး (OSH) လည်း ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်(EMP)၏ အရေးပါသော အပိုင်းများ ဖြစ်သည်။

လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး(OSH)နှင့်ပတ်သက်၍ ကောင်းမွန်ပြီး ဘေးအန္တရာယ်ကင်းသော လက်တွေ့အလုပ်များမှာ လုံခြုံပြီး ဘေးအန္တရာယ်ကင်းရှင်းသော အလုပ်နေရာ ဖန်တီးပေးခြင်း၊ ပညာပေးခြင်း၊ သင်တန်းပေးခြင်းနှင့် အလုပ်သမားများကြီးကြပ်ခြင်း၊ အထူးသဖြင့် ကိရိယာတန်ဆာပလာနှင့် စက်ယန္တရားများကိုင်တွယ်ခြင်း၊ ဓါတုပစ္စည်းများ၊ လောင်စာဆီများ သိုလှောင်ခြင်းတို့ ပါဝင်ပါသည်။ အစီအစဉ်တွင် အိမ်သာများ ဖန်တီးပေးခြင်း၊ သောက်သုံးရေထောက်ပံ့ပေးခြင်း၊

လုံလောက်သော ဆေးဝါးများနှင့် ရှေးဦးသူနာပြုဆေးပုံး ထောက်ပံ့ပေးခြင်း PPE အစရှိသည်တို့ ထောက်ပံ့ပေးခြင်းတို့ ဖြစ်သည်။

ဤအကြောင်းအရာများကို အခန်း(၉)တွင် အသေးစိတ်ဖော်ပြ ထားပါသည်။

အရေးပေါ်အစီအစဉ်

လုပ်ငန်းသည် အရေးပေါ်အစီအစဉ်တွင် ပြုလုပ်ရန်အသင့်ရှိခြင်း၊ တုံ့ပြန်ရန်အစီအစဉ်နှင့် ဖြစ်ပေါ်လာနိုင်သော အရေးပေါ်ကိစ္စအစီအစဉ် အစရှိသည်တို့ကို အကျိုးသက်ရောက်စွာ ဆောင်ရွက်နိုင်ရန် ဖန်တီး ထားပါသည်။

- ဝန်ထမ်းအားလုံးအတွက် အတွင်းနှင့်အပြင်ဆိုင်ရာ အရေးပေါ်အစီအစဉ်အတွက် ထောက်ပံ့ပေးခြင်း
- ထိုကဲ့သို့ အစီအစဉ်များကို အစမ်းလေ့ကျင့်ခြင်း (သို့မဟုတ်) သရုပ်ဆောင်ခြင်းများ ပြုလုပ်ခြင်း

ဤအကြောင်းအရာများကို အခန်း(၉) တွင် ဖော်ပြပါမည်။

စွမ်းဆောင်ရည်မြှင့်သင်တန်းပေးခြင်း

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) အဖွဲ့ခေါင်းဆောင်ကို ပတ်ဝန်းကျင်ဆိုင်ရာအခြေအနေ တိုးတက်မှုအား အကြံပြုနိုင်ရန် သင်တန်းပေးထားပါမည်။ လက်တွေ့ဆန်သော သင်တန်း(၂)ခုမှာ မီးဘေးအန္တရာယ် ကာကွယ်ရေးသင်တန်းနှင့် ရှေးဦးသူနာပြုသင်တန်းတို့ ဖြစ်သည်။ ဝန်ထမ်းအားလုံး ကိုလည်း ပထမအဆင့်တွင် အလုပ်သမားတာဝန် သင်တန်းပေးပါမည်။

ဖြေလျှော့နိုင်မည့်နည်းလမ်းများနှင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း အစရှိသည်တို့အတွက်လည်း သင်တန်းများ ထောက်ပံ့ပေးမည်။ အချိန်တိုအတွင်းတွင် အကျိုးသက်ရောက်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်(EMP) လုပ်ဆောင်နိုင်ရန်အတွက် လိုအပ်သောသင်တန်းများအားလုံး ထောက်ပံ့ပါမည်။

ဤအကြောင်းအရာများကို အခန်း(၉)တွင် အသေးစိတ်ဖော်ပြ ပါမည်။

လူထုပူးပေါင်းပါဝင်မှု နှင့် လူထု ဖွံ့ဖြိုးတိုးတက်မှု

စီမံကိန်း လုပ်ဆောင်နေစဉ် အတွင်း လူထုပူးပေါင်းပါဝင်မှုသည် အရေးကြီးပါသည်။ စီမံကိန်း အဆိုပြုသူသည် စီမံကိန်း နှင့် ပတ်သက်သော သတင်းအချက်အလက်များကို လူထုဆီ အသိပေး အကြောင်းကြားပါမည်။ ထို့အပြင် စီမံကိန်း အဆိုပြုသူသည် လူထုကို ဘေးဖြစ်စေနိုင်သော လုပ်ဆောင်မှု များကို ရှောင်ကြဉ်ပြီး ဒေသ၏ လူမှုဖူလုံရေး တိုးတက်အောင် ထောက်ပံ့ပါမည်။

နစ်နာမှု ဖြေရှင်းပေးခြင်း အစီအစဉ်

စီမံကိန်း လုပ်ကွက် နေရာသည် နေပြည်တော် စည်ပင်သာယာရေးကောင်စီ မှ ငှားရမ်းထားခြင်း ဖြစ်သောကြောင့် မြေယာနှင့်ပတ်သက်သည့် မည်သည့် ပြဿနာမှ မရှိပါ။ သို့သော် သက်ရောက်မှုသည် စီမံကိန်း လည်ပတ်ခြင်းကာလတွင် တွေ့ကြုံနိုင်ရခြေရှိပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)အဖွဲ့.

အကျိုးသက်ရောက်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) ဆောင်ရွက်နိုင်ရန်အတွက် ကုမ္ပဏီသည် ဝန်ထမ်း(၇)ဦးနှင့် ဒေသခံ(၂)ဦးပါဝင်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)အဖွဲ့ကို ဖွဲ့စည်း ပါသည်။ လိုအပ်လျှင်လိုအပ်သလို အဖွဲ့ထဲသို့ ဝန်ထမ်းထပ်ထည့်ပါမည်။

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) အဖွဲ့တွင် ပါဝင်သော အဖွဲ့ဝင်များသည် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် ဆောင်ရွက်ခြင်းနှင့် စီမံကိန်းကာလတစ်ခုလုံးတွင် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း လုပ်ငန်းများကို လုပ်ဆောင်ရမည်။

ESMP အကောင်အထည်ဖော်ခြင်း အတွက် ခန့်မှန်းကုန်ကျစရိတ်

EMP နှင့် MP ကို ထိရောက်စွာ အကောင်အထည်ဖော်နိုင်ရန် အတွက် ကုမ္ပဏီသည် EMP နှင့် MP အကောင်အထည်ဖော်ခြင်းအတွက် (CSR အကောင်အထည်ဖော်ခြင်း အတွက် သီးခြား ရန်ပုံငွေ အပြင်) ရန်ပုံငွေကို ထားရှိပါမည်။ EMP နှင့် MP ကို ထိရောက်စွာ အကောင်အထည်ဖော်ခြင်းအတွက် ကနဦး ကုန်ကျစရိတ် နှင့် ထပ်တလဲလဲ ကုန်ကျစရိတ်ကို ကာမိသည့် EMP ရန်ပုံငွေ အတွက် စီမံကိန်း ရန်ပုံငွေ၏ ၅ ရာခိုင်နှုန်းကို ထားရှိပါမည်။

EMP ရန်ပုံငွေ အောက်ရှိ အစီအစဉ် တစ်ခုခြင်းစီအတွက် ဘတ်ဂျက်ကို အောက်ပါအတိုင်း ခွဲဝေပါမည်-

- EMP ဖွဲ့စည်းခြင်း အတွက် ကုန်ကျစရိတ် - EMP ရန်ပုံငွေ ၏ ၂% (၁,၀၀၀,၀၀၀)
- စက်ပစ္စည်းကိရိယာများ နှင့် ပစ္စည်းများ တစ်စိတ် တစ်ပိုင်း ဝယ်ယူခြင်း အတွက် ကုန်ကျစရိတ် - EMP ရန်ပုံငွေ ၏ ၂၀% (၁၀,၀၀၀,၀၀၀)
- စွမ်းဆောင်ရည်မြှင့် သင်တန်းပေးခြင်း အတွက် ကုန်ကျစရိတ် - EMP ရန်ပုံငွေ ၏ ၇ % (၃,၅၀၀,၀၀၀)
- အစီရင်ခံစာတင်ခြင်း နှင့် မှတ်တမ်း အတွက် ကုန်ကျစရိတ် - EMP ရန်ပုံငွေ ၏ ၇ % (၃,၅၀၀,၀၀၀)
- EMP ၏ ဖြန့်ဝေခြင်း နှင့် သုံးစွဲခြင်း ကို အောက်ပါအတိုင်း သုံးစွဲခြင်း အတွက် ကုန်ကျစရိတ်
 - (က) လျော့ပါးစေရေး လုပ်ငန်းများ လုပ်ဆောင်ခြင်း - EMP ရန်ပုံငွေ ၏ ၂၅ % (၁၂,၅၀၀,၀၀၀)
 - (ခ) စောင့်ကြပ်ကြည့်ရှုခြင်း လုပ်ဆောင်ခြင်း - EMP ရန်ပုံငွေ ၏ ၂၅ % (၁၂,၅၀၀,၀၀၀)

- အရေးပေါ် / အရေးပေါ် အခြေနေ တုံ့ပြန်ခြင်း
အတွက် ကုန်ကျစရိတ် (ဖြစ်နိုင်ခြေရှိသော
အရေးပေါ် အခြေအနေများ အတွက် ခွဲဝေထားခြင်း - EMP ရန်ပုံငွေ ၏ ၁၀ % (၅,၀၀၀,၀၀၀)
- အထွေထွေ အသုံးစရိတ် (EMP အဖွဲ့ဝင် ဒေသခံ ၂
ဦး အတွက် ပုံမှန် ကုန်ကျစရိတ်) - EMP ရန်ပုံငွေ ၏ ၄ % (၂,၀၀၀,၀၀၀)

ဤအကြောင်းအရာများကို အခန်း(၉)တွင် သီးသီးဖော်ပြထားပါသည်။

အထက်တွင် ဖော်ပြထားသော အကြောင်းရာ အသေးစိတ် နှင့် စီမံကိန်း အဆိုပြုသူ၏ သက်ဆိုင်ရာ တာဝန်ရှိသူများ လက်မှတ်ရေးထိုးခြင်းကို အခန်း(၉)တွင် အသေးစိတ်ဖော်ပြထားပါသည်။

EXECUTIVE SUMMARY

This is the Environmental Management Plan (EMP) for the mining of limestone at the 150 acres Block at Taung Philar Area, Lewei Township, Nay Pyi Taw Council Area, submitted by Max Myanmar Manufacturing Co., Ltd.

Max Myanmar Manufacturing Co., Ltd has proposed for the mining/quarrying of limestone at Taung Philar area, Lewei Township, Nay Pyi Taw Council Area. Actually, the permit for proposed project is owned by Nay Pyi Taw City Development Committee (NCDC). Max Myanmar Manufacturing Co., Ltd is lend from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated.

Max Myanmar Manufacturing Co., Ltd was officially registered as a limited company in December 2009 (Document: 1230/2007-2008, Date: 17-12-2009). The company registration number is 141692534. The estimated budget is 300,000,000.

Name of the project proponent : Max Myanmar Manufacturing Co., Ltd, Nay Pyi Taw City Development Council (NCDC)

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Contact person : U Phyo Wai Win, Executive Director

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factory@maxcement.com

Implementation Organization of EMP : Myanmar Environment Sustainable Conservation Co., Ltd (MESCC)

The details are described in detail in **Chapter-1**.

Policy, legal and administration frame work

In doing extraction of limestone, the project proponents will comply the following Laws and Acts.

1. Myanmar Mine Law, 2015
2. Myanmar Mine Rules, 2018
3. Conservation of biodiversity and protected areas law, 2018
4. The Environmental Conservation Law, 2012
5. The Environmental Conservation Rules, 2014
6. Environmental Impact Assessment Procedure, Notification No. 616/2015
7. National Environmental Quality (Emission) Guideline, 2015
8. The Conservation of Water Resources and Rivers Law, 2006
9. The Conservation of Water Resources and Rivers Rules, 2013
10. The Forest Law, 2018
11. The Explosive Substances Act, 1908
12. The Protection and Preservation of Cultural Heritage Region Law, 2019
13. Myanmar High Way Law, 2000
14. Myanmar Insurance Law, 1993
15. Fire Brigade Law, 2015
16. The Social Security Law, 2012
17. Myanmar Companies Law, 2017
18. Labour Organization Law, 2011
19. The Settlement of Labour Dispute Law, 2012
20. Employment and Skill Development Law, 2013
21. Occupational Safety and Health Law, 2019
22. Leaves and Holiday Act, 1951
23. Workmen's Compensation Act, 1923
24. Minimum Wages Law, 2013,
25. The Public Health Law, 1972
26. Prevention and Control of Communicable Diseases Law, 1995 and
27. The Control of Smoking and Consumption of Tobacco Product Law, 2016

The project proponents have made a commitment that it will comply with all the laws, rules and regulations mentioned above.

The EMP report is prepared based on the surveying result of current environmental condition, and the regional data obtained from surveying data, KII interview and Lewei Township data. Moreover, this EMP report is prepared in compliance with the Environmental Impact Procedure, Notification No. 616/2015; date 29-12-2015 by the Environmental Conservation Department, ECD and National Environmental Quality (Emission) Guidelines, Notification No. 615/2015; date 29-12-2015 by Environmental Conservation Department.

The details related with laws, rules and regulations are described in detail in **Chapter-2**.

The description of the project

Max Myanmar Manufacturing Company has started production of Portland cement in February 2010. The former production capacity was 500 ton/day but that was in the process of upgrade to 2100 ton/day. Formerly the wet process" technology was applied but later the dry process" technology was adopted after major change and renovation carried out.

The permit for mining limestone from these 150 acres Taung Philar Mountain Block was lend from Nay Pyi Taw City Development Committee (NCDC) since January 6, 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. The annual production rate of the project is 24,000 Metric Ton. The operation period is 25 years (+5 years 2 times extension). The decommission phase is 1 year.

The limestone mining site is on the western side of Taung Philar Mountain that was owned by Nay Pyi Taw City Development Committee (NCDC) cement factory. The project is located within Lewei Township, Nay Pyi Taw. The project location is east-south 22 miles of the Lewei and east 3 miles far from YayNi-SatPhuu Taung Pa Dut Chaung Road, near the Aung Nan Cho Village. It is inside the Mei-hor Reserved Forest.

The area of the mining site is 150 acres. The project site is located at G.P.S coordinates of N. Lat. 19°31'34.96"; E. Long 96°24'18.00". The elevation is 500 m asl. It is situated at a distance of half mile south west of Aung Nann Cho village, Lewei Township, close to the foot of Taung Phi Lar Mountain.

The site is 10 miles east of Yangon-Mandalay Highway; 25.5 miles South east of Nay Pyi Taw Council Area and 178 miles north of Yangon.

The villages in the near and far vicinities are Aung Silar, Tae Kyi Kone.

Buildings and structures will be small ones and these will include:

- 1) Office building (for geologists, mining engineers, demolition experts and general staff)
- 2) Fuel oil depot
- 3) Store
- 4) Workshop
- 5) Magazine (Explosives dump)
- 6) Nursery the coordinate location

Another main component

- 1) Park for heavy machinery and vehicles
- 2) Crushing facility
- 3) Grinding facility
- 4) Dump site for stockpile of crude limestone
- 5) Dump site for stockpile of pulverized limestone
- 6) Dump site for stockpile of overburden
- 7) Dump site for stockpile of top soil
- 8) Blast shelter

Mining Method

The mining method for limestone mine is open cut mine design. Blasting for extraction is carried out 2 day per week, the blasting is carried out mostly 4:30-5:00 PM. After that the digging and extraction of limestone is carried out deploying excavator and bulldozer.

The mined out/extracted limestone is hauled by dump truck to the stockpile site and the adjacent crusher site. From there the crushed limestone rock is conveyed by conveyor to the factory.

The mined out/extracted out limestone rock is crushed at the crushing site deploying Jaw Crusher (primary crusher) and Hammer Crusher (secondary crusher); the limestone rock is crushed/ground to the size of 0-25 mm.

The crushed limestone rock is stored in the limestone shed/store. It is ready for use as raw materials for manufacturing Portland cement

The project uses 9 cars, 3 trucks, 1 water bowsers and 2 forklift.

The electricity will be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away).

The cement factory is located near the mine site. Therefore, the office buildings, tents, buildings, canteen and other facilities that supported for the employee by the company is located within the cement factory compounds. Only the building for temporary lounge. The crusher site is located at the boundary area of the mine site.

Actually, limestone mining needs little or no water at all. The daily requirement will be less than 2000 gallons; water requirement is minimal, only for dust suppression and occasional drilling. The water from the common tank (main storage tank) at the factory (capacity 250,000 gallons) will be used. The water for the whole project (cement factory project) is sourced from Yay Pu Chaung Stream.

Yearly fuel requirement	Diesel/ Petroleum	15,000 gal/ yr
	Lubricant oil/ Grease/ Hydraulic oil	400 gal / yr

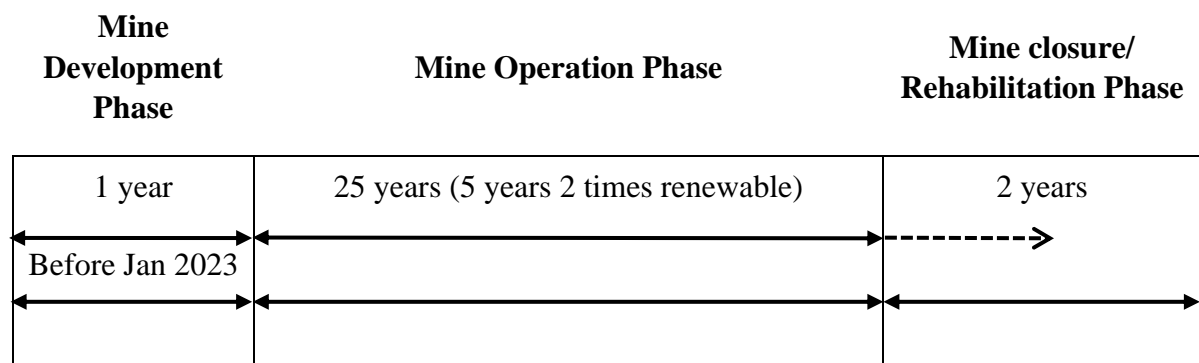
Electricity : Will be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away). There will be back up generators in case of power outage.

Employment, Local Hiring, and Local Purchasing

Working hours : 8 hours/day; the project is mainly operated during daytime

The salary range : 200,000 MMK to 650,000 MMK

The construction and mine development activities are already carried out before hand over from Nay Pyi Taw City Development Committee (NCDC) to Max Myanmar Manufacturing Co., Ltd. The permit for mine operation period is 25 years (+5 years 2 times extension). The decommission/ closure phase is 1 year and the rehabilitation phase is 1 year.



The details related with project descriptions are described in detail in **Chapter-3**.

Description of the environmental and social environment

Setting the study limits

The designated EMP study area encompasses the proposed limestone mining area of 150 acres and the near vicinity within 1 miles radius.

Aung Nan Cho Village and Tae Kyi Kone Village area are incorporated into the designated study area.

The 1 miles radius is designated because the impacts can be actually seen and felt within the inner half mile radius, while the outer half mile can be considered as buffer zone

Climate and meteorology

The meteorological data of Pyinmana district are used to analyze the climate condition of the mining area. The climate is tropical monsoon climate with a hot and dry season (pre-monsoon), a rainy season with moderate rainfall (monsoon) and a cool season (post-monsoon). The area also has partially Dry Zone Climate of Myanmar.

Topography

The area on the whole is a flat terrain with partially degraded forest and was within the Meihor Reserved Forest Area. The mining/quarry site is on the western side of the Taung Philar Mountain range. The elevation at the factory and surrounding flat plain is about 500 feet asl.

Basic geology, soil and hydrology

(From secondary data 2006, from the company's geologists)

The local geology is based on the secondary data obtained from the findings of the geologists who had carried out survey work in the area in 2006. The detailed can be seen in **Chapter-4**.

Soil

Soil samples were collected at Aung Nan Cho village and Tae Kyi Kone village and the project site location. The coordinate location of the soil sample collecting spots were as followings:

At the Project site N. Lat 19°31'27.60", E. Long. 96°24'17.90"

At Tae Kyi Kone Village N. Lat 19°31'49.40", E. Long. 96°24'4.90"

At Aung Nan Cho Village N. Lat 19°30'58.30", E. Long. 96°24'25.70"

Erosion and sedimentation

From the KII interview, the project site location has no erosion and sedimentation.

Natural hazards

According to the Lewei Township data (2019), the natural hazards that occurred at the Lewei Township are as followings

List of natural disasters in Lei-Wei Township

No.	Types of Disaster	Frequency	Loss of Building
1.	Tsunami	37	248
2.	Flood	21	331
3.	Fire		21

Sources: Lewei Township Data (2019)

But there was no precedent of major earthquake in the project area, it is learnt.

Hydrology

Surface water

There are three small streams, namely Yay-pu Chaung, Zali Chaung and Kyauk Phyu Chaung which generally flow from east to west into the Mei-hor rivulet. This rivulet generally flows from north west and drain into the Paung Laung River.

Ground water

The testing for ground water is so far not successful. The underground aquifer is much deeper than anticipated

Summary of Current Environmental Conditions

Water Quality	Number of sampling points	Four sampling points: upper-stream and lower-stream of Yay Pu Stream, Aung Nan Cho Village and Mae Haw Stream (Tae Kyi Kone Village)
	Parameters	Total Coliform Count, Thermotolerant (fecal) Coliform Count, pH, Turbidity, Colour (True), Free Chlorine, Total Chlorine, Arsenic, Nitrate (N.NO ₃)
	Result	<ul style="list-style-type: none"> - The existing values of the parameters of the upper-stream of yay pu stream except the turbidity and colour are lower than the NEQEG effluent guideline values. - The existing values of the parameters of the lower-stream of the yay pu stream except the turbidity and colour are lower than the NEQEG effluent guideline values. - All of the existing values of the parameters of Aung Nan Cho Village are lower than the NEQEG effluent guideline values.

		- The existing values of the parameters of Mae Haw Stream (Tae Kyi Kone Village) except turbidity are lower than the NEQEG effluent guideline values.
Noise and Vibration	Number of sampling points	Three sampling points: the mining site, Aung Nan Cho and Tae Kyi Kone villages
	Result	- The values are on the whole lower than the NEQEG guideline values.
Air Quality	Number of sampling points	Three sampling points: the mining project site, Aung Nan Cho and Tae Kyi Kone villages.
	Parameters	Nitrogen dioxide (NO ₂) 1-hour, Nitrogen dioxide (NO ₂) 24-hour, Sulfur dioxide (SO ₂) 24-hour, Particulate matter PM ₁₀ ^a (24-hour), Particulate matter PM _{2.5} ^b (24-hour), Ozone (O ₃) 8-hour daily maximum, Ozone (O ₃) 24-hour, Ammonia (24 hrs), Carbon Dioxide (CO ₂) (24 hrs), Carbon Monoxide CO (24 hrs), VOC (24 hrs), Oxygen (24 hrs),
	Result	The values on the whole are lower than the NEQEG emission guidelines values.

Biological components

Flora

The some of the data are referenced the report at the same region that was carried out the timeline from 5.9.2016 to 11.9.2016. The second study was conducted from 1.8.2018 to 5.8.2018. The third study from 8-7-2023 to 16-7-2023. A total of 200 species of plants were found, identified and recorded. The list will be described in **Chapter-4**.

Fauna

The some of the data are referenced the report at the same region that was carried out the timeline from 5.9.2016 to 11.9.2016. The second study was conducted from 1.8.2018 to 5.8.2018. The third study from 8-7-2023 to 16-7-2023. The whole area designated for survey (about 16 square miles) was covered. These were areas north, east, south and west of the factory. Focus was also made on the area south east of the factory.

A total of 54 avian species (birds) were found, identified and recorded.

A total of 19 species of herpetofauna were found, identified and recorded. 10 species were reptiles while 9 species were amphibian.

A total of 13 species of mammals including those actually found (primary data) and those gathered from the information (secondary data), were recorded.

Socio-economic components

Socio-economic survey was conducted by members of EMP the data are mostly secondary data provided by the interviewees.

Administrative organizations and limits

Aung Nan Cho Village is under the jurisdiction of Zali-nget-gyi Taung Village Tract, Lewei Township, Nay Pyi Taw Council Area. The Zali-nget-gyi Taung Village Tract comprises, Zali-nget-gyi Taung, Tae-kyi-kone, Aung Nan Cho, Aung Chan Thar, Aung Thar Yar and Aung Silar Villages.

Social profile

Sr. No.	Socio-economic aspects/parameters	Facts and figures	
		Aung Nan Cho	Tae Kyi Kone
1.	<u>Population</u>	744	244
	Males	369	125
	Females	375	119
2.	<u>Religion (%)</u>		
	Buddhists	30%	80%
	Christian	70%	20%
	Other	-	-
3.	<u>Ethnicity (%)</u>		
	Bamar	25%	70%
	Kayin	63%	30%
	Kayan	10%	-
	Others (Shan, Rakhine, Chin	2%	-
4.	<u>Education status (%)</u>		
	Literacy rate (adult) (Mostly primary education and Baka education)	85%	70%
5.	<u>Living conditions (Material life style) (%)</u>		
	Wooden houses	60%	80%
	Bamboo	10%	
	Brick house	30%	20%
6.	<u>Materials possession of each households (%)</u>		
	Cars (Nos)	1 sedan	3sedan
		2 truck	-
	Motorcycle (%)	80%	80%
	Television set (%)	20%	70%
	Hand phone (%)	80%	90%

Economic Profile

Sr. No.	Livelihood and income	Villages	
		Aung Nan Cho	Tae Kyi Kone
1.	<u>Farmers (percentage of households)</u>	80%	-
	<u>Main crops</u>		
	Sesame	√	√
	Bean	√	√
	Sugar cane	√	√
	Ground nut	-	-
	Maize	-	√
	Rice (minor)	-	-
2.	<u>Seasonal works/odd jobs (percentage of households)</u>	20%	almost 100% (no farmer)

Employment

80 % of Tae Kyi Kone Villagers are worked at factory and the remaining 20 % are full time farmers or part time farmers. 10 % of Aung Nan Cho Villagers are worked at the factory and the remaining 90 % are full time farmers or part time farmers. The main crops are peanuts, sesames, corn and green beans.

Household income

It is difficult to estimate the household income from each household. From the rough estimates provided by the village administrator, elders and knowledgeable people the households income's range from Ks. 100,000 to more than Ks. 500,000.

Local Businesses

Agriculture	The local business is typically agricultural business and sugar cane, bean and sesame are the main crop. But there is no large-scale cultivation of sugar cane, been and sesame only small scale and medium scale. There are also no substantial animal farms.
Forestry	Mei-hor Reserved Forest dominates the whole area. In forests are partially degraded but fuel wood and charcoal can be still extracted from the forest. Wood and bamboo are still exploited as building materials.

Fisheries and Aquaculture	There are 3 small streams and one large stream (rivulet), Mei-hor Chaung in the area. Only few villagers catch fish from this stream for household consumption. One cannot eke out a living as a fisherman in the area; fish are getting scarcer each year.
Industry	There are two large cement factories, one owned by Max Myanmar Manufacturing Company and another by NCDC. There is also a limestone and other rock mining/quarry site runs by the Asia World Co., Ltd. There are also some small-scale quarries in the far vicinities operated by other small companies or by the locals.
Mineral Development	There is no mineral development in this area.
Tourism	There is no tourism industry/business in the area.

Health Profile

The Max Myanmar Manufacturing Co., Ltd has the factory clinic. According to the factory clinic 2020 data, there is no communicable disease.	
Access to Health Service	According to the Lewei Township data, there is one rural health branch in Aung Thar Yar and one branch in Aung Si La. Although the other village has no health branch, Lei-way, Thit Pote Pin, Alar, Thar Watti has hospital. Aung Nan Cho village has one factory clinic that was supported by Max Myanmar Manufacturing Company Limited.
Access to Water Supply	The water for Aung Nan Cho and Tae Kyi Kone is sourced from Yay Pu Chaung Stream. The water is stored at the tank.
Mortality and Morbidity	According to the Lewei Township data, the morbidity of Lewei township is diarrhea (1725 persons) and the mortality is Tuberculosis (TB) (25 persons).
Nutrition Levels	The main food of Aung Nan Cho and Tae Kyi Kone Villagers is rice. Beside rice, corn, bean, sesame and sugar crane are also obtained. The nutrition level of villagers are high since the fresh fruits, vegetables and food is obtained.
Communicable Diseases	According to the Lewei Township data and Max Myanmar Manufacturing factory clinic, 2020 data, there is no communicable diseases.

Cultural Components

Archaeology	According to the Lewei Township data, Phaung Taw Chat Ma Pagoda and Sa Ma Taung Pagoda (Kabar Ket Kyaw Pagoda) and Yet Kan Sin Pagoda are located at Lewei Township. But there is archaeology are located at the Aung Nan Cho and Tae Kyi Kone Village.
Temples and Monuments	Aung Nan Cho village has one monastery and pagoda built by Max Myanmar Manufacturing Co., Ltd. The Aung Nan Cho village has two churches. Tae Kyi Kone village has no monastery but one church.

Visual Components

Aesthetic	There is no Aesthetic view to attract the tourisms.
Landscape and Seascapes	There is no landscape and seascapes view to attract the tourisms.
Cultural Landmarks	There is no cultural landmarks.

Impact Assessment and Mitigation Measures

Impacts/potential impacts	Mitigation/corrective measures
Impact on soil and geology (erosion and sedimentation, soil profile disturbance, potential contaminations of soil etc)	<p><u>Mine Operation Phase</u></p> <ul style="list-style-type: none"> - Minimize length and steepness of slope (conduct land cutting, land filling and land construction) - Minimize the area of bare soil exposed as practical as possible (do not clear the vegetation more than necessary leaving large area of bare land) - Implement soil conservation technique to prevent erosion during rainy season - Minimized all exposed area and retain as much existing vegetation as possible

	<ul style="list-style-type: none"> - Run-off from areas adjacent to the site will be diverted around disturbed areas (construction of small diversion canal/drainage) - Control sediment (build sediment trap or dam where necessary) - Stockpile limestone, overburden and top soil separately - Prevent sliding and erosion of overburden stockpiles and top soil stockpile as far as possible: let grass and vegetation grow on stockpile for stabilization - Ensure that stockpiles are stabilized (avoid dumping of overburden and top soil on slope; level the ground for stockpile) - Ensure that the slope of a stockpile is not more than 45° - Overburden/top soil and other stockpiles will be protected with perimeter controls e.g. retaining wall, fence (retaining walls will be furnished with weep holes for water escape) - Ensure that run-off from the site is discharged at non-erosive velocities; discharge will be to location that do not adversely impact the natural waterways (the stream) - Ensure that the land is not cut more than necessary avoid cutting of land as far as possible - Backfill all pits, holes and dents with overburden - Conduct inspection on regular basis to ensure that erosion and land disturbance is well-managed. - Prevent contamination of soil by all means - Avoid oil and chemical spill; should spill occur clean the spill immediately; do not wash down with water; use absorbents - Maintain vehicles and machinery to prevent oil spill - Bund oil depot to prevent spreading of oil
<p>Impact on air quality/air environment (equipment emissions and fugitive dust)</p>	<ul style="list-style-type: none"> - Do not clear the vegetation (and leave the ground bare) more than necessary - Do not blast when strong wind is blowing. generate less dust. Also consider meteorological facts (e.g. precipitation, temperature, wind direction) - Plan for a simple linear layout for material-handling operation (processing plant/site will be located within the quarry area or near as possible)

	<ul style="list-style-type: none"> - Also stop excavation, hauling, loading and unloading for a moment when strong wind is blowing - Dust emissions from excavator, loader and dump truck will be adequately controlled through dust collectors, and water spraying - Limit the drop height during unloading and loading the materials - If possible, use mobile and fixed belt transport and conveyors rather than hauling the materials by trucks (use enclosed rubber-belt conveyors) - Keep the internal roads compact to minimize dust generation due to vehicular movement - Set up speed limit (slow speed) for truck to minimize emission of dust (a speed reduction from 30 km/hr to 15 km/hr will reduce 50% of dust emission) - Spray water on un-paved road during dry months (wet suppression can greatly reduce dust emission up to 70%) - Prevent spill of overburden and top soil during transportation - If possible, use water wash to minimize mud and dust track-out from unpaved road area - Vehicular emission of particulate matter (PM), SO₂, NO₂, hydrocarbons can be maintained by minimized by proper training, operation and maintenance of vehicles and other oil-operated machine - Limit the slope and height of stockpiles (not more than 45° inclination and not higher than 20 feet). A flat stock pile will be subjected to less wind turbulence than a tall conical shape stock pile. - Provide adequate PPE (masks, mouth covers) to workers - Regularly check the engine of vehicles and all other machinery. Well-maintained, well-lubricated and well-operated engine reduces smoke emission - Use fuel oil with low sulphur (if possible) - Use environmentally friendly state of the art instruments and machines (such as engines with higher fuel efficiency, machinery that emit lower noise level), if possible
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	<ul style="list-style-type: none"> - To conserve fuel and to prevent unnecessarily emission of gas (smoke) never let vehicles and instrument left running unnecessarily - Avoid open burning of all kind of solid wastes; reuse and recycle them as far as possible and finally dispose them at approved land fill (dump site) - Plant trees and create green belt or green zone. Trees will effectively sequestrate (remove or absorb) CO₂ in the smoke - Provide Personnel Protection Equipment (PPE) such as nose and mouth cover, face mask etc. to workers exposed to smoke (gas emission) - Gas emission (smoke) can be minimized by proper training, operation and maintenance of vehicles and machines
<p>Impact: noise and vibration (noise and vibration from blasting and equipment, vehicle operation)</p>	<ul style="list-style-type: none"> - Elect appropriate explosive and appropriate amount of explosive (not explosive for military use) to reduce the level of noise - Apply mechanical ripping as far as possible to avoid or minimize the use of explosives (e.g. use hydraulic hammers instead of secondary blasting) - Use specific blasting plans - Workers involve in blasting will be adequately provided with PPE such as ear muffs or ear protectors <p>Heavy machinery such as excavator, bulldozers also generate loud noise:</p> <ul style="list-style-type: none"> - Select new low-noise machine in the first place <p>Heavy trucks also generate high noise level and vibration.</p> <ul style="list-style-type: none"> - Noise specification of vehicle will be taken into consideration when procuring vehicles; install noise abators - Modified old vehicles (and also equipment, and machinery) to reduce noise - Implement effective maintenance for vehicles (and also heavy machinery and equipment) which reduce noise level by more than 50% - Reduce the speed of heavy trucks and dumpers to reduce vibration

	<ul style="list-style-type: none"> - Vibration due to heavy trucks and bumpers from road can be mitigated by ensuring a flat and smooth surface, as far as possible - Conduct regular monitoring/inspection
<p>Impact on water quality/environment (potential degradation of water, reduced stream flow, contamination of water)</p>	<ul style="list-style-type: none"> - Plan for overall drainage, maintain existing pre-mining condition. (In other word, to avoid impact of drainage on overburden and top soil the natural drainage must be left undisturbed.) - New artificial drainage could be created, if necessary. - Sudden inundation of water into excavation site/pit must be avoided or prevented at all costs. - As mentioned earlier overburden, and top soil will be stock-piled at appropriate location. Keep overburden and top soil compact and stabilize as far as possible. Limestone rock must be stockpiled at separate stockyard. - Avoid dumping of waste (solid, liquid) into the stream - Avoid spillage of oil and chemical into the stream - Avoid contamination of water by all means - Also avoid contamination of soil to prevent percolation into ground water - Conserve water as far as possible; educate workers for water conservation - Check ponds, pipes, faucets, joints regularly for leaks and fix the leaks immediately - Use plants that require less water in landscaping
<p>Impact on biological component (deforestation, destruction of habitats, disruption of migratory route and nesting/breeding exploitation for fuel wood etc)</p>	<ul style="list-style-type: none"> - Implement for the protection and conservation of the biological component of the environment - Comply with law, rules and regulation (the Protection of WildLife and Protected Area Law, 2018; Conservation of Environment Law 2012 and Regulation 2014) - Plan for the protection and conservation the flora as far as possible. (The quarry site is inside Mei-hor Reserved Forest area. The forest is already partially degraded. The impact can be significant if the work is not well-managed.) - Plan for minimum disturbance to the flora when conducting mining/quarry activities;

- Do not clear vegetation than necessary for the construction of access road, quarry and mining site; restrict the removal of vegetation; avoid as far as possible the cutting of big trees
- Control and minimize dust and eventual disposition of dust on leaves on plants restricting photosynthesis
- Prevent the spillages of hydrocarbons which has negative impact on plants especially on the root system
- Drip trays and designated bunded side should be used to protect vegetation from hydrocarbons
- Storage of fuel should be done in a designated bunded site
- Restrict the collection of fire wood; do not cut trees for fuel wood but collect fuel wood from fallen trees, dried logs or branches or use charcoal for cooking
- Fire for cooking should only be made in dedicated spot cleared from vegetation
- Avoid open burning of debris
- Educate workers for fire awareness and protection; prohibit the discard of burning cigarette butts carelessly; get rid of all debris that can cause fire
- Provide basic fire fighting training for a few workers
- Identify sensitive species and habitats and try to avoid such spots as far as possible
- Promote environment awareness to workers
- Try to stop illegal logging; inform the authority if there is any
- Implement rehabilitation to promote natural vegetation establishment after completion of quarry at a site
- Implement the protection and conservation of wildlife as far as possible. (The protection and conservation of forest is tantamount to protection and conservation of wildlife)
- Ensure that mining/quarry works have minimal disturbance or wildlife
- Prohibit the hunting and/or trapping of wild animals big and small including rodents, birds, reptiles and amphibians by workers
- Prevent the potential injury or death of wildlife due to vehicular movements especially during night time

	<ul style="list-style-type: none"> - Prevent the potential injury or death of wildlife due to spillages of hydrocarbons, drill fluids and chemicals - Avoid the use of excessive bright light for long hours at night to prevent the aggregation and eventual death of large number of insects (offensive bright light in the forest at night will also scare away wild animals from their natural foraging or breeding ground) - Identify sensitive species which need to be avoided; avoid the disturbance of animal habitat such as nest and breeding ground as far as possible
<p>Impact on socio-economic component (in-migration causing pressure on local community, potential conflict, pressure or resources, permanent employment, boosting local economy, infrastructural social economic improvement)</p>	<ul style="list-style-type: none"> - Implement to avoid or minimize the potential negative impacts on the socio-economic life of the locals as well as the company workers - If dust is generated either from vehicular movement or quarry works, try to suppress dust as far as possible (water spray); reduce the speed of vehicles when passing near the village - Educate the drivers for defensive driving, to maintain zero accident for the safety of the locals and domestic animals - Avoid the contamination of the drinking water source of the locals - Try to build good relation with the locals - Conduct public consultation so that the locals will have a positive perception on the project - Educate the workers for appropriate behavior when dealing with locals; to respect their culture and tradition - The authority and employees of the company should not personally get involve in land and property speculation activities, if any - Consider for Corporate Social Responsibility (CSR) action to be taken when actual mining operation commence - Prioritize the employment of locals - Prioritize the purchase of commodities from the local market - Engage and get involved in community engagement, community assistance and community development as far as possible - Implement for management of misbehavior and social illness - Educate and train workers for discipline and code of conducts - Apply punitive measures such as suspension of the wrong doer

	<ul style="list-style-type: none"> - Strictly prohibit the drinking of alcohol during working hours; ban the use of narcotics and stimulants - Deal with workers on a fair and square basis - Avoid unhealthy relationship with workers; they should not be over worked and underpaid
<p>Impacts on cultural components (potential cultural/religious/heritage disturbances)</p>	<ul style="list-style-type: none"> - Mitigation not necessary since there are none to be impacted. Shwe Hpone Pwint Pagoda is quite far away and cannot be impacted. However; plan and manage to avoid negative impact on the pagoda and any other component, if any. - If there is any religious, cultural and archeological site within 25 meter from the site it should be clearly marked to prevent any accidental damage - If archeological site or burried artifact were discovered during quarry works this should be reported to the authority in time - Carry on donation and charity works for the monastery, church regularly eg. during religious days, religious festivals - Carry on donation in cash and kinds for the monastery and church - Consider for renovation of pagoda and monastery, church if necessary
<p>Impacts on visual components (aesthetic impact: extraction site, overburden unsightly; change in relief and alteration of land scape)</p>	<ul style="list-style-type: none"> - Plan and execute mining/quarry which is focused on visual appeal (random mining will leave ugly dents, pits and holes here and there on the slope) - Carefully select site and conduct systematic blasting and mining one portion or one block at a time rather than random blastings and minings - Do not clear vegetation more than necessary before mining (eg. during preparation for mining site) - Backfill the voids, pits and dents after completion of a work site - Revegetate the site (plant trees) - Continue the creation of green belt in available space as far as possible - As regards painting buildings and structures (eg. office, ware house, workshop, depot etc.) use aesthetically pleasing paints and colours

	<ul style="list-style-type: none"> - Apply appropriate lighting only for security reason; avoid a excessive use of light at night especially offensive light - Use yellow light instead of white light not to attract insects; if so many insects aggregate turn off the light for a while
<p>Health and safety components (potential accidents at work places, lack of safety working atmosphere, lack of nutritious food, potable water, sanitation etc)</p>	<ul style="list-style-type: none"> - Create safety condition for work places (mining/quarry) site, and associated area eg. Mining site and stockpile sites) - Educate and train workers for good working practice, good engineering practice, good safety practice and good house-keeping practice so that these good practices will be ingrained in each and every worker's mind - Prevent and avoid accidents and try to achieve zero accident at work places - Educate and train them for health education and hygiene - Train a few workers in First Aid Training - Keep first aid kit well-stocked with medicines and drugs comprising anti-malaria, anticholera, anti-toxicant and anti-poison for harmful insect and snake bites - Provided adequate PPE, for workers eg. helmets, earplugs, masks, hand gloves, outfit, boots etc - Provide healthy and nutritious food, potable water - Provide adequate sanitation eg. baths, toilets <p><u>Specific mitigation for blasting</u></p> <ul style="list-style-type: none"> - Implement for systematic and safe blasting; select best blasting design - If possible, fence off the blasting area to prevent children and animals straying into the area - Follow acceptable blasting practices eg. those that resulted in more rock fragmentation and lower vibration (eg. relatively shallow slanting drill holes method) - Select appropriate explosives eg. use emulsion type - Keep explosives in maximum security magazine - Use standard detonation fuses and materials; store detonators and explosives separately; do not use outdated explosives - Fly rock happens if there is too much energy in the explosion; minimize blast damage - All drillings and blasting must be strictly supervised by competent demolition experts - Provide adequate training for blasting and the safety storage, handling and application of explosives - Distribute quarry/mining operation manuals to workers

	<ul style="list-style-type: none"> - Conduct blasting according to a consistent time table eg. at 04:30 hrs to 05:30 hr - Sound the sirens 5 minutes before blasting - Inform the nearby local community in advance about the consistent timetable for blasting - Provide adequate PPE, ear, muffs, ear protectors, safety goggles to workers; first aid equipment - Also provide adequate training for other mining/quarry activities such as excavation and extraction, safety transportation and stockpiling of mined out limestone and also top soil and overburden
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Response plan to emergency cases

Emergency procedures (generalized)

- first draw up a plan for prevention/mitigation measures for fire accident
- provide firefighting training for some workers
- provide adequate firefighting facility, water ponds, hydrants, water jet pumps, and fire extinguishers; provide adequate PPEs such as firefighting suits, if possible. (The company has two fire engines, firefighting vehicles.)
- regularly check the firefighting facility, its readiness; ponds to be always filled with water
- organize mock drills regularly and assess the effectiveness of drills and training; assess the readiness, quick response and quick evacuation processes
- provide First Aid Training to some workers
- provide adequate first aid facility-such as stretchers, equipment, first aid kits including medicines; regularly check the condition of first aid facility
- display addresses and phone numbers of Fire Fighting Brigade, Ambulance Service, Hospital's emergency department, police station etc so that everyone can see easily
- set up effective alarm system and control system
- take out insurance for the company; also insurance for fire and for disaster
- effectively install lightning arrestors, lightning strips and rods, down lead and grounding electrodes
- deploy tight security all the time

Community engagement and community development

At 14 July 2023 (09:00 AM to 10:00 AM) the public consultation meeting was held with 30 persons for EMP for mining/quarrying of limestone at Taung Philar Mountain Block at Company's Meeting Room.

Summary of public consultation are as followings:

Managing Director of MESC (third party) explained about the project.

The officer from Nay Pyi Taw City Development Committee (NCDC) said that they also participate in EMP report preparation. They analyzed and reported the positive and negative impacts about the project. Although, whenever one project is carried out there is both positive and negative impacts, the positive impact is need to more significant than the negative impacts.

U Bo Thein (Tae Kyi Kone Village Administrator) said that we have special request about the project. The project has not only positive impacts but also negative impacts but the significant negative impact was not occurred. We want to request one thing (our difficulty). The storage of water for every single house is not sufficient. the village cannot afford for well since the depth is deep. So, we want to request for help to the factory officer.

U Aye Myint Htun (Aung Nan Cho Village Administrator) said that we mainly use the stream water and ground water as a source of drinking water. Although the water is sufficient during the rainy season, the water is insufficient during the summer. Since the surrounding area is the limestone mountain are existed, the amount of lime substance is included. Therefore, the drinking water problem will be faced after long time passed. We had temporary village library. Now we want to renovate the library to make it full of library features. So, I would like to request the help of the project officers.

In the past, street lights were provided from the factory into the village, but now the street lights are no longer provided, so I would like to request that the street lights be returned as it is necessary for the safety of the village.

Head of the Factory said that I will work to restore the street lights as soon as possible. Although monastery, school and street lights have been provided the electricity from the factory, there are power lines going into the house. So, I would like to request to the villager elders to follow up and check.

The manpower supply and materials supply for the renovation of library will support as soon as possible. The library will be renovated and repaired until it is neatly. We also face difficulties regarding with the drinking water. We hired the contract teams to dig the well, but it was inconvenient since the aquifer is so far. We use bottled water as drinking water and use stream water as domestic water. Regarding with the drinking water problem, we will consult with our officers.

The cost of digging well, place and plan need to report to the company from the village elders and the experts will be send to do the best of the will from our side. We will also repair the water tank for water usage.

U Zaw Sai (Villager) said that I would like to request one thing. The factory road to the village is difficult to travel during the heavy rains. Students also use this road, so it is difficult to use for the children. It is hilly and there is no drainage, so it is difficult to walk because of surface running.

Head of the Factory said that I will consult with the heads of the company and take action as soon as possible.

Summary of community development activities

The previous CSR programmer implementation in the form of the construction of 10 miles hard top road which directly benefited the two villages, the building of one bridge across the Mei-hor rivulet; the building of 2 schools, 1 clinic and 1 library and the donation and building of one pagoda (the Shwe Hpone Pwint Pagoda) and two monasteries; and the electrification of the monastery, schools and the village (to all the lamp posts of the village but not to every household yet).

The company uses the CSR budget 51,400,000 MMK during 2020, 181,000,000 MMK during 2021, 28,600,000 MMK during 2022 and 237,300,000 MMK during 2023.

Mine closure

Mine Closure is an integral part of the mining cycle and so the EMP report has to address Mine Closure/Quarry Closure Phase.

After completion of the long Operation Phase (25 years and probably renewable) the mine closure will be commenced.

The company has no plan to dismiss its employee at the end of the Operation Phase but will continue to employ them for 6 months for carrying out the mine closure works. It is expected that mine closure task will take six months.

20% of EMP (10,000,000 MMK) will be allocated for the decommission and rehabilitation phase.

The cost estimation for decommission and rehabilitation fund is based on current unit price. Because the project will be implemented over many years (10 plus years) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

Environmental and Social Management Plan (ESMP)

Environmental Management Plan (EMP) report involves the resulted impact of extraction of limestone, mitigation measurements and environment and social management plan and monitoring plan.

The project proponents need to carry out the following plan

- ✓ Environmental management plan
- ✓ Monitoring plan for environmental protection and implementation
- ✓ Preparing the monitoring report for environmental protection and reporting
- ✓ Occupational health and safety plan
- ✓ Emergency response plan
- ✓ Capacity development and training program
- ✓ Community engagement and community development
- ✓ Grievance redress mechanism plan

Monitoring and reporting

Monitoring of physical, biological and socio-economic environment is essential for successful implementation of EMP and hence the project.

First of all working environment shall be monitored for occupational hazards. But virtually all activities taken places at a project site need to be monitored on a regular basis. Monitoring Plan (MP) is essential for ensuring that the mitigation measures are effective. Monitoring will be planned, designed and implemented by specially trained personal e.g. EMP cell members.

Summary of monitoring programme comprising components and parameters to be monitored, monitoring places/spots, frequency of monitoring, responsible persons and costs are depicted in tabulated form in **Chapter-9**.

Reporting requirement

Reporting is necessary for the effective implementation of EMP and reporting programme covers:

- Internal monitoring and inspection reporting,
- Incidents, accidents and emergency reporting,
- Reporting on performance and
- Reporting on training programme and mitigation measures taken.

These are described in detail in **Chapter-9**.

Occupational Health and Safety (OSH)

OSH is also integral parts of EMP.

As regards OSH: The creation of safe working places, educate, train and supervise workers for good safety practices, especially in the handling of equipment and machinery and storage and handling of fuels. The plan also includes provision of lavatory facilities, potable water supply and provision of first aid kits with adequate medicines and drugs, and provision of Personal Protection Equipment (PPE) etc.

These are described in details in **Chapter-9**.

Emergency response plan

The company will develop Emergency Preparedness and Response Plan and Contingency Plan (Action Plan) for effective implementation.

- Provide operation manuals for External Emergency and Internal Emergency Plan for all staffs.
- Conduct rehearsals or drills for such plans etc.

There are described in **Chapter-9**.

Capacity building and training

EMP cell leader will be trained to be able to recommend measure to improve environmental conditions. Two pragmatic trainings are: Firefighting and First Aid Training. All workers will receive new task employee training (induction course training) in the first place.

Training programme for mitigation works, monitoring works etc will be also provided. In shorts all necessary trainings for the effective execution of EMP programme will be provided.

These are described in relative details in **Chapter-9**.

Community Engagement and Community Development

While implementing the project, community engagement is also important. The projects proponents will be disclosed the information related to the project to the community. Moreover, the project proponents will also avoid the activities that can harm the community and support to improve the welfare of the community.

Grievance redress mechanism plan

Since the project site location is learned from the Nay Pyi Taw City Development Council (NCDC), there is no issue related with the land. But the impact can be occurred during the project operation phase.

EMP cell

For effective execution of EMP, the company has organized and set up a nucleus organization, the EMP cell that comprises 7 staffs and 2 locals. More staff will be added to the list later when necessary.

These EMP cell members are responsible for implementation of EMP and for conducting monitoring works, throughout the project life.

Cost estimation for implementation of ESMP

In order to effectively execute EMP and MP the company has set up a fund for the implementation of EMP and MP (in addition to a separate fund for the implementation of CSR). 5 percent of the project budget (50,000,000 MMK) is set aside for EMP fund which will cover the initial costs and the recurring expenses for the effective implementation of EMP and MP.

The sub-budgets allotted for each programme under EMP fund are as follows:

- Cost for organizing EMP - 2% of EMP fund (1,000,000)
- Cost for partial procurement of equipment and materials - 20% of EMP fund (10,000,000)
- Cost for capacity building and training - 7% of EMP fund (3,500,000)
- Cost for reporting, documentation - 7% of EMP fund (3,500,000)
- Cost for execution and dissemination of EMP in the form of:
 - (a) Taking mitigation action - 25% of EMP fund (12,500,000)
 - (b) Monitoring action - 25% of EMP fund (12,500,000)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% of EMP fund (5,000,000)
- Miscellaneous (casual fees for two locals, who are members of EMP) - 4% of EMP fund (2,000,000)

These are described in details in **Chapter-9**.

These are mentioned in relative details and signed by the responsible officer of the project proponents in **Chapter-9**.

1. INTRODUCTION

1.1 Project Background

Limestone, the alkaline sedimentary rock, occurs throughout this planet earth. In Myanmar limestone mountains and hills are common physical features of the nation and there are abundant limestone resources in the country.

Limestone has various uses but it is the essential raw material for the production of cement, an essential commodity for the infrastructural developments of the nations.

With a view to increasing the cement production and hence the infrastructural development of the nation, Max Myanmar Manufacturing Co., Ltd has proposed for the mining/quarrying of limestone at Taung Philar area, Lewei Township, Nay Pyi Taw Council Area. Actually, the permit for proposed project is owned by Nay Pyi Taw City Development Committee (NCDC). Max Myanmar Manufacturing Co., Ltd is lend from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated.

1.2 Presentation of the Project Proponents

Max Myanmar Manufacturing Co., Ltd was officially registered as a limited company in December 2009 (Document: 1230/2007-2008, Date: 17-12-2009). The company registration number is 141692534. The estimated budget is 300,000,000.

Name of the project proponent	: Max Myanmar Manufacturing Co., Ltd, Nay Pyi Taw City Development Council (NCDC)
Address	: No.123, Alan-pya Pagoda Road, Dagon Township, Yangon Region, Myanmar
Telephone	: 095009988
Fax	: 01 682168
E-mail	: ohnkyaw@maxmyanmargroup.com
Contact person	: U Phyo Wai Win, Executive Director
Telephone	: 09 9699627785
E-mail	: phyowaiwin@maxcement.com www.maxmyanmargroup.com www.maxcement.com
Objectives	: The mining of limestone for the production of Portland cement

Particulars of executive and administrative body

Name	Nationality & National Registration Card No.	Address of resident	Designation	Other business occupation
Daw Htay Htay Khine	Myanmar 12/KaMaYa (N)007040	No.9, Inya Yeikthar Street, Mayangone Township, Yangon	Director	Merchant
U Ohn Kyaw (a) U Aye Thwin	Myanmar 14/Ya Ka Na (N)017084	No.11/12, Thiri Mingalar Street (2), (8) Quarter, Kamayut Township, Yangon	Director	Merchant
U Soe Tint	Myanmar 12/Ka Ma Ta (N)018745	No.14/15, Thiri Mingalar Street (2), (8) Quarter, Kamayut Township, Yangon	Director	Merchant
U Pho Zaw (a) U Zaw Zaw	Myanmar 12/Ba Ha Na (N)084544	No.9, Inya Yeikthar Street, Mayangone Township, Yangon	Director	Merchant

The company is 100% owned by nationals, all shareholders are nationals and foreigners are not involved in this investment.

Each share is worth 10,000 (kyats ten thousand only).

The total number shares allotted are 501,000 shares.

Four executive (allottees) members have taken the number of shares as follow:-

- Daw Htay Htay Khine has taken - 1,010 number of shares
- Max Myanmar Manufacturing Company Limited has taken - 399,970 number of shares
- My Associate Company Limited has taken - 50,000 number of shares
- U Ohn Kyaw (a) U Aye Thwin has taken - 10 number of shares
- U Soe Tint has taken - 10 number of shares
- U Zaw Zaw has taken - 50,000 number of shares



ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်
Certificate of Incorporation

မက်စ် (မြန်မာ) ထုတ်လုပ်မှု ကုမ္ပဏီ လီမိတက်
MAX (MYANMAR) MANUFACTURING COMPANY LIMITED
Company Registration No. 141692534

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ
မက်စ် (မြန်မာ) ထုတ်လုပ်မှု ကုမ္ပဏီ လီမိတက်
အား ၂၀၀၉ ခုနှစ် ဒီဇင်ဘာလ ၁၇ ရက်နေ့တွင်
အစုရှယ်ယာအားဖြင့် တာဝန်ကန်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that
MAX (MYANMAR) MANUFACTURING COMPANY LIMITED
was incorporated under the Myanmar Companies Act 1914 on 17
December 2009 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ
Registrar of Companies
ရင်းနှီးမြုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန
Directorate of Investment and Company Administration



Former Registration No. 1230/2007-2008

Figure-1: Certificate of Incorporation

1.3 Presentation of the Environmental and Social Experts

U Myint Kyaw Thura is a leader of EMP study team. The experts are as follows:

Contact Address : Room no. (B -5), Building no. 67/69, Parami Road, 16 Ward, Hlaing Township, Yangon Region

Contact person : Myint Kyaw Thura
95 9 420105071

Contact number : 95 9 73044903

E-mail : myanmar.esc@gmail.com

Facebook website : www.myanmar.environment.sustainable.conservation.com

Members of MESC who are IEE/EIA appraisers, or IEE/EIA practitioners or who are involved in this IEE/EIA project are as follows:-

Name	Nationality & National Registration Card No.	Registration/license No. by ECD	Designation
U Myint Kyaw Thura M.Sc (Zoology)	Myanmar 12/Da Ga Ta (N)028349	EIA-C 015/2023	Ecology and Biodiversity, Social Study and Analysis, General Environment Managment
Prof: Saw Han Shein B.Sc (Botany) M.Sc (Marine Biology)	Myanmar 10/Ma La Ma (N)008173	EIA-C 014/2023	Ecology and Biodiversity, Risk Assessment and Hazard Management, Water Pollution Prevention, Control, Monitoring and Prediction of Impacts, Natural Resources Management (Fisheries)
U Oakka Kyaw Thu B.Sc (Geology)	Myanmar 7/Ya Ta Ya (N) 090371	EIA-C 016/2023	Geological Assessment, Hydrology, Ground water and underground water management, Natural Resources Managment (Mining)

U Than Soe Oo M.Sc (Forestry)	Myanmar 9/Ma Na Ma (N)050808	EIA-C 017/2023	Land Use, Natural Resources Management (Forestry), Soil Conservation
U Zaw Thein	Myanmar 9/Ma Ma Na (N)012515	EIA-AC 022/2023	Gological Assessment, Natural Resources Management (Mining)
Daw Hnin Nu Nu Aung M.Sc (Environmental Planning and Mangement) B.E (Materials and Metallurgy)	Myanmar 8/ Ma Ka Na (N) 204370	Applied	Environmental Engineer
Daw Khin Thidar La Wun B.Sc (Maths)	Myanmar 12/Sa Kha Na (N) 069879	Support team	Weather and air quality analysis and forecasting

The third party confirmation was approved by the Mining Department. (document 6/2(NPTDC)17/2024 (10633), dated 27-7-2024. (See also ANNEX)



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

The Government of the Republic of the Union of Myanmar

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန

Ministry of Natural Resources and Environmental Conservation

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)

Environmental Impact Assessment License (Individual)



ဦးမြင့်ကျော်သူရ ၊ ၁၂/ဒဂတ(နိုင်)၀၂၈၃၄၉ အား အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is hereby issued that **U Myint Kyaw Thura, 12/DaGaTa(N)028349** has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an **Consultant** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

The areas of expertise, eligible to be conducted, are as follows:

1. ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲ (Ecology and Biodiversity)
2. လူမှုရေးဆိုင်ရာ လေ့လာခြင်းနှင့် သရုပ်ခွဲဆန်းစစ်ခြင်း (Social Study and Analysis)
3. အထွေထွေပတ်ဝန်းကျင်စီမံခန့်ခွဲခြင်း (General Environmental Management)
- 4.
- 5.

လိုင်စင်နံပါတ် License Number	: EIA-C 015/2023
ထုတ်ပေးသည့် ရက်စွဲ Date of Issue	: 1-12-2023
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(သိန်းတိုး)
အန်ကြားရေးမှူးချုပ်

Figure-2: Certificate of Myint Kyaw Thura



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

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Ministry of Natural Resources and Environmental Conservation

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)

Environmental Impact Assessment License (Individual)

ပါမောက္ခစောဟန်ရှိန်၊ ၁၀/မလမ(နိုင်)၀၀၈၁၇၃ အား အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

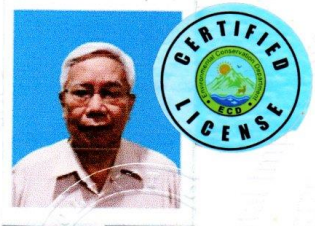
It is hereby issued that **Professor Saw Han Shein, 10/MaLaMa(N)008173** has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an **Consultant** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

The areas of expertise, eligible to be conducted, are as follows:

1. ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲ (Ecology and Biodiversity)
2. ဘေးအန္တရာယ်ရှိမှု ဆန်းစစ်ခြင်းနှင့် ဘေးအန္တရာယ် စီမံခန့်ခွဲခြင်း (Risk Assessment and Hazard Management)
3. ရေထုညစ်ညမ်းမှု ကြိုတင်ကာကွယ်ခြင်း၊ ထိန်းချုပ်ခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်းနှင့် ထိခိုက်မှုကြိုတင် ခန့်မှန်းခြင်း (Water Pollution Prevention, Control, Monitoring and Prediction of Impacts)
- 4.
- 5.

လိုင်စင်နံပါတ် License Number	: EIA-C 014/2023
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(သိန်းတိုး)
ညွှန်ကြားရေးမှူးချုပ်

Figure-3: Certificate of Prof: Saw Han Shein



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

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Ministry of Natural Resources and Environmental Conservation

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)

Environmental Impact Assessment License (Individual)



ဦးဥက္ကာကျော်သူ ၊ ၇/ရတရ(နိုင်)၀၉၀၃၇၁ အား အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

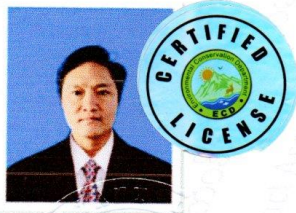
It is hereby issued that **U Okkar Kyaw Thu, 7/YaTaYa(N)090371** has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an **Consultant** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

The areas of expertise, eligible to be conducted, are as follows:

1. ဘူမိဆိုင်ရာ ဆန်းစစ်လေ့လာခြင်း (Geological Assessment)
- 2.
- 3.
- 4.
- 5.

လိုင်စင်နံပါတ် License Number	: EIA-C 016/2023
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(Handwritten signature)
(သိန်းတိုး)
ညွှန်ကြားရေးမှူးချုပ်

Figure-4: Certificate of Okkar Kyaw Thu



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

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Ministry of Natural Resources and Environmental Conservation

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)

Environmental Impact Assessment License (Individual)



ဦးသန်းစိုးဦး ၊ ၉/မနမ(နိုင်)၀၅၀၈၀၈ အား အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is hereby issued that **U Than Soe Oo, 9/MaNaMa(N)050808** has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an **Consultant** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

The areas of expertise, eligible to be conducted, are as follows:

1. မြေအသုံးချမှု (Land Use)
2. သဘာဝသယံဇာတစီမံအုပ်ချုပ်ခြင်း (သစ်တော) (Natural Resources Management (Forestry))
- 3.
- 4.
- 5.

လိုင်စင်နံပါတ် License Number	: EIA-C 017/2023
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(သိန်းတိုး)
ညွှန်ကြားရေးမှူးချုပ်

Figure-5: Certificate of Than Soe Oo



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
 The Government of the Republic of the Union of Myanmar
 သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
 Ministry of Natural Resources and Environmental Conservation
 ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
 Environmental Conservation Department
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)
Environmental Impact Assessment License (Individual)

ဦးဇော်သိန်း၊ ၉/မမန(နိုင်)၀၁၂၅၁၅ အား တွဲဖက်အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is hereby issued that U Zaw Thein, 9/MaMaNa(N)012515 has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an Associate Consultant under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-
 The areas of expertise, eligible to be conducted, are as follows:

1. ဘူမိဆိုင်ရာ ဆန်းစစ်လေ့လာခြင်း (Geological Assessment)
2. သဘာဝသယံဇာတ စီမံအုပ်ချုပ်ခြင်း (ခတ်သတ္တု)(Natural Resources Management (Mining))
- 3.
- 4.
- 5.

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Figure-6: Certificate of Zaw Thein

1.4 Proponent's Commitments

All the commitments made regarding EMP and mitigation measures described in the report will be duly undertaken.

During the implementation of the project, should there arise any directives for amendment for the improvement of the EMP report, regarding up-to-date technology, the project proponent will duly comply with the directives and implement this.

If the project proponent is desirous to amend and revise the report it will submit the case to the authority concerned and proceed with the amendment after approval by the authority.

After the end of the Operation Phase of the project proponents will duly implement Decommissioning and Rehabilitation plan and ensure that no residual impacts, if any, remain in the after match of the project, and that the overall ecology is restored to its quasi condition before the commencement of the project.

U Phyo Wai Win

Director

Max Myanmar Manufacturing Co., Ltd

U Soe Han

Head of Department (Production)

Nay Pyi Taw City Development

Committee (NCDC)

1.5 Third Party Commitments

The consultant firm has made a sincere commitment and confirmed that:

- (a) the information and data in this EMP report are true and accurate and that the report is completed, and
- (b) that the EMP has been prepared in strict compliance with applicable laws including EIA procedure (EIA procedure 616/2015,).

The report has been prepared by Myint Kyaw Thura & team with utmost effort with all reasonable skills, care and diligence within the term of contract with the client (Project Proponent) and based on our experience, using professional judgment and based on the information that is available to us.



Myint Kyaw Thura
Managing Director
Myanmar Environment Sustainable
Conservation

2. POLICY, LEGAL AND ADMINISTRATION FRAME WORK

2.1 Corporate Environmental Policy of the Project Proponents

Max Myanmar Manufacturing Co., Ltd, one of the leading cement production companies in Myanmar has environmental policy of its own. The first and foremost policy is to obey, abide and comply with all laws and rules relating to physical and social environment. Most of all, it will follow all the rules and regulations set up by the Environmental Conservation Department, the main agency responsible for environmental management in Myanmar. The company pledges to do a mining business that will be environmentally sound as far as possible.

The company shall endeavor to:

- operate the limestone quarry with an environmentally and socially responsible manner and to comply with laws and regulation
- prevent pollution of surrounding area; monitoring and adopting suitable measures for environment protection
- implement EMP effectively to mitigate pollution of water, land, air, noise and dust and proper disposal of waste
- develop green belt in available space
- conserve natural resources and energy as far as possible
- if possible, recycling of waste through the principles of 5 Rs (refuse, reduce, reuse, recover, recycle), and
- create environmental awareness among employees and local community through education and training

Corporate Social Responsibility (CSR) and community development

The company very well realizes that the ethic code of 21th century big business is not to make profit at the expense of the environment and the local community. And that the big business should not focus only on economically viable venture but also on environmentally and functionally sound, ecologically viable as well as socially sustainable venture.

CSR has become mandatory in many countries and it is also now an official policy of most big companies. The project proponents had already implemented CSR programmes as far as possible and will continue to do so and carry out community assistance and community development. Generous compensation would be provided if there is any loss or damage due to the implementation of this project. Moreover, charity works and donation works had been carried out and this trend will be continued.

So far project proponent spent about Ks 498,300,000 not including materials and kinds in donation, charity and community assistance works.

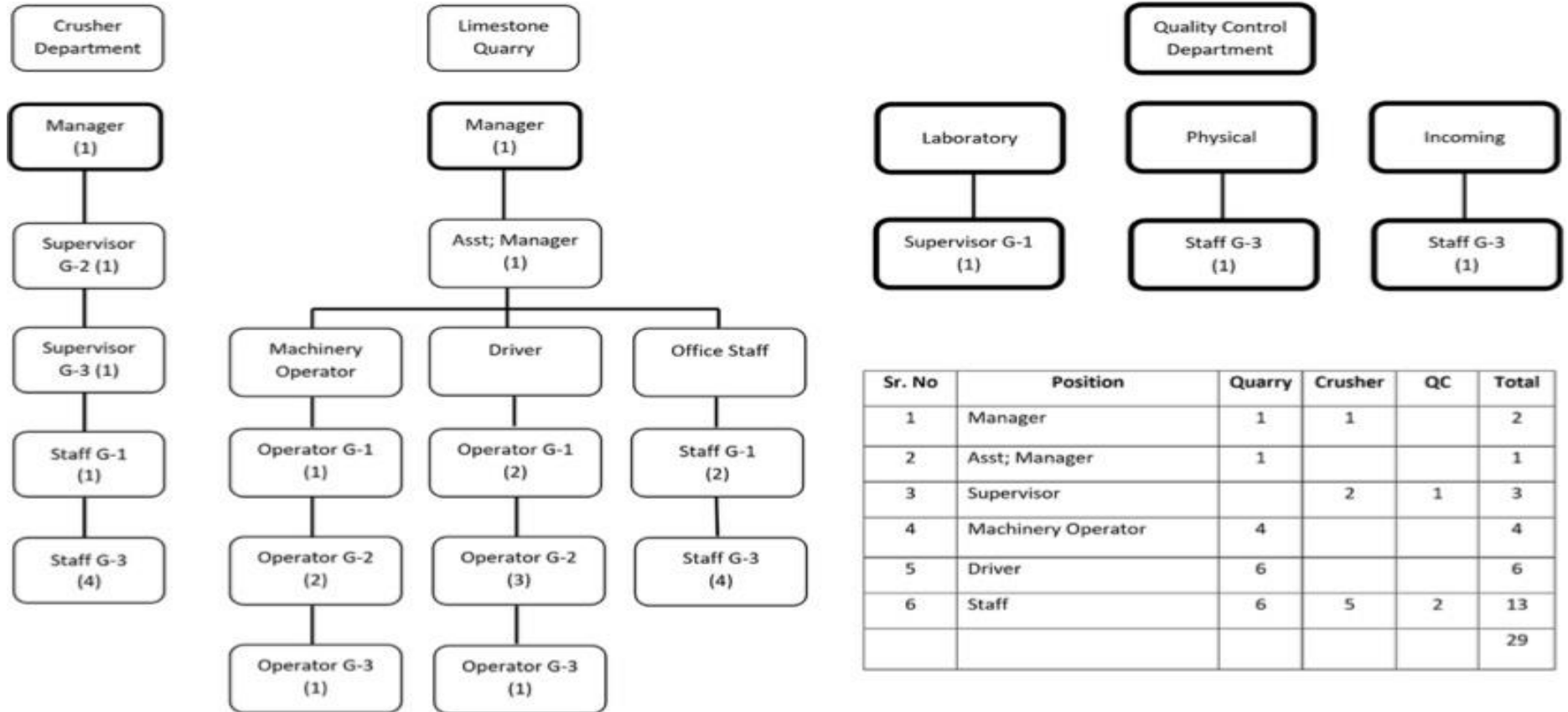
Another form of CSR is the reforestation of mine area after mine closure. The project proponents are already reforested 500 acres of land with teak.

Max Myanmar Manufacturing Company Limited will duly implement CSR and carry out community assistance and community development. Generous compensation would be provided if there is any loss or damage due to the implementation of this project. Moreover, charity and donation works will be carried out. Another form of CSR is the reforestation works and creation of green zone at proposed site after the Operation Phase (25 years from now) and during the Decommissioning Phase of the project life.



Max Myanmar Manufacturing Co., Ltd.

Organization Chart of Limestone Operation for NCDC Quarry



Sr. No	Position	Quarry	Crusher	QC	Total
1	Manager	1	1		2
2	Asst; Manager	1			1
3	Supervisor		2	1	3
4	Machinery Operator	4			4
5	Driver	6			6
6	Staff	6	5	2	13
					29

Figure-7: The Organizational Chart of Max Myanmar Manufacturing Company Limited

For the execution of EMP and undertaken mitigation measures one EMP cell is formed. One of the managers is EMP cell leader while four engineers are EMP cell members. Two Local will be added to the list of EMP cell members.

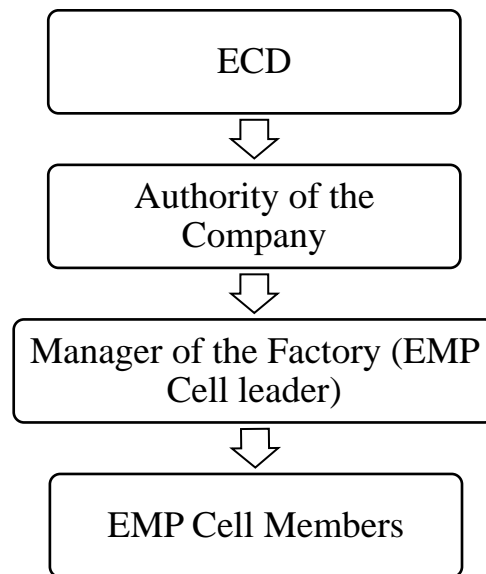


Figure-8: EMP Cell Organization

2.2 Myanmar Environmental Policy and Legal Frame work

There were/are several laws since the colonial days which were/are one way or another pertaining to the environment of the country.

The Protection and Conservation of the Environment was the priority of successive governments.

The National Commissions of Environmental Affairs (NCEA) was formed in 1990. Myanmar Agenda-21 was outlined which contains social, economic, institutional and infrastructural improvement programmes and, most of all, environmental conservation programmes.

Respective ministries devised 56 environmental policies and regulations directly related with environmental conservation and protection.

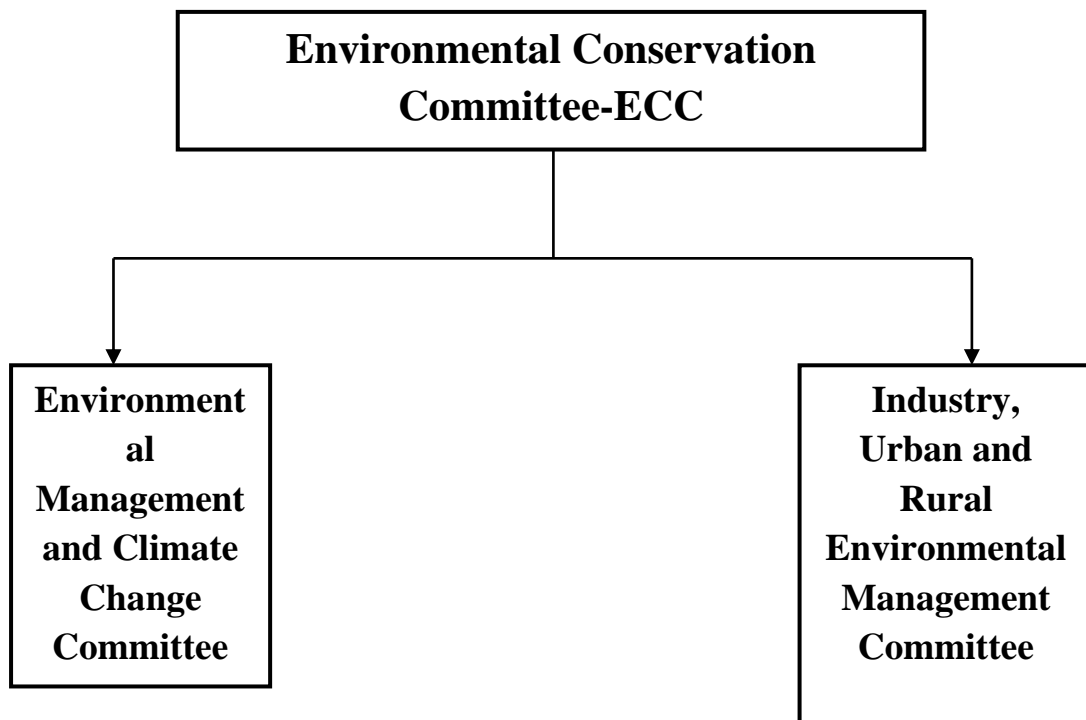
The National Environmental Conservation Committee (NECC) was formed in 2011 with the aim to achieve sound environmental management in the country.

With a view to effectively implementing the protection and conservation of the environment the new government in 2016 has created the new ministry, Ministry of Natural Resources and Environmental Conservation (MONREC). It is believed that effective and meaningful management of the environmental affair will be achieved. The Environmental Conservation Department (ECD) is the focal and coordinating agency for the overall and detail environmental management throughout the country.

2.2.1 Institutional Frame Work

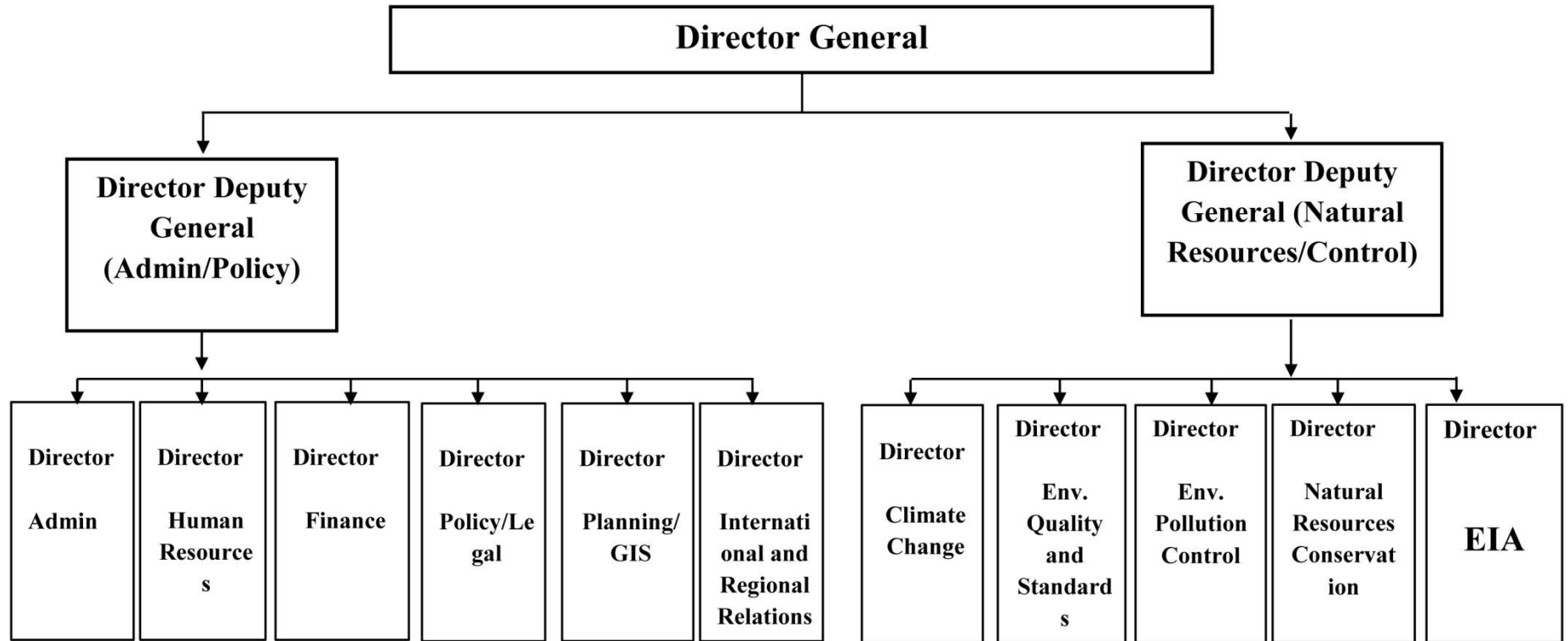
The National Environmental Conservation Committee (NECC) was formed in 2011 with the aim to achieve sound environmental management in the country. It is enlarged and reorganized as National Environmental Conservation and Climate Change Central Committee (NECCCCC).

Later the Environmental Conservation Committee- ECC was formed in 2021. The institutional organization of ECC is as follow:



Institutional organization of ECD

ECD is a major department under MONREC and is headed by a director general. Under the Director General are one Deputy Director General and 4 Directors at the directorate. ECD is the focal and coordinating agency for the overall environmental management of the country. It is also directly responsible for all the management of IEE, EIA, EMP etc. activities taking places all over the country.



These four departments are each headed by a director.

The main tasks of ECD include:

- implementing environmental conservation policy
- designing and implementing monitoring programmes
- prescribing environmental quality standards and,
- conducting activities relating to waste management and conducting environmental impacts assessments

Recently various Environmental Conservation Departments at States and Regional levels under the Directorate were established in all the 14 States and Regions of the nation. This will surely greatly enhance the conservation of the environment and especially the management of the environment of the country.

2.2.2 Applicable Laws, Rules and Regulation

The Ministry of Environmental Conservation and Forestry (MOECAAF) under the previous government has published a book "National Biodiversity and Action Plan" where Laws and Acts relating to environment were listed.

In doing quarry business Project proponent will comply with the following Laws and Acts:

1. Myanmar Mine Law, 2015
2. Myanmar Mine Rules, 2018
3. The Conservation of Biodiversity and Protected Areas Law, 2018
4. The Environmental Conservation Law, 2012
5. The Environmental Conservation Rules, 2014
6. Environmental Impact Assessment Procedure, Notification No. 616/2015
7. National Environmental Quality (Emission) Guideline, 2015
8. The Conservation of Water Resources and Rivers Law, 2006
9. The Conservation of Water Resources and Rivers Rules, 2013
10. The Forest Law, 2018
11. The Explosive Substances Act, 1908
12. The Protection and Preservation of Cultural Heritage Region Law, 2019

13. Myanmar High Way Law, 2000
14. Myanmar Insurance Law, 1993
15. Fire Brigade Law, 2015
16. The Social Security Law, 2012
17. Myanmar Companies Law, 2017
18. Labour Organization Law, 2011
19. The Settlement of Labour Dispute Law, 2012
20. Employment and Skill Development Law, 2013
21. Occupational Safety and Health Law, 2019
22. Leaves and Holiday Act, 1951
23. Workmen's Compensation Act, 1923
24. Minimum Wages Law, 2013,
25. The Public Health Law, 1972
26. Prevention and Control of Communicable Diseases Law, 1995
27. The Control of Smoking and Consumption of Tobacco Product Law, 2016

In this EMP report context these laws will not be elaborated or reproduced. A law by itself is a wide-ranging subject and the responsible persons of the company are not in a position to read or study them all. Therefore, a solicitor or legal expert shall be hired to deal with these laws. For pragmatic purpose the responsible persons of the company shall simply use simple logics and common sense in doing business not to affect the air, water and land environments. This is just for general purpose; for detail purpose the advice of the legal expert is necessary.

In addition to laws and rules there are still regulations and statutory requirements to be complied. For examples the National Environmental Guidelines prescribed by Environmental Conservation Department (ECD) and the statutory requirements by Forest Department (FD). Once again the advice of the legal experts is necessary.

Excerpts of Laws, Rules and Act of relevance

The project proponent will comply with the following Laws, Rules, Acts particularly the Sections/Articles reproduced below.

Myanmar Mine Law, 2015

Chapter-4, Section-13(e): Plan and manage for mining activities without harming the environment.

This includes : to set up fund for environmental conservation.

: set up fund for implementation of decommissioning and rehabilitation.

Chapter-5 – is permit for the use of water (if public water).

Chapter-10 – is offences and penalties for doing mining business and associated business without permit.

Section-29: The Ministry may with the approval of the Government issue prohibitions in respect of purchasing obtaining, storing, possessing, transporting, selling, transferring of any mineral obtained from mineral production.

Myanmar Mine Rules, 2018

Section-: 16. The tenure of the mineral exploration permit shall be according to the period specified in the permit.

Section-: 23. A person or an organization desirous of carrying out large scale production of metallic minerals, industrial minerals or stone shall apply to the Ministry in Form (3) in order to obtain a permit.

Section-: 26. If the holder of a large-scale mineral production permit fails to carry out the operations in accordance with the conditions of the permit within the period specified without any valid reason the mineral production permit shall be deemed to have been invalidated.

Section-: 27. The holder of a large-scale mineral production permit may apply to the Ministry for extension of the tenure of the permit in respect of all or part of the permit area 6 months prior to the expiry of the permit.

Section-: 28. The application for extension of tenure shall state the period for which extension of the tenure is sought and be accompanied by:

- (a) programme of mining operations proposed to be carried out in the period of extension;
- (b) the latest proved, possible or estimated ore reserves;
- (c) estimated capital investments production costs, earning forecasts and cash flow in respect of the period of extension;
- (d) any expected changes in the method of mining and processing;
- (e) programmes for safety and environment protection;

- (f) facts that the Ministry has separately requested;
- (g) map identifying the said area of land if the application for extension of the tenure is in respect of part of the permit area only

Section-: 29. The Ministry may, after scrutinizing the application for extension of the tenure of the large-scale mineral production permit in accordance with Rule 24, extend the permit with the approval of the Government with or without variation of the conditions of the permit for a period not exceeding five years at a time.

Section-: 31 The Ministry shall:

- (a) give notice to the applicant if it is intended to refuse the application for extension of tenure of large-scale mineral production permit, giving particulars of the ground for the intended refusal and stating a date before which the applicant may take appropriate action or submit explanations;
- (b) refuse the application for extension of tenure if the applicant has not taken appropriate action or has failed to submit explanations before the date specified;

Section-: 32. The holder of a large-scale mineral production permit may apply to the Ministry for expansion of his permit area continuously.

Section-: 33 The Ministry:

- (a) shall scrutinize the application made under Rule 32 in accordance with Rule 24 and if it is considered that the mineral resources can be produced effectively and beneficially, may permit the application with the approval of the Government;
- (b) shall not permit the application for expansion if the area applied for is included in an area which cannot be permitted under the provisions of the Law.

The Conservation of Biodiversity and Protected Areas Law, 2018

Section-35: A park warden may pass an administrative order against any person to pay a fine from a minimum kyats 30,000 to a maximum kyats 100,000 if he commits any of the following acts within a protected area or a zoological garden or botanical garden which is administered by the Government or in which the Government has subscribed share capital:

- (a) entering a prohibited area without permission;
- (c) digging on the land, cultivating or carrying out any activity;
- (d) extracting, collecting or destroying in any manner, any kind of wild flora or cultivated plant.

Section-29: With the approval of the Ministry, the Director General:

(a) shall check whether the licence application for a zoological garden or botanical garden conforms with the specified terms and conditions, and issue a licence if the conditions are met;

(b) may withdraw a licence within the prescribed period or cancel it if a person who receives a licence violates the prescribed terms and conditions.

Section-39: Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term not exceeding 3 years or with a fine from a minimum of kyats 200,000 to a maximum of kyats 500,000, or with both:

(a) intentionally polluting soil, water or air, damaging a water-course or poisoning water or electrifying water, or using chemical or explosive materials in the water within the protected area;

The Environmental Conservation Law, 2012

Section-7 (d): The ministry prescribes environmental quality standards including standards on emission, effluents, solid wastes, production procedures, processes and products for conservation and enhancement of environmental quality;

Section-14: 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.

Section-15: 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.

Section-24: The Ministry may, in issuing the prior permission, stipulate terms and conditions relating to environmental conservation. It may conduct inspection whether or not it is performed in conformity with such terms and conditions or inform the relevant Government departments, Government organization to carry out inspections.

Section-29: No one shall violate any prohibition contained in the rules, notification, orders, directives and procedures issued under this Law.

Section-32: Whoever violates any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law shall, on conviction, be punished with imprisonment for a term not exceeding one year, or with fine, or with both.

The Environmental Conservation Rules, 2014

Rule-69 (a): Any person shall not emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants to environment and hazardous waste or hazardous material stipulated by notification under the Law and any these rules at any place which may affect the public directly or indirectly.

Rule-69 (b): Any person shall not carry out the action which can be damaged to natural environment which is changing due to ecosystem and such system, except the permission of the relevant Ministry in order to the interest of the public.

Environmental Impact Assessment Procedure, 2015

Section -102: The project Proponent shall bear full legal and financial responsibility for:

- (a) All of the Project Proponent's actions and omissions and those of its contractors, subcontractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the Project acting
- (b) PAPs until they have achieved socio-economic stability at a level not lower than that in effect prior to the commencement of the Project, and shall support programs for livelihood restoration and resettlement in consultation with the PAPs, related government agencies, and organizations and other concerned persons for all Adverse Impacts.

Section-103: The Project Proponent shall fully implement the EMP, all Project commitments, and conditions, and is liable to ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, the Rules, this Procedure, the EMP, Project commitments and conditions when providing services to the Project.

Section-104: The Project Proponent shall be responsible for, and shall fully and effectively implement, all requirements set forth in the ECC, applicable Laws, the Rules, this Procedure and standards.

Section-105: The Project Proponent shall timely notify and identify in writing to the Ministry, providing detailed information as to the proposed Project's potential Adverse Impacts.

Section-106: The Project Proponent shall, during all phases of the Project (pre-construction, construction, operation, decommissioning, closure and post-closure), engage in continuous, proactive and comprehensive self-monitoring of the Project and activities related thereto, all Adverse Impacts, and compliance with applicable laws, the Rules, this Procedure, standards, the ECC, and the EMP.

Section-107: The Project Proponent shall notify and identify in writing to the Ministry any breaches of its obligations or other performance failures or violations of the ECC and the EMP

as soon as reasonably possible and in any event, in respect of any breach which would have a serious impact or where the urgent attention of the Ministry is or may be required, within not later than twenty-four (24) hours, and in all other cases within seven (7) days of the Project Proponent becoming aware of such incident.

Section-108: The Project Proponent shall submit monitoring reports to the Ministry not less frequently than every six (6) months, as provided in a schedule in the EMP, or periodically as prescribed by the Ministry.

Section-109: The monitoring reports shall include:

- (a) documentation of compliance with all conditions;
- (b) progress made to date on implementation of the EMP against the submitted implementation schedule;
- (c) difficulties encountered in implementing the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties;
- (d) number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation;
- (e) accidents or incidents relating to the occupational and community health and safety, and the environment; and
- (f) monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required.

Section-110: Within ten(10) days of completing a monitoring report as contemplated in Article 108 and Article 109 in accordance with the EMP schedule, the Project Proponent shall make such report (except as relate to National Security concerns) publicly available on the Project's website, at public meeting places (e.g libraries, community halls) and at the Project offices. Any organization or person may request a digital copy of a monitoring report and the Project shall, with ten (10) days of receiving such request, submit a digital copy via email or as may otherwise be agreed upon with the requestor.

Section-111: The Ministry has the right, using the Department's officers at national, regional, state, Nay Pyi Taw Union Territory and/or local offices, the services of any consultant, or both, to conduct monitoring and inspections of a Project and activities related thereto in order to control and determine compliance by the Project with all applicable environmental and socio-economical requirements and, where possible, to prevent violations of the Project's obligations. The Ministry may also, for the implementation of monitoring and inspections, enlist the assistance of other relevant government departments and organizations.

Section-112: If, upon inspection, the Ministry identifies any non-compliance with the conditions in the ECC, the Ministry may require the Project Proponent to undertake remedial measures and/or may impose penalties as provided for in this Procedure.

Section-113: For purpose of monitoring and inspection, the Project Proponent:

- (a) Shall grant to the Ministry and/or its representatives, at any time during normal working hours, access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed; and
- (b) From time to time as and when the Ministry may reasonably require, shall grant the Ministry access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed.

Section-114: In carrying out any inspection, the Ministry may take photographs and make other audio and video recordings of any type, take soil, sediment, water, and air samples, and examine computers, copy documents including digital files, interview persons, and carry out any other investigation which the Ministry believes to be necessary or appropriate. The Ministry, as it deems necessary, may carry out such inspection in coordination with any other ministries.

Section-115: In the event of an emergency, or where, in the opinion of the Ministry, there is or may exist a violation or risk of violation of the compliance by the Project with all applicable environmental and social requirements, the Project shall grant full and immediate access to the Ministry at any time as may be required by the Ministry.

Section-116: The Ministry's inspections may include without limitation sites, facilities, vehicles, computers, archives, documents and all other forms and types of media and information storage, and persons.

Section-117: The Project Proponent shall further ensure that the Ministry's rights of access hereunder shall extend to access by the Ministry to the Project's contractors and information storage, and persons.

National Environmental Quality (Emission) Guideline, 2015

All the guidelines that are of relevance for this project are shown under a separate section of this report.

The Conservation of Water Resources and Rivers Law, 2006

Section-8: No person shall:

- (a) Carry out any act or channel shifting with the aim to ruin the water resources and river and creeks.
- (b) Cause the wastage of water resources willfully.

Section-11: No person shall:

- (a) Dispose of engine, oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk.

Section-19: No one shall dispose of any substance into the river, creek that may cause damage to water way or change of water course from the bank or vessel which is plying, vessel which has berthed, anchored, stranded or sunk.

Section-21: No one shall:

- (a) drill well or pond or dig earth without the permission of the Directorate.

Section-22: No one shall, without the permission of the Directorate, pile sand, shingle and other heavy materials for business purpose on the bank area and water front area.

Section-24: No one shall:

- (a) violate the conditions prescribed by the Directorate so as not to cause water pollution and change of watercourse in rivers and creeks.

Section-29: Whoever attempts or conspires or abets in the commission of an offence under this law shall be punished with the punishment provided for such offence in this law.

Section-30: Any government department and organization or any person desirous of constructing drainage, utilizing river water intake, constructing bridged spanning rivers, connecting underground pipe, connecting underground electric cables, connecting underground telecom cable or digging in river or creeks, bank boundary and water front boundary, under the requirement of work, shall in order not to adversely affect the water resources and river and creeks, carry out only after obtaining the approval of the Ministry of Transport.

The Conservation of Water Resources and Rivers Rules, 2013

Section-8: Chapter-3, Protection of water pollution and conservation of environment

No one:

- (a) must not pollute the river water by dumping hazardous substance into the water
- (b) must not dump plastic bags, any plastic materials or nylon ropes into the water
- (c) must not construct latrine by the river side to prevent water pollution by human wastes
- (d) must not dump any human wastes, fuel oils, chemical toxic wastes into the water
- (e) all activities should be executed according to international standards

Section-9: Anyone who has committed such an offence must pay for this to the Directorate

Section-53: Chapter-11, Construction of buildings/structures on the river bank premise

Anyone who want to construct any buildings or structures near the river must obtain permit from the relevant Ministry and Directorate.

The Forest Law, 2018

Section-12: Whoever, within a forest land and forest covered land at the disposal of the Government:-

- (a) is desirous of carrying out any development work or economic scheme shall obtain the prior approval of the Ministry (of Natural Resources and Environmental Conservation);

Section-14: The Director General may grant permission to any person or any organization for cultivation and maintenance of the following private forest plantations in the forest land in accordance with the stipulation:-

- (a) establishing private forest plantation, with the approval of the Cabinet through the Minister, according to open tender system;

The Explosive Substances Act, 1908

Section-3: Any person who unlawfully and maliciously causes by any explosive substance an explosion of a nature likely to endanger life or to cause serious injury to property shall, whether any injury to person or property has been actually caused or not, be punished with transportation for life or any shorter term, to which fine may be added, or with imprisonment for a term which may extend to ten years, to which fine may be added.

Section-5: Any person who makes or knowingly has in his possession or under his control any explosive substance, under such circumstances as to give rise to a reasonable suspicion that he is not making it or does not have it or had it in his possession or under his control for a lawful object, be punishable with transportation for a term which may extend to fourteen years, to which fine may be added, or with imprisonment for a term which may extend to five years, to which fine may be added.

Section-6: Any person who by the supply of or solicitation for money, the providing of premises, the supply of materials, or in any manner whatsoever, procures, counsels, aids, abets, or is accessory to, the commission of any offence under this Act shall be punished with the punishment provided for the offence.

The Protection and Preservation of Cultural Heritage Region Law, 2019

Section-13: A person desirous of carrying out one of the following shall abide by the provisions of other existing laws and also apply to the Department in accordance with stipulation to obtain prior permission under this law:-

- (a) Within the ancient monumental zone or the ancient site zone
 - (1) Construction or extending a building
 - (2) Renovating the ancient monument or extending the boundary of its enclosure;
- (b) Within the preserved or protected zone, constructing extending, renovating a hotel, motel, guest house, lodging house or industrial building or extending the boundary of its enclosure
- (c) Within the culture heritage region:
 - (1) Carrying out the renovation and maintenance work of the ancient monument without altering the original ancient form and structure or original workmanship;
 - (2) Carrying out archeological excavations;
 - (3) Building road, constructing bridge, irrigation canal and embankment or extending the same

Section-21: No person shall, without prior permission granted under this Law, carry out any of the following in the cultural heritage region.

- (b) carrying out archeological excavation.

Section-22: No person shall construct a building which is not in conformity with the conditions prescribed region wise by The Ministry of Culture in the cultural heritage region.

Myanmar High Way Law, 2000

Section-7: Whoever without the permission of the Public Works commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to 3 years or with fine or with both:- constructing the building within the boundary of the highway

Section-8: Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to months or with fine or with both:- planting, cutting or destroying tree or crops within the boundary of the highway without permission of Public Works.

Section-9: Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to 3 months or with fine or with both:- setting up the signboard of advertisement within the boundary of high ways without permission of Public Works

Myanmar Insurance Law, 1993

Section-15: Owner of motor vehicles shall effect life insurance for a minor

Section-16: An entrepreneur or organization operating an enterprise which may cause loss to state-owned property or which may cause damage to the life and property of the public or which may cause pollution to the environment shall effect compulsory General Liability Insurance with the Myanmar Insurance.

Fire Brigade Law, 2015

Section-24: No person shall fail to abide by the directives in respect of fire precaution and prevention issued under section -16 by the Township Fire Service Department.

Section-25: The owner or manager of the factory, workshop, work site or business exposed to fire hazard shall:

- (a) Not fail to form the reserve fire bridge
- (b) Not fail to provide materials and apparatus for fire precaution and prevention, in conformity with the directive of the Fire Service Department

Myanmar Companies Law, 2017

Project Proponent has to comply with: There are 8 chapters and 31 divisions in this Myanmar Company Law, 2017. The project proponent will duly comply with this law; a legal expert will be hired to do all the works.

The Social Security Law, 2012

Section-11: (b) The project owner will register to the respective social security office.

Section-15: (a) The project owner will pay the social security fund for four types of social security

Section-18: (b) The project owner will pay the fund which have to be paid by himself together with the fund which have to be paid from the salaries of the employees.

Section-48: The project owner will pay the fund for accident, (but it is not related to workmen's compensation)

Section-75: The project owner will submit the lists and records, provided in article 75, to related social security office.

Labour Organization Law, 2011

Section-17: The labour organization shall have the right to carry out freely in drawing up their constitution and rules, in electing their representatives, in organizing their administration and activities or in formulating their programmes the labour organization has the right to negotiate and settle with the employer if the workers are unable to obtain and enjoy the right of the

workers contained in the labour laws and to submit demands to the employer claim in accord with the relevant law if the agreement cannot be reached.

Section-18: The labour organizations have the right to demand the relevant employer to re-appoint a worker if such worker is dismissed by the employer and if there is cause to believe that the reason of such dismissal were based on labour organization membership or activities, or were not in conformity with the labour law.

Section-19: The labour organizations have the right to send representation to the Conciliation Body in settling the dispute between the employer and the worker. Similarly, they have the right send representatives to the Conciliation Tribunal formed with the representatives from the various levels of labour organization.

Section-20: In discussing with the Government the employer and the complaining workers in respect of workers' right or interests contained in the labour laws, the representative of the labour organization also have the right to participate and discuss.

Section-21: The labour organizations have the right to participate in solving the collective bargains of the workers in accord with the labour laws.

Section-22: The labour organizations shall carry out peacefully in carrying out holding meetings, going on strike and carrying out other collective activities in accord with the procedure, regulations, by-law and any directives prescribed by the relevant labour Federation ship.

The Settlement of Labour Dispute Law, 2012

Section-38: No employer shall fail to negotiate and coordinate in respect of the complaint with the prescribed period without sufficient cause

Section-39: No employer shall alter the condition of service relating to workers concerned in such dispute at the consecutive period before commencing the dispute within the period under the investigation of the dispute before the Arbitration Body or Tribunal, to affect the interest of such workers immediately.

Section-40: No party shall proceed to lock-out or strike without accepting negotiation, conciliation and arbitration by Arbitration Body in accord with this law in respect of a dispute.

Section-51: It an employer in the course of settlement of dispute commits any action omission without sufficient case, which by causing reduction in production resulting so as to reduce the workers' benefits shall be liable to pay full compensation in the amount determined by the Arbitration Body or Tribunal. Such money shall be recovered as the arrear of land revenue.

Employment and Skill Development Law, 2013

Section-5: (a) (1) If the employer has appointed the employee to work for an employment, the employment agreement shall be made within 30 days. But it shall not be related with government department and organization for a permanent employment.

(2) If pre training period and probation period are stipulated before the appointment the said trainee shall not be related with the stipulation of sub-section (1).

(b) The following particulars shall be included in the employment agreement:

- (1) The type of employment;
- (2) The probation period;
- (3) Wage, salary;
- (4) Location of the employment;
- (5) The term of the agreement;
- (6) Working hour;
- (7) Day off, holiday and leave;
- (8) Overtime;
- (9) Meal arrangement during the work hour;
- (10) Accommodation;
- (11) Medical treatment;
- (12) Ferry arrangement to worksite and travelling;
- (13) Regulations to be followed by the employees;
- (14) If the employee is sent to attend the training, the limited time agreed by the employee to continue to work after attending the training;
- (15) Resigning and termination of service;
- (16) Termination of agreement;
- (17) The obligations in accord with the stipulation of the agreement;

- (18) The cancellation of employment agreement mutually made between employer and employee;
 - (19) Other matters;
 - (20) Specifying the regulation of the agreement, amending and supplementing;
 - (21) Miscellaneous.
- (c) The worksite regulations contained in the employment agreement shall be in compliance with any existing law and the benefits of the employee shall not be less than those of the any existing law.
- (d) According to the employment agreement, the Ministry shall issue the notification for paying the stipulated compensation to the employee by the employer, if the work is completed earlier than the stipulated period or the whole work or any part of it have to be terminated due to unexpected condition or the work has to be terminated due to various conditions.
- (e) The employment agreement made under sub-section (a) shall be related with daily wage workers, piece rate workers who are appointed temporarily in the government department and organization.
- (f) The worksite regulations and benefits contained in the employment agreement mutually made between the employer and employee or among the employees shall be amended as necessary, in accord with the existing law.
- (g) The employer shall send a copy of the employment agreement made between the employer and employee, to the relevant employment and labour exchange office within the stipulated period and shall get the approval of it.
- (h) The employment agreement made before the enforcement of this law shall be confirmed up to the end of the term of the original agreement.

Section-14: Employer shall conduct occupational training to enhance the skills of workers who are to be employed as well as workers who are presently employed in accordance with the requirements of the enterprise and the policy of the Skills Development Agency

Section-30: (a) The employers of Industrial and Service Enterprises shall pay contribution to the fund every month without fail amounting to not less than below 0.5% of the payroll of his workers up to the level of supervisors of the workers.

Section-30: (b) The employer shall not deduct the contribution paid under sub- section (a) to the fund from the wages of the workers.

Occupational Safety and Health Law, 2019

Chapter (VIII):

Section-26: The Employer shall be responsible to:-

- (a) arrange as required to assess the risks of Workplace, Process and machines and materials used thereat;
- (b) arrange as required to assess the likelihood of occurrence of hazards at the Workplace and to the environment;
- (c) arrange to have Workers medical checked-up by the Recognized Doctor in accordance with stipulations whether they suffer from any Occupational Disease;
- (d) arrange to improve the Workplace until it is safe and good for health based on the findings as per sub-sections (a), (b) and (c);
- (e) provide Workers with 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;
- (f) prescribe precautionary plans and plans for emergency;
- (g) provide a clinic, appoint the Registered Doctors and nurses and provide medicines and supporting equipment for any Industry/Business where the number of Workers is not less than the number determined by the Ministry;
- (h) make necessary arrangements for managers, Workers and members of the Occupational Safety and Health Committee including (Employer) himself/herself to attend Occupational Safety and Health training courses stipulated by the Ministry in accordance with their departments or types of work;
- (i) make necessary arrangements to enable immediate reporting to the Person In-charge for Occupational Safety and Health or manager in case where a Worker suffers an Occupational Accident or his/her life or health is likely to be in danger;
- (j) arrange to prevent any persons in the Workplace from Occupational Safety and Health risks occurred due to materials, machines or wastes used in the Workplace or Process;
- (k) immediately stop the Process, evacuate Workers and conduct necessary rescue plans if any Occupational Accident is about to occur. If possible, Workers will be relocated to another appropriate safe Workplaces;
- (l) display Occupational Safety and Health instructions, danger signs, notices, posters and signage for directions in accordance with stipulations;
- (m) arrange to be complied with precautions when entering restricted hazardous Workplaces;

- (n) arrange to disseminate Occupational Safety and Health manuals and guidelines issued by the relevant Ministries for knowledge, technology, information and skills not only to Workers but also to related persons or raise their awareness or knowledge thereof;
- (o) lay down the fire safety plan, perform fire drilling and train Workers to use fire extinguishers systematically;
- (p) allow the Chief Inspection Officer and Inspection Officers to enter Workplaces, inquire, request documents and information or seize exhibits;
- (q) cause Workers to work only for the specified working hours if they have to work in Hazardous Industry/Business and Workplace; and
- (r) Incur the expenses for Occupational Safety and Health matters.

Section-27: No Employer shall dismiss or demote a Worker: -

- (a) during any period before a medical certificate is issued by the Registered Doctor for occupational injury or by the Recognized Doctor for contact with Occupational Disease;
- (b) because the said Worker has addressed a complaint for hazardous or health detrimental condition;
- (c) because the said Worker has conducted the responsibilities of Occupational Safety and Health Committee; or
- (d) because the said Worker has refused to work in any condition where an Occupational Accident or Occupational Disease is about to occur.

Section-28: If any Worker who has been injured due to an Occupational Accident or contacted with Occupational Disease is not covered under the Social Security Law 2012, the Employer must pay for medical expenses to check the extent of capacity reduction and class of disability of such Worker.

Section-29: The Employer: -

- (a) can prohibit or restrict any Worker to work if he/she does not meet the health standards due to medical check-up results done by the Registered Doctor in accordance with the needs and nature of the Industry/Business;
- (b) must, without delay, employ any Worker who has been prohibited or restricted to work subject to sub-section (a) in his/her original position or at the relevant Workplace upon his/her submission of health improvement evidence; and
- (c) must make necessary arrangements in the Workplace in order not to damage health of female Workers who are pregnant or breast-feed.

Chapter (XIV):

Section-48: (a) Any person who is currently operating or wants to operate any Industry/Business to which this Law applies shall not fail to lodge the registration with the Department.

Section-48: (b) No one shall fail to notify the Department in accordance with the stipulations that he/she will build, extend or restructure a building, place, install, extend or change the use of machines in respective Processes for the Industry/Business to which this Law applies in accordance with Occupational Safety and Health stipulations.

Section-48: (c) No one shall act as an Authorised Examiner or Trainer without Recognition Certificate or Training Centre Founder without Registration Certificate issued by the Director General.

Leaves and Holiday Act, 1951

The law contains 18 sections and the purpose is for regulating the taking of leaves and holidays, covering the hours of work, weekly rest and paid leave. Three types of leaves, namely Earned leave, casual leave and leave on Medical Certificate are stipulated. The holidays during that period (the 1950s) include: Independence Day, Fullmoon of Tabaung, Thingyan, Burmese New Year, May Day, Full Moon of Kason, Resistance Day, and beginning of Buddhist Lent, Martyrs' Day, End of Buddhist Lent, Full Moon of Tansaungmone, and National Day. One Islam Holiday and Hindu Holiday are official but are not written in the Act, but are notified in short advance.

Workmen's Compensation Act, 1923

It was/is an Act to provide for the payment by certain classes of employers to their workmen of compensation for injury by accidents.

This law was amended in 2005 by chairman of the State Peace and Development Council. Since the rate in kyats for compensation during the 1920s are no longer applicable (workable) the rate for compensation are increased. The rate shall be according to the Notification by the existing Ministry of Labour. eg. fine which may extend to "Ks 100" is substituted by "Ks 10,000".

Section-13: Compensation shall be paid in line with the provision of the said law.

Minimum Wages Law, 2013

Section-12: The employer:

- (a) Shall not pay wage to the worker less than the minimum wage stipulated under this Law;
- (b) May pay more than the minimum wage stipulated under this Law;
- (c) Shall not have the right to deduct any other wage except the wage for which it has the right to deduct as stipulated in the notification issued under this Law;

- (d) Shall pay the minimum wage to the workers working in the commercial, production and service business in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash or partly in cash and partly in property, with prevailing regional price, jointly according to the desire of the worker;
- (e) In paying minimum wage to the workers working in the agricultural and livestock business, some cash and some property at prevailing regional price may be paid jointly according to local custom or desire of the majority of workers or collective agreement. Such payment shall be for any personal use and benefit of the worker and his family and the value shall also be considerable and fair.

Section-13: The employer:

- (a) Shall inform the workers the rates of minimum wage relating to the business among the rates of minimum wage stipulated under this Law and advertise it at the workplace to enable to be seen by the relevant workers;
- (b) Shall prepare and maintain the lists, schedules, documents and wages of the workers correctly;
- (c) Shall report the lists, schedules and documents prepared and maintained under sub-Section (b) to the relevant department in accord with the stipulations;
- (d) Shall accept the inspection when summoned by the inspection officer. Moreover, he shall produce the said lists and documents upon asking to submit;
- (e) Shall allow the entry and inspection of the inspection officer to the commercial, production and service businesses, agricultural and livestock breeding workplaces and give necessary assistances;
- (f) If the workers cannot work due to sickness, shall give them holiday for medical treatment in accord with the stipulations;
- (g) If the funeral matter of the member of the family of worker or his parent occurs, shall give holiday without deducting from the minimum wage, in accord with the stipulations.

Section-18: The inspection officer:

- (a) Has the right to enter and inspect the relevant commercial, production and service workplaces, agricultural and livestock breeding workplaces and inspect whether or not they comply with and carry out in accord with the rules, notifications, orders, directives and procedures under this Law, whether or not the lists, schedules and documents, wages relating to the workers are prepared correctly, and whether or not such lists, schedules and documents are reported to the Department in accord with the stipulations;
- (b) May summon, inspect the relevant persons under the assignment of duty by the Department, asking and copying for the relevant lists, schedules and documents.

- (c) If there are outside workers at employer, has the right to inspect information relating to such outside workers, their names and addresses and the right to ask for and copy their lists and documents and lists relating to minimum wage;
- (d) In carrying out under sub-section (a), (b) and (c) relating to inspection, if required by the employer to produce the document, shall show the civil service identify card issued by the relevant department;
- (e) Report to the Department in accord with the stipulations relating to the finding under sub-sections (a), (b) and (c), and documents and papers called for.

The Public Health Law, 1972

Section-3: The company shall cooperate with the authorized person or organization in line with the law and shall abide by any instruction or stipulation for public health.

Section-5: The company shall accept any inspection anytime and anywhere if it is needed.

Prevention and Control of Communicable Diseases Law, 1995

Section-3: In order to prevent the outbreak of Communicable Diseases the Department of Health shall implement the following project activities.

- (a) Immunization of children by injection or orally.
- (a) Carrying out health educative activities relating to Communicable Disease.

Section-4: When a principal epidemic disease of a notifiable disease occurs:-

- (a) Immunization and other necessary measures shall be undertaken by the Department of Health, in order to control the spread thereof
- (b) The public shall abide by the measures undertaken by the Department of Health under sub-section (a)

Section-9: The head of the household or any member of the household shall report immediately to the nearest health department or hospital when any of the following events occur:-

- (a) Rat fall
- (b) Outbreak of a principal epidemic disease
- (c) Outbreak of a notifiable disease

Section-11: In order to prevent and control the spread of a principal disease the health officer may undertake the following measures:-

- (a) Investigation of a patient or any other person required
- (b) Medical examination
- (c) Causing laboratory examination of stool, urine, sputum and blood sample to be carried out
- (d) Causing investigation by injection to be carried out
- (e) Carrying out any other investigation.

The Control of Smoking and Consumption of Tobacco Product Law, 2016

Section-9: The person in charge at the factory shall:-

- (a) Keep the caption and mark referring that it is a non-smoking area the place mentioned.

Section-6: In accordance with stipulation.

- (b) Arrange the specific place where smoking is allowed as mentioned in section-7 and keep the caption and mark also referring that it is a specific place where smoking is allowed, in accordance with the stipulation
- (c) Supervise and carry out measures so that no one shall smoke at the non-smoking area.
- (d) Accept the inspection when the supervisory body comes to the place for which he is responsible.

2.3 Commitment of the project proponent

The project proponents have made a commitment that it will comply with all the laws, rules and regulations mentioned above.

U Phyo Wai Win

Director

Max Myanmar Manufacturing Co., Ltd

U Soe Han

Head of Department (Production)

Nay Pyi Taw City Development
Committee (NCDC)

2.4 International Conventions, Treaties and Agreements

Myanmar has either signed or ratified no less than thirty treaties, conventions and protocols concerning environment, it is learnt.

Some of the regional conventions or protocols signed or ratified by Myanmar are:

- (i) ASEAN Agreement on Conservation of Nature and Natural Resources. Kuala Lumpur, 1985
- (ii) ASEAN Agreement on Tran-boundary Haze Pollution, 2002
- (iii) Establishment of ASEAN Regional Centre for Biodiversity, 2005

Some of the international conventions and protocol which are of importance are:

- (i) Convention for the protection of World Culture and National Heritages. Paris, 1972.
- (ii) Vienna convention for the protection of Ozone Layer. Vienna, 1985.
- (iii) Convention on Biological Diversity. Rio-de-Janero, 1992
- (iv) U N Frame work Convention on Climate Change, 1992.
- (v) Kyoto Protocol on the frame work convention on climate change. Kyoto, 1998
- (vi) Protocol on Bio safety. Cartagena, 2000
- (vii) Convention on Persistent Organic Pollution (POP). Stockholm, 2004
- (viii) UN Climate Change Conference, COP (conference of the parties) 21, Paris, 2015
- (ix) UN Climate change conference, COP 22, Marrakesh, 2016
- (x) International conference on climate change, 2017
- (xi) UN Climate Change Conference, COP 24, Katowice, Poland 2018
- (xii) Second international conference on climate change, Colombo, 2018 and all UN Climate change yearly conference hold in the frame work of UN Framework Convention on Climate Change (UNFCCC).

2.4.1 International Standards and Guideline (to refer to)

The company will also follow the international standards and guidelines as practical as possible:

- 1) ISO: standards and guidelines for limestone quarry.
- 2) IFC: Environmental, Health and Safety guidelines for construction materials extraction, 2007.
- 3) IFC: Health and Safety guidelines for mining, 2007.
- 4) IFC: Environmental, Health and Safety (EHS) general guideline, 2007.
- 5) IFC: Sustainability Frame Work

2.4.2 Environmental and Social Standards (After IFC, 2012)

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

I) Assessment and Management of Environmental and Social Risks and Impacts

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

II) Labour and Working Conditions

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

III) Resource Efficiency and Pollution Prevention

- avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities
- promote more sustainable use of resources, including energy and water
- reduce project-related GHG emissions

IV) Community Health, Safety and Security

- avoid adverse impact on the health and safety of the community during the project life
- ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the community

V) Land Acquisition and Involuntary Resettlement

- avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs
- avoid forced eviction
- avoid, or where avoidance is not possible, minimize social and economic impacts from land acquisition or restriction on land use by
 - (i) providing compensation for loss of assets at replacement cost (value of asset plus transaction costs), and
 - (ii) ensure that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those effected
- improve or restore, the livelihoods and standards of living of displaced persons

VI) Biodiversity Conservation and Sustainable Management of living Natural Resources

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

VII) Indigenous Peoples

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

VIII) Cultural Heritage

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

2.4.3 Standards for Environmental and Social Sustainability

The ethic code for 21th century big business is not to make profit at the expense of the environment and the local community.

The big company should not focus only on economically viable venture but also on functionally sound and ecologically viable as well as socially sustainable venture.

Corporate Social Responsibility (CSR)

CSR has become mandatory in most developed countries. It has also become mandatory for big companies doing business in developing countries. In fact it has become an official policy of many big companies worldwide.

A big company that is doing business in an area must commit itself to environmental and social sustainability. The motto is "**do not harm the environment and the people**".

The company must take the responsibility for community development as far as possible. A certain amount of budget or 2 percent of the net profit has to be allocated for CSR activities, it is learnt. However there is no rule or regulation yet for the percentage of budget to be allocated for undertaking CSR activities.

Many view CSR as a form of compensation for the environmental and socio-economic components impacted. The main objective of CSR is more than mitigation and compensation; it is for the economic and social development of the community impacted by the project. The compensation for land or property lost or damaged due to project, the construction of school, and clinic, the improvement for infrastructure and the provision of alternative livelihoods, donations, charities etc. are parts of CSR activities. The CSR activities must be meaningful and effective, not a mere formality.

The main essence of CSR is taking the responsibility for the community development. And the main principles of CSR are:

- not to destroy the environment
- not to infringe on human rights
- not to get involve in child labour or forced labour, and
- not to get involve in bribery and corruption in league with corrupt officials or authorities when doing business.

2.4.4 Proponent's Contractual and Other List

The company has its own mining engineers and geologists and so will not hire any contractor for the quarry operation. The building of all the small buildings will be also supervised by the company's; only workers will be hired.

Commitments made by the project proponent

- (a) First of all, the project proponent declares that the information in the report is, to the best of its knowledge, true, accurate and complete.
- (b) The EMP report has been prepared in strict compliance with applicable laws, rules, regulations, guidelines and procedures.
- (c) The project proponent will at all times comply fully with the commitments, mitigation measures, and plans in the EMP Report.

Project proponents commit to create a healthy and safe working place and working condition. First priority will be given to the Occupational Health and Safety of the workers and the Environmental, Health and Safety of all workers and the community. Project proponent will strictly follow the National Environmental Quality (air emission and effluent) Guidelines prescribed by ECD.

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Nay Pyi Taw City Development
Committee (NCDC)

2.4.5 Environmental and/or Health Standards Related to the Project

2.4.5.1 Air quality/emission

Project proponent will comply with the General National Environmental Quality Emission Guideline values for air emission as prescribed by the Environmental Conservation Department (from Notification No.615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter PM ₁₀ ^a	1-year	20
	24-hour	50
Particulate matter PM _{2.5} ^b	1-year	10
	24-hour	25
Sulfur dioxide	24-hour	20
	10-minute	500

^a Particulate matter 10 micrometers or less in diameter

^b Particulate matter 2.5 micrometers or less in diameter

2.4.5.2 Water quality/effluent

Project proponent will comply with the Myanmar National Drinking Water Quality Standard Guideline.

Sr. No.	Parameters	Myanmar National Drinking Water Standard Guideline values	Effluent Guidelines (NEQEG)
1.	Total coliform	3 per ml	400 per 100 ml
2.	Fecal coliform	0 per ml	
3.	Colour	Non-set, TCU 15	
4.	Turbidity	NTU 5	
5.	Arsenic	0.05 mg/l	
6.	Nitrate	50 mg/l	
7.	Manganese	0.4 mg/l	
8.	Chloride	250 mg/l	
9.	Hardness	500 mg/l (as CaCO ₃)	
10.	Iron	1 mg/l	
11.	pH	6.5 – 8.5	6-9

12.	Sulphate	250 mg/l	
13.	Total dissolved solid	1000 mg/l	

2.4.5.3 Noise level

The National Environmental Quality Emission General Guideline for noise to be complied with (from Notification No.615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

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

^a Equivalent continuous sound level in decibels

Note: Noise level at work place must not exceed 85-90dBA. (Provide PPE, ear muff, ear protection for workers exposed to high noise level for long period. The ideal level not interfere with health is 45dBA.)

2.4.5.4 Odour

Guideline standard for odorant unit is between 5 and 10.

The overall guidelines and standards for mining can be downloaded from the internet. Here are some exangles:

- i) IFC Good Practice Guideline for mining construction materials.
<http://www.icmm.com>>document, 2007
- ii) IFC Environmental, Health and Safety Guidelines for mining, including limestone.
IFC>wam.2007
- iii) IFC. Environmental, Health and Safety General Guidelines. 2007.

The standards are for developed countries but project proponents will try to follow the standards as far as possible.

3. DESCRIPTION OF THE PROJECT

3.1 Description of the Project and its Objectives

The geological formation of Taung Philar Mountain and associated hill possess abundant limestone for the extraction of this rock. Max Myanmar Manufacturing Company has started production of Portland cement in February 2010. The former production capacity was 500 ton/day but that was in the process of upgrade to 2100 ton/day. Formerly the wet process" technology was applied but later the dry process" technology was adopted after major change and renovation carried out.

The permit for mining limestone from these 150 acres Taung Philar Mountain Block was lend from Nay Pyi Taw City Development Committee (NCDC) since January 6, 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. The annual production rate of the project is 24,000 Metric Ton. The operation period is 25 years (+5 years 2 times extension). The decommission phase is 1 year.

Project objectives

The main objectives of the project are:

- to produce raw lime stone required for the production of quality cement
- to produce quality cement to meet the demand of the nation
- to improve GDP of the nation
- to contribute to the development of the industrial sector
- to contribute to the development of the construction sector and
- to contribute to the development of the further development of the infrastructure of the nation

3.2 Project Location

The limestone store mining site is on the western side of Taung Philar Mountain that was owned by Nay Pyi Taw City Development Committee (NCDC) cement factory. The project is located within Lewei Township, Nay Pyi Taw. The project location is east-south 22 miles of the Lewei and east 3 miles far from YayNi-SatPhuu Taung Pa Dut Chaung Road, near the Aung Nan Cho Village. It is inside the Mei-hor Reserved Forest.

The area of the mining site is 150 acres. The project site is located at G.P.S coordinates of N. Lat. 19°31'34.96"; E. Long 96°24'18.00". The elevation is 500 m asl. It is situated at a distance of half mile south west of Aung Nann Cho village, Lewei Township, close to the foot of Taung Phi Lar Mountain.

The site is 10 miles east of Yangon-Mandalay Highway; 25.5 miles South east of Nay Pyi Taw Council Area and 178 miles north of Yangon.

The villages in the near and far vicinities are Aung Silar, Thabyegyaung, Tae Kyi Kone, Aung Thar Yar and Aung Chan Thar.

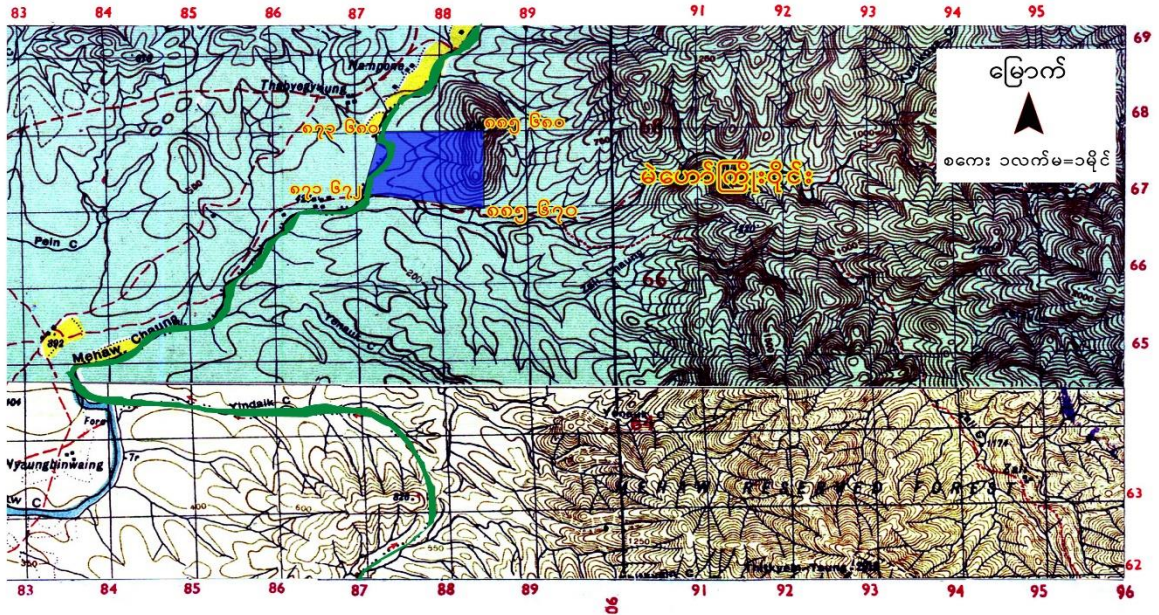
About half mile east of the factory is Aung Nann Cho village while Aung Chan Thar village is 1.5 miles in the southwest and Aung Si La village is also 1.5 miles in the northwest. The other two villages in the vicinity are Aung Tharyar in the northwest and Tae Kyi Kone in the north. About 0.75 mile northwest of the factory is NCDC factory while 0.75 mile in the northeast is the quarry site of NCDC. Further north and hidden from view is the quarry site of Asia World Company (for the production of chips or pebbles for road construction). East of the factory are small paddy fields while there are sugar cane fields and sesame farms and other farms (ground nut, bean etc) around Aung Chan Thar village in the southwest. Aung Nan Cho Village is situated about ½ mile northeast of Max Myanmar Manufacturing Cement Factory and about 1½ miles northwest of taung-philar proposed limestone mining site.

The company has constructed the access road (from the factory to the mining/extraction site) about two miles long. It is a gravel road. The extracted-out limestone rock is transported by dump truck to the limestone stockpile site/dumping site and crusher site about half mile in the west. From there the limestone rock is crushed and conveyed to the factory by a long line conveyor.

The Shwe Bone Pwint Pagoda, built by Max Myanmar Manufacturing Company is about 1.2 miles in the south.

In the north east, east and south east are the forested mountains and valleys and are within the Mei-hor Reserved Forest. There are many small quarries in the area, of which some are probably illegal, it is learnt.

နေပြည်တော်၊ ဒက္ခိဏခရိုင်၊ မဲဟော်ကြီးရိုင်း၊ အကွက်အမှတ် (၁၂) အတွင်း
 နေပြည်တော်စည်ပင်သာယာရေးကော်မတီအား
 ထုံးကျောက်အကြီးစားတူးဖော်ထုတ်လုပ်ရန်ခွင့်ပြုထားသည့် မြေဧရိယာ(၁၅၀)ဧက၏
 လုပ်ကွက်တည်နေရာပြမြေပုံ



ရည်ညွှန်းချက်



-  လုပ်ကွက်တည်နေရာ
-  ကြီးရိုင်းကြီးပြင်ကာကွယ်တောနမိတ်

Figure-9: Map showing the Taung Philar mountain quarry block



LEGEND

(A). 19°31'43.00"N, 96°23'48.00"E

(B). 19°31'44.00"N, 96°24'26.00"E

(C). 19°31'14.00"N, 96°24'26.00"E

(D). 19°31'19.00"N, 96°23'42.00"E

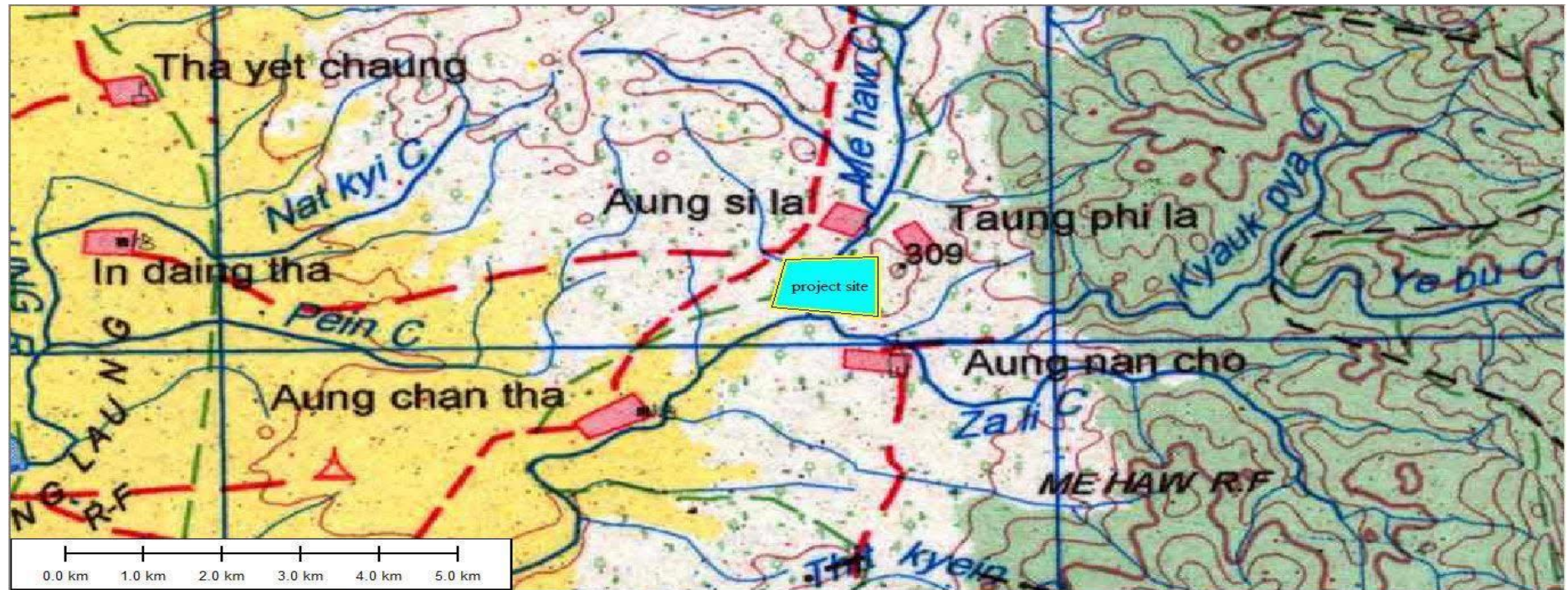
Figure-10: Satellite Image showing project site and its environs

Point A N. Lat. 19°31'43.00"; E. Long 96°23'48.00"

Point B N. Lat. 19°31' 44.00"; E. Long 96°24'26.00"

Point C N. Lat. 19°31'14.00"; E. Long 96°24'26.00"

Point D N. Lat. 19°31'19.00"; E. Long 96°23'42.00"



RGB(241,244,091) [Pix: (1550,2669)] (1996_reg.tif <D:\Globe mapper\Myanmar-map\1996_reg.tif>) 1:54860 |GEO (WGS84) - (96.3113395039, 19.5099073629) |19° 30' 35.67" N, 96° 18' 40.82" E



Figure-11: Map of part of Leiway Township showing project site (in green rectangle)

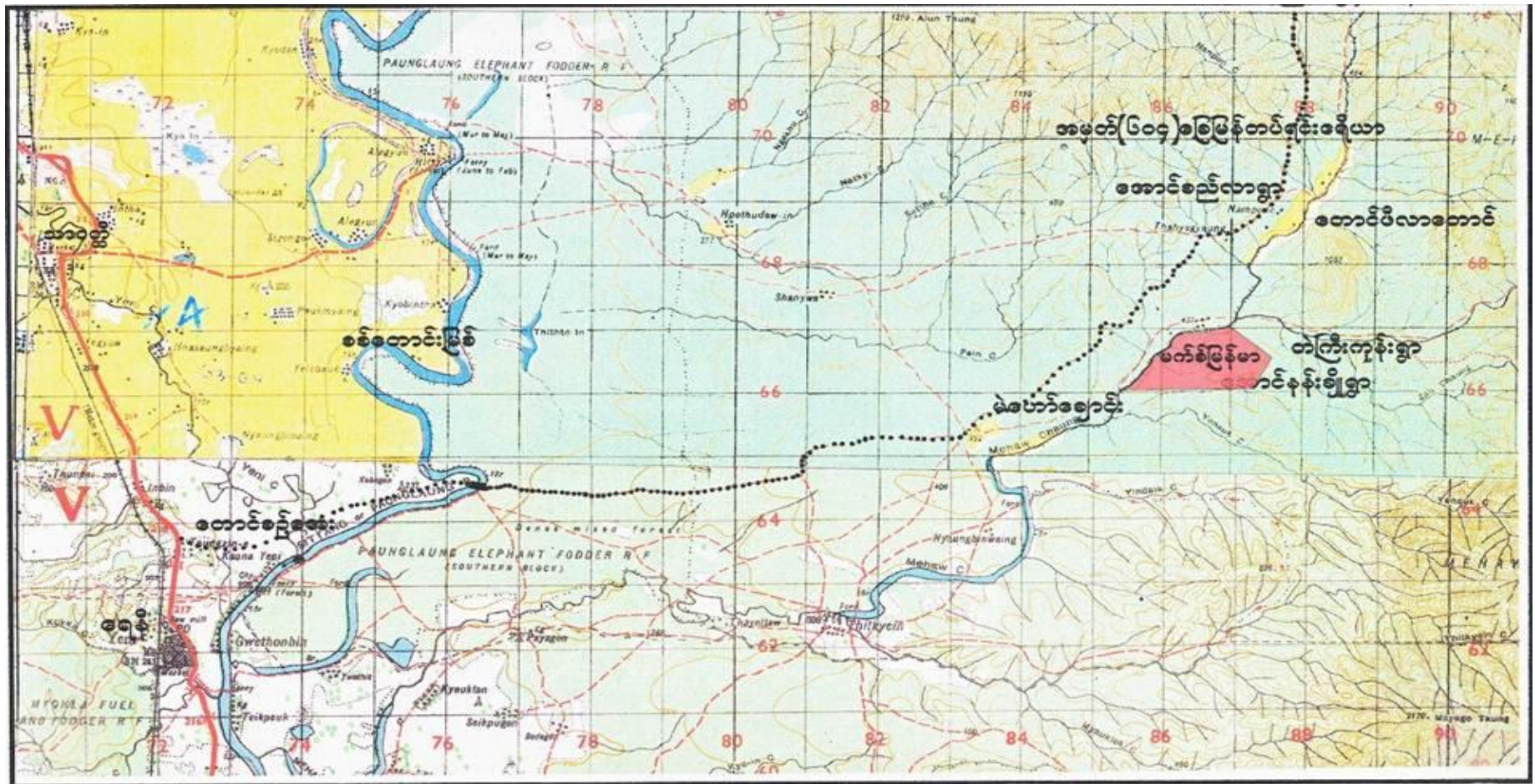


Figure-12: Map of Eastern Part of Lewei Township Showing Project Site

3.3 Basic Components, Facilities, and Activities

Main components at the mining/quarry site

Buildings and structures will be small ones and these will include:

1. Office building (for geologists, mining engineers, demolition experts and general staff)
2. Fuel oil depot
3. Store
4. Workshop
5. Magazine (Explosives dump) the coordinate location and
6. Nursery the coordinate location

Another main component

1. Park for heavy machinery and vehicles
2. Crushing facility
3. Grinding facility
4. Dump site for stockpile of crude limestone
5. Dump site for stockpile of pulverized limestone
6. Dump site for stockpile of overburden
7. Dump site for stockpile of top soil
8. Blast shelter



Figure-13: Part of Taung Philar Mountain (Both Max Myanmar Manufacturing and NCDC has Mines/Quarries on this Small Mountain)



Figure-14: The project site



Figure-15: Truck and Bulldozer



Figure-16: Limestone stockpile



Figure-17: Crusher



Figure-18: Magazine (Explosives Dump)



Figure-19: Nursery

3.4 Site Layout Map

The project site has no building except the temporary canteen. Tae Gyi Kone village is located the north of the project site, NCDC cement factory is western and Aung Nan Cho Village and Max Myanmar Manufacturing Cement factory is located in the southern of the project site.



LEGEND

(A). 19°31'43.00"N, 96°23'48.00"E

(B). 19°31'44.00"N, 96°24'26.00"E

(C). 19°31'14.00"N, 96°24'26.00"E

(D). 19°31'19.00"N, 96°23'42.00"E

Figure-20: The layout map of the project site location

3.5 Construction

The project is already constructed since this project is hand over from Nay Pyi Taw City Development Committee (NCDC). There is no activities related with the construction is not carried out.

3.6 Mine Development

The project is already constructed since this project is hand over from Nay Pyi Taw City Development Committee (NCDC). There is no activities related with the mining development is not carried out.

3.7 Mining Method

The mining method for limestone mine is open cut mine design. The limestone extraction process includes 3 step. First step is drilling process, second step is filling explosive and the last one is blasting. For first drilling process, firstly clear the vegetation at the drilling spot and plot the drill hole pattern and then clear the spots for drilling holes. The next step is plugging the drilling holes and collecting the drill hole samples.

The main importance of second one: filling explosive is safety. Therefore, firstly inspect the drill holes for clearance and filling explosives, and then remove the heavy machinery and vehicles away from the blasting spots. After that hoist the red flag to declare dangerous zone. The final blasting step: is carried out mostly 4:30-5:00 PM. For blasting reinspect that remove the heavy machinery and vehicles away from the blasting spots, block all access road to the area: deploy guard and siren warning before 3 minutes or 5 minutes to declare to the communities that the blasting process will be carried out soon. And then warning by loud speaker 5 minutes before blasting. After blasting gesture showing that the blasting process is safely completed. Blasting for extraction is carried out 2 day per week. After that the digging and extraction of limestone is carried out deploying excavator and bulldozer.

The mined out/extracted limestone is hauled by dump truck to the stockpile site and the adjacent crusher site. From there the crushed limestone rock is conveyed by conveyor to the factory.

The mined out/extracted out limestone rock is crushed at the crushing site deploying Jaw Crusher (primary crusher) and Hammer Crusher (secondary crusher); the limestone rock is crushed/ground to the size of 0-25 mm.

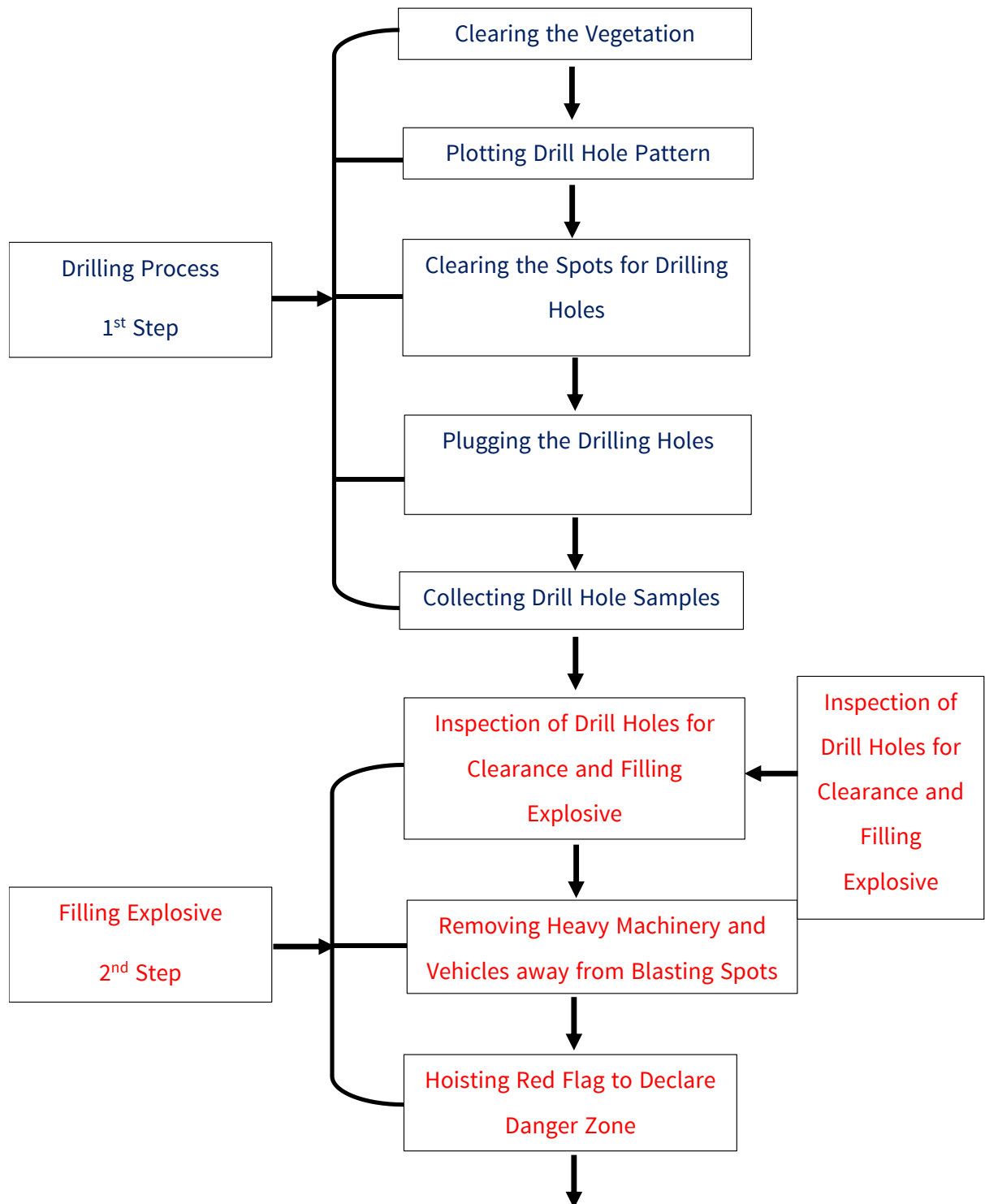
The crushed limestone rock is stored in the limestone shed/store. It is ready for use as raw materials for manufacturing Portland cement.

The process is actually more like quarrying of limestone on the slope of a small mountain (hill). The company does not have complex mining design (for ramp, open pit/open cut mining design) involving: benches, slope, typical cross-section of area and depth by year etc to prevent the landslide.

The location of the dump site is N. Lat. 19°31'43"; E. Long 96°24'19.00". The elevation is 254.08 m. The slope of dump site is 30° and the bench is 20m.

Bulldozers, excavators, wheel loaders and dump trucks are the main heavy machinery deployed. There will be occasionally blasting of the rock where necessary.

Limestone Extraction Process Flow Diagram



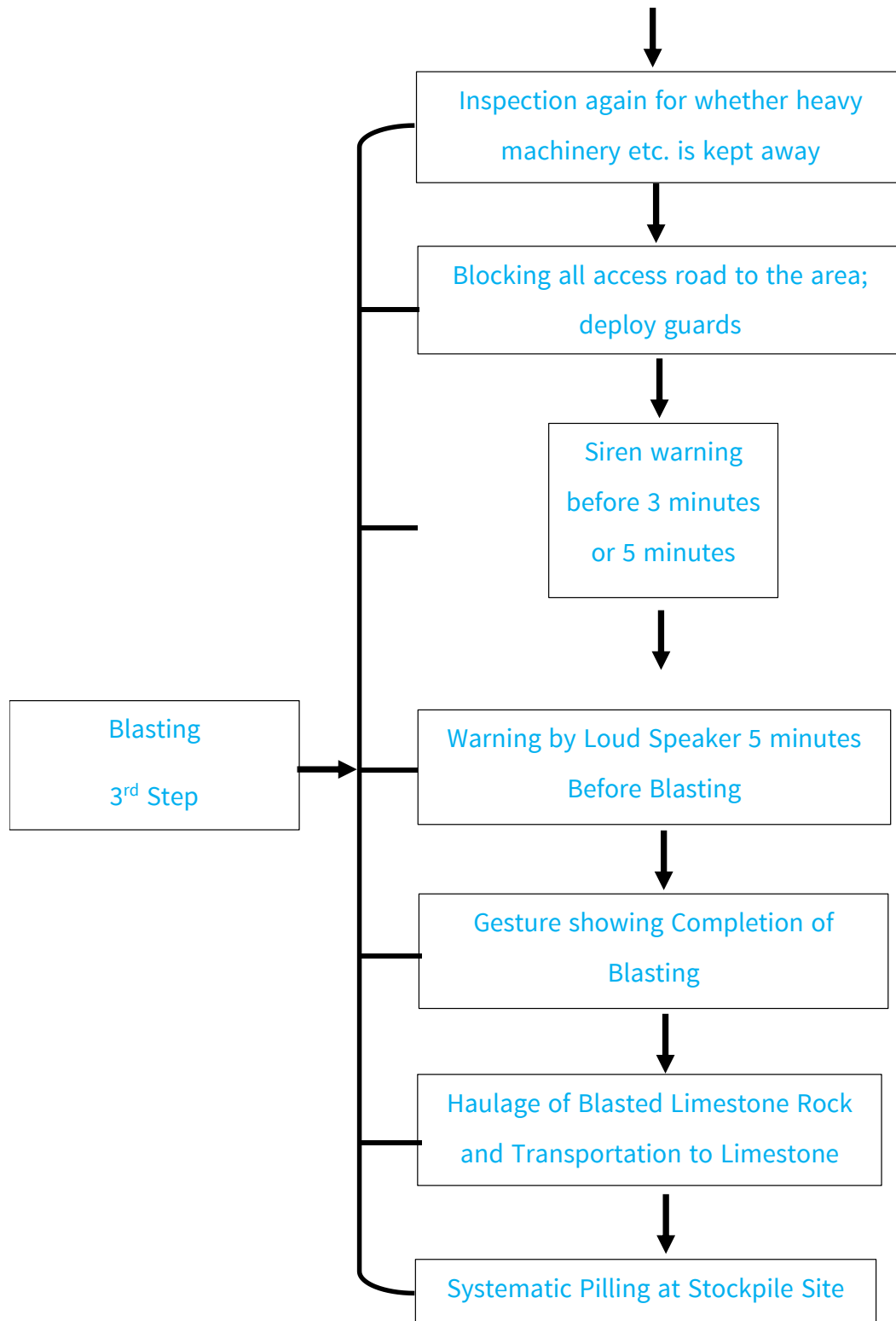


Figure-21: Limestone Extraction Process Flow Diagram



Figure-22: Limestone Extraction Mine Design

Max Myanmar Manufacturing Co., Ltd have 29 employees and two Mining Engineers and two Geologist will be hired.

The explosive will be stored in two building of 60000 lb capacity Magazine (Explosives Dump). The amount of Explosive during year are as followings:

Types	Amount	Unit
Emulsion Explosive	3600	Kg
Detonating Plastic Cord	2808	Meter
Safety Fuse	48	Meter
Plain Detonator	48	detonators

The Detailed plan of Drilling and Blasting Activities are as followings:

Types	Amount	Unit
Volumes of Blasing during One Month	576	m ³
Volumes of Lime Stone during One Year	13824	m ³
Number of Blasting time during one month	2	times
Number of Blasting time during one year	24	times
Volumes of Lime Stone per one time	288	m ³
Number of Drill Holes During one time Blasting	12	holes
Distance Between the Vertical Holes	2	m

Depth of the Vertical Hole	6	m
Amount of Used Emulsion during one time blasting	150	Kg
Amount of Used Detonating Cord during one time blasting	117	Meter
Amount of Used Plain Detonator during one time blasting	2	Detonators
Amount of Used Safety Fuse during one time blasting	2	fuses

3.8 Haulage and Transportation Facilities

The project uses 9 cars, 3 trucks, 1 water bowsers and 2 forklifts. The transportation facilities that are used in the project site are followings:

Table-1: List of heavy machinery, equipment and vehicles

Vehicles Name	Types of Vehicles	Number of Vehicles
Excavator	ZX-350	2
Super Dumper	Komatsu HD- 325	2
Dump truck	Dump Truck	2
Dozer	D-85 Komatsu	1
Rock Drilling Machine	Hydraulic Crawler Drill (Cat C-7)	1
Ferry	Mitsubishi Canter Truck	1
Firefighting Truck	Fuso	1
Water Bowser	ISUZU EIF	1
Total		11 Nos

3.9 Mine Power Supply and Support Facilities

Max Myanmar Manufacturing Company Limited (Cement Production) is located near the limestone mine. The required facilities are supported by the cement factory. The electricity will

be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away).

3.10 Offsite Ancillary Facilities

The cement factory is located near the mine site. Therefore, the office buildings, tents, buildings, canteen and other facilities that supported for the employee by the company is located within the cement factory compounds. Only the building for temporary lounge. The crusher site is located at the boundary area of the mine site. At the crusher site, the crushing mill (jaw crusher: primary crusher, hammar crusher: secondary crusher, screening, conveyor are located. The mined out/extracted out limestone rock is crushed at the crushing site deploying Jaw Crusher (primary crusher) and Hammer Crusher (secondary crusher); the limestone rock is crushed/ground to the size of 0-25 mm.

The crushed limestone rock is stored in the limestone shed/store. It is ready for use as raw materials for manufacturing Portland cement.

3.11 Water Management

Water management include the water supply, management of water usage.

The mainly objective of water management is not to cause the serious and significant water due to the discharge of waste water and not to cause the excessive usage of water.

Water Supply

Actually, limestone mining needs little or no water at all. The daily requirement will be less than 2000 gallons; water requirement is minimal, only for dust suppression and occasional drilling. The water from the common tank (main storage tank) at the factory (capacity 250,000 gallons) will be used. The water for the whole project (cement factory project) is sourced from Yay Pu Chaung Stream.

Water Usage

The mining process does not need water. Water is used for employee and other related activities such washing the car, spraying the water on access road. The daily requirement will be less than 2000 gallons; water requirement is minimal, only for dust suppression and occasional drilling. The annual requirement (for 200 working days is estimated at 400,000 gallons). There will be no separate tank for storage of water. Although this amount cannot be regarded as the excess water usage, EMP cell member will be checked and controlled the water usage not to waste the water usage.

3.12 Mine Closure

It is estimated that this phase will last for 2 years.

During this phase the limestone mine/quarry will be decommissioned and closed. Works involve the removal of machinery, equipment, vehicles, the dismantling and tearing down of building and structures; the reuse or put up for sale for some materials; the disposal of unwanted materials and removal of contaminated soil; and the clearing of the site. Other main works will include backfilling of pits and dents resulted from mining/quarrying activities and leveling of the ground.

After that the rehabilitation task will have to be implemented, mainly in the form of re-vegetation.

EMP for mine closure/rehabilitation will be formulated in advance. The mitigation measures to be taken and EMP to be implemented during this Mine closure/Rehabilitation Phase were already mentioned earlier.

The mine closure and subsequent rehabilitation was once considered unimportant and unnecessary. But in this era of environmental awareness effective mine closure and environmentally sound rehabilitation has become mandatory. A mine closure plan that incorporates both physical rehabilitation and socio-economic consideration must be now an integral part of the project life cycle. These should be considered:

- future public health and safety are not compromised after mine closure
- the after-use of the old site is beneficial and sustainable to the local community in the long term, and
- adverse socio-economic impacts after mine closure are minimized while socio-economic benefits are maximized.

3.13 Employment, Local Hiring, and Local Purchasing

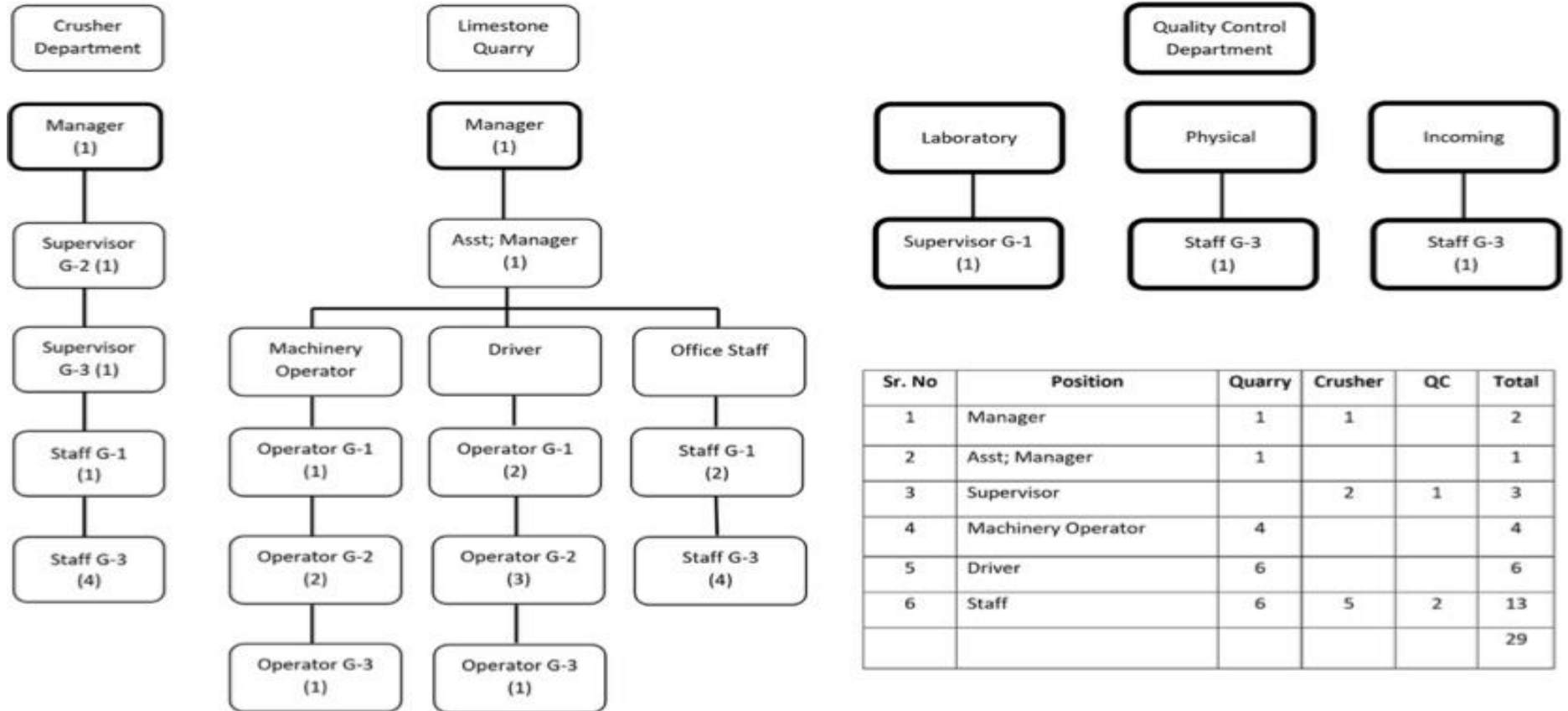
The organization chart of the Max Myanmar Manufacturing Co., Ltd is as followings

Working hours	: 8 hours/day; the project is mainly operated during daytime
The salary range	: 200,000 MMK to 650,000 MMK



Max Myanmar Manufacturing Co., Ltd.

Organization Chart of Limestone Operation for NCDC Quarry



Sr. No	Position	Quarry	Crusher	QC	Total
1	Manager	1	1		2
2	Asst; Manager	1			1
3	Supervisor		2	1	3
4	Machinery Operator	4			4
5	Driver	6			6
6	Staff	6	5	2	13
					29

Figure-23: The Organizational Chart of Max Myanmar Manufacturing Company Limited

3.14 Amount of Type of Emission to Air, Effluent Discharge to Water, a Disposal, and Amount and Type of Hazardous Waste

Emission, effluent, waste and disturbances

(a) Amount and type of emissions to air environment

It is not easy to estimate the amount of emission in advance.

Emissions to air due to quarry/mining activities are in the form of smoke the gas and dust.

Smoke (point source emission)

Point source emissions will be from two crushers. Diesel is the main fuel energy for the crushers. Diesel exhaust pollution includes common pollutants such as Carbon monoxide (CO), unburned hydrocarbon (HC), Particulate Matter PM including PM₁₀, PM_{2.5} and very small Diesel Particulate Matter (DPM), nitrogen oxide NO_x, Sulphur dioxide (SO₂).

Smoke (fugitive emission)

Fugitive emission will be from all other machinery and equipments such as dozers, excavators, wheel loaders, heavy trucks and other vehicles, generators, motors and pump etc. All heavy machinery and heavy trucks use diesel fuel and the type of pollutants from the exhausts of these machinery and equipment are the same above.

It is not easy and practical to estimate the amount of emission in the air. Theoretically when one gallon of diesel is burnt 22.38 pounds of CO₂, 0.3 ounces of SO₂ and 0.8 ounces of NO_x are produced. Generally, when one kilogram of fuel wood is burnt 1.6 kilograms of CO₂ and 0.23 gram of SO₂ and 0.77 gram of NO_x are produced (from references).

Dust (particulate matter)

Another main emission in quarry activities is in the form of dust, fugitive dust.

Virtually all quarry/mining activities generate dust, for instance, from drilling, blasting, bull dozing, extraction excavation, stockpiling, transportation, crushing and end product stockpiling etc.

Huge quantities of dust will be generated during blasting, excavation, hauling land transporting (due to vehicular movements) and crushing.

Normal vehicular movements inside the compound other than quarry/mining works, also generate dust. Strong wind also generated dust and, of course, any activities inside the site compound may generate dust.

It is very difficult and not practical to estimate the amount of dust generated per day or per month due to quarry/mining activities.

Generally, dust in a limestone mining area contains PM_{2.5} and PM₁₀ of feldspar, quartz, mica and hornblende and also silica and CaCO₃.

Ambient air quality standards to be complied with are already depicted earlier in **Chapter-4**. The parameters include SO₂, NO_x, PM₁₀, PM_{2.5} and ozone.

Emission of noise and vibration (disturbances) to the air environment

Virtually all quarry/mining activities generate noises and vibrations. The highest levels of noise and vibration are generated due to blasting. High level of noise and vibration can be heard and felt at a distance of up to 3-4 miles in a rural area setting.

High noise level as well as certain vibration will be generated at the crusher site. Activities of dozers, excavators and heavy trucks also generate relatively high noise level and vibration.

In fact noise is emitted during virtually all phases of quarry/mining activities----drilling, blasting, extraction, excavation, shoveling, hauling, crushing, grinding, screening and stockpiling and also loading and unloading of the materials.

It is not practical to predict the magnitude of high noise level and level of vibration. But these can be exactly measured as shown later in **Chapter-4**.

Ambient noise standards as well as air blasting level and already depicted earlier in **Chapter-4**.

Noise level should not exceed 70dBA and level for air blasting should not exceed 120dBA linear at any time, while level for ground vibration should not exceed 10mm/s at any time.

(b) Amount and type of effluent

Limestone mining actually need no water (exceptional cases: very small quantity of water is sometimes used in drilling and in certain cases crushing) and so generally there will be no effluent discharge of industrial waste water.

(c) Amount and type of solid waste disposal

Limestone quarry/mining needs no processing and beneficiation works that involves complex works and application of chemicals and/or acid.

The main industrial waste if it can be termed so in limestone quarry/mining is the overburden or unwanted quarried out materials.

Top soil can be also termed an industrial waste in limestone quarry/mining. In this area context where top soil layer is thin the amount of top soil generated will be small. In the same way the overburden or unwanted quarried out material is relatively small in quantity given the fact that there are only sheer limestone rock mass or monolith of limestone rock or large boulders of limestone rock only. In certain spots there are no top soil or overburden at all, only sheer limestone; but in certain spots there are certain top soil and overburden.

It is not practical to estimate the quantity of overburden and/or top soil to be generated each day or each month. The stripping ratio can be calculated. In most cases there will be no stripping ratio as limestone is extracted from sheer limestone rock mass.

3.15 Project Development and Implementation Schedule

Max Myanmar Manufacturing Co., Ltd is lend from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The construction and mine development activities are already carried out before hand over from Nay Pyi Taw City Development Committee (NCDC) to Max Myanmar Manufacturing Co., Ltd. The permit for mine operation period is is 25 years (+5 years 2 times extension). The decommission/ closure phase is 1 year and the rehabilitation phase is 1 year.

Mine Development Phase	Mine Operation Phase	Mine closure/ Rehabilitation Phase
1 year	25 years (5 years 2 times renewable)	2 years
Before Jan 2023		

3.16 Water Use

Actually, limestone mining needs little or no water at all. The daily requirement will be less than 2000 gallons; water requirement is minimal, only for dust suppression and occasional drilling. The annual requirement (for 200 working days is estimated at 400,000 gallons). There will be no separate tank for storage of water. The water from the common tank (main storage tank) at the factory (capacity 250,000 gallons) will be used. The water for the whole project (cement factory project) is sourced from Yay Pu Chaung Stream.

3.17 Energy Use

Max Myanmar Manufacturing Company Limited (Cement Production) is located Near the limestone mine. The required facilities are supported by the cement factory. The electricity will be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away).

Yearly fuel requirement:	Diesel / Petroleum	15,000 gal/ yr
	Lubricant oil/ Grease/ Hydraulic oil	400 gal / yr
Electricity	: Will be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away). There will be back up generators in case of power outage.	

4. DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL ENVIRONMENT

As mentioned earlier proposed limestone store mining site is on the western side of Taung Philar Mountain that was owned by Nay Pyi Taw City Development Committee (NCDC) cement factory. The project is located within Lewei Township, Nay Pyi Taw. The project location is east-south 22 miles of the Lewei and east 3 mile far from YayNi-SatPhuu Taung Pa Dut Chaung Road, near the Aung Nan Cho Village. It is inside the Mei-hor Reserved Forest.

The area of the mining site is 150 acres. The project site is located at G.P.S coordinates of N. Lat. 19°31'34.96"; E. Long 96°24'18.00". The elevation is 500 m asl. It is situated at a distance of half mile south west of Aung Nann Cho village, Lewei Township, close to the foot of Taung Phi Lar Mountain.

The site is 10 miles east of Yangon-Mandalay Highway; 25.5 miles South east of Nay Pyi Taw Council Area and 178 miles north of Yangon.

The villages in the near and far vicinities are Aung Silar, Tae Kyi Kone.

About half mile east of the factory is Aung Nann Cho village while Aung Chan Thar village is 1.5 miles in the southwest and Aung Si La village is also 1.5 miles in the northwest. The other two villages in the vicinity are Aung Tharyar in the northwest and Tae Kyi Kone in the north. About 0.75 mile northwest of the factory is NCDC factory while 0.75 mile in the northeast is the quarry site of NCDC. Further north and hidden from view is the quarry site of Asia World Company (for the production of chips or pebbles for road construction). East of the factory are small paddy fields while there are sugar cane fields and sesame farms and other farms (ground nut, bean etc) around Aung Chan Thar village in the southwest. Aung Nan Cho Village is situated about ½ mile northeast of Max Myanmar Manufacturing Cement Factory and about 1½ miles northwest of Pha-yar-kone proposed limestone mining site.

The Shwe Bone Pwint Pagoda, built by Max Myanmar Manufacturing Company is about 1.2 miles in the south.

In the north east, east and south east are the forested mountains and valleys and are within the Mei-hor Reserved Forest. There are many small quarries in the area, of which some are probably illegal, it is learnt.

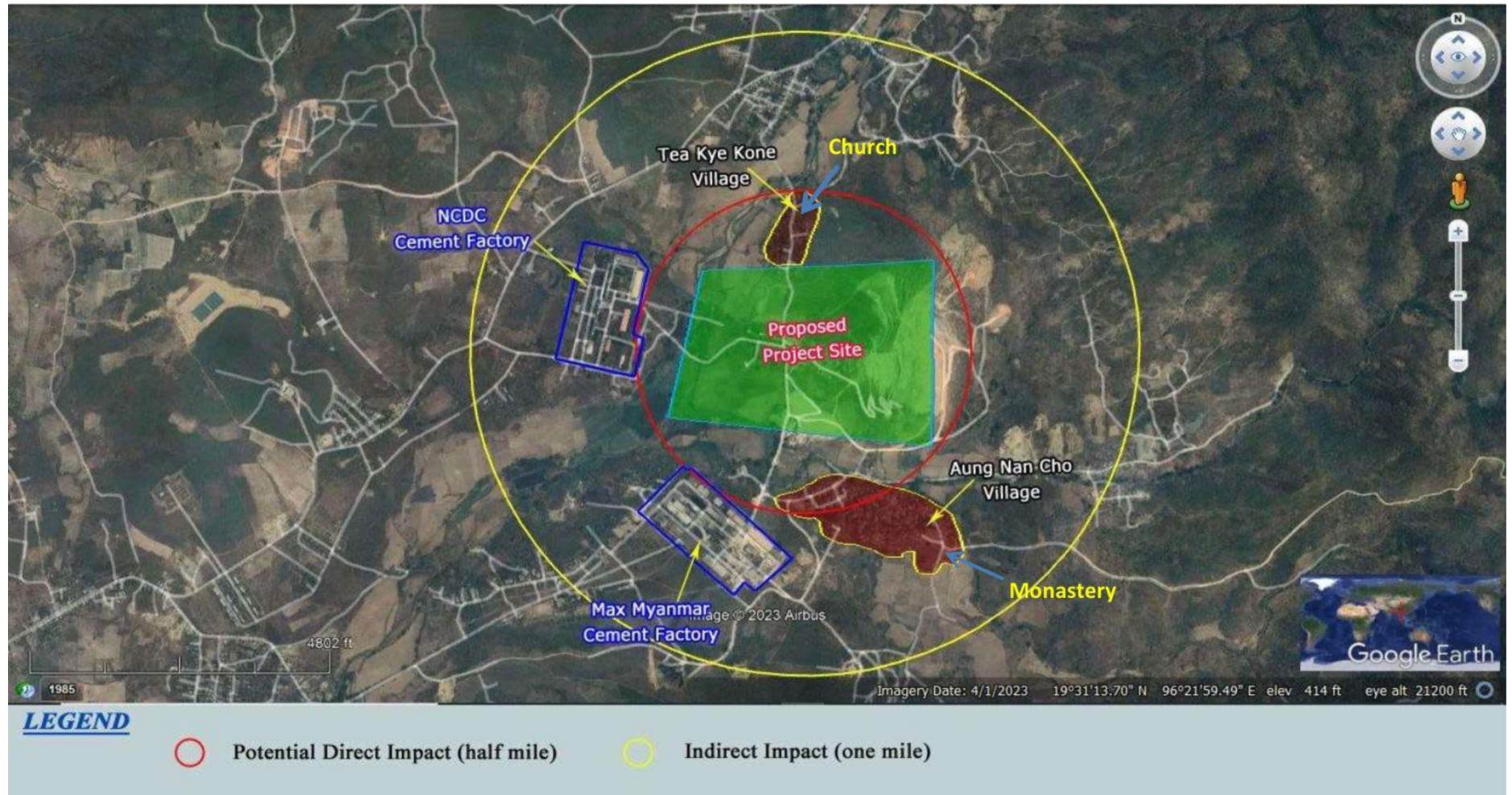


Figure-24: Satellite image showing project site and study limit

The distance is from project site to monastery of Aung Nan Cho is about 0.62 mile and to church of Tae Kyi Kone is about 0.48 mile.

4.1 Setting the Study Limit

The designated EMP study area encompasses the proposed limestone mining area of 150 acres and the near vicinity within 1 miles radius.

Aung Nan Cho Village and Tae Kyi Kone Village area are incorporated into the designated study area.

The 1 miles radius is designated because the impacts can be actually seen and felt within the inner half mile radius, while the outer half mile can be considered as buffer zone. The exceptional impacts such as a very high level noise and strong vibration can be heard from more than 1 miles radius, but are instantaneous (happening within a very brief duration).

4.2 Methodology and Approach

EMP work involved the visual inspection of the area, the surveying work and collection of baseline environmental and social data of the current condition to compare the data that remain and change after carried out the project. Collecting the baseline data is to mitigate the changes and unexpected condition is occurred.

The physical data such as air quality, particulate matter (PM), SO₂, NO₂ and noise were all primary data, collected through field survey. The data for water analysis were also primary data. Soil data were secondary data from geologists contracted by the company who had carried out geological survey of the area earlier.

Data on biodiversity; flora, fauna (birds, mammals, reptiles and amphibian) were all primary data collected through this study. There are no large wild mammals in the area. Data on aquatic organisms, plankton and fish, were from secondary data.

The social data included both primary data collected through visual inspection and transect work, and secondary data acquired through Key Informant Interview (KII) or other secondary source (SS).

Methodology

The methodology involves:

- Desktop study: on references from domestic and international sources.
- Site visit and visual inspection and detail study and collection and documentation of baseline data/information as well as secondary data/information.

The testing and measurement of air quality, ambient air, PM, SO₂ and NO₂ involved the use of relatively sophisticated. The portable air test kits has the advantage of measuring the in situ (on the spot) condition but not so reliable.

For measuring PM, SO₂ and NO_x etc EPAS-HAZ Scanner and EPAS Air Sampler (Respirable dust Sampler Environmentech APM-460NC are deployed Noise EXTECH Sound Level Meter, BENETECH Vibration meter.

According to technicians, these equipments have to be sent abroad annually and underwent calibration there.

Portable water test kits were also not so reliable and water samples have to be brought back to Yangon for analysis at a registered private laboratory, the ISO laboratory in Insein, The technicians at this laboratory carried out the analysis work.

Noise level was measured on the spot using a portable Digital Sound Level Meter, EXTECH, 407732 which was quite reliable. Noise level was also measured by technician from Health Department using sophisticated machine. Later BENETECH Vibration Meter was also used.

All geological data were secondary data from the findings of geologists mentioned above. Their methodology involved satellite image analysis, geological outcrop mapping, litho-geo-chemical survey, gravity investigation and mechanical drilling for extraction of samples at various depths, it was learnt.

All meteorological data, monthly rainfall, monthly maximum and minimum temperature, humidity, wind speed etc. were secondary data. They were obtained from the Township Meteorology Office.

The data on the biological components particularly flora were all primary data. All data on flora, birds, reptiles and amphibian were collected through this field surveys. As mentioned earlier data for fish and plankton were from secondary data or from information gathered from the locals.

The flora study involved the overall taxonomic study of the artificial flora (cultivated plants) covering both annual and perennial plants (fruit trees).

As for fauna, different methods of study have to be applied for different major taxonomic groups, namely, Aves, Amphibia, Reptilia and Mammalia (only rodents). This will be mentioned later. The study of Insecta was omitted due to lack of expertise.

Geological earth satellite imagery was also applied for the overview of the area covering the site, the village, the fallow land around and the overall view of that portion of the stream.

As regards socio-economic data most were secondary data. These were gathered by means of conducting Key Informant Interview (KII) and also from certain Secondary Source (SS). Certain primary data were acquired by means of visual inspections, transect walks and focal group discussion (FGD).

As for cultural components there were no important cultural, religious, historical and archeological monuments or sites in the area.

There is one pagoda, Shwe Bone Pwint Pagoda and monastery, all built by Max Myanmar Manufacturing Company Limited.

There is also no visual component such as scenic spot or conspicuous landmark or major historical/cultural site to be impacted by the project.

4.3 Physical Component

The current environmental conditions of the project site will be study to know the topography, climate and meteorology and other physical quality and to prevent and mitigate the happening of the disaster and natural hazards and environmental and social impacts.

4.3.1 Climate and Meteorology

The climate is tropical monsoon climate with a hot and dry season (pre-monsoon), a rainy season with moderate rainfall (monsoon) and a cool season (post-monsoon). The area also has partially Dry Zone Climate of Myanmar.

The hot dry season (summer) generally starts from March to June and is a period of hot spell. The monthly record for temperature from 2010-2020 is shown in the following **Table-2**. The monthly maximum temperature for 2010-2016 was recorded at 44.5°C in May (2010). The monthly minimum temperature for 2010-2016 was recorded at 9.0°C in January (2012).

The rainy season (monsoon season) generally starts from the middle of June to the end of September. The monthly record for rainfall from 2010-2020 is shown in **Table-3**. The monthly heaviest rainfall for 2010-2020 was record at 16.73inches in July (2018). The cool season (winter) generally starts from November to and continue till the end of February.

Table-2: Monthly maximum and minimum temperature (°C) of Pyinmana District during 2010-2020

Month	Total temperature per month																					
	Maximum											Minimum										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	36.0	33.5	33.5	33.5	32.5	34.0	30.2	31.0	29.8	30.9	31.9	10.0	11.5	9.0	10.5	13.0	11.3	13.9	15.5	14.7	17.8	13.8
February	39.0	38.0	38.5	40.0	37.0	36.6	34.0	33.5	33.4	34.8	33.9	12.0	12.5	11.0	13.0	14.5	14.0	16.8	15.8	14.1	15.0	14.4
March	41.5	41.0	40.0	40.2	39.8	40.2	36.8	36.1	36.2	36.4	37.4	16.5	15.0	13.5	15.5	17.0	16.6	21.4	18.9	18.8	18.8	19.4
April	43.5	40.5	41.0	41.5	41.0	41.5	39.5	36.3	36.7	39.7	39.1	21.0	19.5	18.0	20.0	21.0	20.4	25.1	23.8	23.4	24.2	24.5
May	44.5	37.1	40.5	40.0	39.0	40.8	37.4	37.6	34.5	38.4	38.7	20.0	22.5	20.0	21.5	22.0	22.0	25.2	25.5	23.7	25.8	26.0
June	38.5	36.5	36.0	36.0	39.0	37.6	31.9	32.3	30.9	34.2	33.3	23.5	23.0	20.7	22.5	22.5	21.6	23.9	24.4	23.9	24.5	24.5
July	35.5	35.0	35.0	34.0	34.0	34.9	30.7	31.1	30.6	31.0	32.6	23.5	23.0	22.5	22.5	22.6	21.0	23.8	23.8	23.6	23.7	24.2
August	35.5	33.5	33.5	33.5	34.1	35.0	31.1	31.3	30.6	31.2	31.2	21.4	23.0	22.0	22.5	22.3	23.0	23.9	24.0	23.5	24.1	23.8
September	35.0	35.0	34.5	34.7	35.5	35.7	31.9	32.6	32.4	32.0	33.0	22.0	22.5	23.0	23.0	23.0	23.5	24.0	24.4	23.6	23.5	24.2
October	37.5	35.5	36.5	35.5	35.5	35.0	32.5	32.4	32.3	34.4	33.5	20.0	21.0	19.0	21.7	20.0	22.0	23.7	23.7	22.9	23.3	24.1
November	35.0	35.2	36.5	34.0	36.5	35.0	31.6	32.6	32.3	33.7	32.7	16.5	15.0	19.0	20.1	14.6	18.3	20.7	20.9	19.3	20.9	20.1
December	35.0	35.0	33.0	33.5	34.5	33.8	31.3	30.3	30.8	30.8	32.5	11.5	14.0	12.0	11.6	14.2	10.5	17.8	16.2	17.6	14.4	15.5

Source: Meteorological Station, Pyinmana

Table-3: Monthly rainfall (inch) of Pyinmana District during 2010-2020

Month	Total rainfall per month (inch)										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	0.04	1.77	-	0.32	-	0.16	0.04	0.24	0.60	0.04	0
February	-	0.12	-	-	-	-	0	0.31	0	0	0
March	0.12	1.14	0.16	-	-	-	1.50	0.24	0.08	0	0.04
April	Trace	2.95	1.22	0.55	0.94	1.93	0.16	2.13	4.13	0.35	0.20
May	7.40	6.93	1.30	7.48	2.56	3.74	4.45	7.36	8.98	1.61	5.87
June	7.56	9.53	7.99	7.48	10.55	7.83	9.65	9.06	12.00	3.03	4.49
July	10.35	3.94	10.67	5.35	7.37	12.68	7.60	8.11	16.73	12.91	5.75
August	10.63	12.91	9.18	14.41	15.86	5.27	12.01	7.32	9.25	11.54	11.42
September	7.17	14.65	3.46	11.18	4.41	6.11	8.43	7.60	4.49	5.98	3.23
October	9.13	9.37	0.39	9.37	2.37	4.76	6.38	9.13	5.59	0.98	3.07
November	-	0.19	0.12	0.04	0.86	-	3.74	2.01	0.31	1.34	2.24
December	0.59	0.24	2.52	2.28	-	0.28	0	0	1.22	0	0
Total rainfall	52.99	63.74	37.1	58.46	44.92	42.76	53.96	53.51	63.38	37.78	36.31

Source: Meteorological Station, Pyinmana

Table-4: Monthly humidity (%)

Month	Humidity (%)										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	59	68	60	71	74	68	93	90	93	90	89
February	50	58	50	60	63	55	89	91	94	88	88
March	50	59	51	55	54	53	86	89	88	83	85
April	50	64	60	57	64	58	86	90	91	79	85
May	64	81	66	73	70	70	86	91	92	86	87
June	79	68	88	83	82	84	93	93	94	92	92
July	85	84	86	84	86	90	93	94	93	93	93
August	84	90	88	92	90	88	90	93	92	92	93
September	82	86	85	90	86	88	92	93	92	93	92
October	83	86	83	89	82	86	92	93	94	94	93
November	65	73	78	80	80	78	92	92	92	91	92
December	68	72	74	79	71	76	91	93	91	89	90

Source: Meteorological Station, Pyinmana

A comparison of the values of mean monthly humidity (%) for the years 2010-2016 showed that the highest value, 94, was recorded in July, 2017, February, June 2018 and October, 2019 while the lowest value, 50, was record in February, March and April 2010.

Table-5: Prevailing winds speed (mile/hr) in Pyinmana District during 2010-2020

Month	Winds speed										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	1.0	0.8	0.5	0.9	1.1	2.0	3.6	6.3	5.3	5.2	5.4
February	0.9	1.0	0.5	1.1	0.8	1.4	4.1	4.5	4.4	5.3	4.7
March	1.5	1.4	0.4	0.8	0.8	1.2	5.2	5.3	4.5	5.2	5.3
April	2.8	1.2	0.8	1.3	1.5	1.5	9.3	6.5	5.1	5.9	6.2
May	1.9	1.4	1.0	1.8	1.8	2.4	5.2	6.8	5.4	8.4	7.3
June	2.2	1.6	1.0	1.5	2.4	2.5	10.0	7.8	8.1	8.6	8.8
July	1.4	1.2	0.8	1.7	1.4	2.7	8.6	6.6	7.7	9.4	7.9
August	1.4	0.8	0.8	1.0	1.1	1.6	7.7	7.4	7.0	7.8	8.1
September	1.2	0.6	0.5	1.2	1.0	1.7	6.2	7.4	5.9	6.1	7.2
October	1.2	0.4	0.9	0.9	0.8	1.5	4.7	5.4	4.3	4.7	6.3
November	1.6	0.1	0.6	1.4	0.8	1.7	5.7	5.2	5.6	4.2	5.9
December	2.2	0.2	0.6	1.2	1.0	1.7	6.0	5.6	5.4	5.7	4.7

Source: Meteorological Station, Pyinmana

Table-6: Monthly evaporation (mm) of Pyinmana District during 2010-2020

Month	Evaporation (mm)										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	141.87	156.95	61.66	72.45	65.33	68.55	64.32	2.6	3.0	2.9	3.5
February	195.78	162.39	75.51	153.02	88.09	91.19	84.05	3.2	4.0	4.6	4.4
March	282.33	221.84	100.60	157.50	128.26	145.31	130.80	4.0	6.0	6.2	6.2
April	268.66	167.16	113.73	131.31	125.35	147.46	158.25	4.2	*	7.8	7.8
May	245.83	107.54	102.54	133.52	123.16	139.47	139.56	4.5	5.0	7.3	6.7
June	163.35	70.64	62.39	105.63	107.53	82.88	73.51	2.5	4.0	5.2	4.6
July	138.17	123.75	52.42	80.01	80.13	58.12	65.79	2.1	3.0	4.0	4.3
August	110.65	99.39	66.25	65.90	66.58	74.58	54.72	2.6	3.0	4.3	3.4
September	90.76	100.29	97.66	89.05	84.01	71.17	81.23	2.8	4.0	4.2	4.0
October	99.55	93.52	98.48	84.17	88.14	79.36	92.31	2.7	3.0	5.3	4.3
November	107.01	88.87	90.39	76.17	65.98	67.87	75.21	2.0	3.0	4.9	3.5
December	106.85	65.25	45.92	56.16	64.66	60.81	66.12	2.0	3.0	3.3	3.7

Source: Meteorological Station, Pyinmana

" * " Data not received due to Instrument damage.

The generalized prevailing wind system for the country as a whole shows the following system.

- S.W during the rainy (monsoon) season
- N.E during the cool (winter) season
- Erratic prevailing wind direction during the hot (summer) season

The following table shows the prevailing winds speed for 2016-2020. Due to the topography features surrounding the region and due to partial influence from the South China Sea the directions of the prevailing are rather erratic, that is, not consistent year after year. The highest wind speed of 10.0 mph was recorded in June, 2016.

During the dry hot season there was no known prevailing wind or dominant wind. The climatic condition in the South China Sea sometimes influences the meteorological conditions of the area, bringing light to median rain the area.

Table-7: Wind direction in Pyinmana District during 2016-2020

Month	Winds direction				
	2016	2017	2018	2019	2020
January	NNE	N	N	NW	NW
February	NNE	N	N	NW	NW
March	S	N	N	NE	S
April	S	S	S	SE	SE
May	S	S	S	SE	S
June	S	S	S	SE	S
July	S	S	S	SSE	S
August	S	S	S	SSE	S
September	S	S	S	SSE	SE
October	NNW	S	N	N	SE
November	N	N	N	N	N
December	N	N	N	N	N

The meteorological data (temperature, rainfall, relative humidity, evaporation, wind speed and direction etc) do not indicate evidence of climate change, for instance, a trend in increase in

temperature and decrease in rainfall over the last 6-7 years. It takes at least 30 years to watch meteorological condition to determine if there is any evidence of climate change, it is learnt.

As there is no sub-meteorological station nearby the monthly data of wind speed and direction are obtained from Pinyinana Meteorological Department.

4.3.2 Topography

The area on the whole is a flat terrain with partially degraded forest and was within the Meihor Reserved Forest Area. But in the eastern and southern parts are limestone mountains ranges which runs from north to south, and smaller mountains. Taung Philar is a small mountain. The mountains and hills have karst topography, that is, area of limestone formation with valleys and ravines. There are small ravines that transverse the slope with ephemeral spring. Due to relatively thick top soil the mountains and hills are covered with green forest, that is, greener than the forest at the flat terrain.

The mining/quarry site is on the western side of the Taung Philar Mountain range. The elevation at the factory and surrounding flat plain is about 500 feet asl.



Figure-25: Taung Philar Mountain seen from the southern side

4.3.3 Basic Geology, Soil and Hydrology

(From secondary data 2006, from the company's geologists)

The local geology is based on the secondary data obtained from the findings of the geologists who had carried out survey work in the area in 2006.

There are five types of formations.

(a) **Basic geology (local geology)**

i) Young and old alluvial soil (rock)

Found in southern part of the survey area in the Yay-pu Chaung area while the old alluvial type is found in south and west of the survey area.

ii) Mergui-Mawchi series

Consists of schists of yellow to brownish colour and quartzite schist of red brown to gray colour and found in the eastern part of the survey area in a north to south direction with an inclination of 60° to the west.

iii) Alabaster (calcite)

Found between layers of schist and red brown quartzite schist and formed in a south to north direct with an inclination of 60° to the west.

iv) Mogoke series

Limestone, alabaster and calcium silicate dominate and are found in the eastern part of the survey area and formed in a north to south direction. Alabaster (calcite) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, is one of the varieties of limestone good for the production of quality cement. The colour ranges from white to light grey to grey.

v) Limestone igneous rock

Limestone of fine grain to coarse grain is found in the north east and south of Taung Philar Mountain.

While the mountain are generally limestone mountain the soil of the flat terrain especially along the streams and rivulets are sandy loam. Limestones are part of the south western portion of the Shan Plateau while the area on the other side of the Meihor rivulet can be regarded as the eastern periphery of the Dry Zone. Generally the whole area is an immediate region between the south western part of the Shan Plateau and the south eastern part of the Dry Zone which is geologically speaking, a continental sediment zone.

(b) **Soil**

The basic soil is crosol; sandy loam with pockets of dark brown friable clay loam. Most of the top soils in the area are residual soils (intermingled with lime powder and nodules). There are also top soil of organic humus at certain patches here and there particularly in relatively thick forested spots. In the lower layers are sheer limestone, shale and sand stone.

Clay ($\text{Al}_2 \text{SO}_4 2\text{H}_2\text{O}$) is also present in the area; the colour is reddish brown, and of good quality as raw materials for the production of cement.

(c) Hydrology/hydrogeology

Surface water

There are three small streams, namely Yay-pu Chaung, Zali Chaung and Kyauk Phyu Chaung which generally flow from east to west into the Mei-hor rivulet. This rivulet generally flows from north west and drain into the Paung Laung River.

The Yay-pu Chaung is a fast flowing mountain stream flowing from east to west between the factory and limestone mining site. The depth of the water is generally about one foot. The gradient of the stream bed (from upstream to downstream) is relatively high resulting into fast flowing water. According to information from the villagers there was no precedent of flooding during the rainy season. And there is no plain in the vicinity to be flooded during wet season.

Ground water

The testing for ground water is so far not successful. The underground aquifer is much deeper than anticipated. A few artisans wells were sunk but the results so far are not satisfactory.

At the moment nothing is known about the ground water of this area. Such cases are quite common in the Dry Zone Area of Myanmar where aquifers are at depths of more than one thousand feet.

4.3.4 Soil

Soil samples were collected at Aung Nan Cho village and Tae Kyi Kone village and the project site location. The soil samples of project site, Tae Kyi Kone and Aung Nan Cho were collected at 8 July 2023, 9 July 2013 and 10 July 2013 respectively. The coordinate location of the soil sample collecting spots were as followings:

At the Project site N. Lat 19°31'27.60", E. Long. 96°24'17.90"

At Tae Kyi Kone Village N. Lat 19°31'49.40", E. Long. 96°24'4.90"

At Aung Nan Cho Village N. Lat 19°30'58.30", E. Long. 96°24'25.70"

The soil samples were brought back to Yangon and analysed at Ministry of Agriculture and Irrigation (Department of Landuse) laboratory.

Table-8: Soil test results

Sr. No	Sample plot	pH	Texture	Total N	Available Nutrient
					P
1.	Project Site	Moderately Alkaline	Loam	Very Low	Medium
2.	Aung Nan Cho Village	Slightly alkaline	Sandy Loam	Very Low	Very High
3.	Tae Kyi Kone Village	Moderately alkaline	Sandy Loam	Very Low	Low

Table-9: Soil analytical data sheet

Sr. No	Sample plot	Moisture %	pH soil: Water 1: 2.5	Texture				Total N %	Available Nutrient
				Sand	Silt	Clay	Total		P ppm (Olsen)
1.	Project Site	13.69	8.17	51.54	30.36	18.1	100	0.070	9.74
2.	Aung Nan Cho Village	0.78	7.53	76.54	15.36	8.1	100	0.052	25.81
3.	Tae Kyi Kone Village	1.11	7.71	56.6	30.4	13.1	100.1	0.070	6.81

Note: All the soil samples are free of contamination by hydrocarbon, SO₂ and any other hazardous or toxic substances.

**Figure-26: Collection of Soil Sample at the project site**



Figure-27: Collection of Soil Sample at the Aung Nan Cho Village



Figure-28: Collection of Soil Sample at the Tae Kyi Kone Village

4.3.4.1 Erosion and Sedimentation

From the KII interview, the project site location has no erosion and sedimentation.

4.3.5 Natural Hazards

According to the Lewei Township data (2019), the natural hazards that occurred at the Lewei Township are as followings

Table-10: List of natural disasters in Lei-Way Township

No.	Types of Disaster	Frequency	Loss of Building
1.	Tsunami	37	248
2.	Flood	21	331
3.	Fire	-	21

Sources: Lewei Township Data (2019)

But there was no precedent of major earthquake in the project area, it is learnt.

Natural hazards were/are not found and not anticipated.

The area is well-sheltered and far away from the coast in the south. The factory is on a flat terrain but is not a lowland plain and there are no great rivers or riverine system, no low wetland or no low lying plain to be flooded during the rainy season. The area does not have heavy rainfall but rather have a relatively dry zone climate.

Myanmar is known as an earthquake prone country. The infamous Sagaing Fault runs from north to south dividing the country into 2 parts. There is no major fault line in the area.

There were no precedent of natural hazards such as violent storms, floods and earthquake in the area within memories of 5 decades, it was learnt.

There was also no precedent of extreme weather events, draught and major wild fires, it is learnt.

4.3.6 Hydrology

Surface water

There are three small streams, namely Yay-pu Chaung, Zali Chaung and Kyauk Phyu Chaung which generally flow from east to west into the Mei-hor rivulet. This rivulet generally flows from north west and drain into the Paung Laung River.

The Yay-pu Chaung is a fast-flowing mountain stream flowing from east to west between the factory and limestone mining site. The depth of the water is generally about one foot. The gradient of the stream bed (from upstream to downstream) is relatively high resulting into fast

flowing water. According to information from the villagers there was no precedent of flooding during the rainy season. And there is no plain in the vicinity to be flooded during wet season.

There is no risk of flooding and landslide due to the stream. The stream is not wide and the depth is also narrow.



Figure-29: Yay Pu Chaung



Figure-30: Mae Haw Chaung

Ground water

The testing for ground water is so far not successful. The underground aquifer is much deeper than anticipated. A few artisans' wells were sunk but the results so far are not satisfactory.

At the moment nothing is known about the ground water of this area. Such cases are quite common in the Dry Zone Area of Myanmar where aquifers are at depths of more than one thousand feet.

4.3.7 Surface and Groundwater Quality

(a) Water quality

Water sample was collected from four sampling points, upper-stream and lower-stream of Yay Pu Stream, Aung Nan Cho Village and Mae Haw Stream (Tae Kyi Kone Village). The water samples for all locations were collected at 16 July 2023. The coordinates of water sampling sites are as followings:

The coordinates of water sampling sites

Upper point of Yay Pu Stream,	N. Lat 19°31'11.20", E. Long. 96°23'26.50"
Down point of Yay Pu Stream,	N. Lat 19°30'34.20", E. Long. 96°22'46.80"
Aung Nan Cho Village	N. Lat 19°31'8.00", E. Long. 96°24'12.10"
Mae Haw Stream (Tae Kyi Kone Village)	N. Lat 19°31'56.76", E. Long. 96°24'1.76"

The results are shown in the following table and compared with the guideline values of National Drinking Water Quality Standard.

Table-11: Surface water quality of the existing conditions

Sr. No	Parameters	Existing values at upper stream of yay pu stream	Existing values at lower stream of yay pu stream	Existing values at the Aung Nan Cho Village	Existing values at Mae Haw stream	NDWQS	NEQEG (storm water run off)
1.	Total Coliform	14 CFU/100 ml	10 CFU/100 ml	6 CFU/100 ml	8 CFU/100 ml	3 (0-100 per ml)	400 / 100 ml
2.	Fecal Coliform	4 CFU/100 ml	3 CFU/100 ml	2 CFU/100 ml	2 CFU/100 ml	0 (0-100 per ml)	
3.	Color	40 TCU	30 TCU	Nil	5 TCU	Non-set, TCU 15	
4.	Turbidity	68 NTU	54 NTU	3 NTU	12 NTU	5NTU	
5.	Arsenic	Nil	Nil	Nil	Nil	0.01 mg/l	0.1 mg/l
6.	Lead	Not Detected	Not Detected	Not Detected	Not Detected	0.01 mg/l	0.1 mg/l
7.	Nitrate	0.7 mg/l	0.3 mg/l	0.4 mg/l	0.6 mg/l	50 mg/l	
8.	Manganese	Nil	Nil	Nil	Nil	0.4 mg/l	
9.	Chloride	3 mg/l	2 mg/l	9 mg/l	2 mg/l	250 mg/l	
10.	Hardness	86 mg/l	90 mg/l	144 mg/l	86 mg/l	500 mg/l	

11.	Iron	0.88 mg/l	0.70 mg/l	0.21 mg/l	0.48 mg/l	1 mg/l	3.5 mg/l
12.	pH	7.4	7.3	7.4	7.3	6.5 – 8.5	6-9
13.	Sulphate	10 mg/l	8 mg/l	14 mg/l	10 mg/l	250 mg/l	
14.	Total Dissolved Solid (TDS)	140 mg/l	139 mg/l	227 mg/l	119 mg/l	1000 mg/l	



Figure-31: Taking water sample at the lower point of the Yay Pu Stream



Figure-32: Taking water sample at the Aung Nan Cho Village



Figure-33: Taking water sample at the Mae Haw Stream (Tae Kyi Kone)

4.3.8 Noise and Vibration

Noise levels at the project site, Aung Nan Cho and Tae Kyi Kone villages were measured with EXTECH sound level meter and compared with NEQEG/ECD guideline values. The measuring results are under the NEQEG/ECD guideline values. The noise level of project site, Tae Kyi Kone and Aung Nan Cho were measured at 8 July 2023, 9 July 2013 and 10 July 2013 respectively. The coordinates are as followings:

The coordinates of the noise measurement sampling points-

Project site	N. Lat 19°31'24.50", E. Long. 96°24'20.70"E
Tae Kyi Kone Village	N. Lat 19°31'49.40", E. Long. 96°24'4.90"E
Aung Nan Cho Village	N. Lat 19°30'58.30", E. Long. 96°24'25.70"E



Figure-34: Measuring noise level at project site



Figure-35: Measuring noise level at Aung Nan Cho Village



Figure-36: Measuring noise level at Tae Kyi Kone Village

Table-12: Noise levels

Sr. No.	Parameter	At project site		At Aung Nan Cho		At Tae Kyi Kone		NEQEG guideline values	
		Day	Night	Day	Night	Day	Night	Day	Night
1.	Noise level (in dBA)	49.37	44.03	48.51	38.81	49.36	43.07	55	45

The values are on the whole lower than the NEQEG guideline values.

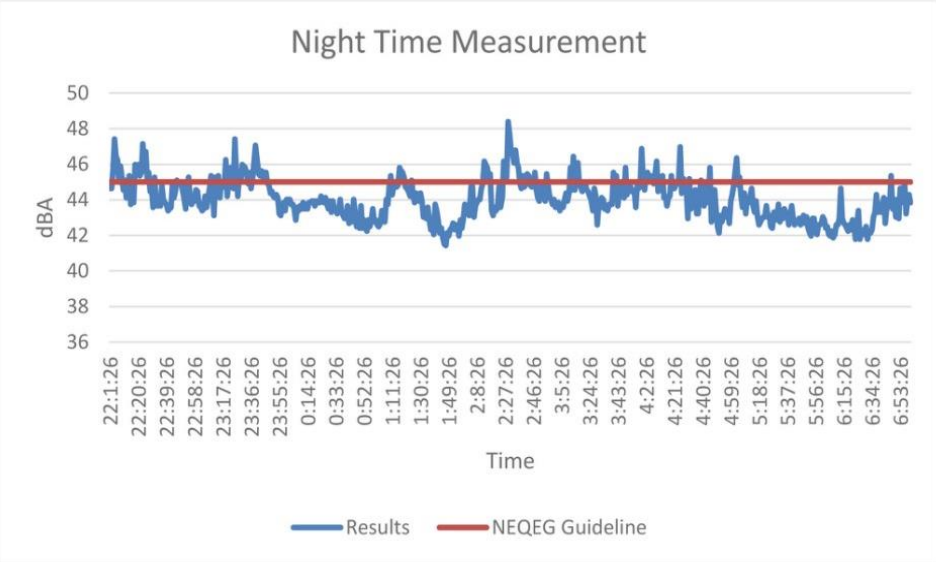
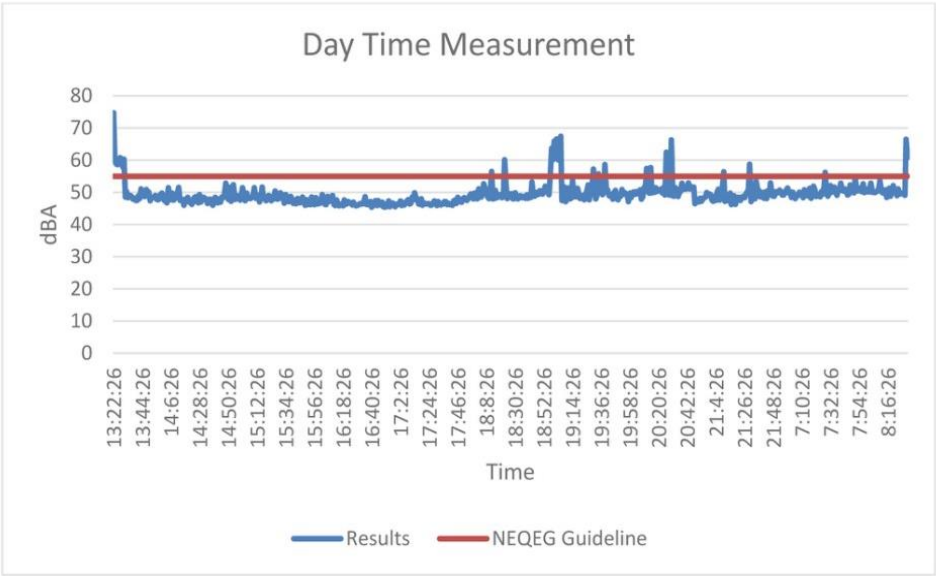


Figure-37: Noise measurement record at the project site

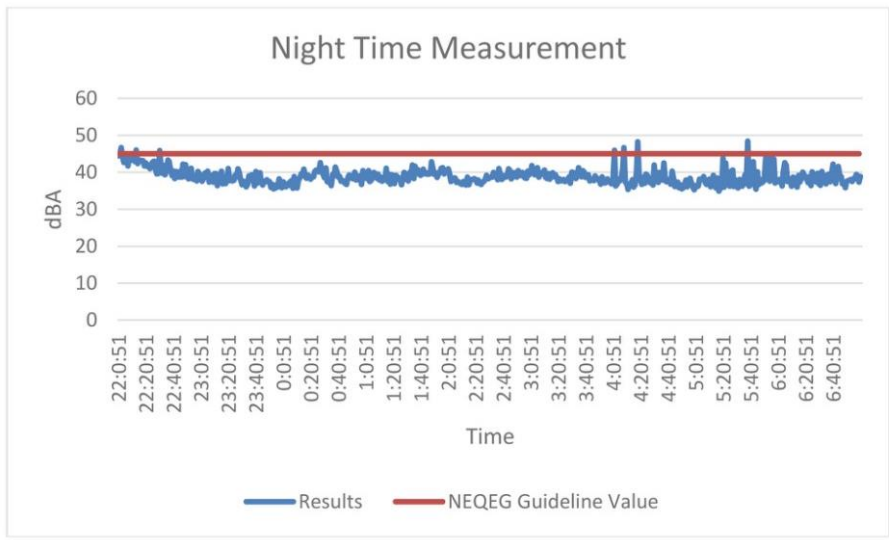
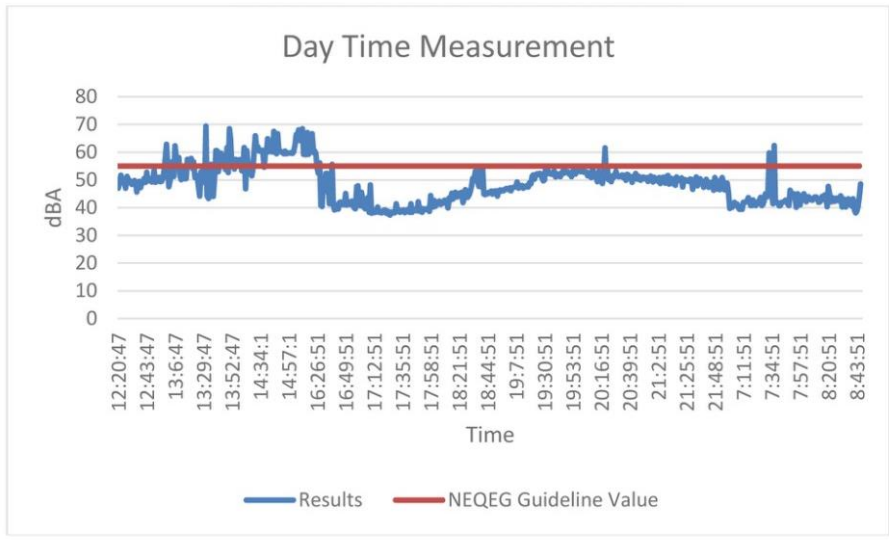


Figure-38: Noise measurement record at Aung Nan Cho Village

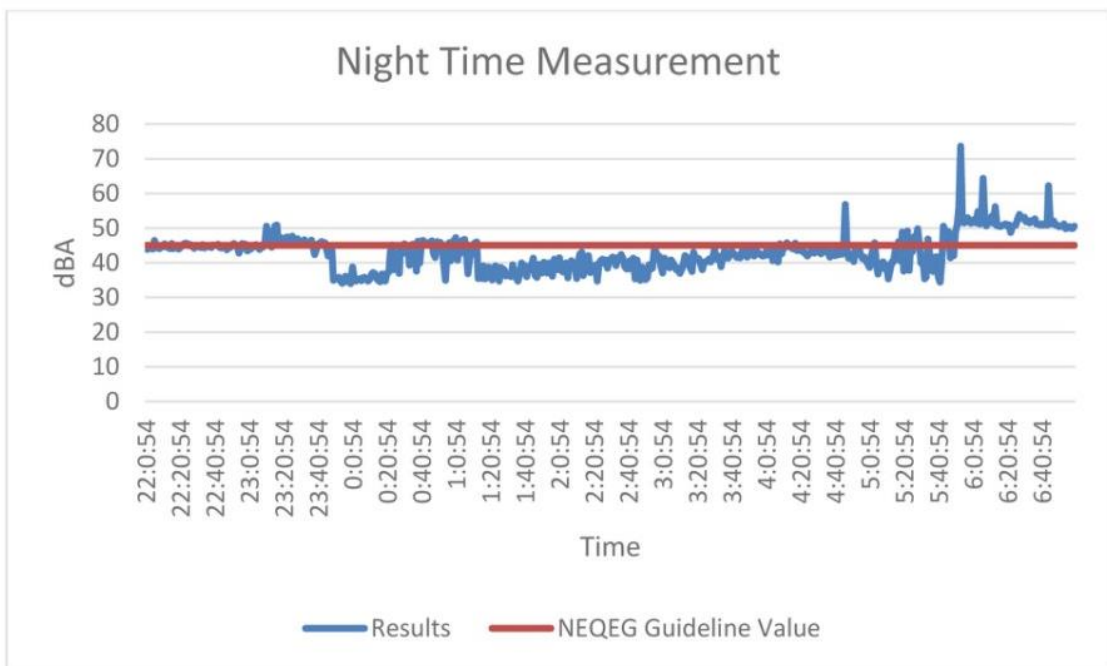
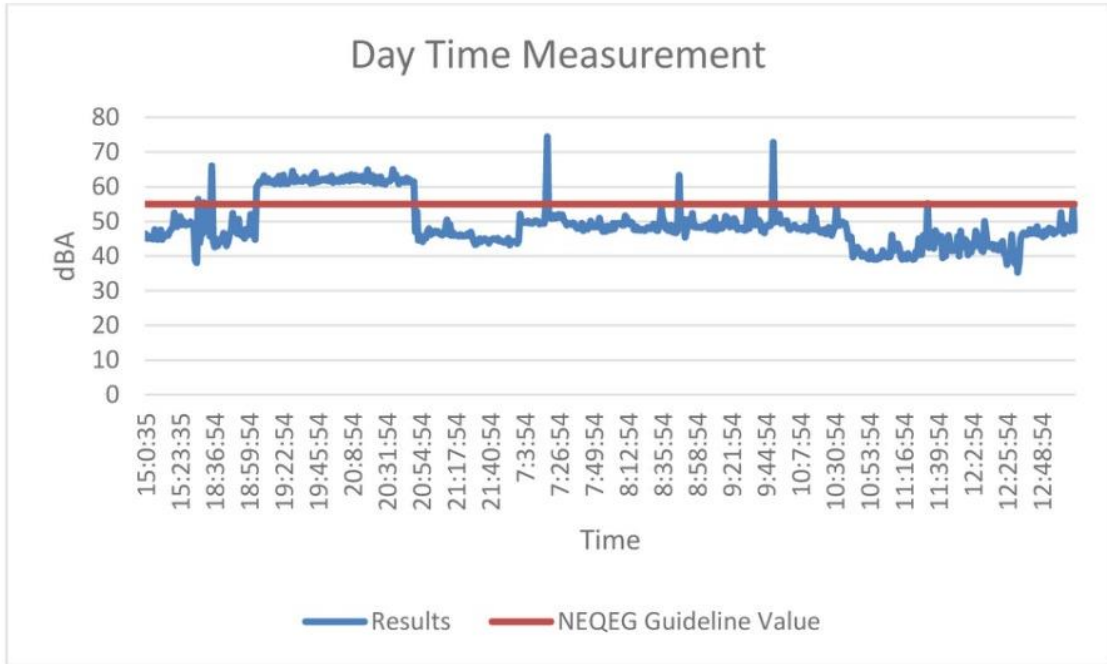


Figure-39: Noise measurement record at Tae Kyi Kone Village

(c) Vibration

BENETECH vibration meter was used for measuring vibration at the mining site, Aung Nan Cho village and Tae Kyi Kone village and the project site. The resultant values are 0 mm/s, 0 mm/s and 0 mm/s. But vibration due to blasting is instantaneous (very temporary). There is no activities that emitted the vibration was not carried out. Therefore, there is no vibration unit at this time. But the vibration while the operation is carried out will be different.

The coordinates are as followings:

The coordinates of the vibration measurement sampling points-

Project site	N. Lat 19°31'24.50", E. Long. 96°24'20.70"E
Tae Kyi Kone Village	N. Lat 19°31'52.50", E. Long. 96°24'3.40"E
Aung Nan Cho Village	N. Lat 19°31'8.2", E. Long. 96°24'10.60"E



Figure-40: Vibration meter



Figure-41: Measuring vibration level at the project site



Figure-42: Measuring vibration level at the Aung Nan Cho Village



Figure-43: Measuring vibration level at the Tae Kyi Kone Village

4.3.9 Air Quality

Ambient air/air emissions were measured three sampling points at the project site, Aung Nan Cho and Tae Kyi Kone villages. The air quality was measured at project site, Tae Kyi Kone and Aung Nan Cho on 8 July 2023, 9 July 2023 and 10 July 2023 respectively.

EPAS air sampler and EPAS-Haz Scanner with auto sensors were used. EXTECH sound level meter was used for measuring sound level. The results are lower the NEQEG/WHO guideline values.



Figure-44: Measuring air quality at the project site



Figure-45: Measuring air quality at Aung Nan Cho village



Figure-46: Measuring air quality at Tae Kyi Kone village

The coordinates of the ambient air measuring points-

Project site N. Lat 19°31'24.50", E. Long. 96°24'20.70"E

Tae Kyi Kone Village N. Lat 19°31'49.40", E. Long. 96°24'4.90"E

Aung Nan Cho Village N. Lat 19°30'58.30", E. Long. 96°24'25.70"E

The values were compared with NEQEG/WHO guideline values.

Table-13: List of air quality

Parameter	Existing Values			NEQEG/WHO Guideline Value $\mu\text{g}/\text{m}^3$
	At project site	At Aung Nan Cho village	Tae Kyi Kone village	
Nitrogen dioxide (NO ₂) 1-hour	16.10 $\mu\text{g}/\text{m}^3$	28.17 $\mu\text{g}/\text{m}^3$	9.36 $\mu\text{g}/\text{m}^3$	200 $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO ₂) 24-hour	0 $\mu\text{g}/\text{m}^3$	0 $\mu\text{g}/\text{m}^3$	0 $\mu\text{g}/\text{m}^3$	20 $\mu\text{g}/\text{m}^3$
Particulate matter PM ₁₀ ^a (24-hour)	40.68 $\mu\text{g}/\text{m}^3$	20.23 $\mu\text{g}/\text{m}^3$	22.02 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
Particulate matter PM _{2.5} ^b (24-hour)	22.07 $\mu\text{g}/\text{m}^3$	10.75 $\mu\text{g}/\text{m}^3$	12.62 $\mu\text{g}/\text{m}^3$	25 $\mu\text{g}/\text{m}^3$
Ozone (O ₃) 8-hour daily maximum	0.88 $\mu\text{g}/\text{m}^3$	0.89 $\mu\text{g}/\text{m}^3$	1.36 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$
Ozone (O ₃) 24-hour	0.94 $\mu\text{g}/\text{m}^3$	0.84 $\mu\text{g}/\text{m}^3$	1.37 $\mu\text{g}/\text{m}^3$	-
Ammonia (24 hrs)	0 ppm	0 ppm	0 ppm	NG
Carbon Dioxide (CO ₂) (24 hrs)	292.80 ppm	0 ppm	269.51 ppm	NG
Carbon Monoxide CO (24 hrs)	0.48 ppb	289.49 ppm	0.38 ppm	NG
VOC (24 hrs)	0 ppb	0 ppb	0.25 ppb	NG
Oxygen (24 hrs)	20.44 %	20.30 %	20.81 %	NG
Wind Direction (24 hrs)	SW	SW	SW	NG
Wind Speed (24 hrs)	1.46 mph	1.35 mph	1.19 mph	NG

^a Particulate matter 10 micrometers or less in diameter

^b Particulate matter 2.5 micrometers or less in diameter

Note: The values on the whole are lower than the NEQEG emission guidelines values.

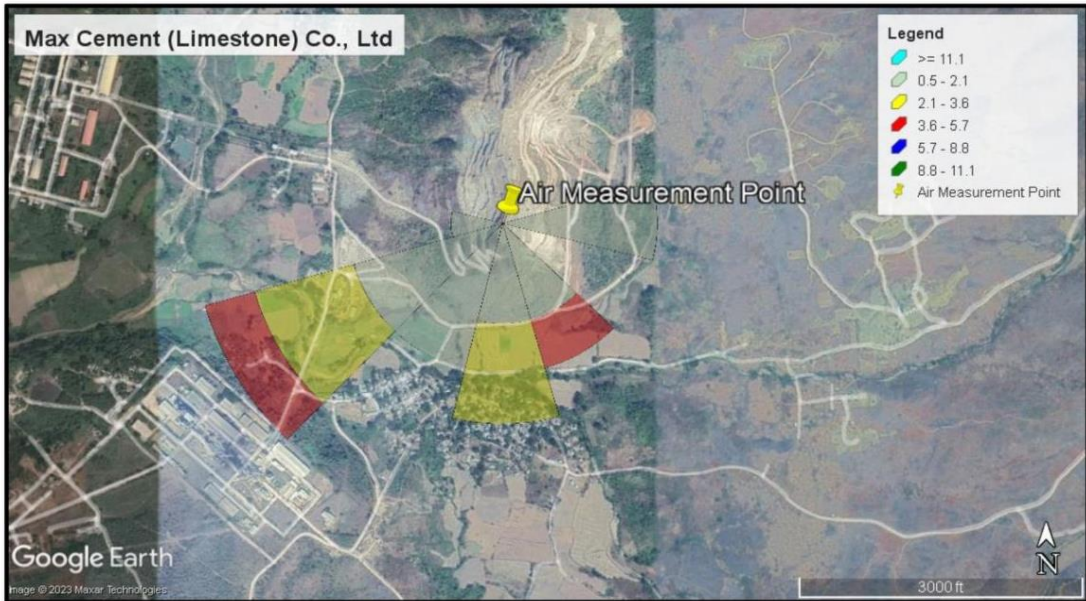


Figure: Wind Speed and Wind Direction 8.7.2023 - 9.7.2023 (Blowing From)

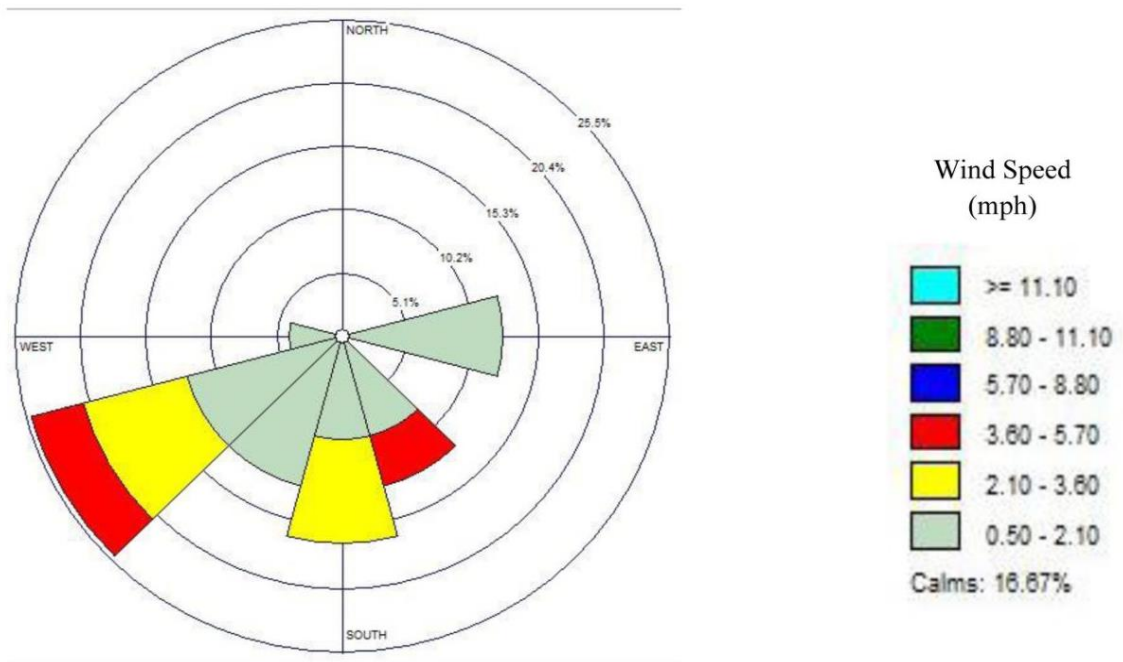


Figure-47: Wind rose map for one day at project site

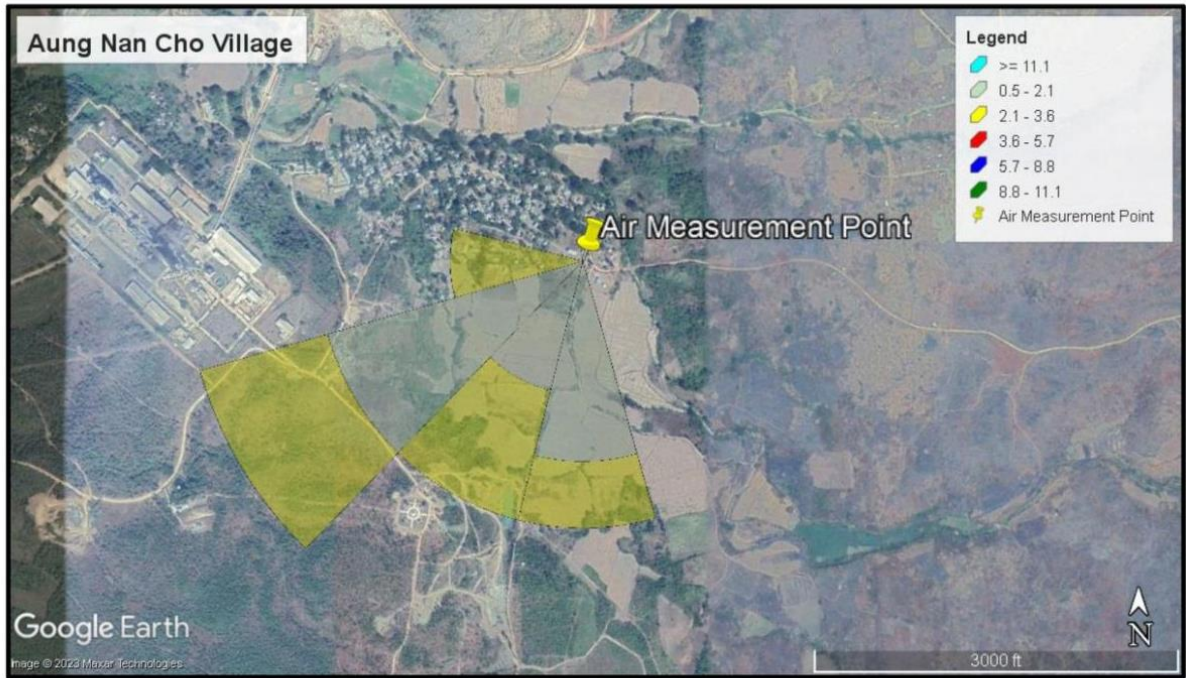


Figure: Wind Speed and Wind Direction 10.7.2023 - 11.7.2023 (Blowing From)



Figure-48: Wind rose map for one day at Aung Nan Cho Village

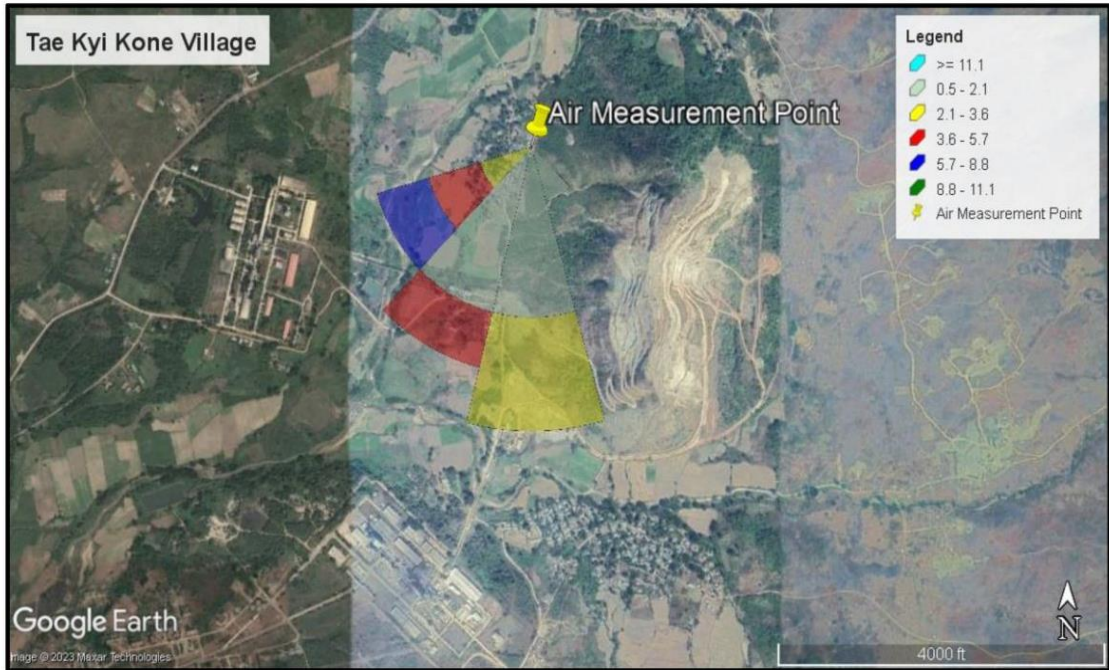


Figure: Wind Speed and Wind Direction 9.7.2023 - 10.7.2023 (Blowing From)

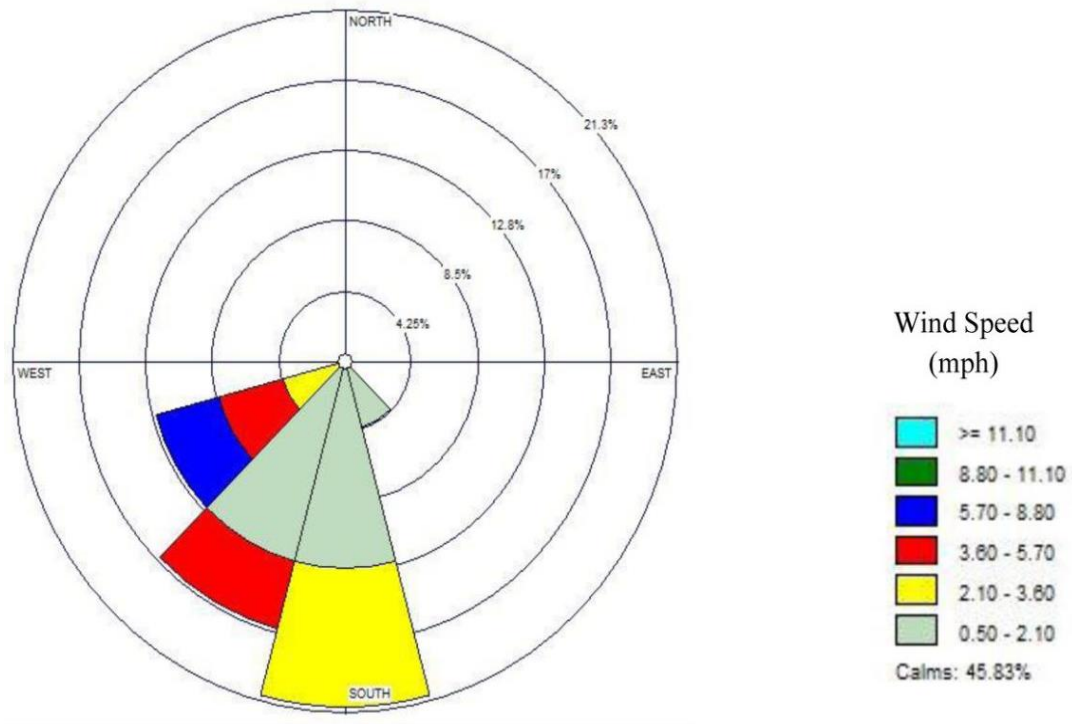


Figure-49: Wind rose map for one day at Tae Kyi Kone Village

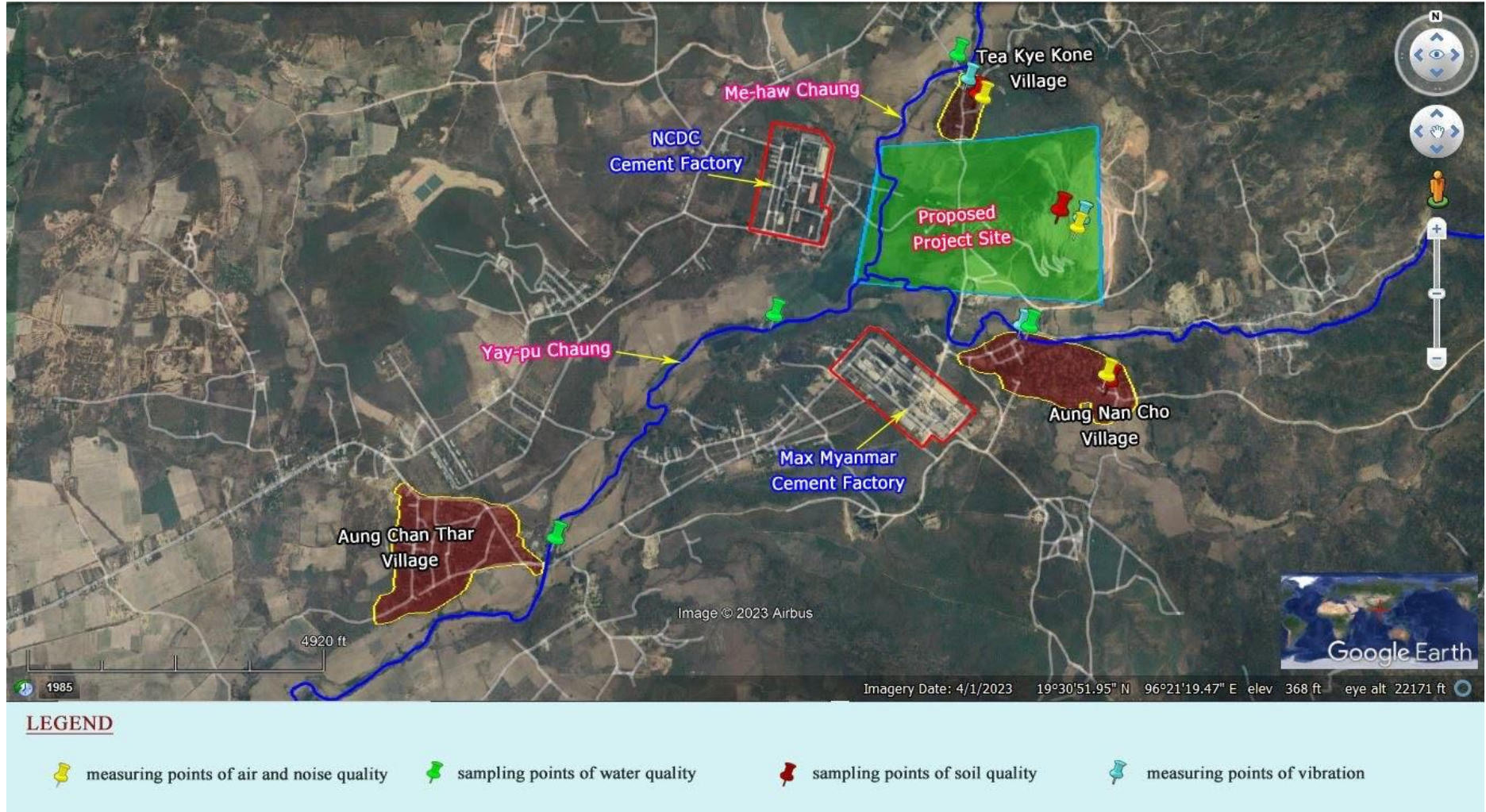


Figure-50: Satellite image showing spots where air quality, noise level, vibration were measured and soil and water samples were taken

4.4 Biological Components

4.4.1 Terrestrial Ecology and Wildlife

A century ago the whole Taung Philar area was covered with Tropical Evergreen Forest. There used to be thick forest with big trees and the British Colonial Government in those days had designated the area as Mei-hor Reserved Forest.

The Tropical Evergreen Forest used to be a species-rich tree flora dominated by members of the family Dipterocarpaceae (e.g. Ka-nyin, In, In-bo) which characterizes this forest type. Even today small plants of Dipterocarpaceae can be seen here and there among the existing bush and shrub but never have a chance to grow taller and bigger due to overexploitation.

Over the decades the cutting of trees for timber, fuel wood and other uses and most of all the overexploitation of the forest had resulted in the severe degradation of the forest and the disappearance of certain valuable tree species.

Due to population pressure over the decades the once Tropical Evergreen Forest had been transformed to a severely degraded secondary forest. The over exploitation goes on and today the plants that remain on the mountain range are mostly woody shrubs, scrub and grass.

As mentioned above small plants of the Dipterocarpaceae family (*Dipterocarpus alatus*, *D. tuberculatus*) and teak (*Tectona grandis*) are still found here and there among the bushes.

Wildlife

As the forest is a greatly degraded secondary forest the wildlife is extremely rare or no longer exists.

According to old and knowledgeable villagers up to three decades or so ago (when the forest was already degraded to a certain extent) there used to be a variety of wildlife such as gibbon, siamese here, jungle cat, wild pig, muntjac and hog deer. Virtually none of these wild animals exist in this area nowadays. Only on very rare occasions a very few probably enter the area at night foraging for food temporarily.

4.4.2 Forest and Vegetation Cover

Although the whole area is within the Mei-hor reserved forest area the natural vegetation coverage is small, less than 40%. The reserved forest on the whole is partially degraded and the floral habitat is greatly fragmented due to the first emergence of Aung Nan Cho Village and farms and small fields in the south. Later the emergence of Max Myanmar Manufacturing and NCDC cement factories compound and limestone sites, staff quarter, weir, various buildings and structure outside the compound and a number of roads cutting through the original reserved forest resulted in severe fragmentation of the habitat.

The vegetation coverage outside the project site, that is on the mountain range is relatively higher--- 60-70%. The green zone in the south on the flat terrain, is the teak plantation area of 500 acres.

4.4.3 Aquatic Biota and Habitat

There is a small stream, Yay-pu Chaung, that flows from east to west near the site into Mei-hor rivulet. It is a perennial stream.

There are streams which dried up after the rainy season.

Aquatic survey was carried out from this small stream. The small stream cannot support even any subsistence fishery. There is also no fish bazaar in the nearby villages. Therefore, for aquatic study only plankton were collected and studied. The list of fish known to be found in the stream and Mei-hor rivulet are listed (secondary information).

Plankton study was made for basic aquatic taxonomy and ecology. Fish study was for ichthyological and fisheries resource study.

There is little chance to catch and study fish (even small ones) in this fast flowing mountain stream. However, there can be aquatic insects or aquatic larvae of certain invertebrates in this stream. But these are beyond the scope of this EMP study due to lack of entomologists.

4.4.4 Wetlands

There is no wet land in this area and its vicinity.

4.4.5 Protected Areas

The proposed project is within the Mei-hor Reserved Forest area. But there is no protected area in the near and far vicinity. There are no Important Bird Area (IBA), Bird Sanctuary (BS), Mountain Park (MP), National Park (NP), Nature Reserve (NR), Protected Area (PA), and Wildlife Park (WP) in the near and far vicinity. Paunglong Catchment Area is in the northeast 30 miles away.

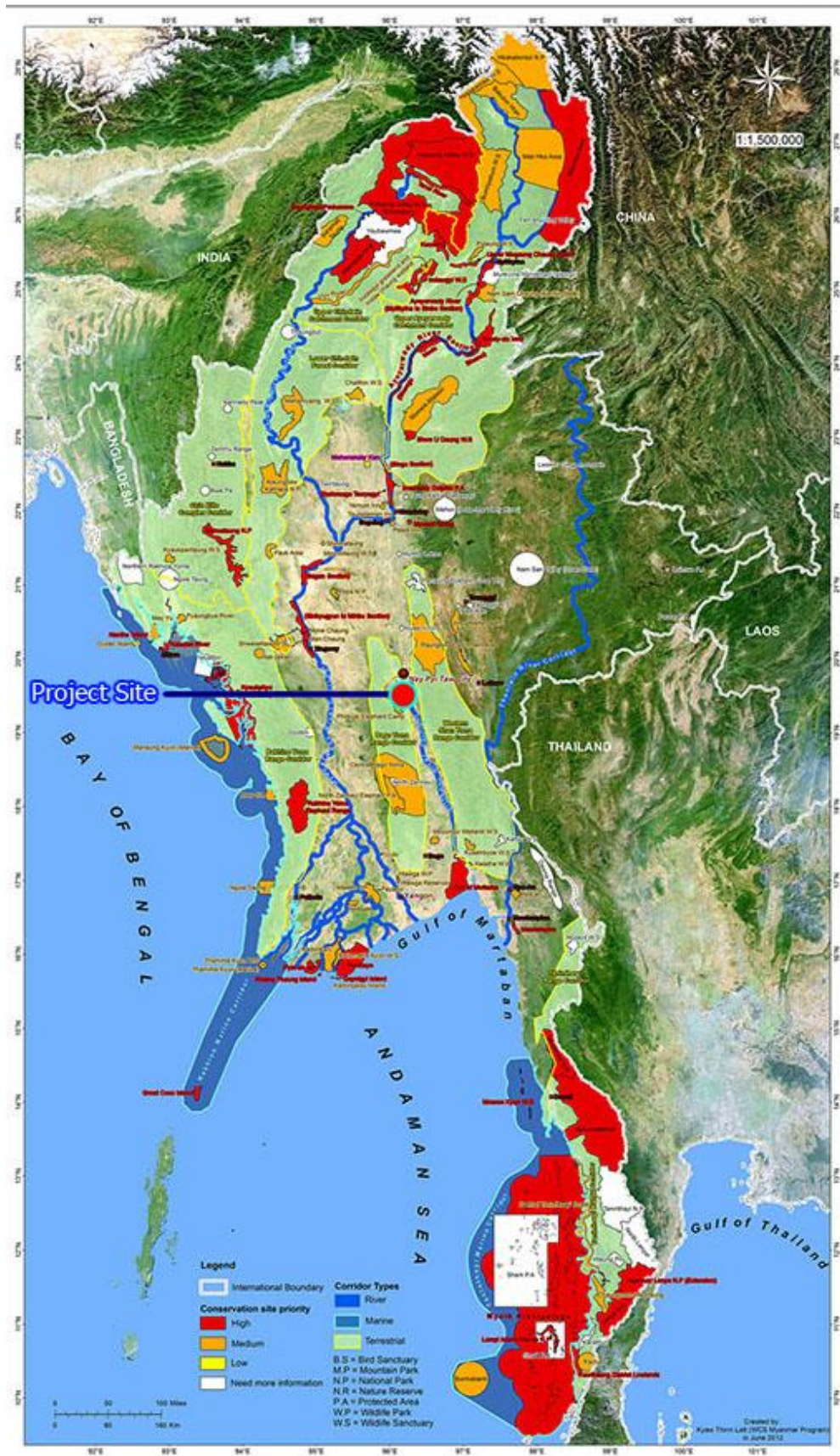


Figure-51: Key Biodiversity Areas (KBAs) in Myanmar

Source: Myanmar Biodiversity, conservation Investment Vision, 2013, MOECAF

4.4.6 Biodiversity and Ecosystems

4.4.6.1 Flora

The floral study involves the overall view of the forest, and classification of forest type (secondary, deciduous), distribution pattern, if possible, transect walk through the forest, walk around the periphery, and on the spot identification of the species. In other word, the methodology applied is simple taxonomic and ecological study.

As the whole area was small (50 acres) no sample quardrat plots were taken and no quantitative ecological study was made. The some of the data are refercenced the report at the same region that was carried out the timeline from 5.9.2016 to 11.9.2016. The second study was conducted from 1.8.2018 to 5.8.2018. The third study from 8-7-2023 to 16-7-2023.

Diversity

A total of 200 species of plants belonging to 67 families were found, identified and recorded. The inventory of plant species is shown in **Table-14**.

Among them, 2 species were categorized as Endangered (EN), 1 species as Near Threatened (NT) and 9 species as Least Concerned (LC) were listed according to the IUCN red list (2014).

Table-14: Inventory of flora species found in the area

No	Scientific Name	Common Name	Family Name	Habit
1	<i>Acacia chundra</i> Willd	Sha	Mimosaceae	T
2	<i>Acacia pennata</i> (L.) Willd	Suyit	Mimosaceae	C/C
3	<i>Acacia pruinescens</i> Kurz	Ka-mon-chin	Mimosaceae	C/C
4	<i>Achyranthes aspera</i> L.	Kyet-mauk-supyan	Amaranthaceae	H
5	<i>Adiantum capillus-veneris</i> L.	Hair-Fern	Pteridaceae	H
6	<i>Aegle marmelos</i> (L.) Correa	Okshit	Rutaceae	T
7	<i>Ageratum conyzoides</i> L.	Khwe-thay-pan	Asteraceae	S
8	<i>Albizia chinensis</i> (Osbeck) Merr	Bon-me-zar	Mimosaceae	T
9	<i>Albizia lebbek</i> Benth	Anya-koko	Mimosaceae	T
10	<i>Alternanthera sessilis</i> L.	Pa-zun-sa-yaing	Amaranthaceae	H
11	<i>Alysicarpus vaginalis</i> (L.)DC	Thanma-naing-kyauk-manaing	Fabaceae	S
12	<i>Amaranthus spinosus</i> L.	hinnu-new subauk	Amaranthaceae	H
13	<i>Amaranthus viridis</i> L.	hinnu-new yaing	Amaranthaceae	H
14	<i>Andrographis paniculata</i> (Burm.F.) Wall ex.	Saga-gyi	Acanthaceae	A

15	<i>Annona muricata</i> L.	Duyin-awza	Annonaceae	ST
16	<i>Annona squamosa</i> L.	Awza	Annonaceae	ST
17	<i>Anogeissus acuminata</i> Wall.	Yon	Combretaceae	T
18	<i>Anthocephalus morindaefolius</i> Korth	Ma-u-let-tan-shae	Rubiaceae	T
19	<i>Antidesma ghesaembilla</i> Gaentn	Kin-balin	Euphorbiaceae	ST
20	<i>Apluda mutica</i> L.	Myet-wa	Poaceae	G
21	<i>Ardisia solanaceae</i> Roxb.	Kyetma-ok	Myrsinaceae	S
22	<i>Aristolochia indica</i> L.	Indian-birthwort	Aristolochiaceae	C/C
23	<i>Aristolochia roxburghiana</i> Klotzsch.	Aristolochia	Aristolochiaceae	C/C
24	<i>Arundo donax</i> L.	Alo-kyu	Poaceae	G
25	<i>Asparagus racemosus</i> Willd	Shint-ma-tet	Asparagaceae	C
26	<i>Bambusa burmanica</i> Gamble	Thaik-wa	Poaceae	B
27	<i>Bauhinia acuminata</i> L.	Swe-daw	Caesalpiniaceae	ST
28	<i>Begonia roxburghii</i> A.DC	Kyauk-chin-pan	Begoniaceae	H
29	<i>Bidens alba</i> DC.	Ta-sae-ark	Asteraceae	H
30	<i>Boerhavia repanda</i> Willd.	Pa-yan-na-wa	Nyctaginaceae	H
31	<i>Bombax ceiba</i> L.	Let-pan	Bombacaceae	T
32	<i>Bombax insigne</i> Wall	De-du	Bombacaceae	T
33	<i>Bothriochloa pertusa</i> (L.) A. Camus	Padaw-pyu	Poaceae	G
34	<i>Bridelia ovata</i> Decne	Seik-che	Euphorbiaceae	T
35	<i>Buchanania lanzan</i> Spreng.	Lunbo	Anacardiaceae	T
36	<i>Butea parviflora</i> Roxb.	Pauk-new	Fabaceae	C/C
37	<i>Calotropis procera</i> (Ait.)R.Br.	Mayo	Asclepiadaceae	S
38	<i>Carallia brachiata</i> (Lour.) Merr	Mani-awga	Rhizophoraceae	T
39	<i>Cardiospermum halicacabum</i> L.	Kala-myet-si	Sapindaceae	C/C
40	<i>Carica papaya</i> L.	Thin-baw	Caricaceae	ST
41	<i>Cassia fistula</i> L.	Ngu	Caesalpiniaceae	T
42	<i>Cassia occidentalis</i> L.	Dan-gywe	Caesalpiniaceae	S
43	<i>Cayratia trifolia</i> L.	Taw sabyit	Vitaceae	C/C
44	<i>Ceiba pentandra</i> (L.) Gaertn.	Le-moh-pin	Bombacaceae	T
45	<i>Centella asiatica</i> (L.)Urb	Myin-hkwa	Apiaceae	H
46	<i>Chloris barbata</i> Sw.	Lay-gwa-myet	Poaceae	G
47	<i>Chromolaera odorata</i> L.	Bi-zet	Asteraceae	S

48	<i>Cleome burmanii</i> Wight & Arn	Taw-hin-ga-lar	Capparaceae	H
49	<i>Colocasia affinis</i> Schott.	Pein	Araceae	H
50	<i>Combretum acuminatum</i> Roxb.	Nabu-new	Combretaceae	C/C
51	<i>Commelina benghalensis</i> L.	Wet-kyok	Commelinaceae	H
52	<i>Commelina communis</i> L.	Wetkyok	Commelinaceae	H
53	<i>Corchorus acutangulus</i> Lam.	Pilaw	Tiliaceae	S
54	<i>Corchorus aestuans</i> L.	Pilaw-hka	Tiliaceae	S
55	<i>Corchorus capsularis</i> Lam.	Pilaw	Tiliaceae	S
56	<i>Costus speciosus</i> Sm.	Phalan-taung-hmwe	Costaceae	H
57	<i>Cratoxylum nerrifolium</i> Kurz.	Bebya	Hyperaceae	T
58	<i>Crocus sativus</i> L.	Gon-ga-man	Iridaceae	H
59	<i>Crotalaria sericea</i> Retz	Taw-paik-san	Fabaceae	S
60	<i>Croton oblongifolia</i> Roxb.	Thetyin-gyi	Euphorbiaceae	ST
61	<i>Curcuma petiolata</i> Roxb.	Marlar	Zingiberaceae	H
62	<i>Cyathuta prostrata</i> L.	Kyet-mauk-pyan	Amaranthaceae	H
63	<i>Cycas rumphii</i> Miq	Mondai	Cycadaceae	ST
64	<i>Cynodon dactylon</i> (L.) Pers	Myay-sar-myet	Poaceae	G
65	<i>Cyperus compressus</i> L.	Wetlar-myet	Cyperaceae	H
66	<i>Cyperus rotundus</i> L.	Myet-mon-nyin	Poaceae	G
67	<i>Cyrtococcum patens</i> (L.) A. Camus	Pa-taw-myet	Poaceae	G
68	<i>Dactyloctenium aegyptium</i> (L.) Willd	Myet-lay-gwa	Poaceae	G
69	<i>Dalbergia cultrata</i> Grah.	Yin-daik	Fabaceae	T
70	<i>Dalbergia foliaceae</i> Wall	Daung-talaung	Fabaceae	C/C
71	<i>Dalbergia oliveri</i> Gamble	Ta-ma-lan	Fabaceae	T
72	<i>Dalbergia sisoo</i> Roxb.	Kala-padauk	Fabaceae	T
73	<i>Decaschistia trilobata</i> Wight	Taw-chin-baung	Malvaceae	H
74	<i>Delonix regia</i> (Bojer ex. Hook)	Sein-pan-gyi	Caesalpiniaceae	T
75	<i>Dendrocalamus longispatus</i> Kurz.	Wanet	Poaceae	B
76	<i>Dendrocalamus strietus</i> Nees	Hmyin-wa	Poaceae	B
77	<i>Desmodium gyrans</i> DC.	Say-ka-myin	Fabaceae	S
78	<i>Desmodium pulchellum</i> Benth	Taung-damin	Fabaceae	S
79	<i>Dillenia pentagyna</i> Roxb.	Zin-byun	Dilleniaceae	T

80	<i>Dioscorea bulbifera</i> L.	Myauk -u	Dioscoreaceae	C/C
81	<i>Dipterocarpus alatus</i> Roxb.	Kanyin	Dipterocarpaceae	T
82	<i>Dipterocarpus pilosus</i> Roxb.	Timber	Dipterocarpaceae	T
83	<i>Dipterocarpus tuberculatus</i> Roxb.	In	Dipterocarpaceae	T
84	<i>Echinochloa colona</i> Link	Be-sar-myet	Poaceae	G
85	<i>Echinochloa staginina</i> (Retz.) P.Beauv.	Myet-thi	Poaceae	G
86	<i>Eclipta alba</i> Hassk.	Kyeik-hman	Asteraceae	H
87	<i>Elephantopus scaber</i> L.	Sin-chae	Asteraceae	H
88	<i>Eleusine indica</i> (L.) Gaertn	Sinngo-myet	Poaceae	G
89	<i>Emblica officinalis</i> Gaertn	Zibyu	Euphorbiaceae	T
90	<i>Eragrostis barbulata</i> Stapf.	Thaman-myet	Poaceae	G
91	<i>Eugenia kurzii</i> Duthie	Thabye-nyo	Myrtaceae	T
92	<i>Eupatorium odoratum</i> L.	Taw bezat	Asteraceae	S
93	<i>Euphorbia heterophylla</i> L.	Kywe-kyaung-myin-si	Euphorbiaceae	S
94	<i>Euphorbia hirta</i> L.	Kyae-kaung-minsay	Euphorbiaceae	S
95	<i>Ficus glomerata</i> Roxb.	Tha-phan	Moraceae	T
96	<i>Garuga pinnata</i> Roxb.	Chinyok	Burseraceae	T
97	<i>Globba orixensis</i> Roxb.	Waso-pan	Zingiberaceae	H
98	<i>Gmelina arborea</i> Roxb.	Yamanae	Verbenaceae	T
99	<i>Gossypium arboreum</i> L.	Wah-gyi	Malvaceae	S/ST
100	<i>Grewia hirsute</i> Vahl	Kyet-tayaw	Tiliaceae	S
101	<i>Habiscus tiliaceus</i> L.	Shaw	Malvaceae	ST
102	<i>Heliotropium indicum</i> L.	Sin-hna-maung	Boraginaceae	H
103	<i>Heterophragma adenophylla</i> Wall.	Phet-than	Bignoniaceae	T
104	<i>Heteropogon contortus</i> L.	Mwe-lein-myet	Poaceae	G
105	<i>Hibiscus surattensis</i> L.	Taw-chin-baung	Malvaceae	S
106	<i>Hiptage benghalensis</i> (L.) Kurz.	Bein-new	Malpighiaceae	C/C
107	<i>Hymenodictyon excelsum</i> (Roxb) W	Khu-than	Rubiaceae	T
108	<i>Indigofera tinctoria</i> L.	Me-net	Fabaceae	S
109	<i>Ipomoea angustifolia</i> Jacq	Not known	Convolvulaceae	C
110	<i>Jatropha glandulifera</i> Roxb.	Taw-kyetsu	Euphorbiaceae	S
111	<i>Jussiaea repens</i> L.	Ye-ka-nyut	Onagraceae	H

112	<i>Jussiaea suffruticosa</i> L.	Taw-lay-nyin-gyi	Onagraceae	H
113	<i>Kaempferia candida</i> Wall.	Pa-dat-sa	Zingiberaceae	H
114	<i>Lagerstroemia tomentosa</i> Presl.	Leza	Lythraceae	T
115	<i>Lagerstroemia villosa</i> Wall	Zaung-bale	Lythraceae	T
116	<i>Lagerstroemia macrocarpa</i> Kurz.	Pyin-ma ywet-gyi	Lythraceae	ST
117	<i>Lanea coromandelica</i> (Houtt) Merr	Na-be	Anacardiaceae	T
118	<i>Lasia spinosa</i> (L.) Thw	Za-yit	Araceae	H
119	<i>Leea</i> sp.	Naga-mauk	Leeaceae	S
120	<i>Leucaena leucocephala</i> (Lam)	Baw-za-gaing	Mimosaceae	T
121	<i>Leucas aspera</i> Spreng	Taw-pin-sein	Lamiaceae	S
122	<i>Leucas cephalotes</i> Spreng	Pin-gu-hteik-peik	Lamiaceae	S
123	<i>Litsea glutinosa</i> (Lour.) C.B.Rob.	On-don	Lauraceae	T
124	<i>Macaranga siamensis</i>	Phet-wun	Euphorbiaceae	T
125	<i>Mangifera</i> sp.	Taw Thayat	Anacardiaceae	ST
126	<i>Mansonia gagei</i> Drum	Kalamat	Sterculiaceae	T
127	<i>Markhamia stipulata</i> (Wall.)	Ma-hlwa	Bignoniaceae	T
128	<i>Melanorrhoea usitata</i> Wall.	Thitsi	Anacardiaceae	T
129	<i>Melastoma malabathricum</i> L.	Nyaung-ye-o-pan	Melastomataceae	S
130	<i>Microcos paniculata</i> L.	Mya-ya	Tiliaceae	ST
131	<i>Millettia brandisiana</i> Kurz	Thit-pagan	Fabaceae	T
132	<i>Millettia extensa</i> Benth	Win-u	Fabaceae	S/C
133	<i>Millingtonia hortensis</i> L.F.	Indian-cork tree	Bignoniaceae	T
134	<i>Mimosa rubicaulis</i> Lam	Bilatt-tikayon	Mimosaceae	H
135	<i>Mimosa pudica</i> L.	Hti-ka-yon	Mimosaceae	H
136	<i>Momordica dioica</i> Roxb.	Kyet-hin-kha	Cucurbitaceae	C/C
137	<i>Monochoria vaginalis</i> (Presl)Kunth	Kadauk-sat	Pontederiaceae	Aquatic
138	<i>Moringa oleifera</i> Lamk	Dan-da-lun	Moringaceae	T
139	<i>Mucuna pruriens</i> (L.)	Khwe-laya	Fabaceae	C
140	<i>Mukia maderaspatana</i> (L.) M.Roem	Sar-thkhwa	Cucurbitaceae	C/C
141	<i>Musa</i> sp.	Nget-pyaw	Musaceae	H
142	<i>Neoalsomitra sarcophylla</i> (Wall.) Hutch	Kyi-ah	Cucurbitaceae	C
143	<i>Ocimum americanum</i> L.	Hoary basil	Lamiaceae	H

144	<i>Ocimum sanctum</i> L.	Kalar-pin-sein	Lamiaceae	H
145	<i>Oldenlandia corymbosa</i> L.	Su-la-na-pha	Rubiaceae	H
146	<i>Oroxylum indicum</i> (L.) Kurz	Kyaungsha	Bignoniaceae	T
147	<i>Paedera foetida</i> L.	Pe-bok-new	Rubiaceae	C/C
148	<i>Paracalyx scariosus</i> (Roxb.) Ali	Taw-pe	Fabaceae	H
149	<i>Pennisetum purpureum</i> Schum	padaw-ni-myet	Poaceae	G
150	<i>Pennisetum</i> sp.	Not known	Poaceae	G
151	<i>Phyllanthus acidus</i> L.	Taung-zi-phyu	Euphorbiaceae	ST
152	<i>Phyllanthus niruri</i> L.	Kyet-tha-hin	Euphorbiaceae	S
153	<i>Physalis minima</i> L.	Bauk-pin	Solanaceae	H
154	<i>Picrorhiza kurroa</i> Royle.	Saung-may-ga	Scrophulariaceae	H
155	<i>Pterocarpus indicus</i> Willd.	Padauk	Fabaceae	T
156	<i>Pterocarpus macrocarpus</i> Kurz	Thit-pa-dauk	Fabaceae	T
157	<i>Pterospermum acerifolium</i> (L.) Willd.	Taw-kalamet	Sterculiaceae	ST
158	<i>Randia uliginosa</i> DC.	Hman-phyu	Rubiaceae	ST
159	<i>Rauvolfia densiflora</i> (Thwaites)	Bonma-yaza	Apocynaceae	S
160	<i>Ricinus communis</i> L.	Kyet-su	Euphorbiaceae	ST
161	<i>Saccharum spontaneum</i> L.	Kaing	Poaceae	G
162	<i>Samanea saman</i> (Jacq) Merr	Ko-Kko	Mimosaceae	T
163	<i>Schleichera trijuga</i> Willd	Gyo	Sapindaceae	T
164	<i>Schrebera swietenoides</i> Roxb.	Than-thay	Oleaceae	T
165	<i>Scoparia dulcis</i> L.	Dan-na-thu-kha	Scrophulariaceae	H
166	<i>Sesbania grandiflora</i> (L.)	Pauk-pan-byu	Fabaceae	ST
167	<i>Sesbania paludosa</i> Roxb.	Nyan	Fabaceae	S
168	<i>Sesbania procumbens</i> (Roxb.)W&Arn	Nyan-thein	Fabaceae	S
169	<i>Setaria lutescens</i> Hubb.	Yon-sar	Poaceae	G
170	<i>Shorea obtuse</i> Wall.	Thit-ya	Dipterocarpaceae	T
171	<i>Shorea siamensis</i> Kz.	Ingyin	Dipterocarpaceae	T
172	<i>Sida acuta</i> Burm	Tabyet-si-ywet-chon	Malvaceae	S
173	<i>Sida cordifolia</i> L.	Tabyet-si-ywet-wine	Malvaceae	S
174	<i>Smilax china</i> L.	Sein-nabaw-lay	Smilacaceae	C/C

175	<i>Smilax glabra</i> Roxb.	sein-nabawgyi	Smilacaceae	C/C
176	<i>Smilax macrophylla</i> Roxb	Katcho	Smilacaceae	C/C
177	<i>Solanum torvum</i> Sw.	Kazaw-kha	Solanaceae	S
178	<i>Sterculia versicolor</i> Wall	Shaw-phyu	Sterculiaceae	T
179	<i>Stereospermum suavedens</i> DC.	Tha-kut	Bignoniaceae	T
180	<i>Sterospermum personatum</i> Chatt.	Thakut-po	Bignoniaceae	T
181	<i>Sterospermum suaveolens</i> (Roxb.) A.DC.	Kywema-gyolein	Bignoniaceae	T
182	<i>Strychnos nux-vomica</i> L.	Kabaung	Loganiaceae	T
183	<i>Synedrella nodiflora</i> (L.) Gaertn.	Bizat-hpo	Asteraceae	H
184	<i>Tamarindus indica</i> L.	Magyi	Caesalpiniaceae	T
185	<i>Tectona grandis</i> L.	Kyun	Verbenaceae	T
186	<i>Terminalia arjuna</i> Wight & Arn	Tauk-kyan	Combretaceae	T
187	<i>Terminalia bellerica</i> Roxb.	Thit-seint	Combretaceae	T
188	<i>Terminalia chebula</i> Retz	Phan-kha	Combretaceae	T
189	<i>Thyrsostachys oliveri</i> Gamble	Thana-wa	Poaceae	B
190	<i>Trema orientalis</i> (L.)	Kywe-sa	Ulmaceae	ST
191	<i>Tridax procumbens</i> L.	Hmwezok	Asteraceae	H
192	<i>Triumfetta bartramia</i> L.	Kat-si-nae-thay	Tiliaceae	S
193	<i>Urena lobata</i> L.	Kat-si-nae-gyi	Malvaceae	S
194	<i>Vernonia cinera</i> (L.) Less	Kadu-pyan	Asteraceae	H
195	<i>Vitex glabrata</i> R.Br.	Tauksha	Verbenaceae	T
196	<i>Vitis discolor</i> Dalzell	Ngwe-gya	Vitaceae	C/C
197	<i>Waltheria indica</i> L.	Bauk-phyu	Sterculiaceae	S
198	<i>Xylia xylocarpa</i> (Roxb.) Taub	Pyin-ka-doe	Mimosaceae	T
199	<i>Ziziphus oenoplia</i> Mill	Taw-zi-new	Rhamnaceae	S/C
200	<i>Ziziphus rugosa</i> Lam	Taw-zi	Rhamnaceae	ST

S - Shrub

H - Herb

T - Tree

ST - Small tree

C - Climber

C/C - Climber/ Creeper

G - Grass

B - Bamboo

Abundance/dominance general pattern

The most abundant plant families in term of number are grass, herbs or small plants. Again species of the Poaceae dominated over all other families. Although not conspicuous they dominate over all other plants in number (quantity).

Small trees under the family Euphorbiaceae are abundant in the area.

In term of conspicuousness big trees of the family Dipterocarpaceae dominated over all other big and small trees.

Rare and vulnerable species

On the whole big trees were very rare. Big trees with GBH of 300cm represented less than 3% of the whole study area. Those large trees were indeed trees that were neglected by loggers due to low quality wood. Trees of quality timber such as *Tectona grandis* and *Xylia xylocarpus* remained only as small trees, rare and sparsely scattered and inconspicuous among others.

According to IUCN data list 2014, 2 species of Endangered and 1 species of Near Threatened were recorded in the area, there are:

- Endangered : *Dalbergia oliveri* (Ta-ma-lan)
Dipterocarpus alatus (Ka-nyin)
- Near Threatened : *Cycas rumphii* (Mondai)

Species of economic and health/nutritional values

The local community relies on this forest for fuel wood and building materials. This partially degraded secondary forest still provides fuel wood for the locals. Illegal logging and illegal production of charcoal are still taking places (outside the study area) it is learnt. In the survey area almost all big trees with the exception of those with very low quality timber wood were already gone. There are still certain isolated big trees of medium wood quality specially those of the family Dipterocarpaceae.

Medicinal plants still exist in this partially degraded secondary forest. But these were found only in small quantity and not economically viable. Rudimentary bamboo thicket could be still found here and there. Mushrooms and bamboo shoots are still available, though no longer plentiful, during the rainy season, it is learnt.



Figure-52: *Paedera foetida* L.



Figure-53: *Costus speciosus* Sm.



Figure-54: *Butea parviflora* Roxb.



Figure-55: *Bauhinia acuminata* L.

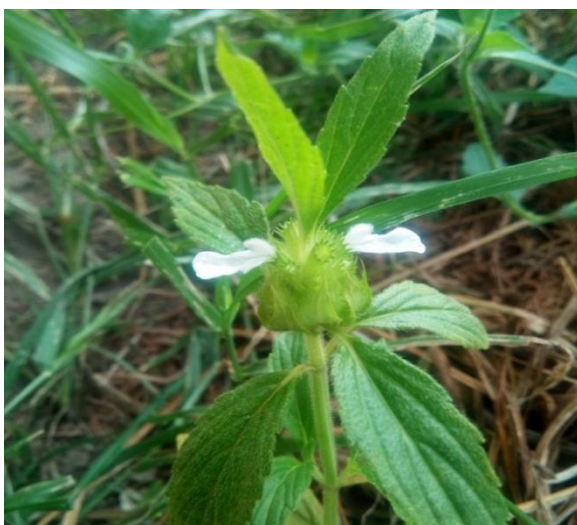


Figure-56: *Leucas cephalotes* Spreng



Figure-57: *Calotropis procera* (Ait.) R.Br.



Figure-58: *Euphorbia heterophylla* L.



Figure-59: *Trema orientalis* (L.)



Figure-60: *Millettia brandisiana* Kurz



Figure-61: *Jatropha glandulifera* Roxb



**Figure-62: *Neoalsomitra sarcophylla*
(Wall.) Hutch**



Figure-63: *Leea macrophylla* Roxb.



Figure-64: *Terminalia arjuna* Wight & Arn.



Figure-65: *Lagerstroemia speciosa* L.



Figure-66: *Terminalia chebula* Retz.



Figure-67: *Crotalaria sericea* Retz.

4.4.6.2 Fauna

(a) Avian fauna (birds)

Methodology in brief

High power telescopes, binocular and camera (tele-lens) were the main tools used for avian study.

The whole area designated for survey (about 16 square miles) was covered. These were areas north, east, south and west of the factory. Focus was also made on the area south east of the factory.

The survey work was carried out from 06:30 hrs till dark, with only one recess from lunch. Usually, more birds are found in early morning and in the evening.

The some of the data are referenced the report at the same region that was carried out the timeline from 5.9.2016 to 11.9.2016. The second study was conducted from 1.8.2018 to 5.8.2018. The third study from 8-7-2023 to 16-7-2023. The work mainly involved transect walk through the forest/bush and visual study. Walk from factory to five different directions, namely, to north, east, south, west and southeast from the factory. The coordinates are as follows:

1. N19.50906°; E 96.37976°
2. N19.52906°; E 96.40685°
3. N19.51814°; E 96.38931°
4. N19.50931°; E 96.40352°
5. N19.50703°; E 96.38421°

Diversity

A total of 54 avian species under 31 families were found, identified and recorded.

Inventory of bird species found are shown in **Table-15**.

Table-15: Bird species recorded in the area

Sr. no	Family name, Common name & <i>Scientific name</i>
	PHASIANIDAE: PERDICINAE Partridges, francolins, quails
1	Chinese Francolin <i>Francolinus pintadeanus</i>
	ARDEIDAE: ARIDEINAE: Herons & egrets
2	Pond-heron <i>Ardeola</i> sp.
3	Little Egret <i>Egretta garzetta</i>
	FALCONIDAE: FALCONINAE: Falcons
4	Common Kestrel <i>Falco tinnunculus</i>
	FALCONIDAE: ACCIPITRINAE: Hawks, eagles & allies
5	Oriental Honey-buzzard <i>Pernis ptilorhynchus</i>
6	Black Kite <i>Milvus migrans</i>
7	Shikra <i>Accipiter badius</i>
	VANELLIDAE: Lapwings & allies
8	Red-wattled Lapwing <i>Vanellus indicus</i>
	SCOLOPACIDAE: TRINGINAE: Godwits, dowitchers, curlews, sandpipers & allies
9	Common Sandpiper <i>Actitis hypoleucos</i>
	COLUMBIDAE: COLUMBINAE: Typical pigeons & doves
10	Rock Pigeon <i>Columba livia</i>
11	Spotted Dove <i>Streptopelia chinensis</i>

	PSITTACIDAE: PSITTACINAE: Parrots & parakeets
12	Grey-headed Parakeet <i>Psittacula finschii</i>
	CUCULIDAE: CENTROPODINAE: Coucals
13	Greater Coucal <i>Centropus sinensis</i>
	CORACIIDAE: Rollers
14	Indian Roller <i>Coracias benghalensis</i>
	ALCEDINIDAE: HELCYONINAE: Larger kingfishers
15	White-throated Kingfisher <i>Halcyon smyrnensis</i>
16	Black-capped Kingfisher <i>Halcyon pileata</i>
	MEROPIDAE: Bee-eaters
17	Little Green Bee-eater <i>Merops orientalis</i>
	PICIDAE: JYGNINAE: Wrynecks
18	Eurasian Wryneck <i>Iynx torquilla</i>
	CAMPEPHAGIDAE: Cuckooshrikes, trillers, minivets & allies
19	Large Cuckooshrike <i>Coracina macei</i>
	ARTAMIDAE: Woodswallows
20	Ashy Woodswallow <i>Artamus fuscus</i>
	AEGITHINIDAE: Ioras
21	Common Iora <i>Aegithina tiphia</i>
	DICRURIDAE: Drongos
22	Ashy Drongo <i>Dicrurus leucophaeus</i>
23	Black Drongo <i>Dicrurus macrocercus</i>
24	Hair-crested Drongo <i>Dicrurus hottentottus</i>
	CORVIDAE: Crows, nutcrackers, magpies, jays, treepies & allies
25	Eastern Jungle Crow <i>Corvus levaillantii</i>
26	Rufous Treepie <i>Dendrocitta vagabunda</i>
	LANIIDAE: Shrikes
27	Brown Shrike <i>Lanius cristatus</i>
	NECTARINIIDAE: Sunbirds & spiderhunters
28	Purple Sunbird <i>Cinnyris asiaticus</i>
	ESTRILDIDAE: LONCHURINAE: Java Sparrow, munias, parrotfinches & allies
29	Scaly-breasted Munia <i>Lonchura punctulata</i>
	PASSERIDAE: Sparrows & allies
30	House Sparrow <i>Passer domesticus</i>
31	Plain-backed Sparrow <i>Passer flaveolus</i>
32	Eurasian Tree-sparrow <i>Passer montanus</i>
	MOTACILLIDAE: Wagtails & pipits
33	Olive-backed Pipit <i>Anthus hodgsoni</i>
34	White Wagtail <i>Motacilla alba</i>
	STURNIDAE: STURNINAE: Mynas, starlings & allies
35	Common Myna <i>Acridotheres tristis</i>
36	Vinous-breasted Myna <i>Acridotheres burmannicus</i>
	MUSCICAPIDAE: SAXICOLINAE: Shortwings, robins, redstarts, rock-thrushes, chats forktails, whistling-thrushes & allies

37	Siberian Rubythroat <i>Luscinia calliope</i>
38	Blue Rock-thrush <i>Monticola solitarius</i>
39	Eastern Stonechat <i>Saxicola maurus</i>
40	Pied Bushchat <i>Saxicola caprata</i>
	MUSCICAPIDAE: MUSCICAPINAE: Old World flycatchers & allies
41	Ultramarine Flycatcher <i>Ficedula superciliaris</i>
42	Taiga Flycatcher <i>Ficedula albicilla</i>
43	White-rumped Shama <i>Copsychus malabaricus</i>
	PYCNONOTIDAE: Bulbuls
44	Streak-eared Bulbul <i>Pycnonotus blanfordi</i>
45	Red-vented Bulbul <i>Pycnonotus cafer</i>
	HIRUNDINIDAE: HIRUNDININAE: Martins, swallows & allies
46	Barn Swallow <i>Hirundo rustica</i>
	PHYLLOSCOPIDAE: Seicercus & Phylloscopus warblers
47	Yellow-browed Warbler <i>Phylloscopus inornatus</i>
48	Dusky Warbler <i>Phylloscopus fuscatus</i>
	TIMALIIDAE: Babblers
49	Yellow-eyed Babbler <i>Chrysomma sinense</i>
50	Puff-throated Babbler <i>Pellorneum ruficeps</i>
51	White-throated Babbler <i>Turdoides gularis</i>
	CISTICOLIDAE: Cisticolas, tailorbirds, prinias & allies
52	Common Tailorbird <i>Orthotomus sutorius</i>
53	Grey-breasted Prinia <i>Prinia hodgsonii</i>
54	Plain Prinia <i>Prinia inornata</i>

Distribution, abundance/dominance

Generally, more birds were found in the north east, east and south east, that is, on the foot hill, slopes of the mountain range. However, quails, sparrows, bee eaters, drongo one bulbul species, mynas and crow (even jungle crow) were more common in the flat terrain area.

Two species of Kingfisher were found along the stream areas. One species of swallow found was no doubt an aerial species spending most of its time in flight.

In term of biodiversity the family Muscicapidae was the dominant family with 7 representative species. That was followed by the family Falconidae with 4 representative species. The families Dicruridae, Passeridae, Timaliidae and Cisticolidae were represented by 3 species each. The remaining 25 families were represented by only one or two species each.

In term of abundance in number (individuals) the family Caraciidae was the most abundant, comprising 18% of all the total number of birds found. That was followed by the members of families Ardeidae and Columbidae each comprising 15% of all bird found. The individual members of the family scolopacidae consisted of 9% of all the number of bird found.

Rare and endangered species

While members of the families Coraciidae, Ardeidae, Columbidae and Hirundinidae were common to very common on the whole birds were relatively rare.

In the cases of nine very rare species (in the study area context) only one individual bird for each species were observed.

No threatened species (according to IUCN red list, 2014 of Critically Endangered, Endangered, Threatened, Near Threatened, Least Concern etc.) were observed during the survey period.

The area was not in the designated Important Bird Area (IBA) or Protected Area System (PAS) of Myanmar.

All the birds found were native or indigenous species; none of them were in the migratory species category.

Species of economic and health/ nutritional values

All kinds of birds are edible in Myanmar and the local will eat any bird if they have the chance to do so. But there are no bird hunters or trappers, it is learnt.



Figure-68: *Pernis ptilorhynchus*



Figure-69: *Psittacula finschii*



Figure-70: *Falco tinnunculus*



Figure-71: *Francolinus pintadeanus*



Figure-72: *Dendrocitta vagabunda*



Figure-73: *Vanellus indicus*



Figure-74: *Turdoides gularis*



Figure-75: *Pycnonotus cafer*

(b) Herpetofauna (Amphibian and reptiles)

Methodology in brief

As the habitats of amphibian and reptiles on the whole are site specific, for instance, water pools, shady and moist area, under old logs and big stones, and under litters, random survey was conducted throughout the study area.

On the other hand, detail survey was concentrated, on the above-mentioned micro habitats or niches. For species that are mainly sedentary, that is, not active wanderers, there were specific niches to be studied.

The survey works mainly involved walking and visual inspection. No traps or snares were used. Surveys were carried out twice a day; one during day time and the other one during night. Virtually all amphibians are nocturnal and many reptiles are also nocturnal in habits. They are more active at night and the chance for encounter is much higher. The animals were captured with specially modified stakes, net and scoops. Small rubber rings were also used to shoot at small reptile (lizards and skinks) and small amphibian (frog). The idea was not to kill the small

animals but only to daze them by shooting at the head. With the exception of a few to be killed and preserved in formalin or alcohol for later detail study, most were released after observation and recording. The study involved the morphometric characters: - size, shape, pattern of spots, stripes, colour, body weight and body length. The measurement of length included total length, head, length and width, snout vent length, tail length, scales and scales row (for reptiles). For amphibian the more or less same methods was applied (care has to be taken when handling dazed snakes).

Since herpetofauna tends to inhabit moist or wet spots the survey was mainly concentrated along the banks of Yay Pu Stream or other ecological riches eg. under logs, stones among leaves litters, around pools etc.

Diversity

A total of 19 species of herpetofauna belonging to 9 families were found, identified and recorded. 10 species were reptiles while 9 species were amphibian (all frogs but only one toad). Of the 10 species of reptiles 6 were lizards and skinks while 4 were snakes. One venomous snake, the pit viper, was found. The species recorded were shown in **Table-16**.

Table-16: Checklist of herpetofauna species recorded from the survey area during survey period

No.	Family Name	Common Name	Scientific Name	IUCN
1	Bufo	Common Toad	<i>Duttaphrynus melanostictus</i>	LC
2	Dicroglossidae	Common Floating Frog	<i>Occidozyga lima</i>	LC
3		Floating Frog	<i>Occidozyga martensii</i>	LC
4		Crab-eating Grass Frog	<i>Fejervarya cancrivora</i>	LC
5		Paddy Frog	<i>Fejervarya limnocharis</i>	LC
6		Paddy Frog	<i>Fejervarya cf limnocharis</i>	
7		Kaing Land Frog	<i>Rana tigerina</i>	
8	Microhylidae	Common Bull Frog	<i>Kaloula pulchra</i>	LC
9		Ornate Narrow-mouthed Frog	<i>Microhyla ornata</i>	LC
10	Agamidae	Blue-crested Forest Lizard	<i>Calotes mystaceus</i>	
11		Garden Fence Lizard	<i>Calotes versicolor</i>	
12	Gekkonidae	Tocky Gecko	<i>Gekko gecko</i>	
13		House Gecko	<i>Hemidactylus frenatus</i>	LC
14		Garnot's Gecko	<i>Hemidactylus garnotii</i>	
15	Scincidae	Common Sun Skink	<i>Eutropis multifasciata</i>	
16	Colubridae	Long-nosed Whip Snake	<i>Ahaetulla nasuta</i>	
17		Brown Cat Snake	<i>Boiga orchacea</i>	
18	Viperidae	White-lipped Pit Viper	<i>Cryptelytrops albolabris</i>	LC
19	Natricidae	Chequered Keelback Water Snake	<i>Xenochrophis piscator</i>	

Distribution, abundance/dominance

The large majority of reptiles and amphibians were found at night; many were found along the streams or special ecological niches. The foot hill area was a better habitat than the flat terrain, it was noticed.

Frogs were rare as the period was not during the rainy season. The gliding lizards were not found due to scarcity of tall trees in the area.

In term of biodiversity the family Dicroglossidae was the dominant family represented by 32% of all individual herpatofauna found. That was followed by Bufonidae (toads) with 16% of the total. The lizard family Agamidae and the snake family Colubridae stood third with 11% each of the total.

In term of individual abundance the family Dicroglossidae with 54% of the total number of herpetofauna found, clearly dominated over all other families. That was followed by Bufonidae 13% and Colubridae 9%. Of particular interest were the floating frog and paddy frog (family Dicroglossidae) which were plentiful and widely distributed even though the season of survey was not the rainy season and the area was not dominated by paddy fields.

Rare and endangered species

On the whole the herpetofauna were relatively rare. There is no doubt that more frogs will be found if the survey was carried out during the rainy season.

Seven species frogs, namely, *D. melanostictus*, *O. lima*, *O. martensi*, *F. Cancrivora*, *F. limnocharis*, *K. pulchra* and *M. ornata* are in the IUCN list of Least Concern (LC).

One species of lizard (gecko), *H. frenatus* and one species of snake, *C. albolabris* are also in the IUCN list of Least Concern (LC).

None of the species found are in the severe red list such as Endangered, or Threatened.

Species of economic and health/ nutritional values

All the frogs under the family Dicroglossidae are edible and some local people catch them for food, especially during the early part of the rainy season when they are more abundant. But that is done just for household consumption not for commercial purpose, it is learnt.

The local people consume the meat of snake if it is available. However, there are no villagers hunting for snake as in the neighbouring country, Thailand. There is also no illegal trading of snakes for export to China, taking place in the area.



Figure-76: *Occidozyga martensii*



Figure-77: *Kaloula pulchra*



Figure-78: *Calotes versicolor*



Figure-79: *Gekko gekko*



Figure-80: *Ahaetulla nasuta*



Figure-81: *Boiga orchacea*



Figure-82: *Cryptelytrops albolabris*



Figure-83: *Xenochrophis piscator*

(c) Mammalian fauna

Methodology in brief

As the wildlife was very rare and the chance for encounter was exceedingly low no systematic transect line, plots and points were designated.

The survey work mainly involved prowling stealthily in the forest looking for mammals. It was a direct intensive search carrying out day and night. Night time survey was more important for large mammals on ground. Day time survey was good for small tree dwelling mammals, such as squirrels. Photographs were taken whenever possible. Focus was also made at expected spot, such as in the valley with luxuriant grass; at spring where mammals were supposed to come and drink water in the afternoon; and at the foot of certain trees which bear fruits, supposed to be eaten by mammals during night time and also in well-shaded spot and undergrowth where the animals were supposed to rest.

The survey method also involved searching for tell-tale signs or evidences such as new or fresh scats, foot prints, scratches, tracks and trails etc. Scats and foot prints are specific and so the animal could be identified quite correctly based on these two evidences.

As wildlife is getting rare it is not possible to observe them during only one survey period. Secondary data have to be gathered from the local elders or old hunters. At least the history of the wildlife of the area can be obtained.

The EIA team have also to rely on the tell-tale signs of wildlife such as foot prints, scats, traces, scratches and resting spots (of course standard methods in biodiversity study).

Another main work was gathering information from hunters (who were very few indeed) and also from old and retired hunters. That was simply gathering secondary data, and looking for recently acquired trophies (horns), leathers and other body parts of the wild animals, if any.

Diversity

A total of 13 species of mammals including those actually found (primary data) and those gathered from the information (secondary data), were recorded. They belong to 10 families under 6 orders.

The families were Manidae (pangolin), Hylobatidae (gibbon), Mustelidae (badger), Viverridae (civet), Herpestidae (mongoose), Felidae (jungle cat), Suidae (wild pig), Cervidae (muntjac), Leporidae (hare) and Muridae (rat).

Table-17: The checklist of mammal species from the study area

Sr. no.	Order	Family	Common Name	Scientific Name	IUCN Red list	CITES	Type of evidence	Track & Sign	Information
1	Pholidota	Manidae	Sunda Pangolin	<i>Manis javanica</i>	CR	II	information		√
2	Primates	Hylobatidae	White-handed Gibbon	<i>Hylobates lar</i>	EN		information		√
3	Carnivora	Mustelidae	Large-toothed Ferret Badger	<i>Melogale personata</i>	DD		information		√
4		Viverridae	Small Indian Civet	<i>Viverricula indica</i>	LC	III	information		√
5			Large Indian Civet	<i>Viverra zibetha</i>	NT	III	information		√
6			Common Palm Civet	<i>Paradoxurus hermaphrodites</i>	LC	III	information		√
7		Herpestidae	Small Asian Mongoose	<i>Herpestes javanicus</i>	LC		information, footprint	√	√
8		Felidae	Jungle Cat	<i>Felis chaus</i>	LC		information		√
9			Leopard Cat	<i>Prionailurus bengalensis</i>	LC		information		√
10	Atriodactyla	Suidae	Eurasian Wild Pig	<i>Sus scrofa</i>	LC		information		√
11		Cervidae	Red Muntjac	<i>Muntiacus muntjak</i>	LC		information		√
12	Largomorpha	Leporidae	Siamese Hare	<i>Lepus peguensis</i>	LC		information		√
13	Rodentia	Muridae	House Rat	<i>Rattus rattus</i>	LC		sighting	√	

Source: All are secondary data except, house rat.

As can be seen in the table all the information are only secondary information (recent) gathered from the locals. Only rats and foot prints of mangoose were actually seen.

Distribution, abundance/dominance

It is not possible to study the distribution abundance and /or dominance as the wildlife were not actually found or their presence noticed, except rats and mongoose.

Although mammalian species were relative abundant and wide spread 20 years ago, they have greatly decreased almost to total depletion now because of exploitation for commercial purpose. The sunda pangolin (CR) and white-handed gibbon (EN) were not seen of any evidences, just only information could be obtained. Many people are encroaching in the reserved forest due to their requirement for food and fire wood. And due to development of

roads, illegal logging was carried out by more local people both by car and motorbike at night. Therefore, the current distribution of mammals is now highly fragmented in much of this range.

Rare and endangered species

All the species mentioned above, with the exception of rats, mongooses and certain civets, are extremely rare or no longer exists in the area. According to IUCN red list 2014, Sunda pangolin is Critically Endangered (EN); White-handed gibbon is Endangered (E); Large India Civet is Near Threatened (NT) and Ferret badger is in the category of Deficient Data (DD). The remaining 9 species including civet, mongoose, cat, rat etc. are in the category of Least Concern (LC).

(d) Aquatic organisms

Methodology in brief

Plankton study was made for basic aquatic taxonomy and ecology. Fish study was for ichthyological and fisheries resource study.

Diversity

a) Plankton

A total of 38 species of phytoplankton and 24 species of zooplankton all together totalling 62 species were recorded.

The classified list of plankton is as follow:

1) Phytoplankton

Phylum	Cyanophyta	Family	Nostocaceae
Class	Cyanophyceae	Genus	<i>Aphanizomenon</i>
Order	Oscillatoriales	Species	<i>Aphanizomenon flos.aquae</i>
Family	Oscillatoriaceae		
Genus	<i>Oscillatoria</i>	Phylum	Bacillariophyta
Species	<i>O. scillatoria curviceps</i>	Class	Bacillariophyceae
	<i>O. limosa</i>	Order	Centrales (Centricae)
	<i>O. tenuis</i>	Family	Coscinodiscaceae
Order	Nostocales	Genus	<i>Cyclotella</i>
		Species	<i>Cyclotella stelligira</i>
Order	Pernales (Pernate)	Genus	<i>Navicula</i>
Family	Tabellariaceae	Species	<i>Navicula anglica</i>
Genus	<i>Climacosphenia</i>		<i>N. lacustris</i>
Species	<i>Climacosphenia moniligera</i>		<i>N. lanceolata</i>

Family	Diatomaceae		<i>N. radiosa</i>
Genus	<i>Diatoma</i>		<i>N. viridis</i>
Species	<i>Diatoma elongatum</i>	Family	Cymbellaceae
		Genus	<i>Cymbella</i>
Family	Fragilariaceae	Species	<i>Cymbella affinis</i>
Genus	<i>Fragilaria</i>		<i>C. ventricosa</i>
Species	<i>Fragilaria capucina</i>		
	<i>F. construens</i>	Family	Nitzschiaceae
	<i>F. crotonensis</i>	Genus	<i>Nitzschia</i>
	<i>F. virescens</i>	Species	<i>Nitzschia acicularis</i>
			<i>N. amphibian</i>
Genus	<i>Synedra</i>		<i>N. frustulum</i>
Species	<i>Synedra acus</i>		<i>N. scalaris</i>
	<i>S. affinis</i>		
	<i>S. tabulata</i>	Phylum	Chlorophyta
		Class	Chlorophyceae
Family	Naviculaceae	Order	Chlorococcales (Centricae)
Genus	<i>Pleurosigma</i>	Family	Scenedesmaceae
Species	<i>Pleurosigma fasciola</i>	Genus	<i>Crucigenia</i>
		Species	<i>Crucigenia</i> sp.
Order	Ulotrichales	Phylum	Dinophyta (Pyrrophyta)
Family	Ulotrichaceae	Class	Dinophyceae
Genus	<i>Hormidium</i>	Order	Dinoflagellata
Species	<i>Hormidium Subtile</i>	Family	Glenodiniaceae
		Genus	<i>Glenodinium</i>
Order	Oedogoniales	Species	<i>Glenodinium</i> sp.
Family	Oedogoniaceae		
Genus	<i>Oedogonium</i>	Family	Ceratiaceae
Species	<i>Oedogonium plusiosporum</i>	Genus	<i>Ceratium</i>
		Species	<i>Ceratium cornutum</i>
			<i>C. hirundinella</i>
Order	Cladophorales		<i>C. kofoidi</i>
Family	Cladophoraceae		
Genus	<i>Rhizoclonium</i>	Family	Gonyaulaceae
Species	<i>Rhizoclonium hieroglyphicum</i>	Genus	<i>Gonyaulax</i>
		Species	<i>Gonyaulax</i> sp.
Order	Zygnematales		
Family	Zygnemataceae		

Genus *Mougeotia*
 Species *Mougeotia japonica*
M. scalaris

2) Zooplankton

Phylum	Protozoa	Species	<i>Diffflugia globulosa</i>
Class	Sarcodina		<i>D. limnetica</i>
Order	Testacea (Lobosia)		<i>D. urceolata</i>
Family	Arcellida		<i>Diffflugia</i> sp.
Genus	<i>Diffflugia</i>		

Genus *Centropyxis*
 Species *Centropyxis ecornis*

Genus *Keratella*
 Species *Keratella valga*
K. valga var. *asymmetrica*
K. valga var. *tropica*
K. valga var. *valga*

Class Ciliata
 Order Holophricha
 Family Holophryidae
 Genus *Holophrya*
 Species *Holophrya simplex*

Family Asplanchnidae
 Genus *Asplanchna*
 Species *Asplanchna priodonta*

Order Trichostomina
 Family Paramecidae
 Genus *Paramecium*
 Species *Paramecium* sp.
 Family Frontoniidae
 Genus *Frontoniella*
 Species *Frontoniella* sp.

Family Trichocercidae
 Genus *Trichocerca*
 Species *Trichocerca longiseta*

Phylum Trochelminthes
 Class Rotifera (Rotatoria)
 Order Monogononta
 Family Brachionidae
 Genus *Brachionus*
 Species *Brachionus caudatus*
B. falcatus
B. forficula
B. quadridentatus

Order Flosculariaceae
 Family Testudinellidae
 Genus *Filinia*
 Species *Filinia opoliensis*

Phylum Arthropoda

Phylum Nematelminthes
 Class Nematoda
 Species *Unidentified nematode*

Sus class Copepoda

Class	Crustaceae	Order	Calanoida
Sus class	Entomostraca	Family	Diaptomidae
Order	Cladocera	Genus	<i>Eodiaptomus</i>
Family	Sididae	Species	<i>Eodiaptomus japonicus?</i>
Genus	<i>Diaphanosoma</i>		
Species	<i>Diaphanosoma lorachyurum</i>	Order	Cyclopoida
		Family	Cyclopidae
Family	Daphnidae	Genus	<i>Cyclops</i>
Genus	<i>Ceriodaphnia</i>	Species	<i>Cyclops</i> sp.
Species	<i>Ceriodaphnia</i> sp		
		Genus	<i>Microcyclops</i>
Order	Ostracoda	Species	<i>Microcyclops</i> sp.
Family	Cypridinidae		
Genus	<i>Cypris</i>	Genus	<i>Eucyclops</i>
Species	<i>Cypris</i> sp	Species	<i>Eucyclops</i> sp.
Species	Unidentified Ostracod		

Distribution, abundance/dominance

In phytoplankton, species of diatoms dominated (60%) all others followed by green algae (17%), dinoflagellates (13%) and blue green algae (10%).

In zooplankton, rotifers dominated (32%) all others, followed by protozoa (29%), copepods (17%), ostracods and cladocerans (both 9%) and nematodes (4%).

As regards number of individual in zooplankton nauplius larvae of copepod dominated (30%) all others; followed by copepodites youngs (25%), copepods and rotifers (both 20%). Cladocerans, ostracods and nematodes were rare.

Rare and endangered species

Blue green algae very commonly found in fresh water environment in Myanmar were rare in this lotic water environment.

Dinoflagellates were very rare.

The phytoplankton and zooplankton were not yet included in the IUCN Red list (probably due to small size and not easily recognizable).

Species of economic and health/ nutritional values

Fresh water plankton are not utilized as food in Myanmar (only certain marine plankton species, were utilized, especially macro and megalzooplankton species).

b) Fish and prawn

Diversity

Table-18: List of fish species (from secondary information)

Sr. No	Scientific name	Common name	Local name	Family
1.	<i>Punticus burmanicus</i>	Barb	Nga-khone-ma	Cyprinidae
2.	<i>P. stigma</i>	Barb	Nga-khone-ma	Cyprinidae
3.	<i>Crossochilus latia</i>	Carp	Nga-loo	Cyprinidae
4.	<i>Chana bachua</i>	Brown snake head	Nga-yant-gaung-toe	Channidae
5.	<i>Anabas testudineus</i>	Climbing parch	Nga-byay-ma	Anabantidae
6.	<i>Lepido-cephali-chrys guinea</i>	Loach/sand eel	Nga-tha-lei-doe	Cobitidae
7.	<i>Ompok patio</i>	Butter cat fish	Nga-nu-thann	Siluridae
8.	<i>O. bimaculata</i>	Butter cat fish	Nga-nu-thann	Siluridae
9.	<i>Clarius batrachus</i>	Walking cat fish	Nga-khoo	Clariidae
10.	<i>Heteropneustes</i>	Stinging cat fish	Nga-gyee	Clariidae
11.	<i>Mystus cavasius</i>	River cat fish	Nga-zin-yaing	Bagridae
12.	<i>Masta cembelus armatus</i>	Spring eel	Nga-mwei-doe	Mastacembelidae
13.	<i>Macrognathus sp</i>	Zip-zig eel	Mwei-na-garr	Mastacembelidae

There was no information on prawn or shrimp of the stream.

Rare and Endangered species

None of these fish were in the IUCN Red List.

Species of economic and health/ nutritional values

All were edible fish and consumed by the local community. The locals caught the fish just occasionally for household consumption only or in a few cases for supplementing their meagre incomes. Due to scarcity of fish no villager could eke out a living as a fisherman; he has to do other odd jobs for survival. Yay-pu Chaung stream or the larger Mei-hor stream could not support even a small scale subsistence fishery.

4.4.7 Invasive Alien Species

Mimso rubicaulis Lam (Japan-hti-ka-yone or Bilatt htikayone) is found in the area. It is a ubiquitous and notorious invasive alien species dominating all other herb or small plants within a short time (a few months) after colonizing an area, especially in low land plain area. But it is not dominant in this area.

There are also opportunistic species such as *Chromolaena odorata* (Bee-zart) and certain species of poacea (grass) that quickly colonize a spot when big trees are removed. They rarely persist for long but later dominated by other longer plants such as shrub/woody shrub and trees.

No other invasive alien species are known to thrive here.

(Kudzu plant, *Puemaria montana* is a very notorious invasive alien plant known to thrive profusely in Japan, E. Asia and S.E Asia but not found in this area.)

The common toad, *Duttaphrynus melanosticus* (formerly *Bufo bufo*) was found in the area It is a well-known invasive species, but only small number were found during this survey in dry season. It reproduces in great number in rainy season.

4.4.8 Feral Animals

From information gathered from locals there are no known feral animals in the area. (In certain remote area of Myanmar water buffaloes become feral animals/wild buffaloes after losing contact with their owner; roaming wildly in the forest, it is learnt; but there are no such wild buffaloes here. Stray dogs can be termed feral animals but there is no information on stray dogs in this area.) Unlike the situation in cities where stray dogs reproduce in great number strays dogs are absent in rural villages.

4.5 Socio-economic Components

Socio-economic survey was conducted by members of MESC the data are mostly secondary data provided by the interviewees.

4.5.1 Administrative Organizations and Limits

Aung Nan Cho Village is under the jurisdiction of Zali-nget-gyi Taung Village Tract, Lewei Township, Nay Pyi Taw Council Area. The Zali-nget-gyi Taung Village Tract comprises, Zali-nget-gyi Taung, Tae-kyi-kone, Aung Nan Cho, Aung Chan Thar, Aung Thar Yar and Aung Silar Villages.

Aung Nan Cho Village is situated about ½ mile northeast of Max Myanmar Manufacturing Cement Factory and about 1½ miles northwest of Pha-yar-kone proposed limestone mining site.

4.5.2 Social Profile

The basic socio-economic aspects of the surrounding environment are as followings.

Table-19: Basic socio-economic aspects

Sr. No.	Socio-economic aspects/parameters	Facts and figures	
		Aung Nan Cho	Tae Kyi Kone
1.	<u>Population</u>	744	244
	Males	369	125
	Females	375	119
2.	<u>Religion (%)</u>		
	Buddhists	30%	80%
	Christian	70%	20%
	Other	-	-
3.	<u>Ethnicity (%)</u>		
	Bamar	25%	70%
	Kayin	63%	30%
	Kayan	10%	-
	Others (Shan, Rakhine, Chin	2%	-
4.	<u>Education status (%)</u>		
	Literacy rate (adult) (Mostly primary education and Baka education)	85%	70%
5.	<u>Living conditions (Material life style) (%)</u>		
	Wooden houses	60%	80%
	Bamboo	10%	
	Brick house	30%	20%
6.	<u>Materials possession of each households (%)</u>		
	Cars (Nos)	1 sedan	3sedan
		2 truck	-
	Motorcycle (%)	80%	80%
	Television set (%)	20%	70%
	Hand phone (%)	80%	90%

4.5.2.1 Demography

Aung Nan Cho Village has 160 houses, 160 households and a population of 744 (Male: 369; Female: 375). Tae Kyi Kone Village has 56 houses, 56 households and a population of 244. (Male: 125; Female: 119).

Age under 18 : 61%

Age above 18 : 39%

4.5.2.2 Communities

Based on religion there are two communities, the majority Christian community and the minority Buddhist community. 80% of communities of Tae Kyi Kone village is Buddhist and the remaining 20% is Christian. 30 % of the communities of Aung Nan Cho village is Buddhist and the other 70 % is Christian.

Based on ethnicity there are three communities, namely the Kayan, Kayin and Bamar communities.

However, the three said ethnic people coexist peacefully together as one whole community.

4.5.2.3 Education

Aung Nan Cho Village has one Middle School with 380 students and 19 teachers. Aung Nan Cho has one library. The literacy rate of Aung Nan Cho and Tae Kyi Kone are 85 % and 70 % respectively.

Adult literacy rate is quite high: 85%, as most are Christians. Virtually all adults can read, write and do simple sum to a certain extent.

4.5.2.4 Vulnerable Groups

On the whole the local people are poor but there are no vulnerable groups as the economic gaps between the rich and poor are not wide. There are no castes or no hereditary social classes and subclasses as in India or some African countries. There are also no beggar society (or beggar village) as it used to be in certain villages in the Dry Zone Area, in the past.

Actually, there are no social outcasts in this village and in this area.

The three ethnic groups, Kayan, Kayin and Bamar, are in good relation and there is no discrimination against race or religion.

4.5.2.5 Ethnic Minorities

60% of the villagers are Kayan, 25% are Kayin and 8% are Bamar. 7% are Shan, Rakhine and Chin.

4.5.2.6 Gender

Of the village total population of 744 at Aung Nan Cho Village 369 are males while 375 are females.

There is no discrimination against sex and there is a more or less gender parity or equality in this rural area.

4.5.2.7 Religion

80% of communities of Tae Kyi Kone village is Buddhists and the remaining 20% is Christians. 30 % of the communities of Aung Nan Cho village is Buddhists and the other 70 % is Christians.

Aung Nan Cho Village has two churches (Roman Catholic and Baptist) and one Buddhist Monastery was built by Max Myanmar Manufacturing Company. Tae Kyi Kone village has no monastery but one church.

4.5.2.8 Political and Social Organizations

The villagers both Christian and Buddhists are on the whole peaceful, quiet and simple people.

There is no known political and social organization in this village. Being a predominantly Christian Village there are no traditional Buddhists religion organization such as "Wut-yut-ah-thinn" or religious verses recitation group. But there are general Kar-la-tharr (young men) and Kar-la-thamee (young women) organization that involve in village community works especially in social occasion of joy or grief (Thar-yay or Nar-yay).

There are no signboards of political parties such as signboard of the National League for Democracy (NLD) party or the Union Solidarity and Development (USAD) party.

4.5.3 Economic Profile

The incomes and livelihoods of the locals of the five villagers are shown in tabulated form.

Table-20: Basic income and livelihood

Sr. No.	Livelihood and income	Villages	
		Aung Nan Cho	Tae Kyi Kone
1.	<u>Farmers (percentage of households)</u>	80%	-
	<u>Main crops</u>		
	Sesame	√	√
	Bean	√	√
	Sugar cane	√	√
	Ground nut	-	-
	Maize	-	√
	Rice (minor)	-	-
2.	<u>Seasonal works/odd jobs (percentage of households)</u>	20%	almost 100% (no farmer)

- Based from HHI on 10% of households encompassing main livelihoods.
- The daily wages in this area range from Ks 4000-6000 for males and Ks 3500-4000.

4.5.3.1 Employment

It is difficult to gauge the rate of employment or unemployment as many are working seasonal jobs and odd jobs and the nature of employment is mostly on and off employment. On the whole employment is quite high in this area.

80 % of Tae Kyi Kone Villagers are worked at factory and the remaining 20 % are full time farmers or part time farmers. 10 % of Aung Nan Cho Villagers are worked at the factory and the remaining 90 % are full time farmers or part time farmers. The main crops are peanuts, sesames, corn and green beans.

4.5.3.2 Traditional Production System

There are no well-known or famous local products, local goods or any well-known locally produced artifacts.

The local agricultural products include sesame, bean and sugar cane, maize and ground nut (rice is a minor crop here). Virtually all crops are for local consumption or local market.

Sesame, been and sugar are still mainly produced in traditional way. There is no large scale farming or cultivation of these crops. Rice is grown only for household consumption.

4.5.3.3 Household Income

It is difficult to estimate the household income from each household. Usually the head of a household does not know the actual annual income of his household. Most even cannot tell their monthly income as they keep no records (banking system does not exist in rural area; rural people do not go to bank). Those involved in seasonal jobs and odd jobs can never tell or even guess their annual income.

The official per capita income (Township Administration Department, to 2017-2018) for Lewei Township is only Ks. 689,215.

From the rough estimates provided by the village administrator, elders and knowledgeable people the households income's range from Ks. 100,000 to more than Ks. 500,000.

Roughly 20% of the households have annual income of Ks. 7-12 lakhs

Roughly 45% of the households have annual income of Ks. 13-20 lakhs

Roughly 20% of the households have annual income of Ks. 21-35 lakhs

Roughly 10% of the households have annual income of Ks. 36-50 lakhs

Roughly less than 5% of the households have annual income of Ks. 51 lakhs and above.

When compare with some remote villages of the Township the villagers of Aung Nan Cho are a little better off.

This is the rough estimation given by them and cannot reflect a true picture. A very few have their off springs or relatives working abroad. Many do not really know the exact amount at all as they have no records.

As regards monthly income the answer is also not much better as many are working seasonal jobs and odd jobs; farmers/planters/cultivators do not have regular monthly income (income only after harvest).

As regards daily wages the range is from Ks 4000 for female worker to Ks 7000 for male worker.

The growth rate of the local economy and the local GDP are not known.

4.5.3.4 Cost of Living

Inflation (moderate to high) is the natural phenomenon of Myanmar and, therefore, the cost of living even in a rural village is high. This situation is exacerbated by the fact that the inflation is high, the purchasing power kyat is very low and the per capital income is very low, the lowest in ASEAN nations (only 1/10 of Thailand; and 1/50 of Singapore). The situation in Aung Nan Cho, Tae Kyi Kone and neighboring villages is not an exception; the inflation is high and so is the cost of living. Just like urban people from Yangon and other big cities the locals of the area have to live under the high cost of living.

4.5.3.5 Land Ownership

The area on the whole is relatively thickly populated.

The land on the whole is scarce in this area and there are no large flat terrains for large scale cultivation. In the east is the forested mountains and valleys, the Mei-hor Reserve Forest. Virtually all land owner villagers own a small plot of orchard land or as small paddy field, none of them more than 50 acres. Most own less than 10 acres plot of land. Many still do not own any land at all.

4.5.3.6 Local Businesses

The local business is typically agricultural business and sugar cane, bean and sesame are the main crop. But there is no large-scale cultivation of sugar cane, bean and sesame only small scale and medium scale. There are also no substantial animal farms.

Crops are grown only one season per year. A few households are involved in setting up house stalls selling commodities. About 25 are working in 2 cement factories.

The only industrial business that exists in the area is the two cement factories and limestone mining business. Many locals are involved in very small scale limestone and other rock quarries; some are illegal, it is learnt.

Fuel wood and charcoal are extracted from the forest but mostly for local consumption some are sold at the nearby towns e.g. Lewei and Yay-ni.

4.5.3.7 Agriculture

As mentioned earlier agriculture is the typical business. Sugar cane, bean and sesame are the main crops grown; other crops grown are of minor importance. Due to uneven terrain and limited cultivable land there is no major agricultural business or no large scale cultivation of rice. All paddy fields are small in size and are not so productive. Rice production per acres is on the average is less than 70 tins (basket or bushel). Rice is grown only in one season, the rainy season (moe-sa-bar). The technology is typically traditional and old fashioned. The farms (sugar cane, bean, sesame) are also mostly small in size.

Labour shortage is quite a serious issue. Farm and field owners are finding it and more difficult each year to get labours (farm hands). Most young people are no longer interested in working in farms and fields here. They are not to blame; the wages/payments are low.

The agriculture on the whole can be termed small scale or subsistence agriculture. There are also very small scale (ta-naing-ta-paing) rearing of animals such as chickens, ducks and pigs. No substantial animal farms exist in the area.

4.5.3.8 Forestry

Mei-hor Reserved Forest dominates the whole area. In forests are partially degraded but fuel wood and charcoal can be still extracted from the forest. Wood and bamboo are still exploited as building materials.

None of the villagers are involved in the planting and growing of trees in the forest. There is also no silviculture (care and development of forest) by the locals. There are clandestine timber extraction and production of charcoal from the partially degraded forest. Unlike some villages in the Dry Zone of Myanmar, there is also no Community Forest, yet.

4.5.3.9 Fisheries and Aquaculture

There are 3 small streams and one large stream (rivulet), Mei-hor Chaung in the area. There is no substantial fishery and aquaculture but only subsistence fishery mainly for household consumption.

The Mei-hor Stream is a relatively large stream (rivulet) and fish used to abound in the stream several decades ago; but that is no longer the case now. The fish known to exist in the stream are also mentioned earlier (from secondary information). Only few villagers catch fish from this stream for household consumption. One cannot eke out a living as a fisherman in the area; fish are getting scarcer each year.

4.5.3.10 Industry

There are two large cement factories, one owned by Max Myanmar Manufacturing Company and another by NCDC. There is also a limestone and other rock mining/quarry site runs by the Asia World Co., Ltd. There are also some small scale quarries in the far vicinities operated by other small companies or by the locals.

Except the above-mentioned businesses there are no other industry or even cottage industry in the area.

4.5.3.11 Mineral Development

There is no mineral development in this area. As limestone cannot be termed "mineral," it can be simply stated that there is no mineral development in the area.

4.5.3.12 Tourism

There is no tourism industry/business in the area. There are no scenic spots or places of aesthetic beauty to attract tourists.

4.5.4 Health Profile

The Max Myanmar Manufacturing Co., Ltd has the factory clinic. According to the factory clinic 2020 data, there is no communicable disease. The data are as following:

မက်စ်ဘီလပ်မြေစက်ရုံ၊ စက်ရုံဆေးခန်း
လစဉ်ရောဂါဖြစ်ပွားမှုအခြေပြဇယား(၂၀၂၀ခုနှစ်)

စဉ်	ရောဂါအမျိုးအမည်	ဇန်နဝါရီလ		ဖေဖော်ဝါရီလ		မတ်လ		ဧပြီလ		မေလ		ဇွန်လ		ဇူလိုင်လ		ဩဂုတ်လ		စက်တင်ဘာလ		အောက်တိုဘာလ		နိုဝင်ဘာလ		ဒီဇင်ဘာလ		မှတ်ချက်
		ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	ဝန်ထမ်း	မိသားစု	
၁	အအေးမိနာစေး	၃၂	၇၇	၄၃	၄၇	၂၉	၄၇	၁၉	၁၆	၁၃	၁၂	၁၇	၂၀	၁၂	၄၂	၁၉	၂၅	၂၃	၁၅	၁၂	၁၃	၃၁	၃၀	၂၇	၃၈	
၂	အထွေထွေအားနည်း	၇	၁၈	၁၂	၁၂	၂၀	၂၃	၁၈	၁၃	၂၁	၁၄	၁၃	၂၄	၂၀	၁၃	၁၈	၁၃	၁၀	၉	၁၂	၁၅	၁၁	၉	၇	၈	
၃	ဝမ်းကိုက်	-	-	-	-	-	၂	၁	၁	-	၁	၁	-	၁	-	-	-	-	-	-	-	၁	-	-	၁	
၄	အဆုတ်လမ်းကြောင်း	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
၅	မွေး/ပိ/ညှင်း/ယားနာ	၁	၃	၅	၅	၅	၆	၆	၂	၅	၄	၆	၉	၄	၇	၁၂	၄	၆	၇	၄	၅	၆	၄	၄	၄	
၆	ထိခိုက်ဒဏ်ရာ	၁	-	၁	-	၁	-	-	-	-	-	-	-	-	-	-	-	၁	-	၁	-	-	-	-	-	
၇	အဆစ်အမြစ်ကိုက်	၆	၄	၇	-	၆	၅	၆	၃	၆	၄	၉	၆	၈	၈	၉	၂	၃	၁	၁၃	၇	၉	၆	၈	၃	
၈	ဇရာနာ	၁၁	၁၆	၁၁	၁၃	၅	၁၁	၈	၁၈	၁၀	၁၀	၁၁	၁၇	၇	၈	၁၂	၂၀	၅	၇	၉	၁၁	၈	၇	၈	၈	
၉	ငှက်ဇရာ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
၁၀	သွေးတိုး	၁၀	၁၄	၁၃	၁၂	၁၈	၉	၉	၇	၁၆	၂	၁၁	၁၃	၈	၁၄	၈	၁၀	၁၀	၁၁	၂၁	၁၀	၈	၈	၁၅	၈	
၁၁	ရိုက်နာ	၅	၁၄	၈	၈	၅	၁၀	၁၁	၁၆	၁၃	၁၂	၈	၇	၁၀	၁၁	၁၀	၉	၁၀	၇	၁၀	၃	၄	၆	၈	၆	
၁၂	မျက်စိနာ	၂	-	၃	-	၃	-	၃	-	၃	-	၃	-	၂	၁	၁	၂	၃	၁	၂	-	၃	၁	၃	၁	
၁၃	နား/နားခေါင်း/လည်းရောင်း	၁	-	-	-	-	-	-	-	၁	၂	-	၁	၁	-	-	-	၁	-	-	၁	၁	-	၁		
၁၄	ဝမ်းပျက်/ဝမ်းလျှော	၁	၇	၅	၉	၃	၁၁	၁	၂	၄	၃	၃	၄	၄	၆	၂	၅	၄	၈	၃	၉	၁	၂	၅	၄	
၁၅	မိနာ	၆	၁	၈	၁	၃	၁	၂	-	၅	၁	၆	၂	၄	-	၁၀	၂	၅	-	၃	၂	၃	၁	၂	-	
၁၆	သံဆူး	၁	-	-	-	-	၁	၂	-	-	-	-	၁	-	၁	၁	၁	၁	-	-	-	-	-	၄	-	
၁၇	သွားနှင့်သွားဆုံးရောဂါ	၁	၃	၄	၇	၂	၅	၄	၃	၆	၁	၃	၄	၃	၅	၅	၂	၁၄	၅	၄	၁	၃	၄	၃	၁	
၁၈	ခေါင်းကိုက်	၇	၃	၁၃	၁၀	၁၀	၁၄	၁၀	၉	၇	၅	၆	၈	၇	၈	၁၀	၁၀	၈	၈	၈	၅	၁၀	၉	၇	၈	
၁၉	ပြည်တည်နာ	၁	-	၁	-	၃	-	၂	၁	၃	-	၃	-	-	-	-	-	-	၁	၁	-	၁	-	၂	၃	
၂၀	လည်ရောင်နာ	၈	၈	၇	၉	၄	၄	၆	၄	၂	၃	၄	၆	၃	၄	၃	၅	၁	၁	၄	၃	၃	၂	၅	၄	
၂၁	ပန်းနာရင်ကြပ်	၁	၁	၁	-	၁	၂	၁	၂	၂	-	၁	၁	-	၁	၁	၂	၁	-	၁	၁	၁	၁	၁	၁	

၂၂	ရွေးကိုင်	-	-	၁	၂	၁	၁	-	-	-	-	-	၂	-	-	-	၁	-	-	-	-	-	-	-	၁	-
၂၃	ရင်အောင့်	၁	-	-	-	-	၂	၁	-	-	၁	-	-	-	၁	-	၁	-	-	-	-	-	၁	-	၁	-
၂၄	အနာ	၇	၁၀	၂	၆	၇	၄	၁၁	၃	၁၄	၉	၃	၄	၁၀	၄	၅	၄	၁၄	၃	၈	၄	၃	၂	၇	၅	-
၂၅	ဆီးလမ်းကြောင်း	၁	၁	၁	၁	-	၁	-	၁	၂	၂	၃	၂	၁	-	၁	-	၁	၁	၃	၁	-	-	၁	-	-
၂၆	အပူလောင်	-	-	-	-	-	-	၂	၁	၂	-	၁	-	-	၁	-	-	၂	၁	-	-	-	-	-	-	-
၂၇	ရေယုန်	-	-	-	-	-	-	-	-	-	-	-	-	၁	-	၂	-	-	-	-	-	-	-	-	-	-
၂၈	ရေကျောက်/ဝက်သက်	-	-	-	၄	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	၁	-	-	-	-
၂၉	ပါးချိပ်ရောင်	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	၁	-	၂	-	-
၃၀	သွေးလွန်တုတ်ကျွေး	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
၃၁	ပျားထုတ်/ကင်းကိုက်/ ပိုးမွှားကိုက်	-	-	-	-	-	-	-	-	၁	-	-	-	-	၁	-	-	၂	၁	၁	-	-	၁	-	၁	-
* စုစုပေါင်း		၁၁၁	၁၈၀	၁၄၆	၁၄၆	၁၂၆	၁၅၉	၁၁၁	၁၀၂	၁၃၅	၈၅	၁၁၄	၁၃၁	၁၀၆	၁၃၇	၁၃၀	၁၁၉	၁၂၅	၈၈	၁၂၀	၉၂	၁၀၈	၉၇	၁၁၇	၁၀၇	-
		၂၉၁		၂၉၂		၂၈၅		၂၁၃		၂၂၀		၂၄၅		၂၄၃		၂၄၉		၂၁၃		၂၁၂		၂၀၅		၂၂၄		-

Source: Cement factory clinic

Figure-84: The Factory Clinic Health Data of Worker and Their Family

မက်စ်ဘီလပ်မြေစက်ရုံ ၊ စက်ရုံဆေးခန်းရောဂါဖြစ်ပွားမှုအခြေအနေပြဇယား
(ပတ်ဝန်းကျင်ပြင်ပ) ၂၀၂၀ခုနှစ်

စဉ်	ရောဂါအမျိုးအမည်	ဇန်နဝါရီလ	ဖေဖော်ဝါရီလ	မတ်လ	မှတ်ချက်
၁	အအေးမိနာစေး	၃	၃	၅	
၂	အထွေထွေအားနည်း	၅	၄	၆	
၃	ဝမ်းကိုက်	-	-	-	
၄	အဆုတ်လမ်းကြောင်း	-	-	-	
၅	ပွေးဝါ/ညှင်း/ယားနာ	-	-	-	
၆	ထိခိုက်ဒဏ်ရာ	-	-	-	
၇	အဆစ်အမြစ်ကိုက်	-	-	-	
၈	ဖျားနာ	-	-	-	
၉	ငှက်ဖျား	-	-	-	
၁၀	သွေးတိုး	-	-	၂	
၁၁	ဗိုက်နာ	၂	-	-	
၁၂	မျက်စိနာ	-	-	-	
၁၃	နား/နားခေါင်း/လည်းချောင်း	-	-	-	
၁၄	ဝမ်းပျက်/ဝမ်းလျှော	၁	၁	၂	
၁၅	ခါးနာ	-	-	-	
၁၆	သံဆူး	-	-	-	
၁၇	သွားနှင့်သွားဖုံးရောဂါ	-	၁	၁	
၁၈	ခေါင်းကိုက်	-	၂	-	
၁၉	ပြည်တည်နာ	-	-	-	
၂၀	လည်ချောင်းနာ	-	-	-	
၂၁	ပန်းနာရင်ကြပ်	-	-	-	
၂၂	ရွေးကိုက်	-	-	-	
၂၃	ရင်အောင့်	-	-	-	
၂၄	အနာ	၂	၂	-	
၂၅	ဆီးလမ်းကြောင်း	-	-	-	
၂၆	အပူလောင်	-	-	-	
၂၇	ရေယုန်	-	-	-	
၂၈	ရေကျောက်/ဝက်သက်	-	-	-	
၂၉	ပါးချိုပ်ရောင်	-	-	-	
၃၀	သွေးလွန်တုတ်ကျွေး	-	-	-	
၃၁	ပျားတုတ်/ကင်းကိုက်/ပိုးမွှားကိုက်	-	-	-	
စုစုပေါင်း		၁၃	၁၃	၁၆	

မှတ်ချက် - ၂၀၂၀ခုနှစ်ဧပြီလမှစပြီး ၊ Covid-19 ရောဂါကာကွယ်ရေးအတွက်ပြင်ပလူများဝင်ရောက်ခွင့်မပြုတော့ပါ

Figure-85: The Factory Clinic Health Data of Villagers

4.5.4.1 Access to Health Service

According to the Lewei Township data, there is one rural health branch in Aung Thar Yar and one branch in Aung Si La. Although the other village has no health branch, Lei-way, Thit Pote Pin, Alar, Thar Watti has hospital. Aung Nan Cho village has one factory clinic that was supported by Max Myanmar Manufacturing Company Limited.

4.5.4.2 Access to Water Supply

The water for Aung Nan Cho and Tae Kyi Kone is sourced from Yay Pu Chaung Stream. The water is stored at the tank.

4.5.4.3 Mortality and Morbidity

According to the Lewei Township data, The morbidity of Lewei township is diarrhea (1725 persons) and the mortality is Tuberculosis (TB) (25 persons). The detail data are as followings:

Table-21: The mortality and morbidity data of Lewei Township

No.	Township	Types of Diseases									
		Malaria		Diarrhea		Tuberculosis (TB)		Dysentery		Hepatitis	
		morbidity	mortality	morbidity	mortality	morbidity	mortality	morbidity	mortality	morbidity	mortality
1.	Lei-Way	7	-	1725	1	619	25	404	-	36	-
Total		7	-	1725	1	619	25	404	-	36	-

Source: Lewei Township Data (mimu township profile)

4.5.4.4 Nutrition Levels

The main food of Aung Nan Cho and Tae Kyi Kone Villagers is rice. Some of the required rice is obtained from farms. Beside rice, corn, bean, sesame and sugar crane are also obtained. The nutrition level of villagers are high since the fresh fruits, vegetables and food is obtained.

4.5.4.5 Communicable Diseases

According to the Lewei Township data and Max Myanmar Manufacturing factory clinic, 2020 data, there is no communicable diseases.

4.5.5 Land Use

The area on the whole is relatively thickly populated.

The land on the whole is scarce in this area and there are no large flat terrains for large scale cultivation. In the east is the forested mountains and valleys, the Mei-hor Reserve Forest. Virtually all land owner villagers own a small plot of orchard land or as small paddy field, none of them more than 50 acres. Most own less than 10 acres plot of land. Many still do not own any land at all.

4.5.6 Infrastructure Facilities

Infrastructure Facilities of Aung Nan Cho, Aung Chan Thar, Aung Thar Yar, Aung Silar and Tae Kyi Kone are as followings:

Table-22: Basic socio-economic aspects

Sr. No.	Socio-economic aspects/parameters	Facts and figures	
		Aung Nan Cho	Tae Kyi Kone
1.	<u>Population</u>	744	244
	Males	369	125
	Females	375	119
2.	<u>Religion (%)</u>		
	Buddhists	30%	80%
	Christian	70%	20%
	Other	-	-
3.	<u>Ethnicity (%)</u>		
	Bamar	25%	70%
	Kayin	63%	30%
	Kayan	10%	-
	Others (Shan, Rakhine, Chin	2%	-
4.	<u>Education status (%)</u>		
	Literacy rate (adult) (Mostly primary education and Baka education)	85%	70%
5.	<u>Living conditions (Material life style) (%)</u>		
	Wooden houses	60%	80%
	Bamboo	10%	
	Brick house	30%	20%
6.	<u>Materials possession of each households (%)</u>		
	Cars (Nos)	1 sedan	3sedan
		2 truck	-
	Motorcycle (%)	80%	80%
	Television set (%)	20%	70%
	Hand phone (%)	80%	90%

4.5.6.1 Water Use and Water Supply

The water for Aung Nan Cho and Tae Kyi Kone is sourced from Yay Pu Chaung Stream. The water is stored at the tank.

4.5.6.2 Hospital and Medical Clinic

According to the Lewei Township data, there is one rural health branch in Aung Thar Yar and one branch in Aung Si La. Although the other village has no health branch, Lei-way, Thit Pote Pin, Alar, Thar Watti has hospital. Aung Nan Cho village has one factory clinic that was supported by Max Myanmar Manufacturing Company Limited.

4.5.6.3 School

Aung Nan Cho Village has one Middle School with 380 students and 19 teachers. Aung Nan Cho has one library. The literacy rate of Aung Nan Cho and Tae Kyi Kone are 85 % and 70 % respectively.

4.5.6.4 Road Transportation

The project is located within Lewei Township, Nay Pyi Taw. The project location is east-south 22 miles of the Lewei and east 3 mile far from YayNi-SatPhuu Taung Pa Dut Chaung Road, near the Aung Nan Cho Village. It is inside the Mei-hor Reserved Forest.

The site is 10 miles east of Yangon-Mandalay Highway; 25.5 miles South east of Nay Pyi Taw Council Area and 178 miles north of Yangon.

4.5.6.5 Navigation

According to the Lewei Township data, there is no Navigation system in these area.

4.5.6.6 Airport

According to the Lewei Township data, Nay Pyi Taw International Airport is located at the Alar Village.

4.5.6.7 Transmission Lines

The National gridline (33KV) at Thae Phyu village is far 13 miles away from the project site location.

4.5.6.8 Electricity

The electricity will be sourced from the cement factory (which is source from the gridline (33KV) at Thae Phyu village, 13 miles away). There will be back up generators in case of power outage.

4.5.6.9 Pipelines

According to the Lewei Township data and Survey data, there is no pipelines in these area.

4.5.6.10 Energy Sources

Aung Nan Cho and Tae Kyi Kone mainly use wood for kitchen uses. The required wood is obtained from the broken tree and branches. The household electricity 85% of Tae Kyi Kone and 80% Aung Nan Cho Villages is obtained from the solar system.

4.6 UXO

The project site is not located as the battle field during the Word War II. Therefore, there is no evidence of occurring the remaining mine and explosive materials.

4.7 Cultural Components

There is no historical buildings and infrastructure. Aung Nan Cho Village has two churches (Roman Catholic and Baptist) and one Buddhist Monastery was built by Max Myanmar Manufacturing Company. Tae Kyi Kone village has no monastery but one church.

4.7.1 Archaeology

According to the Lewei Township data, Phaung Taw Chat Ma Pagoda and Sa Ma Taung Pagoda (Kabar Ket Kyaw Pagoda) and Yet Kan Sin Pagoda are located at Lewei Township. But there is archaeology are located at the Aung Nan Cho and Tae Kyi Kone Village.

4.7.2 Temples and Monuments

Aung Nan Cho village has one monastery and pagoda built by Max Myanmar Manufacturing Co., Ltd.

The Former Taw-ya monastery close to NCDC cement plant was removed and rebuilt by Max Myanmar Manufacturing. The new monastery was re-named Aung Dhama Yeik Thar Set Yon Oo Kyaung. The company has also built a pagoda, the Shwe Phone Pwint Pagoda for the monastery.

The village has two churches.

Tae Kyi Kone village has no monastery but one church.

Note: No annual pagoda festival, or grand religion religious festival. No annual “nat” festival. Only normal religious events on full moon day, new moon day, and the two 8th days of the Burmese months.

4.8 Visual Components

4.8.1 Aesthetic

There is no Aesthetic view to attract the tourisms.

4.8.2 Landscape and Seascapes

There is no landscape and seascapes view to attract the tourisms.

4.8.3 Cultural Landmarks

Since Aung Nan Cho and Tae Kyi Kone villagers are Buddhists and Christians, only the monastery, pagoda and church are located. There is no cultural landmarks.

5. IMPACT ASSESSMENT AND MITIGATION MEASURES

5.1 Method and Approach to Impact Assessment

Considering the project description and the biophysical baseline results, this chapter represents the environmental, social and biodiversity impacts potentially generated by the project during the construction, mine development, operation and mine closure phase and indicates the mitigation measures to be adopted for avoiding or reduction the potential impacts.

The simple method and pragmatic approach are applied for assessment of impacts.

The 7 common impact assessment methods widely practiced are:

- Experts judgment/experts opinion/experts consensus method.
- Check list method.
- Quantitative physical and mathematical model.
- Matrix method (e.g. Leopold matrix and/or Rapid Impact Assessment Matrix (RIAM)).
- Prediction or simulation method.
- Battelle environmental evaluation system.
- Cumulative impact assessment.

Experts judgment method/experts opinion method/expert consensus method or Ad hoc method

This is a qualitative assessment method and in this EMP context this Experts judgment method is applied. The method is pragmatic and workable; it may not be so accurate but cannot go wrong. It is based on the professional opinions of experts that have considerable experience on the area of assessed impacts such as air water, soil and biodiversity. Experts judgment can be conducted to a great extent effectively even if all adequate information and data are not available.

Pragmatically expert judgment method is based on the first-hand experience at various mine sites/quarry sites elsewhere by the experts. It is also based on the information and data gathered from experienced mine/quarry operators and old miners/quarry workers. It is also based from references from abroad downloaded from the internet. (The other methods mentioned above are mostly quantitative assessment and are complex and beyond the capacity of the project proponent and its consultants. These methods involve the application of software and the

application of mathematic and computer modellings. Modelling's methods are really impressive but can sometimes go wrong if all the required information/data are not available. These are actually the works of computer specialists, mathematicians and statisticians involving multi-disciplinary teams of experts.)

In this proposed project context the pragmatic methodology is based on prediction and this is based from previous personal experience and also from theoretical knowledge. The check list method will be also used when the project is in operations.

All impact assessment methods, for the whole life of a project main step.

- (i) Scoping of the assessment
- (ii) Existing condition
- (iii) Assessment of project related environmental effects
- (iv) Assessment of cumulative environmental effect (if any)
- (v) Determination of significance
- (vi) Following-up monitoring (later)
- (vii) Consideration for mitigation measures
- (viii) Consideration for potential accidents, malfunctions, and unplanned events

The approach is pragmatic and integrated approach covering all the 5 main Valued Environmental Components (VECs), namely, the physical, biological, socio-economic, cultural and visual components of the environment.

5.2 Determination of Impact

Impacts are determined based on generally accepted environmental and social standards parameters.

Generally the impacts on the environment are in the forms of:

- impacts on the air environment
- impacts on the land environment
- impact on the water environment

The National Environmental Quality (Emission) Guideline (NEQEG) values prescribed by Environmental Conservation Department (ECD) encompassing air quality/air emission; water quality/effluent, noise and vibration and odour are officially accepted environmental guideline values. Any activities/impacts that resulted in values that are higher than the environmental guideline values are termed "negative" or "adverse" impacts. Therefore, when assessing normal or general impact the above the mentioned guideline values must be complied with at all costs.

In addition, there are:

- impacts on the biological component of the environment
- impacts on the socio-economic component of the environment
- impacts on the cultural component of the environment
- impact on the visual component on the environment

Determination of significance

Many experts consider the following as significant adverse impacts:

- (i) loss of rare or endangered species (biological)
- (ii) reduction of species diversity (biological)
- (iii) loss of critical natural habitat (biological)
- (iv) transformation of natural landscapes (physical)
- (v) impacts on human health (social)
- (vi) reduction in the capacity of renewable resources to meet the needs of present and future generations (socio-economic)
- (vii) loss of current use of lands and resources for traditional purposes by indigenous peoples (socio-economic)
- (viii) for closure of future resource use or production (socio-economic)
- (ix) contribution to global effects (eg- ozone depletion, climate change) (physical)

Therefore, all the impacts within the above-mentioned categories are significant negative/adverse impacts. They must be avoided/prevented/mitigated/remediated/controlled and minimized as far as possible.

5.3 Criteria of Evaluating the Significance of Impacts

Table-23: Suggested criteria of evaluating the significance of impacts

Criteria	Definition	Attribute
Importance	The value that is attached to a specific environmental component in its current condition.	Low High: <ul style="list-style-type: none"> • Human health • Subsistence Agriculture • Subsistence Fisheries • Non-timber forest products • Protected area or species • Global or national importance • Commercially Valuable • Culturally Important
Spatial Extent	The geographic area of the impact	Site Local Regional international
Duration	The time scale for activity	Temporary Short-term Long-term Permanent
Frequency	The rate at which activity occurs or is repeated over a particular period of time.	Intermittent Seasonal Constant
Risk	The probability that the impact will occur	Unlikely Likely Certain
Reversibility (Resilience)	The ability of the environmental components recover their value after an impact has occurred.	Irreversible Short term recovery Long term recovery

Magnitude of Change	The amount of change in environment component	Small Medium Large
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There are also five possible categories for assessing the impacts.

- (i) No impact - The potential impact of the project activity will be assessed as No impact if the project activity is physically removed in space or time from the environmental parameter.
- (ii) Significant impact - (a) Impacts on environmental/social component is high
(b) Extent of impact is regional and national or international
(c) Duration of impact is long term or permanent
(d) Magnitude of impact is medium or large
(e) Impact is irreversible or recovery will take long period of time
- (iii) Insignificant impact - the impact does not meet the abovementioned five significant categories
- (iv) Unknown impact - (a) Nature and location of project activities is uncertain
(b) Environmental component within the study area is uncertain
(c) The time scale of the effect is unknown
(d) The potential spatial scale is unknown
(e) The magnitude of effect cannot be predicted.

5.4 Assessment of Impacts on Key Environmental Components

The impacts on key environmental components that analysis are impact on physical components, biological components, socio-economic components, cultural components, visual components, occupational and communality health and safety. The impacts on physical components include the impact on soils and geology, impact on air quality and air environment, impact of noise and vibration, impact of waste (solid and liquid waste), impact on water quality and water environment.

5.4.1 Impact on Physical Components

5.4.1.1 Potential Environmental Impact on the Physical Components During Mine Development Phase (Construction Phase)

The project is led by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is existing mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

5.4.1.2 Potential Environmental Impact on the Physical Components During Mine Operation Phase

Potential Environmental Impact on Soils and Geology

The Potential impact on soils and geology can be caused mainly by blasting activities. The erosion, sedimentation and contamination and alternation of soil profiles will be occurred. The contamination of soil can be caused by the spillage of fuel oil and engine oil. The extraction of limestone can cause potential land slide, change in relief and structure change of soil profiles and loss of natural resources. The generation of waste rock, overburden and pits can also be occurred. The stripping ratio of limestone production is 1:1. Therefore, the annual production of 24,000 MT of limestone can be generated the 24,000 MT of overburden.

The impact on air quality and air environment

Limestone mine operation involve the activities such as blasting, excavation, breaking, crushing, loading, unloading, screening, stockpiling and transportation that can cause the sources of air pollution in the form of dust, particulate matter and transport emission gas. Blasting, excavation, loading, unloading, stockpiling and transportation is the direct impact on the air environment due to the project and the dust emission from crushing, screening activities is the cumulative impacts that caused by the nearest cement project operated by the Max Myanmar Manufacturing Co., Ltd.

Fugitive emission will also be emitted from all other machinery and equipment such as dozers, excavators, heavy trucks and other vehicles, etc. All heavy machinery and heavy trucks use diesel fuel and the type of pollutants from the exhausts of these machinery and equipment due to burning of diesel fuel are diesel exhaust pollutants such as Carbon monoxide (CO), unburned hydrocarbon (HC), Particulate Matter PM including PM₁₀, PM_{2.5} and very small Diesel Particulate Matter (DPM), nitrogen oxide NO_x, Sulphur dioxide (SO₂).

The camp activities such as kitchen and canteen can also emit the smoke. Since the buildings except the canteen are not located, the emission from the camp activities can be neglectable.

The impact of noise and vibration

the mining activities that emit high level of noise and vibration is blasting and excavation activities. Other activities are limestone breaking, crushing and grinding activities and heavy machinery and vehicle operation. The blasting activities is planned to carry out 2 times per week during the daytimes (4:30 PM to 5:00 PM). Other activities such as limestone breaking, crushing and grinding activities are not the actions of the mining activities. These are the cumulative impacts that occurred near the project site.

Vibrations are associated with many types of equipment used in mining operations, but blasting is considered the major sources.

Impact of waste (Solid and Liquid Waste)

The generation of solid and liquid waste is the household activities of the workers. There is no activities that generate the solid and liquid wastes. Only the overburden generation is included. The annual production of 24,000 MT of limestone generates 24,000 MT of overburden.

Impact on water quality and water environment

The operation of the limestone mine does not generate any wastewater for the extraction of limestone. However, the spillage of oil, grease, fuel oil, glue on the soil can enter the water bodies through the surface running and during the wet season. The fuel oil entering into the water bodies can cause the hydrocarbon pollution. Hydrocarbon contamination can disturb the penetration of light into the water bodies and can affect the aquatic ecosystem. Although, there is no industrial wastewater disposal from the extraction process of limestone, domestic wastewater discharge from the temporary housing of the worker. The temporary housing is located at the factory compound and runoffs from this housing will flow directly into the drainage channel and sedimentary pond and domestic sewage is usually generated with fecal and living washing water. Sewage from the staff quarters will be collected using a pit system and disposed by municipal sewage trucks.

Although the wastewater discharge from the extraction process of the limestone is regarded as non-hazardous wastewater (domestic wastewater and runoff water), the yay pu stream river is located. Therefore, the impact on the yay pu stream will be considered. The surface running from the access road and overburden site due to soil erosion entering the water bodies can change the water quality (eg. turbidity), water depth and can also change the water shed.

It was observed in Chapter 4 that the results of all four sampling points, upper-stream and lower-stream of Yay Pu Stream, Aung Nan Cho Village and Mae Haw Stream (Tae Kyi Kone Village).

Table-24: Potential environmental impacts on physical component during mine operation phase

Sr. No	Potential environmental impact	Explanation (impacts in the form of)
QUARRY ACITVITIES		
1	Potential impact on soils and geology	<ul style="list-style-type: none"> - blasting impact on soil and geological structure - erosion and sedimentation - potential land slide - change in relief and structure change - waste rock, overburden and pits - spill and potential for soil contamination - loss of natural resource (limestone)
2	Potential impact on air quality/air environment	<ul style="list-style-type: none"> - equipment emission and fugitive dust - dust from blasting and other activities e.g. excavation, breaking, crushing, loading, unloading, stockpiling - potential odour - transportation activities and - camp activities
3	Impact: noise and vibration	<ul style="list-style-type: none"> - very high level noise and vibration from blasting and excavation activities - noises from other mine activities e.g. breaking, crushing, grinding - machinery and vehicle operation
4	Impact: waste (solid and liquid waste)	<ul style="list-style-type: none"> - overburden generation
5	Potential impact on water quality/water environment	<ul style="list-style-type: none"> - potential degradation of surface water - potential decreased stream, spring flow - spill contamination - change in stream flow - increased total dissolved solid etc in water
TRANSPORTATION		
1	Potential impact on air quality	<ul style="list-style-type: none"> - vehicle emission and fugitive dust - potential release of Carbon monoxide (CO), unburned hydrocarbon (HC), Particulate Matter

		PM including PM ₁₀ , PM _{2.5} and very small Diesel Particulate Matter (DPM), nitrogen oxide NO _x , Sulphur dioxide (SO ₂).
2	Impact: noise and vibration	- heavy machinery and vehicular activities
3	Potential impact on water quality	- disturbance (erosion and sedimentation at stream crossing - spill at stream crossing/at water body
CAMP ACTIVITIES		
1	Potential impacts on air quality/air environment	- emission (smoke) from kitchen, from generator - emission from vehicles and fugitive dust
2	Potential impacts on water quality/water environment	- water quality degradation - spill and contamination - potential depletion of nearby water sources

Potential environment impacts on physical components during mine closure/rehabilitation phase

Potential Environmental Impact on Soils and Geology

The potential environmental impact on soils and geology during the mine closure/rehabilitation phase due to the effect of blasting and excavation during the operation phase are in the form of impacts are as followings:

- Slope and bench stability
- Effect of seepage on backfill
- Erosion sedimentation
- Long term stability of restored drainage
- Potential residuals

The potential environmental impact on soils and geology during the mine closure/rehabilitation phase due to the effect of restoration activities are in the form of impacts are as followings:

- Erosion and sedimentation
- Long term stability of waste rock piles and mine slopes
- Containment/retaining wall failures
- Change in relief and topography, structural change

The impact on air quality and air environment

The potential impacts on air quality and air environment during the mine closure/ rehabilitation phase is significantly reduced than the impacts on the air quality that occurred during the mine operation phase. The impacts on air quality are caused due to the emission and fugitive dust from the equipment, and vehicles that used for closure activities. Emission also be generated from the equipment and vehicles during the restoration phase since the restoration activities also required the vehicle. The potential positive can be occurred during the restoration phase when compared to the condition of the air quality of the operation phase.

The impact of noise and vibration

The potential impacts of noise and vibration during the mine closure/ rehabilitation phase is significantly reduced than the impacts of noise and vibration that occurred during the mine operation phase. The noise and vibration can be emitted from the backfilling activities, reclamation and restoration activities that carried out during mine mine closure/ rehabilitation phase.

Impact on water quality and water environment.

Surface water and ground water contamination can be caused by the backfilled waste rock (overburden) and effect of seepage from backfill. Discharged of contaminated water can be effect on the surface water quality. The spillage of fuel and oil on the ground can impact on the water quality through the surface running. Potential impacts on surface and ground water can be caused due to flow through pit waste. The erosion and sedimentation can also impact the water environment (water depth, water shed).

The discharge wastewater is not generated during the mine closure phase/ rehabilitation phase. The mine closure phase is not carried during the rainy season, therefore, the impact on the water quality and water environment due to the spillage of fuel and oil and the erosion and sedimentation during the mine closure phase is insignificant.

According to the overall result, the impact on the impact on the water quality and water environment during the mine closure phase is insignificant.

Table-25: Potential environmental impacts on physical component during mine closure/ rehabilitation phase

Sr. No	Potential Environmental impacts	Explanation (impacts in the form of)
REMOVAL AND BACKFILLING		
1	Potential impacts on soils and geology	<ul style="list-style-type: none">- Slope and bench stability- Effect of seepage on backfill- Erosion sedimentation

		<ul style="list-style-type: none"> - Long term stability of restored drainage - Potential residuals
2	Potential impacts on air quality/air environment	<ul style="list-style-type: none"> - Emission from equipment, vehicles and fugitive dust - Dust generation from other activities
3	Impacts: noise and vibration	<ul style="list-style-type: none"> - Noise from removal and backfilling activities
4	Potential impacts on water quality/water environment	<ul style="list-style-type: none"> - Contamination of surface or ground water by backfilled waste rock (overburden). - Discharged of contaminated water - Effect of seepage from backfills - Potential spills - Erosion and sedimentation
RESTORATION ACTIVITIES		
1	Potential impacts on soils and geology	<ul style="list-style-type: none"> - Erosion and sedimentation - Long term stability of waste rock piles and mine slopes - Containment/retaining wall failures - Change in relief and topography, structural change
2	Potential impacts on air quality/air environment	<ul style="list-style-type: none"> - Emission from equipment, vehicle and fugitive dust - Dust generation from restoration activities - Potential change
3	Impacts: noise and vibration	<ul style="list-style-type: none"> - Noise from reclamation and restoration activities
4	Potential impacts on water quality/water environment	<ul style="list-style-type: none"> - Potential impacts on surface and ground water from flow through pit waste - Erosion and sedimentation

5.4.2 Impact on Biological Components

Potential environment impacts on biological component during mine development phase (construction phase)

The project is lend by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

Potential environmental impacts on biological components (Vegetation and Wildlife) during Operation Phase (Mine activities and camp activities)

Potential environmental impacts on biological components (Vegetation and Wildlife) during mine operation phase can be caused by the mine activities and camp activities.

The existing species that are close to the human environment will migrate to the other place due to the operation of machinery (bulldozer) and vehicle. The noise that generates while operating the blasting activities can cause the habitat disturbances. The mining activities can cause the deforestation and loss of habitat/habitat destruction, fragmentation and habitat disturbances, disruption of migration routes and nesting/breeding activities, potential poisoning of birds and other wildlife, potential impacts on aquatic ecology of the nearby streams.

The camp activities also cause the following impacts: deforestation and loss of habitat/habitat destruction, fragmentation and habitat disturbances, potential disruption and dislocation of local wildlife and migratory wildlife, potential impacts on aquatic organism/aquatic ecology of the nearby streams, animals attracted to garbage and food wastes, migratory patterns, breeding/nesting behavior affected by presence of humans and noise from machinery and vehicles, probable hunting trapping by workers, exploitation of edible plants and fruits, fire wood extraction, accidental bush fire. However, the impact on the biological components due to the camp activities can be insignificant since, the project has no camp activities except the temporary canteen.

Table-26: Potential environmental impacts on biological components (vegetation and wildlife) during mine operation phase (mine activities and camp activities)

Sr. No	Potential Environmental impacts	Explanation (impacts in the form of:)
MINE ACTIVITIES		
1	Potential impacts on biological components (vegetation and wildlife)	<ul style="list-style-type: none"> - Deforestation and loss of habitat/habitat destruction, fragmentation and habitat disturbances - Disruption of migration routes and nesting/breeding activities - Potential poisoning of birds and other wildlife - Potential impacts on aquatic ecology of the nearby streams

TRANSPORTATION (impacts on biological component not anticipated)		
CAMP ACITVITIES		
1	Potential impacts on biological components (vegetation and wildlife)	<ul style="list-style-type: none"> - Deforestation and loss of habitat/habitat destruction, fragmentation and habitat disturbances - Potential disruption and dislocation of local wildlife and migratory wildlife - Potential impacts on aquatic organism/aquatic ecology of the nearby streams - Animals attracted to garbage and food wastes - Migratory patterns, breeding/nesting behavior affected by presence of humans and noise from machinery and vehicles - Probable hunting trapping by workers - Exploitation of edible plants and fruits - Fire wood extraction - Accidental bush fire

Potential environmental impacts on biological components during Mine Closure/Rehabilitation Phase

Impacts on biological component not anticipated during removal and backfilling works, restoration activities and post closure. But one potential issue is “failure of vegetation to properly reestablish (failure of reforestation)”.

5.4.3 Impact on Socio-Economic Component

Potential impacts on socio-economic components during mine development phase

The project is lend by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

Potential impacts on socio-economic components during mine operation phase

Potential impacts on socio-economic components during mine operation phase can be positive and negative.

Land use pressure, traditional uses disrupted, area made unproductive for none mine users increased, pressure on resources and inflation, over the years unhealthy relation between the project proponent and local community can arise due to disputes mine and brawls between

employees and local youths; unethical sexual activities etc., drugs uses and HIV, conflicts between company and local community are the negative impact on the socio-economic component.

Permanent employment opportunities during this phase, provision for steady income for locals, direct permanent employment, increasing the local procurement; boosting local economy and increasing the national Gross Domestic Product (GDP) are the positive impacts on the socio-economic impact due to the project.

According to the overall results, the positive impacts are more significant than the negative impacts during this mine operation phase.

Table-27: Potential impacts on socio-economic components during mine operation phase

Sr. No	Potential socio-economic impacts	Explanation (impacts in the form of)
1	Potential impacts on socio-economic components	<ul style="list-style-type: none"> - Land use pressure - Traditional uses disrupted - Area made unproductive for none mine users increased - Permanent employment opportunities during this phase - Provision for steady income for locals - Direct permanent employment - Increase local procurement; boosting local economy - Increase the national Gross Domestic Product (GDP) - Pressure on resources and inflation - Can lead to positive and negative public perception of the project - Over the years unhealthy relation between the project proponent and local community can arise due to disputes mine and brawls between employees and local youths; unethical sexual activities etc. - Drugs uses and HIV - Conflicts between company and local community.

Potential impacts on socio-economic components during the mine closure phase

When the mine closure phase is carried out, the high impact on the employment opportunities. Since the operation period of the project is end, the labour requirement is decrease and the

termination of job can cause the lower employment. This can cause the stress on the community. Sometime, the unusual abandonment of mine town and infrastructure can also be impacted. Although the future land use is planned, failing to meet final land use requirement can also be impacted.

Table-28: Potential impacts on socio-economic components during the mine closure phase

Sr. No	Potential socio-economic impacts	Explanation (impacts in the form of)
1	Potential impacts on socio-economic components	<ul style="list-style-type: none"> - Change in labour force requirement - Termination of some jobs that can land to lower employment - Stress on community to recover - Risk of abandonment of mine town and infrastructure - Failure to meet final land use requirement

5.4.4 Impact on Cultural Components

Potential impacts on the cultural component during mine development phase

The project is lend by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

Potential impacts on the cultural components during the mine operation phase

The operation of mine operation potential cultural religious and heritage site disturbance or destruction can be occurred. But, the historical religious building is not exited near the mine operation area and their buffer zone.

Potential impacts on the cultural components during the mine operation phase can be caused due to the lack of respect on the community culture and tradition. Since, the company respects on the community culture and tradition, this impact will be insignificant.

Table-29: Potential impacts on the cultural components during the mine operation phase

Sr. No	Potential cultural impacts	Explanation (impacts in the form of)
1	Potential impacts on cultural components	<ul style="list-style-type: none"> - Potential cultural religious and heritage site disturbance or destruction. - Potential issue due to lack of respect on the community culture and tradition

Potential impacts on cultural component during the Mine Closure Phase

Impacts on cultural component not anticipated during removal and backfilling works, restoration activities and post closure works.

5.4.5 Impact on Visual Components

Potential impacts on visual component during Mine Development Phase

The project is lent by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

Potential impacts on visual components during mine operation phase

Clearance of vegetation, alteration of natural landscape/a change in relief, dust generation visual impacts can cause the disturbance of visual components. Blasting sites, open pits, overburden disposal sites are unsightly. Mine town not is harmony with natural background. Light pollution due to excessive use of light at night attracts and kills insects.

Table-30: Potential impacts on visual component during mine operation phase

Sr. No	Potential visual impacts	Explanation (impacts in the form of:)
1	Potential impacts on visual components	<ul style="list-style-type: none">- Aesthetic/visual impacts due to clearing of vegetation- Alteration of natural landscape/a change in relief- Dust generation visual impacts- Blasting sites, open pits, overburden disposal sites are unsightly- Mine town not is harmony with natural background- Light pollution due to excessive use of light at night- Bright white light attracts and kills insects at night

Potential impacts on visual component during Mine Closure Phase

Impacts on visual components not anticipated during removal and backfilling works, reclamation, restoration activities and post closure. But one potential issue is failure of

vegetation property reestablish (failure of reforestation). This can lead to sight pollution that is the old unsightly Mine site against the background of natural landscape.

5.4.6 Impact on Health and Safety

(a) During the Mine Development Phase

The project is lent by Max Myanmar Manufacturing Co., Ltd from Nay Pyi Taw City Development Committee (NCDC) since January 6 2023. The proposed project is exiting mine site. The mine preparation and development are already carried out since Nay Pyi Taw City Development Committee (NCDC) was operated. Therefore, the impact that occurred during the construction phase and mine development phase will not be described in this EMP report.

(b) During the Mine Operation Phase

The potential impacts are:

- Workers using equipment and working in inhospitable environment
- Inadequate safety work place requirement; inadequate Personal Protection Equipment (PPE)
- Hazardous working condition
- Prolonged exposure to dust, high level noise and vibration
- Inadequate sanitary facility, potable water and nutrition food; inadequate first aid kits, medicine and drugs; inadequate firefighting facility
- Potential accident at work places e.g. from blasting, fly rock, at crusher site
- Transportation accidents
- Potential community health and safety

(C) During the Mine Closure Phase

The potential impacts are:

- Inadequate safety working condition
- Hazardous working condition
- Potential accidents at work place
- Transportation accidents
- Potential community health and safety issues

5.4.7 Qualitative Impact Assessment (experts consensus method) During the Mine Operation Phase

Table-31: Qualitative impact assessment during mine operation (Operation Phase)

Sr. No	Impacts	Component importance	Spatial extent	Duration	Frequency	Risk	Reversibility /recovery time	Magnitude of the change	Impact significance	Remarks
I	<u>Impacts on soil and geology</u>									
	(1) potential landslide	Low	Site	Temporary	Intermittent	Unlikely	Irreversible	Medium	Significance	
	(2) Soil profile disturbance	High	Site	Long term	Constant	Certain	Long term recovery	Medium	Significance	
	(3) erosion and sedimentation	Low	Site	Short term	Seasonal	Unlikely	Long term recovery	Small	Insignificance	
	(4) loss of granite resource	High	Site	Long term	Constant	Certain	Irreversible	Medium	Significance	
II	<u>Impacts on air quality/environment</u>									
	(1) equipment emission and fugitive dust	High	Site	Temporary	Intermittent	Certain	Short term recovery	Small	Insignificance	
III	<u>Impact: noise and vibration</u>									
	(1) noise and vibration from blasting and equipment operation	High	Site and local	Temporary	Intermittent	Certain	Short term recovery	Medium to large	Insignificance to Significance	Blast Significance
IV	<u>Impaction water quality/ environment</u>									
	(1) potential degradation of water quality	Low	Site	Temporary	Intermittent	Unlikely	Short term recovery	Small	Insignificance	
	(2) reduced stream flow	Low	Site and local	Temporary	Intermittent	Unlikely	Short term recovery	Small	Insignificance	

	(3) contamination due to spills	Low	Site and local	Temporary	Intermittent	Unlikely	Short term recovery	Small	Insignificance	
V	<u>Impacts on biological component</u>									
	(1) deforestation and destruction of habitat	High	Local	Long term	Constant	Certain	Long term recovery	Medium	Significance	
	(2) disruption of migratory route and nesting/breeding of wildlife	High	Local	Long term	Constant	Likely	Long term recovery	Small to medium	Significance	
	(3) exploitation for fuel wood	High	Local	Long term	Seasonal	Unlikely	Short term recovery	Small	Insignificance	
VI	<u>Impacts on socio-economic component</u>									
	(1) in-migration causing, pressure on local community	Low	Local	Short term	Seasonal	Likely	Short term recovery	Small	Insignificance	
	(2) conflict between company and local community	Low	Local	Short term	Intermittent	Unlikely	Short term recovery	Small	Insignificance	
	(3) pressure on resources	Low to high	Local	Long term	Constant	Unlikely	Short term recovery	Small	Insignificance	
	(4) permanent employment	High	Local	Long term	-	-	Short term recovery	Large	Significance	Positive impact
	(5) boosting local economy	High	Local	Long term	-	-	Short term recovery	Medium	Significance	Positive impact

	(6) infrastructure and social improvement	High	Local	Long term	-	-	Short term recovery	Large	Significance	Positive impact
VII	<u>Impacts on cultural component</u>									
	(1) potential cultural/religious heritage disturbance	Low	Local	Long term	Constant	Unlikely	Short term recovery	Small	Insignificance	
VIII	<u>Impacts on visual component</u>									
	(1) aesthetic impact: extraction site, overburden unsightly	High	Local	Long term	Constant	Certain	Long term recovery	Medium to large	Significance	
	(2) change in relief and alteration of landscape	High	Local	Long term	Constant	Certain	Long term recovery	Medium to large	Significance	
IX	<u>Health and safety component</u>									
	(1) potential accident, at work place	Low	Local	Short term	Intermittent	Unlikely	Short term recovery	Small	Insignificance	

(Situation without mitigation measures. Situation will be better after mitigation measures taken)

5.4.8 Qualitative Impact Assessment (experts consensus method) During the Mine Closure/ Rehabilitation Phase

Table-32: Qualitative impact assessment during mine closure/rehabilitation phase

Sr. No	Impacts	Component importance	Spatial extent	Duration	Frequency	Risk	Reversibility /recovery time	Magnitude of the change	Impact significance	Remarks
I	<u>Impacts on soil and geology</u>									
	(1) potential landslide	Low	Site	Short term	Seasonal	Unlikely	Long term recovery	Small	Insignificance	
	(2) erosion and sedimentation	Low	Site	Short term	Seasonal	Unlikely	Long term recovery	Small	Insignificance	
	(3) potential residual impact (fuel spill contamination)	Low	Site	Short term	Intermittent	Unlikely	Short term recovery	Small	Insignificance	
II	<u>Impacts on air quality/environment</u>									
	(1) equipment emission and fugitive dust	High	Site	Short term	Intermittent	Certain	Short term recovery	Small	Insignificance	
III	<u>Impact: noise and vibration</u>									
	(1) noise and vibration from decommission activities	High	Site	Temporary	Intermittent	Certain	Short term recovery	Small	Insignificance	
IV	<u>Impaction water quality/ environment</u>									
	(1) spill and contamination	Low	Local	Short term	Intermittent	Likely	Short term recovery	Small	Insignificance	
V	<u>Impacts on biological component</u>									

	(1) potential vegetation failure to reestablish properly	Low	Site	Long term	Constant	Likely	Long term recovery	Small	Insignificance	
VI	<u>Impacts on socio-economic component</u>									
	(1) termination of job	Low	Local	Long term	Constant	Certain	Long term recovery	Medium	Significance	
V	<u>Health and safety component</u>									
	(1) potential accident, at work place	High	Site	Short term	Intermittent	Unlikely	Short term recovery	Small	Insignificance	

Explanation

- ❖ Component importance : low; high
- ❖ Spatial extent : site; local; regional; national/international
- ❖ Duration : temporary; short term; long term; permanent
- ❖ Frequency : intermittent; seasonal; constant
- ❖ Risk : unlikely; likely; certain
- ❖ Reversibility/recovery time : irreversible; short term recovery; long term recovery
- ❖ Magnitude (size) of the change : small, medium, large
- ❖ Impact significance : no impact; insignificance impact; significance; unknown impact

5.5 Mitigation Measures

Since mitigation measures are integral part of EMP they will be considered together. EMP has to focus on and address all negative/potential negative impacts and subsequent mitigation measures to be taken.

The essence of mitigation is to avoid, minimize, restore or rehabilitate and offset or enhance.

Table-33: Mitigation measures to be taken for impacts on the physical component of the environment in tabulated form

Sr. No	Impacts/potential impacts	Mitigation/corrective measures
1.	Impact on soil and geology (erosion and sedimentation, soil profile disturbance, potential contaminations of soil etc)	<p><u>Mine Operation Phase</u></p> <ul style="list-style-type: none"> - Minimize length and steepness of slope (conduct land cutting, land filling and land construction) - Minimize the area of bare soil exposed as practical as possible (do not clear the vegetation more than necessary leaving large area of bare land) - Implement soil conservation technique to prevent erosion during rainy season - Minimized all exposed area and retain as much existing vegetation as possible - Run-off from areas adjacent to the site will be diverted around disturbed areas (construction of small diversion canal/drainage) - Control sediment (build sediment trap or dam where necessary) - Stockpile limestone, overburden and top soil separately - Prevent sliding and erosion of overburden stockpiles and top soil stockpile as far as possible: let grass and vegetation grow on stockpile for stabilization - Ensure that stockpiles are stabilized (avoid dumping of overburden and top soil on slope; level the ground for stockpile) - Ensure that the slope of a stockpile is not more than 45° - Overburden/top soil and other stockpiles will be protected with perimeter controls e.g. retaining wall, fence (retaining walls will be furnished with weep holes for water escape) - Ensure that run-off from the site is discharged at non-erosive velocities; discharge will be to location that do not adversely impact the natural waterways (the stream)

		<ul style="list-style-type: none"> - Ensure that the land is not cut more than necessary avoid cutting of land as far as possible - Backfill all pits, holes and dents with overburden - Conduct inspection on regular basis to ensure that erosion and land disturbance is well-managed. - Prevent contamination of soil by all means - Avoid oil and chemical spill; should spill occur clean the spill immediately; do not wash down with water; use absorbents - Maintain vehicles and machinery to prevent oil spill - Bund oil depot to prevent spreading of oil
2.	Impact on air quality/air environment (equipment emissions and fugitive dust)	<ul style="list-style-type: none"> - Do not clear the vegetation (and leave the ground bare) more than necessary - Do not blast when strong wind is blowing. Also consider meteorological facts (e.g. precipitation, temperature, wind direction) - Plan for a simple linear layout for material-hundling operation (processing plant/site will be located within the quarry area or near as possible) - Also stop excavation, hauling, loading and unloading for a moment when strong wind is blowing - Dust emissions from excavator, loader and dump truck will be adequately controlled through dust collectors, and water spraying - Limit the drop height during unloading and loading the materials - If possible, use mobile and fixed belt transport and conveyors rather than hauling the materials by trucks (use enclosed rubber-belt conveyors) - Keep the internal roads compact to minimize dust generation due to vehicular movement - Set up speed limit (slow speed) for truck to minimize emission of dust (a speed reduction from 30 km/hr to 15 km/hr will reduce 50% of dust emission) - Spray water on un-paved road during dry months (wet suppression can greatly reduce dust emission up to 70%) - Prevent spill of overburden and top soil during transportation - If possible, use water wash to minimize mud and dust track-out from unpaved road area

		<ul style="list-style-type: none"> - Vehicular emission of particulate matter (PM), SO₂, NO₂, hydrocarbons can be maintained by minimized by proper training, operation and maintenance of vehicles and other oil-operated machine - Limit the slope and height of stockpiles (not more than 45° inclination and not higher than 20 feet). A flat stock pile will be subjected to less wind turbulence than a tall conical shape stock pile. - Provide adequate PPE (masks, mouth covers) to workers - Regularly check the engine of vehicles and all other machinery including heavy machinery, small machinery including pumps. Well-maintained, well-lubricated and well-operated engine reduces smoke emission - Use fuel oil with low sulphur (if possible) - Use environmentally friendly state of the art instruments and machines (such as engines with higher fuel efficiency, machinery that emit lower noise level), if possible - To conserve fuel and to prevent unnecessarily emission of gas (smoke) never let vehicles and instrument left running unnecessarily - Avoid open burning of all kind of solid wastes; reuse and recycle them as far as possible and finally dispose them at approved land fill (dump site) - Plant trees and create green belt or green zone. Trees will effectively sequesterate (remove or absorb) CO₂ in the smoke - Provide Personnel Protection Equipment (PPE) such as mouth cover, face mask etc. to workers exposed to smoke (gas emission) - Gas emission (smoke) can be minimized by proper training, operation and maintenance of vehicles and machines
3.	Impact: noise and vibration (noise and vibration from blasting and equipment, vehicle operation)	<ul style="list-style-type: none"> - Elect appropriate explosive and appropriate amount of explosive (not explosive for military use) to reduce the level of noise - Apply mechanical ripping as far as possible to avoid or minimize the use of explosives (e.g. use hydraulic hammers instead of secondary blasting) - Use specific blasting plans, correct charging procedures and blasting ratio; use delayed detonator (oblique rather vertical down-hole drilling together with short delay detonator improves fragmentation of rock and reduces ground vibration)

		<ul style="list-style-type: none"> - Workers involve in blasting will be adequately provided with PPE such as ear muffs or ear protectors - Heavy machinery such as excavator, bulldozers also generate loud noise: - Select new low-noise machine in the first place - Heavy trucks also generate high noise level and vibration. - Noise specification of vehicle will be taken into consideration when procuring vehicles; install noise abators - Modified old vehicles (and also equipment, and machinery) to reduce noise - Implement effective maintenance for vehicles (and also heavy machinery and equipment) which reduce noise level by more than 50% - Reduce the speed of heavy trucks and dumpers to reduce vibration - Vibration due to heavy trucks and bumpers from road can be mitigated by ensuring a flat and smooth surface, as far as possible - Conduct regular monitoring/inspection
4.	Impact on water quality/environment (potential degradation of water, reduced stream flow, contamination of water)	<ul style="list-style-type: none"> - Plan for overall drainage, maintain existing pre-mining condition. (In other word, to avoid impact of drainage on overburden and top soil the natural drainage must be left undisturbed.) - New artificial drainage could be created, if necessary. - Sudden inundation of water into excavation site/pit must be avoided or prevented at all costs. - As mentioned earlier overburden, and top soil will be stockpiled at appropriate location. Keep overburden and top soil compact and stabilize as far as possible. Limestone rock must be stockpiled at separate stockyard. - Avoid dumping of waste (solid, liquid) into the stream - Avoid spillage of oil and chemical into the stream - Avoid contamination of water by all means - Also avoid contamination of soil to prevent percolation into ground water - Conserve water as far as possible; educate workers for water conservation - Check ponds, pipes, faucets, joints regularly for leaks and fix the leaks immediately - Use plants that require less water in landscaping

5.	Impact on biological component (deforestation, destruction of habitats, disruption of migratory route and nesting/breeding exploitation for fuel wood etc)	<ul style="list-style-type: none"> - Implement the protection and conservation of the biological component of the environment - Comply with law, rules and regulation (Conservation of Biodiversity and Protected Area Law, 2018; Conservation of Environment Law 2012 and Regulation 2014) - Plan for the protection and conservation the flora as far as possible. (The quarry site is inside Mei-hor Reserved Forest area. The forest is already partially degraded. The impact can be significant if the work is not well-managed.) - Plan for minimum disturbance to the flora when conducting mining/quarry activities; - Do not clear vegetation than necessary for the construction of access road, quarry and mining site; restrict the removal of vegetation; avoid as far as possible the cutting of big trees - Control and minimize dust and eventual disposition of dust on leaves on plants restricting photosynthesis - Prevent the spillages of hydrocarbons which has negative impact on plants especially on the root system - Drip trays and designated bunded side should be used to protect vegetation from hydrocarbons - Storage of fuel should be done in a designated bunded site - Restrict the collection of fire wood; do not cut trees for fuel wood but collect fuel wood from fallen trees, dried logs or branches or use charcoal for cooking - Fire for cooking should only be made in dedicated spot cleared from vegetation - Avoid open burning of debris - Educate workers for fire awareness and protection; prohibit the discard of burning cigarette butts carelessly; get rid of all debris that can cause fire - Provide basic fire fighting training for a few workers - Identify sensitive species and habitats and try to avoid such spots as far as possible - Promote environment awareness to workers - Try to stop illegal logging; inform the authority if there is any - Implement rehabilitation to promote natural vegetation establishment after completion of quarry at a site
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		<ul style="list-style-type: none"> - Implement the protection and conservation of wildlife as far as possible. (The protection and conservation of forest is tantamount to protection and conservation of wildlife) - Ensure that mining/quarry works have minimal disturbance or wildlife - Prohibit the hunting and/or trapping of wild animals big and small including rodents, birds, reptiles and amphibians by workers - Prevent the potential injury or death of wildlife due to vehicular movements especially during night time - Prevent the potential injury or death of wildlife due to spillages of hydrocarbons, drill fluids and chemicals - Avoid the use of excessive bright light for long hours at night to prevent the aggregation and eventual death of large number of insects (offensive bright light in the forest at night will also scare away wild animals from their natural foraging or breeding ground) - Identify sensitive species which need to be avoided; avoid the disturbance of animal habitat such as nest and breeding ground as far as possible
6.	Impact on socio-economic component (in-migration causing pressure on local community, potential conflict, pressure or resources, permanent employment, boosting local economy, infrastructural social economic improvement)	<ul style="list-style-type: none"> - Implement to avoid or minimize the potential negative impacts on the socio-economic life of the locals as well as the company workers - If dust is generated either from vehicular movement or quarry works, try to suppress dust as far as possible (water spray); reduce the speed of vehicles when passing near the village - Educate the drivers for defensive driving, to maintain zero accident for the safety of the locals and domestic animals - Avoid the contamination of the drinking water source of the locals - Try to build good relation with the locals - Conduct public consultation so that the locals will have a positive perception on the project - Educate the workers for appropriate behavior when dealing with locals; to respect their culture and tradition - The authority and employees of the company should not personally get involve in land and property speculation activities, if any

		<ul style="list-style-type: none"> - Consider for Corporate Social Responsibility (CSR) action to be taken when actual mining operation commence - Prioritize the employment of locals - Prioritize the purchase of commodities from the local market - Engage and get involved in community engagement, community assistance and community development as far as possible - Implement for management of misbehavior and social illness - Educate and train workers for discipline and code of conducts - Apply punitive measures such as suspension of the wrong doer - Strictly prohibit the drinking of alcohol during working hours; ban the use of narcotics and stimulants - Deal with workers on a fair and square basis - Avoid unhealthy relationship with workers; they should not be over worked and underpaid
7.	Impacts on cultural components (potential cultural/religious/heritage disturbances)	<ul style="list-style-type: none"> - Mitigation not necessary since there are none to be impacted. Shwe Hpone Pwint Pagoda is quite far away and cannot be impacted. However; plan and manage to avoid negative impact on the pagoda and any other component, if any. - If there is any religious, cultural and archeological site within 25 meter from the site it should be clearly marked to prevent any accidental damage - If archeological site or burried artifact were discovered during quarry works this should be reported to the authority in time - Carry on donation and charity works for the monastery, church regularly eg. during religious days, religious festivals - Carry on donation in cash and kinds for the monastery and church - Consider for renovation of pagoda and monastery, church if necessary
8.	Impacts on visual components (aesthetic impact: extraction site, overburden unsightly; change in relief and alteration of land scape)	<ul style="list-style-type: none"> - Plan and execute mining/quarry which is focused on visual appeal (random mining will leave ugly dents, pits and holes here and there on the slope) - Carefully select site and conduct systematic blasting and mining one portion or one block at a time rather than random blastings and minings - Do not clear vegetation more than necessary before mining (eg. during preparation for mining site) - Backfill the voids, pits and dents after completion of a work site

		<ul style="list-style-type: none"> - Revegetate the site (plant trees) - Continue the creation of green belt in available space as far as possible - As regards painting buildings and structures (eg. office, ware house, workshop, depot etc.) use aesthetically pleasing paints and colours - Apply appropriate lighting only for security reason; avoid a excessive use of light at night especially offensive light - Use yellow light instead of white light not to attract insects; if so many insects aggregate turn off the light for a while
9.	<p>Health and safety components (potential accidents at work places, lack of safety working atmosphere, lack of nutritious food, potable water, sanitation etc)</p>	<ul style="list-style-type: none"> - Create safety condition for work places (mining/quarry) site, and associated area eg. Mining site and stockpile sites) - Educate and train workers for good working practice, good engineering practice, good safety practice and good house-keeping practice so that these good practices will be ingrained in each and every worker's mind - Prevent and avoid accidents and try to achieve zero accident at work places - Educate and train them for health education and hygiene - Train a few workers in First Aid Training - Keep first aid kit well-stocked with medicines and drugs comprising anti-malaria, anticholera, anti-toxicant and anti-poison for harmful insect and snake bites - Provided adequate PPE, for workers eg. helmets, earplugs, masks, hand gloves, outfit, boots etc - Provide healthy and nutritious food, potable water - Provide adequate sanitation eg. baths, toilets <p><u>Specific mitigation for blasting</u></p> <ul style="list-style-type: none"> - Implement systematic and safe blasting; select best blasting design - If possible, fence off the blasting area to prevent children and animals straying into the area - Follow acceptable blasting practices eg. those that resulted in more rock fragmentation and lower vibration (eg. relatively shallow slanting drill holes method) - Select appropriate explosives eg. use emulsion type - Keep explosives in maximum security magazine

		<ul style="list-style-type: none"> - Use standard detonation fuses and materials; store detonators and explosives separately; do not use outdated explosives - Fly rock happens if there is too much energy in the explosion; minimize blast damage - All drillings and blasting must be strictly supervised by competent demolition experts - Provide adequate training for blasting and the safety storage, handling and application of explosives - Distribute quarry/mining operation manuals to workers - Conduct blasting according to a consistent time table eg. at 04:30 hrs to 05:30 hr - Sound the sirens 5 minutes before blasting - Inform the nearby local community in advance about the consistent timetable for blasting - Provide adequate PPE, ear, muffs, ear protectors, safety goggles to workers; first aid equipment - Also provide adequate training for other mining/quarry activities such as excavation and extraction, safety transportation and stockpiling of mined out limestone and also top soil and overburden
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6. EMERGENCY RESPONSE PLAN

6.1 Methodology

To prepare the emergency response plan is needed to assess the risk of natural hazards and industrial hazards. The assessment is based on personal experience; Asking local elders, reference from the relevant literature.

6.2 Recording the Natural Hazards and Industrial Hazards

Recording and reporting natural hazards and industrial hazards is necessary for the effective and successful implementation of EMP.

Recording natural hazards and industrial hazards

Natural hazards

According to the Lewei Township data (MIMU Myanmar 2019), the natural hazards that occurred at the Lewei Township are as followings

Table-34: List of natural disasters in Lei-Wei Township

No.	Types of Disaster	Frequency	Loss of Building
1.	Tsunami	37	248
2.	Flood	21	331
3.	Fire		21

Sources: Lewei Township Data (2019)

But there was no precedent of major earthquake in the project area, it is learnt.

Natural hazards were/are not found and not anticipated.

The area is well-sheltered and far away from the coast in the south. The factory is on a flat terrain but is not a lowland plain and there are no great rivers or riverine system, no low wetland or no low lying plain to be flooded during the rainy season. The area does not have heavy rainfall but rather have a relatively dry zone climate.

Myanmar is known as an earthquake prone country. The famous Sagaing Fault runs from north to south dividing the country into 2 parts. There is no major fault line in the area.

There were no precedent of natural hazards such as violent storms, floods and earthquake in the area within memories of 5 decades, it was learnt.

There was also no precedent of extreme weather events, draught and major wild fires, it is learnt.

Industrial Hazards

The main hazard in mine project is the related with the handling of explosive materials. There is no industrial hazards until now. But if happened, the emergency plan will be carried out record the accidents and actions for emergency and contingency procedures.

6.3 Response Plan to Emergency Cases

Objectives

- to minimize confusion through effective delegation of responsibilities
- to minimize danger or safety risks by providing first aids
- to minimize damage to property and the environment by isolating the incident
- to minimize operation and preserve business assets as far as practical

Legal requirement

- Comply with Environmental Impact Assessment Procedure Notification No. 616/ 2015 29 December 2015
- Comply with IFC: Environmental, Health and Safety guidelines for construction materials extraction, 2007.
- IFC: Health and Safety guidelines for mining, 2007.
- IFC: Environmental, Health and Safety (EHS) general guideline, 2007.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Construction, Operation and Decommission and Rehabilitation Phase

Management action

- If the explosion is occurred the flowing emergency response plan will be carried out
- Firstly declare the emergency condition
- Sound the alert, evacuate the danger zone and isolate source
- Mine rescue: Coordinate mine rescue personnel and deploy mine rescue teams
- Communication: Contact emergency personnel and communicate the appropriate information about the emergency. Call 911 and tell the dispatcher the location of the explosion, its seriousness, and any possible injurie
- for accident, immediate first aid treatment and quick admission to the hospital
- first draw up a plan for prevention/mitigation measures for fire accident
- provide firefighting training for some workers
- provide adequate firefighting facility, water ponds, hydrants, water jet pumps, and fire extinguishers; provide adequate PPEs such as firefighting suits, if possible. (The company has two fire engines, firefighting vehicles.)
- regularly check the firefighting facility, its readiness; ponds to be always filled with water
- organize mock drills regularly and assess the effectiveness of drills and training; assess the readiness, quick response and quick evacuation processes

- provide First Aid Training to some workers
- provide adequate first aid facility-such as stretchers, equipment, first aid kits including medicines; regularly check the condition of first aid facility
- display addresses and phone numbers of Fire Fighting Brigade, Ambulance Service, Hospital's emergency department, police station etc so that everyone can see easily
- set up effective alarm system and control system
- take out insurance for the company; also insurance for fire and for disaster
- effectively install lightning arrestors, lightning strips and rods, down lead and grounding electrodes
- deploy tight security all the time

Monitoring plan

- monitor the handling of explosive material and storage of these materials
- regularly check the firefighting facility, its readiness; ponds to be always filled with water

Monitoring point

- Inside the project location : N. Lat. 19°31'34.96"; E. Long 96°24'18.00".

Frequency – Before and After Blasting, Daily

Visual inspection of condition: Daily

Budget and responsibilities

Budget: 10% of EMP fund (5,000,000 Ks)

Responsibilities – hired technicians and ESMP cell members.



Figure-86: First Aid Training (Jan, 2021)



Figure-87: Fire Fighting drill (Feb, 2022)



Figure-88: Safety training (May, 2022)



Figure-89: Chemical handling training (May, 2022)



Figure-90: First Aid training (Jan,2023)



Figure-91: Fire Fighting drill (Feb, 2023)

7. COMMUNITY ENGAGEMENT AND COMMUNITY DEVELOPMENT

Public consultation is an integral part of EIA, IEE and EMP to get the community engagement. Involving the public participation in the EIA, IEE and EMP work are fundamental to increasing the understanding and acceptance of the project.

Public consultation and participation should be started as early as possible in the preparation of EIA and IEE. And it has to be a continuous process, especially during the Operation Phase, carry out from time to time.

Purposes of the consultation during the preparation of the EMP report

- to enlighten the locals/stakeholders about the project
- to increase the understanding and acceptance of the project
- to give the locals/stakeholders the opportunity to present their views, opinions, perception of the project, express their concerns, complaints, grievances etc
- to identify impacts and issues that are not immediately obvious to project proponent and the EMP team
- to access social assistant and community development needs for the locals/stakeholders
- to gain community consent and to interact with the people to further strengthen existing cordial relationship
- to tap local knowledge and to negotiate for mutually beneficial future that is sustainable and locally relevant

Requirements for public consultations:

- public consultation should be conducted in the early phase of project
- must ensure the direct involvement of the locals/stakeholders
- must ensure that all locals/stakeholders who are interested will have the chance to fully participate and express their views, especially the vulnerable and marginalized groups,
- it should be a continuous process --- throughout the entire phase of the project, especially during the long Operation Phase, and
- there must be an action plan or response programme such as complaints and grievances mechanism (CGM) to tackle any issue.

7.1 Community Engagement

To get the community engagement, consensus building (pre-sensitizing visits to the local authority (village Administrator and party, elders) and briefing on the proposed project), transect walk site visit (visit to the village) and conduct visual inspection, holding the public

consultation meeting, and interviewing in the form of KII/SS (Key Informant Interview/Secondary Source) for the gathering of secondary baseline socio-economical data and community profile) are carried out.

The methodology and approach are as followings:

Standard methodology applied here includes:

- (i) **Consensus building:** First of all a pre-sensitizing visits to the local authority (village Administrator and party, elders) and briefing on the proposed project was carried out, and ask for their approval and assistant for holding the public consultation.
- (ii) **Transect walk:** site visit (visit to the village) and conduct visual inspection, and overall observational survey of community profile and village socio-economic situation.
- (iii) **Actual public consultation meeting:** mainly involves disclosure of the proposed project and giving complete and accurate information; consultation mainly in the form of two-way conversation --- listening and talking; waiting for their response; further discussion.
- (iv) **Interviews and discussions:**
 - in the form of KII/SS, (Key Informant Interview/Secondary Source) for the gathering of secondary baseline socio-economical data and community profile with the aid of quasi questionnaires
 - in the form of FGD (Focal Group Discussion); structured interview with few selected people (authority, knowledgeable persons, separate gender etc) especially for ranking the pressing need of the locals and for prioritizing the needs for community assistance and implementation of CSR.

7.1.1 Summary of Consultation, Disclosure and Activities Undertaken

At 14 July 2023 (09:00 AM to 10:00 AM) the public consultation meeting was held for EMP for mining/quarrying of limestone at Taung Philar Mountain Block at Company's Meeting Room The information was launched at facebook website, www.myanmar.environment.sustainable.conservations.com.

7.1.2 Results of Consultation and Activities

Date : 14 July 2023
Time : 09:00 AM to 10:00 AM
Venue : Company's Meeting Room

Attendance : 30 persons

This public consultation meeting was held for EMP for mining/quarrying of limestone at Taung Philar Mountain Block.

U Myint Kyaw Thura (Leader of EMP team): Mingalar bar. Thank you all for giving your time attending this public consultation meeting. My name is Myint Kyaw Thura. The name of our organization is Myanmar Environment Sustainable Conservation (MESC). MESC is neutral Third Party involved in environmental study. We have already done 70 projects.

The objective of holding this public consultation meeting is for preparation of EMP report at the Nay Pyi Taw Council Area (150 acres). Although the public consultation meeting always holds at the village, now the meeting is held at the company's compound because the situation is not favored. The reason for holding the meeting is to express and negotiate freely the view and opinion about the projects.

Our organization does the environmental protection processes: measuring the air quality, collecting the water sample and soil sample, studying the flora and fauna. Besides this, the socio-economic data of the village including the community, economic and health data. The positive and negative impacts caused by the project are prepared in the EMP report and the meeting minute about the meeting also recorded in the report. In conclusion, we invite you to express your views and opinions and to ask questions and give comments frankly, if you have any.

The officer from Nay Pyi Taw City Development Committee (NCDC): said that this area is already lend since 2021. Although, this project is not concerned with us, there is still giving help from our side whenever needed. We also participate in EMP report preparation. We analyzed and reported the positive and negative impacts about the project. Although, whenever one project is carried out there is a both positive and negative impact, the positive impact is need to more significant than the negative impacts. The objective of operating the factory is for the development and job opportunities for the locals and to get the positive effect for local and company. The local also is being impacted of bit amount negative effects. Although the technology is developed and the negative effects are reduced to the limited level, if exceeded to the level, the local need to inform from the liaison officer of the project to the associated department.

The reason of causing the less of water and water pollution is less of natural resources not by the project. The officer from the project side will duly be undertaken the possible CSR and now the supplying the electricity to the village is undertaken by the associated department.

U Bo Thein (Tae Kyi Kone Village Administrator): We does have special request about the project. Quite amount of the villagers are staff of the factory. We rely on the factory project. The project has not only positive impacts but also negative impacts but the significant negative impact was not occurred. We want to request one thing (our difficulty). We mainly use the stream water as a source of drinking water. The stream water is polluted through the surface running during the rainy seasons. The stream water is also polluted due to the unknown reasons during the summer seasons. The storage of water for every single house is not sufficient. The

village cannot afford for well since the depth is deep. So, we want to request for help to the factory officer.

U Aye Myint Htun (Aung Nan Cho Village Administrator): We mainly use the stream water and ground water as a source of drinking water. Although the water is sufficient during the rainy season, the water is insufficient during the summer. Since the surrounding area is the limestone mountain are existed, the amount of lime substance is included. Therefore, the drinking water problem will be faced after long time passed. We had temporary village library. Now we want to renovate the library to make it full of library features. So, I would like to request the help of the project officers.

In the past, street lights were provided from the factory into the village, but now the street lights are no longer provided, so I would like to request that the street lights be returned as it is necessary for the safety of the village.

Head of the Factory: said that I will work to restore the street lights as soon as possible. Although monastery, school and street lights have been provided the electricity from the factory, there are power lines going into the house. So, I would like to request to the villager elders to follow up and check.

The manpower supply and materials supply for the renovation of library will support as soon as possible. The library will be renovated and repaired until it is neatly. We also face difficulties regarding with the drinking water. We hired the contract teams to dig the well, but it was inconvenient since the aquifer is so far. We use bottled water as drinking water and use stream water as domestic water. Regarding with the drinking water problem, we will consult with our officers.

The cost of digging well, place and plan need to report to the company from the village elders and the experts will be send to do the best of the will from our side. We will also repair the water tank for water usage.

U Zaw Sai (Villager): said that I would like to request one thing. The factory road to the village is difficult to travel during the heavy rains. Students also use this road, so it is difficult to use for the children. It is hilly and there is no drainage, so it is difficult to walk because of surface running.

Head of the Factory: said that I will consult with the heads of the company and take action as soon as possible.

In conclusion, I would like to express my gratitude for giving time to attend the meeting.

7.1.3 Community Engagement Plans

As mentioned earlier public consultation must be a continuous process throughout the project period, from through the Mine development phase and mine operation phase to the decommissioning phase. As regards the long operation phase (10 plus years) there should be regular public consultations annually or bi-annually depending on the situation, or from time

to time whenever there is a need for public consultation. This is very important for maintaining the long term cordial relationship with the locals and hence the long term benefit for quarry business.

The Complaints and Grievances Mechanism (CGM) programme should be implemented throughout the entire Operation Phase period. It should be practical and applicable and effective. The public relation officer and EMP cell leader should always give special attention to CGM.

The complaints handling and response must be effective. A hotline for complaint must be set up. The date and time of complaints, detail of complaint, action taken and if no action is required the reason why must be all recorded and documented. There can be also follow up contact with complainant.

Future public consultation should involve the continuation of CSR programme (affordable programme) and donation and charity works as far as possible.



Figure-92: Public consultation meeting



Figure-93: KII Interview



Figure-94: Focal Group Discussion

7.2 Community Development

CSR has become mandatory in most developed countries. It has also become mandatory for big companies doing business in developing countries. In fact, it has become an official policy of many big companies worldwide.

A big company that is doing business in an area must commit itself to environmental and social sustainability. The motto is "**do not harm the environment and the people**".

The company must take the responsibility for community development as far as possible. A certain amount of budget or 2 percent of the net profit has to be allocated for CSR activities, it is learnt. However, there is no rule or regulation yet for the percentage of budget to be allocated for undertaking CSR activities.

The company very well realizes that the ethic code of 21th century big business is not to make profit at the expense of the environment and the local community. And that the big business

should not focus only on economically viable venture but also on environmentally and functionally sound, ecologically viable as well as socially sustainable venture.

CSR has become mandatory in many countries and it is also now an official policy of most big companies. The project proponents had already implemented CSR programmes as far as possible and will continue to do so and carry out community assistance and community development. Generous compensation would be provided if there is any loss or damage due to the implementation of this project. Moreover, charity works and donation works had been carried out and this trend will be continued.

Another form of CSR is the reforestation of mine area after mine closure. The project proponents are already reforested 500 acres of land with teak.

7.2.1 Summary of Community Development Activities

The previous CSR programmer implementation in the form of the construction of 10 miles hard top road which directly benefited the two villages, the building of one bridge across the Mei-hor rivulet; the building of 2 schools, 1 clinic and 1 library and the donation and building of one pagoda (the Shwe Hpone Pwint Pagoda) and two monasteries; and the electrification of the monastery, schools and the village (to all the lamp posts of the village but not to every household yet).

The company uses the CSR budget 51,400,000 MMK during 2020, 181,000,000 MMK during 2021, 28,600,000 MMK during 2022 and 237,300,000 MMK during 2023.

Table-35: CSR funding budget during 2020-2023

Year	Activities	Amount (MMK)
2020	Farewell for the employee and staffs	18,100,000
	Supply the electricity to the school near to the factory area	23,400,000
	Supply the Covid-19 materials and medical for the villages	1,000,000
	Supply for the development of the community near the factory environment	700,000
	Giving support to the employee and staffs during the Covid-19 pandemic	2,100,000
	Donating the cement bags to the villages and monastery	5,100,000
	Planning the tree during every rainy season	1,000,000
Total		51,400,000
2021	Donation form the Monastery and Village	600,000

	Giving support to the employee and staffs during the Covid-19 pandemic	55,200,000
	Supply the Covid-19 materials for the villages near to the factory environment	3,100,000
	Donation to the Covid-19 Center	119,800,000
	Donating the cement bags to the villages and monastery	1,300,000
	Planning the tree during every rainy season	1,000,000
Total		181,000,000
2022	Donation the medicine and materials to the medical care center for Covid-19	1,700,000
	Donation for the Monastery and Village	9,600,000
	Donating the cement bags to the villages and monastery	18,800,000
	Farewell for the employee and staffs	200,000
	Planning the tree during every rainy season	1,000,000
Total		28,600,000
2023	Donation for school	300,000
	Building the inside the factory compound	66,600,000
	Farewell for the employee and staffs	400,000
	Giving support to the Pyin Ma Na communities that suffer the Mocha storm	148,000,000
	Giving the support to the employee and staffs for their children's education	9,400,000
	Donating the cement bags to the villages and monastery	9,400,000
	Planning the tree during every rainy season	1,000,000
Total		237,300,000
Grand Total (2020-2023)		498,300,000



Figure-95: 10 Miles hard top road



Figure-96: Mei-hor Bridge



Figure-97: Schools at Aung Nan Cho village (Left) and at Aung Chan Thar Village (Right) donated and built by Max Myanmar Manufacturing Company Limited



Figure-98: Village library donated and built by Max Myanmar Manufacturing Company Limited



Figure-99: Shwe Hpone Pwint Pagoda built by Max Myanmar Manufacturing Company Limited



Figure-100: Two Monasteries, Left and Right, built by Max Myanmar Manufacturing Company Limited

7.2.2 Draft Community Development Plan

The company must take the responsibility for community development as far as possible. The project proponents will be allocated 2 percent of the net profit. The project proponents will fulfill the necessary of the local and village as far as possible. The charity and donation will also be carried out continuously as like 2020-2023 and as mentioned above.

8. MINE CLOSURE

Mine Closure is an integral part of the mining cycle and so the EMP report has to address Mine Closure/Quarry Closure Phase.

After completion of the long Operation Phase (25 years and probably renewable) the mine closure will be commenced.

The company has no plan to dismiss its employee at the end of the Operation Phase but will continue to employ them for 6 months for carrying out the mine closure works. It is expected that mine closure task will take six months.

The company does not anticipate extra costs for mine closure since all the employees will be paid fully during this Mine Closure Phase. (The company has no plan for a contractor and party for doing this mine closure work.)

In this project context the mine closure will involve closure of mine and decommissioning of the mine facility and rehabilitation.

8.1 Objectivities

The project proponents will take the responsibility of effective mine closure task. In implementing this task the four key objectives will be considered:

- Protect human health and safety
- Alleviate or eliminate environmental damage
- Achieve a productive use of the land, or a return to its original condition or an acceptable alternative, and
- To the extent achievable, provide for sustainability of social and economic benefits. Resulting from quarry development and operation

8.2 Remediation Master Plan

All the mine sites (extraction/evacuation sites) will be finally backfilled with overburden and top soil. (The company has a plan for backfilling all mine sites after the completion of work at each mine site/extraction site. But the final and comprehensive backfilling of all sites will be conducted during this phase to ensure that none are left untended.)

The overburden backfilled will be stabilized and made compact to ensure that water will not enter the former mine pit easily.

Reclamation will be undertaken at all the lands disturbed eg. pits, holes, dents by backfilling.

Compensatory planting of trees (reforestation) will be duly conducted both at the backfilled sites and at all disturbed land. A nursery will be set up during the operation phase and near the end of the operation phase for this purpose.

Waste rock dump/overburden dump

It is expected that all or almost all overburden stockpiled at each dump site will be used up for backfilling and virtually none will be remained. Any remain such waste rock will be filled into any natural, dents or depressions nearby.

Water management

To ensure normal run-on run off of rain water/storm water all the berms, diversion channels, storm water retention basins constructed during the Operation Phase will be left intact. Moreover, natural drainage system will be left intact. During the decommissioning and mine closure phase, the water quality of yay pu stream, Mae Haw stream and the water quality of Aung Nan Cho village will be tested to ensure the water quality is still remain under the guideline of NEQEG even after the project is decommissioned.

Sr. No	Components	Parameters to be monitored	Frequency	Responsibilities person	Cost (MMK)
	Decommissioning/ mine closure (at upper stream of yay pu stream, at lower stream of yay pu stream, at the Aung Nan Cho Village, at Mae Haw stream)	- test pH, oil & grease, TSS, TDS, BOD, COD chloride etc (Ref. NEQEG guideline)	- one time	EMP cell members	1,500,000

8.3 Current Conditions

To record the existing conditions of the current environment, the water quality, air quality, soil quality and noise and vibration are measured. The values are already showed in **Chapter-4**.

The results of the water quality are as followings:

Table-36: Water quality of the existing environment

Sr. No	Parameters	Existing values at upper stream of yay pu stream	Existing values at lower stream of yay pu stream	Existing values at the Aung Nan Cho Village	Existing values at Mae Haw stream	NDWQS
1.	Total Coliform	14 CFU/100 ml	10 CFU/100 ml	6 CFU/100 ml	8 CFU/100 ml	3 (0-100 per ml)
2.	Fecal Coliform	4 CFU/100 ml	3 CFU/100 ml	2 CFU/100 ml	2 CFU/100 ml	0 (0-100 per ml)
3.	Color	40 TCU	30 TCU	Nil	5 TCU	Non-set, TCU 15
4.	Turbidity	68 NTU	54 NTU	3 NTU	12 NTU	5NTU
5.	Arsenic	Nil	Nil	Nil	Nil	0.01 mg/l
6.	Lead	Not Detected	Not Detected	Not Detected	Not Detected	0.01 mg/l
7.	Nitrate	0.7 mg/l	0.3 mg/l	0.4 mg/l	0.6 mg/l	50 mg/l
8.	Manganese	Nil	Nil	Nil	Nil	0.4 mg/l
9.	Chloride	3 mg/l	2 mg/l	9 mg/l	2 mg/l	250 mg/l
10.	Hardness	86 mg/l	90 mg/l	144 mg/l	86 mg/l	500 mg/l
11.	Iron	0.88 mg/l	0.70 mg/l	0.21 mg/l	0.48 mg/l	1 mg/l
12.	pH	7.4	7.3	7.4	7.3	6.5 – 8.5
13.	Sulphate	10 mg/l	8 mg/l	14 mg/l	10 mg/l	250 mg/l
14.	Total Dissolved Solid (TDS)	140 mg/l	139 mg/l	227 mg/l	119 mg/l	1000 mg/l

Table-37: Noise levels of the existing environment

Sr. No.	Parameter	At project site		At Aung Nan Cho		At Tae Kyi Kone		NEQEG guideline values	
		Day	Night	Day	Night	Day	Night	Day	Night
1.	Noise level (in dBA)	49.37	44.03	48.51	38.81	49.36	43.07	55	45

The values are on the whole lower than the NEQEG guideline values.

Vibration

Table-38: Vibration levels of the existing environment

Sr.No	Parameter	At project site	At Aung Nan Cho	At Tae Kyi Kone
1.	Vibration (mm/s)	0 mm/s	0 mm/s	0 mm/s

But vibration due to blasting is instantons (very temporary).

Table-39: Air emission/air quality of the existing environment

Parameter	Existing Values			NEQEG/WHO Guideline Value $\mu\text{g}/\text{m}^3$
	At mining site	At Aung Nan Cho village	Tae Kyi Kone village	
Nitrogen dioxide (NO ₂) 1-hour	16.10 $\mu\text{g}/\text{m}^3$	28.17 $\mu\text{g}/\text{m}^3$	9.36 $\mu\text{g}/\text{m}^3$	200 $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO ₂) 24-hour	0 $\mu\text{g}/\text{m}^3$	0 $\mu\text{g}/\text{m}^3$	0 $\mu\text{g}/\text{m}^3$	20 $\mu\text{g}/\text{m}^3$
Particulate matter PM ₁₀ ^a (24-hour)	40.68 $\mu\text{g}/\text{m}^3$	20.23 $\mu\text{g}/\text{m}^3$	22.02 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$

Particulate matter PM _{2.5} ^b (24-hour)	22.07 µg/m ³	10.75 µg/m ³	12.62 µg/m ³	25 µg/m ³
Ozone (O ₃) 8-hour daily maximum	0.88 µg/m ³	0.89 µg/m ³	1.36 µg/m ³	100 µg/m ³
Ammonia (24 hrs)	0 ppm	0 ppm	0 ppm	NG
Carbon Dioxide (CO ₂) (24 hrs)	292.80 ppm	0 ppm	269.51 ppm	NG
Carbon Monoxide CO (24 hrs)	0.48 ppb	289.49 ppm	0.38 ppm	NG
VOC (24 hrs)	0 ppb	0 ppb	0.25 ppb	NG
Oxygen (24 hrs)	20.44 %	20.30 %	20.81 %	NG
Wind Direction (24 hrs)	SW	SW	SW	NG
Wind Speed (24 hrs)	1.46 mph	1.35 mph	1.19 mph	NG

^a Particulate matter 10 micrometers or less in diameter

^b Particulate matter 2.5 micrometers or less in diameter

Note: The values on the whole are lower than the NEQEG emission guidelines values.

8.4 Rehabilitation Plan

The company will duly implement the compensatory replanting of tree (reforestation) at the site, especially at the mine facility area.

The company has also plan for compensatory replanting of trees at all extraction/evacuation sites after completion of extraction. For instance, when limestone rock at an extraction site is exhausted the spot or pit will be backfilled with overburden and top soil and tree sapplings will be planted during the onset of the monsoon (rainy) season. In other word the company will not wait until the end of the Operation Phase to replant tress.

Therefore, it is expected that by the time the Operation Phase is over all or most of the old extraction/excavation site are already reforested.

Therefore, comprehensive tree planting will concentrate in the abandoned mine facility area. That is, after all the buildings, structures, machinery are removed the comprehensive compensatory replanting of trees will commence. The company has a plan for setting up a

nursery before-hand, that is during the Operation Phase. The four main species of plant selected are *Tectona grandis* (Kyun), *Pterocarpus macrocaripus* (Pa-dauc), *Swietenia macrophylla* (Mahogany) and *Gmelina argorea* (Yama-nay). Some other readily available species will be also planted, for maintaining the natural plants biodiversity.

The company will continue to employ all its employees for carrying out the rehabilitation/reforestation work. The main works involves: planting the sapplings, watering plant, application of fertilizer (both chemical and organic), regular weeding and tending of the young plants.

It is expected that after 18 months of rehabilitation/reforestation the project site of 150 acres can be handed over back to its original owner, the Forest Department in accordance with the lease agreement.

The cost for rehabilitation will be also kept at a minimum; no contractor and party will be hired for their job. The employees will be fully paid as usual until the rehabilitation work is done. There is no need for purchasing tree sapplings as these are available at the company's nursery.

It is expected that five years after the commencement of rehabilitation the ecology of the area can be naturally restored to its quasi-original condition 10 plus years ago. The area with heavy rainfall is suitable for restoration a mini-ecosystem.

8.5 Future Plan of Land Use

After rehabilitation/reforestation the project site of 150 acres will be handed over back to its original owner, the Forest Department in accordance with the lease agreement. There is no future land use plan for this site.

8.6 Decommission and Rehabilitation Schedule

Estimated time of decommission and Rehabilitation phase

1. Mine closure at extraction sites/plots

It is expected that most, if not all, old extraction sites will be already reclaimed, revegetated and restored during the last stage of the Operation Phase, because the company will not wait till the end of the operation to perform this task (already mentioned earlier). However, should there any un-reclaimed, un-revegetated and unrestored sites remain these will be all reclaimed, revegetated and restored. The duration is estimated at 3 months.

2. Decommissioning at mine facility

Decommissioning will be duly undertaken the end of the Operation Phase; the duration is estimated at 3 months.

3. Finalized rehabilitation

Actually, partial rehabilitation at an old extraction site will be undertaken during the Operation Phase whenever the work at that site is completed.

However, the final touch or finalized rehabilitation will be undertaken at all old sites and also at the mine facility and at all disturbed areas.

The duration is estimated at 18 months.

4. Reclamation at all old extraction sites and at all disturbed land areas

As mentioned earlier the company will not wait till the end of the Operation Phase to commence the task. Reclamation will be undertaken when the work at an extraction site is completed. However, should any remain un-reclaimed than the task will be duly carried out.

The duration is estimated at 4 months.

5. Possible, reclamation at the old mine facility area

If necessary the old quarry town area, the crusher area and all remaining disturbed land area will be reclaimed.

The duration is estimated at 1 month.

6. Revegetation works (reforestation works)

Since the required tree sapplings will be always at the ready the revegetation work will take at most 3 months. (For pragmatic purpose this has to be commenced at the beginning of the rainy season.)

8.7 Estimated Budgets

The company will not hire a contractor and party for undertaking the quarry closure and rehabilitation works. All the staffs (38 plus) will be re-employed at the same salaries, for carrying out this task. And of course, the costs will be kept at a minimum as far as possible. There will be no need to purchase tree sapplings as the company will have its own nursery.

Probably fertilizer, insecticides and associated spraying devices may be necessary. The total cost for these materials is estimated at Ks 2,100,000:

Fertilizer (only urea for 2 years) - Ks 1,000,000

Insecticides (2 years) - Ks 300,000

Sprayers (2 sets) - Ks 800,000

Ks 2,100,000

Fertilizer, insecticides, herbicides, fungicides, pesticides etc may not be necessary as the species selected at the nursery will be locally and naturally growing species which are generally hardy naturally growing species that can withstand disease, pests and certain environmental changes. These local species naturally thrive well in the area.

8.8 Fund for Decommission and Rehabilitation

20% of EMP (10,000,000 MMK) will be allocated for the decommission and rehabilitation phase.

The cost estimation for decommission and rehabilitation fund is based on current unit price. Because the project will be implemented over many years (10 plus years) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and social management plan is the key to ensure that the environmental and social situation of the area does not deteriorate due to the implementation of a project. ESMP involves the management of the overall environmental issues including the physical, biological, socio-economic, cultural and visual issues. EMP is a long-term systematic approach for planning, development, implementation, monitoring and feedback. It also involves management for the quality of the project.

9.1 Institutional Arrangement for Implementation of ESMP

Environmental Management Plan (EMP) report involves the resulted impact of extraction of limestone, mitigation measurements and environment and social management plan and monitoring plan.

The detail of the resulted impact of extraction of limestone and mitigation measurement are already mentioned **Chapter-5**.

The project proponents will be carried out the environmental sub-management plan.

9.1.1 Environmental Sub-Management Plan

The project proponents will carry out to implement the environmental sub-mangement plan. The following organization will carry out the EMP.

- ❖ Max Myanmar Manufacturing Company Limited
- ❖ Nay Pyi Taw City Development Committee (NCDC)

The main objectives of EMP

- To study the resulted impact due to the project operation
- To mitigate and manage the negative impact
- To estimate the budget for activities included in Environmental management plan report
- To report the plan that the project proponents follow
- Monitoring plan for environmental protection and implementation
- Preparing the monitoring report for environmental protection and reporting
- Occupational health and safety plan

- Emergency response plan
- Capacity development and training program
- Community engagement and community development
- Grievance redress mechanism plan

Environmental sub-management plan includes the following plans-

- ✓ Monitoring plan for environmental protection and implementation
- ✓ Preparing the monitoring report for environmental protection and reporting
- ✓ Occupational health and safety plan
- ✓ Emergency response plan
- ✓ Capacity development and training program
- ✓ Community engagement and community development
- ✓ Grievance redress mechanism plan

9.1.2 Monitoring Plan for Environmental Protection and Implementation

Environmental monitoring plan is of paramount importance for the effective execution and successful implementation of EMP.

Environmental monitoring focuses on the work environment which includes, pollution control, waste management, health and safety of workers, safety of the facilities; and also, on the biological, socio-economic, cultural and visual components of the environment. Monitoring works will also specially focus on all activities that have been identified to have potentially significant impacts on the environment. There will be also specific occupational health and safety monitoring programme. The objectives of monitoring are: -

- to measure impacts that occur during the implementation of the project
- to ensure compliance with statutory requirements (compliance monitoring)
- to determine the effectiveness of mitigation measures and other measures, and
- to assist in the implementation of EMP

First a small EMP cell consisting of 2-5 members was formed; the Head of Max Myanmar Manufacturing Cement factory will be the EMP authority. If possible, these cell members will be deployed full time for doing monitoring and inspection works.

Monitoring will be carried on a regular basis; the findings or observation have to be systematically catalogued and documented and effective feedback (report back) must be duly done. The authority has to take action in a timely manner.

Monitoring frequency will be sufficient to provide representative data for the parameters being monitored. Monitoring will be conducted by members of EMP cell or trained personnel using properly calibrated and maintained equipment.

The two potential impacts during the Mine Development Phase are socio-economic in nature and so monitoring work is partially necessary.

Regular or occasional monitoring will be required during the long operation periods (10 plus years). It might be necessary to monitor Mine Closure/Decommissioning Phase which will take 6 months, and Rehabilitation Phase, 1½ years.

The air quality, water quality and noise will be measured and monitor at the same point of the sampling site location to compare the result the before and after condition of the site.

The coordinates of the ambient air monitoring points-

Project site N. Lat 19°31'24.50", E. Long. 96°24'20.70"E

Tae Kyi Kone Village N. Lat 19°31'49.40", E. Long. 96°24'4.90"E

Aung Nan Cho Village N. Lat 19°30'58.30", E. Long. 96°24'25.70"E

The coordinates of water monitoring sites

Upper point of Yay Pu Stream, N. Lat 19°31'11.20", E. Long. 96°23'26.50"

Down point of Yay Pu Stream, N. Lat 19°30'34.20", E. Long. 96°22'46.80"

Aung Nan Cho Village N. Lat 19°31'8.00", E. Long. 96°24'12.10"

Mae Haw Stream (Tae Kyi Kone Village) N. Lat 19°31'56.76", E. Long. 96°24'1.76"

The coordinates of the noise measurement monitoring points-

Project site N. Lat 19°31'24.50", E. Long. 96°24'20.70"E

Tae Kyi Kone Village N. Lat 19°31'49.40", E. Long. 96°24'4.90"E

Aung Nan Cho Village N. Lat 19°30'58.30", E. Long. 96°24'25.70"E

Table-40: Summary of environmental monitoring and management programme in tabulated form for operation phase

Sr. No	Components	Parameters to be monitored	Frequency	Responsible Person	Cost (MMK)
1.	Weather	- monitor weather - listen to weather news, forecasts	- Daily - Daily	EMP cell members	Free of charge
2.	Blasting activity	- monitor preparation for blasting - monitor blasting and aftermath	- Every blast - Every blast	EMP cell members	Free of charge
3.	Excavation/extraction work (extraction of crude limestone)	- monitor manual excavation - monitor excavator performance - monitor limestone quantity extracted - monitor stockpiling	- Daily - Daily - Daily - Daily	EMP cell members	Free of charge
4.	Limestone processing; crushing, grinding, transport, stockpiles	- monitor crusher, grinder, screen performance - stockpile of pulverized limestone (quantity) - truck or conveyor	- From time to time - From time to time - From time to time	EMP cell members	Free of charge
5.	Air quality	- monitor SO ₂ , NO ₂ , PM and other, if possible (Ref. NEQEG guideline)	- Semi-annually	Hired technicians	2,000,000
6.	Air emission	- monitor SO ₂ , NO ₂ , PM, GHG if possible (Ref. NEQEG guideline) - wearing of PPE (if necessary)	- Semi-annually - Regularly	EMP cell members	900,000
7.	Noise and vibration	- monitor noise level in dBA - wearing of PPE at mine site	- Semi-annually - From time to time	Hired technicians	50,000
8.	Overburdens	- monitor locations, size and stability condition	- Monthly (rainy season)	EMP cell members	Free of charge
9.	Erosion and siltation	- monitor overburden, natural drainage system	- Weekly (rainy season)	EMP cell members	Free of charge

10.	Extraction of limestone	- monitor and calculate amount of extraction	- Monthly	EMP cell members	Free of charge
11.	Water	- monitor water consumption - monitor flow rate and water level at stream	- Weekly - Monthly	EMP cell members	Free of charge
12.	Solid waste	- monitor industrial, domestic, office wastes, debris; amount generated, recycled, or reused; check work place	- Monthly	EMP cell members	300,000
13.	Traffic	- monitor schedule of vehicle movement, log book for each vehicle	- Weekly	EMP cell members	Free of charge
14.	Water quality	- test pH, oil & grease, TSS, TDS, BOD, COD chloride etc (Ref. NEQEG guideline)	- Semi-annually	Hired technicians	1,500,000
15.	Materials procurement	- monitor all materials purchased, consumed and unaccounted for	- Monthly	EMP cell members	Free of charge
16.	Fuel oil consumption	- monitor oil purchased, used, used oil generated, oil waste	- Monthly	EMP cell members	Free of charge
17.	Routine operation of equipment	- monitor operation hours of equipment and machines - monitor distance travelled of vehicles - monitor log books	- Weekly - Weekly - Weekly	EMP cell members	Free of charge
18.	Biodiversity	- inspect selection of new quarry site - monitor clearing of vegetation - monitor reforestation effort	- Before starting a new site - Ditto - Monthly	EMP cell members	Free of charge
19.	Social illness	- check disciplinary action taken - monitor conducts of worker	- From time to time - Regularly	EMP cell members	Free of charge

20.	Emergency	<ul style="list-style-type: none"> - inspect facilities for emergency preparedness - monitor training (firefighting and first aid) and drill for emergency - monitor overall occupational health and safety including occupational accident and diseases 	<ul style="list-style-type: none"> - Quarterly - Regularly - From time to time 	EMP cell members	Free of charge
21.	Security	<ul style="list-style-type: none"> - monitor performance of security staffs 	<ul style="list-style-type: none"> - Weekly 	EMP cell members	Free of charge
22.	Capacity building	<ul style="list-style-type: none"> - monitor effectiveness of capacity building programme and other training including first aid 	<ul style="list-style-type: none"> - From time to time 	EMP cell members	Free of charge
23.	Environmental performance standard	<ul style="list-style-type: none"> - monitor the overall programme for high environmental performance standard - monitor the overall effectiveness of pollution management 	<ul style="list-style-type: none"> - Monthly - Monthly 	EMP cell members	Free of charge
24.	Compliance with regulation, a legal requirement	<ul style="list-style-type: none"> - monitor all main activities to ensure compliance with legal requirement and corporate commitment 	<ul style="list-style-type: none"> - Monthly 	EMP cell members	Free of charge
25.	Effectiveness of mitigation measures	<ul style="list-style-type: none"> - monitor mitigation measures taken and check their effectiveness 	<ul style="list-style-type: none"> - From time to time 	EMP cell members	Free of charge
26.	Rehabilitation for each site (after completion of mining at a site)	<ul style="list-style-type: none"> - monitor tree planting and rehabilitation for each site after completion of mining for that site 	<ul style="list-style-type: none"> - After completion for a site 	EMP cell members	Free of charge

Table-41: Summary of environmental monitoring and management programme in tabulated form for decommissioning/ mine closure and rehabilitation phase

Sr. No	Components	Parameters to be monitored	Frequency	Responsibilities person	Cost (MMK)
	Decommissioning/ mine closure (at upper stream of yay pu stream, at lower stream of yay pu stream, at the Aung Nan Cho Village, at Mae Haw stream)	- test pH, oil & grease, TSS, TDS, BOD, COD chloride etc (Ref. NEQEG guideline)	- one time	EMP cell members	1,500,000
1.	Decommissioning/mine closure (at office compound and mine site)	- monitor the Decommissioning/mine closure works (dismantling, torn down, removal, refilling pits and leveling ground)	- Daily or weekly	EMP cell members	Free of charge
2.	Rehabilitation (at office compound and mine site)	- monitor rehabilitation works (plant nursery, planting, growing, tending)	- Monthly	EMP cell members	Free of charge

EMP covers so many aspects of a project and so MP too has to cover most, if not all EMP. In the tables shown above MP covered virtually all aspects of EMP as far as the environmental was concerned.

Note: The monitoring report regarding air quality/emission, noise and vibration, and water quality/effluent will be submitted to the authority semi-annually.

In the future in addition to Monitoring Plan there should be Auditing Plan in the form of Internal Environmental Audit and External Environmental Audit.

The audits will assess the Environmental Performance of the operation in complying with environmental laws, rules and regulations.

The purposes are to ensure that all activities are:

- in compliance with the EMP
- upholding best practices environmental management performance in day-to-day operation

9.1.3 Preparing the Monitoring Report for Environmental Protection and Reporting

Reporting is necessary for the effective implementation of EMP. Indeed, all activities taking place during the operation of the project need to be reported regularly or occasionally. Reporting (and documentation) has to cover a very wide spectrum such as reporting on compliance with regulation, guideline; internal monitoring and inspection reporting; accident, incident and emergency reporting; performance reporting; reporting on training programs; reporting on mitigation measures taking; reporting on all kinds of monitoring works and so on.

(A) Internal monitoring and inspection reporting

The physical and social parameters to be monitored are already mentioned earlier. Each and every monitoring/inspection work carried out by members of EMP cell must be catalogued in relevant log books. The internal monitoring and inspection will also have to involve in checking the performance of machinery, equipment and vehicles or at least the regular monitoring/checking of the log books of machinery, equipment and vehicle. All these findings or observations have to be reported bi-annually.

Members of the EMP and MP cell will also have to check the log book or registered book weekly or monthly. Member of MP cell do not need to report on their work on daily basis. However, there should be a monthly reporting session for effective communication with the EMP leader or authority.

(B) Incident, accident and emergency reporting

In cases of incident and accident (including near miss) prompt reporting has to be carried out. This must be in the form of verbal reporting follows by written statement, after emergency and contingency procedures have been undertaken.

The written statement will be more comprehensive and should include the location and cause of accident, the time, extent and intensity and how actions for emergency and contingency procedures were taken. Estimate of loss will have to be followed later. A good reporting will help the EMP leader and authority to take future action, to learn lesson from the incident or accident and enable them to draw future plan for health, safety risks and emergency management.

Reporting on incidents of misbehavior such as quarrels, and brawls etc. may not be necessary. It is actually the duty of the security staff to take action.

(C) Measuring performance indicators and interpreting and acting on the indicators

Based on the finding or observation from the monitoring or inspection on the performance of EMP and MP cell members, a report on the performance including the assessment of the performance and its effectiveness or success has to be submitted to the authority. This will have to be undertaken on a regular basis and the performance has to be documented and registered.

It is very important to report regularly on evaluation of mitigation/corrective measures taken. Evaluation should be made during regular monitoring/inspection works.

There must be a mechanism for auditing the EMP and its implementation processes. This will involve reviewing all the log books, registered books, documents and reports. This will help in reviewing and verifying the EMP implementation and also assist in assessing the effectiveness or success of the EMP.

As mentioned earlier there must be a separate log book for registering complaints and grievances, if any. Prompt reporting on complaints and grievance is necessary and the authority has to take necessary measures in a timely manner.

(D) Reporting on Training Programmes

As mentioned earlier there must be regular monitoring and inspection of all training programmes provided, namely, capacity building training, training provided for safety such as firefighting training and training provided for health such as First Aid Training; also training for quick response and preparedness such as drills and mock drills.

It is not necessary to monitor every session of a training programme and its process. But it is necessary to monitor, inspect and watch every drill, mock drill or rehearsal.

EMP cell members conducting monitoring and inspection works must be able to interpret and assess the overall condition of the training processes especially assessment of the effectiveness and applicability of each training.

A report on the training including assessment on its effectiveness must be submitted at the end of each and every training programme.

Finally Annual review should be prepared and an Annual Environmental Management Report should be submitted.

This annual report/review will summarize the key activities and environmental performance for the preceding 12 months. It will also include comprehensive review of monitoring results and complaints records, if any.

9.1.4 Occupational Health and Safety Plan

Every person related with the project has the responsibilities of occupational health and safety. The project proponent is the main responsible person for taking care about the occupational health and safety. Therefore, Safety is the first priority during the project operation period. Health and Safety Officer need to be assigned to fulfill this responsibility. As for the Health and Safety Officer will perform the following activities:

- Prepare the documentation and safety sign related with the safety and accidental management,
- Collect the data and national law, bylaw, rule and regulation associated with the occupational safety,
- Prepare the safety plan and monitor the operation process to ensure all of the operations are safe,
- Prepare the documentations and Monitor the Environmental Management Plan (EMP) that have done during the project duration like (operation phase and decommission phase)
- Keep the documentations about the activities that have done for EMP reports and comments while surveying by the ECD and third party,
- Support the Personnel Protective Equipment (PPE) for the employees that operate the manufacturing and production of the copper cable wire and restrict the employees to follow the safety practices,
- Support the pure drinking water for the employee and make ensures that this drinking water is safe,
- Prepare the plan for the solid waste management system,
- Report and announce the industrial accidents from time to time,
- Notice the updated and changed national law, bylaw, rule and regulation associated with the industrial safety and labor law, and
- Making and preparing the schedule for the human resources programs like capacity building and training programs for the employee.

First of all, the project proponents will plan and manage for the creation of a safe working environment, particularly, safety working places following the guideline prescribed by IFC.

The company will educate, train and supervise its workers for good working practice, and good safety practice until these good practices are ingrained in their mind sets and become good habits.

The company will also educate them for good health practices, good hygiene practices and good environmental awareness.

For practical purpose the OHS plan will cover:

Safe Working Place and Working Condition

Facility and work place will be designed and constructed in the first place to ensure for structural integrity and equipped to protect OHS.

Facility (building) will have adequate space for all kinds of activities (works), emergency exist, evacuation plan, safe access (eg. fire exit).

Work place will be designed in the first place to prevent the start of fire; provision of fire-fighting equipment, fire detector and fire alarm system.

- Will provide adequate lavatory facilities, eg. toilets, baths and washing areas with essential tissue papers and soaps etc., (the company has already done this)
- Will provide adequate potable drinking water of quality standard, (the company has already done this)
- Provide healthy living spaces and provide clean eating area for workers safety and health, (the company has already done this)
- Provide sufficient natural light or artificial illumination for worker safety and health,
- Supply sufficient fresh air and good ventilation system (The company has already done this)
- Provide first aid at all times for workers. Provide the factory clinic (The company has already done this).

Communication and training, especially for OHS,

- Provide OHS training for all workers. In addition to good working practice and good safety practice workers will be trained for personal safety (preventing accident, injuries), basic hazards awareness, site specific hazards and emergency procedure for fire evacuation and natural disaster. (the company already done this)
- New task employee training (prior to employment) will be provided; these cover: knowledge of materials, equipment and tools; known hazards in the operation and their control; potential risk to health; precaution to prevent exposure to risks; hygiene requirement; wearing of PPEs and appropriate responses to accidents.
- Moreover, educate, train and supervise workers thoroughly in the safety handling and operation of respective machinery and equipment, and chemical; in the safety storage, handling and application of chemicals or substances, both hazardous and non-hazardous and fuel oils.
- Area signage and marking hazardous areas (eg. electrical room, fuel depot and chemical warehouse, magazine etc.) as well as emergency exit. Also labeling of all containers of chemicals, if any, and substances eg. Pictogram to be easily understood by all; signage in accordance with international standards.

The authorities of the company are very aware of the potential hazards, namely, physical hazards, chemical hazards, etc., and the essential PPE for OHS.

Industrial Vehicle Driving and Site Traffic

- Train operators in the safety operation of vehicles; to strictly follow operating rules and procedures.

Fire and explosion

Since some of the raw materials and chemicals are easily flammable materials, the fire hazard is one of the issues that should consider. Therefore, OHS plan is necessary.

- Fuel and flammable storage will be kept at a remote spot,
- Keeps adequate fire extinguishing equipment,
- Restrict the indiscipline manner of the employee (smoking),
- Define and label warning sign for fire hazard area, and
- Provide specific training for handling of flammable materials.

Personnel protective equipment (PPEs)

The company provide the Personnel Protective Equipment for the all the employees when the PPEs are necessary. The supported PPEs are safety rubber tall boots, goggle, helmets, safety belt, rubber gloves, mask, to avoid the industrial accidents.

Note: The company supports the first aid kits.

9.1.5 Emergency Response Plan

The chance for major accident to occur in a well-managed quarry and the mining site was very remote.

The project proponents prepared to cover the loss of life, property and building cause of natural hazards and accidents. In case of emergency, difference emergency situations can encounter depending on the working situations and working environments. In preparing the emergencies, the project proponents will also consider the natural disasters. The proponents prepared the emergency response plan for industrial accidents, fire accidents, response plan for storm and flood and earthquake. The detailed emergency response plan are already mentioned in **Chapter-5**.

9.1.6 Capacity Development and Training Program

EMP and environmental monitoring is a new subject even in developed western countries. EMP cell leader and EMP cell members will try to be aware of the latest information regarding environment and environmental activities carried out in developed countries.

EMP cell leader or EMP officer will be able to recommend measures to improve environmental condition. He will be able to implement control and protective measures for effective implementation of EMP. He will be also able to ensure suitability, adequacy and effectiveness of the MP implemented.

Training is essential for effective and efficient implementation of EMP and MP. However, it is not yet practical to plan for capacity building of the EMP cell members up to standard of developed countries. Training needs will be identified based on the existing and available capacity of the company and project personnel.

The approach will be a pragmatic one based on the availability of qualified personnel and materials and equipment.

The two pragmatic training programmes, Fire Fighting and First Aid Training are already addressed. One capacity building and training of importance for EMP cell members will be practical training for conducting monitoring and inspection and for assessment of the finding or observation. The parameters to be monitored and inspected are already mentioned earlier.

The training programme for monitoring and inspection work involves the selection or location of the spot/place and the parameter to be monitored. As already mentioned earlier the parameters include physical ones---air, noise level, water, waste as well as social aspects already mentioned, and inspecting the performance of workers and workers compliance with environmental requirements.

The capacity building and training programme will also cover other basic aspects such as:

- conduct environmental awareness to the staffs/workers
- conduct safety programme to create safety awareness among staffs/workers
- train staffs/workers on general safety measures and, if necessary, conduct safety rehearsal or safety drill to educate them

The training programme will instruct EMP and MP cell members how to keep log books or registered books and how to carry out observations and findings. They will be provided with abbreviated specific forms (short to the point) for filling; and also abbreviated forms for reporting incidents and accidents, or grievances.

As regards the actual monitoring and inspection this will be carried out in the form of visual inspection only.

For the sake of accuracy to a certain extent relatively sophisticated equipments as well as relatively complex chemical analysis are required. Therefore, specially trained technicians or experts, for instance, from the Health Department have to be hired for air quality analysis and water samples have to be sent to registered laboratory in Yangon for analysis.

Max Myanmar Manufacturing Co., Ltd has at the moment a quality control laboratory (for cement quality). The company can procure the equipment and chemicals necessary for monitoring and testing the environmental parameters. The company can train its EMP cell members in the operation of these requirements and the application of chemicals for EMP implementation, especially for testing and analysis of air and water quality. This should be considered in advance because in the near future EMP implementation will become mandatory or compulsory.

9.1.7 Community Engagement and Community Development

While implementing the project, community engagement is also important. The projects proponents will be disclosed the information related to the project to the community. Moreover, the project proponents will also avoid the activities that can harm the community and support to improve the welfare of the community. The project proponents already carried out the public consultation meeting to disclose the information. The details of community engagement and community development are already mentioned in **Chapter-6**.

9.1.8 Grievance Redress Mechanism Plan

Since the project site location is learned from the Nay Pyi Taw City Development Council (NCDC), there is no issues related with the land. But the impact can be occurred during the project operation phase. Therefore, the project proponents prepare the EMP reports that include the assessment of impacts, mitigation plan to reduce these impacts and monitoring plan to monitor the effectiveness of these implementing plan.

9.2 Responsibilities for Implementation of ESMP

For the effective implementation of EMP first of all a small and dedicated organization, the EMP cell, has been organized and formed. The EMP cell members include the Head of cement factory, who is the EMP cell leader and two mining engineers, technicians and staffs. This EMP cell will be also the monitoring committee. Two locals will be also added to this monitoring committee. More members will be added to the list when necessary.

The monitoring works will cover the Operation Phase and Decommissioning Phase of the project life. The EMP cell leader (monitoring committee leader) and members are responsible for execution of the EMP and monitoring programme.

They will be specially trained for doing this. As for monitoring specific parameters eg- air quality, water quality and soil, technicians or experts will be hired to do the analysis works.

It might be too demanding for 7 staffs to effectively carry out the EMP task. Therefore, additional staffs have to be deployed as alternate cell members to carry on the EMP works smoothly.

It is not pragmatic for the EMP members, especially the seven employees, of the company to get involve solely in EMP and MP activities because their main task is production work while EMP and MP activities are actually supplementary works. The company will not be in a position to set aside 7 well-paid employees just to engage in EMP or MP work alone; it will otherwise result in under-staffed situation for the project. Therefore, the EMP cell leader and members have also to get involved in the routine production work as far as possible.

The project proponents have organized EMP cell organization as follow:

EMP Cell members

Sr no.	Name	Destination	Responsibility
1.	U Naung Naung Aye	Head of Cement Factory	EMP cell leader
2.	Daw Mon Mon Thet	General Manager	Cell member
3.	U Thet Lail	Deputy General Manager	Cell member
4.	Daw Khin Mar Htay	Asst: General Manager	Cell member
5.	U Pyae Phyo A Yar	Asst: Manager (Mining Engineer)	Cell member
6.	U Aye Myint Tun	Ward Administrator (Aung Nan Cho Village)	Cell member
7.	U Ye Min Soe	Villager	Cell member
8.	U Myo Aung	Manager (Mining Engineer)	Cell member
9.	U Ko Ko Naing	Asst: Manager (Admin)	Cell member

The head of cement factory is the leader of the EMP cell and manages the process of the environmental management sector. The head will be familiar with not only all of the activities of the environmental management processes but also all of environmental cell members. Giving the instruction about the environmental management process to the cell members is one of the responsibilities of the cell leader. Moreover, all of the cell members need to have knowledge about the environmental protection and environmental degradation. Therefore, the company will give the knowledge sharing program and awareness raising plan to all EMP cell leader and members.

Engineer (Environmental Protection Officer), one of the cell members, has responsibility of the inspection of the machineries and equipment and operation process not to cause the accident and excessive emission because of the failures of the machineries and equipment.

Another one of the engineers has the responsibility as the occupational health and safety officer. The learning about the update new of environmental protection process, supporting the safety and happy work environment for the employees, caring about the social development, religion culture, and health and safety associated with the project are the responsibilities as the cell member.

The remaining members perform the reducing actions of the environmental degradation and manage the performance activities of EMP procedure. Moreover, one of the members will be also liaison officer for dealing with the locals to know the public opinions and responses. The two locals will be involved in monitoring works from time to time.

These EMP cell members will also involve in Monitoring Plan (MP) works. They will be also involved in the undertaking of all mitigation measures throughout the project life of 25 years (+5 years 2 times extensions). Besides the above-mentioned responsibilities, the EMP cell members also have responsibilities to do the following activities.

- Familiar with the instruction that described in the EMP report,
- Monitor the participation of employee and project proponent to perform the environmental management plan,
- Record and collect the data of the process associated with the environmental management,
- Report to the responsible person about the industrial accidents and other accident related with the environmental pollution, and avoid not causing the repetitive accidents, and
- Prepare the monthly report associated with the environmental protection performances.

Not only the EMP cell members but also the project proponent, the environmental protection organization also have the responsible of taking care of the environment.

9.3 Implementation Schedule of ESMP

This is merely the overall work plan and schedule for the effective implementation of EMP during the Mine Development Phase, Operation Phase and Mine closure/Rehabilitation Phase, of the project life. Since the project is hand over from Nay Pyi Taw City Development Committee (NCDC), the mine development phase is already carried out.

EMP plans and implementation should be formulated since in the early Mine Operation Phase and through the Mine Operation Phase and up to the early Mine closure Phase.

MP plans and implementation should be started at the early Mine Operation Phase through the Operation Phase to the end of Mine closure/Rehabilitation Phase.

A generalized time frame for planning and implementation of EMP and MP is shown in the Figure-101 below.

Mine Development Phase (already carried out)	Mine Operation Phase	Mine Closure/ Rehabilitation Phase
1 year	25 years (+ 5 years extension two times)	2 years
<p>EMP</p> <p>MP</p>		

Figure-101: Generalized Time Frame for Planning and Implementation of EMP and MP During the Phases of Project Life

During the Mine Operation Phase

It is estimated that this long-term phase will last for up to 25 years and renewable.

As it is the most important phase of the whole project effective EMP and MP will be duly implemented during this phase. The long-term sustainable success of the whole project also depends very much on the effectiveness of EMP and MP implementation by efficient EMP cell members.

The mitigation measures to be taken and the EMP to be implemented during the Operation Phase where already mentioned earlier in tabulated form in **Chapter-5**.

During the Mine closure/Rehabilitation Phase

It is estimated that this phase will last for 2 years.

During this phase the limestone mine/quarry will be decommissioned and closed. Works involve the removal of machinery, equipment, vehicles, the dismantling and tearing down of building and structures; the reuse or put up for sale for some materials; the disposal of unwanted materials and removal of contaminated soil; and the clearing of the site. Other main works will include backfilling of pits and dents resulted from mining/quarrying activities and leveling off the ground.

After that the rehabilitation task will have to be implemented, mainly in the form of re-vegetation.

EMP for mine closure/rehabilitation will be formulated in advance. The mitigation measures to be taken and EMP to be implemented during this Mine closure/Rehabilitation Phase were already mentioned earlier.

The mine closure and subsequent rehabilitation was once considered unimportant and unnecessary. But in this era of environmental awareness effective mine closure and environmentally sound rehabilitation has become mandatory. A mine closure plan that incorporates both physical rehabilitation and socio-economic consideration must be now an integral part of the project life cycle. These should be considered:

- future public health and safety are not compromised after mine closure
- the after-use of the old site is beneficial and sustainable to the local community in the long term, and
- adverse socio-economic impacts after mine closure are minimized while socio-economic benefits are maximized.

9.4 Cost Estimation for Implementation of ESMP

Since EMP involves the management of all environmental issues, there have to be adequate budget for the implementation of EMP.

This budget will be only for the implementation of EMP but it will cover the procurement of certain devices, and equipment for uses in monitoring and certain materials for uses in emergency aspects eg- PPEs first aid facility medicines etc.

In order to effectively execute EMP and MP the company has set up a fund for the implementation of EMP and MP (in addition to a separate fund for the implementation of CSR). 5 percent of the project budget (50,000,000 MMK) is set aside for EMP fund which will cover the initial costs and the recurring expenses for the effective implementation of EMP and MP.

Because the Decommissioning/Rehabilitation Phase will come 25 plus years later the EMP budget for this last phase will be raised only during the last year of the Operation Phase.

Since mitigation and monitoring are integral part of EMP (and each and every EMP has to be based from each every impact) all the cost for implementing mitigation and monitoring are actually the main expense for the execution of EMP and MP. The expenses for most routine mitigation work and monitoring works will be also covered by the main budget of the project.

Allotment of EMP fund

The sub-budgets allotted for each programme under EMP fund are as follows:

- Cost for organizing EMP - 2% of EMP fund (1,000,000 Ks)

- Cost for partial procurement of equipment and materials - 20% of EMP fund (10,000,000 Ks)
- Cost for capacity building and training - 7% of EMP fund (3,500,000 Ks)
- Cost for reporting, documentation - 7% of EMP fund (3,500,000 Ks)
- Cost for execution and dissemination of EMP in the form of:
 - (c) Taking mitigation action - 25% of EMP fund (12,500,000 Ks)
 - (d) Monitoring action - 25% of EMP fund (12,500,000 Ks)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% of EMP fund (5,000,000 Ks)
- Miscellaneous (casual fees for two locals, who are members of EMP) - 4% of EMP fund (2,000,000 Ks)

Note: Cost for rehabilitation will be covered by the Decommissioning budgets.

Labor cost will be kept at a minimum. Only staffs will be involved in the implementation of EMP. Staff will be first trained for this EMP purpose.

A portion of the EMP fund will be used up for the procurement and operation of equipment and materials that are essential for the execution of EMP. eg. firefighting equipment such as fire extinguishers, water jet pumps and other accessories; Personnel Protective Equipment (PPEs). And also potable equipment for casual measurement of water and air one water pond for firefighting will be also constructed. In addition, adequate First Aid Kits with adequate medicine and drugs and other First Aid Kit accessory will have to be purchased. Some of the equipment for EMP will be covered in the original main project budget as the EMP fund cannot cover all these items.

Most of the EMP fund will be used up for the implementation of mitigation measures (which an integral part of EMP) and implementation of MP (which is also integral part of EMP). Mitigation and monitoring have to be carried out almost on a routine basis or daily basis, and that is why a large percentage of EMP has to be used. Sometime experts and/or technicians have to be hired since certain physical and chemical parameters cannot be tested or measured by the staffs of the factory.

For capacity building and for training for emergency trainers from Fire Brigade and trainers from the Red Cross Society will have to be hired.

The cost for emergency/contingency programme is difficult to estimate. Unfortunately, if a major accident is happened this fund has to be considerably increased.

The above-mentioned cost estimation is based on the current unit price. Because the project will be implemented over many years (even decades) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

The fund cannot cover the whole life of the project of 25 plus years. The fund can be considered as seed money; as time goes on more money will have to be added to the fund.

The funds for reporting programme and capacity building and training can be fixed to a great extent. But the fund for emergency programme cannot be fixed due to the unpredictable nature of emergency programme. Unfortunately, if major accidents happen more funds will have to be raised and reallocated for emergency programme (Emergency, health, safety are parts of EMP).

The fund for monitoring programme may not be also fixed for the long run. Depending on the finding of internal and external environmental audits and also based on the degree of achievement against the environmental objectives the monitoring programme has to be changed or modified. If more monitoring works have to be carried out then the funding will have to be increased.

All the EMP cell members are responsible for the execution of EMP and MP. Reserves cell members are also responsible for this task. Contractor will not be hired for doing EMP and MP. Of course, there are no such contractors in Myanmar yet. For pragmatic purpose the expenses are estimated as follows:

9.5 Commitments Made by the Project Proponent

First of all, the project proponents declare that the information in the report is, to the best of its knowledge, true, accurate and complete. The project proponents are committed to the truth, accuracy and completeness of the report.

The EMP report is prepared in compliance with laws, rules, regulations, guidelines and, most of all, the procedures as prescribed by the Environmental Conservation Department (ECD).

All the commitments made regarding EMP and mitigation measures described in the report will be duly undertaken.

During the implementation of the project, should there arise any directives for amendment for the improvement of the EMP report, regarding up-to-date technology, the project proponent will duly comply with the directives and implement this.

If the project proponent is desirous to amend and revise the report it will submit the case to the authority concerned and proceed with the amendment after approval by the authority.

After the end of the Operation Phase of Max Myanmar Manufacturing Company Limited will duly implement Decommissioning and Rehabilitation plan and ensure that no residual impacts, if any, remain in the after match of the project, and that the overall ecology is restored to its quasi condition before the commencement of the project.

U Phyo Wai Win

Director

Max Myanmar Manufacturing Co., Ltd

U Soe Han

Head of Department (Production)

Nay Pyi Taw City Development

Committee (NCDC)

10. CONCLUSION AND CONTEMPLATION

The project proponent has the desire to extract the limestone following rule and regulations to make the eco-friendly production.

The project proponent, Max Myanmar Manufacturing Company Limited and Nay Pyi Taw City Development Council (NCDC) will implement this project and will proceed with minimum impact on the environment as far as possible.

The project is the extraction of limestone

The objectives of the EMP report for the extraction of limestone are to legally produce quality cement from the raw materials limestone in Myanmar, to abide by the rules and duly pay the tax and revenue etc., as a responsible company, to upgrade the capacity of the factory and increase both the quantity and quality of the cement, to comply with the rules and regulation, particularly, and to do environmentally sound business. Moreover, the project also intended to the regional development.

The company will operate the extraction of limestone and manufacturing of cement to cause the minimum environmental impacts as far as possible and will follow the EMP that prepared by the MESC. The MESC prepares the EMP report based on the surveying and analyzing the results of current environmental condition, and the regional data obtained from the project site, Aung Nan Cho Village and Tae Kyi Kone Village, General Administration Office, the resulted data obtained from the social meeting. Moreover, this EMP report is prepared in compliance with the Mining EIA Guideline: date 2018 November and the Environmental Emission Guidelines, Notification No. 615/2015; date 29-12-2015 by Environmental Conservation Department.

The project is already in operation. Therefore, the environmental impacts that can cause during the preparation phase and construction phase is omitted while preparation of the EMP report. The environmental impacts like the water quality, air quality, soil quality, noise and vibration, occupational health and safety, biodiversity and socioeconomic conditions that can face during the operation phase and decommission phase and the mitigation plan for reducing these impacts described in this EMP report. The emergency response plan, monitoring plan also described.

In this EMP report, not only the management plan for the environment but also cooperate social responsibilities, the public consultation and regional development program also included.

Although the objectives of the public consultation are to make the open discussion with the public and make the transparency. There is no conflicts and complaints from the stated operated period to until now.

Finally, the project proponent pledges to comply with the regulation, guidelines and procedures as prescribed by the Environmental Conservation Department (ECD) in the implementation of this project and will do its best to minimize the impacts on the physical and social environment of the region as practical as possible.

The mitigation measures to be taken and the EMP and MP to be implemented will be duly undertaken.

10.1 List of Commitments

According to Chapter 3, article 3.4, the project proponent committed to the followings

- Committed to the truth, accuracy and completeness of the report.
- The EMP report is prepared in compliance with laws, rules, regulations, guidelines and, most of all, the procedures as prescribed by the Environmental Conservation Department (ECD).
- All the commitments made regarding EMP and mitigation measures described in the report will be duly undertaken.
- During the implementation of the project, should there arise any directives for amendment for the improvement of the EMP report, regarding up-to-date technology, the project proponent will duly comply with the directives and implement this.
- After the end of the Operation Phase of Myawaddy and Golden Hill International Limited will duly implement Decommissioning and Rehabilitation plan and ensure that no residual impacts, if any, remain in the after match of the project, and that the overall ecology is restored to its quasi condition before the commencement of the project.

According to Chapter 6, article 6.4, the project proponent committed to the followings:

- a commitment to do its best not to have serious negative impact on the physical, biological, socio-economic and cultural components due to the operation of the project site.
- The project proponent has committee to duly take all mitigation measures for each and every impacts caused by the operation of the project. It has also committed to enhance or maximize the positive impacts of the project.

- Compensation will also be duly provided if there is any impact on the socio-economic component (damage or loss of properties) and cultural and religious component (monastery, historical, and cultural heritage)

According to Chapter 7, article 7.5, the project proponent committed to the followings:

- The project proponent is committed itself to the holding of more public consultation meetings on a regular annual or bi-annual basis. It necessary emergency/non-regular meeting will be also held from time to time.
- The project proponent has committed itself to set up a adequate budget for the implementation of EMP. It has also a budget for implementation of CSR programme.

According to Chapter 8, article 8.13, the project proponent committed to the followings:

- The project proponent has made a commitment to duly execute all monitoring plans, especially the specific monitoring plan, and the results of monitoring will be incorporated into the regular semi-annual report, to be reported to ECD.
- The proponent is committed to undertake the management and monitoring sub-plan, particularly, taking mitigation measures, in its daily operation of project.

List of Commitments Table

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ANNEX



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ပုံစံ (၂၃) ၇


ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
ဓာတ်သတ္တုအကြီးစားထုတ်လုပ်ရန် ခွင့်ပြုမိန့်

ခွင့်ပြုမိန့်အမှတ်၊ ၀၀၄၈/၂၀၁၁ (Non-PSC မှ PSC ကူးပြောင်းခြင်း) ရက်စွဲ၊ ၂၀၂၃ ခုနှစ်၊ ဇန်နဝါရီလ ၁၆ ရက်

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဝန်ကြီးဌာနသည် ဆောက်ဖော်ပြုပြင် ပိုမိုလှ သို့မဟုတ် အဖွဲ့အစည်း အား ခွင့်ပြုသည့် လုပ်ကွက်ဧရိယာအတွင်း ဓာတ်သတ္တုအကြီးစား ထုတ်လုပ်ခြင်းလုပ်ငန်း လုပ်ကိုင်ရန် မြန်မာ့သတ္တုတွင်း ဥပဒေပုဒ်မ ၇၊ ၈ နှင့် နည်းဥပဒေ ၅၂၊ နည်းဥပဒေခွဲ (က) နှင့် (ခ) တို့အရ စည်းကမ်းချက်များ သတ်မှတ်၍ ဝန်ကြီးဌာနမှ စီမံခန့်ခွဲရေးကော်မတီ(ရှေးအမှတ်-၁၉)၏ (၁/၂၀၂၃) ကြိမ်မြောက် အစည်းအဝေးမှ သဘောတူခွင့်ပြုချက်အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည် -

- ၁။ ခွင့်ပြုမိန့်ရရှိသည့် ပုဂ္ဂိုလ် -
 - (က) အမည်နှင့်နိုင်ငံသားစိစစ်ရေး -
ကတ်ပြားအမှတ်/ နိုင်ငံခြားသား။
နိုင်ငံကူးလက်မှတ် အမှတ်
 - (ခ) နေရပ်လိပ်စာနှင့် ဆက်သွယ်ရန်ဖုန်း -
ဖက်(စ်)အမှတ်၊ အီးမေးလ် လိပ်စာ
- ၂။ ခွင့်ပြုမိန့်ရရှိသည့် အဖွဲ့အစည်း -
 - (က) ကုမ္ပဏီ၊ အဖွဲ့အစည်းအမည် - နေပြည်တော်စည်ပင်သာယာရေးကော်မတီ
 - (ခ) မှတ်ပုံတင်အမှတ်၊ ထုတ်ပေးသည့်ရက်စွဲ -
 - (ဂ) တည်နေရာလိပ်စာနှင့် ဆက်သွယ်ရန် - နေပြည်တော်ဘိလပ်မြေစက်ရုံ၊ နေပြည်တော်(လယ်ဝေး)
- ၃။ ဓာတ်သတ္တု အကြီးစား ထုတ်လုပ်ရန် - ထုံးကျောက် (စက်မှုတွင်းထွက်ကုန်ကြမ်း)
- ၄။ ခွင့်ပြုသည့် ဓာတ်သတ္တုအမျိုးအစား -
- ၅။ ခွင့်ပြုသည့် လုပ်ငန်းပုံစံ -
 - (က) တစ်ဦး/ တစ်ဖွဲ့တည်း ရာခိုင်နှုန်းပြည့် - ကုမ္ပဏီမှ(၁၀၀%) ရင်းနှီးမြှုပ်နှံခြင်း
လုပ်ကိုင်ခြင်း
 - (ခ) ဖက်စပ်လုပ်ကိုင်ခြင်းနှင့် -
ရင်းနှီးမြှုပ်နှံမှုအမျိုး
- ၆။ ဓာတ်သတ္တု အကြီးစား ထုတ်လုပ်ရန် ခွင့်ပြုသည့် လုပ်ကွက်ဧရိယာ -
 - (က) လုပ်ကွက်ဧရိယာ၏တည်နေရာ - တောင်ဖီလာဒေသ၊ နေပြည်တော်(လယ်ဝေး)မြို့နယ်၊
(ကျေးရွာ၊ မြို့နယ်၊ ခရိုင်၊ နေပြည်တော်
တိုင်းဒေသကြီး/ ပြည်နယ်)

- (ခ) လုပ်ကွက်ဧရိယာအကျယ်အဝန်း - ၁၅၀ ဧက (၀.၆၀၇၀ တောရန်းကီလိုမီတာ)
- (ဂ) နယ်နိမိတ်သတ်မှတ်ချက် - ခန့်မှန်းမြေပုံညွှန်း။ ၉၄အေ/၆(၈၇၃ ၆၈၄ ၈၅၅ ၆၈၄ ၈၅၅ ၆၇၀ ၈၇၀ ၆၇၂) (ပူးတွဲမြေပုံပါ အကျယ်အဝန်းအတိုင်း)
- ၆။ မူလခွင့်ပြုမိန့် သက်တမ်း (Non-PSC) - (၂၅) နှစ် (၃၁.၈.၂၀၁၁ မှ ၃၀.၈.၂၀၃၆ ထိ)
- ၇။ ထုတ်လုပ်မှုအပေါ်ခွဲဝေခံစားသည့် ခန့်မှန်း ဧက - (၁၆.၁.၂၀၂၃ မှ ၃၀.၈.၂၀၃၆ ထိ)
- ၈။ ဓာတ်သတ္တုလိုက် ခန့်မှန်းပမာဏ -
- ၉။ ခွင့်ပြုလုပ်ကွက် ဧရိယာ၏နယ်မြေရှိ အုပ်ချုပ်မှုဆိုင်ရာအဖွဲ့အစည်း - နေပြည်တော်(လယ်ဝေး)မြို့နယ်အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာန
- ၁၀။ ခွင့်ပြုလုပ်ကွက် ဧရိယာမှ တစ်ဆင့် သွားလာဝင်ထွက်ခွင့်ရှိသည့် မြို့နယ် - နေပြည်တော်(လယ်ဝေး)
- ၁၁။ ဓာတ်သတ္တု အကြီးစား ထုတ်လုပ်ရေးကာလ ပုံသေမြေငှားရမ်းခ (Dead Rent) - တစ်တောရန်းကီလိုမီတာလျှင်တစ်နှစ်- ၁၀၀၀၀၀၀ကျပ်နှုန်း
- ၁၂။ ခွင့်ပြုသည့် ဓာတ်သတ္တု အကြီးစား ထုတ်လုပ်ရေးနည်းစနစ်နှင့်အသုံးစရိတ် - မြေပေါ်ဟင်းလင်းဖွင့် တူးဖော်ခြင်းနှင့် မြေအောက်တူးဖော်ခြင်း
- ၁၃။ ခွင့်ပြုမိန့်ရရှိသူသည် ခွင့်ပြုမိန့်ပါ စည်းကမ်းချက်များကို တိကျစွာလိုက်နာရမည်။



 ပြည်ထောင်စုဝန်ကြီး

သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန

Max Myanmar Manufacturing Co., Ltd.


Max Cement Factory (Nay Pyi Traw)

Quality Research & Innovation Department

Chemical Analysis of NCDC Limestone

Date-18.7.2023

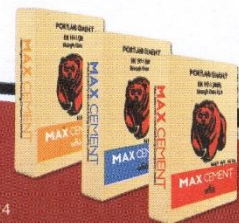
Loss on Ignition (%)	=	38.69
SiO ₂ (%)	=	8.61
Al ₂ O ₃ (%)	=	0.71
Fe ₂ O ₃ (%)	=	0.12
CaO (%)	=	49.28
MgO (%)	=	0.12
Total (%)	=	97.53


Zin Zin Mon
Chief Chemist
Quality Control Department
Max Cement



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Hot Line : +95 9 960 960 560 (Tech) +95 9 770 770 770 (Sales)
Email : ho@maxcement.com / Web Site : www.maxcement.com

Factory :
Taung Philar, Lewei Township, Nay Pyi Taw, Myanmar. / Tel : +95 9 5000 737, +95 9 49 20 50 24
Email : factory@maxcement.com





DEPARTMENT OF AGRICULTURE (LAND USE)

SOIL INTERPRETATION OF RESULTS

MESC (17.7.2023)

Division - နေပြည်တော်ကောင်စီနယ်မြေ။

Sheet No. 1

Township - လယ်ဝေးမြို့နယ်။

Sr No. S 1-3 / 2023

Sr No.	Sample	pH Soil:Water 1:2.5	Textrure	Total N	Available Nutrients
					P
1	Project Site	Moderately Alkaline	Loam	Very Low	Medium
2	Aung Nan Cho Village	Slightly Alkaline	Sandy Loam	Very Low	Very High
3	Tae Gyi Kone Village	Moderately Alkaline	Sandy Loam	Very Low	Low

(ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ
 ၀



DEPARTMENT OF AGRICULTURE (LAND USE)
SOIL ANALYTICAL DATA SHEET
MESC (17.7.2023)

Division - နေပြည်တော်ကောင်စီနယ်မြေ။
 Township - လယ်ဝေးမြို့နယ်။

Sheet No. 1
 Sr No. S 1 - 3 / 2023

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	Texture				Total N %	Available Nutrients
				Sand %	Silt %	Clay %	Total %		P (ppm) (O)
1	Project Site	13.69	8.17	51.54	30.36	18.1	100	0.070	9.74
2	Aung Nan Cho Village	0.78	7.53	76.54	15.36	8.1	100	0.052	25.81
3	Tae Gyi Kone Village	1.11	7.71	56.6	30.4	13.1	100.1	0.070	6.81

O= Olsen Method


 (ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ

The result of the soil sample at the three sampling points

M0723 013

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	MESC
Nature of Water	ရေပူချောင်းရေ (Upper)
Location	လယ်ဝေး
Date and Time of collection	16.7.2023
Date and Time of arrival at Laboratory	17.7.2023
Date and Time of commencing examination	17.7.2023
Date and Time of completing	18.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

Total Coliform Count	14	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	4	CFU/100ml	Not detected
pH	7.4		6.5 - 8.5
Turbidity	68	NTU	5 NTU
Colour (True)	40	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

Tested by

Signature:

Name:

Hein
Zaw Hein Oo
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature:

Name:

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

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0723 387

WATER QUALITY TEST RESULTS FORM

Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (Upper)
 Location _____ လယ်စေ:
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

pH	7.4		6.5 - 8.5
Colour (True)	40	TCU	15 TCU
Turbidity	68	NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	86	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	0.88	mg/l	0.3 mg/l
Chloride (as CL)	3	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	10	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	140	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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

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

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

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W0723 387

WATER QUALITY TEST RESULTS FORM

Client	MESC
Nature of Water	ရေပူချောင်းရေ (Upper)
Location	လယ်ခေး
Date and Time of collection	16.7.2023
Date and Time of arrival at Laboratory	17.7.2023
Date and Time of commencing examination	18.7.2023
Date and Time of completing	20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

Parameter	Unit	Value	Guideline (mg/l)
Temperature (°C)	°C		
Fluoride (F)	mg/l		1.5 mg/l
Lead (as Pb)	mg/l		0.01 mg/l
Arsenic (As)	mg/l	Nil	0.01 mg/l
Nitrate (N.NO ₃)	mg/l	0.7	50 mg/l
Chlorine (Residual)	mg/l		
Ammonia Nitrogen (NH ₃)	mg/l		
Ammonium Nitrogen (NH ₄)	mg/l		
Dissolved Oxygen (DO)	mg/l		
Chemical Oxygen Demand (COD)	mg/l		
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	mg/l		
Cyanide (CN)	mg/l		0.07 mg/l
Zinc (Zn)	mg/l		3 mg/l
Copper (Cu)	mg/l		2 mg/l
Silica (SiO ₂)	mg/l		

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

Tested by

Signature:

Name:

Hein
Zaw Hein Oo
 B.Sc (Chemistry)
 Sr.Chemist
 ISO Tech Laboratory

Approved by

Signature:

Name:

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 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

The result of the water quality of the upper point of the yay pu stream

M0723 014

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	MESC
Nature of Water	ရေပူချောင်းရေ (Lower)
Location	လယ်ဝေး
Date and Time of collection	16.7.2023
Date and Time of arrival at Laboratory	17.7.2023
Date and Time of commencing examination	17.7.2023
Date and Time of completing	18.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

Total Coliform Count	10	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	3	CFU/100ml	Not detected
pH	7.3		6.5 - 8.5
Turbidity	54	NTU	5 NTU
Colour (True)	30	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

Tested by

Signature:

Name:

Hein
Zaw Hein Oo
 B.Sc (Chemistry)
 Sr.Chemist
 ISO Tech Laboratory

Approved by

Signature:

Name:

Soe Thit
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W0723 388

WATER QUALITY TEST RESULTS FORM


Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (Lower)
 Location _____ လယ်စေ:
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

pH	7.3		6.5 - 8.5
Colour (True)	30	TCU	15 TCU
Turbidity	54	NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	90	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	0.70	mg/l	0.3 mg/l
Chloride (as CL)	2	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	8	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	139	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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

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

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

(a division of WEG Co.,Ltd.) **ISO Tech Laboratory**

No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0723 388

WATER QUALITY TEST RESULTS FORM

Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (Lower)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Temperature (°C)	°C	
Fluoride (F)	mg/l	1.5 mg/l
Lead (as Pb)	mg/l	0.01 mg/l
Arsenic (As)	Nil mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.3 mg/l	50 mg/l
Chlorine (Residual)	mg/l	
Ammonia Nitrogen (NH ₃)	mg/l	
Ammonium Nitrogen (NH ₄)	mg/l	
Dissolved Oxygen (DO)	mg/l	
Chemical Oxygen Demand (COD)	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	mg/l	
Cyanide (CN)	mg/l	0.07 mg/l
Zinc (Zn)	mg/l	3 mg/l
Copper (Cu)	mg/l	2 mg/l
Silica (SiO ₂)	mg/l	

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

Tested by

Signature: _____

Name: _____

Hein
Zaw Hein Oo
 B.Sc (Chemistry)
 Sr.Chemist
 ISO Tech Laboratory

Approved by

Signature: _____

Name: _____

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

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 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

The result of the water quality of the lower point of the yay pu stream



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

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

M0723 015

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (အောင်နန်းချိုကျေးရွာ)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 17.7.2023
 Date and Time of completing _____ 18.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Total Coliform Count	6	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	2	CFU/100ml	Not detected
pH	7.4		6.5 - 8.5
Turbidity	3	NTU	5 NTU
Colour (True)	Nil	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

Tested by

Signature: 
 Name: **Zaw Hein Oo**
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

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

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W0723 389

WATER QUALITY TEST RESULTS FORM

Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (အောင်နန်းချိုကျေးရွာ)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

pH	7.4		6.5 - 8.5
Colour (True)	Nil	TCU	15 TCU
Turbidity	3	NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	144	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	0.21	mg/l	0.3 mg/l
Chloride (as CL)	9	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	14	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	227	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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

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

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

(a division of WEG Co.,Ltd.) ISO Tech Laboratory

W0723 389

WATER QUALITY TEST RESULTS FORM

Client _____ MESC
 Nature of Water _____ ရေပူချောင်းရေ (အောင်နန်းချိုကျေးရွာ)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Temperature (°C)	°C	
Fluoride (F)	mg/l	1.5 mg/l
Lead (as Pb)	mg/l	0.01 mg/l
Arsenic (As)	Nil mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.4 mg/l	50 mg/l
Chlorine (Residual)	mg/l	
Ammonia Nitrogen (NH ₃)	mg/l	
Ammonium Nitrogen (NH ₄)	mg/l	
Dissolved Oxygen (DO)	mg/l	
Chemical Oxygen Demand (COD)	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	mg/l	
Cyanide (CN)	mg/l	0.07 mg/l
Zinc (Zn)	mg/l	3 mg/l
Copper (Cu)	mg/l	2 mg/l
Silica (SiO ₂)	mg/l	

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

Tested by

Signature: _____

Name: _____

Henry
Zaw Hein Oo
 B.Sc (Chemistry)
 Sr.Chemist
 ISO Tech Laboratory

Approved by

Signature: _____

Name: _____

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

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The result of the water quality of Aung Nan Cho Village



LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung

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



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Issue No - 1.0/Page 1 of 1

M0723 016

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client _____ MESC

Nature of Water _____ မဲဟော်ချောင်းရေ (တဲကြီးကုန်း)

Location _____ လယ်ဝေး

Date and Time of collection _____ 16.7.2023

Date and Time of arrival at Laboratory _____ 17.7.2023

Date and Time of commencing examination _____ 17.7.2023

Date and Time of completing _____ 18.7.2023

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Total Coliform Count	8	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	2	CFU/100ml	Not detected
pH	7.3		6.5 - 8.5
Turbidity	12	NTU	5 NTU
Colour (True)	5	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

Tested by

Signature: _____

Name: _____

Hein
Zaw Hein Oo
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature: _____

Name: _____

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

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

Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0723 390

WATER QUALITY TEST RESULTS FORM


Client _____ MESC
 Nature of Water _____ မဲတော်ချောင်းရေ (တဲကြီးကုန်း)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

pH	7.3		6.5 - 8.5
Colour (True)	5	TCU	15 TCU
Turbidity	12	NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	86	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	0.48	mg/l	0.3 mg/l
Chloride (as CL)	2	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	10	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	119	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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

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

Approved by
 Signature: 
 Name: **See Thit**
B.E (Civil) 1980
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.) **ISO Tech Laboratory**

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 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0723 390

WATER QUALITY TEST RESULTS FORM

Client _____ MESC
 Nature of Water _____ မဲဟော်ချောင်းရေ (တဲကြီးကုန်း)
 Location _____ လယ်ဝေး
 Date and Time of collection _____ 16.7.2023
 Date and Time of arrival at Laboratory _____ 17.7.2023
 Date and Time of commencing examination _____ 18.7.2023
 Date and Time of completing _____ 20.7.2023

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Temperature (°C)	°C	
Fluoride (F)	mg/l	1.5 mg/l
Lead (as Pb)	mg/l	0.01 mg/l
Arsenic (As)	Nil mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.6 mg/l	50 mg/l
Chlorine (Residual)	mg/l	
Ammonia Nitrogen (NH ₃)	mg/l	
Ammonium Nitrogen (NH ₄)	mg/l	
Dissolved Oxygen (DO)	mg/l	
Chemical Oxygen Demand (COD)	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	mg/l	
Cyanide (CN)	mg/l	0.07 mg/l
Zinc (Zn)	mg/l	3 mg/l
Copper (Cu)	mg/l	2 mg/l
Silica (SiO ₂)	mg/l	

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

Tested by

Signature: _____

Name: _____

Hein
Zaw Hein Oo
 B.Sc (Chemistry)
 Sr.Chemist
 SO Tech Laboratory

Approved by

Signature: _____

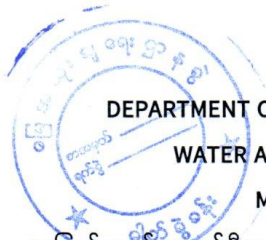
Name: _____

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

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

The result of the water quality of Mae Haw Stream (Tae Kyi Kone Village)



DEPARTMENT OF AGRICULTURE (LAND USE)

WATER ANALYTICAL DATA SHEET

MESC (17.7.2023)

Division - နေပြည်တော်ကောင်စီနယ်မြေ။

Sheet No. 1

Township - လယ်ဝေးမြို့နယ်။

Sr No. W 1-4 / 2023

Sr No.	Sample	Lead (Pb) ppm
1	Project Site (Upper)	Not Detected
2	Project Site (Lower)	Not Detected
3	Aung Nan Cho Village	Not Detected
4	Tae Gyi Kone Village	Not Detected

(ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ

ထုံးကျောက်တောင် တူးဖော်ထုတ်လုပ်ခြင်း လုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)
ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် အောင်ညွန့်ရွာ၊ ဝက်ကြီးကျေး

နေ့စွဲ 14.3.2023

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁	ဦးကိုသိန်း		အုပ်ချုပ်ရေးမှူး
၂	ဦးမြင့်စင်		
၃	ဦးမြင့်လွင်		
၄	ဦးစောလင်း		
၅	ဦးသန်းမြင့်		
၆	ဦးစောလင်း		
၇	ဦးစောလင်း		
၈	ဦးစောလင်း		
၉	ဦးစောလင်း		
၁၀	ဦးစောလင်း		
၁၁	ဦးစောလင်း		
၁၂	ဦးစောလင်း		

ထုံးကျောက်တောင် တူးဖော်ထုတ်လုပ်ခြင်း လုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)
ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် ကောင်းညို + ဝါဇွန်


နေ့စွဲ 14.7.2025

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁၃	တင်စိုးသန့်		
၁၄	ဒိုးဇော်		
၁၅	ကျော်စိုးဦး		
၁၆	ဦးလှစန်း		
၁၇	ဒေါ်ခင်ခင်ဦး		
၁၈	မောင်ပေါက်		
၁၉	အောင်ကိုလတ်		
၂၀	ရောင်အောင်		
၂၁	ဦးစောအိန်		
၂၂	မင်းစို		
၂၃	ဦးကျော်သိန်း		
၂၄	ဦးစိုးဦး		

ထုံးကျောက်တောင် တူးဖော်ထုတ်လုပ်ခြင်း လုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)
ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် ~~အောင်တန်းကျေးရွာ~~ + တစ်(၆) ကျော်

နေ့စွဲ 14.7.2023

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၂၅	သန်းဝဇွန်	သန်းဝဇွန်	
၂၆	ကို မှော်	မှော်	
၂၇	ဒေါ်ဝင်း	ဝင်း	
၂၈	မြညိုမြစော		
၂၉	၁၉ မောင် ဝင်း	ဝင်း	
၃၀	သိန်းမောင်	သိန်း	

List of attendance



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
အမှတ်(၁)သတ္တုတွင်းလုပ်ငန်း
နေပြည်တော်

ဖုန်း ၀၆၇ ၄၀၉၄၄၅၊ ဖက်စ် ၀၆၇ ၄၀၉၃၉၄၊ e-mail: meone@e-monrec.gov.mm

စာအမှတ်၊၆/၂(NPTDC)/၁၇/၂၀၂၄ (၁၀၆၃၃)
ရက်စွဲ၊ ၂၀၂၄ ခုနှစ်၊ ဇူလိုင် လ ၂၇ ရက်

သို့

ဌာနကြီးမှူး

နေပြည်တော်စည်ပင်သာယာရေးကော်မတီ

အကြောင်းအရာ။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာ ရေးသားပြုစုမည့် အဖွဲ့၏ အမည်စာရင်းနှင့် အချက်အလက်များ ပေးပို့တင်ပြလာမှုအပေါ် သဘောထားမှတ်ချက်ပြန်ကြားခြင်း

- ရည်ညွှန်းချက်။ (၁) နေပြည်တော်စည်ပင်သာယာရေးကော်မတီ၏ ၂၆.၆.၂၀၂၄ ရက်စွဲ ပါစာအမှတ်၊ ၄၉၂၇/၂-၂/နပတ (ကော်မတီ)
- (၂) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၂၂-၇-၂၀၂၄ ရက်စွဲပါ စာအမှတ်၊ EIA-၂/၁၃/ သဘောထား(TP) (၃၀၀၅/၂၀၂၄) (ခါတ်ပုံ မိတ္တူပူးတွဲ)

၁။ နေပြည်တော်စည်ပင်သာယာရေးကော်မတီသည် နေပြည်တော်ကောင်စီနယ်မြေ၊ လယ်ဝေး မြို့နယ်၊ တောင်ဖိလာဒေသ၊ ခန့်မှန်းမြေပုံညွှန်း၊ 94-A/6(A-873 680, B-885 680, C-885 670, D-871 672) အတွင်းရှိ မြေဧရိယာ (၁၅၀) ဧကတွင် ဓာတ်သတ္တုအကြီးစားထုတ်လုပ်ရန် ခွင့်ပြုမိန့်အမှတ် (၀၀၄၈/၂၀၁၁) ဖြင့် (၃၁-၈-၂၀၁၁) ရက်နေ့မှ (၃၀-၈-၂၀၃၆) ရက်နေ့အထိ (၂၅) နှစ် သက်တမ်းရှိသော ထုံးကျောက်အကြီးစားထုတ်လုပ်မှုလုပ်ငန်းကို Non-PSC စနစ်ဖြင့် လုပ်ငန်းများဆောင်ရွက်ခဲ့ပြီး ခွင့်ပြုမိန့်အမှတ် (၀၀၄၈/၂၀၁၁) (Non-PSC မှ PSC ကူးပြောင်းခြင်း) ဖြင့် (၁၆-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၈-၂၀၃၆) ရက်နေ့အထိ အမှတ် (၁) သတ္တုတွင်း လုပ်ငန်းနှင့် ထုတ်လုပ်မှုအပေါ် ခွဲဝေခံစားသည့်စနစ်ဖြင့် လုပ်ငန်းသဘောတူစာချုပ် ချုပ်ဆို ဆောင်ရွက်လျက်ရှိပါသည်။

၂။ နေပြည်တော်စည်ပင်သာယာရေးကော်မတီအနေဖြင့် အဆိုပါ ထုံးကျောက်အကြီးစား လုပ်ကွက် မြေဧရိယာ (၁၅၀) ဧကတွင် ထုံးကျောက်တူးဖော်ထုတ်လုပ်မှုလုပ်ငန်းများ ဆောင်ရွက် နိုင်ရန်အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာ ရေးဆွဲပြုစုမည့်အဖွဲ့ရှိ


တတိယပုဂ္ဂိုလ်များ၏ အမည်စာရင်းနှင့် အချက်အလက်များကို ရည်ညွှန်း (၁) ပါစာဖြင့် တင်ပြ ခဲ့ရာ အမှတ်(၁)သတ္တုတွင်းလုပ်ငန်းမှတစ်ဆင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ သဘော ထားပြန်ကြားပေးနိုင်ပါရန် ညှိနှိုင်းပေးပို့ခဲ့ပါသည်။

၃။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနအနေဖြင့် နေပြည်တော်စည်ပင်သာယာရေးကော်မတီ က တင်ပြခဲ့သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာ ရေးသားပြုစုမည့် တတိယပုဂ္ဂိုလ်များ၏ အမည်စာရင်းနှင့် အချက်အလက်များအား စိစစ်ရာတွင် လုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်) ရရှိထားသည့် အကြံပေးပုဂ္ဂိုလ် (၄)ဦး၊ တွဲဖက်အကြံပေးပုဂ္ဂိုလ် (၁)ဦး၊ လုပ်ငန်းလိုင်စင် မရရှိသေးသော တတိယပုဂ္ဂိုလ် (၄)ဦးနှင့် အထောက်အကူပြုအဖွဲ့ဝင် (၂) ဦးပါဝင်ကြောင်း စိစစ်တွေ့ရှိပါကြောင်း၊ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းများ လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံး လုပ်နည်းအပိုဒ် ၅၀ တွင် “ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ၊ နည်းဥပဒေ ၅၅ အရ ကနဦးပတ် ဝန်းကျင်ဆန်းစစ်ခြင်း သို့မဟုတ် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ပြုလုပ်ရန် လိုအပ်သည့် စီမံကိန်းအမျိုးအစားအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ရေးဆွဲရန်ဖြစ်စေ၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအပိုဒ် ၂၄ အရ ဝန်ကြီးဌာနက ရွေးချယ်သတ်မှတ်သော စီမံကိန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ရေးဆွဲရန်ဖြစ်စေ ဆောင်ရွက်မည့် လေ့လာဆန်းစစ်ရေးအဖွဲ့တွင် အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေး ပုဂ္ဂိုလ် အနည်းဆုံး (၂) ဦး ပါဝင်ရမည်” ဟု ပြဋ္ဌာန်းထားပါသဖြင့် လိုအပ်သည့်နယ်ပယ်များ အလိုက် တာဝန်ယူဆောင်ရွက်မည့် လုပ်ငန်းလိုင်စင်ရရှိထားသူများပါဝင်ကြောင်း စိစစ်တွေ့ရှိရ သဖြင့် ကန့်ကွက်ရန်မရှိပါကြောင်းနှင့် အဆိုပါထုံးကျောက်အကြီးစားလုပ်ကွက် (၁၅၀) ဧက အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) အစီရင်ခံစာအား အောက်ပါအတိုင်း ဆက်လက် ဆောင်ရွက်နိုင်ရန် ရည်ညွှန်း (၂) ပါစာဖြင့် သဘောထားမှတ်ချက်ပြန်ကြားလာပါသည်-

- (က) နေပြည်တော်စည်ပင်သာယာရေးကော်မတီ၏ ထုံးကျောက်အကြီးစားတူးဖော် ထုတ်လုပ်မှုလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ကို ပူးတွဲပါ လေ့လာဆန်းစစ်ရေးအဖွဲ့ဝင်များဖြင့် ဆောင်ရွက်မည့်အပေါ် အတည်ပြုကြောင်း၊
- (ခ) လေ့လာဆန်းစစ်ရေးအဖွဲ့တွင် လုပ်ငန်းလိုင်စင်မရရှိသေးသော တတိယပုဂ္ဂိုလ်များ ထည့်သွင်းဆောင်ရွက်မည်ဆိုပါက အထောက်အကူပြုအဖွဲ့ဝင်အဖြစ် (၁)ဦးသာ ခွင့်ပြုမည်ဖြစ်ပြီး နယ်ပယ်တစ်ခုအတွက်သာ ဆောင်ရွက်ခွင့်ရှိကြောင်း၊
- (ဂ) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအပိုဒ် ၆၃ (ဇ)၊ ၇၇ ပါ သတ်မှတ်ချက်များနှင့်အညီ ရေးဆွဲ၍ သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသို့ တင်ပြ အတည်ပြုချက်ရယူရန်၊

(ဃ) စီမံကိန်းနှင့် ဆက်စပ်သောဒေသများတွင် ဌာနဆိုင်ရာအဖွဲ့အစည်းများ၊ အစိုးရ မဟုတ်သော အဖွဲ့အစည်းများ၊ မိဒီယာများ၊ ဒေသခံများ၊ စီမံကိန်းကြောင့် အဓိက ထိခိုက်ခံစားရမည့်သူများပါဝင်လျက် တွေ့ဆုံဆွေးနွေးမှုများ ဆောင်ရွက်ရန်နှင့် ၎င်းတို့၏ အကြံပြုချက်နှင့် လိုလားချက်များအား အလေးထားပေါင်းစပ်ဆောင် ရွက်ရန်။

၄။ သို့ဖြစ်ပါ၍ နေပြည်တော်စည်ပင်သာယာရေးကော်မတီအနေဖြင့် နေပြည်တော်ကောင်စီ နယ်မြေ၊ လယ်ဝေးမြို့နယ်၊ တောင်ဖိလာဒေသရှိ မြေဧရိယာ (၁၅၀) ဧက ကျယ်ဝန်းသော လုပ်ကွက်တွင် ထုံးကျောက်အကြီးစားထုတ်လုပ်ရန်အတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာရေးသားမည့် တတိယပုဂ္ဂိုလ်များအမည်စာရင်း တင်ပြခဲ့မှုနှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှ ကန့်ကွက်ရန်မရှိကြောင်း ပြန်ကြားလာပါသဖြင့် ပတ်ဝန်း ကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)ကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃(ဇ)၊ ၇၇ ပါသတ်မှတ်ချက်များနှင့်အညီ ရေးဆွဲ၍ အမှတ်(၁)သတ္တုတွင်းလုပ်ငန်းသို့ ပေးပို့နိုင်ပါရန် အကြောင်းကြားအပ်ပါသည်။


ဦးဆောင်ညွှန်ကြားရေးမှူး(ကိုယ်စား)
(ကျော်ဇင်ဦး၊ အထွေထွေမန်နေဂျာ)

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