

ENVIRONMENTAL IMPACT ASSESSMENT  
FOR  
PRODUCTION AND MARKETING OF TMT  
REBARS

YANGON J.R FAMILY LTD.

Project Proponent



Yangon J.R Family Ltd.

Prepared by





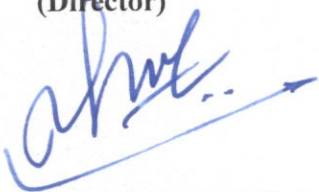
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## Report Review Form

<b>Report Title:</b> Environmental Impact Assessment (EIA) for Production and Marketing of TMT Rebars Project	
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<b>Summary:</b> EIA Report  This document presents the Environmental Impact Assessment report for Production and Marketing of TMT Rebars Project.	<b>Approved by:</b> U Tin Aung Moe  (Director) 

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## **DISCLAIMER**

This report has been prepared within the terms of references (TOR) adopted for this report and those of the contract with the client according to the prevailing active Laws, Rules, Regulations, and Procedures within the framework of Myanmar Environmental Impact Assessment Procedure 2015. We do not assume any responsibility or liability in regard with any matters beyond the scope of the TOR and the contract.

Data analysis, impact assessment, devising mitigation measures and report formulation were carried out based on the information/ plan/ processes provided by the project proponent, available secondary data and information, and onsite observation and measurement of E Guard's environmental study team in line with the relevant national and international guidelines and standards. While we do take effort to ensure that the information contained in this report is reliable and accurate, we disclaim no responsibility for errors and omissions which might occur despites of our reasonable skill and care.

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**Commitment to Follow and Compliance with Environmental Conservation Law, Rules,  
Environmental Impact Assessment Procedure, National Environmental Quality  
(Emission) Guidelines, Relevant Environmental Standards and Mitigation Measures  
Stated in the Environmental Impact Assessment (EIA) Report**

With regard to the above matter, we, E Guard Environmental Services has prepared the Environmental Impact Assessment (EIA) Report for Production and Marketing of TMT Rebar Project, established by Yangon J.R Family Ltd. Our company strongly commits that this EIA report has been prepared by following Environmental Conservation Law (2012), Environmental Conservation Rules (2014), Environmental Impact Assessment Procedure (2015), National Environmental Quality (Emission) Guidelines (2015) and relevant environmental standards through successful implementation of mitigation measures and environmental monitoring plans stated in the Environmental Impact Assessment (EIA) report.



**Third Party**

**E Guard Environmental Services**



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## List of Abbreviation

ABBREVIATION DESCRIPTION	
ACGIH	: American Conference of Governmental Industrial Hygienists
AIDS	: Acquired Immune Deficiency Syndrome
AOI	: Area of Influence
BOD	: Biochemical Oxygen Demand
CCM	: Continuous Casting Machine
CL	: Central Lowland
CO	: Carbon Monoxide
CO <sub>2</sub>	: Carbon Dioxide
COD	: Chemical Oxygen Demand
CSR	: Corporate Social Responsibility
DO	: Dissolved Oxygen
EAF	: Environmental Assessment Form
ECC	: Environmental Compliance Certificate
ECD	: Environmental Conservation Department
EH	: Eastern Highland
EIA	: Environmental Impact Assessment
EMP	: Environmental Management Plan
EPA	: Environmental Protection Agency
EPAS	: Environmental Perimeter Air Station
ESIA	: Environmental and Social Impact Assessment
EQ	: Environmental quality
FES	: Fume Extraction System
FO	: Furnace Oil
GAD	: General Administration Department
GHG	: Greenhouse Gas
HCL	: Hydrogen Chloride
HF	: Hydrogen Fluoride
HIA	: Health Impact Assessment
HIV	: Human Immunodeficiency Virus
HS	: Hydrogen Sulphate
HSE	: Health, Safety and Environment
IAIA	: International Association for Impact Assessment
IEE	: Initial Environmental Examination
IFC	: International Finance Corporation
IEMA	: Institute of Environmental Management and Assessment
ILO	: International Labour Organization
IRR	: Internal Rate of Return
NO <sub>2</sub>	: Nitrogen Dioxide
MEC	: Myanmar Economic Corporation
MIC	: Myanmar Investment Commission
MMK	: Myanmar Kyat
MOC	: Ministry of Construction
MONREC	: Ministry of Natural Resource and Environmental Conservation

<b>ABBREVIATION DESCRIPTION</b>	
MS	: Mild Steel
MSDS	: Material Safety Data Sheets
NDWQS	: National Drinking Water Quality Standards
NEQ	: National Environmental Quality (Emission) Guideline
NO <sub>2</sub>	: Nitrogen Dioxide
NO <sub>x</sub>	: Nitrogen Oxide
NTU	: Nephelometric Turbidity Units
O <sub>3</sub>	: Ozone
OSHA	: Occupational Safety and Health Administration
PCB	: Polychlorinated Biphenyls
pH	: Potential of Hydrogen
PM <sub>10</sub>	: Particulate Matters Equal to or less than 10μm
PM <sub>2.5</sub>	: Particulate Matters Equal to or less than 2.5μm
PPE	: Personal Protective Equipment
PVC	: Poly Vinyl Chloride
QC	: Quality Control
R.O	: Reverse Osmosis
SO <sub>2</sub>	: Sulphur Dioxide
SPM	: Suspended Particulate Matter
SWG	: Sustainable Water Group
TB	: Tuberculosis
TDS	: Total Dissolved Solid
TMT	: Thermo-Mechanically Treated
TOR	: Term of Reference
TPA	: Tons per Annual
TSP	: Total Suspended Particulates, Particulate Matters Equal to or less than 50μm
TSS	: Total Suspended Solid
VOCs	: Volatile Organic Compounds
USD	: American Dollar
WFB	: Western Fold Belt
WHO	: World Health Organization
YCDC	: Yangon City Development Committee
YESB	: Yangon City Electric Power Supply Board
YESC	: Yangon Electricity Supply Corporation
<b>DIMENSION</b>	
%	: Percentage
°C	: Degrees Celsius
cbm	: Cubic meter
cal/g	: Calorie per gram
dB (A)	: A Weighted Decibel
Ft	: Feet
g	: Gram
HP	: Horse Power
Hz	: Hertz
in	: Inches



<b>ABBREVIATION DESCRIPTION</b>	
L	: Liter
LPH	: Liter per hour
LPM	: Liter per minute
KL	: Kilo Liter
KLD	: Kilo Liter per day
m	: Meter
mm	: Millimeter
m <sup>2</sup>	: Square Meter
m <sup>3</sup>	: Cubic Meter
mg /l	: Milligram Per Liter
mph	: Mile per hour
m/s	: Meter per second
mi <sup>2</sup>	: Square Mile
MT	: Metric Tons
ppb	: Part Per Billion
ppm	: Part Per Million
RH%	: Relative Humidity
rpm	: Revolution Per Minute
μm	: Micro Milligram
μg/m <sup>3</sup>	: Micro Gram Per Cubic Meter
mg/m <sup>3</sup>	: Milligram Per Cubic Meter
Km	: Kilometer
km <sup>2</sup>	: Square Kilometer
kph	: Kilometer Per Hour
KWh	: Kilo Watt Hour
KVA	: Kilo Volt-Amperes
TPA	: Tons per Annum

## အစီရင်ခံစာအကျဉ်းချုပ်

ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာအား ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ အကွက်အမှတ်- ၃၄၀၊ ၃၄၃၊ ၃၃၈၊ ၃၄၅၊ ၃၃၉ နှင့် ၃၄၄ တွင်တည်ရှိသော ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ ထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူးရောင်းချခြင်းလုပ်ငန်း စီမံကိန်း အတွက် ရေးသားထားပါသည်။ စီမံကိန်းအဆိုပြုသူမှာ Yangon J.R Family Limited ဖြစ်ပြီး အီးဂတ် ပတ်ဝန်းကျင်ဆိုင်ရာ ဝန်ဆောင်မှုမှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာကို သက်ဆိုင်ရာအစိုးရ အဖွဲ့အစည်းများမှ ထုတ်ပြန်ထားသောဥပဒေ၊ နည်းဥပဒေ၊ စည်းမျဉ်းစည်းကမ်းများ၊ စီမံကိန်းအမျိုးအစားနှင့် အတိုင်းအတာအပေါ်မူတည်၍ နိုင်ငံတကာ လမ်းညွှန်ချက်များနှင့်အညီ Yangon J.R Family Limited ကိုယ်စားပြင်ဆင်ရေးသားခဲ့ပါသည်။ ဤအစီရင်ခံစာကို မြန်မာနိုင်ငံပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လုပ်ထုံးလုပ်နည်း (၂၀၁၅) နှင့်အညီ သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနမှ ခွင့်ပြုချက်ရရှိရန်အတွက် ပြင်ဆင်ရေးသားခဲ့ပါသည်။ ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် စီမံကိန်းအကောင်အထည်ဖော် ဆောက်ရွက်သည့်ကာလအတွင်း ဖြစ်ပေါ်လာသော သက်ရောက်မှုများနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ အစိတ်အပိုင်းတစ်ခုချင်းစီအတွက် လျော့ပါးစေရေး နည်းလမ်းများနှင့် စီမံခန့်ခွဲမှု အစီအစဉ်များကို ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လုပ်ငန်းစဉ်၏ ရည်ရွယ်ချက်မှာ အဆိုပြုစီမံကိန်း (သို့မဟုတ်) အနီး ပတ်ဝန်းကျင်အပေါ် သက်ရောက်လာနိုင်မည့် ပတ်ဝန်းကျင်ထိခိုက်မှုများအား ထုတ်ဖော်သတ်မှတ်၍ အစီရင်ခံစာတွင် အသေးစိတ်ဖော်ပြပေးရန် ဖြစ်ပါသည်။ တိုင်းတာရရှိလာသည့် အချက်အလက်များနှင့် ထပ်ဆင့်ရရှိထားသည့် အချက်အလက်များအပေါ်မူတည်၍ ဖြစ်နိုင်ချေရှိသော သိသာထင်ရှားသည့် သက်ရောက်မှုများအား တွက်ချက်သတ်မှတ်ပေးရပါသည်။ တိုင်းတာရရှိထားသည့် အချက်အလက်များနှင့် အခြေခံပတ်ဝန်းကျင် အချက်အလက်များဖြစ်သည့် ရူပ၊ ဇီဝနှင့် လူမှုစီးပွားအချက်အလက်များကို တိုက်ရိုက် ကောက်ခံ၍ သော်လည်းကောင်း (သို့မဟုတ်) ထုတ်ပြန်ထားသည့် အစီရင်ခံစာများ၊ စာအုပ်စာတမ်းများအပေါ် အခြေခံ၍သော်လည်းကောင်း ကောက်ယူထားခြင်းဖြစ်ပါသည်။

ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆောင်ရွက်ရာတွင် စီမံကိန်း၏ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွား ရှုထောင့်နှင့် သက်ဆိုင်သည့် မြန်မာနိုင်ငံ၏မူဝါဒ၊ ဥပဒေများနှင့် အဖွဲ့အစည်း၏ မူဘောင်များနှင့် နိုင်ငံတကာရှိ လမ်းညွှန်ချက်များကိုပါ သုံးသပ်လေ့လာထားပါသည်။ အဆိုပြုစီမံကိန်းသည် အမျိုးသားအဆင့် စံသတ်မှတ်ချက်များနှင့် ဥပဒေများအတိုင်း ဆောင်ရွက်ထားပါသည်။ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းနှင့် စပ်လျဉ်း၍ အမျိုးသားအဆင့်ဥပဒေတွင် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာမူဝါဒ (၁၉၉၄)၊ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် များ (၂၀၁၅) နှင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) တို့ပါဝင်ပါသည်။ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များတွင် ပတ်ဝန်းကျင်

ညစ်ညမ်းမှုကို ကာကွယ်ရန်၊ ပတ်ဝန်းကျင်နှင့် ပြည်သူ့ကျန်းမာရေးကို ကာကွယ်ရန်အတွက် စီမံကိန်းမှ ထွက်ရှိသော ဆူညံသံ၊ အခိုးအငွေ့ထုတ်လွှတ်မှုနှင့် ရေဆိုးစွန့်ထုတ်မှုထိန်းချုပ်ခြင်းအတွက် အခြေခံ အချက်များကို ဖော်ပြထားပါသည်။

စီမံကိန်းလုပ်ငန်းအတွင်း ပတ်ဝန်းကျင်နှင့်သက်ဆိုင်သည့် လိုက်နာဆောင်ရွက်ရမည့် ဥပဒေများမှာ-

- ၁။ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာမူဝါဒ (၂၀၁၉)
- ၂။ အမျိုးသားမြေအသုံးချမှုမူဝါဒ (၂၀၁၆)
- ၃။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)
- ၄။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေ (၂၀၁၄)
- ၅။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း (၂၀၁၅)
- ၆။ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅)

အာမခံလုပ်ငန်းအတွက်-

- ၁။ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆)
- ၂။ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေ (၂၀၁၇)
- ၃။ မြန်မာ့အာမခံဥပဒေ (၁၉၉၃)

ကျန်းမာရေးအတွက်-

- ၁။ ဓာတုဗေဒနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေ (၂၀၁၃)
- ၂။ ပြည်သူ့ကျန်းမာရေးဥပဒေ (၁၉၇၂)
- ၃။ ကူးစက်ရောဂါများကာကွယ်နိုင်ရန်ရေးဥပဒေ (၂၀၁၁)
- ၄။ ဆေးလိပ်နှင့်ဆေးရွက်ကြီးထွက်ပစ္စည်းသောက်မှုထိန်းချုပ်ရေးဥပဒေ (၂၀၀၆)

တည်ဆောက်ရေးကာလအတွင်း လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးမှာ အခြေခံကျသော လိုအပ်ချက်ဖြစ်ပါသည်။

- ၁။ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဥပဒေ (၂၀၁၉)

စီမံကိန်းအတွက်အခြားလိုအပ်သော ဥပဒေများမှာ-

- ၁။ ယာဉ်အန္တရာယ် ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုဥပဒေ (၂၀၂၀)
- ၂။ ယာဉ်အန္တရာယ် ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုနည်းဥပဒေ (၂၀၂၂)
- ၃။ လျှပ်စစ်ဥပဒေ (၂၀၁၄)
- ၄။ သဘာဝဘေးအန္တရာယ်စီမံခန့်ခွဲမှုဥပဒေ (၂၀၁၃)
- ၅။ မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ ဥပဒေ (၂၀၁၅)
- ၆။ မြန်မာနိုင်ငံအင်ဂျင်နီယာကောင်စီဥပဒေ (၂၀၂၂)
- ၇။ လုပ်ငန်းခွင်သုံးပေါက်ကွဲစေတတ်သောဝတ္ထုပစ္စည်းများဆိုင်ရာ ဥပဒေ (၂၀၁၈)
- ၈။ မြန်မာနိုင်ငံ ကုမ္ပဏီများဥပဒေ (၂၀၁၇)

စီမံကိန်းအကောင်အထည်ဖော် ဆောင်ရွက်ခြင်းအတွက် အလုပ်သမားများနှင့် သက်ဆိုင်သည့် ဥပဒေများမှာ-

- ၁။ အလုပ်သမားအဖွဲ့အစည်းဥပဒေ (၂၀၁၁)
- ၂။ အလုပ်သမားရေးရာအငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ (၂၀၁၂)
- ၃။ အလုပ်အကိုင်နှင့်ကျွမ်းကျင်မှုဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ (၂၀၁၃)
- ၄။ အနည်းဆုံးအခကြေးငွေဥပဒေ (၂၀၁၃)
- ၅။ အခကြေးငွေပေးချေရေးဥပဒေ (၂၀၁၆)
- ၆။ အလုပ်သမားလျော်ကြေးအက်ဥပဒေ (၁၉၂၃)
- ၇။ ခွင့်နှင့်အလုပ်ပိတ်ရက်များအက်ဥပဒေ (၁၉၅၁)
- ၈။ လူမှုဖူလုံရေးဥပဒေ (၂၀၁၂)

စီမံကိန်းနှင့်သက်ဆိုင်သည့် ဥပဒေများမှာ-

သယံဇာတထိန်းသိမ်းရေး

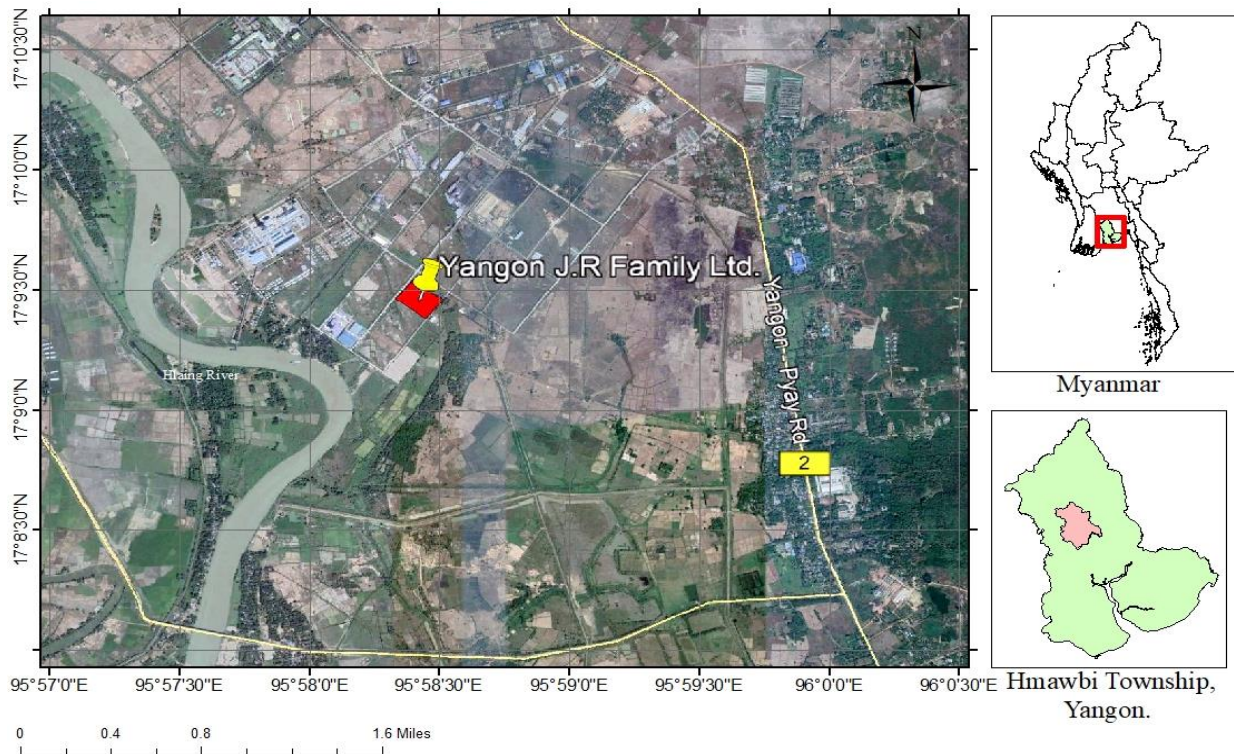
- ၁။ ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးဥပဒေ (၂၀၀၆)
- ၂။ ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးနည်းဥပဒေ (၂၀၁၃)
- ၃။ သစ်တောဥပဒေ (၂၀၁၈)

ယဉ်ကျေးမှုဆိုင်ရာအမွေအနှစ်များ

- ၁။ ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၉)
- ၂။ ရှေးဟောင်းဝတ္ထုပစ္စည်းများကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၅)
- ၃။ ရှေးဟောင်းအဆောက်အအုံများကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၅)
- ၄။ တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့်ဥပဒေ (၂၀၁၅)
- ၅။ တိုင်းရင်းသားလူမျိုးများ၏အခွင့်အရေးကာကွယ်စောင့်ရှောက်သည့်နည်းဥပဒေ (၂၀၁၉)
- ၆။ ရေနံနှင့်ရေနံထွက်ပစ္စည်းဥပဒေ (၂၀၁၇)
- ၇။ ရေနံနည်းဥပဒေ (၁၉၃၇)
- ၈။ စက်မှုဇုန်ဥပဒေ (၂၀၂၀)
- ၉။ ပုဂ္ဂလိကစက်မှုလုပ်ငန်းဥပဒေ (၁၉၉၀)

စီမံကိန်းအဆိုပြုသူသည် ၂၀၁၈ ခုနှစ်၊ ဧပြီလ (၂၀) ရက်နေ့တွင် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မတီ (MIC) သို့ စီမံကိန်းရင်းနှီးမြှုပ်နှံမှု အဆိုပြုလွှာကို လျှောက်ထားခဲ့ပါသည်။ ထို့နောက် ၂၀၁၈ ခုနှစ်၊ မေလ၊ (၁၁) ရက်နေ့တွင် အဆိုပါဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူးရောင်းချမည့် (TMT Rebars) စက်ရုံစီမံကိန်းအား Yangon J.R Family Limited အမည်ဖြင့် (၁၀၀%) နိုင်ငံခြားရင်းနှီးမြှုပ်နှံခြင်းဆိုင်ရာ စီမံကိန်း၏ အဆိုပြုလွှာအပေါ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သက်ဆိုင်သော သဘောထားမှတ်ချက်ရယူရန်အတွက် သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဝန်ကြီးဌာနသို့ ဆက်လက်တင်ပြခဲ့ပြီး လမ်းညွှန်ချက်တောင်းခံခဲ့ပါသည်။ အဆိုပါဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ

ထုတ်လုပ်ခြင်းနှင့် မြန်ဖြူးရောင်းချခြင်း လုပ်ငန်းစီမံကိန်း၏ တည်ဆောက်ရေး သတ်မှတ်ကာလမှာ ၂၀၁၈ ခုနှစ်၊ ဧပြီလ မှ ၂၀၂၀ ခုနှစ် ဇူလိုင်လထိ ဖြစ်ပါသည်။ စီမံကိန်း မြေဧရိယာမှာ ၁၀,၉၇၇ ဧက ဖြစ်ပြီး စက်ရုံအဆောက်အအုံတွင် စားသောက်ခန်း၊ လုံခြုံရေးခန်း၊ ရေတွင်း၊ မီးအားမြှင့်စက်အစရှိသည်များ ပါဝင်ပါသည်။ အဆိုပြုစီမံကိန်း၏ ကိုဩဒိနိတ်ပွိုင့်မှာ မြောက်လတ္တီကျု ၁၇° ၉' ၂၃.၁၃၂" နှင့် အရှေ့လောင်ဂျီကျု ၉၅° ၅၈' ၂၇.၃၅၈" ဖြစ်ပြီး ရွေးချယ်သတ်မှတ်ထားသည့် စက်ရုံတည်နေရာကို ပုံ ၁-၁ တွင် ဖော်ပြထားပါသည်။



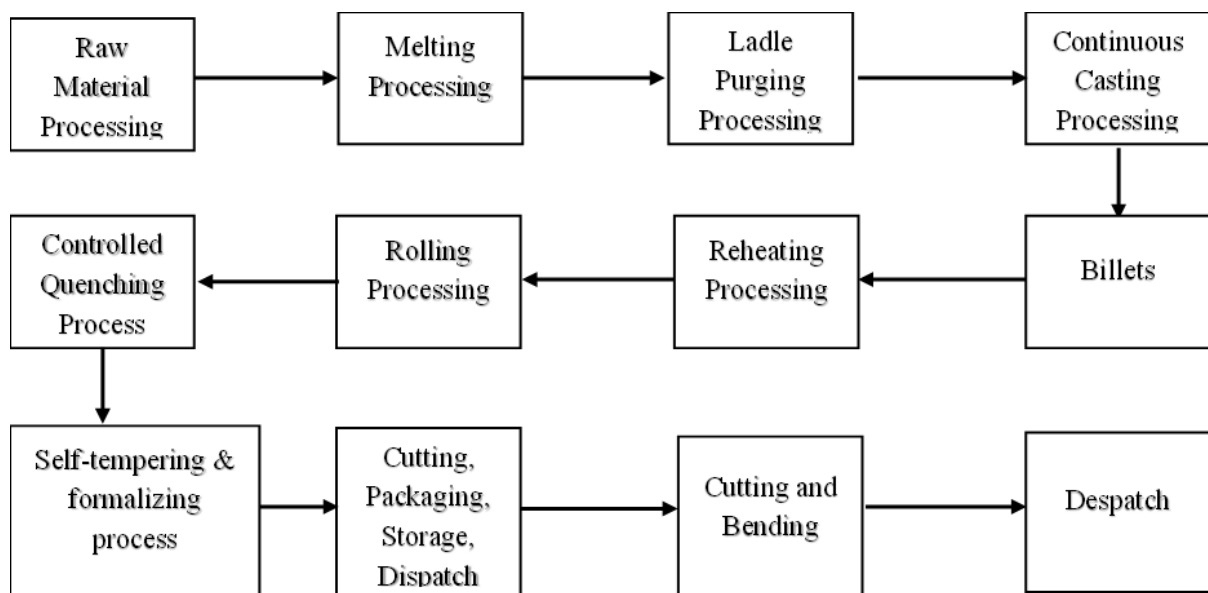
**ပုံ ၁-၁ စီမံကိန်းတည်နေရာပြပုံ**

ကုန်ကြမ်းပစ္စည်းအများစုကို ပြည်တွင်းရောင်းချသူများနှင့် မြန်မာစီးပွားရေးဦးပိုင်မှ အဓိကဝယ်ယူပြီး အိမ်ဆိုင်များမှလည်း ဝယ်ယူပါသည်။ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများထုတ်လုပ်ခြင်းအတွက် အဓိကကုန်ကြမ်းပစ္စည်းများမှာ သံတိုသံစ၊ ဆီလီကွန်မဂ္ဂနီစ်၊ ဖယ်ရိုဆီလီကွန်အစရှိသည်တို့ ဖြစ်ပါသည်။ နှစ်စဉ်ပျမ်းမျှရေအသုံးပြုမှုမှာ ၁,၅၁၄ ကီလိုလီတာ (၄၀၀,၀၀၀ ဂါလံ) ဖြစ်ပါသည်။ တစ်နေ့လျှင် ၁ ကီလိုလီတာ အား ပွတ်တိုက်ဆေးကြောသည့်အရည်အဖြစ် အသုံးပြုပြီး ၄ ကီလိုလီတာအား အအေးပေးရသည့်သော အရည်အဖြစ်အသုံးပြု၍ ပြန်လည်အသုံးပြုနိုင်ရန် သိုလှောင်ထားပါသည်။ တစ်နေ့လျှင် ရေ (၁၀) ကီလိုလီတာ လိုအပ်ချက်အတွက် အဆိုပြုထားသည့်ရေတွင်းမှ ရယူပါမည်။ ရေသန့်စင်သည့်စနစ် (R.O စနစ်) ကို တပ်ဆင် ထားပြီး သောက်သုံးရေအရည်အသွေးအား R.O စနစ်ဖြင့် ၆ လတစ်ကြိမ် စစ်ဆေးဆောင်ရွက်ထားပါသည်။ လက်ရှိအခြေအနေများအရ သံရေကျိုဖိုတွင် အသုံးပြုရသည့်ဆီအား တစ်လလျှင် တစ်ရက်သာ အသုံးပြုပေးရ ပြီး မီးဖိုအားအပူပေးရန် တစ်ရက်လျှင် ၈ နာရီအသုံးပြုပါသည်။ တစ်နာရီကြာ လည်ပတ်ရန် မီးဖိုဆီ ၄၅၈ လီတာလိုအပ်ပြီး တစ်လလျှင် စုစုပေါင်း ၃,၆၆၄ လီတာလိုအပ်ပါမည်။ စက်ရုံမှမီးဖိုအား အပူပေးရန်အတွက်



မီးဖိုဆီကို လောင်စာဆီအဖြစ် အသုံးပြုပါသည်။ လက်ရှိတွင် ဒီဇယ်ဆီအသုံးပြုမှုကို လျှပ်စစ်မီးထွန်းရန်သာ အဓိကအသုံးပြုပြီး ခန့်မှန်းချေအားဖြင့် တစ်လလျှင် ၄၅၀ လီတာဖြစ်ပါသည်။ လျှပ်စစ်ကို ပင်မဓာတ်အားလိုင်းမှ တစ်ဆင့် ၁၅,၀၀၀ ကီလိုဗို့နှင့် ၇,၀၀၀ ကီလိုဗို့ရှိသည့် ကိုယ်ပိုင်ထရန်စဖော်မာများဖြင့် သွယ်တန်းရရှိပါသည်။ လက်ရှိတွင် အဆိုပြုလွှာတွင် ဖော်ပြခဲ့သည့် အလုပ်အကိုင်လိုအပ်ချက်များမှာ စက်မှုဇုန်အတွင်း လျှပ်စစ်ရရှိနိုင်မှုအပေါ်မူတည်၍ ကွဲပြားခြားနားမှု ရှိပါသည်။ စီနီယာအဆင့်ပညာရှင်များနှင့် ကျွမ်းကျင်ပညာရှင် ဝန်ထမ်းအရေအတွက်မှာ (၂၀) ဦးရှိပြီး ထုတ်လုပ်မှုလုပ်ငန်းစဉ်များအတွက် အလုပ်သမား အရေအတွက် ၂၂ ဦး ရှိပါသည်။ နိုင်ငံခြားကျွမ်းကျင်ပညာရှင်များအတွက်သာ စီမံကိန်းဧရိယာအတွင်းတွင်နေထိုင်ရန် ထောက်ပံ့ပေးထားပါသည်။

အဆိုပြုစီမံကိန်းသည် အရည်အသွေးမြင့်သံမဏိချောင်းများ (mild steel billets) များကို ထုတ်လုပ်ရန် ရည်ရွယ်ပါသည်။ တစ်နှစ်လျှင် ခန့်မှန်းချေထုတ်လုပ်နှုန်းပမာဏမှာ ၆၀,၀၀၀ မက်ထရစ်တန် ဖြစ်ပါသည်။ သံမဏိချောင်းများထုတ်လုပ်ခြင်းသည် အလွန်ရိုးရှင်းသော လုပ်ငန်းစဉ်ဖြစ်ပြီး အသေးစိတ်လုပ်ငန်းစဉ်အား အောက်ဖော်ပြပါ ဇယားနှင့်အညီ အလိုအလျောက် ထိန်းချုပ်သည့် စနစ်အောက်တွင် စနစ်တကျ လည်ပတ်ဆောင်ရွက်ပါသည်။ သံမဏိချောင်းများကို သံတိုသံများအား sponge iron နှင့် အခြားသတ္တုစပ်များနှင့် ရောစပ်၍ လျှပ်စစ်သံရည်ကျိုဖိုတွင် အပူပေးအရည်ပျော်စေပြီး ထုတ်လုပ်ပါသည်။ တစ်နှစ်လျှင် သံတိုသံစ ပမာဏ ၇၅,၀၀၀ တန် နှင့် sponge iron ပမာဏ ၉,၀၀၀ တန် တို့မှ mild steel billets ပမာဏ ၈၀,၀၀၀ မက်ထရစ်တန်အား ထုတ်လုပ်နိုင်ပါသည်။



ပုံ ၁-၂ ထုတ်လုပ်သည့်လုပ်ငန်းစဉ်အဆင့်များ



<p><b>(၁) သံတိုသံစပုံခြင်းနှင့် ခွဲခြားခြင်း</b></p> <p>ထရပ်ကားများ၊ ကွန်တိန်နာများမှ ရရှိသည့် သံတိုသံစများကို အရည်အသွေးအတွက်စစ်ဆေးပေးပြီး သီးခြားပုံပေးပါသည်။ ကားအကာများ၊ ဆလင်ဒါများ၊ ကွန်တိန်နာများကို သီးသန့်ထား၍ ဖယ်ရှားထားပါသည်။ အရွယ်အစားကြီးမားသည့် သံတိုသံစနှင့် cast iron များကိုလည်း ဖယ်ရှားပေးပါသည်။</p>	
<p><b>(၂) သံတိုသံစများ စီမံခန့်ခွဲခြင်း</b></p> <p>သီးခြားခွဲထားသော သံတိုသံစများ အားဖယ်ရှားပြီးနောက် သံတိုသံစ အမျိုးအစားအလိုက်ပုံ၍ ဆင့်ထားပါမည်။</p>	
<p><b>(၃) မီးဖိုထဲသို့ သံတိုသံစများထည့်သွင်းခြင်း</b></p> <p>သံတိုသံစများအား မီးဖိုထဲသို့ ရွှေ့ပြောင်းရန် သံလိုက် (သို့မဟုတ်) ကုတ်စက်အား ကရိန်းနှင့် တွဲချိတ် ပေးရပါသည်။ သံတိုသံစများအား သံလိုက်နှင့် မီးဖိုထဲသို့ ထည့်ပြီးနောက် သံတိုသံစများ စတင်အရည်ပျော်လာပြီး လျှင် မီးဖိုထဲသို့ ထပ်မံ၍ သံတိုသံစများ ထည့်သွင်းပေးရပါသည်။ သံတိုသံစများနှင့် sponge iron အား သတ္တု၏ဓာတုဂုဏ်သတ္တိကို ထိန်းပေးရန် သတ်မှတ်ထားသော အချိုးအစားအတိုင်း မီးဖိုထဲသို့ထည့်သွင်း အပူပေးရပါသည်။</p>	

**(၄) အရည်ကျိုထားသောသံကို ပုံးထဲသို့ လောင်းထည့်ခြင်း**

သံတိုသံစအားလုံးအား မီးဖိုထဲတွင် အပူပေးအရည်ပျော်စေပြီးလျှင် ပုံးအားစောင်းပေးပြီး ချော်များအား ဖယ်ရှားပါသည်။ အရည်ပျော်နေသော သတ္တု၏ ဓာတုဂုဏ်သတ္တိကို စစ်ဆေးခြင်းနှင့် ကာဗွန်ပါဝင်မှုအား ချိန်ညှိပေးပြီးလျှင် သတ်မှတ်ထားသော silico manganese ပမာဏကို အရည်ပျော်နေသော သတ္တုထဲသို့ ထည့်ပေးပါသည်။ အရည်ပျော်နေသော သတ္တု၏ အပူချိန်မှာ ၁၆၅၀ ဒီဂရီစင်တီဂရိတ်သို့ ရောက်ရှိပြီးပါက မီးဖိုထဲရှိ သတ္တုရည်အား စောင်းစေပြီး ပုံးထဲသို့ လောင်းထည့်ပါသည်။



**(၅) ပုံးအား အဆက်မပြတ်ပုံသွန်းလောင်းသည့် စက်ပေါ်သို့ထားခြင်း**

သတ္တုရည်များပါဝင်သည့် ပုံးအား အဆက်မပြတ်ပုံသွန်းလောင်းသည့် စက်ပေါ်သို့ရွှေ့ပြောင်းပေးပြီး အပူချိန်အားစစ်ဆေးရပါသည်။ သတ္တုရည်အား ပုံးအောက်ခြေမှ အောက်စီဂျင်ဖြတ်သန်း စေခြင်းဖြင့် သန့်စင်စေပြီး အရည်ကျိုထားသော သတ္တုများ ရောနှောသွားစေရန်ပြုလုပ်ပါသည်။ ပြီးနောက် ပုံးအား အဆက်မပြတ်ပုံသွန်းလောင်းသည့် စက်၏ ပုံးများထားသည့်တန်းတွင် သွားရောက် နေရာချပေးပါသည်။



**(၆) သံပြားများပုံသွင်းခြင်းအတွက် လျှောတံခါး ဖွင့်ပေးခြင်း**

ပုံးအောက်ခြေရှိ လျှောတံခါးစနစ်သည် ပွင့် သွားပြီး ပုံးအောက်တွင် ရှိထားသည့် သတ္တု အရည်များသည် စတင်စီးဆင်းလာပါသည်။ ကတော့မှသတ္တုရည်များသည် ရေအေးဖြင့်အအေးခံ ထားသော ပုံသွင်းထားသည့် ကြေးနီ ပြန်ထဲသို့ စတင်စီးဆင်းပါသည်။



3-Hi ROUGHING MILL STAND

**(၇) ပုံသွင်းစက်မှပုံသွင်းထားသောပစ္စည်းအား အရှည်ဖြတ်တောက်ခြင်းနှင့် အအေးခံထားသော ကြမ်းခင်းတွင်စီထားခြင်း**

သတ္တုသည် လေးထောင့်ပုံစံရှိသော ကြေးနီပုံစံ အတိုင်း ယူဆောင်ပြီး ပုံသွင်းပစ္စည်းအား အဆက်မပြတ် သွန်းလုပ်ပေး ပါသည်။ ထို့နောက် ပုံသွင်းပစ္စည်းများကို လိုချင်သော အရှည်အတိုင်း ဖြတ်ပြီး လေအေးပေးရန်အတွက်အအေးခံ ရမည့် နေရာသို့ လွှဲပြောင်းပေးပါသည်။ ပုံသွင်းထား သောပစ္စည်းများအား အအေးခံပြီး ပါက ပြန်လည် ဆယ်ယူပြီး စီထားပါသည်။



**COLD SHEAR**

**(၈) အကောင်းဆုံး ဖြစ်နိုင်သော အရည်အသွေးနှင့် ဓာတုဖွဲ့စည်းမှု များအတွက် Spectro Lab တွင် စမ်းသပ်ထားခြင်း**

ပုံသွင်းပစ္စည်း၏ နမူနာကို ပုံသွင်းနေစဉ်အတွင်း ဖြတ်တောက်ပြီး ဓာတုပါဝင်မှုပမာဏအတွက် ရောင်စဉ် တိုင်း ကိရိယာတွင် စမ်းသပ်ရန် နမူနာ ပြင်ဆင် ထားပါသည်။ စမ်းသပ်ထားသော ပုံသွင်း ပစ္စည်း များကိုအမှတ်အသားပြုလုပ်ပြီး အမှတ် အသား ပြုထား သောအမှတ်စဉ် နံပါတ်များဖြင့် ဆင့်ပေးထားပါသည်။



**(၉) လိုမ့်စက်ထဲတွင်လိုမ့်ရန် အဆင်သင့် ဖြစ်နေ သောပုံသွင်းပစ္စည်းများ**

စမ်းသပ်ထားသောပုံသွင်းပစ္စည်းများကို ၁,၁၀၀ ဒီဂရီ စင်တီဂရိတ်တွင် အပူပေးပြီး လျှပ်စစ်မီးဖိုဖြင့် လောင်ကျွမ်းစေပါသည်။

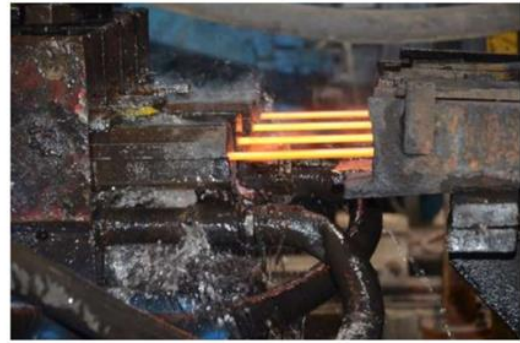


**3-Hi ROUGHING MILL AREA**



(၁၀) ကြိတ်စက်မှတစ်ဆင့်ပုံသွင်းပစ္စည်းများ ဖြတ်သန်း သွားခြင်း

ပူနေသောပုံသွင်းပစ္စည်းများသည် ကြိတ်စက်တွင် အဆက်မပြတ် စီးဆင်းဖြတ်သန်းသွားပြီး လိုချင်သောအရွယ်အစားအထိ လိုမ့်ပေးပါသည်။



FOUR STRAND ROLLING

(၁၁) ငြိမ်းသတ်ပေးသော လုပ်ငန်းစဉ် (သံချောင်းများအား လိုချင်သော အရည်အသွေး ဂရိတ်ရစေရန် ရေဖြန်းပေးသည့် Box ကိုဖြတ်သန်းစေခြင်း)

သံချောင်းများသည် သတ်မှတ်ထားသောရေဖြန်းမှုကြောင့် အပူလျော့သွားပြီး အလိုရှိသော စက်ပိုင်းဆိုင်ရာ ဂုဏ်သတ္တိများရရှိသည့် အပူငြိမ်းသတ်ပေးသောနေရာ များကိုဖြတ်သန်းသွား ပါသည်။ နမူနာများသည် လိမ့်နေစဉ်အတွင်း ထွက်ပေါ်လာပြီး စက်ပိုင်းဆိုင်ရာ အရည်အသွေးများနှင့်ပြည့်စုံစေရန်အတွက် စမ်းသပ်စစ်ဆေးထားပါသည်။



CHAIN TRANSFER

(၁၂) အအေးခံမျက်နှာပြင်

သံချောင်းများကို အအေးခံကြမ်းခင်းတွင် စုပုံထားပါသည်။



**(၁၃) စည်းနှောင်ပြီး ပေးပို့ရန်အဆင်သင့် အနေအထား**

အအေးခံကြမ်းခင်းမှ သံချောင်းများကို တစ်စုတစ်စည်းတည်း စည်းနှောင်ပြီး သိုလှောင်ရုံသို့ရွှေ့ပြောင်းကာ ပေးပို့ရန်အဆင်သင့် ဖြစ်စေပါသည်။



သံရည်ကျိုဖိုမှ ထွက်ရှိသော ခေါင်းတိုင်အငွေ့များထဲတွင် အခြားသော ကြွင်းကျန်သံမှုန်သံစများနှင့်အတူ အမှုန်အမွှားများပါဝင်ပေရာ သန့်စင်မှုစနစ်အား အောက်ပါစက်ကိရိယာများဖြင့် ဖွဲ့စည်းထားပါသည်-

- လေစုပ်ပြွန်
- 400 HP အားရှိသောလေမှုတ်စက်
- Dia 2750 mm x 5500 mm ht ရှိသော ရေဖြန်း၍ လေသန့်စင်သည့်စက်
- 900 mm dia x 30 m ht ရှိသော MS မီးခိုးခေါင်းတိုင်

အပူပေးဖိုမှထွက်ရှိသော ခေါင်းတိုင်အငွေ့များထဲတွင် အခြားသော ကြွင်းကျန်သံမှုန်သံစများနှင့်အတူ ဆာလဖာဒိုင်အောက်ဆိုဒ်ခါတ်ငွေ့နှင့် အမှုန်အမွှားများ ပါဝင်ပါသည်။ အဆိုပါသန့်စင်မှုစနစ်အား အောက်ပါစက်ကိရိယာများဖြင့် ဖွဲ့စည်းထားပါသည်-

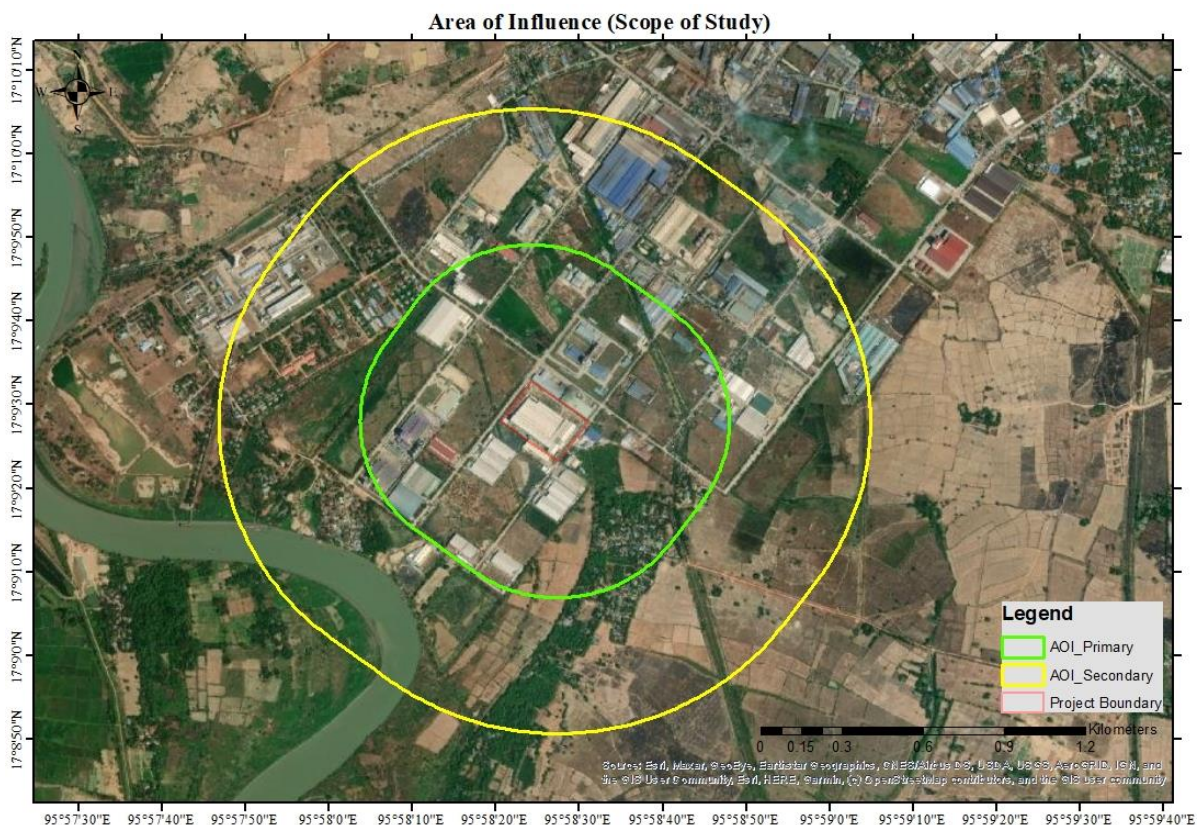
- လေစုပ်ပြွန်
- 400 HP အားရှိသောလေမှုတ်စက်
- သံရည်ကျိုဖိုအတွက် အမှုန်စစ်စနစ်
- 900 mm dia x 30 m ht ရှိသော MS မီးခိုးခေါင်းတိုင်
- Lime ရောနှောခြင်းအတွက် 2.0 HP ရှိသောမွှေစက်

စက်ရုံဧရိယာအတွင်း သစ်ပင်များပြန်လည်စိုက်ပျိုးခြင်းသည် မြင်ကွင်းပသာဒ ကောင်းမွန်စေရုံ သာမက သဘာဝပတ်ဝန်းကျင် ရေရှည်ဖွံ့ဖြိုးတိုးတက်စေခြင်းနှင့် အလုပ်သမားများအတွက်ပါ ကောင်းကျိုးရရှိနိုင်ပါသည်။ သစ်ပင်များပြန်လည်စိုက်ပျိုးခြင်း၏ ရည်ရွယ်ချက်မှာ မြင်ကွင်းလှပစေခြင်း၊ စက်ရုံမှထွက်ရှိသော ဆူညံသံကြောင့် ဘေးပတ်ဝန်းကျင်သို့ ဆူညံသံသက်ရောက်မှု နည်းပါးစေခြင်း၊ ပူပြင်းသည့် ရာသီတွင် အလုပ်သမားများ သက်တောင့်သက်သာနားနေနိုင်ရန်နှင့် အရိပ်ရစေခြင်း စသည်တို့ဖြစ်ပါသည်။ စိမ်းလန်းစိုပြေသောနေရာဖြစ်စေရန် သရက်ပင် ၁၀ ပင်၊ ကွမ်းပင် ၁၀ ပင်နှင့် မဇူသကပန်းပင် ၂၉၉ ပင်တို့ကို စိုက်ပျိုးထားရှိပါသည်။ နန်းဆွဲခြင်းလုပ်ငန်းစဉ်မှ ထွက်ရှိသော 3400 TPA သံဖြတ်စများနှင့် ဖြတ်တောက်ခြင်းလုပ်ငန်းစဉ်မှ ထွက်ရှိသော 1450 TPA သံတိုသံစများအား လုပ်ငန်းစဉ်တွင် ပြန်လည်အသုံးပြုသွားပါမည်။



အခြားလုပ်ဆောင်နိုင်သော နည်းလမ်းများအနေဖြင့် စီမံကိန်း၏နည်းပညာပိုင်း၊ ငွေကြေးပိုင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာနှင့် လူမှုရေးဆိုင်ရာဖြစ်နိုင်ခြေများကို နှိုင်းယှဉ်သွားမည်ဖြစ်ပါသည်။ အခြားလုပ်ဆောင်နိုင်သော နည်းလမ်းများ လေ့လာခြင်းဆိုသည်မှာ စက်ရုံအား ဘေးအန္တရာယ်ကင်းရှင်းစွာ လည်ပတ်နိုင်ရန်နှင့် ဒေသအလုပ်အကိုင်အခွင့်အလမ်းများရရှိရန် အဆိုပြုထားသောနေရာကို လေ့လာဆန်းစစ်ခြင်းလုပ်ငန်းစဉ် ဖြစ်ပါသည်။ ဤလေ့လာဆန်းစစ်ချက်တွင် ပတ်ဝန်းကျင် ညစ်ညမ်းမှုကာကွယ်ရန်နှင့် အရည်အသွေးတိုးတက်ကောင်းမွန်ရန်လည်း ရည်ရွယ်၍ လေ့လာဆန်းစစ်မှုများ ပြုလုပ်ထားပါသည်။

အခြေခံအချက်အလက်များ ကောက်ယူခြင်းတွင် စီမံကိန်းဧရိယာအတွင်းရှိ လက်ရှိသဘာဝ ပတ်ဝန်းကျင်အခြေအနေများ၊ ထိခိုက်ခံစားရနိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ အချက်အလက်များကို ခွဲခြမ်းစိတ်ဖြာခြင်း၊ စီမံကိန်းတည်ဆောက်ခြင်းနှင့် လည်ပတ်ခြင်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ ထိခိုက်သက်ရောက်ခြင်းများ ပါဝင်ပါသည်။ ဖော်ပြပါထိခိုက်သက်ရောက်မှုများ ပါဝင်သည့် အခြေခံအချက်အလက်များ ကောက်ယူခြင်းအား တိုက်ရိုက်ထိခိုက်သက်ရောက်မှုနှင့် ဆက်စပ်ထိခိုက်သက်ရောက်မှုမဟုတ်သော လွှမ်းမိုးမှုဧရိယာအတွင်း ပြုလုပ်ခဲ့ပါသည်။ (လွှမ်းမိုးမှုဧရိယာပြမြေပုံအား ပုံ ၁-၃ တွင် ဖော်ပြထားပါသည်)

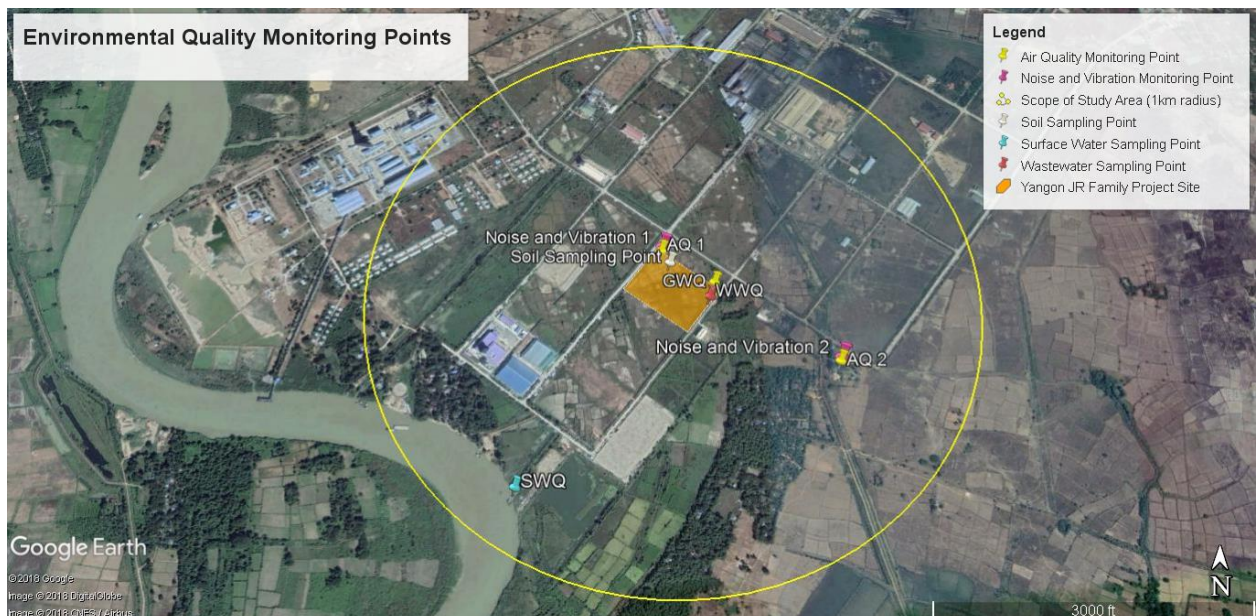


**ပုံ ၁-၃ စီမံကိန်းအား လေ့လာဆန်းစစ်မှုပြုလုပ်မည့် နယ်ပယ်ဧရိယာ**

အခြေခံအချက်အလက်များ စစ်တမ်းကောက်ယူသည့် နေရာများအား ပုံ ၁-၃ တွင် ဖော်ပြထားရှိပါသည်။ လေထုအရည်အသွေးစောင့်ကြည့်တိုင်းတာခြင်းအား ဩဂုတ်လ ၃၀ ရက်နေ့မှ စက်တင်ဘာ ၁ ရက်နေ့အထိနှင့် နိုဝင်ဘာလ ၅ ရက်နေ့မှ ၇ ရက်နေ့အထိ ၂၄ နာရီစီ တိုင်းတာခြင်းများ ဆောင်ရွက်ခဲ့ပါသည်။ စံသတ်မှတ်ချက်



များဖြစ်သည့် PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, VOC နှင့် O<sub>3</sub> တို့၏ တိုင်းတာရရှိသည့် ရလဒ်များအား အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်မှုများ ပြုလုပ်ခဲ့ပါသည်။ လေအရည်အသွေး တိုင်းတာရလဒ်များအရ ပါရာမီတာတစ်ခုချင်းစီ၏ ရလဒ်များအားလုံး သည် အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်းတွင် ရှိသည်ကို တွေ့ရှိရပါသည်။ စီမံကိန်းဧရိယာအတွင်းရှိ ဆူညံသံအရည်အသွေးရလဒ်များမှာ NEQEGs အတွင်းတွင်ရှိပြီး ဓမ္မရေအေးဘုန်းကြီးကျောင်းတွင် တိုင်းတာရရှိသည့်ရလဒ်မှာ NEQEGs ၏ လူနေရပ်ကွက် စံချိန်စံညွှန်းထက် ကျော်လွန်နေသည်ကို တွေ့ရှိရပါသည်။ ကျော်လွန်ရခြင်း အကြောင်းအရင်းမှာ ဘာသာရေးဆိုင်ရာ အခမ်းအနားများတွင် စပီကာများအသုံးပြုခြင်းကြောင့် ဖြစ်ပါသည်။ ရေအရည်အသွေးကောက်ယူခြင်းတွင် မြေအောက်ရေအရည်အသွေးအားသိရှိနိုင်ရန် စီမံကိန်းဧရိယာအတွင်းရှိ ရေတွင်း၌လည်းကောင်း၊ စွန့်ပစ်ရေ အရည်အသွေးအားသိရှိနိုင်ရန် စီမံကိန်းဧရိယာအရှေ့ရှိ စွန့်ပစ်ရေမြောင်း၌လည်းကောင်း၊ မြေပေါ်ရေ အရည်အသွေးအားသိရှိနိုင်ရန် လှိုင်မြစ်၌လည်းကောင်း ရေအရည်အသွေးကောက်ယူခြင်းများ ဆောင်ရွက်ခဲ့ ပါသည်။ ရေအရည်အသွေးကောက်ယူခြင်းအား စိုစွတ်ရာသီဖြစ်သည့် ၂၀၁၈ ခုနှစ် စက်တင်ဘာလတွင် ဆောင်ရွက်ခဲ့ပြီး ခြောက်သွေ့ရာသီဖြစ်သည့် ၂၀၁၈ ခုနှစ် နိုဝင်ဘာလတွင်လည်း ဆောင်ရွက်ခဲ့ပါသည်။ ဓါတ်ခွဲခန်းတိုင်းတာရရှိသည့် ရလဒ်များအရ BOD နှင့် COD ရလဒ်များသည် စံချိန်စံညွှန်းများအတွင်းတွင် ရှိပြီး ရေနမူနာကောက်ယူသည့် နေရာ ၃ ခုလုံး၌ Total Suspended Solids သည် စံချိန်စံညွှန်းထက် ကျော်လွန်နေသည်ကို တွေ့ရှိရပါသည်။ မြေနမူနာတိုင်းတာရရှိသည့် ရလဒ်များအရ pH သည် အက်စစ်ဓါတ် အနဲငယ်ပိုသည်ကိုတွေ့ရှိပြီး ရေတွင်ပျော်ဝင်နိုင်သော Cl<sup>-</sup> ပါဝင်မှုမှာ နည်းပါးပါသည်။ စက်မှုဇုန် မတည်ဆောက်မီ မြောင်းတကာစက်မှုဇုန်၏ မြေနေရာအား စိုက်ပျိုးမြေအဖြစ် အသုံးပြုခဲ့ပါသည်။



ပုံ ၁-၄ ပတ်ဝန်းကျင်အရည်အသွေး တိုင်းတာသည့် နေရာများ

ပထဝီဝင်တည်နေရာ၊ မြေမျက်နှာသွင်ပြင်၊ ရာသီဥတု၊ အခြေခံအဆောက်အအုံနှင့် မြေအသုံးချမှုများစသည့် အမျိုးမျိုးသော အချက်များအပေါ်မူတည်၍ သဘာဝဘေးအန္တရာယ်များ ဖြစ်ပွားနိုင်ပါသည်။ ရာသီဥတု ပြောင်းလဲခြင်းသည် ၎င်းအဖြစ်အပျက်များ၏ ကြိမ်နှုန်းနှင့်ပြင်းအားများ မြင့်တက်လာခြင်းကြောင့် ဖြစ်ပေါ် စေနိုင်ပါသည်။ ရာသီဥတုပြောင်းလဲခြင်းကြောင့် အခြေခံအဆောက်အအုံများ ပျက်စီးခြင်း၊ စီမံကိန်း လည်ပတ်ခြင်းအား အနှောင့်အယှက်ဖြစ်စေနိုင်ခြင်းနှင့် သံမဏိစက်ရုံအပေါ် ဘေးအန္တရာယ်များ ဖြစ်ပေါ်စေ နိုင်ပါသည်။ မြန်မာနိုင်ငံသည် မုတ်သုံရာသီဥတုဖြစ်ပြီး ရာသီဥတုပြောင်းလဲခြင်းကြောင့် မိုးရွာသွန်းမှုပုံစံ ပြောင်းလဲခြင်းသည် စက်မှုလုပ်ငန်းများတွင် ရေအသုံးချမှုအပေါ် အကျိုးသက်ရောက်မှုများ ဖြစ်ပေါ်စေနိုင် ပါသည်။

လေ့လာဆန်းစစ်မှု ပြုလုပ်မည့်ဧရိယာအဖြစ် စီမံကိန်းဧရိယာပတ်လည် (၁) ကီလိုမီတာအတွင်း သတ်မှတ်ခဲ့ပြီး မြောင်းတကာစက်မှုဇုန်အနီးရှိ ကံကလေးရွာ၊ ကုန်းကလေးရွာနှင့် မှော်ဘီမြို့နယ်တို့ကို လူမှုစီးပွားဆိုင်ရာ ဆန်းစစ်အကဲဖြတ်ခြင်းများ ဆောင်ရွက်ခဲ့ပါသည်။ ၂၀၁၈ ခုနှစ် နိုဝင်ဘာလ၊ ဒုတိယ အပတ်တွင် အိမ်ခြေ အားလုံး၏ ၃၅ % ၊ အိမ်ခြေ ၆၇ အိမ်ရှိသော ရွာ ၂ ရွာအား စစ်တမ်းကောက်ယူခြင်းများ ဆောင်ရွက်ခဲ့ပါသည်။ အသက်၊ ကျား/မ၊ ပညာရေး၊ အလုပ်အကိုင်၊ မိသားစုတစ်နှစ်ဝင်ငွေနှင့် အသုံးစရိတ်၊ ရွာ၏စွန့်ပစ်အမှိုက် စီမံခန့်ခွဲထားရှိမှုနည်းစနစ်၊ လျှပ်စစ်နှင့်ရေယူသုံးစွဲမှု အရင်းအမြစ်များသည် ဖော်ပြချက် ခွဲခြမ်းစိတ်ဖြာခြင်း ပေါ်တွင် အခြေခံ၍ ရယူထားသော စစ်တမ်းကောက်ယူမည့်ဧရိယာ၏ ဒေသဆိုင်ရာ အချက်အလက်များပင် ဖြစ်ပါသည်။ ပုံ ၆-၁ တွင် ဖော်ပြထားချက်အရ ဒေသခံများသည် စက်မှုဇုန်မှ အမျိုးမျိုးသော သက်ရောက်နိုင်မှုများကို စိုးရိမ်ကြသည်။ လူမှုစီးပွားစစ်တမ်းကောက်ယူခြင်း ရလဒ်များအရ စက်မှုဇုန်အနီးရှိ ကံကလေးရွာနှင့် ကုန်းကလေးရွာမှ ဒေသခံများ၏ဖြေဆိုချက်အရ ဓာတ်မြေဩဇာ ထုတ်လုပ်သည့်စက်ရုံမှ သိသာထင်ရှားသော မနှစ်မြို့ဖွယ်အနံ့များထွက်ရှိကြောင်းနှင့် အစာကြိတ်စက်ရုံမှ ဆူညံသံများ ထွက်ရှိကြောင်း သိရှိရပါသည်။

TMT Rebar များ ထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူးရောင်းချခြင်းလုပ်ငန်းမှ အမျိုးမျိုးသော လုပ်ဆောင်ချက်များ ကြောင့် ပတ်ဝန်းကျင်အပေါ် ကောင်းကျိုးသက်ရောက်မှုများသာမက ဆိုးကျိုးသက်ရောက်မှုများလည်း ဖြစ်ပေါ်လာနိုင်ဖွယ်ရှိပါသည်။ ထို့အပြင် TMT Rebar များထုတ်လုပ်ခြင်း၏ လည်ပတ်မှုအဆင့်ဆင့်သည် ပုံစံ အမျိုးမျိုးဖြင့် ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှုများ ရှိနိုင်သော်လည်း ဒီဇိုင်းနှင့်တည်နေရာ သတ်မှတ်ချက် များသည် တည်နေရာတစ်ခုနှင့်တစ်ခု ကွဲပြားနိုင်သည်။ သိသာထင်ရှားသော သက်ရောက်မှုများကို အကဲဖြတ် နိုင်ရန်အတွက် စီမံကိန်းဖော်ပြချက်များအပေါ် အခြေခံ၍ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွား ဆိုင်ရာသက်ရောက်မှုများကို ဖော်ထုတ်နိုင်သည်။ သိသာထင်ရှားသော သက်ရောက်မှုများအား ဆန်းစစ် အကဲဖြတ်ရာတွင် အပြည်ပြည်ဆိုင်ရာဆန်းစစ်အကဲဖြတ်အဖွဲ့အစည်းမှ သက်ရောက်မှု ဆန်းစစ်အကဲဖြတ်ခြင်း နည်းလမ်းအား ရွေးချယ်အသုံးပြုထားပါသည်။ သိသာထင်ရှားသောအမှတ်ကို အောက်ပါပုံသေနည်းဖြင့် တွက်ချက်ပါသည်။

သိသာထင်ရှားသောအမှတ် = (ပမာဏ/အရွယ်အစား + ကြာမြင့်ချိန် + အတိုင်းအတာ) \* ဖြစ်တန်စွမ်း

ဇယား ၁-၁ အလားအလာရှိသောသက်ရောက်မှုများအား ခွဲခြမ်းစိတ်ဖြာခြင်း အကျဉ်းချုပ်

ပတ်ဝန်းကျင်ဆိုင်ရာ ပါရာမီတာများ	အကြောင်းအရာ	တည်ဆောက် သည့် ကာလ	လည်ပတ်သည့် ကာလ	ပိတ်သိမ်း သည့် ကာလ
လေအရည်အသွေး	<ul style="list-style-type: none"> <li>စက်ယန္တရားများနှင့် ယာဉ်များမှ အမှုန်အမွှားများနှင့် အိတ်ဇောငွေ့များ ထွက်ရှိခြင်း၊</li> <li>တူးဖော်ခြင်း၊ သံတိုသံစများ ကိုင်တွယ်ခြင်းနှင့် ခွဲခြားခြင်း၊ ဖြိုချခြင်း လုပ်ငန်းများမှ အမှုန်အမွှားများ ထွက်ရှိခြင်း၊</li> <li>သံရည်ကြိုခြင်းနှင့် အပူပေးခြင်း လုပ်ငန်းစဉ်တို့မှ SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC နှင့် PM များ ထွက်ရှိခြင်း၊</li> </ul>	အနည်းငယ်	အလယ်အလတ်	အနည်းငယ်
ဆူညံသံနှင့် တုန်ခါမှု	<ul style="list-style-type: none"> <li>စီမံကိန်းတည်ဆောက်ခြင်း၊ ပိတ်သိမ်းခြင်း လုပ်ငန်းစဉ်များနှင့် ပစ္စည်းများ သယ်ယူပို့ဆောင်ခြင်းမှ ဆူညံသံနှင့် တုန်ခါမှုထွက်ရှိခြင်း၊</li> <li>သယ်ယူပို့ဆောင်ရေး လမ်းကြောင်း တစ်လျှောက် ယာဉ်များမောင်းနှင်ခြင်းနှင့် ဒီဇယ်ဂျင်နရေတာမှ ဆူညံသံထွက်ရှိခြင်း၊</li> <li>သံရည်ကျိုခြင်း၊ နန်းဆွဲခြင်းနှင့် ဖြတ်တောက်ခြင်းလုပ်ငန်းတို့မှ ဆူညံသံထွက်ရှိခြင်း၊</li> </ul>	အနည်းငယ်	အလယ်အလတ်	အနည်းငယ်
မြေဆီလွှာ ညစ်ညမ်းခြင်း	<ul style="list-style-type: none"> <li>အဆောက်အအုံများ ဆောက်လုပ်ရာတွင် အခြေခံအုတ်မြစ်များ တူးဖော်ခြင်းမှ မြေဆီလွှာညစ်ညမ်းခြင်း၊</li> <li>စီမံကိန်းဧရိယာအတွင်း မီးဖိုရာတွင် အသုံးပြုသောဆီနှင့် ဒီဇယ်များ ယိုဖိတ်ကျခြင်း၊</li> <li>စီမံကိန်းဧရိယာအတွင်း ဖြိုဖျက်ပစ္စည်းများ စုပုံခြင်း၊</li> </ul>	အနည်းငယ်	အနည်းငယ်	အနည်းငယ်

ပတ်ဝန်းကျင်ဆိုင်ရာ ပါရာမီတာများ	အကြောင်းအရာ	တည်ဆောက် သည့် ကာလ	လည်ပတ်သည့် ကာလ	ပိတ်သိမ်း သည့် ကာလ
ရေအရည်အသွေး	<ul style="list-style-type: none"> <li>လူနေသုံးနှင့် တည်ဆောက်ရေး လုပ်ငန်းများတွင် ရေများသုံးစွဲခြင်း၊</li> <li>အအေးခံခြင်း လုပ်ငန်းစဉ်တွင် ရေ သုံးစွဲခြင်း၊</li> </ul>	အနည်းငယ်	အနည်းငယ်	အနည်းငယ်
စွန့်ပစ်ရေ စွန့်ထုတ်ခြင်း	<ul style="list-style-type: none"> <li>အလုပ်သမားတန်းလျား၊ အိမ်သာသုံး ရေများနှင့် ရုံးခန်းမှ စွန့်ပစ်ရေများ စွန့်ထုတ်ခြင်း၊</li> </ul>	အနည်းငယ်	အနည်းငယ်	အနည်းငယ်
အမှိုက်စွန့်ပစ်ခြင်း	<ul style="list-style-type: none"> <li>ဖြိုဖျက်ခြင်းလုပ်ငန်းမှ ထွက်ရှိသော အမှိုက်များ၊ အလုပ်သမားတန်းလျား နှင့် ရုံးခန်းမှအိမ်သုံးအမှိုက်များ ထွက် ရှိခြင်း၊</li> <li>သံရည်ကြိုခြင်းနှင့် အပူပေးခြင်း လုပ်ငန်းစဉ်မှ ချော်ရည်များ ထွက်ရှိ ခြင်း၊</li> <li>နန်းဆွဲခြင်းလုပ်ငန်းစဉ်မှ ထွက်ရှိ သော ဆီနှင့်ချောဆီများ၊ သံအကြမ်း ထည်နှင့် ရေဖြန်း၍ လေသန့်စင်သည့် စက်မှ စွန့်ပစ်အမှိုက်များ ထွက်ရှိခြင်း၊</li> </ul>	အနည်းငယ်	အလယ်အလတ်	အလယ်အလတ်
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>တည်ဆောက်ရေး လုပ်ငန်းများ ဆောင်ရွက်နေစဉ် ယာဉ်ယန္တရားကြီး များ မောင်းနှင်ခြင်း၊ သံတိုသံစများ ကိုင်တွယ်ခြင်း၊ ကုန်တင်ကုန်ချ လုပ်ငန်းများ ဆောင်ရွက်နေစဉ် ရုပ်ပိုင်းဆိုင်ရာ မတော်တဆထိခိုက်မှု များဖြစ်ပွားနိုင်ခြင်း၊</li> <li>အရည်ပူများနှင့် ထိတွေ့ကိုင်တွယ် နေရသော လုပ်သားများ အပူဒဏ် ခံစားရခြင်း၊</li> <li>သံတိုသံစများ ကိုင်တွယ်ခြင်း၊ ကုန်တင်/ကုန်ချ လုပ်ဆောင်ခြင်းတို့ ကြောင့် အသက်ရှူလမ်းကြောင်း ဆိုင်ရာ အန္တရာယ်များ ဖြစ်ပွားနိုင် ခြင်း၊</li> </ul>	အနည်းငယ်	အလယ်အလတ်/ မြင့်	အနည်းငယ်

ပတ်ဝန်းကျင်ဆိုင်ရာ ပါရာမီတာများ	အကြောင်းအရာ	တည်ဆောက် သည့် ကာလ	လည်ပတ်သည့် ကာလ	ပိတ်သိမ်း သည့် ကာလ
	<ul style="list-style-type: none"> <li>သံရည်ကြိုခြင်းလုပ်ငန်းစဉ်မှ မီးဘေးအန္တရာယ်နှင့် ပေါက်ကွဲမှုဖြစ်စဉ်များ ဖြစ်ပွားနိုင်ခြင်း၊</li> <li>ဗို့အားများသော လျှပ်စစ်ပစ္စည်းများကြောင့် လျှပ်စစ်အန္တရာယ်များ ဖြစ်ပွားနိုင်ခြင်း၊</li> </ul>			
လူထု ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>တည်ဆောက်ရေး ပစ္စည်းများ၊ လုပ်ငန်း သုံးစက်ယန္တရားများ၊ သံတို သံစများနှင့် သံချောင်းများ သယ်ပို့ခြင်းကြောင့် မတော်တဆမှုများ ဖြစ်ပွားနိုင်ခြင်းနှင့် ယာဉ်ကြောများ ပိတ်ဆို့ခြင်း၊</li> <li>တည်ဆောက်ရေး လုပ်ငန်းများ ဆောင်ရွက်နေစဉ်အတွင်း ကူးစက် ရောဂါများ ဖြစ်ပွားခြင်း၊</li> </ul>	အနည်းငယ်	အနည်းငယ်	အနည်းငယ်

သံမဏိစက်ရုံအတွက် ထိခိုက်မှုဆန်းစစ်အကဲဖြတ်ခြင်းဆိုသည်မှာ အထူးသဖြင့် လူသားတို့ကို ထိခိုက်စေနိုင်သော စီမံကိန်း၏လုပ်ငန်းစဉ်များ၊ အစိတ်အပိုင်းများနှင့် တည်နေရာများအား စေ့စပ်သေချာစွာ ကြည့်ရှုဆန်းစစ်ခြင်းပင်ဖြစ်သည်။ ဘေးအန္တရာယ်၏အရေးပါမှုကို နားလည်သဘောပေါက်၍ အန္တရာယ် ဖြစ်စေနိုင်သောအရာများကို စာရင်းပြုစုထားရှိပြီး ဘေးအန္တရာယ်ဆိုင်ရာ မက်ထရစ်အတွင်းရှိမရှိ စစ်ဆေးရပါမည်။ အန္တရာယ်အဆင့်သတ်မှတ်ချက်များအပေါ်အခြေခံ၍ အကာအကွယ်ပေးခြင်း အစီအမံများကို ဖော်ပြ ထားရှိပြီး နောက်ဆုံးတွင် ဖြစ်ပေါ်လာနိုင်သော အန္တရာယ်များကို ကာကွယ်ရန်/ ဖယ်ရှားရန် အကြံပြုချက်များ ကို ဖော်ထုတ်ရပါမည်။



**ဇယား ၁-၂ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်အကဲဖြတ်ခြင်း**

ထိခိုက်မှု	ဖြစ်နိုင်ခြေ	အကျိုးဆက်	အန္တရာယ်အဆင့် သတ်မှတ်ခြင်း	ထိန်းချုပ် ဆောင်ရွက်မှုများ
အသံ	ဖြစ်နိုင်သော	အသေးအဖွဲ	အလယ်အလတ်	အင်ဂျင်နီယာပိုင်းနှင့် စီမံခန့်ခွဲမှုနည်းလမ်းများ
တုန်ခါမှု	ဖြစ်နိုင်သော	သိသာ ထင်ရှားမှုမရှိ	အနည်းငယ်	-
အပူဒဏ်	ဖြစ်နိုင်ခြေ ရှိသော	သင့်တင့်သော	မြင့်မားသော	အင်ဂျင်နီယာပိုင်း၊ စီမံခန့်ခွဲမှုနည်းလမ်းများ၊ PPE
ဓါတုပစ္စည်း	ဖြစ်နိုင်ခြေ မရှိသော	အသေးအဖွဲ	အနည်းငယ်	-
ရှူရှိုက်နိုင်သော အရာများ (ဓါတ်ငွေ့များ၊ ငွေ့ရည်များ၊ အမှုန်နှင့်ဖုန်မှုန့်များ)	ဖြစ်နိုင်သော	အသေးအဖွဲ	အလယ်အလတ်	အင်ဂျင်နီယာပိုင်းနှင့် စီမံခန့်ခွဲမှုနည်းလမ်းများ
သီးသန့်နေရာ	ဖြစ်နိုင်ခြေ မရှိသော	အသေးအဖွဲ	အနည်းငယ်	-
လုပ်ငန်းခွင်သုံး စက်ကိရိယာ များနှင့် စက်ယန္တရားများ စောင့်ကြပ်ခြင်း	ဖြစ်နိုင်ခြေ ရှိသော	သင့်တင့်သော	မြင့်မားသော	အင်ဂျင်နီယာပိုင်း၊ စီမံခန့်ခွဲမှုနည်းလမ်းများ၊ PPE
ပြုတ်ကျနိုင်သော အရာဝတ္ထု များ	ဖြစ်နိုင်ခြေ မရှိသော	အသေးအဖွဲ	အနည်းငယ်	-
ချော်လဲခြင်း၊ ခလုတ်တိုက်ခြင်း နှင့် ပြုတ်ကျခြင်း	ဖြစ်နိုင်ခြေ မရှိသော	အသေးအဖွဲ	အနည်းငယ်	-
လုပ်ငန်းခွင်အတွင်း သက် တောင့် သက်သာရှိခြင်းနှင့် အဆင်ပြေချောမွေ့ခြင်း	ဖြစ်နိုင်ခြေ ရှိသော	အသေးအဖွဲ	အလယ်အလတ်	အင်ဂျင်နီယာပိုင်းနှင့် စီမံခန့်ခွဲမှုနည်းလမ်းများ
ပုံသွင်းပြီးသော သတ္တုများနှင့် ချော်ရည်များ ကိုင်တွယ်ခြင်း၊	ဖြစ်နိုင်ခြေ ရှိသော	အသေးအဖွဲ	အလယ်အလတ်	အင်ဂျင်နီယာပိုင်းနှင့် စီမံခန့်ခွဲမှုနည်းလမ်းများ
နန်းဆွဲခြင်း	ဖြစ်နိုင်သော	သင့်တင့်သော	အလယ်အလတ်	အင်ဂျင်နီယာပိုင်းနှင့် စီမံခန့်ခွဲမှုနည်းလမ်းများ
ဆေးမှုတ်ခြင်း	ဖြစ်နိုင်သော	သိသာ ထင်ရှားမှုမရှိ	အနည်းငယ်	-



ကျန်းမာရေးဆိုင်ရာသက်ရောက်မှု ဆန်းစစ်အကဲဖြတ်ခြင်းအတွက် ကမ္ဘာ့ဘဏ် (၂၀၀၉) နှင့် ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့ (၂၀၂၁) တို့၏ အကြံပြုချက်များအား ထည့်သွင်းအသုံးပြုထားပါသည်။ သံမဏိစက်ရုံ၏ ကျန်းမာရေးဆိုင်ရာ သက်ရောက်မှုဆန်းစစ်အကဲဖြတ်ခြင်းတွင် သုတေသန အချက်အလက်များကို ကိုးကား၍ စုစည်းတင်ပြခြင်းအား အသုံးပြုထားပါသည်။ ကျန်းမာရေးဆိုင်ရာသက်ရောက်မှု ဆန်းစစ်အကဲဖြတ်ခြင်း သုတေသနအချက်အလက်များသည် ဖြစ်နိုင်ခြေရှိသော ကျန်းမာရေးဆိုင်ရာ သက်ရောက်မှုများ၏ အရည်အသွေးဆိုင်ရာ သုံးသပ်ချက်ဖြစ်ပြီး သတင်းအချက်အလက်များကို မေးခွန်းလွှာများမေးမြန်းခြင်းဖြင့် ရယူအသုံးပြုပါသည်။ သတင်းအချက်အလက်များ ရယူစုဆောင်းခြင်း၏ ရလဒ်အနေဖြင့် တွေ့ရှိရလေ့ရှိသည့် ရောဂါများမှာ ဖျားနာခြင်း၊ လေဖြတ်ခြင်း၊ အသည်းရောဂါ၊ နှလုံးရောဂါနှင့် သွေးတိုးရောဂါတို့ ဖြစ်ပါသည်။ ပုံ ၆-၂ သည် ၎င်းတို့၏အလုပ်အကိုင်များအပေါ်မူတည်၍ စီမံကိန်းဧရိယာအတွင်းရှိ ကျန်းမာရေး အခြေအနေအား ဖော်ပြထားရှိပါသည်။ ဒေသခံများတွင် သွေးတိုးရောဂါရှိသူ (၉ ယောက်) အား တွေ့ရှိရပြီး ဖြေဆိုသူအများစု (၃၈ ယောက်) ၏ ဖြေကြားချက်အရ ၎င်းတို့သည် နာတာရှည်ရောဂါများ မခံစားရကြောင်း ဖြေဆိုခဲ့ပါသည်။ မှော်ဘီမြို့၏ ဒေသဆိုင်ရာကျန်းမာရေးအချက်အလက်များနှင့် နှိုင်းယှဉ်ပါက မှော်ဘီမြို့နယ်တွင် ဖြစ်ပွားလေ့ရှိသော ရောဂါများမှာ ဝမ်းပျက်ဝမ်းလျှောရောဂါနှင့် တီဘီရောဂါ တို့ဖြစ်ပါသည်။

ထို့အပြင် လုပ်ငန်းခွင်ကျန်းမာရေး၊ ပတ်ဝန်းကျင်ကျန်းမာရေးနှင့် လူထုကျန်းမာရေးဆိုင်ရာ ကျွမ်းကျင်ပညာရှင်များသည် ထိခိုက်ခံစားရသောသူများနှင့် အဖွဲ့အစည်းများပါဝင်သည့် လုပ်ငန်းခွင် ကျန်းမာရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ဆန်းစစ်ခြင်းအား အတူတကွလုပ်ဆောင်ရန် လိုအပ်ပါသည်။ စီမံကိန်းတစ်လျှောက် လုပ်သားများနှင့်ဒေသခံလူထုတို့၏ ကောင်းကျိုးရရှိရန်နှင့် လုပ်ငန်းခွင်ကျန်းမာရေးဆိုင်ရာ အန္တရာယ်များကို လျော့ချရန် ရည်ရွယ်၍ စီမံကိန်းအဆိုပြုသူသည် နည်းပညာထိန်းချုပ်မှုများ၊ တစ်ကိုယ်ရည်ကာကွယ်ရေး ပစ္စည်းကိရိယာများ၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေးသင်တန်းများကဲ့သို့သော အကြံပြုတင်ပြထားသည့် လျော့ပါးသက်သာစေရေး နည်းလမ်းများအား ထည့်သွင်း၍ လိုက်နာဆောင်ရွက်သင့်ပါသည်။

တည်ဆောက်ရေးအဆင့်၊ လည်ပတ်ရေးအဆင့်နှင့် ဖျက်သိမ်းရေးအဆင့်တို့တွင် ဖြစ်ပေါ်နိုင်သော သက်ရောက်မှုများအား လျော့နည်းသက်သာစေရန် အောက်ပါလျော့ပါးသက်သာစေရေး နည်းလမ်းများကို လိုက်နာဆောင်ရွက်ရမည်-

- လမ်းများအား ရေဖြန်းစက်ဖြင့် သတ်မှတ်ထားသောအချိန်ကာလတွင် ပုံမှန်ရေဖြန်းခြင်းများ ဆောင်ရွက်ရန်။
- ဆောက်လုပ်ရေးလုပ်ငန်းသုံးပစ္စည်းများနှင့် ကုန်ကြမ်းများအား သယ်ယူပို့ဆောင်နေစဉ် ဖုန်မှုန့်များပြန့်လွှင့်ခြင်းမှကာကွယ်ရန် အမိုးအကာများဖြင့် ဖုံးအုပ်ထားရန်။
- သိုလှောင်ရုံများနှင့် လမ်းများသာမက စက်ရုံဘေးပတ်လည်အား စိမ်းလန်းစိုပြေသော ပတ်ဝန်းကျင် ဖြစ်စေရန် ဆောင်ရွက်ရန်။

- ဖုန်မှုန့်များထွက်ရှိသည့်နေရာများတွင် လုပ်ကိုင်နေသော လုပ်သားများအတွက် ဖုန်မှုန့်များ ကာကွယ်သည့် အသက်ရှူလမ်းကြောင်းဆိုင်ရာကိရိယာများ ထားရှိပေးရန်။
- စက်ရုံအတွင်းရှိ လမ်းများအားလုံးကို ခင်းထားရန်။
- လမ်းများတွင်ဖုန်မှုန့်များပျံ့လွင့်ခြင်းမှ ကာကွယ်ရန် စက်ရုံဝင်းအတွင်း သွားလာနေသော ယာဉ်များအား တစ်နာရီလျှင် ၁၀ ကီလိုမီတာထက်ကျော်လွန်၍ မောင်းနှင်ခြင်းမပြုရန် သတ်မှတ် ထားရန်။
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း ရှိစေရန် လေထုညစ်ညမ်းမှု ထိန်းချုပ်ရေးအစီအမံများအား ပုံမှန်စောင့်ကြည့် တိုင်းတာခြင်းများ ဆောင်ရွက်ရန်။
- စက်ရုံဝင်းအတွင်း လုပ်ငန်းခွင်ဆူညံသံများ ဘေးကင်းစေရန် သင့်လျော်သော ထိန်းချုပ်ရေး အစီအမံများ ထားရှိရန်နှင့် ယာဉ်များအား ပုံမှန်ပြုပြင်ထိန်းသိမ်းခြင်းများ ဆောင်ရွက်ရန်။
- လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး ပေါင်းစပ်ညှိနှိုင်းဆောင်ရွက်ပေးမည့် တာဝန်ခံအရာရှိတစ်ဦးအား စက်ရုံအတွင်းခန့်အပ်ရန်။
- စက်ရုံဝင်းအတွင်း ကောင်းမွန်သော သန့်ရှင်းရေးများ ဆောင်ရွက်ရန်။
  - စက်ရုံအတွင်းလမ်းများအား ပုံမှန်သန့်ရှင်းရေးပြုလုပ်ရန်၊
  - လမ်းများအား ပုံမှန်ရေဖြန်းခြင်း ပြုလုပ်ရန်၊
  - အခန်းတွင်းရှိ စက်ကိရိယာများတွင် ဖုန်မှုန့်များ စုဝေးခြင်းမှကာကွယ်ရန် လေဝင် လေထွက် ကောင်းမွန်သည့်စနစ်အား ထားရှိရန်၊
  - ဆူညံသံနှင့် ညစ်ညမ်းဓါတ်ငွေ့များ ပျံ့လွင့်ခြင်းမှကာကွယ်ရန်သာမက ပိုမိုကောင်းမွန် သောရှူခင်းများအတွက် စိမ်းလန်းစိုပြေသောဧရိယာအား ပုံမှန်ထိန်းသိမ်းခြင်းများ ပြုလုပ် ရန်၊
- ညစ်ညမ်းမှုထိန်းချုပ်ရေးအစီအမံများအား ပုံမှန်စစ်ဆေးရန်နှင့် ပြုပြင်ထိန်းသိမ်းရန်၊
- ဝန်ထမ်းများအား အပူကာကွယ်ရေးကိရိယာ လိုအပ်ပါက တစ်ကိုယ်ရည်ကာကွယ်ရေး ကိရိယာ များကို အသုံးပြုစေရန်၊
- ညစ်ညမ်းမှုထိန်းချုပ်ရေးနှင့် ဖုန်မှုန့်များပျံ့လွင့်ခြင်းစနစ်များအား လုပ်ငန်းလည်ပတ်ရာတွင် အသုံးပြုသည့် စက်ကိရိယာများနှင့် အတူတကွယှဉ်တွဲမောင်းနှင်ခြင်းများ ဆောင်ရွက်ရန်၊
- ကျန်းမာရေးနှင့် ဘေးကင်းရေးဆိုင်ရာပြဌာန်းချက်များအား စက်ရုံအတွင်း ကျင်းပရန်၊
- လုပ်သားများအား လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အသိပညာပေးခြင်း များ ပြုလုပ်ပေးရန်၊
- နေရာအသီးသီး၌ ရှေးဦးသူနာပြုအထောက်အကူပစ္စည်းများ ထားရှိပေးရမည်။ ရှေးဦးသူနာပြု များကို သင်တန်းကျောင်းများမှ သင်တန်းပေးရန်၊
- မတော်တဆမှုများကြုံတွေ့လာပါက အရေးပေါ်ကူညီနိုင်ရန် လုပ်သားများအား သင်တန်းပေးရန်၊

- ဆူညံသံထွက်သည့်ပစ္စည်းများနှင့် ထိတွေ့နေရသော လုပ်သားများအား နားအကာများ ပေးထားရန်နှင့် လိုအပ်ပါက အလုပ်ချိန်အား အလှည့်ကျတာဝန်ပေးရန်၊
- လုပ်သားတစ်ဦးချင်းစီ၌ လုပ်ငန်းခွင်သို့စဝင်သည့်အချိန်မှစ၍ နှစ်စဉ်ကျန်းမာရေး စစ်ဆေးပေးရန်နှင့် ဆေးမှတ်တမ်းများထားရှိရန်၊

ဆက်စပ်သက်ရောက်မှုများဆိုသည်မှာ စီမံကိန်းတစ်ခု သို့မဟုတ် တစ်ခုထက်ပိုသောစီမံကိန်းများကြောင့် လူမှုစီးပွားနှင့် ပတ်ဝန်းကျင်အပေါ် စုပေါင်း၍သက်ရောက်ခြင်းကို ဆိုလိုသည်။ အခြားသော အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့် စီမံကိန်းများသည် တူညီသောဧရိယာအတွင်းတွင် လုပ်ငန်းလည်ပတ်ခြင်း (သို့မဟုတ်) စီမံကိန်းလည်ပတ်သည့်ကာလတူညီခြင်းတို့ကြောင့် စုပေါင်း၍ အကျိုးသက်ရောက်ခြင်းဖြင့် ၎င်းသက်ရောက်မှုများ ဖြစ်ပေါ်လာနိုင်ပါသည်။ ဆက်စပ်သက်ရောက်မှုကို လေ့လာဆန်းစစ်ရာတွင် နေရာနှင့်အချိန်နယ်နိမိတ်ပေါ်မူတည်၍ ဆက်စပ်သက်ရောက်မှု ဆန်းစစ်ခြင်းနည်းလမ်းနှင့် ဆက်စပ်သက်ရောက်မှုစံနှုန်းများအပေါ် အခြေခံကာ သက်ရောက်မှုဆန်းစစ်ခြင်း၊ သုံးသပ်ခြင်းနှင့် စီမံကိန်းအနီးရှိ အခြားစီမံကိန်းများ၏ သက်ရောက်မှုများကိုပါ ထည့်သွင်းစဉ်းစားရမည်။

- ✓ မြောင်းတကာစက်မှုဇုန်အတွင်းရှိ စက်ရုံများလည်ပတ်ခြင်းမှ လေအရည်အသွေးသက်ရောက်မှု တိုးပွားလာခြင်း၊
- ✓ အနီးပတ်ဝန်းကျင်ရှိ စက်ရုံအလုပ်ရုံများလည်ပတ်ခြင်းနှင့် သယ်ယူပို့ဆောင်ရေးယာဉ်များမှ ဆူညံသံ တိုးပွားလာခြင်း၊
- ✓ စက်ရုံအလုပ်ရုံများမှ မြေအောက်ရေသုံးစွဲမှုများကြောင့် မြေအောက်ရေထိခိုက်ခြင်း၊
- ✓ မီးလောင်ကျွမ်းမှုအန္တရာယ်နှင့် အခြားမတော်တဆအန္တရာယ်များ ဖြစ်ပွားနိုင်ပြီး လမ်းပန်းဆက်သွယ်ရေးကြောင့် ယာဉ်မတော်တဆမှုများနှင့် ယာဉ်ကြောပိတ်ဆို့မှုများ ဖြစ်ပွားနိုင်ခြင်း၊

တွေ့ရှိရသော ဆက်စပ်သက်ရောက်နိုင်မှုများမှာ အောက်ပါအတိုင်းဖြစ်သည်။

“သိသာထင်ရှားမှုနည်း” သည့် ဆက်စပ်သက်ရောက်မှုများတွင်

- ဆူညံသံနှင့် တုန်ခါမှု
- မြေပေါ်ရေ
- မြေအောက်ရေ

“သိသာထင်ရှားမှု အလယ်အလတ်” ရှိသည့် ဆက်စပ်သက်ရောက်မှုများတွင်

- လေအရည်အသွေး
- မီးအန္တရာယ်နှင့် မတော်တဆထိခိုက်နိုင်မှုများ
- စွန့်ပစ်ပစ္စည်း

သံမဏိစက်ရုံလုပ်ငန်းအား အကောင်အထည်ဖော်ရာ၌ သက်ဆိုင်ရာအခန်းများတွင် ဖော်ပြထားရှိသည့် လျော့ပါးသက်သာစေရေး နည်းလမ်းများနှင့်အညီ အကောင်အထည်ဖော် ဆောင်ရွက်ပါက ဆောက်လုပ်ရေး လုပ်ငန်းသုံး သံမဏိချောင်းထုတ်လုပ်မှုလုပ်ငန်း၏ သက်ရောက်မှုအလုံးစုံအား စီမံခန့်ခွဲနိုင်မည် ဖြစ်ပါသည်။

TMT Rebar ထုတ်လုပ်ခြင်းစီမံကိန်းသည် ပတ်ဝန်းကျင်ဆိုင်ရာ ဆိုးကျိုးသက်ရောက်မှုများရှိသော်လည်း ၎င်းသက်ရောက်မှုများအား သင့်လျော်သော လျော့ပါးသက်သာစေရေးနည်းလမ်းများဖြင့် ဆောင်ရွက် မည်ဆိုပါက သက်ရောက်မှုများအား လျော့ချနိုင်မည် ဖြစ်ပါသည်။ မည်သို့ပင်ဆိုစေကာမူ ဆောက်လုပ်ရေး လုပ်ငန်းသုံး သံမဏိချောင်းထုတ်လုပ်ခြင်းလုပ်ငန်းသည် အပူနှင့်ထိတွေ့ရသော လုပ်ငန်းဖြစ်ပေရာ အလုပ်သမားများ၏ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးကင်းရေးအပေါ် ဖြစ်ပေါ်လာနိုင်သည့် ဆိုးကျိုး သက်ရောက်မှုများမှာမူ ရှောင်လွှဲ၍မရနိုင်ပေ။ လုပ်ငန်းလည်ပတ်ခြင်း အဆင့်တွင် ၎င်းသက်ရောက်မှု၏ လျော့ပါးသက်သာစေရေး နှင့်စပ်လျဉ်း၍ ဇယား ၈-၂ တွင် ဖော်ပြထားရှိပါသည်။ လျော့ပါးသက်သာစေရေး နည်းလမ်း၏ အဓိကရည်ရွယ်ချက်မှာ စက်ရုံလည်ပတ်ခြင်း ဆောင်ရွက်ရာတွင် အမြင့်ဆုံးခွင့်ပြုနိုင်သော ပတ်ဝန်းကျင်စံချိန် စံညွှန်းများနှင့်အညီ လိုက်နာဆောင်ရွက်ရန်ဖြစ်သည်။ စီမံကိန်း၏သက်ရောက်မှုများကို လျော့နည်းစေရန် အောက်ပါစီမံခန့်ခွဲမှုအစီအစဉ်များကို စီမံကိန်းလည်ပတ်သည့်ကာလတစ်လျှောက် အကောင်အထည်ဖော် ဆောင်ရွက်သွားရမည်ဖြစ်ပါသည်။

- လေနှင့်အနံ့အရည်အသွေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- ဆူညံသံနှင့် တုန်ခါမှုအရည်အသွေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- မြေဆီလွှာအရည်အသွေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- ရေအရည်အသွေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- စွန့်ပစ်ရေအရည်အသွေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- စွန့်ပစ်အစိုင်အခဲစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- လုပ်ငန်းခွင်နှင့် ဒေသခံတို့၏ ကျန်းမာရေးနှင့် ဘေးကင်းရေးစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ
- ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်
- ဘေးအန္တရာယ်စီမံခန့်ခွဲမှုနှင့် အရေးပေါ်တုံ့ပြန်ရေးအစီအစဉ်
  - မီးဘေးအန္တရာယ်အရေးပေါ်တုံ့ပြန်ရေးအစီအစဉ်
  - ဆေးဘက်ဆိုင်ရာ အရေးပေါ်တုံ့ပြန်ရေးအစီအစဉ်
  - ဘေးအန္တရာယ်စီမံခန့်ခွဲမှုအစီအစဉ်
- အရေးပေါ်ကြိုတင်ပြင်ဆင်မှု အစီအစဉ်နှင့် လေ့ကျင့်ရေးအစီအစဉ်များ
- လူမှုစီးပွားတာဝန်ယူမှု အစီအစဉ်

၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ ၃၀ ရက်နေ့တွင် ရန်ကုန်တိုင်း၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ ဓမ္မရေအေး ကျောင်းတိုက်၌ အများပြည်သူနှင့်ဆွေးနွေးတိုင်ပင်ခြင်းအခမ်းအနားကို ဌာနဆိုင်ရာမှ တက်ရောက်သူ ၁ ဦး၊ အနီးဝန်းကျင်စက်ရုံများမှ တာဝန်ရှိသူ ၁၁ ဦး၊ မြောင်းတကာစက်မှုဇုန်မှဒေသခံ ၇ ဦးတို့ တက်ရောက်ခဲ့ပါသည်။

ဆွေးနွေးပွဲသို့ တက်ရောက်လာသူများမှ ပတ်ဝန်းကျင်နှင့် သက်ဆိုင်သည့် အကြောင်းအရာများ၊ ဒေသ ဖွံ့ဖြိုးတိုးတက်ရေးနှင့် သက်ဆိုင်သည့်အကြောင်းအရာများ ဆွေးနွေးခဲ့ကြ ပါသည်။ ကုမ္ပဏီတာဝန်ရှိသူများမှ ရေအရင်းအမြစ်စီမံခန့်ခွဲမှု၊ ဇီဝမျိုးစုံမျိုးကွဲဆိုင်ရာနယ်ပယ်၊ ကာဗွန်ဒိုင်အောက်ဆိုဒ်ထွက်ရှိခြင်းတို့နှင့် ပတ်သက်၍ စီမံကိန်းနှင့်သက်ဆိုင်သည့် ပတ်ဝန်းကျင်ဆိုင်ရာ လမ်းညွှန်ချက်များ၊ စည်းမျဉ်းစည်းကမ်းတို့ နှင့်အညီ လိုက်နာဆောင်ရွက်သွားမည်ဟု ဖြေကြားခဲ့ပါသည်။

လုပ်ငန်းလည်ပတ်ခြင်းနှင့်ပိတ်သိမ်းခြင်းအဆင့်တို့တွင် လေအရည်အသွေး၊ ဆူညံသံနှင့်တုန်ခါမှု၊ အမှိုက် စွန့်ပစ်မှု၊ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ်ကင်းရှင်းရေး (အထူးသဖြင့် အပူနှင့်ဆူညံသံနှင့် ပတ်သက်သည့်ကိစ္စများ)နှင့် ဒေသခံများ၏ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးစသည့် သက်ရောက်မှု ပမာဏ အလယ်အလတ်ရှိပါသည်။ ယင်းသက်ရောက်မှုများကို လျော့ချရန်အတွက် လျော့ပါးသက်သာစေရေး နည်းလမ်းများနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်များအား အကောင်အထည် ဖော်ဆောင်ရွက်ရန် လိုအပ်ပါသည်။ စီမံကိန်းအားဆောင်ရွက်ရာတွင် ရေရှည်ဖွံ့ဖြိုးတိုးတက်သော ပတ်ဝန်းကျင်ဆိုင်ရာ အလေ့အကျင့်ကောင်းများနှင့်အညီ ဆောင်ရွက်ရန် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တွင် ရေးဆွဲထားပါသည်။ နိဂုံးချုပ်အနေဖြင့် TMT Rebars စီမံကိန်းသည် ဒေသခံများ၏ အလုပ်အကိုင်အခွင့်အလမ်းရရှိစေရန်၊ လုပ်သားကျွမ်းကျင်မှုတိုးတက်လာစေရန်၊ ဒေသခံများနှင့်နိုင်ငံတော်ဖွံ့ဖြိုးတိုးတက်လာစေရန် မျှော်မှန်း ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်နှင့်အတူ လျော့ပါးသက်သာစေရေး နည်းလမ်းများကို အကောင်အထည်ဖော်ဆောင်ရွက်ခြင်းသည် လုပ်ငန်းလည်ပတ်သည့်ကာလတွင် ကျန်ရှိမည့် သက်ရောက်မှု များကို ဖြေရှင်းနိုင်မည်ဖြစ်ပြီး ပတ်ဝန်းကျင်ရေရှည်ဖွံ့ဖြိုးတိုးတက်မှုကို အထောက်အကူပြုမည် ဖြစ်ပါသည်။

## 1. EXECUTIVE SUMMARY

This document is the Environmental Impact Assessment (EIA) report for Production and Marketing of TMT Rebars, at Plot No. 340, 343, 338, 345, 339, 344, Myaung Da Gar Industrial Zone, Hmawbi Township in Yangon Region, Myanmar. The project proponent is Yangon J.R Family Limited whereas E Guard Environmental Services has been appointed to carry out an EIA for the project in strict compliance to applicable national laws, rules and regulations issued by the relevant Myanmar governmental agencies, as well as to satisfy current international best practices and guidelines for projects of this nature and scale. This report was prepared for the approval of the Ministry of Natural Resources and Environmental Conservation (MONREC) in compliance with the Myanmar Environmental Impact Assessment Procedures 2015 (EIA Procedures). This EIA report described the impacts from project development and implementation period and mitigation measures and management plans for each environmental component.

The purpose of the EIA process is to identify key environmental issues specific to the proposed project or the receiving environment (receptor), which are addressed in detail in this EIA report. The determination of the significant issues to be assessed for the potentially significant impacts is determined through the primary and secondary data. Regarding the collection of primary data, baseline environmental data, relating to physical, biological and socio-economic sources were collected by direct observation, secondary data from published reports and literature.

Relevant policies, legislation and institutional framework of Myanmar and International guidelines in the context of environmental and socio-economic aspects of the project have been reviewed in the EIA process. The proposed project will be undertaken in line with a number of national and local standards and laws. Local laws relating to EIA include National Environmental Policy (1994); Environmental Conservation Law (2012); National Environmental Quality (Emission) Guidelines (2015); and Environmental Impact Assessment Rules and Regulations (EIA Procedure 2015). The National Environmental Quality (Emissions) Guidelines provide the basis for regulation and control of noise and air emissions and effluent discharges from projects in order to prevent pollution and protect the environment and public health.

For this project, the following laws are related to Environment-

- National Environmental Policy of Myanmar (2019)
- National Land Use Policy (2016)
- The Environmental Conservation Law (2012)
- The Environmental Conservation Rules (2014)
- The Environmental Impact Assessment Procedure (2015)
- National Environmental Quality (Emission) Guidelines (2015)

For Insurance,

- The Myanmar Investment Law (2016)
- The Myanmar Investment Rules (2017)
- The Myanmar Insurance Law (1993)



For Health,

- Prevention of Hazard from Chemical and Related Substances Law (2013)
- The Public Health Law (1972)
- The Prevention and Control of Communicable Diseases Law (2011)
- The Control of Smoking and Consumption of Tobacco Product Law (2006)

In Construction phase, the occupational health and safety is essential.

- The Occupational Health and Safety Law (2019)

Other necessary laws for this project-

- The Vehicle Safety and Motor Vehicle Management Law (2020)
- The Vehicle Safety and Motor Vehicle Management Rules (2022)
- The Electricity Law (2014)
- Natural Disaster Management Law (2013)
- The Myanmar Fire Brigade Law (2015)
- The Myanmar Engineering Council Law (2022)
- The Industrial Explosive Materials Law (2018)
- The Myanmar Companies Law (2017)

Implementation of this project, the following laws are required for labors-

- The Labor Organization Law (2011)
- The Settlement of Labor Dispute Law (2012)
- The Employment and Skill Development Law (2013)
- The Minimum Wage Law (2013)
- Payment of Wages Law (2016)
- Workmen's Compensation Act (1923)
- The Leaves and Holidays Act (1951)
- The Social Security Law (2012)

The following Laws are applicable for this project-

Resource Conservation

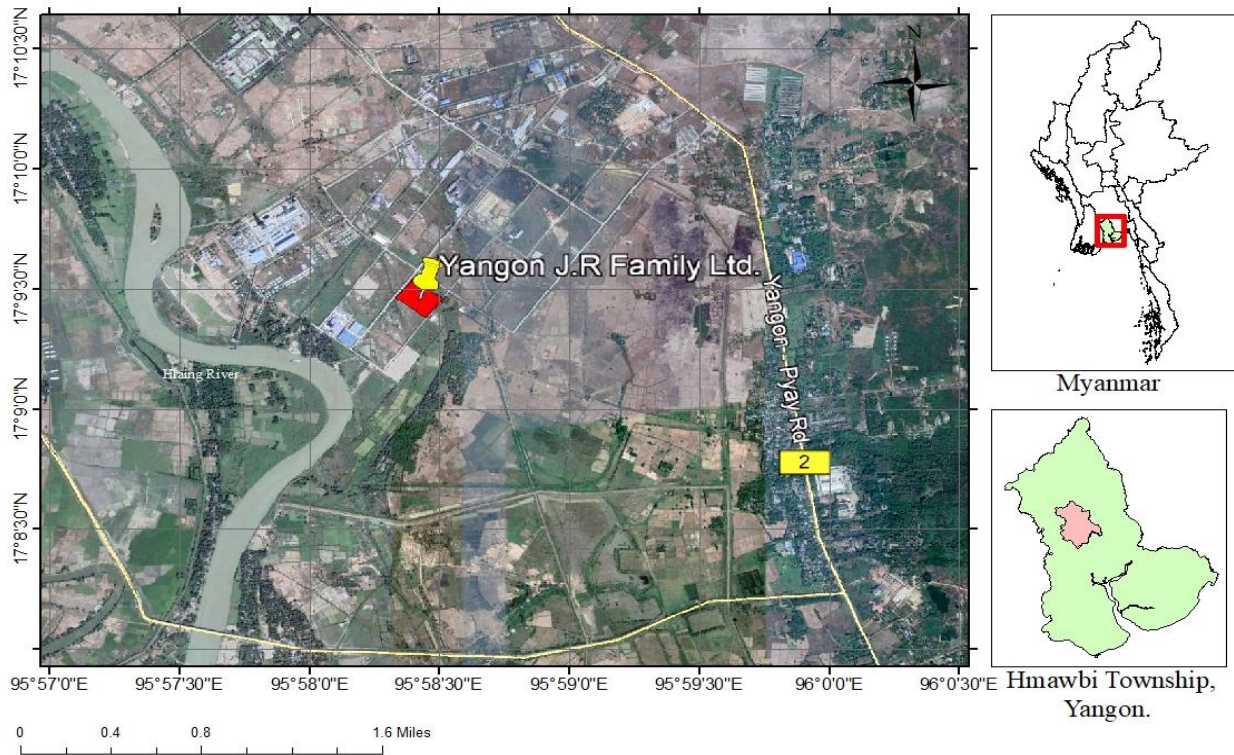
- The Conservation of Water Resources and Rivers Law (2006)
- The Conservation of Water Resources and Rivers Rules (2013))
- The Forest Law (2018)

Cultural Heritages

- The Protection and Preservation of Cultural Heritage Regions Law (2019)
- The Protection and Preservation of Antique Objects Law (2015)
- The Protection and Preservation of Ancient Monuments Law (2015)
- The Ethnic Rights Protection Law (2015)
- The Ethnic Rights Protection Rules (2019)
- The Petroleum and Product of Petroleum Law (2017)
- The Petroleum Rules (1937)
- The Industrial Zone Law (2020)
- The Private Industrial Enterprise Law (1990)

The investor submitted a project investment proposal on April 20, 2018 to the Myanmar Investment Commission (MIC) and then, for the environmental approval and comments of the Ministry of the Natural Resources and Environmental Conservation (MONREC) on the

proposal for investment in — Production and Marketing of TMT Rebars under the name of Yangon J.R Family Limited as a wholly owned foreign investment from the India, on May, 11, 2018. The construction phase of the proposed Production and Marketing of TMT Rebars was initiated in April, 2018 until July, 2020. In addition, project site has total land 10.977 acres with fully built-up structures of gated and fenced up facility including dining room, security office, tube well, transformer etc. The coordinate point of the proposed project is 17° 9' 23.132" N and 95° 58' 27.358" E and location of the designated factory is shown in Error! Reference s  
ource not found..

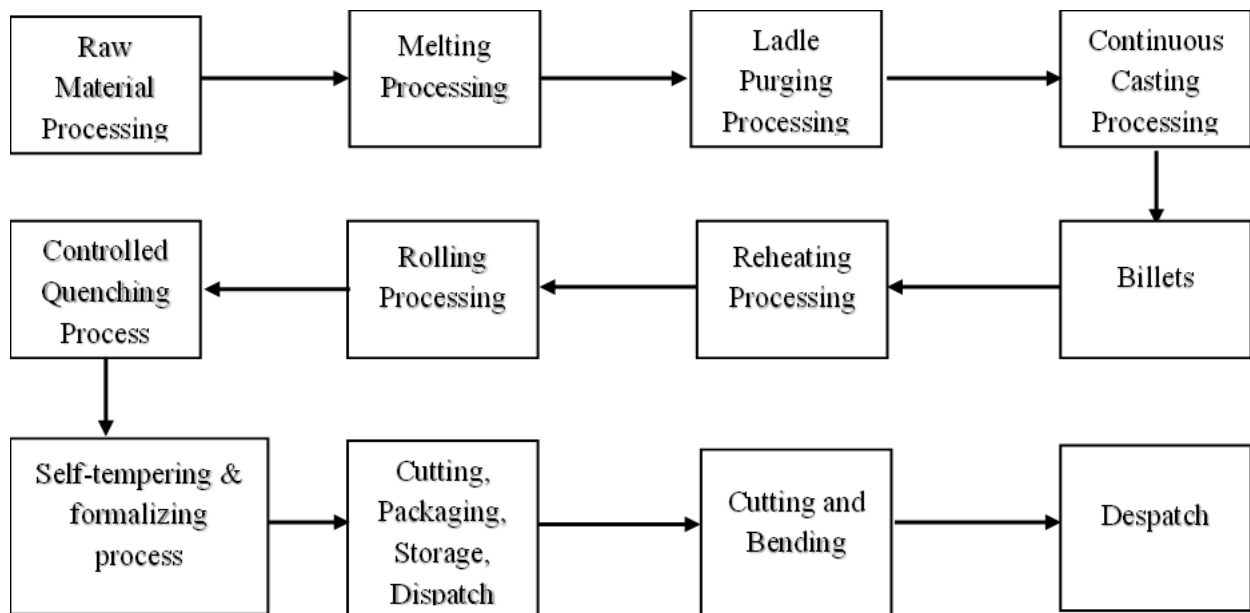


**Figure 1.1 Location of the Project**


Most of the raw materials will be purchased from local suppliers and from Myanmar Economic Corporation (MEC) and secondly from domestic suppliers. The major raw materials which required for production TMT rebars are scrap-iron, silico manganese, ferro silico etc. The average annual water supply is 1,514 KL (400,000 gallon). 1 KLD is used for scrubbing liquid and 4 KLD for coolant water which will be kept under complete re-circulation in a closed circuit and store the recirculating water. The water requirement of 10 KLD will be met out through the proposed bore well. The water treatment system (R.O system) had been installed and drinking water quality is maintained and checked by R.O system supplier in every 6-month. According to the current situation, furnace oil is needed to use only 1 days (8 hours) for a month to run the reheating furnace 8 hours for one day. 458 litter of furnace oil is required to run for an hour and the total is 3,664 litter for a month. The industry proposes to use Furnace Oil (F.O) as a fuel for re-heating the furnace. Currently, diesel consumption is mainly for lighting purposes and approximately 450 litter per month. The electricity can be assessed from the national grid through own transformer (15,000 KVA and 7,000 KVA). Currently, there has differences in employment requirement as described in proposal because of the availability of

electricity in the industrial zone. There are 20 employees for senior management, professionals and technicians and 22 workers for production activities. For only foreign technicians, the accommodation is provided within the project premises.





The proposed project has planned to produce highest quality TMT Rebars (mild steel billets). Estimated production capacity per year is 60,000 metric tons (MT). Production of TMT Rebars is very simple process in which detail process for scrap melting will operate systematically in accordance with the below flow chart under the fully automatic control. TMT Rebars are manufactured by melting steel scraps with sponge iron and other metallic alloy ingredients in electric induction furnace. The unit will be producing about 80,000 MT of mild steel Billets per annum from mild steel scrap of 75,000 TPA and sponge iron of 9,000 TPA.




**Figure 1.2 Production Steps of Process**

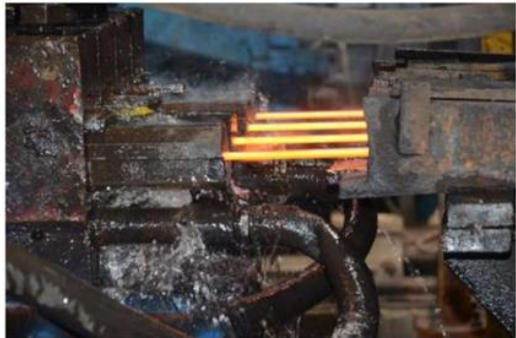



<p><b>(1) Scrap unloading and segregation</b></p> <p>All scrap received from trucks/ containers are inspected for quality and unloaded separately. Shock absorber, cylinders, closed containers are segregated and removed. Oversized scrap and cast iron are also removed.</p>	
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<p><b>(2) Scrap Handling</b></p> <p>The segregated scrap is then moved and stacked quality wise like heavy melting scrap, bundle scrap and sponge iron.</p>	
<p><b>(3) Charging in Induction Furnace</b></p> <p>The scrap to be charged in the furnace is shifted to furnace platform with Magnet or Grab attached to crane. The scrap is then charged in to the furnace with magnet and as the scrap starts melting further quantity of scrap are charged in the furnace. The scrap and sponge iron are charged in the furnace in pre-determined proportion to control chemistry of the metal.</p>	
<p><b>(4) Pouring molten iron into ladle bucket</b></p> <p>After the entire scrap has melted the furnace is tilted to remove slag. After checking chemistry of molten metal and adjusting carbon, desired quantity of Silico Manganese is added to molten metal. After the molten metal temperature reaches 1650 °C the liquid metal is poured into ladle by tilting the furnace.</p>	
<p><b>(5) Placing of the ladle on the CCM (Continuous Casting Machine)</b></p> <p>The ladle with liquid metal is moved to continuous casting machine and temperature is checked. The liquid metal is then purged by passing oxygen from bottom of ladle to homogenize the molten metal. The ladle is then positioned on the CCM ladle stand.</p>	

<p><b>(6) Opening of Slide Gate for Billet Casting</b></p> <p>The slide gate system at bottom of ladle is opened and liquid metal starts flowing in to tundish which is kept below the ladle. From the tundish the liquid metal enters in the copper mold tube which is water cooled.</p>	 <p><b>3-HI ROUGHING MILL STAND</b></p>
<p><b>(7) Cast Billet from the CCM cut to length, and stacked on Cooling Bed</b></p> <p>The metal takes the shape of copper mold which is square and is continuously cast into billets. The billets are then cut to desired length and transferred to cooling bed for air cooling. After cooling the billets are recovered and stacked.</p>	 <p><b>COLD SHEAR</b></p>
<p><b>(8) Billet tested in Spectro Lab for the best possible Quality and Chemical Compositions</b></p> <p>During casting sample of billet is cut and sample prepared for testing in SPECTRO (spectrometer) for chemical composition. The tested billets are marked and stacked with batch number marked on the billets.</p>	
<p><b>(9) Billet ready to be rolled in the rolling mill</b></p> <p>The tested billets are heated to 1100°C in reheating furnace fired by electric furnace</p>	 <p><b>3-Hi ROUGHING MILL AREA</b></p>



<p><b>(10) Billet passing through the Rolling Mill</b></p> <p>The hot billets pass through successive rolls in the rolling mill and are rolled to desired size.</p>	 <p><b>FOUR STRAND ROLLING</b></p>
<p><b>(11) Quenching Process: Bars are passed through the quenching box for grading</b></p> <p>The bars pass through quenching boxes where due to controlled water spray the bars undergo heat treatment process and gets desired mechanical properties. Samples are taken during rolling and tested for mechanical properties to ensure the quality of bars.</p>	 <p><b>CHAIN TRANSFER</b></p>
<p><b>(12) Cooling Bed</b></p> <p>The bars are then collected in cooling bed.</p>	
<p><b>(13) Bundled and ready to dispatch</b></p> <p>The bars from cooling bed are then bundled and shifted to storage yard ready for dispatch.</p>	

The flue gas from the proposed induction furnace contains suspended particulate matter (SPM) and traces of gases along with other metallic contaminants. The proposed treatment scheme comprises of the following equipment:



- Sucker Hood and ducting arrangement
- 400 HP Centrifugal Blower
- Packed Bed Wet Scrubber of dia 2750 mm x 5500 mm ht.
- M S Stack of 900 mm dia x 30 m ht

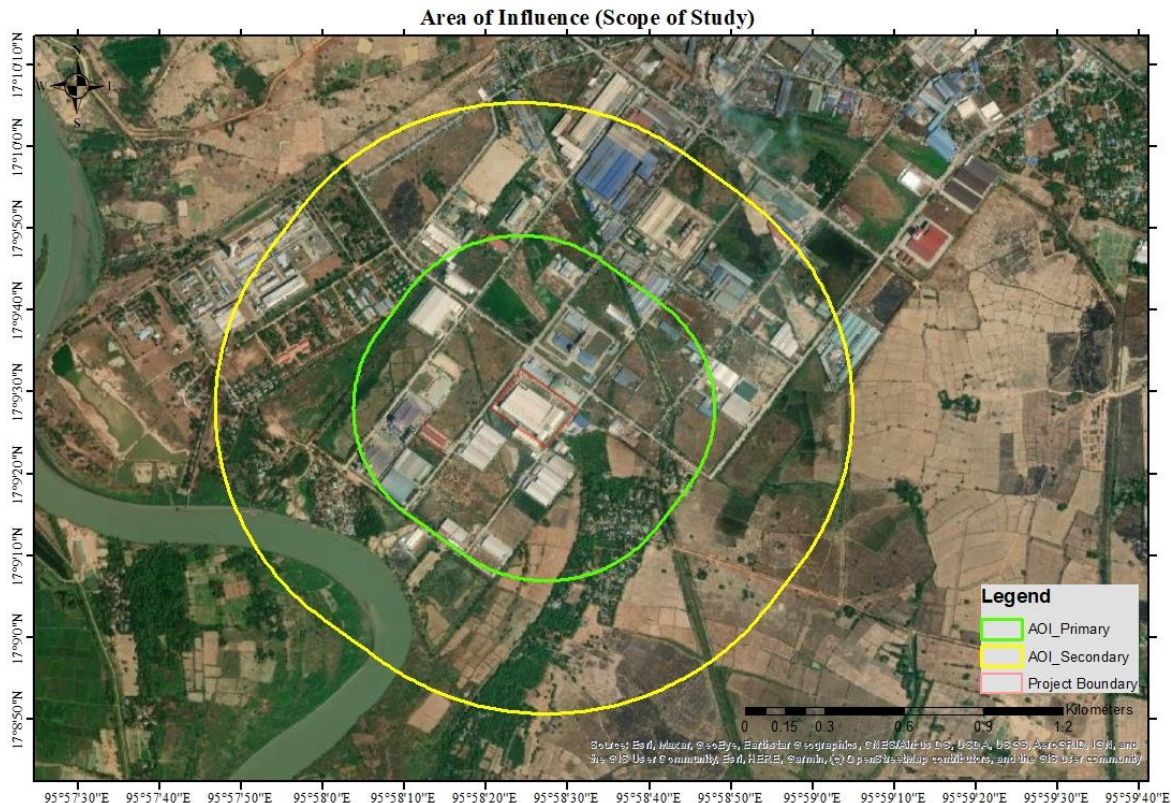
The flue gas from the proposed Re-heating furnace contains suspended particulate matter (SPM) and trace of Sulphur di-oxide along with other metallic contaminants. The scheme proposed comprises of the following requirements:

- Sucker hood and ducting arrangement
- 400 HP Centrifugal Blower
- Fume Extraction System (FES) for Induction Furnace
- M S stack of 900 mm dia x 30 m ht.
- 2.0 HP Agitator for mixing lime

The planting of trees and plants not only enhances aesthetics but also contributes to environmental sustainability and the well-being of workers. The objectives of the replantation program are aesthetic enhancement, a noise barrier to reduce the impact of industrial noise on the surrounding area, and shading for workers to rest and work comfortably, especially during hot weather. There are 10 mango trees, 10 betel trees, and 299 Mowra-butter trees that were planted to create a green space. Not only 3400 TPA of Misrolls generated from the re-rolling process but also 1450 TPA of Endbits that are byproducts from cutting process will be recycled to the induction furnace for further re-processing.

Project alternatives also compares the technical, financial, environmental, and social feasibility of the project, where is applicable. Alternative analysis is the process of analyzing the proposed location to operate the plant safely and to obtain local job opportunities. This analysis also covers the environmental aspect of pollution prevention and improvement.

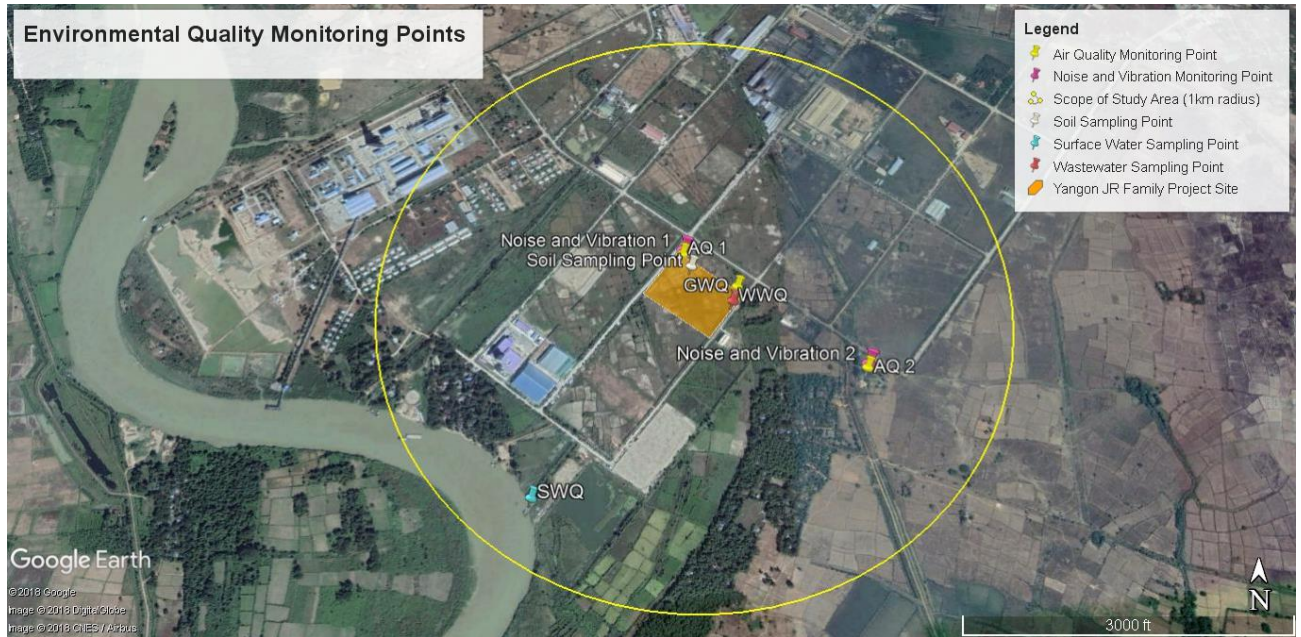
The baseline information provides general description of the status of the receiving environment in the project area and identification of sensitive environmental, social features and possible receptors of the proposed project that serves as the benchmark for evaluating environmental and social management performance of the project construction and operation. The information that covers above mentioned resources of EIA of this project was collected within area of influence (AOI), primary and secondary impact zone as shown in **Figure 1.3**.



**Figure 1.3 Scope of Study Area of Yangon JR Steel Mill**

The baseline environmental quality surveys have been conducted at the specific locations as shown in **Figure 1.4**. Air quality monitoring was done, 24 hours at each selected location from 30<sup>th</sup> August to 1<sup>st</sup> September 2018 and 5<sup>th</sup> to 7<sup>th</sup> November 2018. During this survey, the criteria pollutants PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, VOC and O<sub>3</sub> were measured and are compared with National Emission Guidelines. According to the air quality baseline survey, all the resultant values of each parameter are below the National Environmental Quality (Emission) Guidelines (NEQG) (2015). All noise levels at project site meet the NEQG Guidelines but background noise level at the receptor (Dhamma Yayaye Monastery) exceeds the standard for residential area due to the usage of loud speaker at the traditional ceremony. Water quality sampling was carried out at the designated sites for three locations: tube well that is at the project site for ground water, wastewater canal where is in front of the project site for wastewater and Hlaing River for the surface water. The wet (rainy) season data was collected on September, 2018 and the dry season data was collected on November, 2018. The report of lab analysis indicated that all BOD and COD data meet the standard but values of total suspended solids at three water samples exceed standard value. The soil pH level is strongly acid and water-soluble Cl<sup>-</sup> is low. The soil of Myaung Da Gar industrial area was used for agricultural practices before establishing industrial zone.





**Figure 1.4 Location of Environmental Quality Sampling Points**

Vulnerability to natural disasters can depend on various factors, including geographical location, topography, climate, infrastructure and land use planning. Climate change can lead to an increase in the frequency and intensity of these events, which can damage infrastructure, disrupt operations and pose safety risks to the steel mill. Myanmar has a monsoonal climate with seasonal variations in precipitation. Changes in precipitation patterns due to climate change can affect the availability of water resources for industrial processes.

The scope of the study area was established inside a 1 km circle surrounding the planned project area in order to undertake the social impact assessment. Kan Kalay village, Kone Kalay village, and Hmawbi Township are located close to Myaung Da Gar Industrial Zone. The field survey, which involved 67 houses and a sample size of 35% of all households, was carried out in two villages during the second week of November 2018. Age, gender, education, occupation, annual household incomes and expenditures, the targeted villages' solid waste management methods, and the sources of energy and water were some of the demographic characteristics of the research areas that were characterized based on the descriptive analysis. In accordance with the analysis of social survey data, the local people concerned about the different kinds of impacts from the industrial zone which is presented on **Figure 6.1**. Most of the local people who live near industrial zone (Kan Kaly and Kone Kalay villages) complained about significant unpleasant odor from the fertilizer mill. Some people distressed due to the noise pollution which is generated from feed mill.

For the development project of production, it has various kinds of activities from the proposed Production and Marketing of TMT Rebars project are likely to occur positive impact as well as negative impact on the environment. Furthermore, operation phase of production of TMT Rebars may have the potential to the environment in many ways but it can differ widely in terms of their design and location, and key issues are likely to vary from site to site. In order to assess likely significant impacts, possible environmental and social impacts by the project have

to be identified based on the project description. The significance of impact was assessed by impact assessment methodology adopted by International Association for Impact Assessment (IAIA). Then, the significant point (SP) is calculated by following formula.

$$\text{Significant Point (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) * \text{Probability}$$

**Table 1-1 Summary of Potential Impacts Identification**

Environmental Parameters	Issues	Construction Phase	Operation Phase	Decommissioning Phase
Air Quality	<ul style="list-style-type: none"> <li>Fugitive dust and exhaust gas emission from heavy machineries and vehicles</li> <li>Dust emissions from drilling, iron scrap handling and segregation and demolishing activities</li> <li>Generation of Flue gas (SO<sub>2</sub>, NO<sub>x</sub>, CO), VOC and particulate matter from operation activities especially induction and re-heating activities</li> </ul>	Low	Moderate	Low
Noise and Vibration	<ul style="list-style-type: none"> <li>Noise and vibration from construction, demolishing and transportation of materials</li> <li>Noise from diesel generators and traffic along main transport/ access routes</li> <li>Noise from induction, casting, rolling and cutting activities</li> </ul>	Low	Moderate	Low
Soil Contamination	<ul style="list-style-type: none"> <li>Excavation of soil for building foundation</li> <li>Spillage of diesel and furnace oil at site</li> <li>Amassing the demolished materials at the project site</li> </ul>	Low	Low	Low
Water Quality	<ul style="list-style-type: none"> <li>Water consumption for construction activities and domestic purpose</li> <li>Water usage for cooling process</li> </ul>	Low	Low	Low
Wastewater Effluents	<ul style="list-style-type: none"> <li>Discharged wastewater from office, toilet facilities and worker camps</li> </ul>	Low	Low	Low

Environmental Parameters	Issues	Construction Phase	Operation Phase	Decommissioning Phase
Waste Disposal	<ul style="list-style-type: none"> <li>Domestic waste from office, staff quarter, demolition waste</li> <li>Slag form induction melting process and re-heating furnace activities</li> <li>Effluents from scrubbers and coarse scale, oil and grease from rolling process</li> </ul>	Low	Moderate	Moderate
Occupational Health and Safety	<ul style="list-style-type: none"> <li>Physical and accidental hazards due to handling with heavy machineries during construction activities and scrap handling, loading and unloading activities</li> <li>Heat stress and hot liquids exposure to workers</li> <li>Respiratory hazards due to scrap handling, loading and unloading activities</li> <li>Explosion and fire hazards of induction activities</li> <li>Electrical hazards due to deal with heavy-duty electrical equipment</li> </ul>	Low	Moderate/High	Low
Community Health and Safety	<ul style="list-style-type: none"> <li>Traffic volume and accidents from transportation of construction material, operation equipment, iron scraps and steel bars from mill</li> <li>Communicable diseases during construction activities</li> </ul>	Low	Low	Low

A risk assessment for steel mill is a thorough look at the farm to identify situation, components and processes, etc. that may cause harm, particularly to people. The known hazards are listed and checked within the risk matrix to grasp the importance of risk, the safeguarding controls/measures will be described based on the risk ranks and at last the recommendation shall be provided to prevent/ eliminate the potential hazards.

**Table 1-2 Risk Assessment of Occupational Health and Safety for Yangon J.R Steel Mill Project**

Hazard	Likelihood	Consequence	Risk Rating	Control Measures
Noise	Possible	Minor	Medium	Engineering and Administrative
Vibration	Possible	Insignificant	Low	



Hazard	Likelihood	Consequence	Risk Rating	Control Measures
Heat stress	Likely	Moderate	High	Engineering, Administrative, PPE
Chemicals	Unlikely	Minor	Low	
Inhalable agents (gases, vapors, dusts and fumes)	Possible	Minor	Medium	Engineering and Administrative
Confined space	Unlikely	Minor	Low	
Work equipment and machinery guarding	Likely	Moderate	High	Engineering, Administrative, PPE
Falling objects	Unlikely	Minor	Low	
Slips, trips and falls	Unlikely	Minor	Low	
Ergonomics	Likely	Minor	Medium	Engineering and Administrative
Handling molten metal, dross or slag	Likely	Minor	Medium	Engineering and Administrative
Rolling mill	Possible	Moderate	Medium	Engineering and Administrative
Coating lines	Possible	Insignificant	Low	

For the health impact assessment, both introduction to Health Impact Assessment (World Bank, 2009) and World Health Organization (WHO, 2001) recommendations have been utilized. Desktop Health Impact Assessment was applied in this Health Impact Assessment (HIA) for steel mill project. A desktop HIA is a qualitative review of potential health impacts and is used to internally inform and interview questionnaire. As the result of primary data collection, the common types of diseases are fever, paralytic stroke, liver disease, heart disease and hypertension. **Figure 6.2** shows the health status of project area based on their occupation. Hypertension disease is likely occurred at the local community (9 persons). Most of the respondents (38 persons) answered that they do not suffer any chronic diseases. To compare with Hmawbi Township health profile, the common diseases found in Hmawbi Township are Diarrhea and TB.

Additionally, occupational health, environmental health and community health professionals should work together on occupational health impact assessments, and affected people and organizations should also contribute. Throughout the life of the project, it is intended to reduce hazards to occupational health and to protect the welfare of both workers and the community. To lessen or eliminate the identified health hazards, the project proponent should adhere to and put into practice the recommended mitigation measures, such as engineering controls, personal protective equipment and health and safety training.

The following mitigation measures have to be followed to minimize the potential impacts on environment during construction, operation and decommissioning phases.

- Roads are sprinkled with water at regular intervals for which water tankers with sprinkler arrangement are deployed.

- Trucks carrying construction materials and raw materials are covered with tarpaulin to prevent spreading of dust during transportation.
- Green belt and greenery development around storage yards, around plants, either side of roads and around the periphery of the industry.
- Dust respirators are provided for the people working dust generating locations.
- All internal roads in the premise are paved.
- Speed limit of 10 km/h is enforced for vehicles in the plant premises to prevent road dust emission.
- The air pollution control measures will ensure monitoring regularly to meet the standard of NEQG.
- Suitable measures have to be adopted for occupational noise safety in factory and good maintenance of vehicles.
- Safety officer who will co-ordinate and manage occupational health safety will be appointed in the industry
- Good housekeeping must be practiced in the industry.
  - Regular cleaning of plant roads
  - Regular wetting of roads with water
  - Keeping ventilation systems in good working order to avoid accumulation of dust on equipment inside the room
  - Maintaining adequate green belts inside and along the plant for not only suppression of noise and pollutant transportation but also for better aesthetics.
- Regular inspection and maintenance of pollution control plants
- Heat insulation of hot surfaces, wherever necessary, personnel protective appliances will be used by the workers.
- All pollution control and dust suppression systems shall be interlocked with operation of process equipment or are run along with process equipment
- Health and safety related displays will be exhibited at strategic locations in the industry.
- Workers are educated workers on health, hygiene and safety and trained in occupational health safety.
- First aid facilities will be provided at different locations. Further first aiders will be trained from reputed training institute.
- Workers are trained to assist emergency management in case of any such incidences
- The workers exposed to noisy equipment shall be provided with ear muffs. If necessary, the duty hours will be rotated, so that noise exposure time is kept within specified limits.
- Regular health check-up of the workers will be carried out and health records of individual workers. Each worker will have a baseline medical check-up at the time of joining followed by annual medical check-up.

Cumulative impacts can be defined as successive and combined impacts of the one or more projects upon the society, economy and the environment. Such impacts may occur due to the accumulation and interaction of other developments, being developed within the same area or over a similar time frame of operation to the project being assessed. The cumulative assessment defined the spatial and temporal boundary for assessment and review impact significance based

on “Cumulative Impact Assessment Matrix” and Cumulative Impact Significance Criteria” and considering the impacts from other projects in the vicinity of steel mill.

- ✓ Air quality impact may be increased from operation of various factories in the vicinity of site of Myaung Da Gar Industrial Zone.
- ✓ Noise levels may be also increased by combining operation activities of adjacent factories and transportation vehicles.
- ✓ Groundwater consumption may also be affected by cumulative operation of factories in future.
- ✓ Risk of fire explosions and other accidental hazards may be potential and road accidents and traffic congestion may be increased by transportation.

The following provides the summary of the findings.

Cumulative Impacts having “Low Significance” which includes:

- Noise and vibration
- Surface water
- Groundwater

Cumulative Impacts having “Medium Significance” includes:

- Air quality
- Risk of fire and accidental hazards
- Waste

However, if the implementation of the proposed steel mill is in line with the mitigation measures described in the receptive chapters, the overall impact of TMT rebar production project could be manageable.

The proposed TMT Rebar production project acknowledges the presence of several adverse environmental impacts, but emphasizes that these impacts can be reduced through appropriate mitigation measures. Nonetheless, the project recognizes the inevitability of certain adverse effects on the occupational health and safety of its workers, primarily related to long-term and short-term exposure to steel particles and excessive heat. To address these concerns, a comprehensive mitigation plan for the operational phase has been outlined in **Table 8-2**. The primary objective of this plan is to ensure that the factory operations comply with the maximum allowable environmental norms and standards. To mitigate the impacts of the project, these following detail sub-plans and management plans would be established and implemented throughout the lifecycle of the project.

- Air and odor quality management sub-plan
- Noise and vibration quality management sub-plan
- Soil quality management sub-plan
- Water quality management sub-plan
- Wastewater quality management sub-plan
- Solid waste disposal management sub-plan
- Occupational and community health and safety management sub-plan
- Environmental Monitoring Plan

- Disaster Management and Emergency Response Plan
  - Fire Emergency Response Plan
  - Medical Emergency Response Plan
  - Risk Management Plan
- Emergency Preparedness Plan and Training Programs
- Corporate Social Responsibility (CSR) Plan

On 30<sup>th</sup> July 2019, a public consultation and disclosure ceremony was held at Dhamma Yay Aye Monastery, Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon Region in order to disclose the project information to the following personnel: 1 person from government official, 11 persons from adjacent private, 7 local people near Myaung Da Gar Industrial Zone. The meeting attendees discussed various environmental and community-related concerns. The responses provided reassurances regarding water resource management, biodiversity scope, and carbon dioxide emissions, aligning the project with established environmental guidelines and regulations.

During the operational and decommissioning phases, there are moderate impacts on air quality, noise and vibration, waste disposal, occupational health and safety (particularly heat and noise-related issues), and community health and safety. Mitigation measures and the implementation of the Environmental Management Plan (EMP) are proposed to minimize these impacts. The EMP is designed to ensure that the project is carried out in an environmentally sustainable manner.

In conclusion, the TMT Rebars project is expected to provide local employment opportunities, improve employee skills, and have a positive impact on the local community and national development. Proper implementation of mitigation measures, along with the EMP, will address any residual impacts during the operation phase, contributing to environmental sustainability.

## **2. INTRODUCTION**

### **2.1. Background of the Study**

The Environmental and Social Impact Assessment (ESIA) report of “Production and Marketing of TMT Rebar” by Yangon J.R Family Limited was prepared to initiate the required processes under Myanmar Environmental Impact Assessment Procedure (2015).

According to Myanmar Environmental Conservation Law 2012, the proponents of every development project in the country have to submit an Environmental Management Plan (EMP) or Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) to the Ministry of Natural Resources and Environmental Conservation (MONREC). On behalf of MONREC, the Environmental Conservation Department (ECD) is responsible for implementing National Environmental Policy, strategy, framework, planning and action plan for the integration of environmental consideration into the national sustainable development processes. Thus, the scoping report for the ESIA had submitted to ECD Head Office on August 2018. After review on this scoping, ECD give some good comments on 6<sup>th</sup> June, 2019 and these comments will be taken into consideration in this EIA report.

Therefore, as required by article (65) of the EIA procedure, the project proponent has to be responsible to prepare EIA report. This EIA report has to submit Environmental Conservation Department (ECD), Ministry of Natural Resources and Environmental Conservation Department (MONREC), for review and approval of Environmental Compliance with Myanmar’s Law and regulations.

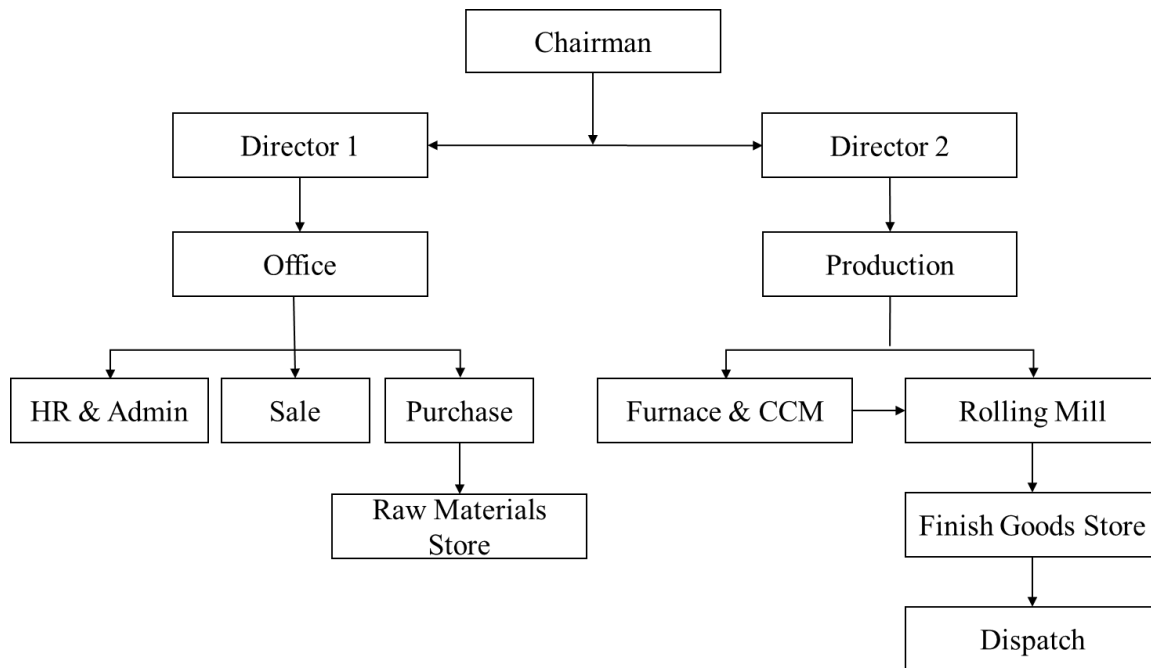
### **2.2. Detail Information of the Project Proponent**

The project proponent is Yangon JR Family Co., Ltd with 100% foreign investment.

**Table 2-1 Project Proponent Information**

<b>Project Proponent Name</b>	Mr. Narayan Singh
<b>Company Name</b>	Yangon J.R Family Limited
<b>Office Address</b>	Plot (340, 343, 338, 345, 339, 344), Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon.
<b>Factory Location</b>	Plot (340, 343, 338, 345, 339, 344), Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon.
<b>Contact Email Address</b>	yangonjrfamilyco.ltd@gmail.com
<b>Contact Phone No.</b>	09764724859





**Figure 2.1 Organization Chart of Yangon JR Family Limited**

### 2.2.1. Purpose of the Project

The project proponent is Yangon JR Family Limited with 100% foreign investment. Yangon is a preferred destination for various business which may require construction for infrastructure development. Therefore, steel industry is experiencing tremendous growth due to mushrooming of those construction activities. The major aim of this project is to set up a steel plant considering a demand of every need in the construction industry at internationally competitive prices. With the aim of manufacturing, the company expects not only to provide quality of steel bars but also to create a technical transfer employment opportunity for local residents. The investment amount for proposed project is 4.95 million dollars (in USD).

### 2.2.2. Production Capacity

Rebar production sizes from the company are 10 mm, 12 mm, 16 mm, 18 mm, 20 mm, 25 mm, and 32 mm respectively. The production per annual is approximately 60,000 metric tons.

## 2.3. Study Team for Environmental and Social Studies

The first stage of the EIA process is a scoping study of scoping report preparation with an emphasis on public involvement and desktop study based on secondary data. Initial site visit for scoping stage of proposed steel mill was carried out on 20<sup>th</sup> July, 2018. The purposed of site visit was

- to catch up the project team with the project proposal,
- to familiarize with affected project area, and
- to begin the environmental and social screening and scoping process.

The baseline surveys for environmental quality were conducted on 30<sup>th</sup> and 31<sup>st</sup> August, 2018 for wet season and 5<sup>th</sup> and 6<sup>th</sup> November, 2018 for dry season. E Guard Environmental Services

Co., Ltd. started the EIA report preparation on August, 2018 in line with Myanmar Environmental Conservation Law and Regulation for Production and Marketing of TMT Rebar project. The members of the EIA team are listed in **Table 2-2** indicating their ECD Registration No. and the contact address are shown as follows:

**Table 2-2 EIA Study Team and their Responsibility**

No.	Name	Position	Transitional Consultant Registration Numbers	Role
	E Guard Environmental Services	EIA Organization	0028	
1	U Tin Aung Moe	Project Leader	10103	Overall responsibility for EIA Project Report Preparation
2	Daw Yadanar Swam Htet Kyaw	Team Leader	00224	Natural Resources Management Impact Identification and Analysis Risk Assessment Social Analysis and Assessment Soil conservation
3	U Aye Thiha	Team Member	10067	Health Impact Assessment
4	U Kaung Htet Swan	Co-Team Leader	00302	Air pollution Control, Water Pollution Control
5	Dr. Shwe Sin Ko Ko	Team Member	0000101	Air quality, Waste management and Water pollution control
6	U Si Thu Aung	Team Member	00261	Water pollution control
7	Daw May Pwint Phoo	Team Member	00369	Solid Waste Management
8	U Aung Moe Oo	Team Member	00336	Noise and vibration
9	Daw May Thu Win	Team Member	00380	Laws and Legislation
10	Daw Kyawt Kay Paing	Team Member	-	Disaster risk and management
11	Daw Nway Phyu Pyar Oo	Team Member	-	Solid waste management Social Survey, Data entry, Assist for

				Database requirements
12	Daw Ei Ei Phyo	Team Member	-	Social Survey, Data entry, Assist for Database requirements
13	Daw Haymarn Thae Pwint Phyu	Team Member	-	General environmental management
14	Daw Chan Myae Hnin	Team Member		Electrical engineering Noise and vibration
15	U Nay Oo Lwin	Team Member	-	Materials & Metallurgy
16	U Myo Win	Surveyor	-	Field Surveyor for Environmental Quality Data

### 2.3.1. Study Team for Environmental and Social Experts

E Guard Environmental Services prepared this EIA report with the following study team members.

#### **U Tin Aung Moe (Director)**

U Tin Aung Moe is a Director who holds Transitional Consultant Certificate No 0103; described expertise is Facilitation of meeting, Land use, Risk Assessment and Hazard Management, RS and GIS. He is one of the founding members of E Guard. He has been working for Environmental Assessment and Environmental Technologies development and capacity building for the Developing countries in Asia and Pacific Region. He is responsible for the policy and institutional linkages and harmonization of E Guard.

#### **Daw Yadanar Swam Htet Kyaw (Senior Consultant)**

Ms. Yadanar Swam Htet Kyaw is a Senior Consultant, who received Bachelor of Agricultural Science from Yezin Agricultural University in 2014. She also received Master of Science in Natural Resources Management from Asian Institute of Technology, Thailand in 2017. She has experience in environmental fields spanning almost eight years including her master degree thesis, “Villagers’ Assessment of the Impacts of Eucalyptus Plantations in the Mandalay Region of Myanmar”. She is also familiar with conducting reconnaissance surveys, socio-economic surveys and environmental assessment. Furthermore, she got Diploma in Remote Sensing and Geographical Information System from Dagon University and also experienced in carrying out the project paper of “Assessment of Traffic Noise Pollution on Pyay Road from Haldan Junction to 8-Mile Junction. She is familiar with not only conducting reconnaissance surveys and socio-economic surveys but also environmental impact assessment and

environmental management plan on livestock and aquaculture projects. Her responsibilities include project management and compilation of the report for the project.

### **U Aye Thiha (Managing Director)**

Since E Guard was formed, U Aye Thiha has been working for the company as Managing Director. He obtained his Bachelor Degree from University of Yezin in 1995. Furthermore, he got his Natural Resources Management Master Degree from Asia Institute of Technology in 2001. He was also awarded Master of Business of Administration from Yangon University of Economic in 2018. He also got a Diploma in Computer Science from the University of Yangon. He has a broad range of experiences in managing and implementing numerous projects (including local and foreign funded infrastructure development as well as investment projects). At E Guard, he is responsible for cost estimation, contracting, staff recruitment, etc.

### **U Kaung Htet Swan (Consultant)**

U Kaung Htet Swan is a Consultant, who holds Master of Engineering with specializing in Environmental Engineering and Management from Asian Institute of Technology, Bangkok in 2018 and Bachelor of Engineering with specializing in Mechanical Engineering from West Yangon Technological University in 2016. He has experiences in air pollution control management, air quality modeling, environmental risk assessment, planning the environmental management plans and systems, occupational health safety and environment, mechanical engineering and interpretation. His responsibilities are concerning with project management and compilation of the report for the project, including public and stakeholder's consultation.

### **Dr. Shwe Sin Ko Ko (Principal Consultant)**

Daw Shwe Sin Ko Ko is a Principal Consultant working on EIA project reporting in E Guard Environmental Services Co., Ltd. since 2016. She received Bachelor of Civil Engineering from Taunggyi Technological University in 2011 and Master of Engineering in (International Graduate Program in Environmental and Water Resources Engineering) from Mahidol University, Thailand in 2016. She had experiences in environmental fields for 9 years including her master degree research, "Study of Dissolved Oxygen Dynamics in the Cha-Am Municipality Wastewater Treatment Ponds System Using Mathematical Modeling and GIS". Her master thesis paper was presented in 49th Computational Hydraulics International (CHI) Conference, Toronto, Canada. April 2014. She has completed her Ph.D. (International Graduate Program in Environmental and Water Resources Engineering) from Mahidol University, Thailand in 2022. Her research is Mathematical Modeling of Air Pollution resulting from Proposed Yangon Outer Ring Road Construction (Eastern Section) in Myanmar. Her research was presented in the 10th International Conference on Environmental Engineering, Science and Management, and published in Engineering Access Journal and Environment and Natural Resources Journal (EnNJR). She had worked as a site engineer at IDEAL Construction Group, Taunggyi, and Southern Shan State from October 2012 to April 2014. She has been involved in Hydropower Projects Studies and Impact Assessment for those projects. She will take responsibilities as main consultant in the Nam Lin Hydropower project (especially in

environmental quality study, impacts assessment, mitigation measures and management plan conducting) and report preparation.

#### **U Si Thu Aung (Consultant)**

U Si Thu Aung is a Consultant at E Guard Environmental Services Co. Ltd. He gained his Civil Engineering Degree from Thanlyin Technological University in 2014. He also pursued his Master Degree in Environmental Engineering at Yangon Technological University in 2018 while he started his career with E-Guard. He is also a Registered Engineer (Water Supply and Sanitation) at Myanmar Engineering Council and holding Transitional Consultant Registration Certificate No. 00261 with Water Pollution Control and Facilitation of Meeting expertise from Environmental Conservation Department. Through his time at E-Guard, he has been involved in the preparation of ESIA, related reports and in negotiation with relevant stakeholders such as Report Writing, Stakeholders Engagement, Secondary Data Collection, Site Investigation, Impact Assessment, Mitigation Measures and Environmental Management Plan, etc. He has worked in Myanmar EIA Field and in a range of different local and international projects about five years. His quest for seeking out new sources and making friends for data collection led to him assist his primary works and provide information to the organization and colleagues. Currently he is working in the organization as a motivated and collaborative team player.

#### **Daw May Pwint Phoo (Associate Consultant)**

Daw May Pwint Phoo is an Associate Consultant, who had her Engineering Bachelor Degree in Civil at West Yangon Technology University, Yangon, Myanmar and Master Degree in Urban Environmental Management from Asian institute of Technology University, Bangkok, Thailand. She is currently working as an associate consultant at E Guard Environmental Services Co., Ltd. She had experience in working as project leader in Elite petrochemical project and Myanmar Shwe Nagar Fertilizers production and distribution project. She prepared for requirements of the contents of the report related to waste management and hazardous waste management.

#### **U Aung Moe Oo (Assistant Consultant)**

U Aung Moe Oo is an Assistant Consultant, who received his Bachelor Degree in Chemical Engineering from Technological University in 2016. He has almost six years-experiences in monitoring the environmental quality, writing the environmental quality reports and project monitoring reports including Japan's ODA Loan Project. He also takes part in ISO document controlling of Environmental Quality Team. In this project, he assisted in data collection (air, noise and water), data computing, analyzing and environmental quality reporting.

#### **Daw May Thu Win (Assistant Consultant)**

Daw May Thu Win is working as an Assistant Consultant in E-Guard Environmental Services Co., Ltd. She obtained her bachelor's degree in Law from East Yangon University (Tarwa) in 2018. She is currently assisting in preparing Laws, Rules, Regulations, Policies, Directions and Notifications used for environmental reports, public consultations and information gathering processes. As a legal expert, she has the responsibility of Legal study and analysis of this



project. She will mainly contribute to the Policy, Legal and Institutional Framework Chapter of this EIA study.

**Daw Kyawt Kay Paing (Assistant Consultant)**

Daw Kyawt Kay Paing is an Assistant Consultant, who holds Master of Science degree in Climate Change and Sustainable Development from Asian Institute of Technology, Thailand in July 2023. She received her bachelor's degree in forestry from the University of Forestry and Environmental Sciences in November 2016. She also received a Post Graduate Diploma in Geographic Information System from Dagon University in December 2019. She has almost four years of experience in reviewing and commenting of Environmental Management plan reports, one year of experience in the preparation of Environmental Management Plan and Initial Environmental Examination reports for various development projects and one year of experience in Climate and Hydrological Modeling and climate change impact assessment on hydrology and hydropower projects. As a member of this EIA study, Daw Kyawt Kay Paing has taken the responsibility of climate change impact assessment on project construction and operation, elaborating climate mitigation measures, and report writing and report preparation for climate adaptation and mitigation sub-plan.

**Daw Nway Phyu Pyar Oo (Project Assistant)**

Daw Nway Phyu Pyar Oo is a Project Assistant, who received her Bachelor Degree in Chemical Engineering from West Yangon Technological University in 2018. She did research paper in her Bachelor Degree thesis, "Preparation of Pectin from Pomelo Rinds". She has experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. She also participates in the activities of social survey, data entry and public hearing of the projects.

**Daw Ei Ei Phyoe (Project Assistant)**

Daw Ei Ei Phyoe is a Project Assistant, who received Bachelor of Civil Engineering from Technological University (Taunggyi) in 2018. Now, she is working as a Project Assistant in E Guard Environmental Services. She has experience in environmental fields based on University Project show and graduation thesis. She had various national trainings concerning with the Environmental Engineering, Science and Management.

**Daw Haymarn Thae Pwint Phyu (Project Assistant)**

Daw Haymarn Thae Pwint Phyu has been working as a Project Assistant in E Guard Environmental Services. She obtained her Bachelor Degree in Civil Engineering from Technological University (Hmawbi) in the year 2019. She did her Bachelor Degree's thesis in "Production of Coconut (coir) Cement Ceiling Board from Coconut Waste". She also participated in the project of "Problems and Solutions of Traffic Congestion at Junction". Furthermore, she employed as a Site Engineer in construction for 2 years. Her responsibilities are monitoring labor forces and work progress according to schedule. She also has drafting skills with AutoCAD, familiar with site inspection works. Moreover, she also attended quantity surveying course that helps to know better about cost estimation, claims within construction

projects. Her contribution to the projects in E Guard Environmental Services is being part of assisting in environmental reporting works.

**Daw Chan Myaie Hnin (Project Assistant)**

Daw Chan Myaie Hnin has been working as a Project Assistant in E Guard Environmental Services. She graduated with a Bachelor of Engineering in Electrical Engineering from West Yangon Technological University, 2014. She worked as QS Engineer, Electrical Design Engineer and Electrical Design Consultant in M&E construction field for Golden Empire Hotel Project, Summit Park View Hotel Extension Project, Metro Star II Thilawa Project, PTTEP Office Building Project, Yangon Complex Project, Land Mark Project and Tourist Burma Building Project in Yangon Region within last 4 years. Her contribution to the projects in E Guard Environmental Services is being part of the environmental assistant work.

**U Nay Oo Lwin (Project Assistant)**

U Nay Oo Lwin is a Project Assistant who holds a Bachelor Degree of Materials & Metallurgy Engineering from University of Technology Yatanarpon Cyber City in 2018 and has been working in E Guard Environmental Services Co, Ltd. He performed a research paper in making Rose Gold Metal for his Bachelor Degree's Thesis. He also got certificate in wastewater and water management system from S.I.T.E in 2019. He contributed in reporting and revising comment reply for environmental projects. He also participated in site visit and SHM meeting for the projects.

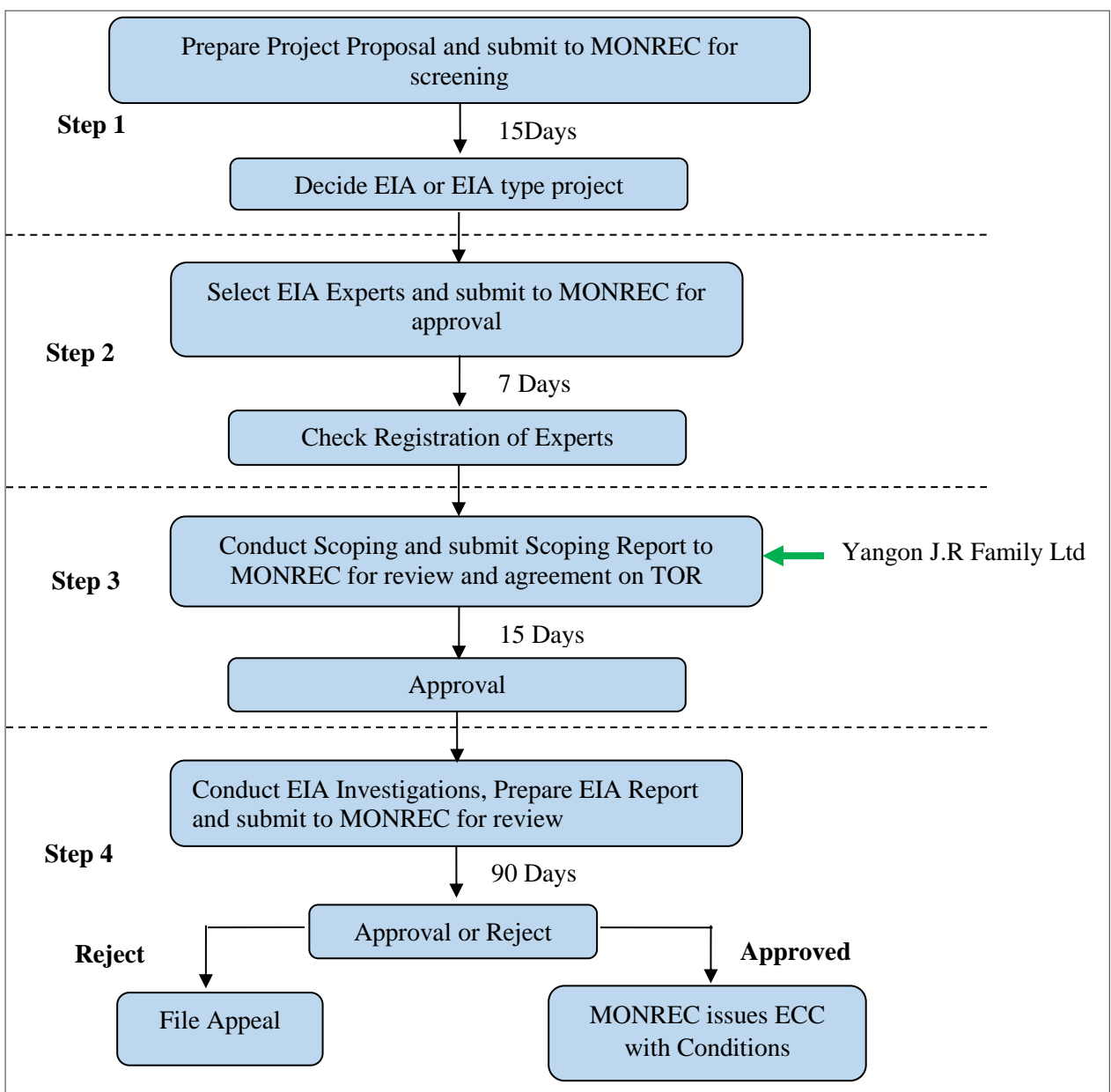
**U Myo Win (Surveyor)**

U Myo Win specializes in instrumentation and field data collection of environmental condition of the site and measuring of environmental baseline data.

The objectives of the EIA study according to EIA Procedure (2015) are as follow:

- To determine the potential impacts between the proposed project and key environmental receptors
- To identify the baseline environmental data in order to monitor the changes that have taken place during the project life cycle
- To identify and evaluate the potential environmental impacts
- To recommended mitigation measures in order to reduce or remove potential adverse impacts
- To prepare an Environmental Management Plan (EMP) for proper implementation of the project

The EIA process is explained in the diagram below **Figure 2.2**.



**Figure 2.2 Environmental Impact Assessment Process**

### 3. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This section reviews the relevant policies, national laws, regulations, legislations and institutional framework of Myanmar, National Environmental Quality (Emission) Guidelines, International standards, guidelines, and agreements relevant in the context of environmental and socio-economic aspect of the project. The project proponent understood and should compile in accordance with the followings:

#### 3.1. Overview of Myanmar Regulatory Framework

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

- (1) Ministry of Natural Resources and Environmental Conservation (MONREC)
- (2) The Environmental Conservation Department (ECD)
- (3) Ministry of Health (MOH)
- (4) Ministry of Labor (MOL)
- (5) Ministry of Investment and Foreign Economic Relations
- (6) Ministry of Electricity
- (7) Ministry of Energy
- (8) Ministry of Industry
- (9) Yangon City Development Committee

Every citizen has the duty to assist the Union carrying out the environmental conservation under sub-section (b) of section 390 of **The Constitution of the Republic of the Union of Myanmar (2008)**.

For this project, the following laws are related to Environment-

- National Environmental Policy of Myanmar (2019)
- National Land Use Policy (2016)
- The Environmental Conservation Law (2012)
- The Environmental Conservation Rules (2014)
- The Environmental Impact Assessment Procedure (2015)
- National Environmental Quality (Emission) Guidelines (2015)

For Insurance,

- The Myanmar Investment Law (2016)
- The Myanmar Investment Rules (2017)
- The Myanmar Insurance Law (1993)

For Health,

- Prevention of Hazard from Chemical and Related Substances Law (2013)
- The Public Health Law (1972)
- The Prevention and Control of Communicable Diseases Law (2011)
- The Control of Smoking and Consumption of Tobacco Product Law (2006)

In Construction phase, the occupational health and safety is essential.

- The Occupational Health and Safety Law (2019)

Other necessary laws for this project-

- The Vehicle Safety and Motor Vehicle Management Law (2020)



- The Vehicle Safety and Motor Vehicle Management Rules (2022)
- The Electricity Law (2014)
- Natural Disaster Management Law (2013)
- The Myanmar Fire Brigade Law (2015)
- The Myanmar Engineering Council Law (2022)
- The Industrial Explosive Materials Law (2018)
- The Myanmar Companies Law (2017)

Implementation of this project, the following laws are required for labors-

- The Labor Organization Law (2011)
- The Settlement of Labor Dispute Law (2012)
- The Employment and Skill Development Law (2013)
- The Minimum Wage Law (2013)
- Payment of Wages Law (2016)
- Workmen's Compensation Act (1923)
- The Leaves and Holidays Act (1951)
- The Social Security Law (2012)

The following Laws are applicable for this project-

#### Resource Conservation

- The Conservation of Water Resources and Rivers Law (2006)
- The Conservation of Water Resources and Rivers Rules (2013)
- The Forest Law (2018)

#### Cultural Heritages

- The Protection and Preservation of Cultural Heritage Regions Law (2019)
- The Protection and Preservation of Antique Objects Law (2015)
- The Protection and Preservation of Ancient Monuments Law (2015)
- The Ethnic Rights Protection Law (2015)
- The Ethnic Rights Protection Rules (2019)
- The Petroleum and Product of Petroleum Law (2017)
- The Petroleum Rules (1937)
- The Industrial Zone Law (2020)
- The Private Industrial Enterprise Law (1990)

#### **1. The Constitution of the Republic of the Union of Myanmar (2008)**

- The Union shall protect and conserve natural environment under section-45 of said law.
- Every citizen has the duty to assist the Union carrying out the environmental conservation under sub-section (b) of section 390 of said law.

#### **2. National Environmental Policy of Myanmar (2019)**

- **Mission:** To achieve a clean environment, with healthy and functioning ecosystems, that ensures inclusive development and wellbeing for all people in Myanmar.
- **Vision:** To establish national environmental policy principles for guiding environmental protection and sustainable development and for mainstreaming environmental considerations into all policies, laws, regulations, plans, strategies, programs and projects in Myanmar.

#### **3. National Land Use Policy (2016)**

#### **Objectives:**

- To promote sustainable land use management and protection of cultural heritage areas, environment, and natural resources in the interest of all people in the country;
- To strengthen land tenure security for the livelihood's improvement and food security of all people in both urban and rural areas of the country;
- To recognize and protect customary land tenure rights and procedures of the ethnic nationalities;
- To develop transparent, fair, affordable and independent dispute resolution mechanisms in accordance with the rule of law;
- To promote people centered development in land resources and accountable land use administration in order to support the equitable economic development of the country;
- To develop a National Land Law in order to implement the above objectives of the National Land Use Policy.

#### **4. The Environmental Conservation Law (2012)**

Objectives: To construct a healthy and clean environment and to conserve natural and cultural heritage for the benefit of present and future generations; to maintain the sustainable development through effective management of natural resources and to enable to promote international, regional and bilateral cooperation in the matters of environmental conservation.

- The project proponent has to pay the compensation for damages if the project will cause injuries to environment under sub-section (o) of section 7 of said law.
- The project proponent has to purify, emit, dispose and keep the polluted materials in line with the stipulated standards under section 14 of said law.
- The project proponent has to install or use the apparatus which can control or help to reduce, manage, control or monitor the impacts on the environment under section 15 of said law.
- The project proponent has to allow relevant governmental organization or department to inspect whether performing is conformity with the terms and condition included in prior permission, stipulated by the ministry, or not under section-24 of said law.
- The project proponent has to comply with the terms and conditions included in prior permission under section 25 of said law.
- The project proponent has to abide by the stipulations included in the rules, regulation, by-law, order, notification and procedure under section 29 of said law.

#### **5. The Environmental Conservation Rules (2014)**

- The project proponent has to avoid emit, discharge or dispose the materials which can pollute to environment, or hazardous waste or hazardous material prescribed by notification in the place where directly or indirectly injure to public under sub-rule (a) of rule 69 of said law.
- The project proponent has to avoid performing to damage to ecosystem and the environment generated by said ecosystem under sub-rule (b) of rule 69 of said law.

#### **6. The Environmental Impact Assessment Procedure (2015)**

- The project proponent has to be liable for all adverse impacts caused by doing or omitting of project owner or contractor, sub-contractor, officer, employee,

representative or consultant who is appointed or hired to perform on behalf of project owner under sub-paragraph (a) of paragraph 102 of said law.

- The project proponent has to support, after consultation with effected persons by project, relevant government organization, government department and other related persons, to resettlement and rehabilitation for livelihood until the effected persons by the project receiving the stable socio-economy which is not lower than the status in pre-project under sub-paragraph (b) of paragraph 102 of said law.
- The project proponent has to fully implement all commitments of project and conditions included in EMP. Moreover, the project proponent has to be liable for contractor and sub-contractor who perform on behalf of him/her have to fully abide by the relevant laws, rules, this procedure, EMP and all conditions under paragraph 103 of said law.
- The project proponent has to be liable and fully & effectively implement all requirements included in ECC, relevant laws and rules, this procedure and standards under paragraph 104 of said law.
- The project proponent has to inform the completed information, after specifying the adverse impacts caused by the project, from time to time under paragraph 105 of said law.
- The project proponent has to continuously monitor all adverse impacts in the pre-construction phrase, construction phrase, operation phrase, suspension phrase, closure phrase and post-closure phrase, moreover has to implement the EMP with abiding the all conditions included in ECC, relevant laws & rules and this procedure under paragraph 106 of said law.
- The project proponent has to submit, as soon as possible, the failures of his or her responsibility, other implementation, ECC or EMP. If dangerous impact caused by this failure or failure should be known by the Ministry the project proponent has to submit within 24 hours and other than this situation has to submit within 7 days from knowing it under paragraph 107 of said law.
- The project proponent has to submit the monitoring report dually or prescribed time by Ministry in line with the schedule of EMP under paragraph 108 of said law.
- The project proponent has to prepare the monitoring report under paragraph 109 of said law.
- The project proponent has to show this monitoring report in public place such as library, hall and website and office of project for the purpose to know this report by public within 10 days from the date which the report is submitted to the Ministry. Moreover, has to give the copy of this report, by email or other way which way agreed with the asked person, to any asked person or organization under paragraph 110 of said law.
- The project proponent has to allow inspector to enter and inspect in working time and if it is needed by Ministry has to allow inspector to enter and inspect in the office and work-place of project and other work-place related to this project in any time under paragraph 113 of said law.
- The project proponent has to allow inspector to immediately enter and inspect in any time if it is emergency or failure to implement the requirements related to social or environment or caused to it under paragraph 115 of said law.

- The project proponent has to allow inspector to inspect the contractor and sub-contractor who implement on behalf of project under paragraph 117 of said law.

#### **7. National Environmental Quality (Emission) Guidelines (2015)**

Objectives: The project proponent has to emit, discharge or dispose in line with the standards stipulated in said guideline.

#### **8. The Myanmar Investment Law (2016)**

Objectives: To ensure the appointing of employees, fulfilling the rights of employees, avoiding any injury to environment, social and cultural heritage, insure the prescribed insurance in line with the above law.

- The project proponent has to submit a proposal to the Commission and invest after receiving the Permit under section 36 of said law.
- The project proponent has not to invest in prohibited investment under section 41 of said law.
- The project proponent has to register the land lease contract at Registration of Deeds Office in accordance with the Registration of Deeds Law under sub – section (d) of section 50 of said law.
- The project proponent has to appoint a qualified person of any citizenship in the investor's investment within the Union as senior manager, technical and operational expert, and advisor in accordance with applicable laws under sub -section (a) of section 51 of said law.
- The project proponent has to appoint the nationalities in the various levels of administrative, technical and expert work by the arrangement to develop their expertise under sub- section (b) of section 51 of said law.
- The project proponent has to appoint the nationalities only in normal work without expertise under sub – section (c) of section 51 of said law.
- The project proponent has to appoint either foreigner or nationality with the appointment agreement in accord with the law under sub – section (d) of section 51 of said law.
- The project proponent has to ensure the entitlements and rights contained in applicable labor laws and rules including minimum wages and salary, leave, holiday, overtime fee, damages, workman's compensation, social welfare and other insurance relating to workers by stipulating the rights and duties of employers and employees and other employment terms and conditions contained in the employment contract under sub – section (e) of section 51 of said law.
- The project proponent has to settle disputes arising amongst employers, amongst workers, between employers and workers, between workers and technicians or staff in accordance with applicable laws under sub – section (f) of section 51 of said law.
- The project proponent has to respect and comply with the customs, traditions and culture of the national races in the Union under sub – section (a) of section 65 of said law.
- The project proponent has to establish and register a company or sole proprietorship or legal entities or branches under the applicable laws in order to invest under sub – section (b) of section 65 of said law.

- The project proponent has to abide by the rules and stipulations of special licenses, permits and business operation certificates issued to them including the rules, procedures, notifications, orders and directives issued under applicable laws and this law, terms and conditions of contract and tax obligations under sub – section (c) of section 65 of said law.
- The project proponent has to carry out in accordance with the stipulations of department concerned if it is required by the nature of business or other need to obtain any license or permit from the relevant Union Ministries, government bodies and organizations, or to carry out registration under sub – section (d) of section 65 of said law.
- The project proponent has to immediate inform to the Commission if natural mineral resources or antique objects and treasure trove, which are not related to the permitted business and not included in original contracts, are found above and under the land on which the investor is entitled to lease or use under sub – section (e) of section 65 of said law.
- The project proponent has not made any significant alteration of topography or elevation of the land on which he is entitled to lease or has rights to use, without the approval of the Commission under sub – section (f) of section 65 of said law.
- The project proponent has to comply with the international best practices, existing laws, rules and procedures to not damage, pollute, and injure to environment, cultural heritage and social under sub – section (g) of section 65 of said law.
- The project proponent has to prepare and keep proper records of books of account and annual financial statement, and necessary financial matters relating to the investments which are performed by permit or endorsement in accordance with internationally and locally recognized accounting standards under sub – section (h) of section 65 of said law.
- The project proponent has to close the project after paying the compensation to the employees in accord with the existing laws if violates the appointment agreement or terminate, transfer or suspend the investment or reduce the number of employees under sub – section (i) of section 65 of said law.
- The project proponent has to pay the wages or salary to the employees in accord with the laws, rules, order and procedures in the suspension period under sub – section (j) of section 65 of said law.
- The project proponent has to pay the compensation or injured fees to the respected employees or their inheritors if injury in or loss of part of body or death caused by work under sub – section (k) of section 65 of said law.
- The project proponent has to stipulate the foreign employees to respect the culture and custom and abide by the existing laws, rules, orders, and directives under sub – section (l) of section 65 of said law.
- The project proponent has to abide by labor laws under sub – section (m) of section 65 of said law.
- The project proponent has to right to sue and be sued in accordance with laws under sub – section (n) of section 65 of said law.



- The project proponent has to pay the compensation, to the injured person for damages if damage to environment or socio-economy is occurred by misuse of project under sub – section (o) of section 65 of said law.
- The project proponent has to inspect in anywhere of project if Myanmar Investment Commission inform to inspect the project under sub – section (p) of section 65 of said law.
- The project proponent has to obtain the permission of MIC before EIA process and report back this process to Myanmar Investment Commission under sub – section (q) of section 65 of said law.
- The project proponent has to insure the prescribed insurance by rules under section 73 of said law.

#### **9. The Myanmar Investment Rules (2017)**

- The project proponent has to submit confirmation of its compliance with the applicable requirements of the Environmental Conservation Law, rules and environmental impact assessment procedures to undertake, obtain and implement an initial environmental examination, assessment, certificate and management plan as those requirements are met under section 190 of said law.
- The project proponent has to comply with the conditions of the permit issued by MIC and applicable laws when making the investment under section 202 of said law.
- The project proponent has to fully assist while negotiating with the Authority for settling the grievances of the local community that have been affected due to Investments under section 203 of said law.
- If the project proponent is desirous to appoint a foreigner as senior management, technician expert or consultant according to section 51(a) of the Law. The project proponent has to submit such foreigner's passport, expertise evidence or degree and profile to the Commission Office for approval under section 206 of said law.
- The project proponent has to insure the relevant insurance out of the following types of the insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business:
  - (a) Property and Business Interruption Insurance;
  - (b) Engineering Insurance;
  - (c) Professional Liability Insurance;
  - (d) Bodily Injury Insurance;
  - (e) Marine Insurance; or
  - (f) Workmen Compensation Insurance;
  - (g) Life Insurance;
  - (h) Fire Insurance. Under section 212 of said law.

#### **10. The Myanmar Insurance Law (1993)**

Objectives: The project can cause the damages to the environment and injuries to public so to ensure the needed insurances are insured at Myanmar Insurance.

- If the project proponent uses the owned vehicles the project owner has to insure the insurance for injured person under section 15 of said law.

- The project proponent has to insure the insurance to compensate for general damages because the project may cause the damages to the environment and injury to public under section 16 of said law.

### **11. Prevention of Hazard from Chemical and Related Substances Law (2013)**

Objectives: To ensure to use the hazardous chemical and related substances safely and safety for the employees. Moreover, safety in carrying the hazardous chemical and related substances and storage place of it. If it is needed to train how to use the safety dresses which provided to the employees with free of charges. Insure to compensate for injury to person or damage to environment. The project has to be inspected for safety use of hazardous chemical and related substances before starting the project.

- The project owner has to be inspected for the safety and resistance of the machinery and equipment by the respective Supervisory Board and Board of Inspection before starting the business under sub section (a) of section 15 of said law.
- The project owner has to assign the employees, who will serve with the hazardous chemical and substances, to attend the trainings on prevention of hazardous chemical and substances in local or abroad under sub section (b) of section 15 of said law.
- The project owner has to abide by the conditions included in the license under sub section (a) of section 16 of said law.
- The project owner has to abide by and assign to the employees who serve in this work to abide by the instructions for safety in using the hazardous chemical and related substances under sub section (b) of section 16 of said law.
- The project owner has to arrange the enough safety equipment in the work-place and provide the safety dresses to the employees who serve in this work with free of charge under sub-section (c) of section 16 of said law.
- The project owner has to train, in work-place my arrangement, the know-how to use the occupational safety equipment, personal protection equipment and safety dresses systemically in the work-place under sub section (d) of section 16 of said law.
- The project owner has to allow the receptive Supervisory Board and Board of Inspection to inspect whether the hazard may be injured to health of human or animal or damaged to environment under sub section (e) of section 16 of said law.
- The project owner has to assign the healthy employees who have obtained the recommendation that is fit for this work after taken medical check- up and keep systematically the medical records of employees under sub section (f) of section 16 of said law.
- The project owner has to inform the copy of storage permission for hazardous chemical and related substances to the relevant township administrative office under sub section (g) of section 16 of said law.
- The project owner has to obtain the approval with instructions of relevant fire force before starting the work if the project will use the fire hazard substances or explosive substances sub section (h) of section 16 of said law.
- The project owner has to transport only the limited amount of the chemical and related substance in accord with the prescribed stipulations in local transportation under sub section (i) of section 16 of said law.

- The project proponent has to take the permission from the Central Supervisory Board if the chemical and related substance is altered and transferred from one place to any other place which contained in the license under sub – section (j) section 16 of said law.
- The project owner has to insure, in accord with the stipulations, to pay the compensation if the project cause injury to person or animals or damage to environment under section 17 of said law.
- The project owner has to abide by the conditions included in the registration certificate. Moreover, will abide by the orders and directives issued by the Central Supervisory Board from time to time under section 22 of said law.
- The project owner has to classify the level of hazard to protect it in advance according to the properties of chemical and related substances under sub section (a) of section 27 of said law.
- The project proponent has to express the Material Safety Data Sheet and Pictogram under sub – section (b) of section 27 of said law.
- The project owner has to provide the safety equipment, personal protection equipment to protect and reduce the accident and assign to attend the training to use the equipment systematically under sub section (c) of section 27 of said law.
- The project proponent has to perform in accordance with the stipulations in respect of transporting, possessing, storing, using, discharging the chemical and related substances under sub – section (d) of section 27 of said law.

#### **12. The Public Health Law (1972)**

Objectives: To ensure the public health include not only employees but also resident people and cooperation with the authorized person or organization of health department.

- The project proponent has to abide by any instruction or stipulation for public health under section 3 of said law.
- The project proponent has to allow any inspection, anytime, anywhere, if necessary, under section 5 of said law.

#### **13. The Prevention and Control of Communicable Diseases Law (2011)**

Objectives: To ensure the healthy work environment and prevention the communicable diseases by the cooperation with the relevant health department.

The project proponent has to build the housing in line with the health standards, distribute the healthful drinking water & using water and arrange to systematically discharge the garbage & sewage under clause (9) of sub section (a) of section 3 of said law.

The project proponent has to abide by any instruction or stipulation by Department of health and Ministry of Health under section 4 of said law.

The project proponent has to inform promptly to the nearest health department or hospital if the following are occurred: under section 9 of said law.

- (a) Mass death of animals included in birds or chicken;
- (b) Mass death of mouse;
- (c) Suspense of occurring of communicable disease or occurring of communicable disease;
- (d) Occurring of communicable disease which must be informed.

The project proponent has to allow any inspection, anytime, anywhere if it is need to inspect by health officer under section 11 of said law.

**14. The Control of Smoking and Consumption of Tobacco Product Law (2006)**

Objectives: To ensure the creation of smoking area and non-smoking area in the power plant area for health and control of smoking.

- The project proponent has to keep the caption and mark referring that is non- smoking area in the project area under sub section (a) of section 9 of said law.
- The project proponent has to arrange the specific place for smoking in the project area and keep the caption and mark in accordance with the stipulations under sub section (b) of section 9 of said law.
- The project proponent has to supervise and carry out the measures so that no one shall smoke at the non-smoking area under sub section (c) of section 9 of said law.
- The project proponent has to allow the inspection of supervisory body in the power plant area sub section (d) of section 9 of said law.

**15. The Occupational Health and Safety Law (2019)**

Objectives: To effectively implement measures related to safety and health in every industry and to set occupational safety and health standards.

- The project proponent has to-
  - a) Appoint a person in-charge for occupational safety and health according to the type of industries to closely supervise the safety and health of the workers in accordance with the specifications of the Ministry.
  - b) Establish each occupational Safety and Health Committee comprising equal number of employers and workers' representatives according to the types of industry without lessening the number of workers prescribed by the Ministry to be safe and healthy workplace, in accordance with the specifications of the Ministry. In establishing the Committee, occupational safety and health matters for female workers shall be considered according to the nature of work under sub – section (a) and (b) of section 12 of said law.
- The project proponent has to comply with this Law and rules, orders, directives and procedures issued under this Law to be safe and healthy workplace under section 14 of said law.
- The inspectors shall inspect the workplace under this Law for occupational safety and health, instruct the respective employer on the facts to be observed, and report to the chief inspector under section 16 of said law.
- For the purposes of occupational safety and health in line with the code of conduct, inspectors are entitled to;
  - a) Enter, inspect and examine any workplace applicable to this Law without a warrant by showing their identity cards at any time;
  - b) Inspect and copy all records, books and documents relating to the workplace and process, and seize any of them as exhibits, if necessary;
  - c) Take photographs and video records of the workplace situations and processes which may be harmful to the occupational safety and health;
  - d) Assess and record the amount of impact and time on the workplace environment, due to noise, illumination, temperature, dust, fume and hazardous materials, with the assistance of an expert on the respective subjects, if necessary;

- e) Inquire any person working at the workplace during working hours about contracting occupational diseases or potential situations with the assistance of a certified doctor;
- f) Ask the responsible person from hospitals and medical clinics to confidentially send the medical report of a worker who is receiving medical treatment for injuring in a workplace accident or suffering from an occupational disease or information about death or the autopsy report requested with the form prescribed by the Department under section 17 of said law.
- The inspectors shall issue a temporary order to the employer for work stoppage partially or wholly with the approval of the chief inspector and inform the relevant departments, if necessary, if any occupational accident, disease, dangerous occurrence or major accident happens or is likely to happen due to any of the following facts;
  - a) Impropropriety to work continuously due to the unsafe workplace conditions, unsafe acts of workers, the existence of hazardous material and machinery at the workplace, or parts of machinery or laying out of machinery at the workplace and working practices;
  - b) Impropropriety to work continuously due to violation of or failure to comply with any provision of this Law;
  - c) Assumption to be harmful to workers at the workplace due to any act of negligence and carelessness or omission by any person;
  - d) Necessity to evacuate workers for safety due to the imminent danger situation of the occupational injury under section 18 of said law.
- The project proponent has to provide adequate and relevant personal protective equipment to workers free of charge and make them wear it during work so as not to expose workers to any serious occupational diseases or hazards under sub section (e) of section 26 of said law.
- The project proponent has to arrange and display occupational safety and health instructions, warning signs, notices, posters, and signboards under sub section (l) of section 26 of said law.
- The worker shall wear or use at all times any protective clothes, equipment and tools provided by the employer for the purpose of safety and health under sub section (a) of section 30 of said law.
- The worker shall proper and systematic use any equipment and tools, machines, any parts of the machines, vehicles, electricity and other substances being used at the workplace under sub section (d) of section 30 of said law.
- The worker shall take reasonable care for the safety and health of himself/ herself and of other persons who may be affected by his/ her acts or omissions at work under sub section (e) of section 30 of said law.



**16. The Vehicle Safety and Motor Vehicle Management Law (2020)**

Objectives: When the construction period and if necessary, in operation and production period for the all vehicles.

- The project proponent has to comply with the restrictions and restrictions on the use of domestic vehicles by the Ministry of Transport and Communications with the approval of the Union Government under sub section (a) of section 9 of said law.
- The project proponent has to comply with safety, environmental regulation, standards and regulations regarding the initial registration of vehicles issued by the Ministry under sub section (c) of section 12 of said law.
- The project proponent has to drive at the speed limit set by the Road Transport Directorate to ensure the safe movement of vehicles on public roads under sub section (r) of section 14 of said law.
- The project proponent has to maintain the vehicles in accordance with the standards set by the Department so that it can be driven safely under sub section (a) of section 18 of said law.
- The project proponent has not to carry or transport hazardous materials in public places in accordance with the regulations under sub section (g) of section 81 of said law.

**17. The Vehicle Safety and Motor Vehicle Management Rules (2022)**

- The project proponent has to comply with the Commercial Vehicle Regulations in Chapter (9) and the Motor Vehicle Traffic Regulations in Chapter (10).

**18. The Electricity Law (2014)**

- Objectives: To ensure the compliance with the conditions of permission for productions of electricity, abiding by any stipulation, implementing with the best practices and paying compensation in line with above law. It stipulated the following obligations of the project proponent.
- The project proponent has to implement the project with the best practices to reduce the damages on the environment, health and socio-economy, also will pay compensation for the damages and will pay the fund for environmental conservation under sub section (b) of section 10 of said law.
- The project proponent has to take the certificate of electric safety, issued by the chief-inspector, before the commencement of power generation under section 18 of said law.
- The project proponent has to abide by the rules, regulations, bye-laws, notifications, orders, directives and procedures issued by the Ministry in carrying out the electrical business contained in the permit under section 20 of said law.
- The project proponent has to be liable for damages to any person or enterprise by failure to abide by the quality standards or rules, regulation, by-law, order and directive issued under said law under sub section (a) of section 21 of said law.
- The project proponent has to be liable for damages to any person or enterprise by negligence of project owner under sub section (a) of section 22 of said law.
- The project proponent has to pay if damages or losses arise to any other electric power user or any electrical business due to negligence of any electric power user, the calculated compensation in accord with the method prescribed by the Ministry for the value of damage or loss under section 24 of said law.

- The project proponent has to comply with the permission for electric searching and generation under sub section (a) and (b) of section 26 of said law.
- The project proponent has to inform promptly to chief-inspector and head officer of related office while occurring of accident in electricity generation under section 27 of said law.
- The project proponent has to comply with the standards, rules and procedure. Moreover, will allow the inspection by respected governmental department and organization if it is necessary under section 40 of said law.
- The project proponent has to pay the compensation to anyone who is injured or caused to death in electric shock or fire caused by the negligence or omitting of the project owner or representative of project owner under section 68 of said law.

### **19. Natural Disaster Management Law (2013)**

Objectives: To implement natural disaster management programs and to coordinate with national and international organizations in carrying out natural disaster management activities; to conserve and restore the environment affected by natural disaster and to provide health, education, social and livelihood programs in order to bring about better living conditions for victims;

- The project proponent has to perform preparatory and preventive measures for natural disaster risks reduction before the natural disaster strikes under sub section (a) (i) of section 13 of said law.
- The project proponent has to undertake rehabilitation and reconstruction activities for improving better living standard after the natural disaster strikes and conservation of the environment that has been affected by natural disaster under sub section (a)(iii) of section 13 of said law.
- The project proponent has to carry out better improvement on early warning system of natural disaster under sub section (b) of section 14 of said law.
- The project proponent has to carry out together with the measures of natural disaster risk reduction in development plans of the State under sub section (d) of section 14 of said law.
- Whoever if the natural disaster causes or is likely to be caused by any negligent act without examination or by willful action which is known that a disaster is likely to strike, shall be punished with imprisonment for a term not exceeding three years and may also be liable to fine under section 25 of said law.
- Whoever interferes, prevents, prohibits, assaults or coerces the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding two years or with fine or with both under section 26 of said law.
- Whoever violates any prohibition contained in rules, notifications and orders issued under this law shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both under section 29 of said law.
- Whoever willful failure to comply with any of the directives of the department, organization or person assigned by this law to perform any natural disaster management shall, on conviction, be punished with imprisonment for a term not exceeding one year or with fine or with both under sub section (a) of section 30 of said law.

**20. The Myanmar Fire Brigade Law (2015)**

Objectives: To ensure to prevent the fire, to provide the precautionary material and apparatuses, if the fire caused in the project area to be defeated because the project is business in which electricity and any inflammable materials such as petroleum are used. So, the project owner has to institute the specific fire service in line with the above law.

- The project proponent has to institute the specific fire services under sub section (a) of section 25 of said law.
- The project owner has to provide materials and apparatuses for fire precaution and prevention under sub section (b) of section 25 of said law.

**21. The Myanmar Engineering Council Law (2022)**

Objectives; To ensure the safety in technical and engineering work in the project. This law focuses the following;

- The project proponent has to ensure the employees who are engineers abide to the provisions of Myanmar Engineering Council law, prohibitions included in the rules, order and directive issued under said law, conditions included in the registration certificate issued by the Myanmar engineering council, under section 34 of said law.
- The project proponent has to appoint the employees, who obtained the registration certificate issued by the Myanmar Engineering Council, in the technical and engineering work, under section 37 of said law.

**22. The Industrial Explosive Materials Law (2018)**

Objectives;

- (a) To manufacture, import, transfer, store and use industrial explosive materials systematically;
- (b) To be safe and secure at work places where dynamite and related substances are used;
- (c) To supervise manufacture and use of industrial explosive materials systematically.

On receipt of the direction from the Ministry under sub – section (b),

The project proponent has not refused inspection of the Chief Inspector or and inspector under section 8 of said law.

The project proponent, in an unlicensed magazine, has to

- Accept to store industrial explosive materials;
- Deliver to store industrial explosive materials under section 16 of said law.

The project has to-

- (a) Store industrial explosive materials only in the licensed magazine;
- (b) Take necessary preventive measures in accord with the specifications to avoid harm in transport, manufacture, use or possession of industrial explosive materials
- The project proponent has not refused inspection of the Chief Inspector or and inspector under section 18 of said law.

The project proponent has to-

- (a) Import, transport, store, manufacture, use, possess or transfer industrial explosive materials without permission in accordance with this law;
- (b) Destroy industrial explosive materials without approval of the Executive Committee of Defense Service Council
- (c) Fail to act in accordance with the rules, regulations, by-laws, notifications, orders and directives issued under section 19 of said law.

The project proponent has not to

- Accept to store industrial explosive materials more than the limited amount mentioned in the license issued by the Ministry;
- Fail to inform the nearest police station immediately and to report the Chief Inspector timely if anything mentioned in sub-section (c) of section 15 occurs due to industrial explosive materials;
- Continue to store industrial explosive materials without renewal after expiration of the license under section 21 of said law.

### **23. The Myanmar Companies Law (2017)**

Essential Requirements of Companies are as follows,

- A company registered under the Myanmar Companies Law shall have the following facts: under section-4, sub-section (a) of said law.
  - a) a name;
  - b) a constitution
  - c) at least one share in issue (provided that a company limited by guarantee need not have a share capital)
  - d) at least one member
  - e) subject to sub-section (vi), at least one director who shall be ordinarily resident in the Union;
  - f) if the company is a public company, at least three directors, one of whom shall be a Myanmar citizen who is ordinarily resident in the Union; and
  - g) a registered office address in the Union, under section-4, sub-section (a), sub-section i, ii, iii, iv, v, vi and vii of said law.

Capacity and powers of companies are as follows,

- A company: under section-5, sub-section (a) of said law.
  - (i) will be a legal entity in its own right separate from its members having full rights, powers, and privileges and continuing in existence until it is removed from the register: under section-5, sub-section (a), sub-section (i) of said law.
  - (ii) subject to this law and any other law, has both with other and outside the Union full legal capacity to carry on any business or activity, do any act, or enter into any transaction, including the power to: under section-5, sub-section (a), sub-section (ii) of said law.
    - a) issue shares, debentures or securities which convert into shares in the company; under sub-section (ii), sub-section (aa) of said law.
    - b) grant options to subscribe for shares or debentures in the company: under sub-section (ii), sub-section (bb) of said law.
    - c) grant a security interest over any of its property: under sub-section (ii), sub-section (cc) of said law.
    - d) distribute any of the company's property among the members, in kind or otherwise, under sub-section (ii), sub-section (dd) of said law.
- The constitution of a company may contain a provision relating to the capacity, rights, powers, or privileges of the company only if the capacity of the company or those rights, powers and privileges are restricted, under section-5, sub-section (b) of said law.

- A company may act as a holding company of another company and incorporate and hold shares in any number of subsidiaries, under section-5, sub-section (c) of said law.

#### **24. The Labor Organization Law (2011)**

Objectives: To ensure protection the rights of the employees, having the good relationships between the employees and employer and enabling to form and carry out the labor organizations systematically and independently.

- The project owner has to allow the labor organization to negotiate and settle with the employer if the workers are unable to obtain and enjoy the rights of the workers contained in the labor laws and to submit demands to the employer and claim in accord with the relevant law if the agreement cannot be reached under section 17 of said law.
- The project proponent has to allow the demand for the re-appointment of worker who is dismissed by the employer without the conformity with the labor laws under section 18 of said law.
- The project proponent has to send the representatives to the Conciliation Body in settling a dispute between the employer and the worker under section 19 of said law.
- The project proponent has to allow the labor organization to participate and discuss in discussing with the government, the employer and the complaining employees in respect of employee's rights or interest contained in the labor laws under section 20 of said law.
- The project proponent has to allow the labor organization to participate in solving the collective bargains of the employees in accord with the labor laws under section 21 of said law.
- The project proponent has to allow the labor organization to carry out the holding the meetings, going on strike and other collective activities in line with the procedure, regulation, by-law and directive of relevant Chief Labor Organization under section 22 of said law.

#### **25. The Settlement of Labor Dispute Law (2012)**

Objectives: To ensure negotiation and discussion between employees and project proponent, abiding the decision of Tribunal.

- The project proponent has to not absent to negotiation within the stipulated time for complaint under section 38 of said law.
- The project proponent has to not change the existing stipulations for employees within conducting period before tribunal under section 39 of said law.
- The project proponent has to not close the work without negotiation, discussion on dispute in accord with this law, decision by tribunal under section 40 of said law.
- The project proponent has to pay the compensation decided by Tribunal if violates any act or any omission to damage the interest of labor by reducing of product without efficient cause under section 51 of said law.

#### **26. The Employment and Skill Development Law (2013)**

Objectives: To ensure the job security and to develop the employee's skill with the fund of project owner.

- The project proponent has to appoint employees with the contract under section 5 of said law.



- The project proponent has to carry out the training programs with the policy of Skill Development Body to develop the employment skill of employees who is appointed or will be appointed under section 14 of said law.
- The project proponent has to monthly pay to the fund, which is fund for development of skill of employees, not less below 0.5 percentage of the total payment to the level of worker supervisor and the workers below such level under sub section (a) of section 30 of said law.
- The project proponent has to promise not to deduct from the payment of employees for above mentioned fund under sub section (b) of section 30 of said law.

## **27. The Minimum Wage Law (2013)**

Objectives: To ensure the project owner pay the wages not less than prescribed wages and notify obviously these wages in work place, moreover to be inspected.

The project proponent hasn't to pay wage to the worker less than the minimum wage stipulated under this Law.

The project proponent has to pay more than the minimum wage stipulated under this Law.

The project proponent hasn't not had 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.

The project proponent has to pay the minimum wage to the workers working in the commerce, production business and service in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash in accord with the stipulations or jointly in some cash and in some produce prescribed in local price according to the desire of the worker. The project proponent has to pay jointly in some cash and some produce prescribed in local price according to the local custom or desire of the majority of workers or collective agreement in paying the minimum wage to the workers and working in the agriculture and livestock breeding business. 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 under section 12 of said law.

- The project proponent has to notify the prescribed wages obviously in work place under sub section (a) of section 13 of said law.
- The project proponent has to correctly record the lists, schedules, documents and wages and report these to the relevant department and give if these are asked while inspecting, in accord with the stipulations under sub section (b)(c)(d) of section 13 of said law.
- The project proponent has to allow to be inspected by the inspector under sub section (d) and (e) of section 13 and section 18 of said law.
- The project proponent has to allow holiday for medical treatment if the employee's health is not fit to work under sub section (f) of section 13 of said law.
- The project proponent has to allow holidays without deducting from the wages if one of parents or one of family dies under sub section (g) of section 13 of said law.

**28. The Payment of Wages Law (2016)**

Objectives: To ensure the way of payment and avoiding delay payment to the employees.

- The project proponent has to pay the wages under section 3 and 4 of said law.
- The project proponent has to submit with the agreements of employees & reasonable ground to department if it is difficult to pay because of force majeure included in natural disaster under section 5 of said law.
- The project proponent has to abide by the provisions of section 7 to 13 in chapter (3) in respect of deduction from wages under section 7 to 13 in chapter (3) of said law.
- The project proponent has to pay the overtime fees, prescribed by law, to the employees who work over working hours under section 14 of said law.

**29. Workmen's Compensation Act (1923)**

Objectives: To ensure the compensations to injured employee while implementing in line with the above law and to pay the prescribed compensations in various kinds of injury.

- The project proponent has to pay the compensation in line with the provisions of said law base on kind of injury and case by case under section 13 of said law.

**30. The Leaves and Holiday Act (1951)**

Objectives: The employees can take the leaves and get the holidays legally and to ensure the right to get the holidays and leaves.

- The project proponent has to allow the leaves and holidays in line with the law.

**31. The Social Security Law (2012)**

Objectives: The project proponent has to create the social security for the employees because the project is the business under the Myanmar Citizen Investment Law. To ensure the social security for employees of the project, the project owner has to register to the social security offices and to pay the prescribed fund.

- The project proponent has to register to the respected social security office under sub section (a) of section 11 of said law.
- The project proponent has to pay the social security fund for at least four types of social security included in sub-section (a) of section 15 under section 15 of said law.
- The project proponent has to pay the fund which has to be paid myself and together with the fund which has to be paid from their salary by the employees. Moreover, the project owner will pay the cost for paying the above-mentioned fund only myself under sub section (b) of section 18 of said law.
- The project proponent has to pay the fund for accident sub section (b) of section 48 of said law.
- The project proponent has to make correctly and submit the list and record provided in section 75 to respected social security office under section 75 of said law.

**32. The Conservation of Water Resources and Rivers Law (2006)**

Objectives: The project proponent will avoid the disposal of stipulated materials into river-creek.

- The project proponent has to avoid any act to damage to the river, any creek and water resource under sub section (a) of section 8 of said law.
- The project proponent has to avoid disposing the fuel, chemicals, toxic substances, other substances and explosive substances from the bank to the river under sub section (a) of section 11 of said law.

- The project proponent has to avoid disposing any material, which may damage or change the water way, from the bank to the river under section 19 of said law.
- The project proponent has to avoid constructing the toilets, which are not suitable, at the bank under sub section (a) of section 21 of said law.
- The project proponent has to avoid digging the well or lake and digging the soil without permission of the Directorate under sub section (b) of section 21 of said law.
- The project proponent has to avoid putting the heavy materials in the bank without permission of the Directorate under section 22 of said law.
- The project proponent has to avoid the violation of conditions stipulated by the Directorate for prevention of water pollution under sub section (b) of section 24 of said law.

### **33. The Conservation of Water Resources and Rivers Rules (2013)**

Objectives; To ensure the project scope and project period are submitted to the department and the permission is given before commencing the construction of the project. This law focuses as follows;

- If the project proponent has to build a river-crossing bridge or stream-crossing bridge alongside within the stream territory, river bank territory and strand territory as necessity, present the project scope and project period to the Ministry of Transport and request the agreement contract, in line with the section (20) of said law.
- After reviewing the request form in accordance with section 20 and if there is no possible impact on conservation of water resources and rivers, the Ministry of Transport shall define the regulations and give the permission of constructing stream-crossing bridges and river-crossing bridges, in line with the section (21) of said law.
- If the permission is given according with section 21, the project proponent has to submit the project scope and monitoring service charges to the department for the construction of the river-crossing bridges and stream-crossing bridges, in line with the section (22) of said law.

### **34. The Forest Law (2018)**

Objectives: to ensure in carrying out the project with the permission of Ministry of Natural Resources and Environmental Conservation if the project land is forest land or forest covered land. This law focuses as follow;

- The project proponent has to obtain the permission of Ministry of Natural Resources and Environmental Conservation before starting the work if the project land is forest land or forest covered under sub- section (a) of section 12

### **35. The Protection and Preservation of Cultural Heritage Regions Law (2019)**

Objectives: To ensure the protection of cultural heritages and the cultural heritage area from the damage by the natural disaster or man-made.

- The project proponent has to apply to get the prior permission of Directorate of Ancient-Research to build the road, bridge or dam in the cultural heritage area under section 13 of said law.
- When the project proponent wants to carry out any of the following undertakings shall adhere to the provisions of the existing laws.
- The project proponent has to apply to the Region or State Preservation Committee if it is within the world heritage region or national level cultural heritage region, and apply

to the Regional Preservation Committee if it is within the respective cultural heritage region apart from the world heritage region or national level cultural heritage region for obtaining the prior permission that there is no impact on cultural heritages in accordance with the stipulations;

In the buffer area;

- a) Constructing roads, renovating and extending wharfs, parking lots, rail tracks, railway station, stadium, sports grounds, buildings and bridges;
  - b) Conducting and erecting pylons, underground works, underground electric power lines, high voltage power lines, transformer stations, lamp posts and gas pipelines;
  - c) Arranging the flights of helicopter, hot air balloons and gliders;
  - d) Constructing theatres such as the entertainment building, accommodation facilities, recreation centers, riding and race camps and infrastructures under sub – section (b) section 21 of said law.
- The project proponent promises not to build the building which is not in line with the stipulations prescribed by the Ministry of Culture in the cultural heritage area under section 22 of said law.

### **36. The Protection and Preservation of Antique Objects Law (2015)**

Objectives: To ensure the protection of ancient monument and information about it if it was in the project area. This law focuses as follow;

- The project proponent has to inform to the village-tract or ward administrator if any antique objective is found in project area under section 12 of said law.

### **37. The Protection and Preservation of Ancient Monuments Law (2015)**

Objectives: To ensure the protection of ancient monument and information about it if it was in the project area. This law focuses as follows;

- The project proponent has to report to the village-tract or ward administrators if the project proponent will find any ancient monument under the ground or on the ground or under the water under section 12 of said law.
- The project proponent has to obtain the prior permission of Department of Ancient Research Museum if the project area is in the prescribed area of ancient monument under section 15 of said law.
- The project proponent has to obtain the prior permission, by written, of Department of Ancient Research and National Museum if the project proponent disposes the chemical and solid waste in the Ancient Monument area under sub section (f) of section 20 of said law.

### **38. The Ethnic Rights Protection Law (2015)**

Objectives: To ensure to disclose to residents' ethnic nationalities about the project fully, moreover to ensure to cooperate with them. This law focuses the following matters;

- The project proponent has to disclose all about the project fully to the residents who are national races.
- The project proponent has to cooperate with the residents who are national races according to section 5 of said law.

### **39. The Ethnic Rights Protection Rules (2019)**

- The project proponent has to compliance with rule 20 shall be reported to the Ministry in full and submitted to the ministry before the project commences under sub-section (a) of section 21 of said law.
- After the implementation of the project, the plan must be submitted to the ministry under sub-section (b) of section 21 of said law.

#### **40. The Petroleum and Petroleum Product Law (2017)**

Objectives; This law is holding license for import and storage of petroleum and petroleum products, and the holder's compliance with the license terms. This law is applicable to the project because of the transportation and storage of fuel in all project phases. The obligations of the project proponent are;

- To transport the fuel by the vehicle or vessel which is licensed by the Ministry of Transportation and Communication under sub-section (a) of section 9;
- To abide by the procedures and conditions specified by the Ministry of Transportation and Communication under sub-section (e) of section 9;
- To transport after obtaining the transportation license issued by the Ministry of Natural Resource and Environmental Conservation under sub-section (b) of section 10;
- To allow inspection by the Ministry of Natural Resource and Environmental Conservation under sub-section (d) of section 10;
- To store the fuel in the tank which is licensed by the Ministry of Natural Resource and Environmental Conservation under sub-section (a) of section 10; and
- To show the sign of danger on the tank or container of fuel under section 11.

#### **41. The Petroleum Rules (1937)**

The purpose of the Rules is to ensure the project owner's compliance with the stipulations for transportation of oil. The project proponent has to abide by the provisions of chapter (3) for transportation as well as the provisions of chapter (4) for storage.

#### **42. The Industrial Zone Law (2020)**

- The project proponent has to obtain the approval of the Central Committee through the Regional Committee for the investment proposal in carrying out investment activities under section 23 of said law.
- The project proponent has to manufacture of finished goods, manufacture of related products, manufacture of packaging and value-added products under section 24 of said law.
- The project proponent has to apply to the Regional Committee through the Management Committee for obtaining the investment enterprise license under section 25 of said law.
- The project proponent has to register in accordance with the existing laws in the relevant departments under section 27 of said law.
- The project proponent has to abide by the standardization contained in the Environmental Conservation Law and carry out not to affect the occupational safety and health in accordance with the existing laws under section 28 of said law.
- If the project proponent wants to start, close or liquidate his or her enterprises, the project proponent has to notify the relevant departments and management committee in advance and carry out it in accordance with the stipulations under section 29 of said law.



- When the project proponent transfers the whole or part of shares of his or her enterprise, company or organization, the project proponent has to notify the relevant departments and the Management committee, and carry out it in accordance with the existing laws under section 30 of said law.
- The project proponent has to submit the appointment status of the local and foreign staff to the Management Committee under section 31 of said law.
- The project proponent has to use the permitted land in accordance with the prescribed conditions under section 34 of said law.
- The project proponent has to report immediately to the Management Committee if the natural mineral resources or antiques or treasure not related to the permitted investment enterprises which are not included in the original contract are found above or under the permitted land. If the Management Committee submits it to the Nay Pyi Taw Council, the relevant Region or State Government and obtains the permission, the investor or developer may continue to operate on such land. If the permission is not obtained, the project proponent has to move it to the area arranged by the Regional Committee under section 35 of said law.
- The project proponent has to carry out the environmental conservation in accordance with the existing laws in establishing the industrial zone or operating the industrial enterprises under section 37 of said law.
- The project proponent has to make the necessary systems and construction to be used jointly for conserving and cleaning the waste of industrial enterprises and disposing of waste safely in the new industrial zone under section 38 of said law.
- The project proponent has to carry out the Pollution Control Management and Energy Management in accordance with the procedures issued by the relevant Ministries under section 39 of said law.
- The project proponent has to incur the reasonable rate specified by the Management committee for expenditures of storage, treatment and safe disposal of waste by the collective system in the industrial zone according to the amount of waste generated under section 41 of said law.

#### **43. The Private Industrial Enterprise Law (1990)**

- The duties and powers of the Supervisory Body are as follows-
  - a) Supervising to ensure the compliance by the entrepreneurs in the conducting of the industrial enterprises in accordance with the basic principles;
  - b) Giving opinion for the determination of industrial areas and for the granting of lease of land for the private industrial enterprises under sub-section (d) of section 11 of said law.
- The project proponent has to maintain systematically and fully as prescribed by the Directorate, the statement of accounts relating to the registered private industrial enterprise and has to submit the same to the relevant Government department, organization or Supervisory Body when required to do so under sub-section (f) of section 11 of said law.
- The project proponent has to abide by the existing laws under sub-section (d) of section 13 of said law.

- The project proponent has not to violate any provision of section 13 under sub-section (h) of section 13 of said law.
- The project proponent has not failed to comply with any order or decision passed by the Minister and the Director General under sub-section (b) and (c) of section 27 of said law.

### 3.2. Applicating of International and Domestic Guidelines

The ultimate EIA report will be prepared based on the Myanmar Environmental Impact Assessment Procedure (2015) and International best practice and guidelines. Specifically, the environmental impact assessment for this “PRODUCTION AND MARKETING OF TMT REBARS” shall be conducted following not only the National Environmental Guidelines but also International Guidelines and Practices such as WHO standards, IFC performance indicators. The international guidelines are as follows;

- Environmental Health and Safety Guidelines for Hazardous Materials Management
- Environmental Health and Safety Guidelines for General Environmental, Health and Safety Guidelines
- Environmental Health and Safety Guidelines for Occupational, Health and Safety
- Environmental Health and Safety Guidelines for Integrated Steel Mills

In addition, IFC performance standard (PS) represent the policy and performance-based framework and requirements for the ESIA and sustainable social and environmental management for the project. Whereas the World Bank Group’s EHS Guidelines provide guidance on general and industry best practice as well as recommended numerical limits for air emissions to the atmosphere, noise, liquid and solid wastes, hazardous waste, occupational health and safety, and other aspects of industrial facilities and other types of development project. The IFC performance standard (PS) includes:

- PS 1 Assessment and Management of Environmental and Social Risks and Impacts
- PS 2 Labor and Working Conditions
- PS 3 Resource Efficiency and Pollution Prevention
- PS 4 Community Health, Safety and Security
- PS 5 Land Acquisition and Involuntary Resettlement
- PS 6 Biodiversity Conservation and Sustainable Management of Natural Resources
- PS 7 Indigenous Peoples
- PS 8 Cultural Heritage

**Table 3-1 International Conventions of relevance to Project**

Legislation	Relevance to the Project	Ratification Status (in Myanmar)
<b>Environmental</b>		
Vienna Convention for the Protection of the Ozone Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer 1989	Not relevant to the Project as the Project will not use any ozone depleting substances.	Accession 16 <sup>th</sup> Sep 1998 (Vienna) & Accession 24 <sup>th</sup> Nov 1993 (Montreal)

Legislation	Relevance to the Project	Ratification Status (in Myanmar)
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	The Project may generate hazardous wastes.	Entered into force 6 <sup>th</sup> April 2015
United Nations Framework Convention on Climate Change 1992 (UNFCCC) and Kyoto Protocol 1997	The project will form part of Myanmar's total emissions output.	Entered in for 23 <sup>rd</sup> Feb 1995 (UNFCCC) and 16 <sup>th</sup> Feb 2005 (Kyoto Protocol)
United Nations Agenda 21	Not relevant to Project. Relevant to the government.	Since 1997

**Table 3-2 List of Commitments**

Particulars	Heading Number	Description of commitment	Chapter Number
Executive summary	1	Project location and description, descriptions and purpose of EIA process and baseline information, environmental impacts, cumulative impact assessment, applicable laws and environmental management plan are briefly described in this report.	1
Project proponent description	2.2	The contents of project proponent description are exact and correct.	2
Study Team for Preparation of EIA	2.3	The information of Third-party organization and responsible people are exactly stated.	2
Policy, legal and institutional framework and commitments	3.1, 3.2	Law, legislation, policy, framework, standards, guidelines and commitments and laws by project proponent stated in the report shall be followed.	3
Project description	4.1, 4.2, 4.3, 4.4	In this report, project background and its investment plan, location, site layout maps, project history and construction schedule, project description and factory layout plan of project area are exact and correct.	4
	4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11	Raw materials and their availability, the conditions for water consumption and fuel requirement, electricity consumption, manpower requirement, production process of TMT rebars and process flow chart, treatment scheme to induction furnace, disposal methods of sewage and solid waste, list of equipment and machineries, and condition of alternative selection are exactly described.	4

Particulars	Heading Number	Description of commitment	Chapter Number
Study on surrounding environment and socio-economic condition	5.1, 5.2, 5.3	Ambient air quality, water quality, noise and vibration, soil quality are measured to know environmental quality of the current project and compared with national environmental quality emissions guidelines and descriptions for rainfall, temperature, wind speed data and wind direction, topography of Hmawbi Township, regional, and structural and economic geology and earthquake intensity are exactly described.	5
	5.4, 5.5, 5.6	The regional information of this project for socio-economic resources such as population and communities, religion, races and ethnic minority, educational, employment status and health information are referenced and stated from Hmawbi Township profile and primary data by E guard study team, infrastructure facilities and cultural condition are exactly described.	5
Impact Assessment and Mitigation Measures	6.2	This chapter describes the potential impacts on the environment of the study area and socioeconomic impacts during construction, operation and decommissioning phases.	6
	6.3	Yangon JR certainly commits that the described mitigation measures for avoiding and reducing the potential environmental and socioeconomic impacts during construction, operation and decommissioning phases.	6
Cumulative Impact Assessment	7.2	Yangon JR commits to collaborate with other project owners within 500m AOI of the proposed project to implement of the related mitigation measures to maintain the existing environment.	7
Environmental management plan and environmental management method	8.3	Yangon JR should comply with existing environment policy, laws, rules, procedures and emission standards of the Republic of the Union of Myanmar. This chapter describes the potential source of impact and the mitigation measures to reduce the effects caused by operation project.	8
	8.4	Yangon JR commits the environmental monitoring plan that has included the measurement parameter, method, area and	8

Particulars	Heading Number	Description of commitment	Chapter Number
		frequency during the operation phase as the following; <ul style="list-style-type: none"> <li>• Air Quality</li> <li>• Water Quality</li> <li>• Soil Quality</li> <li>• Noise Pollution</li> <li>• Solid Waste</li> <li>• Occupational Health and Safety</li> </ul> Environmental monitoring plan that has included the measurement parameter, method, area and frequency during decommissioning phase as the following; <ul style="list-style-type: none"> <li>• Air Quality</li> <li>• Waste Water Quality</li> <li>• Solid Waste</li> <li>• Socio-economic aspects</li> <li>• Noise Pollution</li> </ul>	
	8.5	Yangon JR commits the following emergency response plan; <ul style="list-style-type: none"> <li>• Fire Emergency Response Plan</li> <li>• Medical Emergency Response Plan</li> <li>• Risk Management Plan</li> </ul> Estimated budget for the implementation of the mitigation measures and monitoring plan for the project are described in <b>Table 8-7</b> . Yangon JR commits to follow the measures of Grievance Redress Mechanism to solve the complaint from the project affected persons or stakeholder.	8
	8.6	Yangon JR commits to follow the emergency preparedness plan to reduce serious injury or loss of life and extensive damage that the employee touch with excessive heat for melting, casting and reheating processes.	8
	8.7	Yangon JR has a plan to implement and donate two percent of the profit (2%) per year for Corporate Social Responsibility (CSR) and Employee Welfare Arrangement.	8
Public Consultation	9.1, 9.2, 9.3	Description of necessity of SHM, place of public consultation ceremony, date and time, number of people who attended and subjects	9



Particulars	Heading Number	Description of commitment	Chapter Number
		which were discussed are strongly committed correct.	
Conclusion	10.1, 10.2	Description of EIA report along with Environmental Management Plan for production and marketing of TMT rebars and its activities during EIA report study are briefly described and committed correct. The effective implementation of the proposed mitigation measures and recommendation for future works will ensure towards good environmental management within the project area.	10

The following commitments for environmental and social components, which are outlines in this report, are made by Yangon JR Family Limited.

**Table 3-3 Commitments for Production and Marketing of TMT Rebar Established by Yangon JR Family Limited**

Heading		Commitment
Policy, Legal and Institutional Framework		
Laws and Regulations	Relevant Articles	Commitment
<b>The Environmental Conservation Rules (2014)</b>	Rule 69 (a)	Project Proponent commits to- <ul style="list-style-type: none"> <li>Avoid emit, discharge or dispose the materials which can pollute to environment, or hazardous waste or hazardous material prescribed by notification in the place where directly or indirectly injure too public</li> <li>Avoid performing to damage to ecosystem and the environment generated by said ecosystem</li> </ul>
	Rule 69 (b)	
<b>The Ethnic Rights Protection Law (2015)</b>	Section 5	To ensure to disclose to residents' ethnic nationalities about the project fully, moreover to ensure to cooperate with them. This law focuses the following matters; <ul style="list-style-type: none"> <li>The project proponent has to disclose all about the project fully to the residents who are national races.</li> <li>The project proponent has to cooperate with the residents who are national races.</li> </ul>
	Sub-section (a) of section 21	
<b>The Ethnic Rights Protection Rules (2019)</b>	Sub-section (b) of section 21	<ul style="list-style-type: none"> <li>The project proponent has to compliance with rule 20 shall be reported to the Ministry in full and submitted to the ministry before the project commences</li> <li>After the implementation of the project, the plan must be submitted to the ministry</li> </ul>
	Objectives	
<b>The Vehicle Safety and Motor Vehicle Management Law (2020)</b>	Sub-section (a) of Section 9	When the construction period and if necessary, in operation and production period for the all vehicles. The project proponent has to- <ul style="list-style-type: none"> <li>Comply with the restrictions and restrictions on the use of domestic vehicles by the Ministry of Transport and Communications with the approval of the Union Government</li> </ul>

Heading	Commitment	
	Sub-section (c) of Section 12  Sub-section (r) of Section 14  Sub-section (a) of section 18  Sub-section (g) of section 81	<ul style="list-style-type: none"> <li>• Comply with safety, environmental regulation, standards and regulations regarding the initial registration of vehicles issued by the Ministry</li> <li>• Drive at the speed limit set by the Road Transport Directorate to ensure the safe movement of vehicles on public roads</li> <li>• Maintain the vehicles in accordance with the standards set by the Department so that it can be driven safely</li> <li>• Not to carry or transport hazardous materials in public places in accordance with the regulations</li> </ul>
<b>The Vehicle Safety and Motor Vehicle Management Rules (2022)</b>	Chapter 9 and 10	The project proponent has to comply with the Commercial Vehicle Regulations in Chapter (9) and the Motor Vehicle Traffic Regulations in Chapter (10).
<b>The Conservation of Water Resources and Rivers Law (2006)</b>	Objectives  Sub-section (a) of section 8 Sub-section (a) of section 11  Section 19  Sub-section (a, b) of section 21  Section 22  Sub-section (b) of section 24	The project proponent has to avoid the disposal of stipulated materials into river-creek. The project proponent commits to- <ul style="list-style-type: none"> <li>• Avoid any act to damage to the river, any creek and water resource</li> <li>• Avoid disposing the fuel, chemicals, toxic substances, other substances and explosive substances from the bank to the river</li> <li>• Avoid disposing any material, which may damage or change the water way, from the bank to the river</li> <li>• Avoid digging the well or lake and digging the soil without permission of the Directorate</li> <li>• Avoid putting the heavy materials in the bank without permission of the Directorate</li> <li>• Avoid the violation of conditions stipulated by the Directorate for prevention of water pollution</li> </ul>
<b>The Conservation of Water Resources and Rivers Rules (2020)</b>	Objectives	To ensure the project scope and project period are submitted to the department and the permission is given before commencing the construction of the project. This law focuses as follows;

Heading	Commitment	
	Section 20  Section 21  Section 22	<ul style="list-style-type: none"> <li>• If the project proponent has to build a river-crossing bridge or stream-crossing bridge alongside within the stream territory, river bank territory and strand territory as necessity, present the project scope and project period to the Ministry of Transport and request the agreement contract, in line with the section (20) of said law.</li> <li>• After reviewing the request form in accordance with section 20 and if there is no possible impact on conservation of water resources and rivers, the Ministry of Transport shall define the regulations and give the permission of constructing stream-crossing bridges and river-crossing bridges, in line with the section (21) of said law.</li> <li>• If the permission is given according with section 21, the project proponent has to submit the project scope and monitoring service charges to the department for the construction of the river-crossing bridges and stream-crossing bridges, in line with the section (22) of said law.</li> </ul>
<b>The Protection and Preservation of Cultural Heritage Regions Law (2019)</b>	Objectives  Section 13  Section 22	To ensure the protection of cultural heritages and the cultural heritage area from the damage by the natural disaster or man-made. The project proponent commits to- <ul style="list-style-type: none"> <li>• Apply to get the prior permission of Directorate of Ancient-Research to build the road, bridge or dam in the cultural heritage area</li> <li>• Promise not to build the building which is not in line with the stipulations prescribed by the Ministry of Culture in the cultural heritage area</li> </ul>
<b>Prevention of Hazard from Chemical and Related Substances Law (2013)</b>	Objectives  Sub-section (a) of Section 15	To ensure to use the hazardous chemical and related substances safely and safety for the employees. Moreover, safety in carrying the hazardous chemical and related substances and storage place of it. If it is needed to train how to use the safety dresses which provided to the employees with free of charges. Insure to compensate for injury to person or damage to environment. Project owner has to- <ul style="list-style-type: none"> <li>• Be inspected for the safety and resistance of the machinery and equipment by the respective Supervisory Board and Board of Inspection before starting the business</li> </ul>

Heading	Commitment	
	Sub-section (b) of Section 15	<ul style="list-style-type: none"> <li>Assign the employees, who will serve with the hazardous chemical and substances, to attend the trainings on prevention of hazardous chemical and substances in local or abroad</li> </ul>
	Sub-section (a) of Section 16	<ul style="list-style-type: none"> <li>Abide by the conditions included in the license</li> </ul>
	Sub-section (b) of Section 16	<ul style="list-style-type: none"> <li>Abide by and assign to the employees who serve in this work to abide by the instructions for safety in using the hazardous chemical and related substances</li> </ul>
	Sub-section (c) of Section 16	<ul style="list-style-type: none"> <li>Arrange the enough safety equipment in the work-place and provide the safety dresses to the employees who serve in this work with free of charge</li> </ul>
	Sub-section (d) of Section 16	<ul style="list-style-type: none"> <li>Train, in work-place my arrangement, the know-how to use the occupational safety equipment, personal protection equipment and safety dresses systemically in the work-place</li> </ul>
	Sub-section (e) of Section 16	<ul style="list-style-type: none"> <li>Allow the receptive Supervisory Board and Board of Inspection to inspect whether the hazard may be injured to health of human or animal or damaged to environment</li> </ul>
	Sub-section (f) of section 16	<ul style="list-style-type: none"> <li>Assign the healthy employees who have obtained the recommendation that is fit for this work after taken medical check- up and keep systematically the medical records of employees</li> </ul>
	Sub-section (g) of section 16	<ul style="list-style-type: none"> <li>Inform the copy of storage permission for hazardous chemical and related substances to the relevant township administrative office</li> </ul>
	Sub-section (h) of section 16	<ul style="list-style-type: none"> <li>Obtain the approval with instructions of relevant fire force before starting the work if the project will use the fire hazard substances or explosive substances</li> </ul>
	Sub-section (i) of section 16	<ul style="list-style-type: none"> <li>Transport only the limited amount of the chemical and related substance in accord with the prescribed stipulations in local transportation</li> </ul>



Heading	Commitment	
	Section 17  Section 22  Sub-section (a) of section 27  Sub-section (c) of section 27	<ul style="list-style-type: none"> <li>• Insure, in accord with the stipulations, to pay the compensation if the project cause injury to person or animals or damage to environment</li> <li>• Abide by the conditions included in the registration certificate. Moreover, will abide by the orders and directives issued by the Central Supervisory Board from time to time</li> <li>• Classify the level of hazard to protect it in advance according to the properties of chemical and related substances</li> <li>• Provide the safety equipment, personal protection equipment to protect and reduce the accident and assign to attend the training to use the equipment systematically</li> </ul>
<b>The Myanmar Fire Brigade Law (2015)</b>	Objectives    Sub-section (a) of section 25 Sub-section (b) of section 25	<p>To ensure to prevent the fire, to provide the precautionary material and apparatuses, if the fire caused in the project area to be defeated because the project is business in which electricity and any inflammable materials such as petroleum are used. So, the project owner has to institute the specific fire service in line with the above law.</p> <p>The project proponent has to-</p> <ul style="list-style-type: none"> <li>• Institute the specific fire services</li> <li>• Provide materials and apparatuses for fire precaution and prevention</li> </ul>
<b>The Occupational Health and Safety Law (2019)</b>	Section 12	<ul style="list-style-type: none"> <li>• The project proponent has to-</li> <li>a) Appoint a person in-charge for occupational safety and health according to the type of industries to closely supervise the safety and health of the workers in accordance with the specifications of the Ministry;</li> <li>b) Establish each Occupational Safety and Health Committee comprising equal number of employers and worker's representatives according to the types of industry without lessening the number of workers prescribed by the Ministry to be safe and healthy workplace, in accordance with the</li> </ul>

Heading	Commitment	
	Section 14  Section 16  Section 17  Section 18    Section 26  Section 27	<p>specifications of the Ministry. In establishing the Committee, occupational safety and health matters for female workers shall be considered according to the nature of work.</p> <ul style="list-style-type: none"> <li>• The persons in-charge for occupational safety and health has to comply with this law and rules, orders, directives and procedures issued under this law to be safe and healthy workplace.</li> <li>• The inspectors have to inspect the workplace under this law for occupational safety and health, instruct the respective employer on the facts to be observes, and report to the chief inspector.</li> <li>• For the purposes of occupational safety and health in line with the code of conduct, inspectors are entitled to;               <ol style="list-style-type: none"> <li>a) Enter, inspect and examine any workplace applicable to this law without a warrant by showing their identity cards at any time.</li> </ol> </li> <li>• The inspectors have to issue a temporary order to the employer for work stoppage partially or wholly with the approval of the chief inspector and inform the relevant departments, if necessary, if any occupational accident, disease, dangerous occurrence or major accidents happens or is likely to happen due to any of the following facts               <ol style="list-style-type: none"> <li>a) Impropriety to work continuously due to the unsafe workplace conditions, unsafe acts of workers, the existence of hazardous material and machinery at the workplace, or parts of machinery or laying out of machinery at the workplace and working practices.</li> </ol> </li> <li>• The project proponent has to arrange to assess the risk severity of material and machinery used in the workplace and process, if necessary.</li> <li>• The project proponent has not to dismiss or suspend any worker due to one of the following reasons;</li> </ul>

Heading	Commitment	
	Section 34  Section 36	a) Before obtaining the medical report of a registered doctor for being injury in the workplace or the medical report of certified doctor for contracting occupational disease. <ul style="list-style-type: none"> <li>• The project proponent has to inform the Department in case of an occupational accident, dangerous occurrence and major accident.</li> <li>• Inspectors has to investigate the occupational accident, dangerous occurrence, occupational disease and occupational poisoning if they become aware of.</li> </ul>
<b>The Electricity Law (2014)</b>	Section 20  Sub-section (a) of section 21  Section 24  Section 27  Section 29	<ul style="list-style-type: none"> <li>• The project proponent has to abide by the rules, regulations, bye-laws, notifications, orders, directives and procedures issued by the Ministry in carrying out the electrical business contained in the permit under section 20 of said law.</li> <li>• The project proponent has to be liable for damages to any person or enterprise by failure to abide by the quality standards or rules, regulation, by-law, order and directive issued under sub-section (a) of section 21 of said law.</li> <li>• The project proponent has to pay the value of damage or loss, if damages or losses arise to any other electric power user or any electrical business due to negligence of any electric power user, the calculated compensation in accord with the method prescribed by the Ministry under section 24 of said law.</li> <li>• The project proponent has to inform promptly to chief-inspector and head officer of related office while occurring of accident in electricity generation under section 27 of said law.</li> <li>• The Ministry shall inspect the specification of quality and standardizations in respect of the factories, equipment installed to them, business buildings,</li> </ul>

Heading	Commitment	
	Section 33  Section 40  Section 68	<p>and electrical equipment which are manufactured, imported and sold from the local and foreign country under section 29 of said law.</p> <ul style="list-style-type: none"> <li>• The Chief Inspector, Inspectors and persons conferred duty by them have the right to enter and inspect any place or building to perform their duties in accord with stipulations under section 33 of said law.</li> <li>• The project proponent has to comply with the standards, rules and procedure. Moreover, will allow the inspection by respected governmental department and organization if it is necessary under section 40 of said law.</li> <li>• The project proponent has to pay the compensation to anyone who is injured or caused to death in electric shock or fire caused by the negligence or omitting of the project owner or representative of project owner under section 68 of said law.</li> </ul>
<b>The Industrial Zone Law (2020)</b>	Section 23  Section 24  Section 25  Section 27  Section 28  Section 29	<ul style="list-style-type: none"> <li>• The project proponent has to obtain the approval of the Central Committee through the Regional Committee for the investment proposal in carrying out investment activities.</li> <li>• The project proponent has to manufacture of finished goods, manufacture of related products, manufacture of packaging and value-added products.</li> <li>• The project proponent has to apply to the Regional Committee through the Management Committee for obtaining the investment enterprise licence.</li> <li>• The project proponent has to register in accordance with the existing laws in the relevant departments.</li> <li>• The project proponent has to abide by the standardization contained in the Environmental Conservation Law and carry out not to affect the occupational safety and health in accordance with the existing laws.</li> <li>• If the project proponent wants to start, close or liquidate his or her enterprises, the project proponent has to notify the relevant departments</li> </ul>

Heading	Commitment
Section 30	<p>and management committee in advance and carry out it in accordance with the stipulations.</p> <ul style="list-style-type: none"> <li>When the project proponent transfers the whole or part of shares of his or her enterprise, company or organization, the project proponent has to notify the relevant departments and the Management committee, and carry out it in accordance with the existing laws.</li> </ul>
Section 31	<ul style="list-style-type: none"> <li>The project proponent has to submit the appointment status of the local and foreign staff to the Management Committee.</li> </ul>
Section 34	<ul style="list-style-type: none"> <li>The project proponent has to use the permitted land in accordance with the prescribed conditions.</li> </ul>
Section 35	<ul style="list-style-type: none"> <li>The project proponent has to report immediately to the Management Committee if the natural mineral resources or antiques or treasure not related to the permitted investment enterprises which are not included in the original contract are found above or under the permitted land. If the Management Committee submits it to the Nay Pyi Taw Council, the relevant Region or State Government and obtains the permission, the investor or developer may continue to operate on such land. If the permission is not obtained, the project proponent has to move it to the area arranged by the Regional Committee.</li> </ul>
Section 37	<ul style="list-style-type: none"> <li>The project proponent has to carry out the environmental conservation in accordance with the existing laws in establishing the industrial zone or operating the industrial enterprises.</li> </ul>
Section 38	<ul style="list-style-type: none"> <li>The project proponent has to make the necessary systems and construction to be used jointly for conserving and cleaning the waste of industrial enterprises and disposing of waste safely in the new industrial zone.</li> </ul>



Heading	Commitment	
	Section 39	<ul style="list-style-type: none"> <li>The project proponent has to carry out the Pollution Control Management and Energy Management in accordance with the procedures issued by the relevant Ministries.</li> <li>The project proponent has to incur the reasonable rate specified by the Management committee for expenditures of storage, treatment and safe disposal of waste by the collective system in the industrial zone according to the amount of waste generated.</li> </ul>
	Section 41	
<b>The Industrial Explosive Materials Law (2018)</b>	Sub-section (c) of section 6	<ul style="list-style-type: none"> <li>On receipt of the direction from the Ministry under sub-section (b), the Chief Inspector shall notify the applicant to construct a magazine with specified features on the approved plot.</li> <li>If the Office of the Commander-in-Chief (Army) found that the finding and remark of the sub-committee for procurement, provision, storage and distribution of explosives is in conformity with the specifications, the office shall grant permission to the applicant to carry out any one or more of import, transport, store, manufacture, use, process or transfer of industrial explosive materials. A copy of permission shall be sent to the Ministry.</li> <li>When the application for a license under section 10 is received, the Chief Inspector shall inspect whether the magazine is constructed in specified features and               <ul style="list-style-type: none"> <li>a) Grant a license to the applicant with the approval of the Ministry if the magazine is constructed in specified features.</li> </ul> </li> <li>The project proponent has to apply to renew the license, 30 days before expiration to the Chief Inspector in accordance with the stipulations if the project proponent wishes to continue to store industrial explosive materials.</li> </ul>
	Sub-section (c) of section 7	
	Sub-section (b) of section 11	
	Section 13	

Heading	Commitment	
	Sub-section (b) of section 14	<ul style="list-style-type: none"> <li>When the application for renewal of the license under section 13 is received, the Chief Inspector shall inspect the magazine of the applicant and</li> </ul>
	Section 15	<ul style="list-style-type: none"> <li>a) May renew the license with the approval of the Ministry if the magazine is constructed in specified features.</li> </ul>
	Section 16	<ul style="list-style-type: none"> <li>The project proponent has to;               <ul style="list-style-type: none"> <li>a) Systematically store industrial explosive materials without exceeding the permitted amount in accordance with the specifications;</li> <li>b) Accept the inspection of the Chief Inspector or an inspector from time to time;</li> <li>c) If damage to property, injury to or death of people occurs due to loss, burning explosion of industrial explosive materials, the project proponent has to inform about it to the nearest police station immediately, and report it to the Chief Inspector timely;</li> <li>d) Pay license fees stipulated by the Ministry to the Department.</li> </ul> </li> </ul>
	Section 18	<ul style="list-style-type: none"> <li>The project proponent has to-</li> </ul>
	Section 19	<ul style="list-style-type: none"> <li>a) Store industrial explosive materials only in the licensed magazine;</li> <li>b) Take necessary preventive measures in accordance with the specifications to avoid harm in transport, manufacture, use or possession of industrial explosive materials.</li> <li>The project proponent has not to refuse inspection of the Chief Inspector or an inspector.</li> <li>The project proponent has not to -               <ul style="list-style-type: none"> <li>a) Import, transport, store, manufacture, use, possess or transfer industrial explosive materials without permission in accordance with this law;</li> <li>b) Destroy industrial explosive materials without approval of the Executive Committee of Defense Service Council under section 8,</li> </ul> </li> </ul>

Heading	Commitment	
	Section 20  Section 21	c) Fail to act in accordance with the rules, regulations, by-laws, notifications, orders and directives issued under this law.  • The project proponent has not to – a) Accept to store industrial explosive materials; b) Deliver to store industrial explosive materials.  • The project proponent has not to – a) Accept to store industrial explosive materials more than the limited amount mentioned in the license issued by the Ministry; b) Fail to inform the nearest police station immediately and to report the Chief Inspector timely if anything mentioned in sub-section (c) of section 15 occurs due to industrial explosive materials; c) Continue to store industrial explosive materials without renewal after expiration of the license.
<b>The Myanmar Investment Rules (2017)</b>	Rule 212	• The project proponent has to- Insure the relevant insurance out of the following types of the insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business; a) Property and business interruption insurance; b) Engineering insurance; c) Professional liability insurance; d) Bodily injury insurance; e) Marine insurance; or f) Workmen compensation insurance; g) Life insurance; h) Fire insurance;
<b>The Settlement of Labor Dispute Law (2012)</b>	Sub-section (a) of Section 38	• The project proponent has not failed to form the coordinating committee in accordance with the provision contained in section 3. The project

Heading	Commitment	
	Section 43	<p>proponent has not failed to reform the coordination committee within 60 days from the date of conviction by the court due to failure to form it.</p> <ul style="list-style-type: none"> <li>The project proponent has not failed to comply or undertake any condition contained in the agreement concluded before the conciliation body with respect to the dispute.</li> </ul>
<b>The Private Industrial Enterprise Law (1990)</b>	<p>Sub-section (d) of section 11</p> <p>Sub-section (f) of section 11</p> <p>Sub-section (d) of section 13</p> <p>Sub-section (h) of section 13</p> <p>Sub-section (b) and (c) of section 27</p>	<ul style="list-style-type: none"> <li>The duties and powers of the Supervisory Body are as follows-               <ul style="list-style-type: none"> <li>c) Supervising to ensure the compliance by the entrepreneurs in the conducting of the industrial enterprises in accordance with the basic principles;</li> <li>d) Giving opinion for the determination of industrial areas and for the granting of lease of land for the private industrial enterprises.</li> </ul> </li> <li>The project proponent has to maintain systematically and fully as prescribed by the Directorate, the statement of accounts relating to the registered private industrial enterprise and has to submit the same to the relevant Government department, organization or Supervisory Body when required to do so.</li> <li>The project proponent has to abide by the existing laws.</li> <li>The project proponent has not to violate any provision of section 13.</li> <li>The project proponent has not failed to comply with any order or decision passed by the Minister and the Director General.</li> </ul>
<b>The Petroleum Rules (1937)</b>	Purpose	<p>To ensure the project owner's compliance with the stipulations for transportation of oil</p> <ul style="list-style-type: none"> <li>The project proponent commits to-</li> </ul> <p>Abide by the provisions of chapter (3) for transportation as well as the provisions of chapter (4) for storage</p>
<b>Description of the project</b>		

Heading	Commitment	
Location of the project	Yangon JR Company Limited is located on 17°9'23.132"N and 95°58'27.358"E which is at plot No. (340, 343, 338, 345, 339, 344), Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon Region. Hmawbi Township, the location of project area, is located on the northwest of the city of Yangon and bounded by Hlegu Township in the East, Htantabin Township in the West, Mingalardon Township in the South and Taikyi Township in the North and also home to the Myaung Da Gar Steel Industrial Zone (constructed in 2006- 2008) being house all of Yangon’s steel factories.	
Production Process	Yangon JR Company Limited purchases raw materials from local suppliers, Myanmar Economic Corporation (MEC) and domestic suppliers. These scraps would be checked and separated from hazardous material and oil before using raw sources for smelting process. TMT rebars are manufactured by melting steel scraps with sponge iron and other metallic alloy ingredients in electric induction furnace. Pre-tested, sorted mild steel scrap of different varieties will be charged into the Induction Furnace Crucible by charged Electro Magnetic Bucket and will be melted into a liquid form. After de-slagging by tilting Crucible during the process, sponge iron, silico-manganese and ferro silicon shall be added with the temperature involved in the process about 1640°C. The liquid steel thus obtained is casted into required billet sizes through continuous casting machines. Billets from the Continuous Casting Machines will be rolled in a rolling mill to required sizes to meet customers’ needs. The unit will be producing about 80,000 MT of mild steel billets per annum from mild steel scrap of 75,000 TPA and sponge iron of 9,000 TPA. Estimated production capacity per year is 60,000 metric tons (MT) and will be delivered and sold to local market.	
Identification and Assessment of Environmental Impacts and Mitigation Measures		
For Production and Marketing of TMT Rebars project, potential impacts are discussed Chapter (6) widely in terms of production process, resource consumption and sensitivity of surrounding environment. Based on the present environmental status and baseline data, onsite measurement had been done to identify and evaluate the potential impacts on the environment of the study area. Direct and indirect effect on soil, water, air, climate, landscape, human beings of the industrial zone and the interaction among these factors are to be identified and assessed. Socio-economic issues include social impacts such as local economy, employment and livelihood, utilization of local resources, existing social infrastructures and services, local conflicts of interest and working conditions including occupational health and safety.		
Mitigation Measures of Anticipated Impacts for Construction Phase		
Environmental Component	Potential Source of Impact	Mitigation Measures
Impact on Air Quality	➤ Earth moving activities and site preparation	❖ Spraying water to the working ground



Heading	Commitment	
	<ul style="list-style-type: none"> <li>➤ Dust emission from drilling, transportation of construction materials at the project site</li> <li>➤ Fugitive dust and exhaust gas emission from heavy machines</li> <li>➤ Gaseous emission from vehicles for delivering construction materials and machines that use for construction</li> </ul>	<ul style="list-style-type: none"> <li>❖ Controlling the speed of transportation vehicles for delivering construction materials within the project site</li> <li>❖ Excavation and leveling is limited to short-term</li> <li>❖ Green Shade net fencing must be used to control dust emission from the site to the neighbors/ roads and can reduce the accidents due to falling of heavy objects from the high.</li> </ul>
Impact of Noise and Vibration	<ul style="list-style-type: none"> <li>➤ Construction activities like pile driving, drilling and delivering of construction materials</li> <li>➤ Noise from diesel generators and traffic along main transport/ access routes</li> </ul>	<ul style="list-style-type: none"> <li>❖ The working time will be 8:30 AM – 5:00 PM during weekdays.</li> <li>❖ Do not use heavy machineries like piling, drilling and loading/unloading of materials during night time</li> <li>❖ Switch off vehicle engines while unloading materials</li> <li>❖ Avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as school and hospitals</li> <li>❖ Should make regular maintenance to construction machineries, vehicles and generators</li> <li>❖ Recommend silent type generator and heavy-duty equipment must be insulated or placed in enclosures to minimize ambient noise levels</li> <li>❖ The proponent will use bored piling method for foundation, which has lower vibration</li> <li>❖ Should notify to the public for the construction activities which can generate adverse noise and vibration level</li> </ul>
Impact on Soil Quality	<ul style="list-style-type: none"> <li>➤ Excavation of soil for foundation and landscaping</li> <li>➤ Accidents spillage and release of diesel and other construction waste at the project site</li> </ul>	<ul style="list-style-type: none"> <li>❖ Impacts on soil can be mitigated by using modernized machineries and must be maintained regularly</li> <li>❖ Isolated maintenance area would be identified with paved ground</li> </ul>

Heading	Commitment	
	<ul style="list-style-type: none"> <li>➤ Leakage of engine oil and fuel while using vehicles for construction activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent has a plan to plant some indigenous species of trees, ornamental trees and grass which can restore the top soil.</li> <li>❖ Can be reduced through using leak-proof fuel containers with secondary containments in fuel storage area and diesel generators</li> <li>❖ Refilling fuel should be done with great care for preventing spillage</li> </ul>
Impact on Water Quality	<p>Groundwater Consumption</p> <ul style="list-style-type: none"> <li>➤ Water Consumption for construction activities and domestic purpose</li> </ul> <p>Surface Water Contamination</p> <ul style="list-style-type: none"> <li>➤ Water discharges from construction activities</li> <li>➤ Oil spillage from the construction machines and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>❖ Tube well water is a main source of water consumption for proposed project.</li> <li>❖ To reduce ground water consumption, close water tab all times if unnecessary.</li> <li>❖ When in rainy season, collect rain water for spraying ground and construction activities.</li> <li>❖ There are two drainage systems besides project area.</li> <li>❖ Regular maintenance and check the water pipe line.</li> <li>❖ The project proponent must check and maintain drainage system every week.</li> <li>❖ The proponent must systematically manage to use groundwater to prevent depletion of groundwater.</li> <li>❖ Regular inspection for construction vehicles and machines must be done to prevent oil spillage.</li> </ul>
Impact on Wastewater Effluents	Dispose sewage and discharged wastewater from toilet facilities and worker camps	<ul style="list-style-type: none"> <li>❖ Dispose sewage and discharged wastewater from toilet facilities and worker camps</li> </ul>
Impact of Solid Waste Disposal	<p>Generation of Hazardous and Non-hazardous solid waste</p> <ul style="list-style-type: none"> <li>➤ Generation of construction waste from construction activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent will conduct with YCDC and third-party waste disposal service in line with YCDC's guideline for disposal of excavated soil.</li> <li>❖ Overloading of excavated soil waste on the truck must be restricted at the traffic time.</li> </ul>

Heading	Commitment	
	Used oil from machines, maintenance waste oil from construction vehicles and machines	<ul style="list-style-type: none"> <li>❖ Solid wastes including stones, wood chips, glasses, plastics, containers, metal rods, pieces of iron sheets, sharp objects and other construction wastes will be disposed by using YCDC's on-call service for wastes.</li> <li>❖ Before final disposal, the project proponent must dispose at the Myaung Da Gar Industrial Zone's disposal site.</li> <li>❖ Recommend that the project proponent should consider the use of recycled or refurbished construction materials.</li> </ul>
Impact on Human	<b>Occupational Health and Safety</b> <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling from elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Operation noise from construction activities</li> <li>➤ Use of vehicles and lifting equipment in the movement of machinery and materials</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent should prepare health and safety management plan for the construction workers based on the EMP in Myanmar language and any other language that workers can read will be displayed prominently at the site. Personal Protective Equipment (PPEs) such as safety shoes, safety gloves, helmet, safety goggles, earmuffs etc., must be provided to all workers.</li> <li>❖ First aid training, safety training, firefighting training and other essential trainings must be arranged for those who handling the construction machineries. Trained and licensed industrial machine operators will be provided in the safe operation of machinery such as cranes.</li> <li>❖ The project proponent must tag the safety signage at the project site which are shown at EMP.</li> </ul>
	<b>Community Health and Safety</b> <ul style="list-style-type: none"> <li>➤ Traffic volume and accidents from transportation of construction materials</li> <li>➤ Communicable diseases during construction activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ The proposed project is located in Myaung Da Gar Steel Industrial Zone, so, the project compound has enough space where construction materials transportation vehicles can unload building materials.</li> <li>❖ However, the project proponent must carry out time management for traffic to avoid trucks and vehicles congestion along Yangon-Pyay Highway.</li> </ul>

Heading	Commitment	
		❖ Recommend that the construction machines or materials should not put outside the project compound.
<b>Mitigation Measures of Anticipated Impacts for Operation Phase</b>		
Impact on Air Quality	<ul style="list-style-type: none"> <li>➤ Dust emission from iron scrap handling and segregation</li> <li>➤ Fugitive dust and exhaust gas emission from induction and reheating activities</li> <li>➤ Generation of flue gas from induction and reheating activities</li> <li>➤ Gaseous emission from vehicles and machines for loading and unloading of iron scraps</li> <li>➤ Sources of odor impacts are rolling, cooling and slag handling, particularly if the slag is exposed to moisture</li> </ul>	<ul style="list-style-type: none"> <li>❖ Regular check and maintain fume wet scrubber system installed at chimney</li> <li>❖ Preventive maintenance of valves and other equipment.</li> <li>❖ Ambient air quality and stack/fugitive monitored periodically.</li> <li>❖ A good housekeeping consisting of simple, obvious task of clearing up, removing accumulations and in general keeping things neat and clean will from a part of normal operation and maintenance procedure.</li> <li>❖ Regular inspect and maintain storage room.</li> <li>❖ Encase solid waste storage tanks to prevent odor emission.</li> <li>❖ To minimize dust emission around the project area, spray the water daily if necessary.</li> <li>❖ The project proponent must install proposed pollution control system to reduce adverse impacts of indoor air quality.</li> <li>❖ Replant the trees along the fence of the compound</li> <li>❖ Install and maintain effective ventilation and exhaust systems to capture and remove odorous emission</li> <li>❖ Conduct regular maintenance of equipment and systems and monitor air quality and emission to detect any changes in odor levels or potential issues</li> <li>❖ Develop GRM for addressing the complaints promptly, investigating their causes, and taking corrective action as needed.</li> </ul>
Impact of Noise and Vibration	➤ Noise and vibration from operation activities and loading and unloading of iron scrap	❖ Proper maintenance of the equipment at various processing units can also reduce the noise level in the plant. However, the

Heading	Commitment	
	<ul style="list-style-type: none"> <li>➤ Noise from heavy machines and traffic along main transport/access routes</li> </ul>	<p>community impact due to noise during construction phase will be negligible, since the plant is located near an industrial estate.</p> <ul style="list-style-type: none"> <li>❖ Noise generation sources and their platforms would be maintained properly to minimize noise and vibration.</li> <li>❖ Roofs of building of plant will be constructed of reinforced concrete of light weight concrete.</li> <li>❖ Natural ventilation and proper ventilation systems should be installed in the plant.</li> <li>❖ Training would be imparted to plant personnel to generate awareness about damaging effect of noise.</li> <li>❖ The emergency generators must be placed in enclosures or silence-type generator is recommended to use.</li> <li>❖ Make regular check and maintenance to vehicles.</li> <li>❖ To reduce noise pollution, the project proponent has a plant to plant some indigenous species of trees, ornamental trees and grass.</li> </ul>
Impact on Soil Quality	<ul style="list-style-type: none"> <li>➤ Land filling of treated sludge at the project site</li> <li>➤ Accidental spillage and release of diesel, furnace oil and other related chemicals at the project site</li> <li>➤ Leakage of engine oils and fuels while transportation vehicle operate</li> </ul>	<ul style="list-style-type: none"> <li>❖ Install and prepare adequate containment measures particularly in furnace oil storage room and transfer area to minimize risk of soil contamination.</li> <li>❖ Use drip trays under machinery to prevent oil and grease spillage.</li> <li>❖ Modify the process or storage condition to reduce the potential consequences of an accidental off-site release of hazardous chemicals.</li> <li>❖ Formulate and test through exercises for emergency plan to ensure that procedures to prevent or mitigate impacts due to accidents or spillage are in place and operated effectively.</li> <li>❖ The project proponent should establish standard maintenance yard for machines and vehicles and provide oil and lubricant</li> </ul>



Heading	Commitment	
		storage facility with paving floor or placing secondary containments. ❖ Make regular check and maintenance to vehicles.
Impact on Water Quality	Groundwater Consumption ➤ Water consumption for cooling process and domestic purpose. Surface Water Contamination ➤ Wastewater discharges from staff quarters and operation activities ➤ Storm water runoff where accidental oil spillage from the machines and vehicles.	❖ Water conservation measures have to be implemented for this project. ❖ Record the amount of water usage by water meters for production units. ❖ Train all staff practices of water usage efficiency in the toilets and other areas of water consumption. ❖ Install water saving devices for toilets and kitchen.
Impact of Wastewater Effluents	➤ Dispose sewage and discharged wastewater from toilet facilities and staff quarter.	❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste. ❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity. ❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline ❖ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site. ❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow. ❖ Regular inspection and maintenance of vehicles and emergency must be done.
Impact of Waste Disposal	➤ Generation of domestic waste from staff quarter ➤ Generation of treated sludge from web scrubber	❖ Regularly inspection must be carried out of all bulk containment on site prevent leakage and product loss.

Heading	Commitment	
	<ul style="list-style-type: none"> <li>➤ Generation of maintenance waste oil from operation vehicles and machines</li> <li>➤ By product collection and deposition</li> </ul>	<ul style="list-style-type: none"> <li>❖ Train both cleaners and employees for proper good housekeeping practice at production area.</li> <li>❖ Regular check the temporary storage site of generated solid waste from the whole factory.</li> <li>❖ All employee must be followed and practiced by the principle of waste reduction, recycling, recovery and reusing.</li> <li>❖ Solvents and Oil waste must be collected by designated jerry cans</li> <li>❖ Provide appropriate control devices in storage of solvents, diesel to avoid possible leakages.</li> <li>❖ Provide site-specific training to department members who work with chemicals (furnace oil) at laboratory and production area.</li> <li>❖ Dispose at permitted areas in the Myaungdagar Steel Industrial Zone.</li> <li>❖ Regularly check the storage and disposal areas of all hazardous chemical to prevent accidental release.</li> <li>❖ Provide separate storage tank or designated bin for chemical wastes.</li> <li>❖ Regular inspection must be carried out of all bulk containment on site prevent leakage and product loss.</li> <li>❖ Any spillage of hazardous chemicals on land area of plant remise must be avoided with MSDS guideline.</li> <li>❖ All waste must be disposed of any applicable environmental regulation.</li> <li>❖ Dispose the hazardous material to the identified respective place away from the canteen and production area.</li> </ul>

Heading	Commitment	
		<ul style="list-style-type: none"> <li>❖ Ensure that all inside and outside areas, buildings, facilities and equipment are kept clean and in good state to function as intended and to prevent contamination.</li> <li>❖ Monitor the storage area of raw materials, feed additives and drugs storage and disposal area to prevent accidental release.               <ul style="list-style-type: none"> <li>➤ Provide spill mitigation equipment, double wall tanks and diking storage tanks.</li> </ul> </li> </ul>
Impact on Human	<p>Occupational Health and Safety</p> <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling from elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Operation noise from casting, rolling and cutting process of steel production</li> <li>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> <li>➤ Acrid fumes emission from induction and smelting process</li> <li>➤ High temperatures and potential contact with hot metal or hot water of induction</li> </ul> <p>Community Health and Safety</p> <ul style="list-style-type: none"> <li>➤ Emission of air pollutants from operation activities such as induction, re-heating process.</li> <li>➤ Fire hazards from accidental electric shock and other operational activities error</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor and strict of employee and workers to wear the uniform and full personal protective equipment (PPE) during working at operation area.</li> <li>❖ Monitor the workplace to determine the levels of grain dust present at production area.</li> <li>❖ Provide the appropriate action to protect employees from dust exposures that exceed the level permitted by OSHA.</li> <li>❖ Arrange appropriate health check-up facilities.</li> <li>❖ Instruct and train all employees to use control measures properly and talk about the health risk.</li> <li>❖ Provided the informing and training employees on the use of control measures for exposure of grains dust.</li> <li>❖ Measure the PM 10 and PM2.5 concentration in production area by quarterly and compare with NEQ (emission) guideline.</li> <li>❖ Plant must implement the safety and health program designed to identify, evaluate, monitor and control safety and health hazards.</li> <li>❖ All employee must not be exposed at noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Provide appropriate training for machine handling.</li> <li>❖ Ensure all rooms are well ventilated and lighting.</li> </ul>

Heading	Commitment
	<ul style="list-style-type: none"> <li>❖ Ensure factory laws are strictly followed.</li> <li>❖ Clearly display warning signs or symbols for dangerous areas at the factory.</li> <li>❖ Monitoring plan must be prepared by accredited professionals.</li> <li>❖ Ensure that all employees are provided with appropriate PPE, including helmets, gloves, safety glasses, ear protection and steel-toed boots</li> <li>❖ Enforce the proper use of PPE at all times</li> <li>❖ Regular maintenance of the road and Use of traffic signs.</li> <li>❖ Regular identify and assess potential hazards in the workplace and prioritize hazards based on severity and likelihood of occurrence.</li> <li>❖ Provide the training programs for industrial vehicles operators in the safe operation of specialized vehicle such as forklifts, including safe loading/unloading, load limits.</li> <li>❖ Keep Material Safety Data Sheet (MSDS) from the manufacturer for flammable combustible liquids indicating their flammable ranges in % per volume</li> <li>❖ Provide spill absorbent material/ equipped with secondary containment facility for storage of hazardous materials.</li> <li>❖ Emergency procedures for hazardous chemical spillage must be implement.</li> <li>❖ Implement of engineering and administrative control measures to avoid or minimize the release of hazardous substance.</li> <li>❖ Work process, engineering, and administrative controls must be designed, maintained, and operated to avoid or minimize release of biological agents into the working environments.</li> <li>❖ The employee must review and assess known and suspected presence of biological agents at the work place and implement</li> </ul>

Heading	Commitment	
		<p>appropriate safety measures, monitoring, training, and training verification programs.</p> <ul style="list-style-type: none"> <li>❖ Provide comprehensive training for all employees on steel mill safety procedures, including emergency response protocols</li> <li>❖ Implement ergonomic training and adjustments to workstations as needed</li> <li>❖ Conduct regular fire drills and provide fire safety training to employees</li> <li>❖ Ensure that all employees are aware of assembly points and emergency contact information</li> <li>❖ Implement measures to protect workers from heat stress, such as providing shaded rest areas, adequate hydration and acclimatization for new employees</li> <li>❖ Foster a culture of safety where employees are encouraged to report safety concerns without fear of reprisal</li> <li>❖ Recognize and reward safe behavior and practices</li> <li>❖ Conduct regular safety inspections to identify and rectify any safety deficiencies promptly</li> </ul>
<b>Mitigation Measures of Anticipated Impacts for Decommissioning Phase</b>		
Impact on Air Quality	<ul style="list-style-type: none"> <li>➤ Dust emission from demolition activities</li> <li>➤ Delivering and transportation of demolished materials</li> <li>➤ Gaseous emission from vehicles and machines for decommissioning activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Ensure that proper notification and sign must be prepared prior to demolition</li> <li>❖ Set up dust barriers at strategic locations</li> <li>❖ Implement and prepare the dust suppression technique, such as applying water or non-toxic chemicals to reduce dust from vehicle movements and demolished activities</li> <li>❖ Provide and enforce the appropriate use of full PPE against dust (i.e., Mask)</li> </ul>
Impact of Noise and Vibration	<ul style="list-style-type: none"> <li>➤ Noise and vibration from vehicles and machines for decommissioning activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use noise control devices, such as temporary noise barriers for workers and exhaust muffling devices for combustion engines</li> </ul>

Heading	Commitment	
	<ul style="list-style-type: none"> <li>➤ Noise from heavy machines and traffic along main transport/ access routes</li> </ul>	<ul style="list-style-type: none"> <li>❖ Schedule noisy activities during day time period and arrange the work rotation program for heavy machineries and equipment</li> <li>❖ Ensure machineries are well maintained to reduce noise generating</li> <li>❖ Unused equipment will be turned off and the parallel use of noisy equipment/machinery must be avoided</li> </ul>
Impact on Soil Quality	<ul style="list-style-type: none"> <li>➤ Keeping the demolished materials and iron scraps at the project site</li> <li>➤ Accidental spillage and release if diesel and other related chemicals at the project site</li> <li>➤ Leakage of engine oils and fuels while transportation vehicles operate</li> </ul>	<ul style="list-style-type: none"> <li>❖ Dispose the iron scraps and residual materials for factory and other construction materials to YCDC's on-call services.</li> <li>❖ Proper demolition of the sewage system to prevent pollution by contents into the environment and ground water</li> <li>❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals</li> <li>❖ Clean the spillages of oil and other chemicals as soon as possible</li> <li>❖ Well maintain the transportation vehicles and other machineries used in demolition activities regularly.</li> </ul>
Impact on Water Quality	<p>Groundwater Consumption</p> <ul style="list-style-type: none"> <li>➤ Water consumption for domestic purpose</li> </ul> <p>Surface Water Contamination</p> <ul style="list-style-type: none"> <li>➤ Wastewater discharge from worker camp</li> <li>➤ Storm water runoff where accidental oil spillage from the machines and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>❖ Ensure sewage system is functional during demolition to prevent pollution of nearby underground and surface water sources</li> <li>❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals must be cleaned up immediately</li> <li>❖ Dispose hazardous materials to identified landfill</li> </ul>
Impact on Wastewater Effluents	Discharge wastewater from toilet facilities and worker camps	<ul style="list-style-type: none"> <li>❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste.</li> <li>❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.</li> </ul>



Heading	Commitment	
		<ul style="list-style-type: none"> <li>❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline</li> <li>❖ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site.</li> <li>❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow.</li> <li>❖ Regular inspection and maintenance of vehicles and emergency must be done.</li> </ul>
Impact of Waste Disposal	<ul style="list-style-type: none"> <li>➤ Dispose of sewage and domestic waste from worker camp</li> <li>➤ Accidental spillage and disposal of maintenance waste oil from transportation vehicles and machines</li> </ul>	<ul style="list-style-type: none"> <li>❖ Enforce segregation of waste at the source to encourage reuse and recycling and use recyclable waste where as possible</li> <li>❖ Disposal of solid waste in compliance with local government policy and good housekeeping practices are essential during the Decommissioning Phase</li> <li>❖ Removes all equipment and debris ready to utilize the site for other uses</li> <li>❖ Demolished materials waste must remove from the site and properly disposed of in designed location</li> <li>❖ Provide the adequate secondary containment for fuel storage tanks and for the temporary storage of the other fluid such as lubricating oils and hydraulic fluids</li> <li>❖ Clean-up the excessive waste debris and liquid spills regularly</li> </ul>
Impact on Human	<b>Occupational Health and Safety</b> <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor the decommissioning site by assigned person of HSE Officer and use well trained person to identify and remove waste materials from processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation and dismantling or demolition</li> <li>❖ Provide adequate Personal Protective Equipment (PPE) throughout decommissioning phase</li> </ul>

Heading		Commitment				
		<div>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</div> <div>Community Health and Safety</div> <div>➤ Emission of air pollutants from demolished activities</div>	<div>❖ Training of workings in lifting and materials handling techniques in decommissioning phase</div> <div>❖ Provide the first aid kid at decommissioning site</div> <div>❖ Ensure the planning work site layout to minimize the need for manual transfer of heavy loads</div> <div>❖ Implement good housekeeping practice, such as the sorting and placing loose demolition debris in established area away from the foot paths</div> <div>❖ Set up necessary barriers for not to cause any disturbance for nearby community</div>			
Environmental Monitoring Plan						
Monitoring of the anticipated environmental and social impacts in the receiving environments is important in evaluating the effectiveness of mitigation plan and compliance with the regulatory measures in place. During the operation phase and decommissioning phase monitoring will be undertaken to ensure that proposed mitigation measures for negative impacts and enhancement measures for positive impacts are implemented.						
Environmental Monitoring Plan During Operation Phase						
Component	Parameter	Target Level	Measurement Method	Area to be Monitored	Monitoring Frequency	Responsible Person
Air Quality Ambient Air Quality Indoor Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, CO <sub>2</sub> , NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , O <sub>3</sub> , VOC, ammonia, Cadmium, HF, HCl, HS, Lead, Nickel, Polychlorinated dibenzodioxin and dibenzofuran	Within NEQ Guideline and International Standards	Relevant Air Quality Monitoring Equipment	Project site of downwind direction and inside the production area 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N 95°58'43.386"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Water Quality 1.Ground Water 2.Drainage Water	Ground Water Parameter and Waste	Within NEQ Guideline and WHO Standards	Relevant Laboratory	Tube well water 17° 9'26.20"N 95°58'24.11"E	Biannually	Yangon J.R Family Limited/

Heading		Commitment				
3. Drinking water	Water Effluent (see in Chapter 5)	National Drinking Water Quality Standard		Effluent from Wastewater Discharge 17° 9'28.89"N 95°58'21.14"E		Environmental Officer
Soil Quality	pH, As, Pb, Cd, Cu, Zn, Mn, Fe	-	Relevant Laboratory	At Project Site 17° 9'28.88"N 95°58'28.34"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Noise and Vibration	Noise Level (dB level)	Within NEQ Guideline and International Standards	Relevant Noise Meter Equipment	At Project Site and at the nearest village 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N 95°58'43.386"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Solid Waste (Generation of Hazardous and Non-hazardous)	Domestic Waste from staff quarter and sludge from scrubber	Volume of solid waste (ton)	Co-ordination with YCDC and Hmawbi CDC	At Project Site and surrounding 17° 9'28.88"N 95°58'28.34"E	Daily	Yangon J.R Family Limited/ YCDC
Occupational Health and Safety	Accidents and incidents, Periodic medical examination	Zero accident cases, Safety Training for workers and accident reports, community consultations	The Occupational Health and Safety Plan of the Government of Union of Myanmar, Ministry of Industry (1) and IFC General HSE Guidelines	Workers working at risk areas (Noisy workplace, Dusty workplace)	Monthly Yearly (medical examination)	Yangon J.R Family Limited/ HSE Office
Social aspects and Community Health and Safety	Perception of the project, Health status	Within Standard Limit levels and Grievance Redress Mechanism	Random Sampling	Nearest receptor (Kan Kalay and Kone Kalay Villages)	Biannually	Yangon J.R Family Limited/ HSE Office

Heading		Commitment				
Environmental Monitoring Plan During Decommissioning Phase						
Air Quality	CO, SO2, NO2, CO2, VOC, O3, PM10, PM2.5	Within NEQ Guideline and International Standards	Relevant Air Quality Monitoring Equipment	Project site of downwind direction and inside the production area 17° 9'29.39"N 95°58'27.92"E 17°09'19.138"N 95°58'43.386"E	Once (During decommissioning phase)	Yangon J.R Family Limited/ Environmental Officer/ Contractor
Waste Water Quality	Site Runoff wastewater discharges parameter	Within NEQ Guideline	As NEQ Guidelines	At project site	Once (During decommissioning phase)	Yangon J.R Family Limited/ Environmental Officer/ Contractor
Solid Waste	Demolition debris, including concrete, metal, drywall, wood, glass and other hazardous demolished materials	Volume of solid waste (ton)	Co-ordination with YCDC and Hmawbi CDC	Disposal Sites of decommissioning phase of project site	Daily	Yangon J.R Family Limited/ Environmental Officer/ Contractor
Socio-economic aspects	Local Economy, Employment's compensation, Gender Issues	Within Standard Limit levels and Grievance Redress Mechanism	Samples	Near project site	Once (During decommissioning phase)	Yangon J.R Family Limited/ Contractor
Noise Pollution	Noise Level (dB scale)	Within NEQ Guideline	Relevant Noise Meter Equipment	At project site and receptor	Once (During Decommissioning phase)	Contractor/ Yangon J.R Family Limited/ Environmental Officer

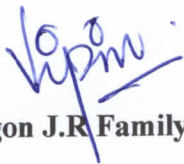
Heading	Commitment
<b>Cumulative Impact Assessment</b>	
<p>Positive impacts of socioeconomic, social infrastructures and livelihoods will arise due to the industrial zone development. Project's contribution relates to potential cumulative impacts.</p> <p>All of anticipated cumulative impacts relate with proposed development project of steel production and marketing can be reduced and enhanced by using recommended mitigation measures in below;</p> <ul style="list-style-type: none"> <li>✓ Implement the environmental policy on air emission impact organized by industrial zone committee.</li> <li>✓ Implement collaborative HSE policy by leading the industrial zone committee</li> <li>✓ Properly treat industrial waste from all factories in this industrial zone to minimize the cumulative impacts of the wastewater on nearest water bodies of Hlaing River.</li> <li>✓ Regular samplings of wastewater have to be taken from the inlet and outlet of the common public drainage and effluent levels need to be compliance with the National Environmental Quality (Emission) Guideline.</li> </ul>	
<b>Public Consultation</b>	
Public Consultation	<p>A consultation meeting was held at Dhamma Yay Aye Monastery on 30<sup>th</sup> July 2019 to disclose the project information and the project team engage and communicate with all respective stakeholders including relevant government organizations, local authorities at Hmawbi Township, business communities and local people who are potentially affected by the project as well as other interested parties related to this project to acquire and to disseminate information. All feedback and comments from public consultation meeting should be considered in the formulation of Environmental Management Plan, monitoring plan and CSR plan.</p> <p>The Environmental Impact Assessment developed for Production and Marketing of TMT Rebars initiated by Yangon JR Company Limited can be downloaded and read in the following link.</p> <p><a href="https://www.mediafire.com/folder/v5r43qjxaoqd5/Production+and+Marketing+of+TMT+Rebar+(Yangon+J.R+EI+A)">https://www.mediafire.com/folder/v5r43qjxaoqd5/Production+and+Marketing+of+TMT+Rebar+(Yangon+J.R+EI+A)</a></p>



**Commitment to follow Environmental Conservation Law, Rules and Regulation, Environmental Standards and Mitigation and Management Measures Stated in the Environmental Management Plan (EMP) of Environmental Impact Assessment (EIA) Report**

With regard to the above matter,

We, Yangon J.R. Family Ltd., are writing this letter to reaffirm our strong commitment to environmental responsibility and compliance with all relevant environmental regulations and standards in connection with the production and marketing of TMT rebar at Myaungtagar Steel Industrial Zone, Hmawbi Township, Yangon. Our company commits to the following key principles and actions: Compliance with Environmental Conservation Law 2012, Environmental Conservation Rules 2014 and all relevant environmental standards, as set forth by the regulatory authorities, Implementation of Mitigation Measures outlined in the environmental management plan (EMP) of the EIA report, Preparing the Environmental Monitoring Plan (EMoP) to regularly assess and report on the environmental performance of our project and Establishing a Grievance Redress Mechanism to address any concerns or complaints related to our project's environmental impact. We will proactively seek out innovative and sustainable practices to reduce our environmental footprint and enhance our overall environmental performance.



**Yangon J.R Family Ltd.**

**MR. VIPIN KUMAR SINGH**  
Director  
Yangon JR Family Limited

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## 4. PROJECT DESCRIPTION AND ALTERNATIVES

### 4.1. Project Background

The project proponent is Yangon JR Family Limited with 100% foreign investment. The major aim of this project is to set up a steel plant considering a demand for every need in the construction industry at internationally competitive prices. With the aim of manufacturing, the company expects not only to provide quality of steel bars but also to create a technical transfer employment opportunity for local residents.

### 4.2. Project Location, Overview Map and Site Layout Maps

The production and marketing of TMT rebars factory is located at plot No. (340, 343, 338, 345, 339, 344), Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon, Myanmar. The designated land area acquired from local owner that consists of main building. The coordinate point of the proposed project is 17° 9' 23.132" N and 95° 58' 27.358" E and location of the designated factory is shown in **Figure 4-1**.

### 4.3. Project Development Schedules and Investment Plan

Activities of the Project Plan, the project history and construction schedule are shown in the activities of the project plan as follows:

**Table 4-1 Project History and Schedule of Project Development**

Date	Progress
<b>Project History</b>	
May 2018	Preliminary feasibility study from MOC
July 2018	Selection of EIA study by E Guard Environmental Services Co., Ltd
2 <sup>nd</sup> August, 2018	Stakeholder Meeting for scoping study
13 <sup>th</sup> August, 2018	Submission of Scoping Report and TOR
6 <sup>th</sup> June, 2019	Receive approving of Scoping Report
<b>Construction Schedule</b>	
2 <sup>nd</sup> February 2018	Land Lease
April 2018	Selection of Contractor
April 2018 to July 2020	Construction Period
Since 2020 (The project has been given approval for 50 years by the MIC)	Operation Period

The investment plan of the project is shown in **Table 4-2** and categorized as the building, machine, cash and office utilities.

**Table 4-2 Investment Plan**

Item	Investment Amount (USD)
Building	923,076.92
Machine (Import)	3,469,230.76
Cash	542,307.70
Office Utilities	15,304.62

Production and Marketing of TMT Rebars, Yangon J.R Family Ltd.



**Figure 4.1 Location of Project Area**

#### 4.4 Description of the Project

Project site has total land 10.977 acres with fully built-up structures of gated and fenced up facility including security office, tube well, transformer etc. Therefore, there are no big construction process and water supply is obtained from tube well within the site and electricity is obtained from the YESB's grid line by own transformer. The factory layout plan is shown in **Figure 4-3**. The initial stage of project will involve the following activities;

- Pumping out the water from the project land.
- Construction of one-story building for production processes, lab, office, QC room and locker room facilities, and installation of machines bought in from overseas during renovation phase.
- During the operation phase, the proposed plant will operate on 20 hours/day, with separate batch workforce.
- Decommissioning phase covers an investment period of 50 years with extension of 20 years.

**Table 4-3 Project Description**

Item	Scale
Component Type	Main Steel Structure Building
Sector	Steel Mill
Project Site Area	10.977 acre
Main Building Length	198 m
Main Building Width	120 m
Building Value	USD 0.923 Million





## 4.5 Resources Consumption

### 4.5.1 Raw Materials

Most of the raw materials will be purchased from local suppliers and from Myanmar Economic Corporation (MEC) and secondly from domestic suppliers. The major raw materials which required for production TMT rebars are scrap-iron, silico manganese, ferro silico etc. Scraps and cast-iron pieces will be brought into the steel plant premises by Tipper/ Trucks/ Dumpers and unloaded either in the scrap yard where it will be intermittently stored or directly into the scrap bay and shown in **Photo 4-1**. The scrap supervisor check each and every car for controlling and removing the hazardous materials and oil, like shorkabsorbers.



Transportation of Raw Material



Storage of Raw Material

**Photo 4-1 Transportation and Storage of Raw Material**

**Table 4-4 Resources Availability**

No.	Raw Materials	Source
1	Scrap Iron	MEC/ Domestic Market
2	Silico Manganese	MEC/ Domestic Market
3	Ferro Silicon	MEC/ Domestic Market

List of Raw materials required for the proposed induction melting operation to produce Billets of 75,000 TPA.

**Table 4-5 TPA and Product Mix**

No.	Raw Material	Total Quantity required in TPA	Product Mix (%)
1.	MS Scrap including Miss Rolls, End bits from rolling mill	75,000	88.43
2.	Scrap Iron	9,000	10.61
3.	Silico Manganese	800	0.94
4.	Ferro Silicon	15	0.02
	<b>TOTAL</b>	<b>84,815</b>	<b>100</b>
5.	Deduct Slag-off	4,470	5.28
	<b>Total Quantity of Billets</b>	<b>80,000</b>	



Billets of quantity 80,000 TPA from the Furnace will be fed into the Rolling Mill and will be re-rolled into various Steel products. The rolling loss expected is approximately 3% and therefore the finished product quantity will be 75,000 TPA of Re-rolled Steel Products. The finished products (steel bars) will be transported by heavy goods Lorries (12 wheels) and stored in factory warehouse systematically and carefully handled when they are loaded up with Lorries. It is shown in **Photo 4-2**.

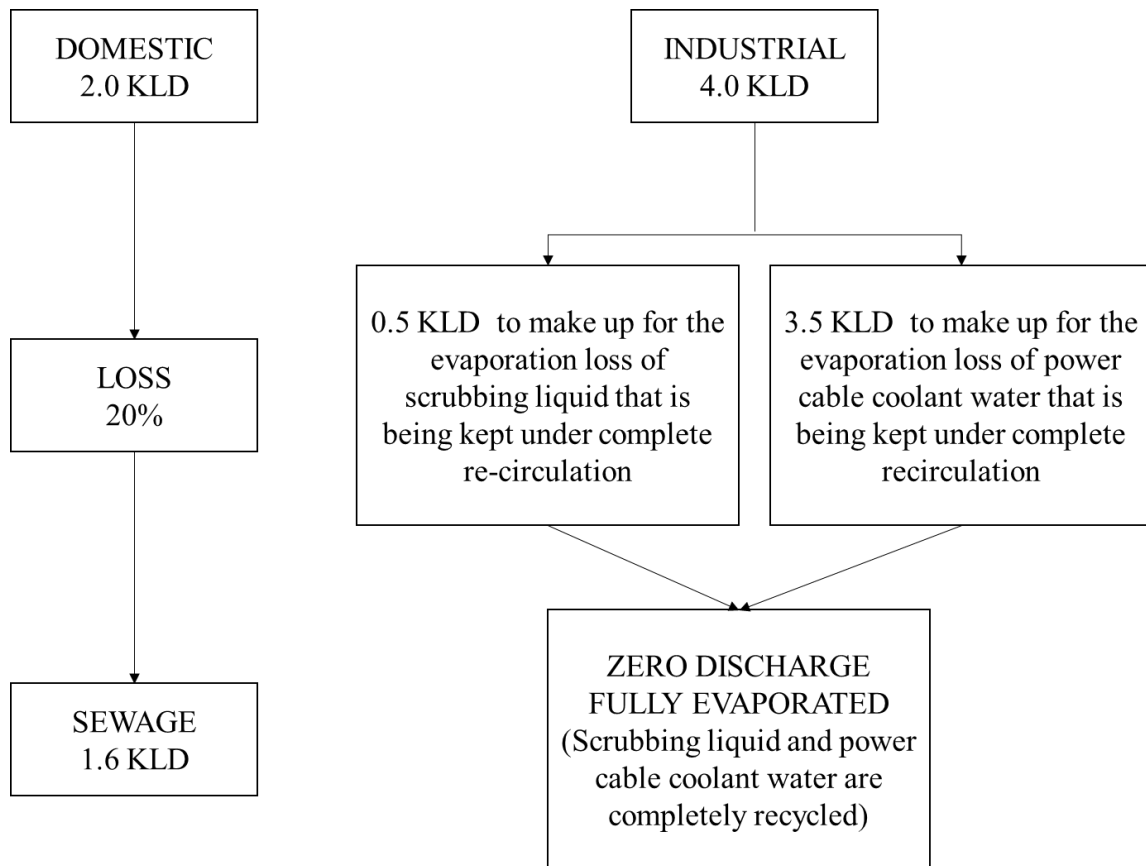


**Photo 4-2 Records of Rebar Storage and Loading/ Unloading**

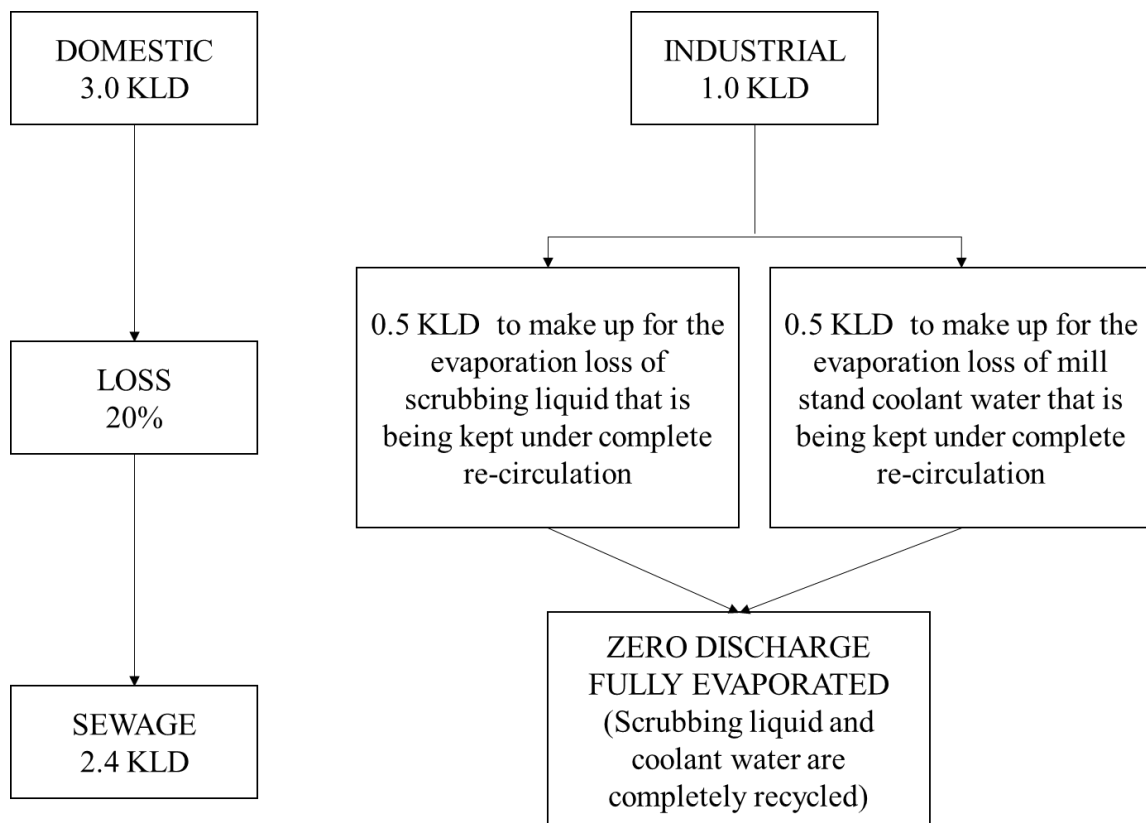
#### 4.5.2 Water Consumption and Process Wastewater Treatment

The average annual water supply is 1,514 KL (400,000 gallon). Generally, 5 kiloliter per day (KLD) of water will be provided for domestic and another 5 kiloliter per day (KLD) for induction melting and re-rolling process. As mentioned in **Figure 4.3** and **Figure 4.4**, 1 KLD is used for scrubbing liquid and 4 KLD for coolant water which will be kept under complete re-circulation in a closed circuit and store the recirculating water as shown in **Photo 4-4**. The water requirement of 10 KLD will be met out through the proposed bore well. For domestic usages, water treatment system (R.O system) had been installed and drinking water quality is maintained and checked by R.O system supplier in every 6-month.





**Figure 4.3 Water Balance (Induction Melting Division)**



**Figure 4.4 Water Balance (Rolling Mill)**



**Photo 4-3 Water Treatment System for Drinking Water Usage**



**Photo 4-4 Rolling Mill Recycle Water Tank (Cooling Purpose)**

### 4.5.3 Fuel Requirement

According to the current situation, furnace oil is needed to use only 1 days (8 hours) for a month to run the reheating furnace 8 hours for one day. 458 litter of furnace oil is required to run for an hour and the total is 3,664 litter for a month. The industry proposes to use Furnace Oil (F.O) as a fuel for re-heating the furnace and its requirement is given below in **Table 4-6**. The Furnace oil which contains only 3.5% of sulfur content (percentage by mass) has 10,000 cal/g of gross calorific value, even though it is more costly than the pulverized coal commonly used which has 6% of sulfur content and a calorific value of 5,500 cal/g. The furnace oil will be bought from not only the local markets but also export from the India and will be sent to the factory with 13,400-liter tanker and stored in the tank are shown in **Photo 4-5**. Currently, diesel consumption is mainly for lighting purposes and approximately 450 litter per month. Diesel is carried within barrel and transported by rented car.



**Photo 4-5 Furnace Oil Tanker and Oil Storage Tanks**

**Table 4-6 Fuel requirement**

No.	Description of Item	F.O Requirement
1	Re-heating Furnace (Re-rolling Mill)	20-22 liters/ Tons of re-rolled steel product
2	Burning rate of F.O.	458 LPH (liter per hour)

#### 4.5.4 Electricity consumption

The electricity can be assessed from the national grid through own transformer (15,000 KVA and 7,000 KVA) and the proponent also has own generator (1,500 KVA) to continue the production process although the electricity will be cut off. The following table explains about the power requirement of each production process.

**Table 4-7 Annual Electricity Consumption**

Production Process	Power consumption (KWH)
Induction Melting Furnace	134,400
Billet Casting	14,400
Rolling Mill	38,400
Pollution Control Equipment, Rolling mill Auxiliaries	4,800
Miscellaneous usage	8,000
<b>Total</b>	<b>200,000</b>

#### 4.5.5 Manpower Requirement

The following table shows the manpower requirement of the proposed project. Currently, there has differences in employment requirement as described in proposal because of the availability of electricity in the industrial zone. For only foreign technicians, the accommodation is provided within the project premises.

**Table 4-8 List of staff at steel mill**

No.	Designation/ Rank	Citizen	Foreign
1	Senior Management (Managers, Senior Officer)		20
2	Professionals		
4	Technicians		
5	Workers	22	-
<b>Total</b>			<b>42</b>

#### 4.6 Manufacturing Process

The proposed project has planned to produce highest quality TMT Rebars (mild steel billets). Estimated production capacity per year is 60,000 metric tons (MT). Production of TMT Rebars is very simple process in which detail process for scrap melting will operate systematically in accordance with the below flow chart under the fully automatic control.

TMT Rebars are manufactured by melting steel scraps with sponge iron and other metallic alloy ingredients in electric induction furnace. The unit will be producing about 80,000 MT of mild steel Billets per annum from mild steel scrap of 75,000 TPA and sponge iron of 9,000 TPA.

There will be two sets of furnaces in the unit. At any time only one furnace will be operated and one will be stand-by. One heat in one Induction Furnace is estimated to take about 150-

160 minutes on an average. The melting bay has to therefore handle 8 hours per month according to current situation. The proposed production goes capacity of the induction furnace is 230 MT per day and will give hot liquid metal of 10 metric tons per hour.

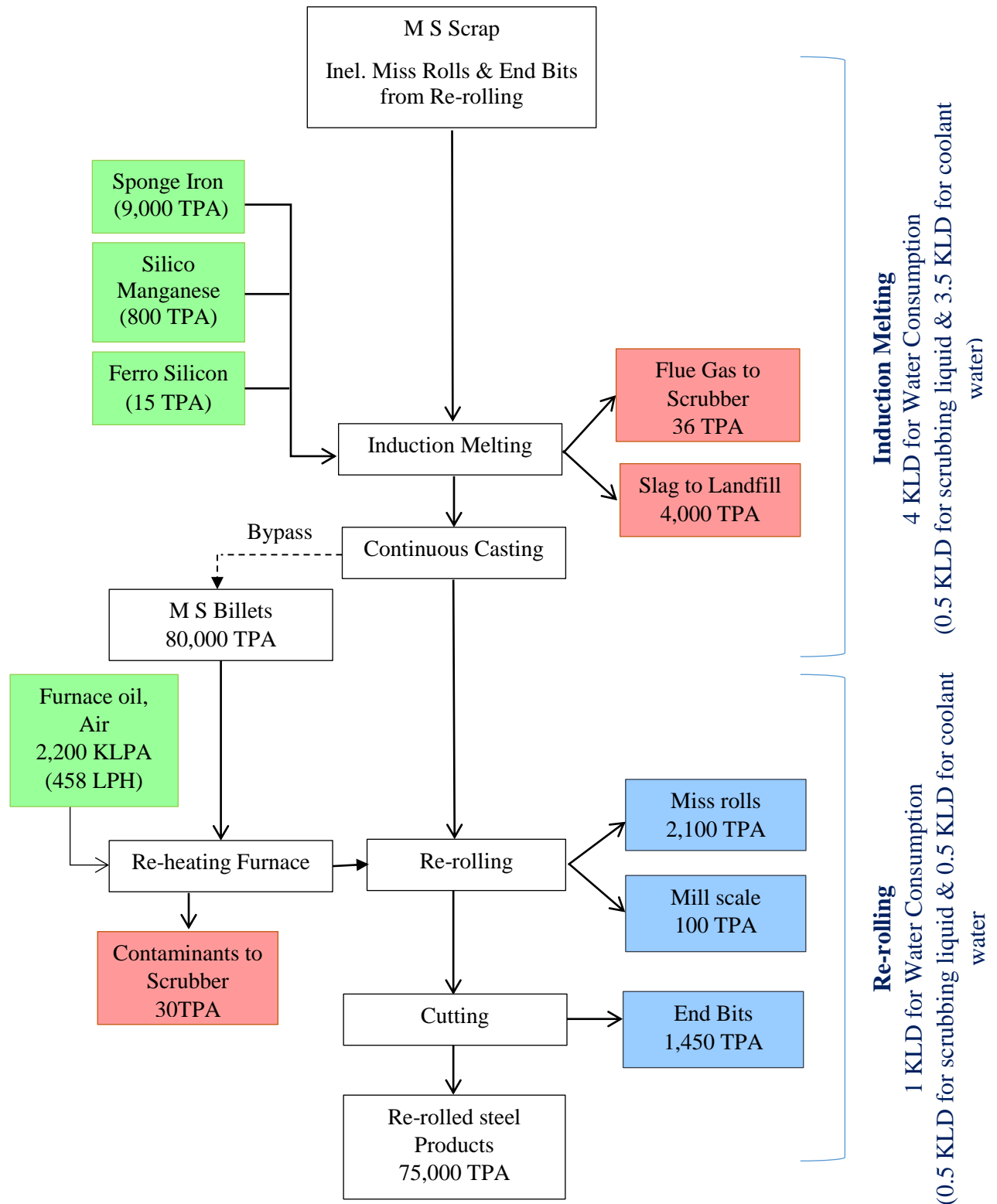
The scrap will be brought into the steel plant premises by Tipper/ Trucks/ Dumpers and unloaded either in the open scrap yard where it will be intermittently stored or directly into the scrap bay. Pre-tested, sorted mild steel scrap of different varieties will be charged into the Induction Furnace Crucible by charged Electro Magnetic Bucket. The first charge of 1 ton will consists of scrap and cast-iron pieces only. Sponge Iron (also called direct reduction iron) will be fed into the crucible in two or three installments. These crucibles are already lined with Refractory Ramming Mass and the scrap will be melted by induction heating into a liquid form. The induction heating is aided by the flow of medium frequency current in the coil which is supplied by the use of static frequency converter, DC chock, capacitor bank and water-cooled power cables.

The liquid metal will be tested in the laboratory by using Metal Analyzer for carbon content etc., and there is no release wastewater from laboratory. Necessary ingredients such as sponge iron, silico-manganese and ferro silicon shall be added after the removal of slag and the temperature involved in the process about 1640°C. The slag removing process is called Slag-off. De-slagging will be done by tilting the Crucible forward during the process while the power is reduced to a minimum for 1-2 minutes. This will be done 5-6 times every heat and the slag will fall into the slag box parked below the Induction Furnace.

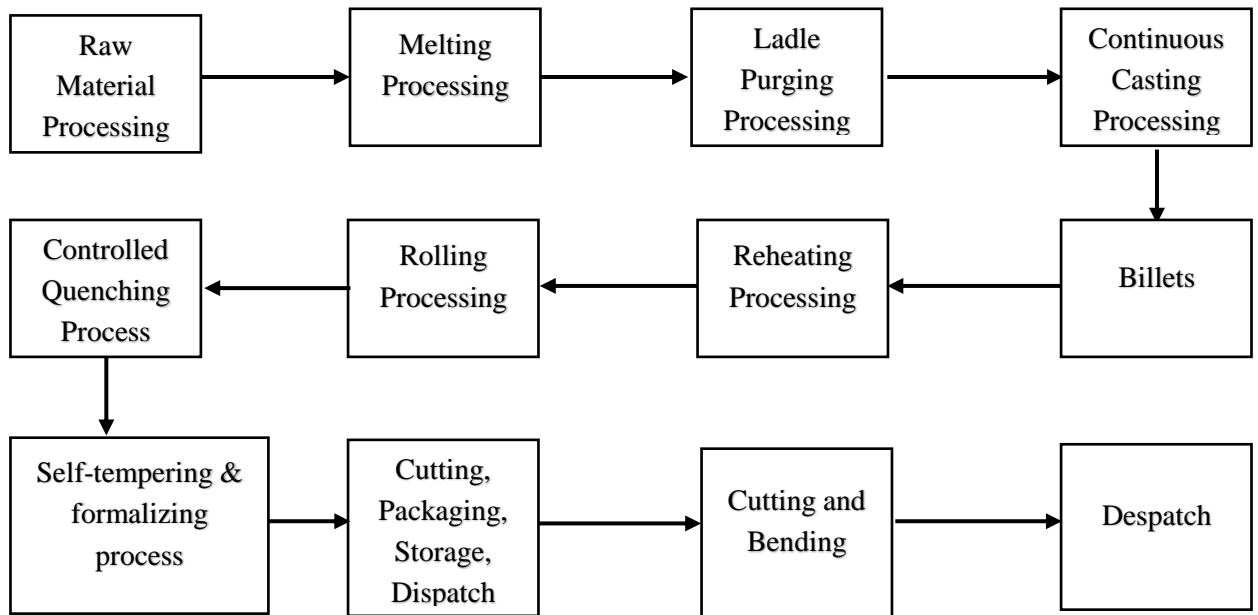
The slag box holding capacity is 3 tons to take care of the slag of each heat. The slag plot will be lifted by the EOT crane and will be emptied at the end of the bay. From there the slag will be taken to the solid waste storage area. The liquid steel thus obtained is casted into required billet sizes through continuous casting machines. Billets from the Continuous Casting Machines will be rolled in a rolling mill to required sizes to meet customers' needs. The top portion of the furnace is provided with mild steel draft hood with rotating arrangement (motorized). The transport ducts connected to an induced centrifugal blower outside is attached to scrubber which controls the emissions from induction melting operation. The photo records of the machinery setting up for production activities can be seen in **Photo 4-8**.



#### 4.6.1. Process Flow Chart and Production Steps









**Figure 4.5 Process Flow Chart of Steel Production**




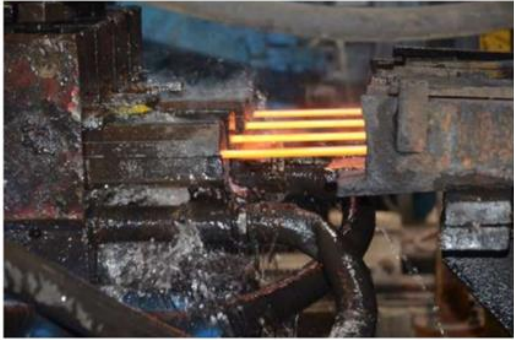


**Figure 4.6 Production Steps of Process**



**Table 4-9 Description of Production Steps**

<p><b>(14) Scrap unloading and segregation</b></p> <p>All scrap received from trucks/ containers are inspected for quality and unloaded separately. Shock absorber, cylinders, closed containers are segregated and removed. Oversized scrap and cast iron are also removed.</p>	
<p><b>(15) Scrap Handling</b></p> <p>The segregated scrap is then moved and stacked quality wise like heavy melting scrap, bundle scrap and sponge iron.</p>	

<p><b>(16) Charging in Induction Furnace</b></p> <p>The scrap to be charged in the furnace is shifted to furnace platform with Magnet or Grab attached to crane. The scrap is then charged in to the furnace with magnet and as the scrap starts melting further quantity of scrap are charged in the furnace. The scrap and sponge iron are charged in the furnace in pre-determined proportion to control chemistry of the metal.</p>	
<p><b>(17) Pouring molten iron into ladle bucket</b></p> <p>After the entire scrap has melted the furnace is tilted to remove slag. After checking chemistry of molten metal and adjusting carbon, desired quantity of Silico Manganese is added to molten metal. After the molten metal temperature reaches 1650 °C the liquid metal is poured into ladle by tilting the furnace.</p>	
<p><b>(18) Placing of the ladle on the CCM (Continuous Casting Machine)</b></p> <p>The ladle with liquid metal is moved to continuous casting machine and temperature is checked. The liquid metal is then purged by passing oxygen from bottom of ladle to homogenize the molten metal. The ladle is then positioned on the CCM ladle stand.</p>	
<p><b>(19) Opening of Slide Gate for Billet Casting</b></p> <p>The slide gate system at bottom of ladle is opened and liquid metal starts flowing in to tundish which is kept below the ladle. From the tundish the liquid metal enters in the copper mold tube which is water cooled.</p>	 <p><b>3-Hi ROUGHING MILL STAND</b></p>

<p><b>(20) Cast Billet from the CCM cut to length, and stacked on Cooling Bed</b></p> <p>The metal takes the shape of copper mold which is square and is continuously cast into billets. The billets are then cut to desired length and transferred to cooling bed for air cooling. After cooling the billets are recovered and stacked.</p>	 <p><b>COLD SHEAR</b></p>
<p><b>(21) Billet tested in Spectro Lab for the best possible Quality and Chemical Compositions</b></p> <p>During casting sample of billet is cut and sample prepared for testing in SPECTRO (spectrometer) for chemical composition. The tested billets are marked and stacked with batch number marked on the billets.</p>	
<p><b>(22) Billet ready to be rolled in the rolling mill</b></p> <p>The tested billets are heated to 1100°C in reheating furnace fired by electric furnace</p>	 <p><b>3-HI ROUGHING MILL AREA</b></p>
<p><b>(23) Billet passing through the Rolling Mill</b></p> <p>The hot billets pass through successive rolls in the rolling mill and are rolled to desired size.</p>	 <p><b>FOUR STRAND ROLLING</b></p>



<p><b>(24) Quenching Process: Bars are passed through the quenching box for grading</b></p> <p>The bars pass through quenching boxes where due to controlled water spray the bars undergo heat treatment process and gets desired mechanical properties. Samples are dawn during rolling and tested for mechanical properties to ensure the quality of bars.</p>	 <p style="text-align: center;"><b>CHAIN TRANSFER</b></p>
<p><b>(25) Cooling Bed</b></p> <p>The bars are then collected in cooling bed.</p>	
<p><b>(26) Bundled and ready to dispatch</b></p> <p>The bars from cooling bed are then bundled and shifted to storage yard ready for dispatch.</p>	

## 4.7 Pollution Control System

### 4.7.1. Treatment Scheme to Induction Furnace

The flue gas from the proposed induction furnace contains suspended particulate matter (SPM) and traces of gases along with other metallic contaminants. The proposed treatment scheme comprises of the following equipment:

- Sucker Hood and ducting arrangement
- 400 HP Centrifugal Blower
- Packed Bed Wet Scrubber of dia 2750 mm x 5500 mm ht.
- M S Stack of 900 mm dia x 30 m ht

In operation the flue gas from the furnace will be sucked into the Packed Bed Wet Scrubber with the help of blower and ducting system proposed. The Scrubber is a vertically placed



cylindrical vessel of size 2750mm x 5500 mm, having dish end top and conical bottom. Stack boring to a height of 900mm are proposed as a packing medium.

Water of a total volume of 25m<sup>3</sup> from the catch pit shall be sprayed in the counter-current direction to that of the flue gas at the rate of 40 LPM with the help of 2 H.P pump proposed. The Scrubbing liquid shall then be sand filtered in semi-rapid Sand filters of size 2.5m x 2.5m x 1.0m TD (5 Nos) and collected in the sump/ catch pit of size 5m x 5m x 1.5 LD from where is shall be recycled back to the scrubber with the help of the recycling pump proposed.

The design of the scrubber is done in such a way that the gas will have a residence time of not less than 3 seconds in the scrubber which will be sufficient enough to bring down the level of the suspended particulate matter present in the flue gas, below the standards for emission to the atmosphere through the chimney of diameter 0.9m x 30m height.

**Table 4-10 Major Specification of Mechanical Equipment Proposed for Air Pollution Control System (Induction Melting)**

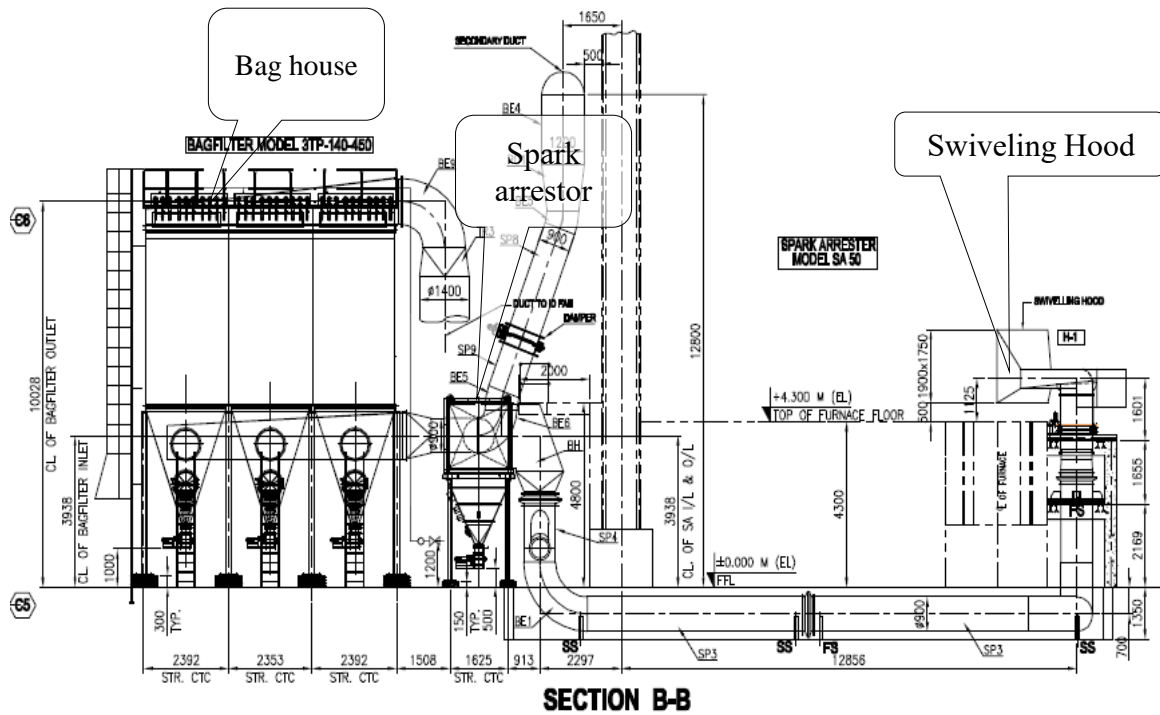
<b>1.</b>	<b>Blower</b> No. of unit Type H. P Normal Fan Speed Volume of Smoke St. Pressure @ MSL	One Centrifugal Fan 400 HP 1440 30,000 CMH 400 mm WGP
<b>2.</b>	<b>Wet Scrubber</b> Size Material of Construction Media Depth	2750 mm dia x 5,500 mm ht. M.S. 900 mm
<b>3.</b>	<b>Chimney</b> Diameter Height Material of Construction	900 mm 30 m M. S.
<b>4.</b>	<b>Recycling Pump</b> Capacity Make	2.0 HP Standard

#### 4.7.2. Treatment Scheme Proposed to Re-furnace

The flue gas from the proposed Re-heating furnace contains suspended particulate matter (SPM) and trace of Sulphur di-oxide along with other metallic contaminants. The schematic diagram of the treatment provided is shown in the drawing enclosed. The scheme proposed comprises of the following requirements:

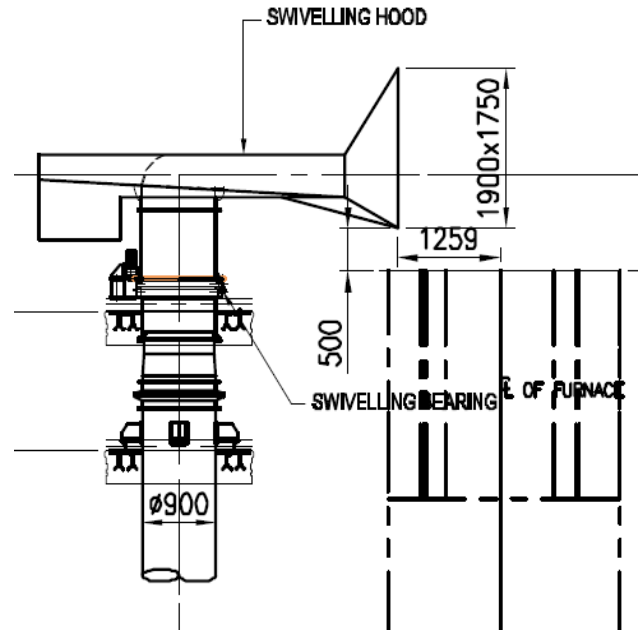
- Sucker hood and ducting arrangement
- 400 HP Centrifugal Blower
- Fume Extraction System (FES) for Induction Furnace
- M S stack of 900 mm dia x 30 m ht.
- 2.0 HP Agitator for mixing lime

In the operation, the flue gas ( $200,000 \text{ m}^3/\text{hr}$ ) generated from the induction furnace is captured by the Fumes Extraction System (FES). FES for an induction furnace is predominantly a bag filter-based fume extraction system. In this FES system, the fumes are captured by a swiveling hood arrangement (either canopy type hood or a side draft hood) nearby furnace and transport the fume at the outlet of bag filter via spark arrestor and filter the same to a concentration level of less than  $30 \text{ mg}/\text{Nm}^3$ . The outlet is connected to a chimney.



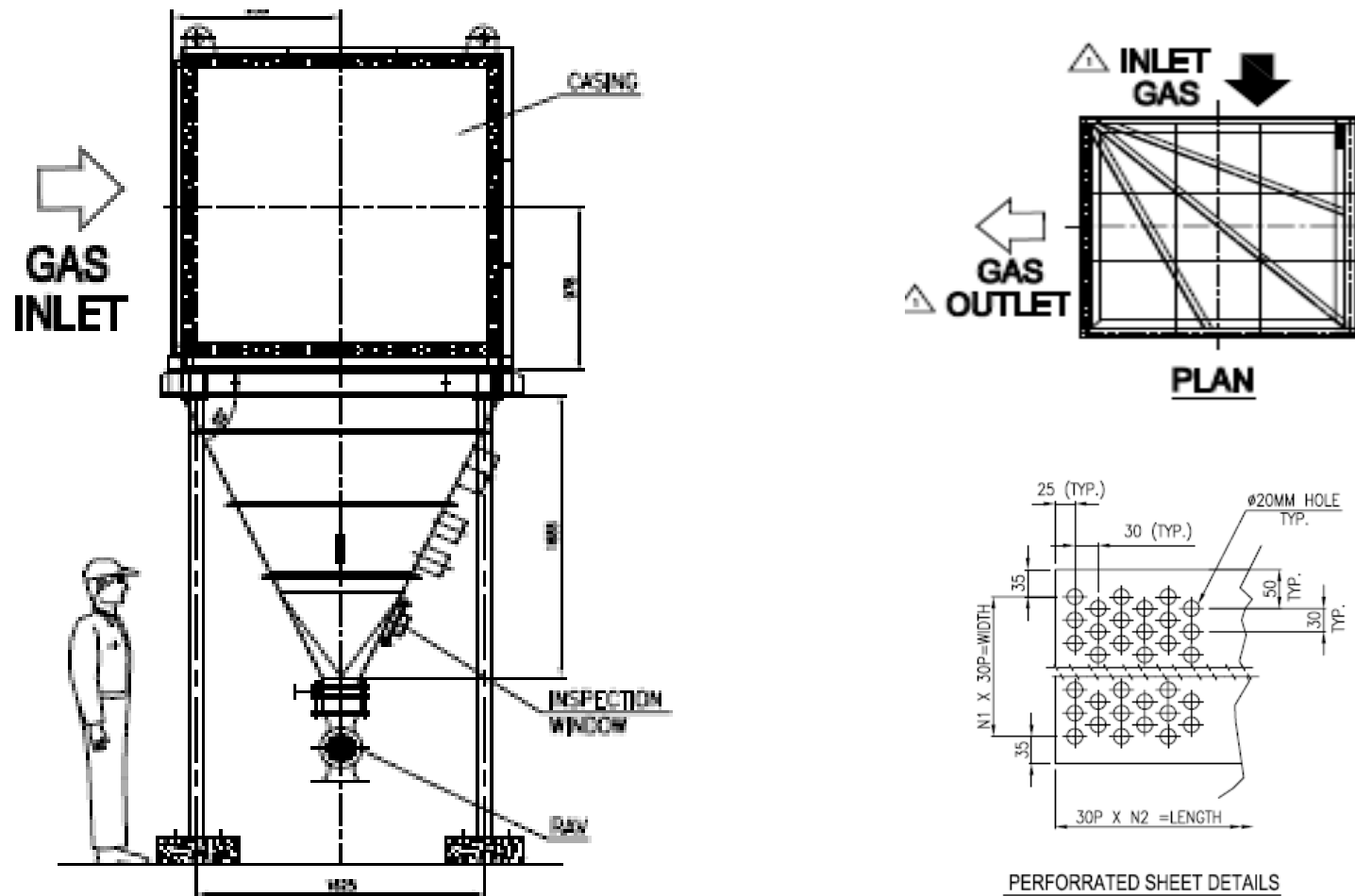
**Figure 4.7 Layout Plan of Typical FES System**

The swiveling hood is basically a dust and fumes collecting hood which can rotated 360 degrees about a pivot point and it is located just above the furnace. The hood will be facing to the induction furnace and it extracts all the fumes and sparks generated from the induction furnace and it will be rotated away from the furnace during tilting operation.



**Figure 4.8 Detailed Cross-section of Swiveling Hood**

During the process of melting and poking of scrap into the furnace, lot of sparks are generated and these sparks would even travel longer distances and into the bag filter. To protect the fabric bags from these sparks, a spark arrestor/cyclone is provided prior to the bag filter. Spark arrestors have perforated sheets-built insides its shell and hopper and obstruct the flow of the fumes and sparks in it and it's cooled down the particles. The spark arrestor is then followed by a set of an Off-Line bag filter, Model No. 6TS-224(212)-500.



**Figure 4.9 Layout of Spark Arrestor**

Inside the bag filter, cylindrical bags made of polyester are intercepted in the flow path of air and the particles are collected onto these filters by mechanisms interception, inertial impaction and diffusion. The pulse jet collector is continuous automatic filter capable of filtering dust laden air through a felted non-woven filter media. The dust laden air enters through the hopper by suction or positive pressure. The heavier dust particles fall immediately into the hopper, while the lighter dust gets deposited on the outside of the filter bags. This dust is removed in a pre-determined cycle by pulse of high pressure compressed air.

The bag filter is followed by a Centrifugal Fan (induced draft fan) which is normally located at the outlet between dust collector and chimney. This generates the driving force in the system and creates negative pressure which causes a suction hot flue gas from the furnace through dust collector. The clean air from the bag filter is being discharged by the backward inclined blade centrifugal fans and vented to same to atmosphere to chimney.

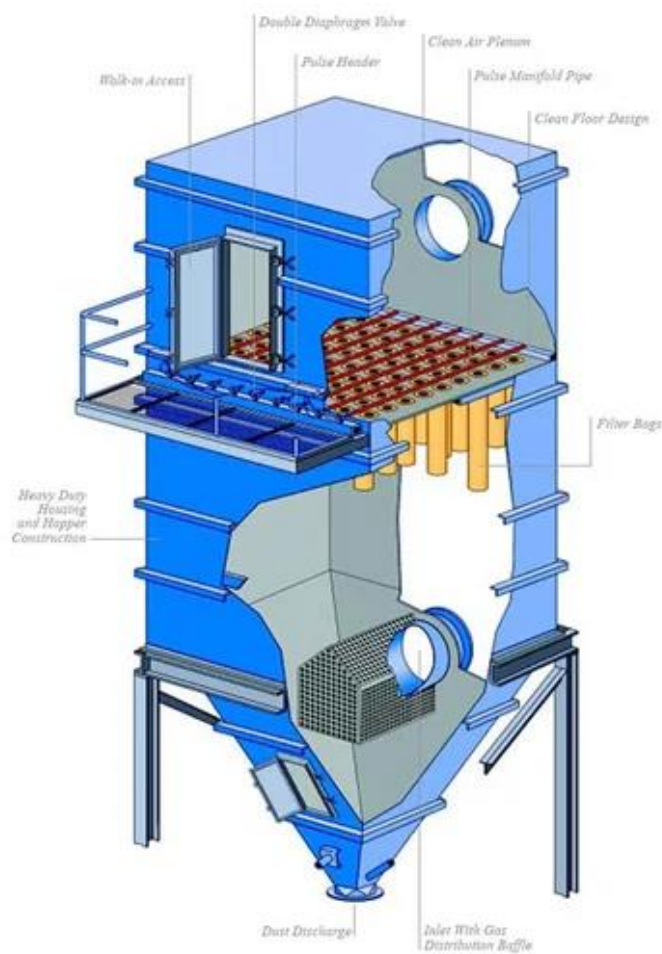
**Table 4-11 Major Specifications of Mechanical Equipment for Air Pollution Control  
(Re-rolling Operation)**

<b>1.</b>	<b>Blower</b> No. of unit Type H.P Normal Fan Speed Volume of Smoke St. Pressure @ MSL	One Centrifugal Fan 400 HP 1440 30,000 CMH 400 mm WGP
<b>2.</b>	<b>Fume Extraction System (FES)</b> Furnace Capacity Gas Volume Bag Filter Model Type of Cleaning No. of Module No. of Bags Bag Length Type of Bags Outlet Emission	30 TPH 200,000 m <sup>3</sup> / hr 6TS-224 (212)-500 OFF-Line 6 Nos. 1272 Nos. (212 per module) 5000 mm Polyester Less than 30 mg/Nm <sup>3</sup>
<b>3.</b>	<b>Chimney</b> Diameter Height Material of Construction	900 mm 30 m M. S.
<b>4.</b>	<b>Recycling Pump</b> Capacity Make	2.0 HP Standard
<b>5.</b>	<b>Agitator for Mixing Lime</b> Capacity RPM Make	2.0 HP 960 ENVIRO TECH





**Photo 4-6 Chimney and Pollution Control Unit**



**Figure 4.10 Drawing of Bag Filter**

#### 4.8 Replantation program of the Yangon JR Project

Yangon JR Family Limited has initiated a replantation program for the steel mill premises. The planting of trees and plants not only enhances aesthetics but also contributes to environmental sustainability and the well-being of workers. The objectives of the replantation program are aesthetic enhancement, a noise barrier to reduce the impact of industrial noise on the surrounding area, and shading for workers to rest and work comfortably, especially during hot weather. There are 10 mango trees, 10 betel trees, and 299 Mowra-butter trees that were planted to create a green space. **Photo 4-7** shows the current status of replantation of the trees by Yangon JR.



**Photo 4-7 Current Status of Replantation around the Steel Mill**

#### 4.9 Solid Waste Management

The slag of about 4,000 TPA generated from the process shall be land filled within the premises. The various contaminants present in the raw material used, estimated at about 40 TPA are released during the induction heating along with the flue gas which shall be scrubbed to an extent of 90% by the treatment scheme proposed leaving behind about 36 TPA of waste material, in the form of sludge in the sand filters proposed for filtering the scrubbing liquid. This will be deposited as sludge on the semi rapid sand filters which will be removed periodically and shall be used for land filling within the premises.

**Table 4-12 Major Specification of Civil Works Proposed for Air Pollution Control (APC)**

No.	Structural Specifications	Dimension in MTS	Qty
1.	<b>Semi Rapid Sand Filters</b> Bottom slab of PCC 1:4:8 using 40 mm HBG jelly over that wearing coat of 1:3:6 will be provided and the side walls will be of brick work in CM 1:5 stock brick II class & plastering with CM 1:4 as per specification	2.5 M x 2.5 M x 1.0 M	4
2.	<b>Catch Pit/ Sump</b> Bottom slab of PCC 1:4:8 using 40 mm HBG jelly over that wearing coat of 1:3:6 will be provided and the side walls will be of brick work in CM 1:5 stock brick II class & plastering with CM 1:4 as per specification	5 M x 5 M x 1.5 M LD	1

Not only 3400 TPA of Misrolls generated from the re-rolling process but also 1450 TPA of Endbits that are byproducts from cutting process will be recycled to the induction furnace for further re-processing. The 100 TPA of mill scale generated from the process will be land filled within the premises.

The contaminants present in the raw material used, estimated about 50 TPA are released during the reheating process along with the flu gas which shall be scrubbed to an extent of 90% by the treatment scheme proposed leaving behind 45 TPA of waste material. This material along with the 30 TPA of lime added to neutralize the scrubbing liquid will be deposited as sludge on the semi rapid sand filters which will be removed periodically and shall be used for land filling within the premises and will be planned to sell to the cement plant or fertilizer factory as an alternative way.

#### 4.10 List of Equipment for the project

The detail machineries are listed in appendix. The following major machineries are used:

**Table 4-13 List of Major Machineries in Production Process**

No.	Machine List	Unit	Qty	Amount (US\$)	Imported from
1	Induction Furnace Completed	Set	1	1,230,769.23	India
2	TMT Rolling Mill Complete	Set	1	2,153,846.15	India



No.	Machine List	Unit	Qty	Amount (US\$)	Imported from
3	14000KW/150-300 Hz, 24 pulse Medium Frequency Solid State Power Supply Unit	Set	2		India
4	Continuous Casting Machine (6/11 M Radius X 3 Strand CCM)	Set	1	307,692	India
5	Transformer	Set	1	107,692	India
6	EOT crane	Nos	3	393,613	India
7	Ladle	Nos	2	35,000	India

**Table 4-14 List of Equipment for Pollution Control**

No.	Description	Unit	Qty	Amount (US\$)	Imported from
1	Supply of powered side draft hood fitted with 20HP special duty motor with S.S impeller along with Header duct arrangement up to rotating arrangement.	Nos	1	53,846.15	
2	Supply of rotating arrangement with 10HP Geared Motor Unit	Nos	1		
3	Supply of Centrifugal Blower with Belts and pulleys suitable for 370HP/ 1440rpm Motor	Nos	1		
4	Swiveling Hood	Nos	1		
5.	Spark Arrestor	Nos	1		
7.	Bag Filter	Nos	1		
8.	No. of bag	Nos	1272		
9.	Supply of water separator assembly with spin and anti-spin baffles, inspection door and ladder with platform facility	Nos	1		
10.	Supply of Ducts	Nos	1		

**Table 4-15 List of Equipment for Quality Control Lab**

No.	Description	Qty	Amount (US\$)	Country
1	Chemical Testing Lab	1	5,769.33	India
2	Spectrometer Lab	1	25,000	Germany
	<b>TOTAL</b>	2	30,769.33	

**Table 4-16 Furnace Capacities**

No.	Item	Capacity
1	Induction Melting Furnace	2 x 25 Ton
2	Re-heating Furnace	75000 MT/ Annual



**3-Hi ROUGHING MILL STAND**



**AUTOMATIC RAKE TYPE COOLING BED**



**BAR TRANSFER RUN OUT ROLLER TABLE**



**BLOCK MILL STANDS**



**BENDING MACHINE**



**CHAIN TRANSFER**





**CLOSED TOP TRAVERSABLE MILL STAND**



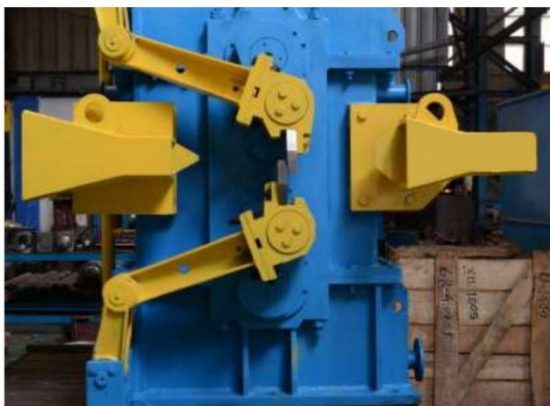
**COIL LAYING HEAD**



**CROP & COBBLE FLYING SHEAR**



**DUAL MODE DIVIDING SHEAR (FLYING MODE)**



**DUAL MODE DIVIDING SHEAR (CRANK MODE)**



**COLD SHEAR**



**3-Hi ROUGHING MILL AREA**



**HOUSINGLESS MILL TRAIN**





**HOUSINGLESS MILL STAND**



**THERMO-MECHANICAL TREATMENT (TMT) LINE**



**KICK OFF MECHANISM WITH CRADLE**



**PRE & POST TMT LINE PINCH ROLL**



**REHEATING FURNACE AREA**



**INTER STAND VERTICAL LOOPER**



**HOUSINGLESS MILL TRAIN**



**MAIN MILL MOTORS**



**SEMI AUTOMATIC TYING MACHINE**



**TAIL BRAKE PINCH ROLLS**

**INTERCONNECTING BUS BARS & FLEXIBLE WATER COOLED CABLES**  
Water Cooled Bus Bars



**TILTING TABLE**





MILL STAND CARDAN SHAFTS

**Photo 4-8 Photos of Setting up the Machinery at Mill**

### 4.11 Project Alternatives

According to the requirement of EIA procedure clause 63, alternatives of the project have to be examined together with “**No action alternatives**”. The comparisons between proposed alternatives are described below.

#### **Alternative 1: Without Project or No Action Alternative**

It means that the proposed project would not be implemented. Without any development work, the situation remains unchanged because this alternative does not involve any construction, operation and decommissioning activities and as a result there will be no impact to the environment. Social impacts related to the project are not expected. No financial costs associated with implementation of this proposed project would be necessary. However, this kind of situation will not be able to accommodate the increasing demand of product along with economic growth in Myanmar. People will not be able to benefit from the expected increase in jobs or the secondary socio-economic benefits accrued from the project implementation as follows:

- If there is no project, people have to import steel bars from overseas and will cost more.
- By importing from foreign countries, the products will be more expensive and cannot buy easily.
- If there is no foreign investment in Myanmar, there will be a deficit in foreign currency.
- No job opportunities will be created for local people if the project does not exist.
- If the government cannot any taxes by the project, the development cannot be made to local areas.
- If there is no project in Myaung Da Gar Industrial Zone, there is no development in the industrial zone and in the township.

#### **Alternative 2: With Project or Action Alternative**

It means that the proposed project will be implemented as planned. The major benefits of the proposed project play a significant role in improvement of economical and potential of employment generation. However, the environmental and social impacts are predicted to be localized, short-term, and reversible with implementation of appropriate mitigation measures

and by undertaking regular compliance environmental monitoring plan. No adverse irreversible environmental or social impacts are anticipated. As a conclusion, this proposed project will be developed in Myaung Da Gar Steel Industrial Zone and the development of this project not only will support in building up of National Economy but also will create job opportunities of local people.

#### **4.12 Comparison and Selection of the Preferred Alternatives**

This section discusses various alternatives considered in developing the project. It also compares the technical, financial, environmental, and social feasibility of the project, where is applicable. Alternative analysis is the process of analyzing the proposed location to operate the plant safety and to obtain local job opportunities. This analysis also covers the environmental aspect of pollution prevention and improvement. The proceeding subsections review these alternatives in the subjects of: location, schedule, design, inputs with mitigation.

##### **4.12.1 Alternative Location**

Since the proposed project area is situated in Myaung Da Gar Steel Industrial Zone, Hmawbi Township, and Yangon Region, which has been designated as the Industrial Zone for the development of industrial activities by the government since 2006. There will be available facilities like infrastructure, communication, fuel, water, national grid line, unskilled, skilled labor, etc. There is no rehabilitation and resettlement because the project is located in existing industrial zone. Moreover, transportation is very easy because the project site is located at beside Yangon – Pyay Highway. No protected area or culture heritage within 500m radius distance. Therefore, no alternative site has been proposed aside from this area.

##### **4.12.2 Alternative Schedules**

During the production process, some noises and vibration could be produced by loading and unloading scrap metals, machinery movements and handling, melting by furnace and so on. To minimize the impacts, working with heavy machines should be avoided at night and should be scheduled in days.

##### **4.12.3 Alternative Design**

As Yangon J.R Family is one of the renowned steel industries in India and as the company would being in the prototype steel plant that they are using in India, supplement with energy efficient and environmentally friendly facilities incompatible with the plant from abroad, there is no alternative design needed, for the time being.

##### **4.12.4 Alternative Inputs**

- The main source for electricity supply is national grid line that will be connected from the existing grid line with transformer.
- The major option for water usage is from tube well.
- Domestic waste water from labor housings discharged into septic sewer system while storm water from the project area will be channeled into the drainage system.
- Discarded scrap will be collected from dustbins in the project area by waste collector of Hmawbi City Development Committee.



- Dust and sand from scrubber will be removed periodically from filters and shall be used for land filling in the project site.

#### **4.12.5 Comparison and Selection of the Preferred Alternative**

If the project is implemented, various potential impacts can be achieved.

- The new steel industry will be developed in Myaung Da Gar Industrial zone and the industrial zone becomes developed.
- The project will use with energy efficient and environmentally friendly design with low impact on the environment.
- Job opportunities will be created for about 358 people during the construction period of 24 months.
- During the operation period, there will be opportunities for estimated 200 local workers to obtain jobs depending on their project.
- Moreover, job opportunities will be created during the decommission phase.
- The villages and wards near the industrial zone could be developed by the project's CSR Program.
- When the steel product is produced in local, the foreign import for steel will be reduced.
- Therefore, no import tax will be paid and the transport charge of cargo deliver will be reduced.
- Encourage foreign investment to Myanmar.
- By developing the project in Myaung Da Gar Industrial Zone, the urbanization in Hmawbi Township will be developed.
- By steel production in local, people can purchase easily, save times, and the products will be cheaper than other import products.
- If the production exceeds in the future, the products can be exported to other countries.
- One of the pros of steel industry is that the recycling practices and segregation of wastes become developed wider.
- Thus, the environmental impacts can be reduced by recycling.
- No adverse immutable environmental or social impacts are expected.
- To reduce air emissions from induction process, Fumes Extraction System (FES) is used to control air pollution. Thus, no harmful pollutants will emit.

The following negative impacts are possible:

- During the construction phase and decommission phase, some traffic congestion will increase, due the presence of heavy-duty vehicles for constructing and excavation the buildings.
- There is a small risk of vehicular accidents during the entry and exit of vehicles carrying construction materials to the project site.
- The neighborhood living around the industrial zone will experience some noise problem due to the operation of construction equipment, but this is a temporary.

For the above-mentioned negative impacts, the following improvements can be achieved by adhering to the following measures:

- Site HSE officer can handle the traffic during construction and decommissioning phases through proper scheduling of traffic by adopting a speed limit of 20 km/h inside the Myaung Da Gar Industrial Zone, in order to avoid risk of vehicle accidents.
- For noise problem concerning with the neighborhood, it could be handled properly by adopting most of the working-hours during the daytime.

## 5. DESCRIPTION OF THE SURROUNDING ENVIRONMENT

This chapter describes environmental and socio-economic conditions of the project area based on the available secondary information and primary information collected from field surveys.

Hmawbi Township is located on the northwest of the city of Yangon. It is situated between 17° 36' N latitude and 176° to 136° E longitude. It has 183.78 mi<sup>2</sup> and mainly 27 ft above the sea level. The Hlaing River is situated near the end of the northern boundary of Hmawbi Township. Yangon-Pyay highway road passed through the Hmawbi Township. Hmawbi Township is bounded by Hlegu Township in the East, Htantabin Township in the West, Mingalardon Township in the South and Taikyi Township in the North. The principal town and administrative seat are Hmawbi. Hmawbi Township is home to the Myaung Da Gar steel industrial zone, which is 11,016 acres (4.11 km<sup>2</sup>) zone constructed in 2006 – 2008 and is intended to house all of Yangon's steel factories.



**Figure 5.1 Hmawbi Township Map**

### **5.1. Setting of Study Area Limits**

It is essential to establish the baseline information on the environmental and socio-economic condition of an area, which could experience direct and indirect impacts during the construction, operation and decommission phases of the project.

The baseline information provides:

- General description of the status of the receiving environment in the project area
- Identification of sensitive environmental, social features and possible receptors of the proposed project that serves as the benchmark for evaluating environmental and social management performance of the project construction and operation.

The baseline information related to the environment and socio-economic is typically divided into three resources:

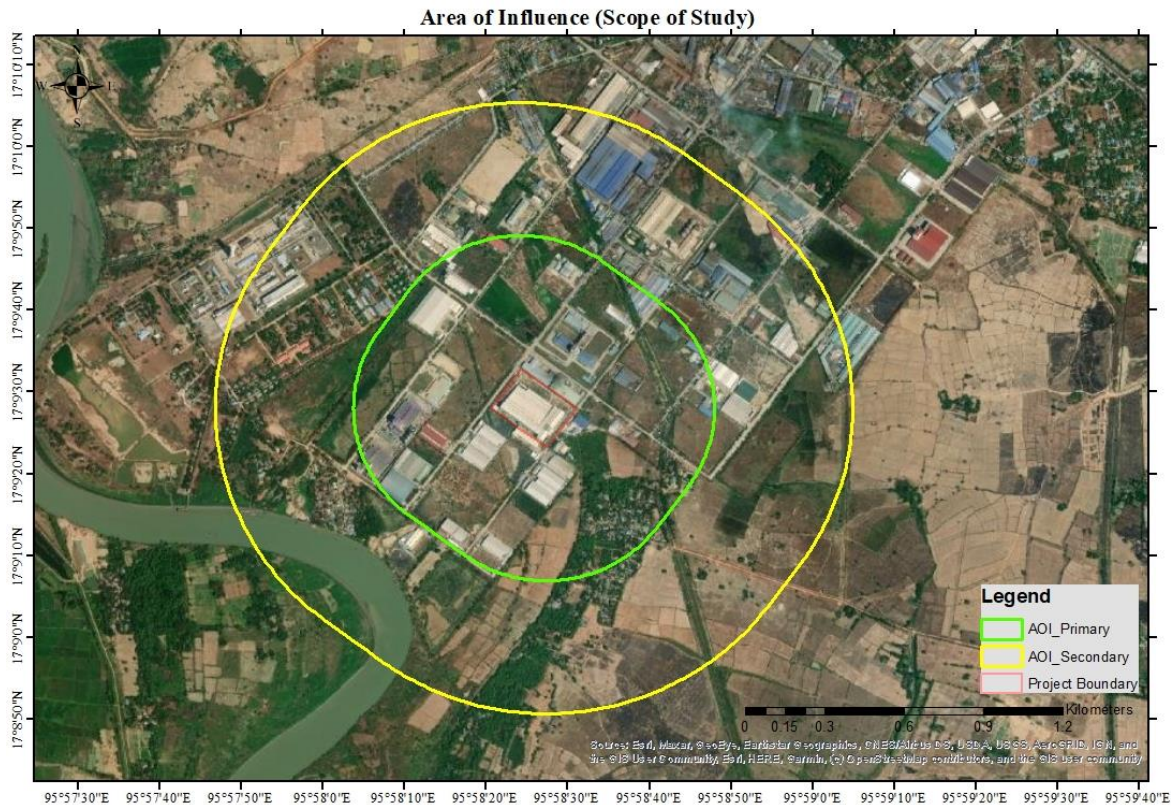
#### **Physical resources**

- Air Quality
- Noise and Vibration
- Surface Water
- Ground Water
- Climate/ Meteorological
- Topography
- Regional Geology

#### **Socio-economic resources**

- Administrative Organization
- Social Profile
- Economic Profile
- Health Profile
- Infrastructures
- Roads
- Water Supply
- Electricity

However, the information that covers above mentioned resources of EIA of this project was collected within area of influence (AOI), primary and secondary impact zone as shown in **Figure 5.2.**



**Figure 5.2 Scope of Study Area of Yangon JR Steel Mill**

## 5.2. Methodology and Objectives of Data Collection and Analysis

The objective of the ESIA baseline data collection is to present the general description of the environmental and social surveys as primary data collections as well as some secondary data were used to carry through in-depth analysis.

### 5.2.1 Ambient Noise and Vibration

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

**Table 5-1 Locations of Noise and Vibration Points for Wet Season and Dry Season**

Item	GPS Coordinates	Locations	Parameters
Noise and Vibration Point 1	Lat: 17°09'31.862"N Long: 95°58'24.336"E	Yangon JR Family Limited Factory (Project Site)	Noise: (LAeq (dB (A)) (1hr interval for 24 hours)



Item	GPS Coordinates	Locations	Parameters
Noise and Vibration Point 2	Lat: 17°09'19.138"N Long: 95°58'43.386"E	Dhamma Yayaye Monastery	Vibration: Lveq (dB) (1hr interval for 24 hours)

Equipment used to measure ambient air and noise measurement are shown in **Appendix XII**.

### 5.2.2 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites using the Environmental Perimeter Air Station (EPAS), Aeroqual S500 and results were compared with National Environmental Quality (NEQ Emission) Guidelines. EPAS provides direct readings in real time with data-logging capabilities. Air quality is composed of dust and gas emissions of the ambient air.

**Table 5-2 Locations of Air Quality Points for Wet season and Dry Season**

Item	GPS Coordinates	Locations	Parameters
Air Quality Point 1	Lat: 17°09'31.862"N Long: 95°58'24.336"E	Yangon JR Family Factory (Project Site)	Gas Emission: CO, CO <sub>2</sub> , SO <sub>2</sub> , NO <sub>2</sub> , VOC, O <sub>3</sub>
Air Quality Point 2	Lat: 17°09'19.138"N Long: 95°58'43.386"E	Dhamma Yayaye Monastery	Dust Emission: PM <sub>10</sub> , PM <sub>2.5</sub>

### 5.2.3 Water Quality

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

The Environmental Quality assessment team (EQ Team) has a list of local laboratories providing analytical services for water quality analysis. Up to this date, there is no laboratory having accredited laboratory for water quality testing (environmental analysis) in Myanmar.

The following laboratories were used for analysis of water and parameters shown in **Table 5-3**.

1. SGS Minerals and Environmental Services, No. 79D, Bo Chain Street, 6-1/2 Miles, Hlaing Township, Yangon. Tel; 01 654 795, 654 796
2. ISO Lab, No-18, Lanthit Road, Insein Township, Yangon. Tel; 01 540 955, 732251575
3. SUPREME Water Doctor Company, o.19-C, Nawaday Garden, Yagon-Pathein Road, Tel: 01 689376

**Table 5-3 Locations of Surface Water, Ground Water and Waste Water Points for Wet Season and Dry Season**

Item	GPS Coordinates	Locations	Parameters
Surface Water Quality Sampling Point	Lat: 17° 9'5.60"N Long: 95°58'9.35"E	Hlaing River near project site	<b>Physical Parameters:</b> TSS, Temperature, Color, Turbidity, Total Coliform Count <b>Chemical Parameters:</b> COD, BOD, pH, Dissolved Oxygen, Oil and Grease <b>Nutrients:</b> Total Nitrogen, Total Phosphorus, Chloride <b>Metals:</b> Ar, Cd, Cr, Zn, Mn, Fe <b>Biological Parameters:</b> Fecal Coliform, Total Coliform
Ground Water Quality Sampling Point	Lat: 17°09'28.086"N Long: 95°58'30.168"E	Project site	
Waste Water Quality Sampling Point	Lat: 17°09'26.393"N Long: 95°58'29.637"E	Cannel beside the project site	

On-site water quality measurements, water samplings are conducted using the equipment as described in the **Appendix XII**Error! Reference source not found..

#### 5.2.4 Soil Quality

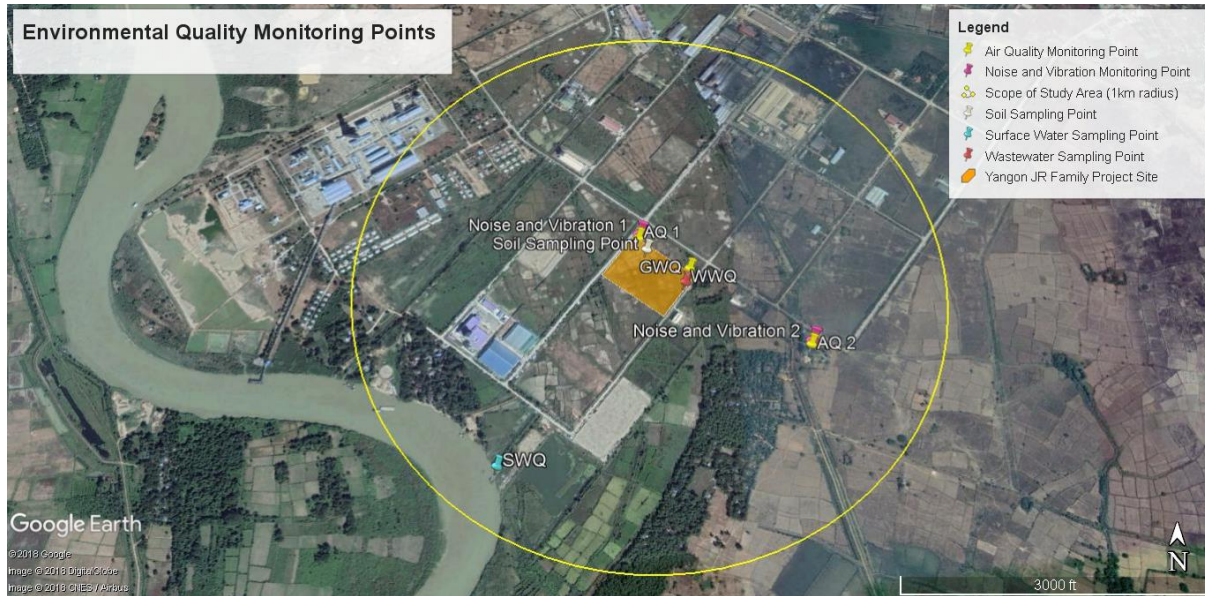
Soil samples were collected on site with appropriate sampling equipment and using Standard Operation Procedures of E Guard. The sampling team has pre-arranged with the labs in Yangon for analysis and logistic arrangement made to reach the preserved samples with unique IDs to the designated labs.

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

The designated laboratories were used for analysis of soil parameters which is sampled from the following location as shown in **Table 5-4**.

**Table 5-4 Location of Soil Sampling Point for Wet Season and Dry Season**

Item	GPS Coordinates	Locations	Parameters
Soil Sampling Point	Lat: 17°09'30.408"N Long: 95°58'25.260"E	JR Family project site	pH, As, Pb, Cd, Cu, Zn, Mn, Fe



**Figure 5.3 Locations of Environmental Quality Sampling Points**

### 5.3. Physical Resources

#### 5.3.1 Results of Baseline Surveys

##### 5.3.1.1 Air Quality

The quantitative air quality impact assessment was conducted for two seasons (wet season and dry season) in EIA study, which could identify sources of air emissions and assess the potential effects on sensitive receptors due to the proposed project. Air quality monitoring was done, 24 hours at each selected location from 30<sup>th</sup> August to 1<sup>st</sup> September 2018 and 5<sup>th</sup> to 7<sup>th</sup> November 2018. During this survey, the EPA criteria pollutants PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, VOC and O<sub>3</sub> were measured and are compared with National Emission Guidelines.



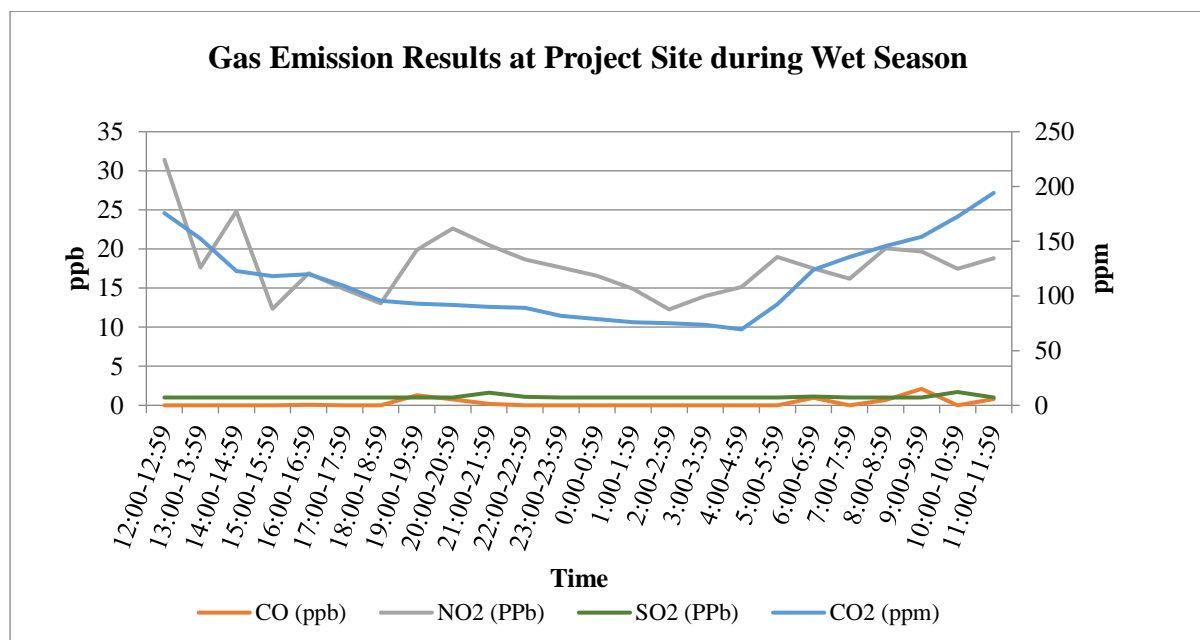
**Figure 5.4 Location of Air Quality Sampling Points**

The air quality results of each parameter were shown at the following table and figures. According to the air quality baseline survey, all the resultant values of each parameter are below the National Environmental Quality (Emission) Guidelines (NEQG) (2015).

**Table 5-5 Air Pollutants Emission Results of Yangon JR Family Project**

Air Quality Parameters		Measured Values (Average)							
		PM <sub>10</sub>	PM <sub>2.5</sub>	CO	CO <sub>2</sub>	NO <sub>2</sub>	SO <sub>2</sub>	VOC	O <sub>3</sub>
Point 1 Yangon JR Family (Source)	Wet Season	10.86	5.68	0.28	113.68	17.99	1.06	0.22	0.0086
	Dry Season	25.29	15.58	0.0018	240.14	27.76	3.33	0.44	0.0008
Point 2 Dhama Yayaye Monastery (Receptor)	Wet Season	11.92	6.56	0.42	224.33	23.83	1.05	0.10	0.0045
	Dry Season	23.66	12.42	0.00007	153.05	42.92	2.96	1.57	0.0029
Unit		µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppm	ppm	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppm	ppm
Guideline Value		50	25	25	5000	200	20	20	100
Applicable Standard		NEQG	NEQG	ACGIH	NEQG	WHO	ACGIH	NEQG	NEQG

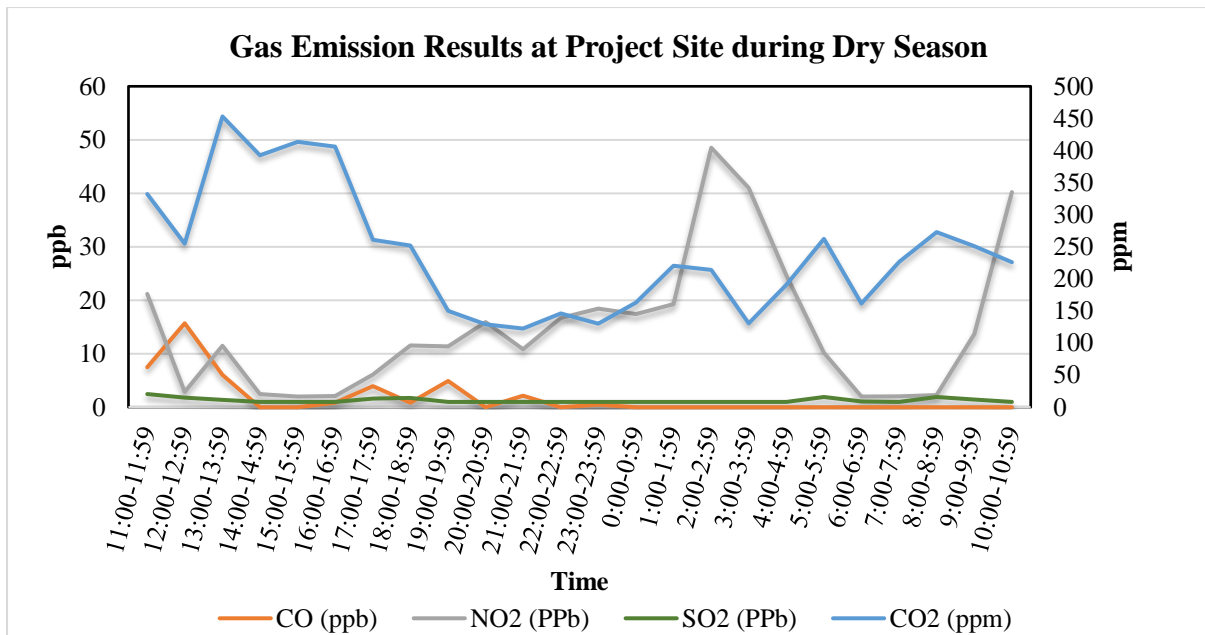
The result of air pollutants emission of Yangon J.R indicated all parameters are within permissible limits for all season.



**Figure 5.5 Gas Emission Results at Yangon JR Family Project Site during Wet Season**

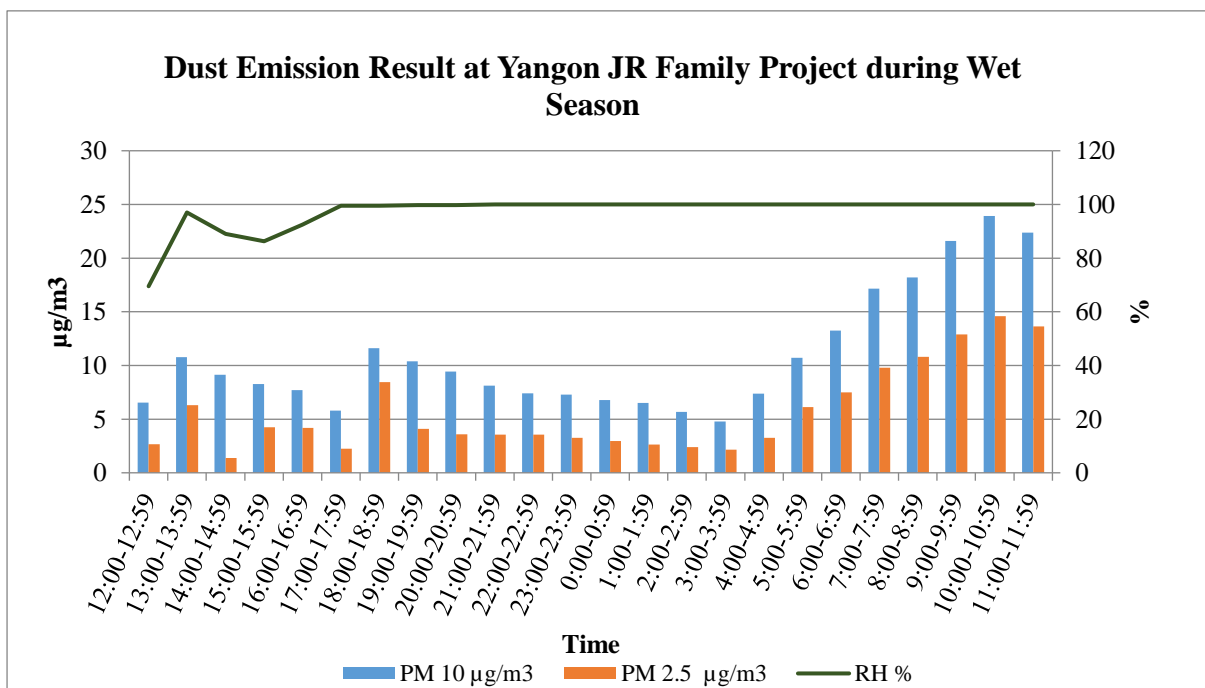
The emission of NO<sub>2</sub> gas has harmful effect for human health but the existing NO<sub>2</sub> emission does not harm to the people. During wet season, Nitrogen oxide is high at 12:00 – 12:59 pm, 31.42 ppb and low at 15:00 – 15:59 pm, at 2.37 ppb. Carbon monoxide and Sulfur dioxide emissions are found to be quite low. Carbon dioxide is between 10 ppb to 30 ppb the whole day.





**Figure 5.6 Gas Emission Results at Yangon JR Family Project Site during Dry Season**

The maximum level of nitrogen oxide is 48.52 ppb at 2:00 to 2:59 am and minimum level is 1 ppb in the dry season thus due to combustion of fuel and on-road and off-road vehicles. Carbon monoxide and sulfur dioxide emissions are also found to be quite low as shown in **Figure 5.6**. The existing Carbon dioxide level is acceptable level for human health.

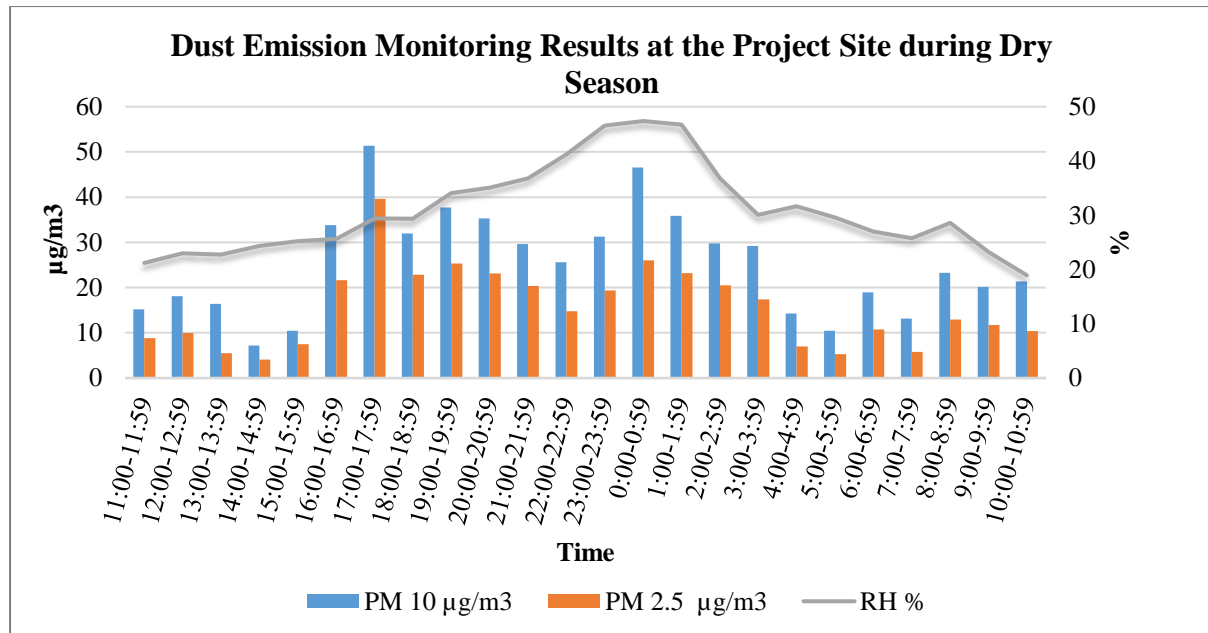


**Figure 5.7 Dust Emission Results at Yangon JR Family Project Site during Wet Season**

Ambient dust quality such as PM<sub>10</sub> and PM<sub>2.5</sub> were measured for 24 hours at project site. During wet season, the result of RH% is quite stable at 100% and both PM<sub>10</sub> and PM<sub>2.5</sub> were high level at 7:00 to 12:00 am and low at the night time under 10 µg/m<sup>3</sup>. In this air quality survey of the

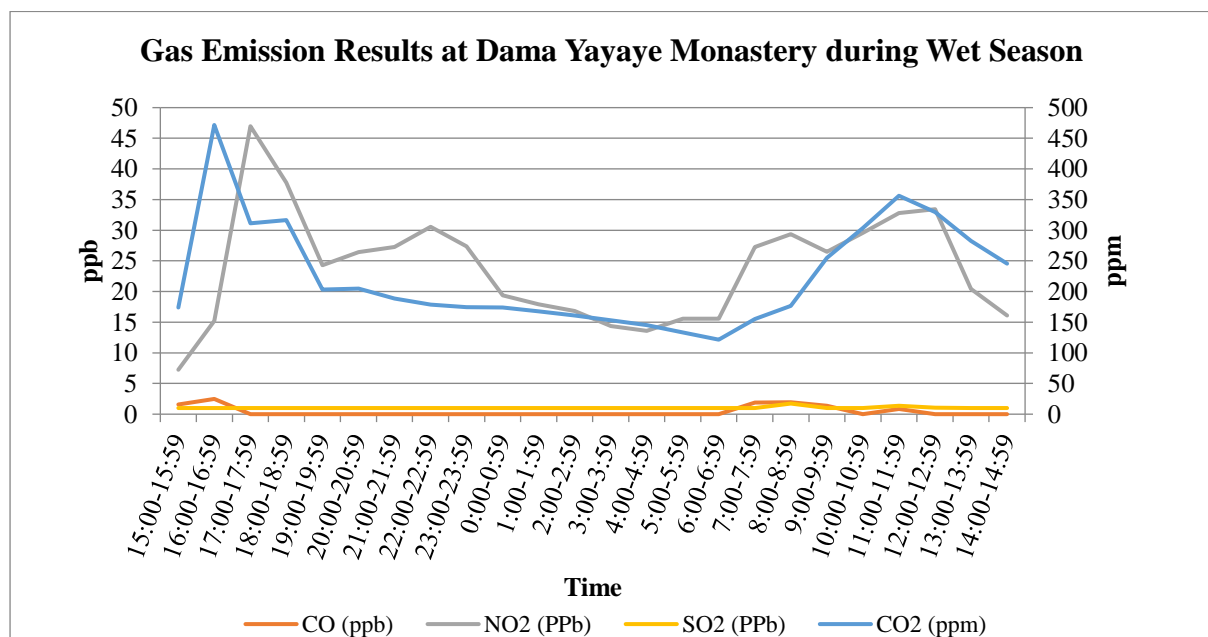


project site, the surveyed results of these particulate matters gathered from EPAS. The results with one-hour interval are shown in the **Figure 5.7**.



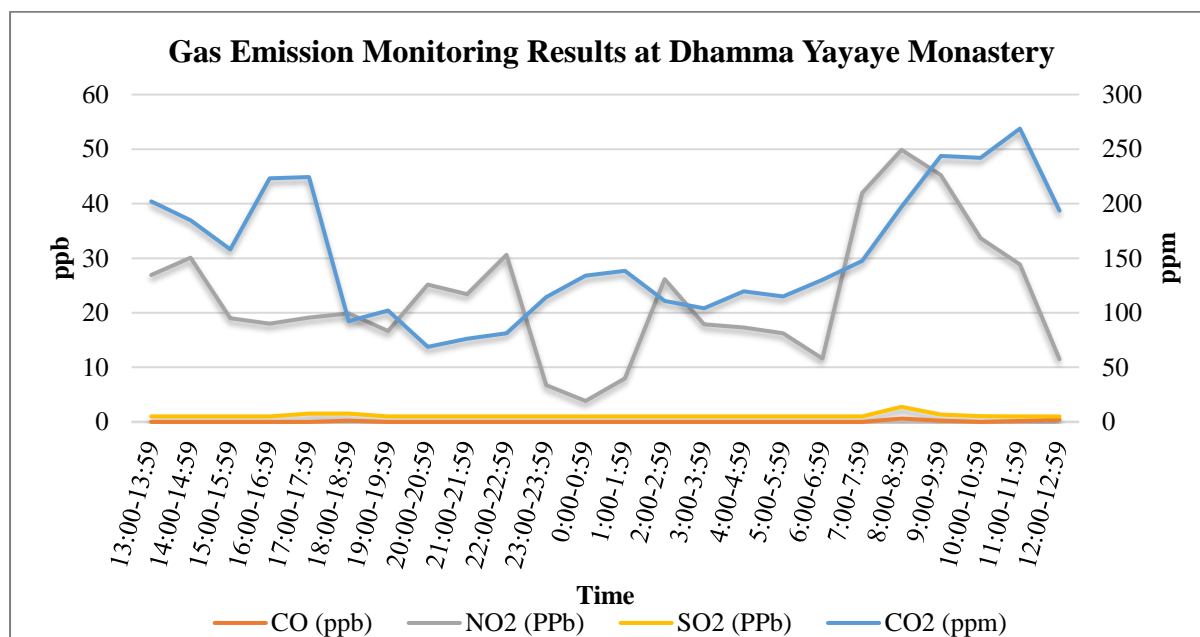
**Figure 5.8 Dust Emission Monitoring Results at Yangon JR Family Project Site during Dry Season**

PM<sub>10</sub> is high over 50 µg/m<sup>3</sup> at 17:00 – 17:59 in the evening and low under 5 µg/m<sup>3</sup> at the 14:00 – 14:59. PM<sub>2.5</sub> is high around 40 µg/m<sup>3</sup> at 17:00 – 17:59 in the evening and low as 7 µg/m<sup>3</sup> at the 14:00 – 14:59 in the dry season at project site. RH % is unlike wet season. RH% is high at night and relatively low at the day time. The maximum RH% was 47.35 at midnight.



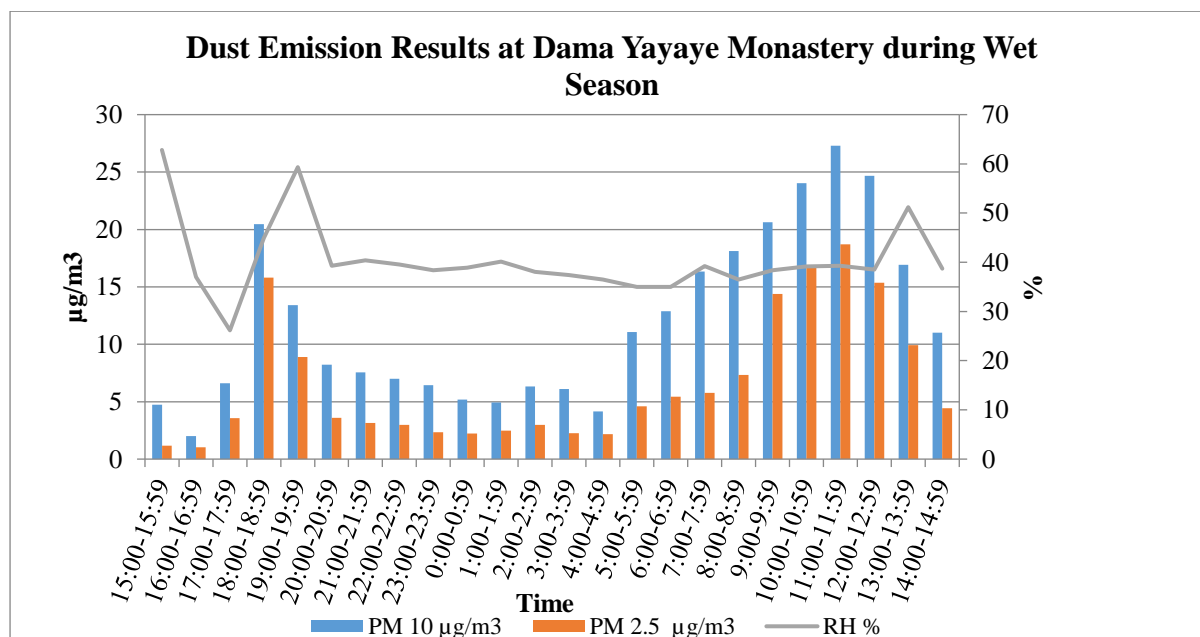
**Figure 5.9 Gas Emission Results at Dhamma Yayaye Monastery during Wet Season**

During wet season, gas emissions of carbon monoxide and sulfur dioxide were quite low around Dhamma Yayaye Monastery. The maximum level of both carbon dioxide and nitrogen dioxide were over 450 ppm in the evening. Carbon dioxide and nitrogen dioxide were low at 120 ppm and 60 ppm respectively.



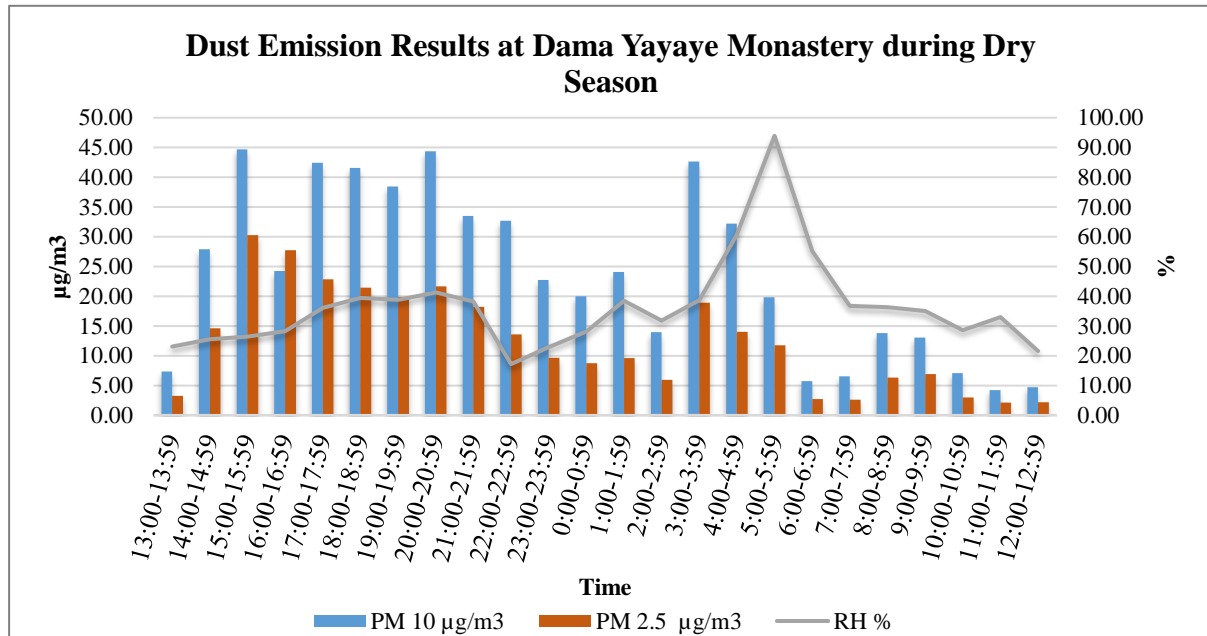
**Figure 5.10 Gas Emission Results at Dhamma Yayaye Monastery during Dry Season**

The maximum level of carbon dioxide was 270 ppm and minimum level was 70 ppm during dry season near Dhamma Yayaye Monastery. The maximum level of nitrogen dioxide was as low as carbon dioxide 250 ppm. Threshold limit values of CO<sub>2</sub> is 5,000 ppm for 8-hour, time-weighted average. Thus, it can be concluded that the existing CO<sub>2</sub> level is acceptable for human health. Carbon monoxide and sulfur dioxide were quite stable at 1 ppm.



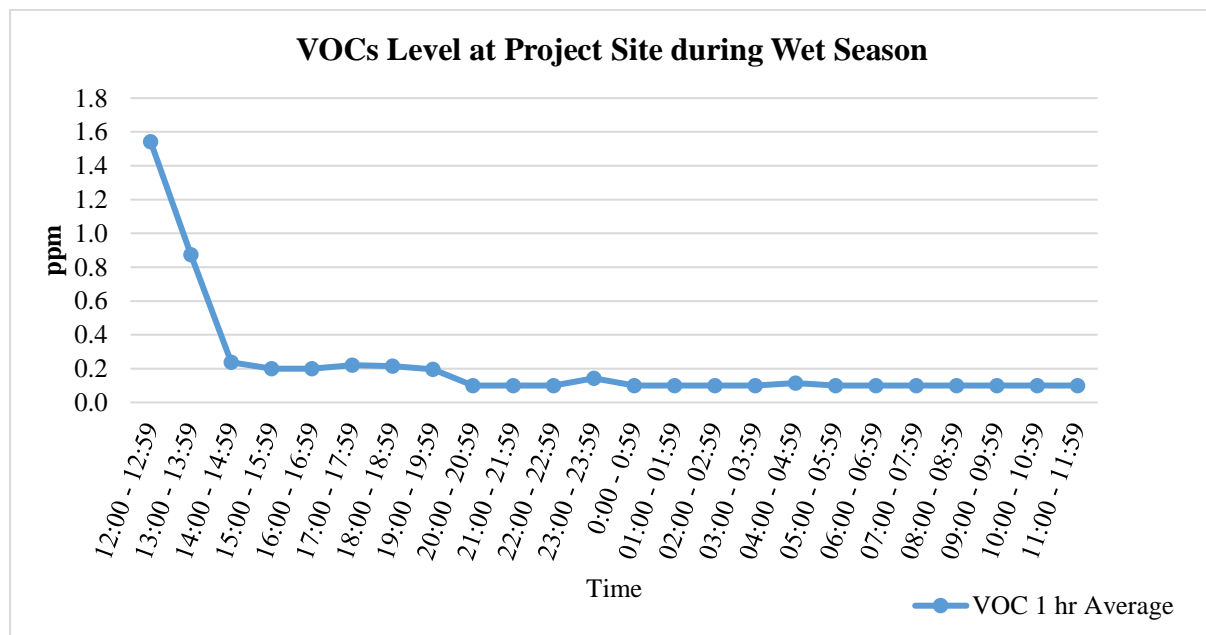
**Figure 5.11 Dust Emission Results at Dhamma Yayaye Monastery during Wet Season**

Ambient dust quality such as PM<sub>10</sub> and PM<sub>2.5</sub> were measured for 24 hours at project site during wet season. Both PM<sub>10</sub> and PM<sub>2.5</sub> were high level at the day time and low at the night time under 10 µg/m<sup>3</sup>. The lowest level of RH% was 11 µg/m<sup>3</sup> at 17:00 -17:59 pm and highest level was over 25 µg/m<sup>3</sup> as shown in **Figure 5.11**.



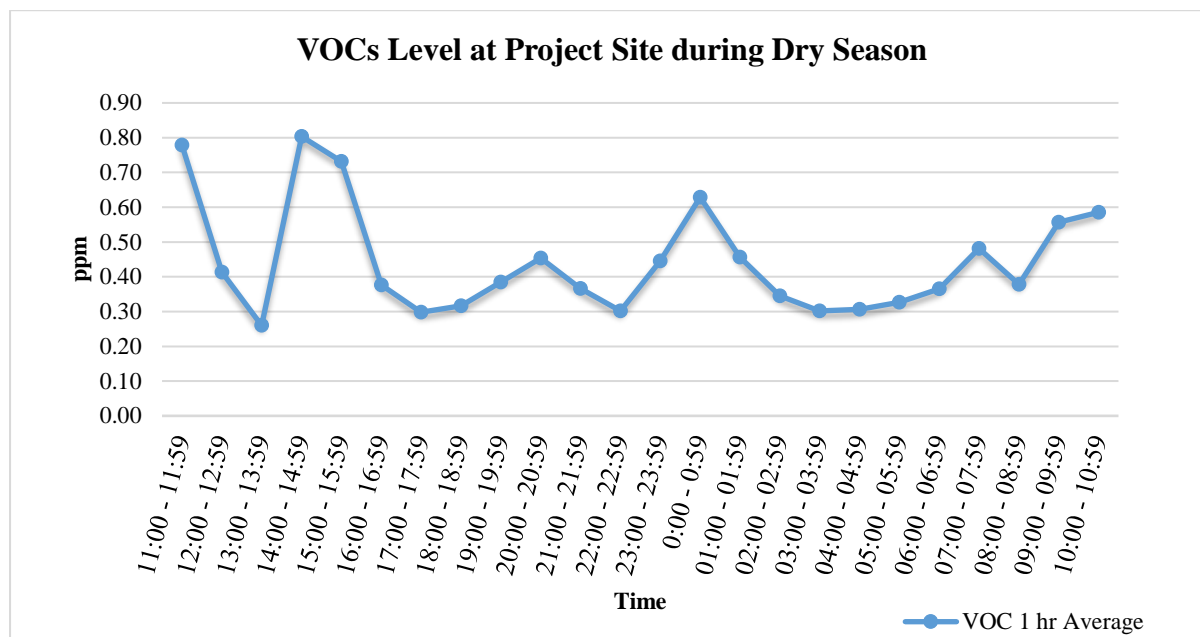
**Figure 5.12 Dust Emission Results at Dhamma Yayaye Monastery during Dry Season**

During dry season at Dama Yayaye Monastery, PM<sub>10</sub> is high over 40 µg/m<sup>3</sup> and low under 5 µg/m<sup>3</sup>. PM<sub>2.5</sub> is high around 30 µg/m<sup>3</sup> at 15:00 – 15:59 pm and low as 5 µg/m<sup>3</sup> at the day time. RH% is high at night around 5:00 – 5:59 and relatively low at the day time. The maximum RH% was 47.35 at midnight. Error! Reference source not found.



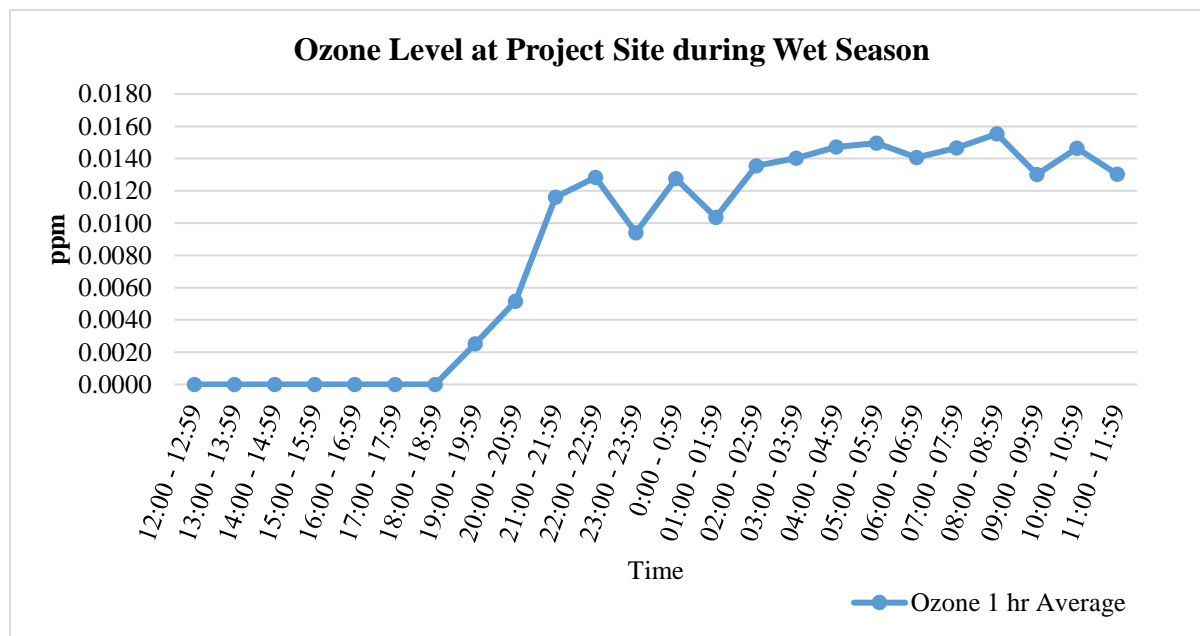
**Figure 5.13 VOCs Level at Project Site during Wet Season**

Volatile Organic Compounds (VOCs) levels were measured for 24 hours at project site during wet season and the maximum level of Volatile Organic Compounds (VOCs) was 1.54 ppm in 12:00 – 12:59. In **Figure 5.13**, the Volatile Organic Compounds (VOCs) level is become low and stable at around 0.2 ppm the whole day since 14:00 – 14:59 pm.



**Figure 5.14 VOC level at Project Site during Dry Season**

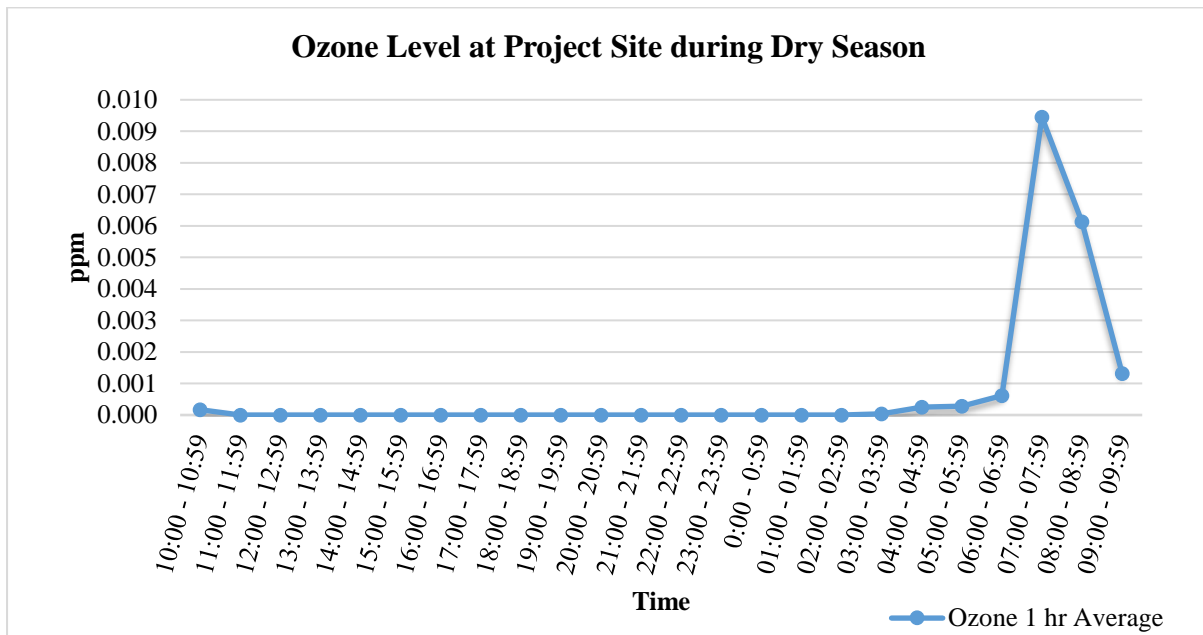
Volatile Organic Compounds (VOCs) levels were measured for 24 hours at project site during dry season. The maximum level of VOCs is 0.8 ppm at 14:00 – 14:59 pm and minimum level is 0.25 ppm in the dry season, as shown in **Figure 5.14**.



**Figure 5.15 Ozone Level at Project Site during Wet Season**

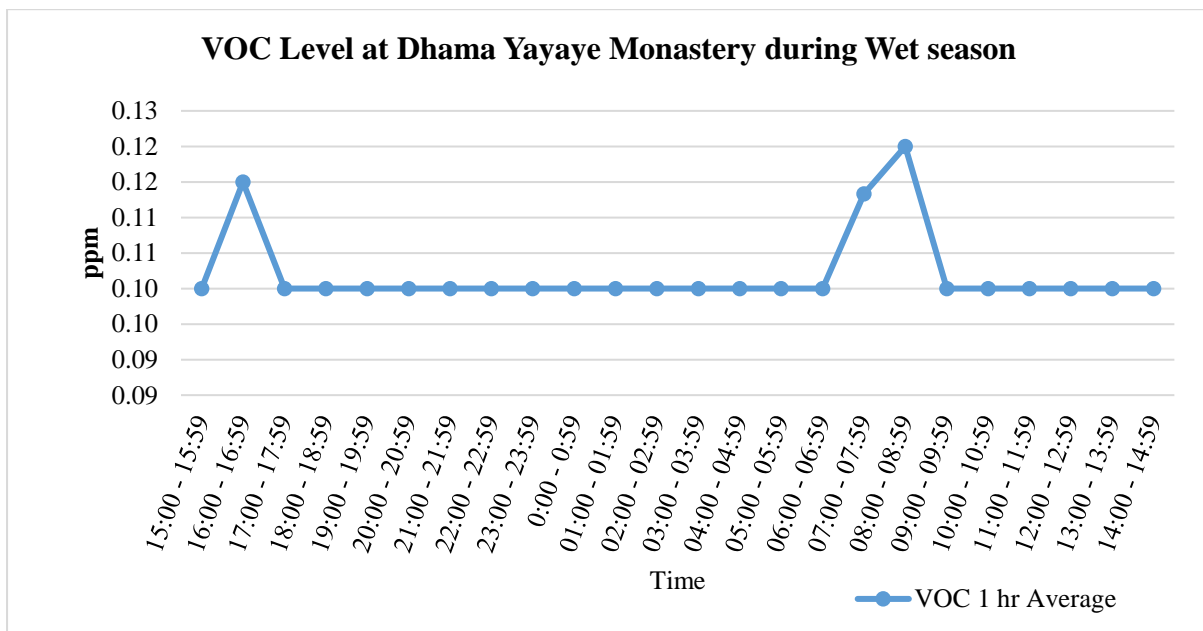
In dry season, Ozone level measured for 24 hours at project site during wet season. Ozone level is stable at 0 ppm in the evening and become a high at 0.0025 ppm. At the level 0.012 ppm,

ozone level start varies in day time. As the intensity of the sunlight decreases, the ozone level also decrease. By late afternoon, most of the ozone formed during the day breaks down into other compounds, and by early evening the ground-level ozone is essentially destroyed.



**Figure 5.16 Ozone Level at Project Site during Dry Season**

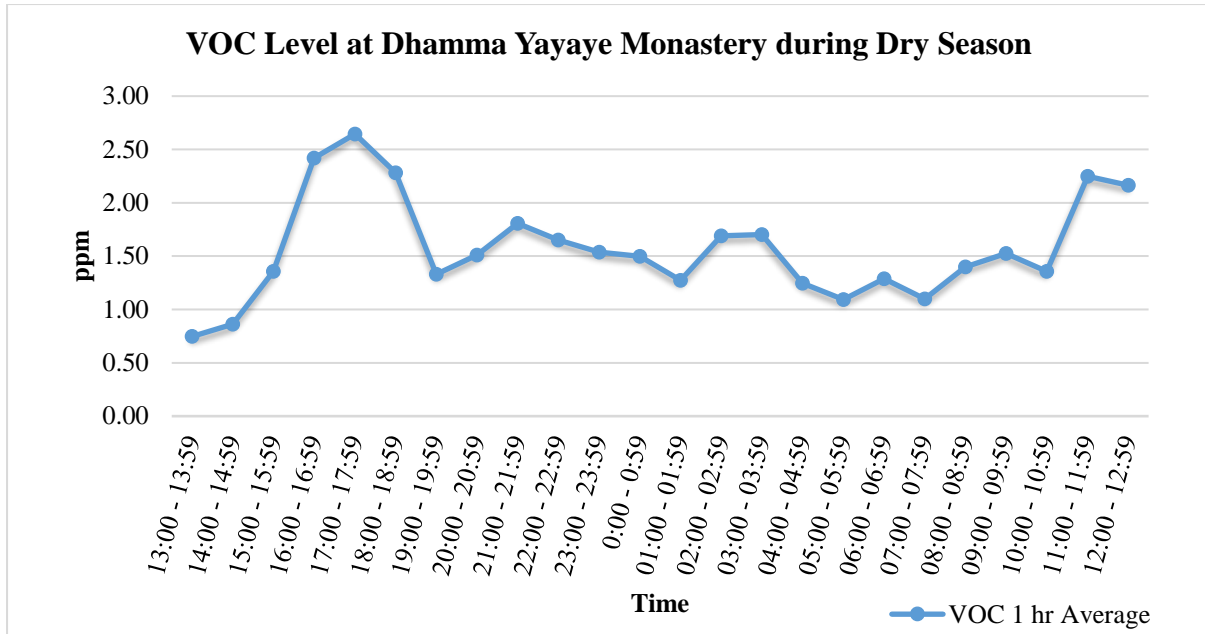
During dry season, ozone level is very low as 0.000 ppm over half day period. The maximum ozone level is 0.0095 ppm at 7:00 – 7:59 am. When night time, solar radiation and temperatures are low ozone is destroyed.



**Figure 5.17 VOC Level at Dhama Yayaye Monastery during Wet Season**

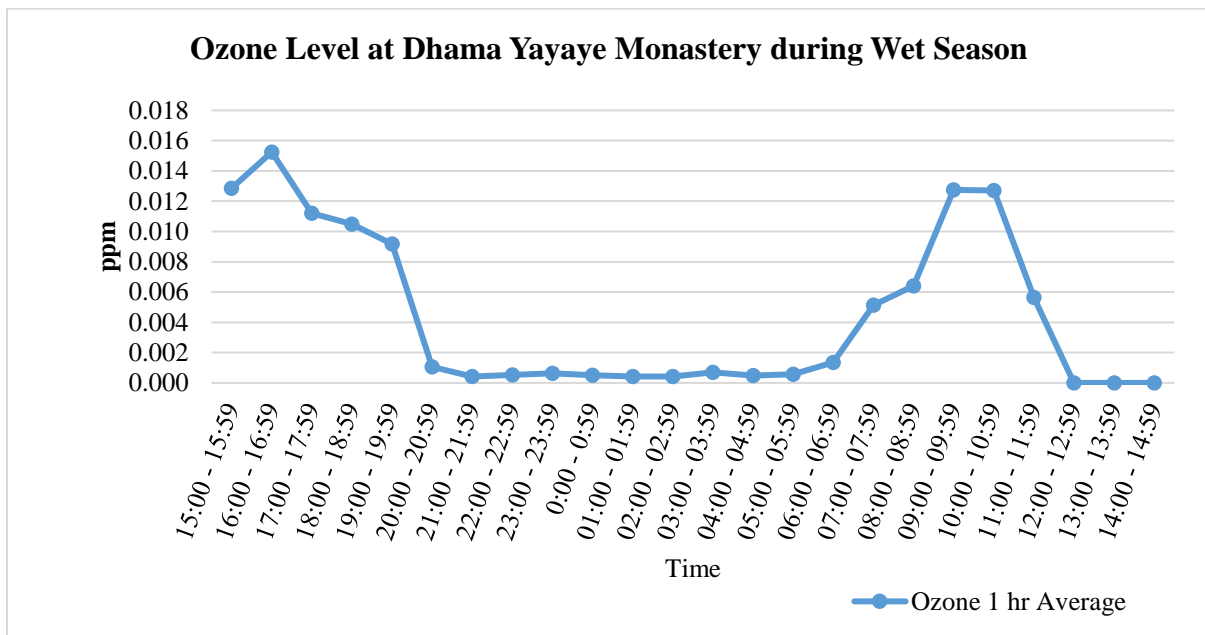
Volatile Organic Compounds (VOCs) measured for 24 hours at project site during wet season. Volatile Organic Compounds (VOCs) is stable at 0.1 ppm nearly the all day. Volatile Organic Compounds (VOCs) level high at 0.12 ppm within permissible limit as in NEQG.





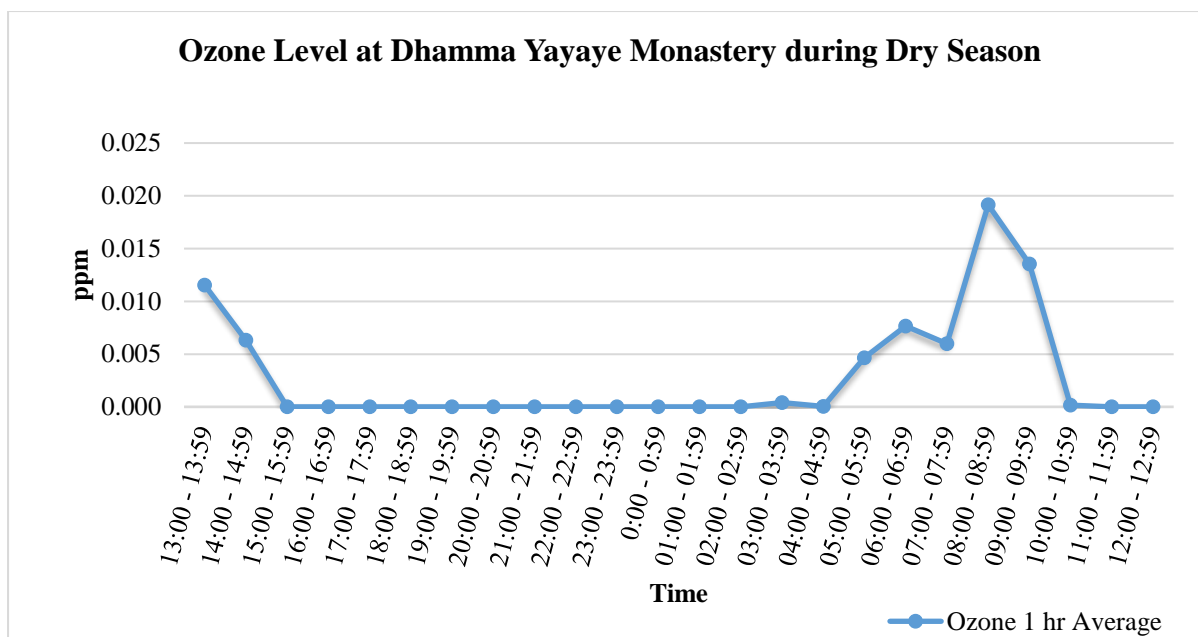
**Figure 5.18 VOC Level at Dhama Yayaye Monastery during Dry Season**

During dry season, VOCs level is low at the 0.75 ppm 13:00 – 13:59 pm. The maximum VOCs level is 2.65 ppm at 17:00 – 17:59 am.



**Figure 5.19 Ozone Level at Dhama Yayaye Monastery during Wet Season**

Ozone level measured for 24 hours at project site during wet season. Ozone level is stable between 0 to 2 ppm in the night time. The maximum level of ozone is 0.0153 ppm at 15:00 – 15:59 pm.



**Figure 5.20 Ozone Level at Dhama Yayaye Monastery during Dry Season**

During dry season, ozone level is very low as 0.000 ppm half day period. The maximum ozone level is 0.0192 ppm at 8:00 – 8:59 am, as shown in **Figure 5.20**.

#### 5.3.1.2 Wind Speed and Wind Direction

The table provided historical information on the wind speed in Hmawbi Township. The rainy season, which runs from June to September, is when the winds are likely to be at their strongest.

**Table 5-6 Wind Speed Rose in Hmawbi Township (2011-2020)**

No.	Year	Wind Speed (mph)									
	Month	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	January	4.9	5.3	4.92	4.85	5.71	5.87	5.83	5.11	5.5	5.42
2	February	5.57	5.17	5.89	5.85	5.98	6.84	5.61	5.42	5.39	6.02
3	March	6.65	6.46	6.7	6.41	7	7.78	6.88	6.67	7.06	7.06
4	April	5.9	7.19	7.49	7.51	8.42	9.08	8.06	7.9	8.12	7.31
5	May	6.05	6.49	7.61	6.98	9.65	8.07	8.11	8.07	8.93	7.93
6	June	8.68	8.68	6.83	7.39	9.07	7.85	7.82	9.51	8.2	7.07
7	July	6.88	7.29	7.02	7.18	10.76	7.66	7.44	9.28	7.49	6.53
8	August	6.69	6.75	6.8	6.26	8.01	7.51	6.61	9.3	7.97	7.02
9	September	6.12	5.6	5.22	5.11	7.09	5.3	5.26	6.23	6.39	5.24
10	October	4.68	4.33	4.76	4.54	5.44	5.05	4.76	4.66	4.54	6.22
11	November	6.52	4.29	5	4.75	6.23	5.8	5.48	5.76	4.8	4.77
12	December	6.61	5.28	5.77	5.77	5.54	5.4	6.1	5.19	5.36	4.56

Source: Weather and Climate - The Global Historical Weather and Climate Data, Hmawbi, Yangon, Myanmar Climate ([tckctck.org](http://tckctck.org))

On August 30-31, 2018 (for wet season) and on November 5-6, 2018 (for dry season), wind direction and speed were monitored at the project site and monastery for Yangon JR. The following subsections, wind rising diagrams, and wind class frequency distribution bar charts provide a summary of the findings. The wind rose's circular shape indicates the direction the

wind came from, and the distance between each “spoke” around the circle indicates how frequently the wind came from that direction.

The different colors of each spoke provide details on the speed, in meters per second (m/s), of the wind from each direction. In the below wind rose diagrams, the wind speed is described as the value greater than 11.10 m/s in cyan, the wind speed in the range of 8.80 m/s to 11.10 m/s in green, 5.70 m/s to 8.80 m/s in blue, 3.60 m/s to 5.70 m/s in red, 2.10 m/s to 3.60 m/s in yellow and 0.5 m/s to 2.10 m/s in grey. For wind class frequency distribution bar charts, each bar shows how often the wind generally blew at that wind speed for each day.

For instance, the wind rise of the project site (wet season) reveals that 21% of the wind came from the Northeast (NE), 17% of the wind came from the Southwest (SW) and Southeast (SE). Thus, it can be inferred that Northeast (NE), Southwest (SW) and Southeast (SE) are the predominant wind directions. The rest of the place at monastery (wet season) of the wind occasionally blew from the Northeast (NE). Dry season, the wind rise of the project site reveals that 12.7% of the wind came from the Southeast (SE) and 7.9% of the wind came from the Southwest (SW). The rest of the place at monastery of the wind blew from the Northeast (NE).

Wind class frequency distribution bar chart of the project site (wet season) shows that the wind blew 4.2% of the time in the day with a speed in calms, 16.7% with a speed between 0.5 m/s to 2.1 m/s, 37.5% with a speed between 2.10 m/s to 3.60 m/s and 3.60 m/s to 5.70 m/s, 4.2% with a speed between 5.70 m/s to 8.80 m/s. At the monastery (wet season), the wind blew 4.2% of the time in the day with a speed in calms, 37.5% with a speed between 0.5 m/s to 2.1 m/s, 25% with a speed between 2.10 m/s to 3.60 m/s and 3.60 m/s to 5.70 m/s, 8.3% with a speed between 5.70 m/s to 8.80 m/s. Dry season, the project site shows that the wind blew 25% of the time in the day with a speed in calms, 54.2% with a speed between 0.5 m/s to 2.1 m/s, 12.5% with a speed between 2.10 m/s to 3.60 m/s and 8.3% with a speed between 3.60 m/s to 5.70 m/s. At the monastery, wind class frequency distribution bar chart with the same as wet season.

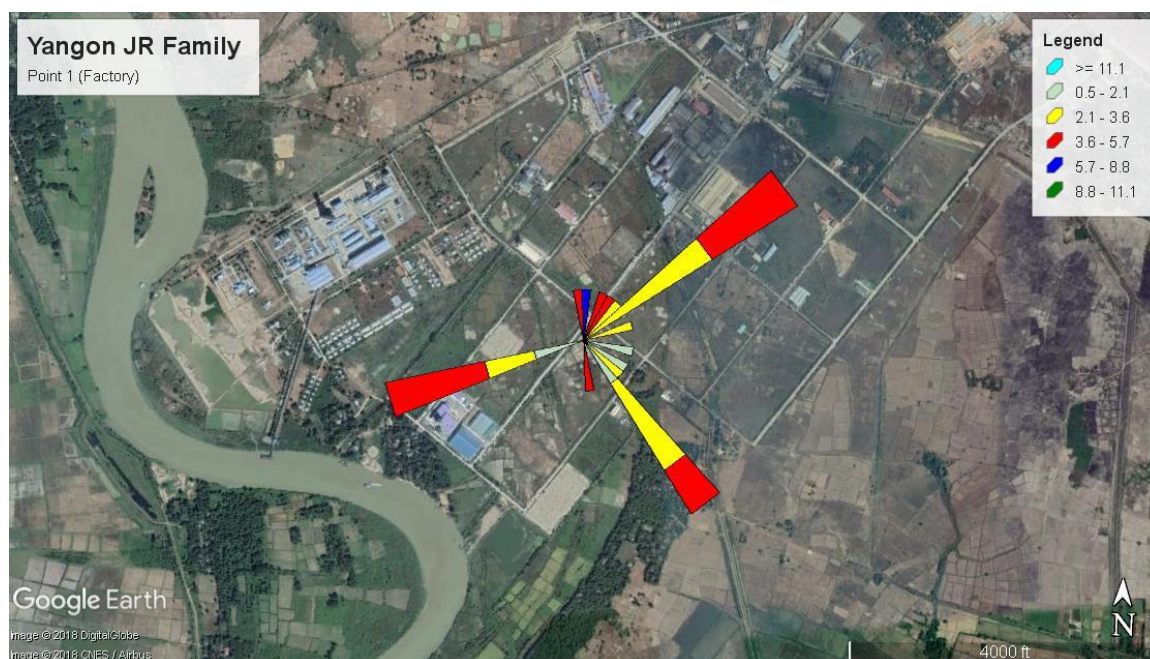
It can, thus, be concluded from the results that, the wind blew mostly from Southwest (SW), Northeast (NE) and Southeast (SE) at the wind speeds at the range of calm to 8.8 m/s.

**Table 5-7 Summarized Survey Results of Wind Speed and Wind Directions**

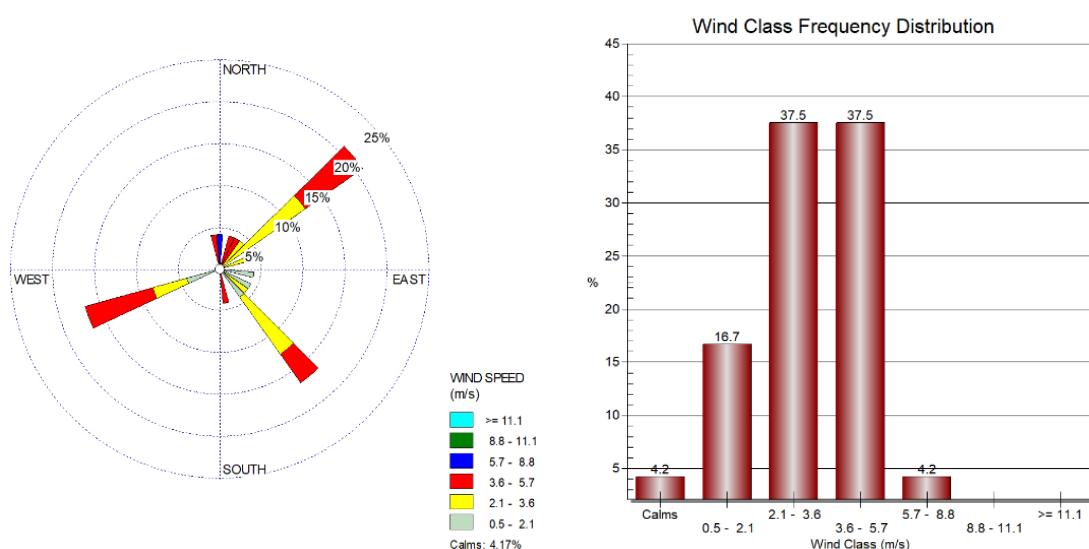
Point	Prevailing Wind Directions with % of the time of the day	Wind Speed (m/s) with % of the time of the day
<b>Wet Season</b>		
Project Site	NE (21%), SE (17%), NW (17%)	Calms (4.2 %), 0.5 m/s – 2.1 m/s (16.7%), 2.1 m/s – 3.6 m/s & 3.60 m/s - 5.70 m/s (37.5 %), 5.70 m/s – 8.8 m/s (4.2 %)
Monastery	NE (21%)	Calms (4.2 %), 0.5 m/s – 2.1 m/s (37.5 %), 2.1 m/s – 3.6 m/s & 3.60 m/s - 5.70 m/s (25 %), 5.70 m/s – 8.8 m/s (8.3 %)
<b>Dry Season</b>		

Project Site	SW (7.9 %), SE (12.7 %)	Calms (25 %), 0.5 m/s – 2.1 m/s (54.2 %), 2.1 m/s – 3.6 m/s (12.5 %), 3.60 m/s - 5.70 m/s (8.3 %)
Monastery	NE (21%)	Calms (4.2 %), 0.5 m/s – 2.1 m/s (37.5 %), 2.1 m/s – 3.6 m/s & 3.60 m/s - 5.70 (25 %), 5.70 m/s – 8.8 m/s (8.3 %)

The following figures describe the wind speed, wind direction and wind class frequency distribution of the proposed project site as source and nearest monastery as the receptor on, 30<sup>th</sup> to 31<sup>st</sup> August 2018.

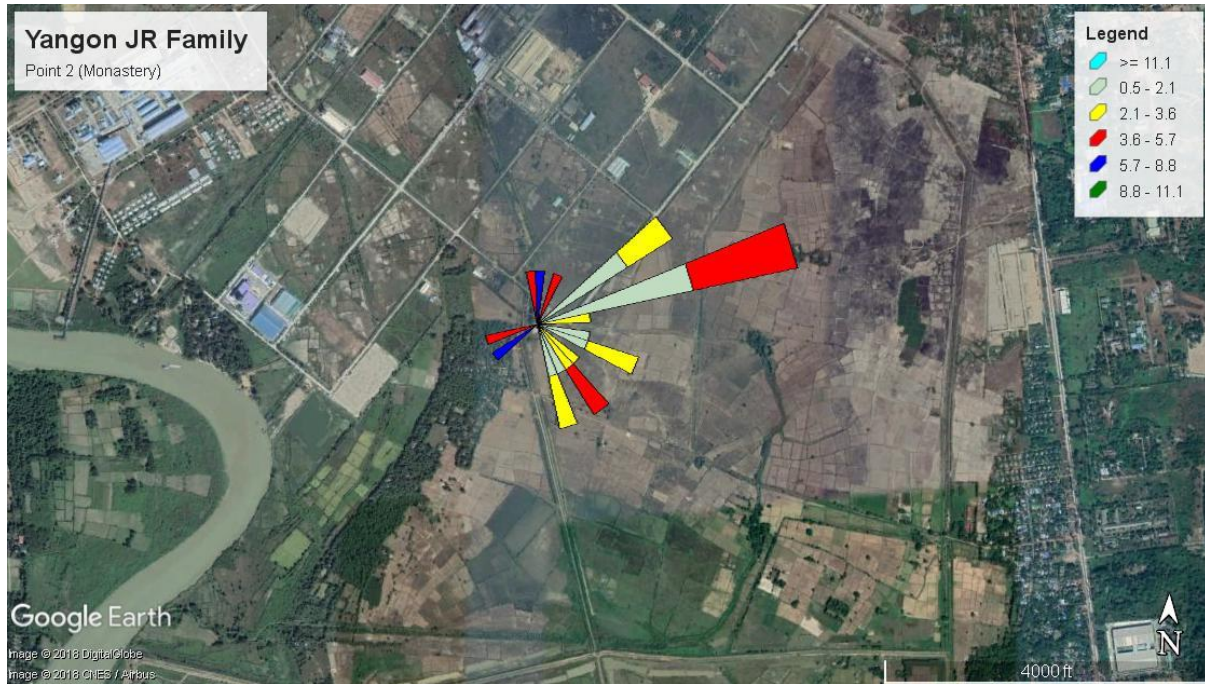


**Figure 5.21 Wind Speed and Wind Direction (Blowing from) at Project Site during Wet Season**

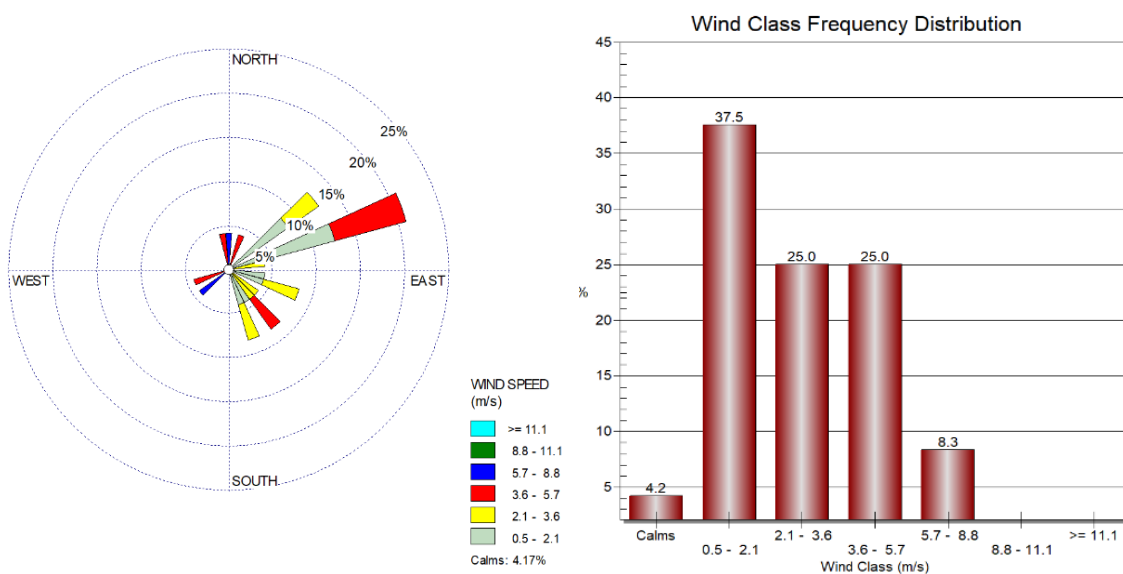


**Figure 5.22 Wind Speed Data and Wind Class Frequency Distribution at Project Site during Wet Season**





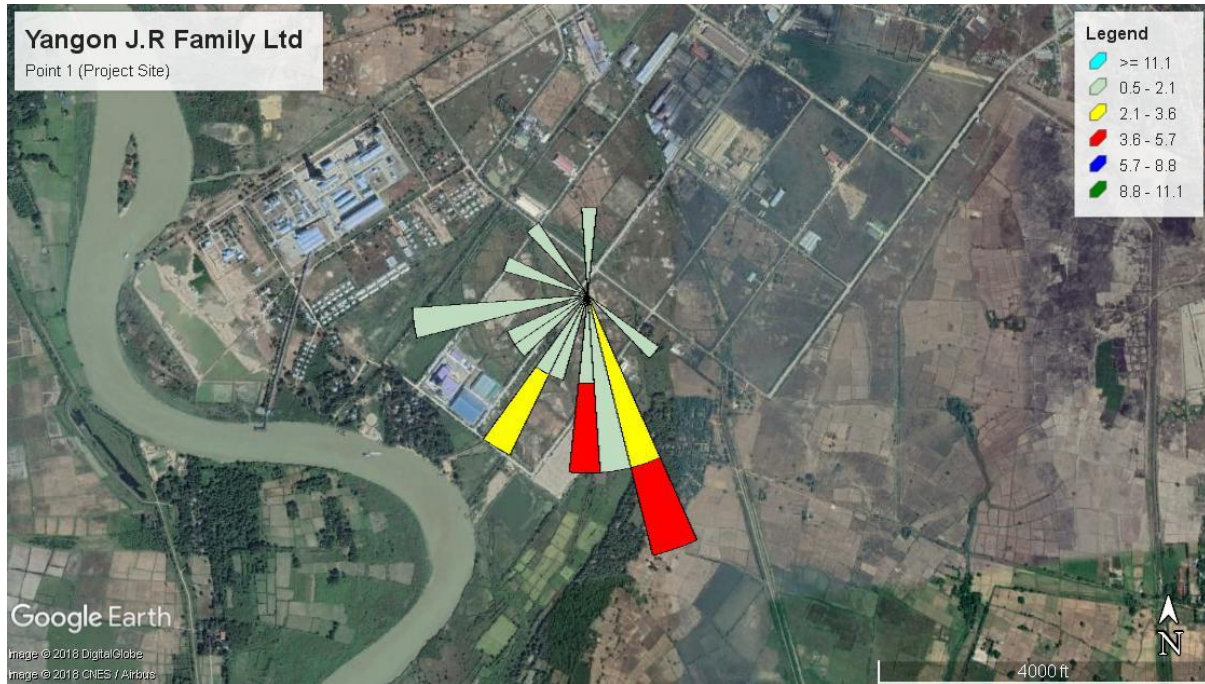
**Figure 5.23 Wind Speed and Wind Direction (Blowing from) at Monastery during Wet Season**



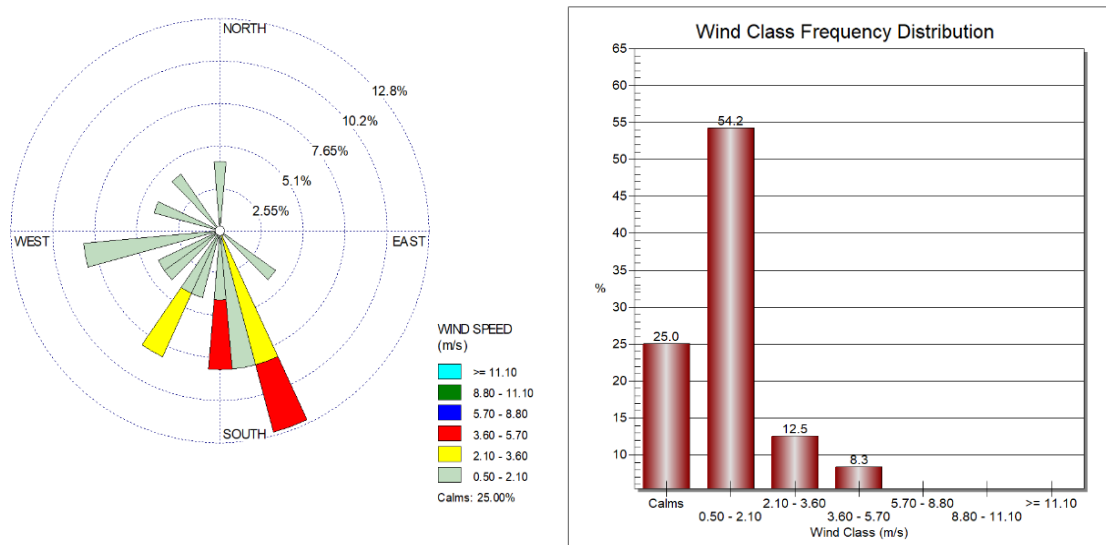
**Figure 5.24 Wind Speed Data and Wind Class Frequency Distribution at Monastery during Wet Season**

The following figures describe the wind speed, wind direction and wind class frequency distribution of the proposed project site as source and nearest monastery as the receptor on 5<sup>th</sup> to 6<sup>th</sup> November 2018.

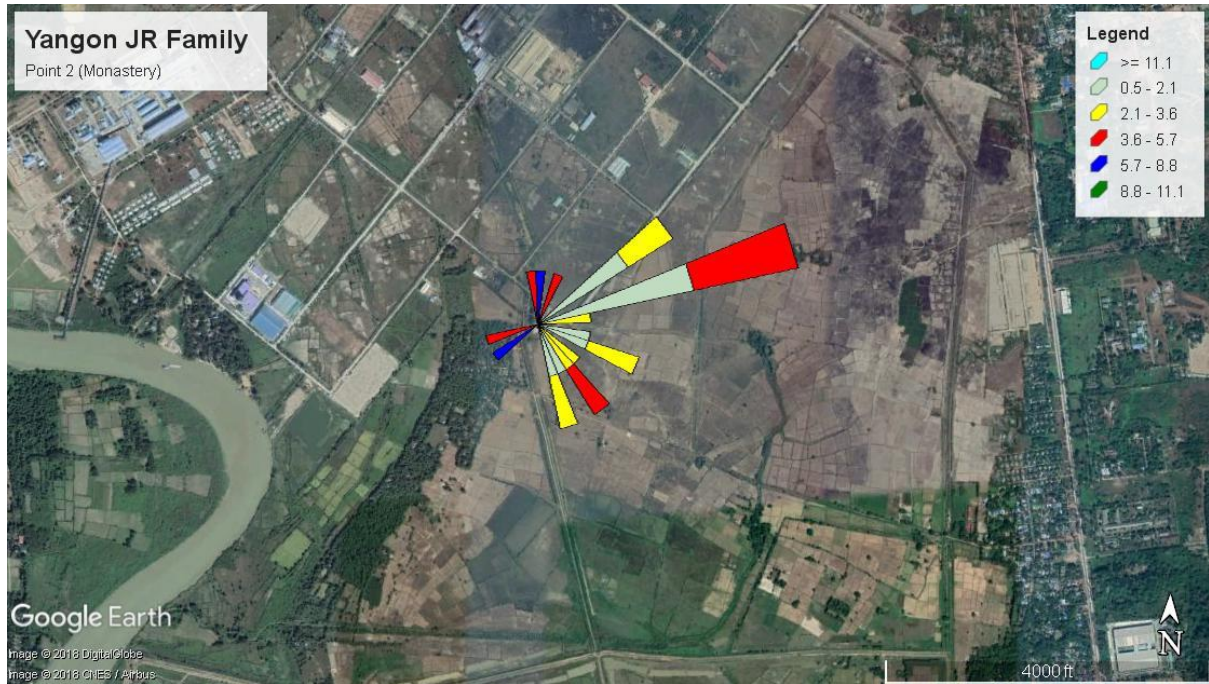




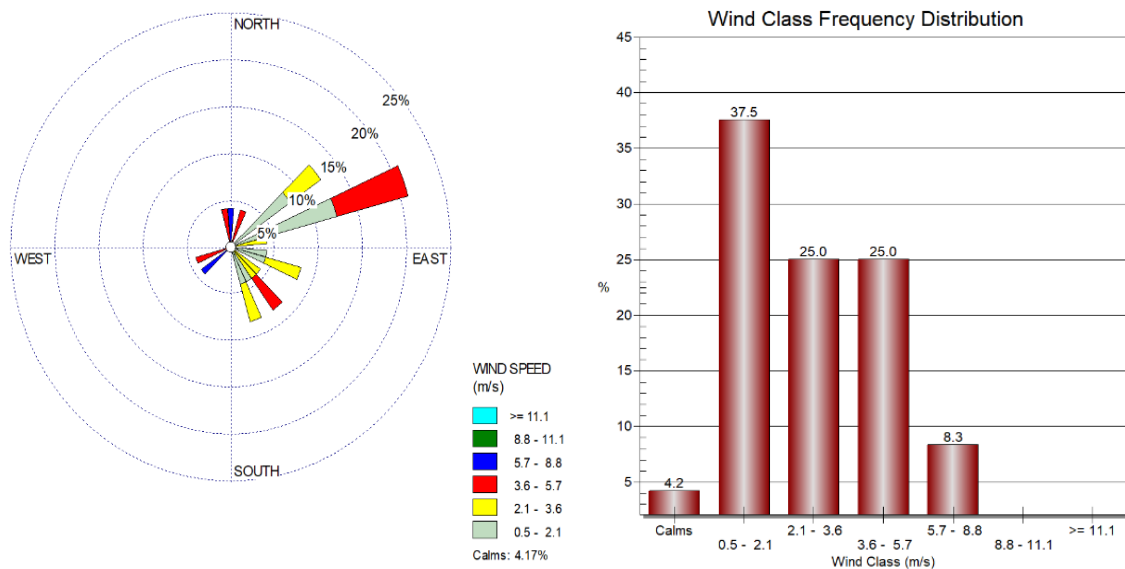
**Figure 5.25 Wind Speed and Wind Direction (Blowing from) at the Project Site during Dry Season**



**Figure 5.26 Wind Speed Data and Wind Class Frequency Distribution at Project Site during Dry Season**



**Figure 5.27 Wind Speed and Wind Direction (Blowing from) at Monastery during Dry Season**



**Figure 5.28 Wind Speed Data and Wind Class Frequency Distribution at Monastery during Dry Season**



### Wet Season



### Dry Season



Air Quality Survey Point 1  
(at the Project Site)



Air Quality Survey Point 2  
(at Dhamma Yayaye Monastery)

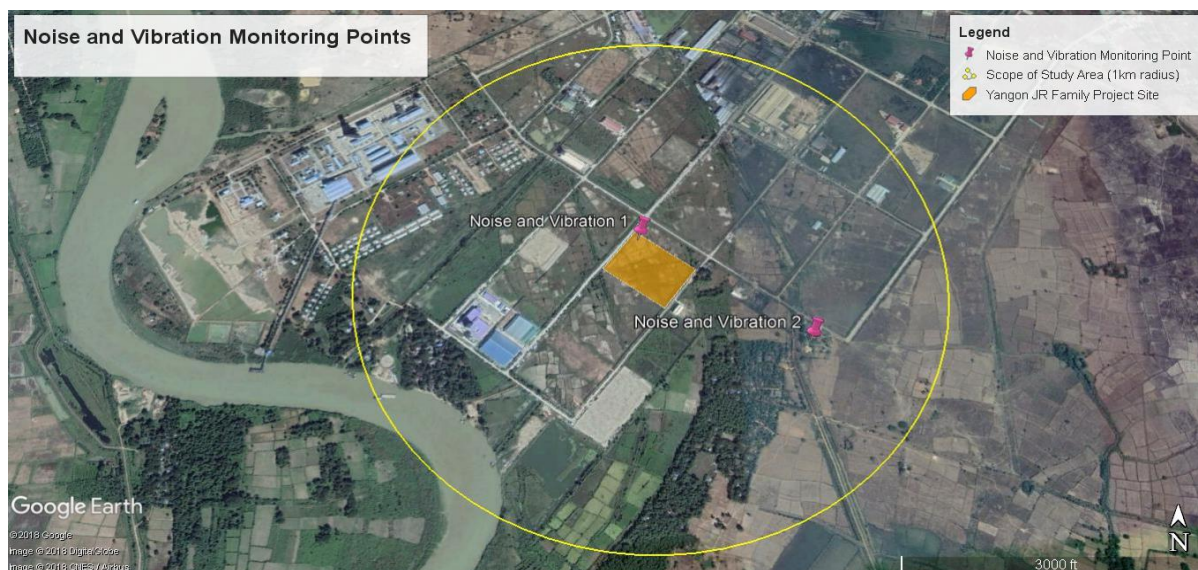
**Photo 5-1 Baseline Air Quality Monitoring at Yangon JR Family and Dhamma Yayaye Monastery**

#### 5.3.1.3 Noise and Vibration

Noise and vibration levels were measured at same points of air quality measurement at the same time for two seasons as shown in **Figure 5.29**. The environmental noise quality at sites was recorded using Digital Sound Level Meter. Measurement range of the noise measuring unit is 20-130 dBA. The environmental noise quality was recorded at every 1 minute for 24 hours. Hourly averaged noise levels are shown in **Table 5-8** below in energy weighted values in day and night time average. All noise levels at project site meet the NEQG Guidelines but background noise level at the receptor (Dhamma Yayaye Monastery) exceeds the standard for residential area due to the usage of loud speaker at the traditional ceremony.

Vibration measurement includes data analysis and test services to minimize environmental impacts. In order to find out the vibration at the pre-construction phase, vibration measurement was measured to get the baseline data for the project. **Table 5-9** shows the results of vibration studies for two locations as source and receptor, at the proposed project site and Dhamma Yayaye Monestry receptively. As the Environmental Quality Emission Guidelines (NEQG)

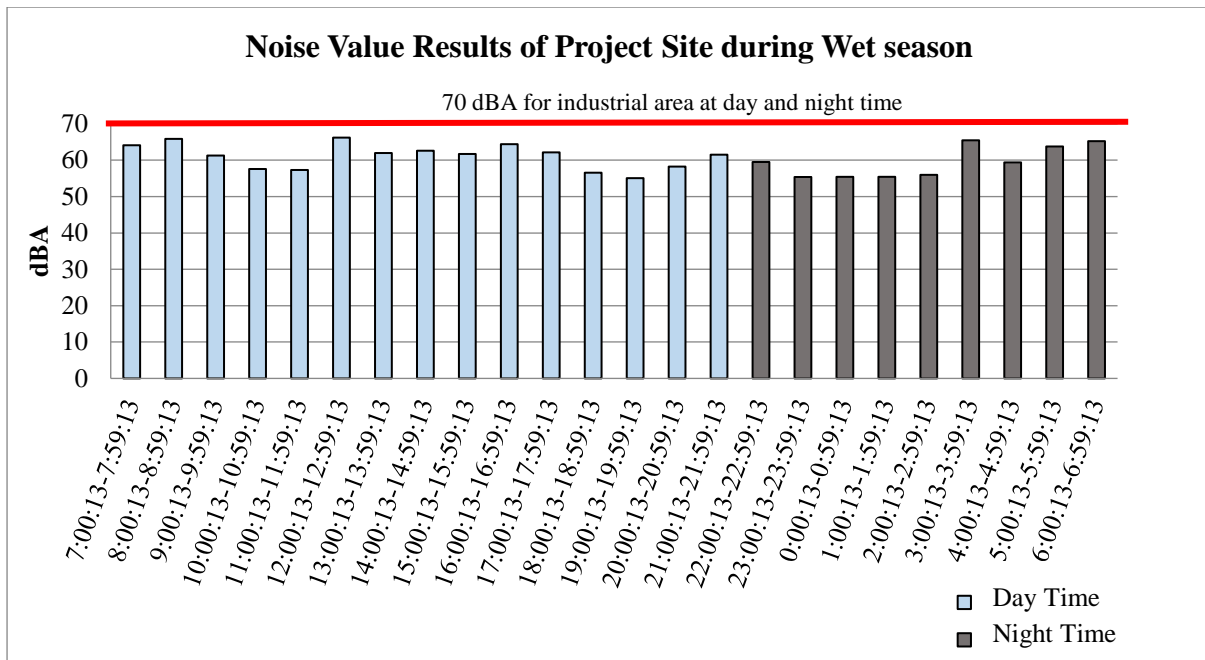
Myanmar does not specify the standard for vibration, the vibration standards for Japan developed by Ministry of Environmental was referred as regulatory standards for this study.



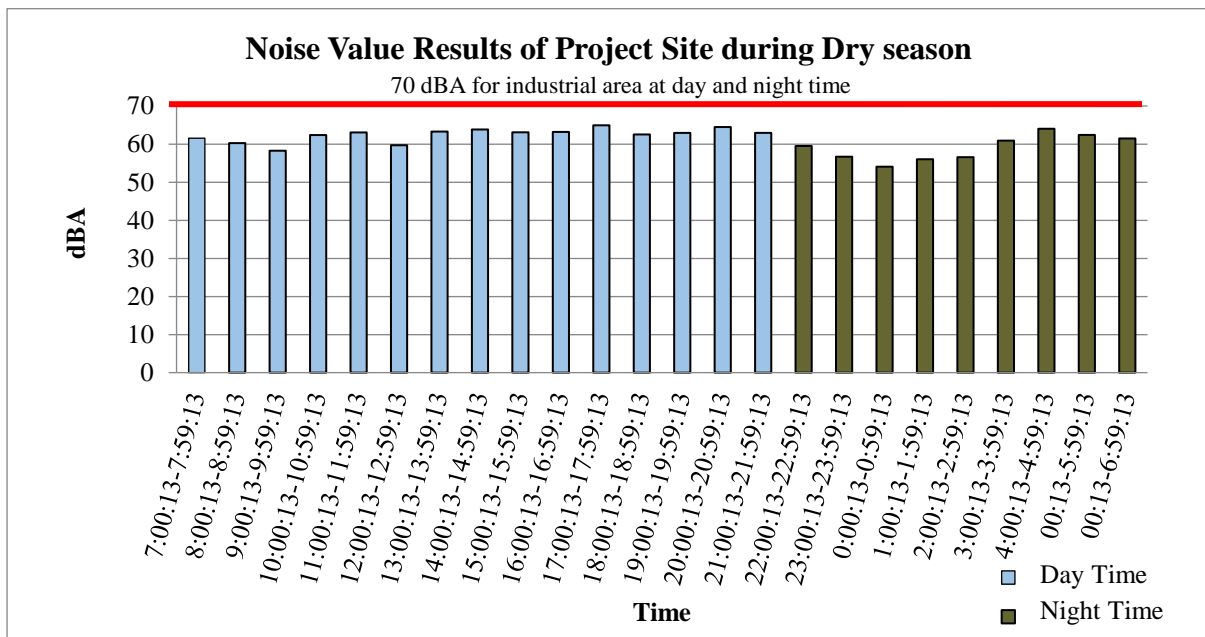
**Figure 5.29 Location of Noise and Vibration Points**

**Table 5-8 Summary of Noise Survey**

Location	Season	Measured Values (dB(A))	
		Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Yangon JR Family	Wet Season	61.10	59.51
	Dry Season	62.43	59.08
Dhamma Yayaye Monastery	Wet Season	<b>58.27</b>	<b>56.70</b>
	Dry Season	<b>59.26</b>	<b>55.72</b>
Applicable Standard Value: NEQEG Guideline	Source	<b>70</b>	<b>70</b>
	Receptor	<b>55</b>	<b>45</b>

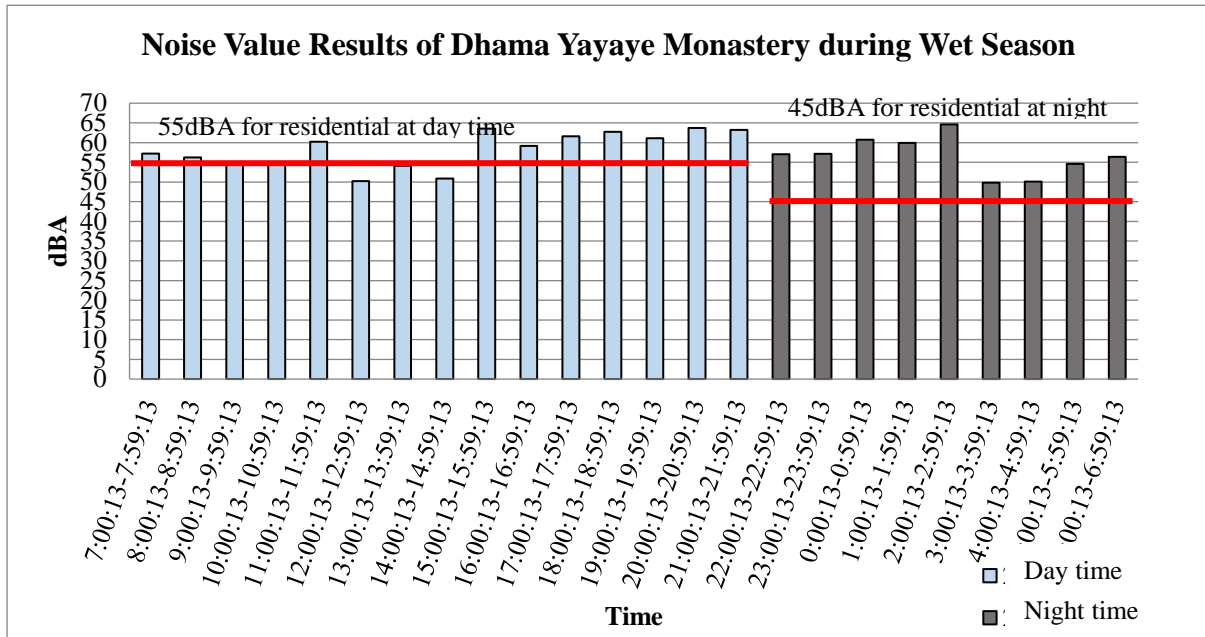


**Figure 5.30 Day and Night time Noise Data at Project Site during Wet Season**

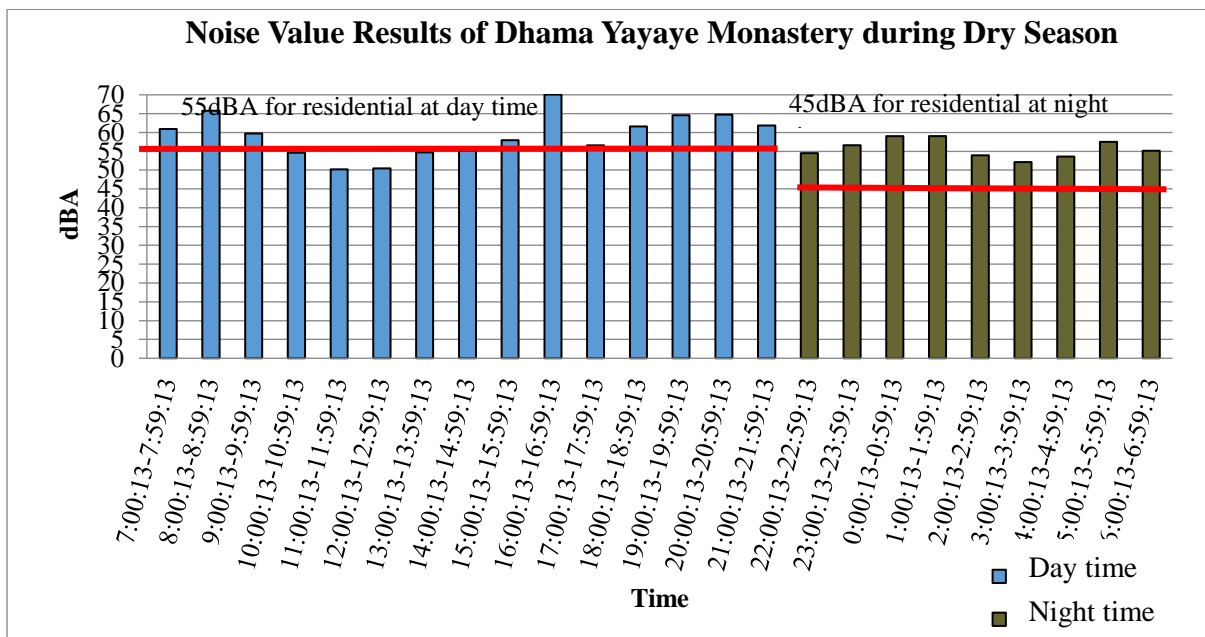


**Figure 5.31 Day and Night time Noise Data at Project Site during Dry Season**





**Figure 5.32 Day and Night Time Noise Data at Monastery during Wet Season**



**Figure 5.33 Day and Night Time Noise Data at Monastery during Dry Season**

**Wet Season**

**Dry Season**


Noise Testing Point 1  
(at the Project Site)

Noise Testing Point 2  
(at Dhamma Yayaye Monastery)

**Photo 5-2 Baseline Noise Survey at Yangon JR Family and Dhamma Yayaye Monastery**

**Table 5-9 Summary of Vibration Survey**

Location	Season	X-Lveq (dB)		Y-Lveq (dB)		Z-Lveq (dB)	
		Day Time 7:00- 22:00	Night Time 22:00- 6:00	Day Time 6:00- 22:00	Night Time 22:00- 6:00	Day Time 6:00- 22:00	Night Time 22:00- 6:00
Point-1 Yangon JR Family	Wet Season	37	35	37	35	38	36
	Dry Season	36	30	35	30	39	29
Point-2 Dhamma Yayaye Monastery	Wet Season	39	39	38	37	35	33
	Dry Season	39	31	39	31	44	39

**Table 5-10 Regulatory Standards for Vibration Emitted from Specified Factories  
(Summary)**

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



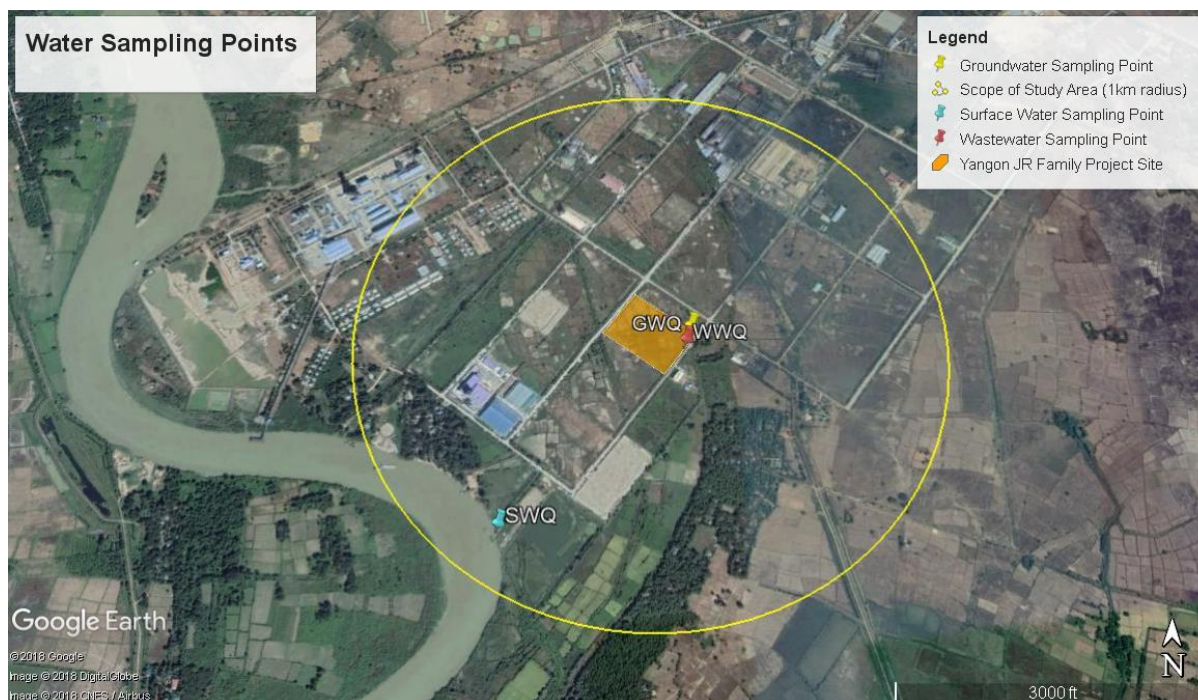
**Photo 5-3 Baseline Vibration Survey at Proposed Project Site**

#### *5.3.1.4 Water Quality*

The reason for sampling baseline water quality is to examine and predict the pollution by construction and operation activities. To measure and analyze such as **Physical Parameters:** TSS, Temperature, Color, Turbidity, Total Coliform Count, **Chemical Parameters:** COD, BOD, pH, Dissolved Oxygen, Oil and Grease, **Nutrients:** Total Nitrogen, Total Phosphorus, Chloride, **Metals:** Ar, Cd, Cr, Zn, Mn, Fe, water samples were collected according to SOP of E Guard and send to the above-mentioned laboratories in Yangon. The analysis results are shown in **Table 5-11**, **Table 5-12** and **Table 5-13**. The report of lab analysis indicated that all BOD and COD data meet the standard but values of total suspended solids at three water samples exceed standard value.

Water quality sampling was carried out at the designated sites for three locations: tube well that is at the project site for ground water, wastewater canal where is in front of the project site

for wastewater and Hlaing River for the surface water. The wet (rainy) season data was collected on September, 2018 and the dry season data was collected on November, 2018.



**Figure 5.34 Location of Water Sampling Points**

**Table 5-11 Ground Water Quality results at Yangon J.R Family Project Site**

No.	Parameters	Unit	Water Quality Results	NDWQS
<b>Laboratory Finding (Ground Water at Yangon JR Family Project Site during Wet Season)</b>				
1	pH	pH	7.5	6.5 to 8.5
2	Color	TCU	90	15
3	Turbidity	NTU	133	5
4	Iron	mg/l	7.5	1
5	Chloride	mg/l	7	250
6	Manganese	mg/l	1.76	0
7	Total suspended Solids	mg/l	140	35
8	Chemical Oxygen Demand	mg/l	32	n/a
9	Biochemical Oxygen Demand	mg/l	8	n/a
10	Oil and Grease	mg/l	<5	5
11	Total Coliform Count	CFU/100ml	3	0.05
12	Total Phosphorus	mg/l	0.372	0.01
13	Total Nitrogen	mg/l	1.3	n/a
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	9.3	n/a
16	Arsenic	mg/l	0.03	0.01
17	Chromium	mg/l as CaCO <sub>3</sub>	0.24	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0.11	0.003
Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)				



<b>Laboratory Finding (Ground Water at Yangon JR Family Project Site during Dry Season)</b>				
1	pH (Lab Result)	pH	6.9	6-9
2	Color	TCU	180	15
3	Turbidity	NTU	78.1	5
4	Iron	mg/l	9.8	0.3
5	Chloride	mg/l	5	n/a
6	Manganese	mg/l	1.01	0.05
7	Total suspended Solids	mg/l	372	35
8	Chemical Oxygen Demand	mg/l	32	n/a
9	Biochemical Oxygen Demand	mg/l	4	n/a
10	Oil and Grease	mg/l	<5	5
11	Total Coliform Count	CFU/100ml	0	0.05
12	Total Phosphorus	mg/l	0.272	0.01
13	Total Nitrogen	mg/l	2.3	n/a
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	5.8	n/a
16	Arsenic	mg/l	0.08	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.46	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
19	Dissolved Solids	mg/l	96	n/a
<i>Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Nov, 2018)</i>				



**Photo 5-4 Ground Water Sampling at Yangon JR Family**



**Table 5-12 Water Quality Result at Hlaing River Water near Project Site**

No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
<b>Laboratory Finding (Hlaing River Water near Project Site during Wet Season)</b>				
1	pH	pH	7.5	6-9
2	Color	TCU	150	15
3	Turbidity	NTU	295	5
4	Iron	mg/l	5.8	0.3
5	Chloride	mg/l	4	250
6	Manganese	mg/l	1.76	0.05
7	Total suspended Solids	mg/l	125	35
8	Chemical Oxygen Demand	mg/l	64	250
9	Biochemical Oxygen Demand	mg/l	18	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	20	400
12	Total Phosphorus	mg/l	0.06	0.01
13	Zinc	mg/l	Nil	3
14	Total Nitrogen	mg/l	3.1	n/a
15	Dissolved Oxygen	mg/l	8.1	n/a
16	Arsenic	mg/l	0.03	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.24	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0.11	0.003
19	Dissolved Solids	mg/l	388	1000
<i>Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)</i>				
<b>Laboratory Finding (Hlaing River Water near Project Site during Dry Season)</b>				
1	pH	pH	7.1	6-9
2	Color	TCU	300	15
3	Turbidity	NTU	281	5
4	Iron	mg/l	8.6	0.3
5	Chloride	mg/l	4	250
6	Manganese	mg/l	0.84	0.05
7	Total suspended Solids	mg/l	650	35
8	Chemical Oxygen Demand	mg/l	96	250
9	Biochemical Oxygen Demand	mg/l	30	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	0	400
12	Total Phosphorus	mg/l	0.038	0.01
13	Zinc	mg/l	Nil	3
14	Total Nitrogen	mg/l	3.4	n/a
15	Dissolved Oxygen	mg/l	55	n/a
16	Arsenic	mg/l	0.01	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.49	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
19	Dissolved Solids	mg/l	109	1000
<i>Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Nov, 2018)</i>				



**Photo 5-5 River Water Sampling**

**Table 5-13 Wastewater Quality Results near Yangon J.R Family Project Site**

No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
<b>Laboratory Finding (Wastewater near Yangon JR Family Project Site during Wet Season)</b>				
1	pH	pH	7.1	6-9
2	Color	TCU	80	15
3	Turbidity	NTU	120	5
4	Iron	mg/l	5.4	0.3
5	Chloride	mg/l	5	250
6	Manganese	mg/l	0.8	0.05
7	Total suspended Solids	mg/l	125	35
8	Chemical Oxygen Demand	mg/l	96	250
9	Biochemical Oxygen Demand	mg/l	28	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	12	400
12	Total Phosphorus	mg/l	0.372	2
13	Total Nitrogen	mg/l	3.2	30
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	7.1	n/a
14	Arsenic	mg/l	0.008	0.01
15	Chromium	mg/l as CaCO <sub>3</sub>	0.23	0.05
16	Cadmium	mg/l as CaCO <sub>3</sub>	0.087	0.003
17	Lead	mg/l	Nil	0.2
<i>Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)</i>				
<b>Laboratory Finding (Wastewater near Yangon JR Family Project Site during Dry Season)</b>				
1	pH	pH	7.1	6-9
2	Color	TCU	400	15
3	Turbidity	NTU	1000	5
4	Iron	mg/l	8.9	0.3

No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
5	Chloride	mg/l	6	250
6	Manganese	mg/l	2.73	0.05
7	Total suspended Solids	mg/l	820	35
8	Chemical Oxygen Demand	mg/l	128	250
9	Biochemical Oxygen Demand	mg/l	48	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	16	400
12	Total Phosphorus	mg/l	0.054	2
13	Total Nitrogen	mg/l	4.7	30
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	4.7	n/a
14	Arsenic	mg/l	0.03	0.01
15	Chromium	mg/l as CaCO <sub>3</sub>	0.38	0.05
16	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
17	Lead	mg/l	Nil	0.2
18	Dissolved Solids	mg/l	138	1000
<i>Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Nov, 2018)</i>				



**Photo 5-6 Wastewater Sampling**

#### 5.3.1.5 Soil Quality

The reason for sampling baseline soil quality is to examine the baseline quality of soil and to record as baseline data that can be compared with the monitoring result of soil quality in future. As there is no guideline for soil in National Emission Quality Guidelines (NEQG), the results of some parameters were compared with Thailand Environmental Standard (not for habitat or agriculture) which topography is similar to Myanmar. According to the lab result, soil pH level is strongly acid and water-soluble Cl<sup>-</sup> is low. The soil of Myaung Da Gar industrial area was used for agricultural practices before establishing industrial zone.

**Table 5-14 Soil Results of Proposed Project Site**

No.	Parameters	Unit	Value	Guidelines Thailand (not for habitat or agriculture)
1	pH		5.05	-
2	Water Soluble Cl <sup>-</sup>	mmol/100g	0.13	-
3	Zinc	ppm	3.44	-
4	Copper	ppm	4.51	-
5	Manganese	ppm	285.00	32,000
6	Iron	ppm	386.21	-
7	Lead	ppm	9.45	750

Source: Thailand: Notification of National Environmental Board No. 25


**Photo 5-7 Soil Sampling**

### 5.3.2 Climate and Meteorology

Yangon has a tropical monsoon climate under the Koppen climate classification system. The city typically experiences distinct rainy season from the month of May through to October when a substantial amount of precipitation occurs; and dry season which commences from November and ends in April.

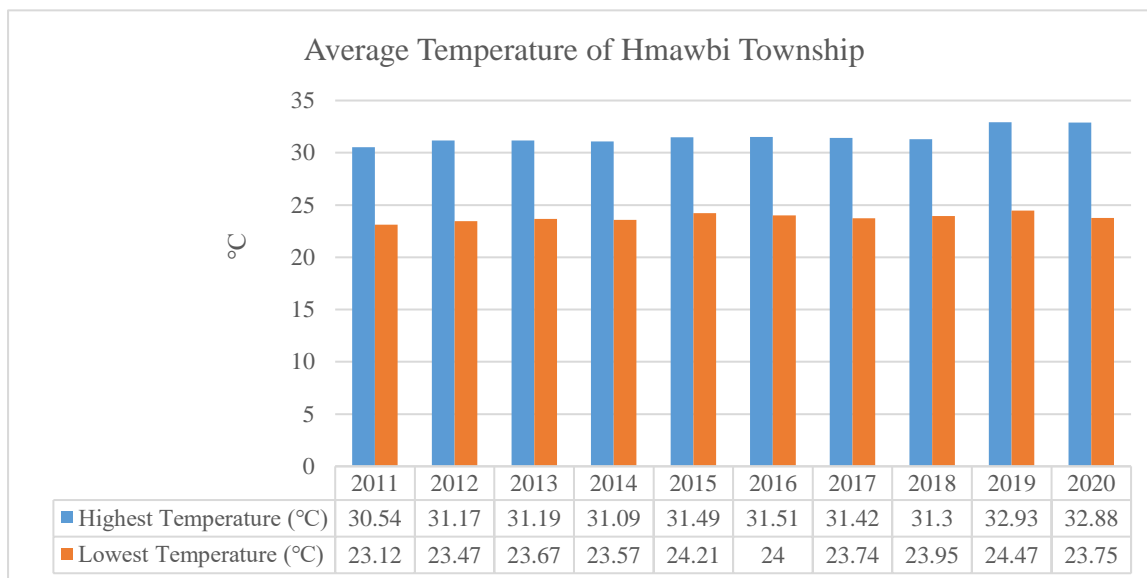
**Table 5-15 Rainfall data of Hmawbi Township (2011 – 2020)**

No.	Year Month	Rainfall (inches)									
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	January	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
2	February	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	March	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
4	April	0.02	0.03	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.02
5	May	0.22	0.18	0.07	0.1	0.13	0.13	0.11	0.19	0.14	0.14
6	June	0.47	0.28	0.17	0.28	0.24	0.18	0.21	0.38	0.86	0.67
7	July	0.28	0.35	0.27	0.33	0.27	0.28	0.29	0.48	1.04	0.58
8	August	0.33	0.32	0.25	0.27	0.26	0.23	0.39	0.54	1.06	1.05
9	September	0.33	0.19	0.18	0.23	0.27	0.18	0.28	0.25	1.11	0.76
10	October	0.13	0.06	0.1	0.06	0.08	0.09	0.19	0.11	0.17	0.67
11	November	0.00	0.01	0.01	0.07	0.00	0.01	0.02	0.01	0.19	0.16

No.	Year Month	Rainfall (inches)									
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
12	December	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01

Source: Weather and Climate - The Global Historical Weather and Climate Data, Hmawbi, Yangon, Myanmar Climate (tckctck.org)

The highest temperature of Hmawbi Township is about 40°C and the lowest temperature is about 19°C in 2017. The following items: raining days, rainfall and temperature of 2013 to 2017 obtained from Township data of Hmawbi Township are shown in below.



Source: Weather and Climate - The Global Historical Weather and Climate Data, Hmawbi, Yangon, Myanmar Climate (tckctck.org)

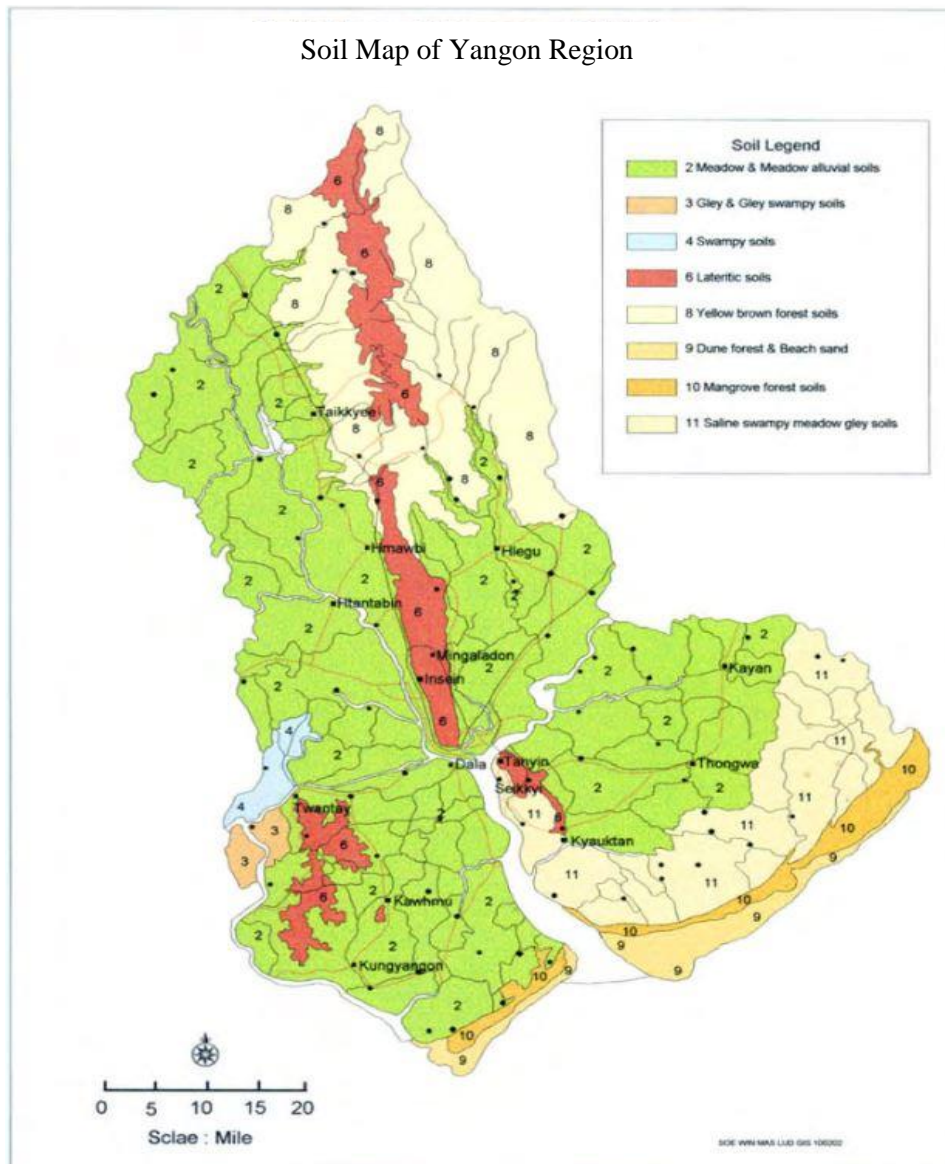
**Photo 5-8 Average Temperature of Hmawbi Township**

### 5.3.3 Topography and Soil

Hmwabi Township is mainly flat land, which is located northwest of the city of Yangon. It is home to the Myaung Da Gar Industrial Zone, which is 1,016 acres (4.11km<sup>2</sup>) in extent, constructed in 2006-2008 for Yangon's steel factories. The nearest water body to the project site is Haling River.

The study area is flat with elevations from 27 feet above of mean sea level. There are several soil types in Yangon Region which is located at the eastern extremity of the Ayeyarwady Delta with the Andaman Sea on the south, classifying as follows: (1) Meadow soils and meadow alluvial soils, (2) Clay and clay swampy soils, (3) Swampy soils, (4) Lateritic soils, (5) Yellow brown forest soils, (6) Dune Forest and beach sand, (7) Mangrove Forest soils, (8) Saline swampy meadow and gray soils. Among them, the soil type of study area is Meadow soils and meadow alluvial soils which are widely occurring in the different parts of Myanmar in river plains, delta and low coastal plains and valleys. The texture and properties of this soil type of lower Myanmar has clayey to clay and yellowish-brown color containing large amount of iron which have very strong acid reaction.





Sources: Land Use Division, Myanmar Agricultural Service (Feb 11, 2002)

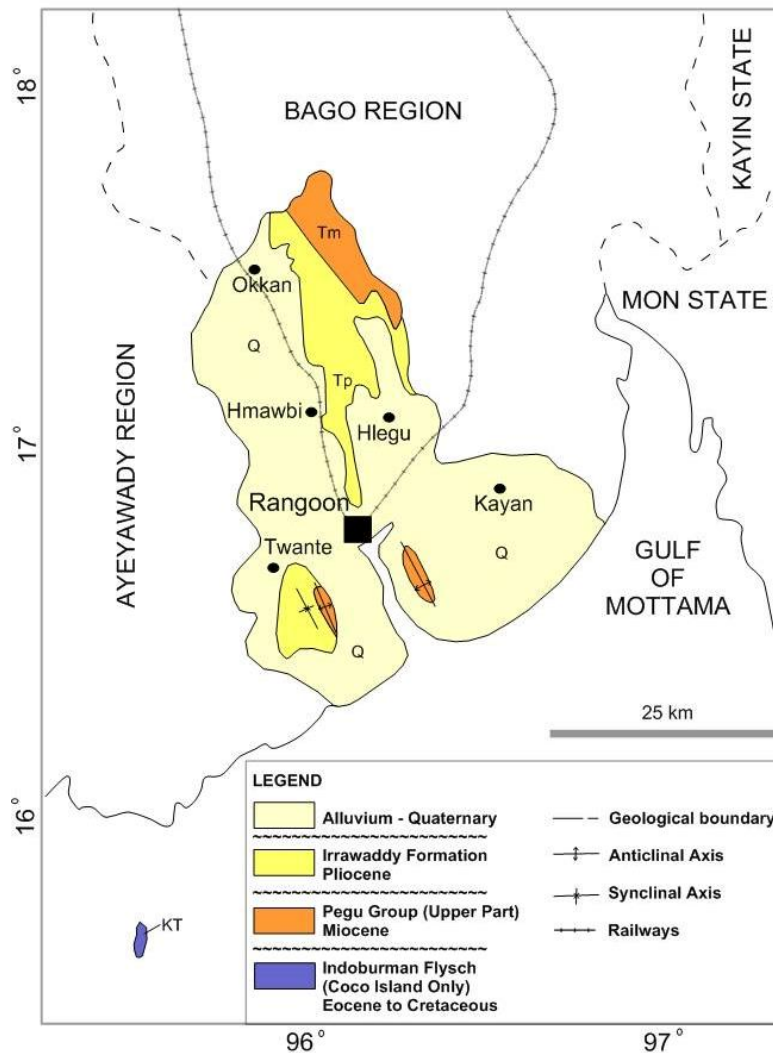
**Figure 5.35 Soil Map of Yangon Region**

### 5.3.4 Regional Geology

Myanmar can be subdivided into three provinces: namely, the Western Fold Belt (WFB) in the West, the Central Lowland (CL) in the middle, and the Eastern Highland (EH) in the East (Maung Thein, 1993). Tectonically, Yangon is situated in the southern part of the Central Lowland, which is one of three major tectonic provinces of Myanmar. The Central Lowland is the fertile alluvial, intermittently cropped out by the mountain range and hills running in north south direction and also enhanced. Yangon Region is located at the eastern extremity of the Ayeyarwady Delta area with Andaman Sea on the south-east.

Yangon Region is bordered on the west by the Ayeyarwady Region, on the north and east by Bago Region and on the south by the Gulf of Mottama. High areas of the region are the southern end of the Bago Yoma near Phaunggyi, and its farther southward extensions of isolated low

hills and ridges like those near Hlawga Lake, the Shwedagon Pagoda Hill in Yangon City itself, and the ridge or rolling hills southeast of Thanhlyin. Laterite for use as road material is now being quarried at Wanetchaung, between Hmawbi and Taikkyi, north of Yangon.



**Figure 5.36 Yangon Regional Geology**

### 5.3.5 Structural Geology

The structural geology of Myanmar is not complex. One of the major active faults is Sagaing Fault. It controls the structural geology. It passes through just east of Bago and enters western Gulf of Martaban. In the north-east part of the project site, the anticlinal ridge is located in the Thanlyin area. In the eastern part of this project, there has Kyauktan fault. The axis of the anticline is trending in the NW– SE direction. On that anticline, there have three numbers of oblique minor faults. The project site is located in a zone of moderate seismicity zone (II) according to the seismic zone map of Myanmar 2005.

### 5.3.6 Economic Geology

Most geologists would agree the fact that Yangon Region has hardly any economic mineral potential, expect for the possible occurrence of oil and natural gas underneath the extensive

alluvial plains and the longitudinal anticlinal ridges. Laterite for use as road material is now being quarried at north of Yangon.

### 5.3.7 Hydrology

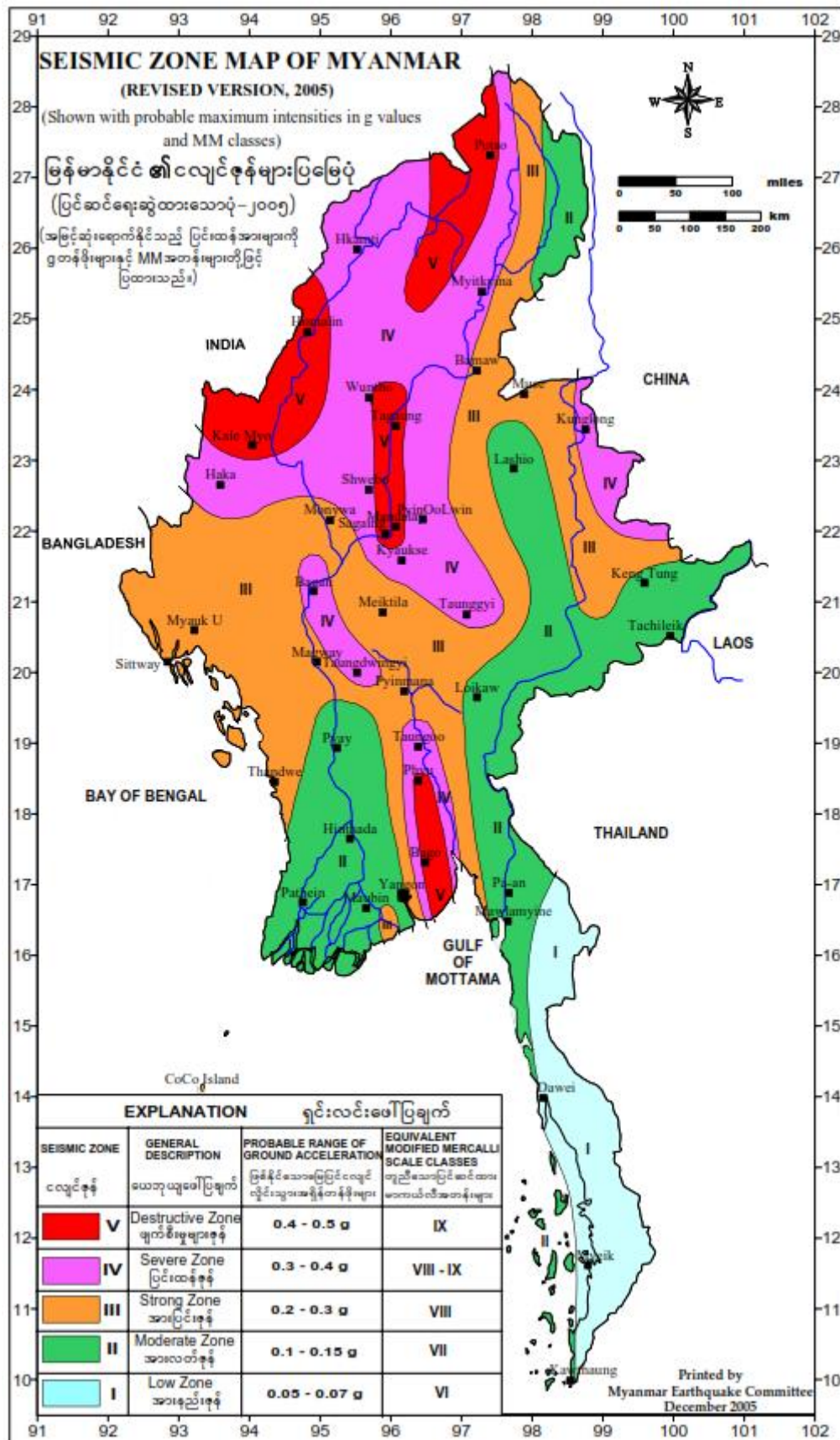
Hlaing River (also known as Yangon River) is about 40 km long (25 miles), and flows from Southern Myanmar as an outlet of the Ayeyarwaddy River into the Ayeyarwaddy delta. The Hlaing River drains the Bago Mountain Range; both the Yangon and the Patheingyi Rivers enter the Ayeyarwaddy at the delta.



**Photo 5-9 Hlaing River near Myaung Dagar Industrial Zone**

### 5.3.8 Earthquake Intensity of Myanmar

Myanmar, located in Southeast Asia, is known to be seismically active due to its position along the boundary of two tectonic plates: the Eurasian Plate to the north and the Indian Plate to the south. This tectonic activity makes Myanmar susceptible to earthquakes of varying magnitudes and intensities. The earthquake intensity in Myanmar can range from minor tremors to significant seismic events. The origin and occurrence of earthquakes occurred in Myanmar including Yangon Region and other parts of the country can be interpreted as below. Earthquake intensity in the area can be seen in following **Figure 5.37**.



Source: (Swe & Thein, 2006)

Figure 5.37 Seismic Zone Map of Myanmar



### 5.3.9 Exposure and Vulnerability to Natural Disasters and Climate Change

Vulnerability to natural disasters can depend on various factors, including geographical location, topography, climate, infrastructure and land use planning. It is crucial for residents and local authorities to stay informed about potential risks and to have disaster preparedness and response plans in place to mitigate the impact of natural disasters. Community-based organizations and local government agencies often play a vital role in disaster risk reduction and response efforts. Earthquake intensity zones indicate where there is a 20% probability that degrees of intensity shown on the map will be exceeded in 50 years. Tropical storm intensity zones indicate where there is a 10% probability of a storm of this intensity striking in the next 10 years.

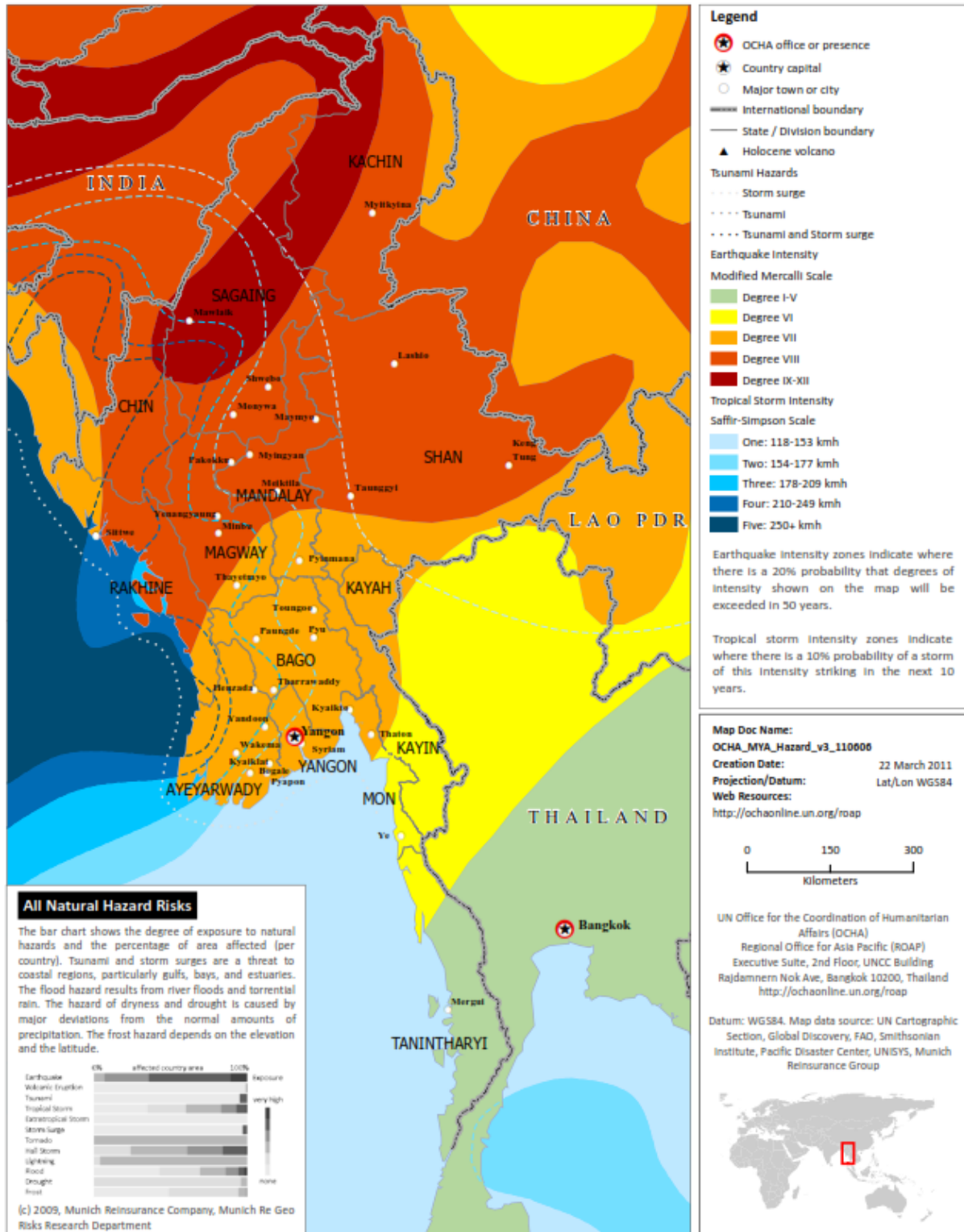
The bar chart shows the degree of exposure to natural hazards and the percentage of area affected (per country). Tsunami and storm surges are a threat to coastal regions, particularly gulfs, bays and estuaries. The flood hazard results from river floods and torrential rain. The hazard of dryness and drought is caused by major deviations from the normal amounts of precipitation. As depicted in the picture, the project site is located in an area (Degree VII) of earthquake strength ranges.

Flooding is the most frequent hazard in Myanmar, with the largest overall impact on people and property. Climate change and environmental degradation are increasing flood risk in Myanmar, though not changing which areas are most at risk. While the effects of climate change on flood risk are not clear from the available historical data, projected increases in rainfall intensity will increase flood risk across the country in the future. Based on the flood probability designations from the SERVIR-Mekong Historical Flood Analysis Tool, over two million vulnerable people live in high flood probability areas in Yangon and Ayeyarwady Regions (MIMU, 2022).

Climate change impacts on steel mill projects can vary depending on the geographical location and local climate conditions. Myanmar is vulnerable to extreme weather events such as cyclones and heavy monsoon rains. Climate change can lead to an increase in the frequency and intensity of these events, which can damage infrastructure, disrupt operations and pose safety risks to the steel mill. Myanmar has a monsoonal climate with seasonal variations in precipitation. Changes in precipitation patterns due to climate change can affect the availability of water resources for industrial processes, particularly during dry seasons.



OCHA Regional Office for Asia Pacific  
**MYANMAR: Natural Hazard Risks**  
Issued: 22 March 2011



The names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Source: [4164\\_ocha-myahazardv3110606.pdf](http://4164_ocha-myahazardv3110606.pdf) ([preventionweb.net](http://preventionweb.net))

**Figure 5.38 Natural Hazard Risks of Myanmar**

## 5.4. Socio-economic Resources

### 5.4.1 Secondary Data

#### 5.4.1.1 Population and Communities

Hmawbi Township is composed of 4 wards, 39 village tracks and 195 villages. There are 43,068 households having a total population 191,020 in the township. According to township data (2017, March), the female population is slightly higher than male with the ratio 1.1. Population data of Hmawbi Township as below:

**Table 5-16 Land and Demographic Conditions of Hmawbi Township**

Name of Township	Area sq. miles	Above Sea level (Highest)	Population (Person)				Population growth rate	Population Density
		Feet	2015-2016	2016-2017	2017-2018	2018-2019	%/year	person/km <sup>2</sup>
Hmawbi	183.78	27	186,190	191,020	194,160	202,904	4.96	1,104

Source:(Department, 2019)

**Table 5-17 Total Population of Hmawbi Township**

Name of Township	Total population			Male: Female Ratio (1: no.)	House	No. of Households
	Total	Male	Female			
Hmawbi	191020	90643	100377	1:0.9	39905	43068

Source:(Department, 2019)

#### 5.4.1.2 Religion, Races and Ethnic Minority

The primary religious in Hmawbi are Buddhism, Christian, Islam and Hindu. According to Township data of Hmawbi Township, most of them are Buddhist. Races of the people living in the townships along the section are shown in **Table 5-18**.

**Table 5-18 Percentage of different Religions by Township**

Township	Buddhist	Christian	Hindu	Islam	Other	Total
Hmawbi	185700	14247	656	2301	-	202904

Source:(Department, 2019)

**Table 5-19 Percentage of different Races by Township**

Sr.	Race	Population
1	Kachin	388
2	Kayar	2120
3	Kayin	17524
4	Chin	1605
5	Mon	340
6	Bamar	17524
7	Rakhine	981
8	Shan	2198
9	Others	0
Total		42,680

Source:(Department, 2019)

#### 5.4.1.3 Educational Status

According to Township data, Hmawbi Township had one Technological University, ten Basic Education High Schools, seven Basic Education Middle Schools, one hundred and twenty-seven Basic Primary School, and twenty-seven libraries. The teachers and the students' ratios were 1:13 for Academic level, 1:39 for High School level, 1:28 for Middle School level and 1:49 for Primary level.

#### 5.4.1.4 Employment Status

According to information from the Township General Administration Department Offices, A breakdown for each targeted township is shown in **Table 5-20**.

**Table 5-20 Status of Employment**

Township	Total Population	No. of workable person	No. of Employed person	No. of Unemployed person	% of Employed person	% of Unemployed person
Hmawbi	202,904	142,834	119,473	23,361	80.45%	19.55%

Source:(Department, 2019)

#### 5.4.1.5 Health Profile

There are general stated owned hospitals and rural health care center as shown in **Table 5-21**. The most common disease found in Hmawbi Township are diarrhea.

**Table 5-21 Places for Health Care**

No.	Name of Hospital	State Own/Private Own	No. of Bed
1	Hmawbi Hospital	State owned	50
2	Hpu Gyi Hospital	State owned	16
3	War Net Chaung Hospital	State owned	16
No.	Name of Clinic	State Own/Private Own	Curable Disease
1	Hmawbi	State owned	General
No.	Name of Rural Health Center	Name of Rural Health Sub Center	
1	War Net Chaung	Let Pan Tan Su	
2	Myaung Ta Kar	Hpu Gyi	
3	Shwe Hlay Kyi	War Pa Taw	
4	Yae Kyaw	Ku Lar Kone	
5	Sat Thwar Taw	Bant Bway Kone	

Source:(Department, 2019)

**Table 5-22 Common Disease and HIV in Hmawbi Township**

Township	Common Disease					HIV/AIDS
	Malaria	Diarrhea	TB	Dysentery	Hepatitis	
Hmawbi	4	1,111	361	100	-	128

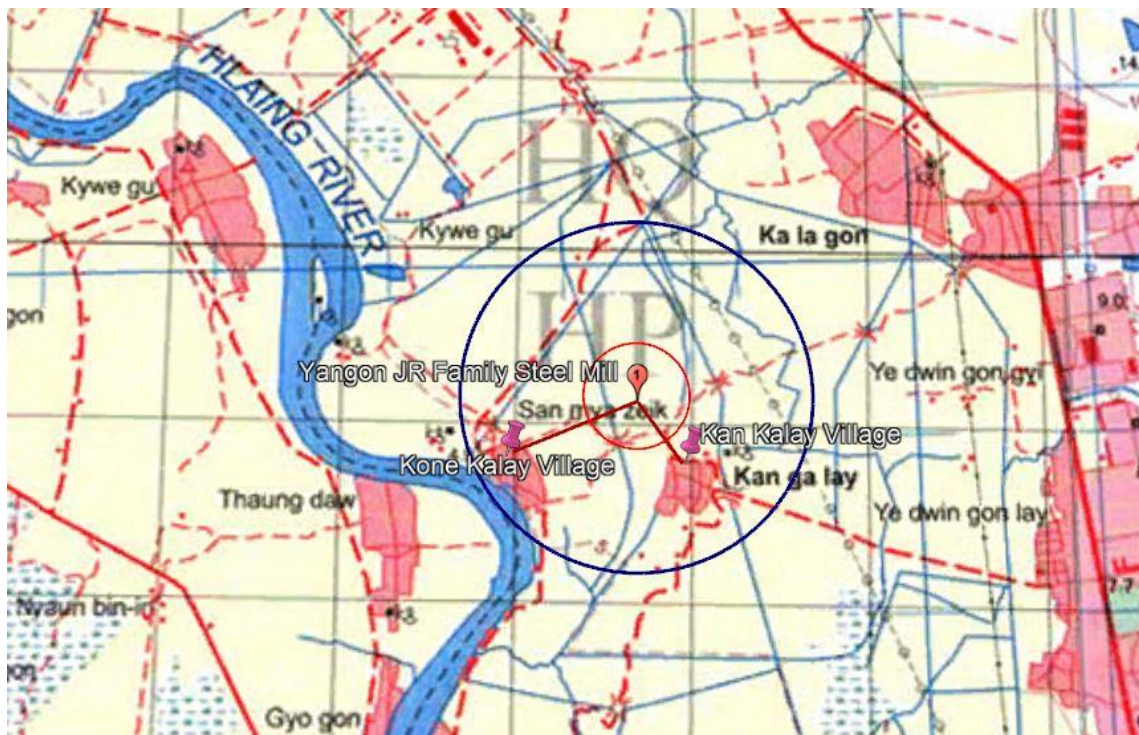
Source:(Department, 2019)

### 5.4.2 Primary Data

The study was conducted by the socio-economic survey through a combination of qualitative and quantitative research questionnaires to find out the impacts and perception of local people residing near the Myaung Da Gar Industrial Zone.

To conduct the social impact assessment, the scope of the study area was defined within the zone of 1 km radius around the proposed project area. Myaung Da Gar Industrial Zone has been situated near Kan Kalay village and Kone Kalay village, Hmawbi Township. As shown in Figure, these two villages, situating within 1 km radius were selected for socio-economic survey to find out the social impacts and perception of local people on the construction of steel production mill.

The nearest villages to the Myaung Da Gar Industrial Zone are Kan Kalay village (0.3 miles) and Kone Kalay village (0.5 miles). There are 150 and 70 households in Kan Kalay village and Kone Kalay village respectively.



**Figure 5.39 Distances between Yangon J.R Family Steel Production Site and nearby Villages**

#### 5.4.2.1 Field Survey Activities

Firstly, the draft questionnaire was formulated and pre-tested by E Guard Environmental Services in October, 2018. Based on the pre-test result, the standardized questionnaire was developed, modified and finalized for effective household survey. Finally, the field survey was conducted during the second week of November, 2018 in two villages covering 67 households which have sample size of 35% of the total households.



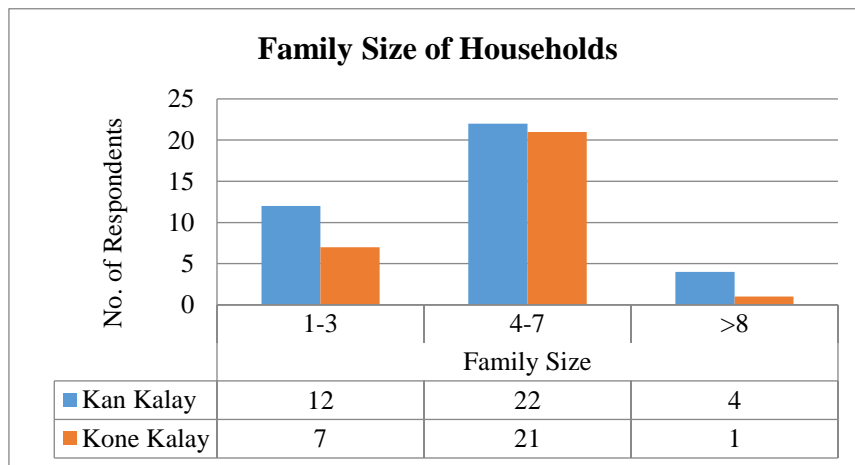


**Photo 5-10 Photo Records of Social Survey Activities**

#### 5.4.2.2 Profile of Study Areas

##### *Family Size*

**Figure 5.40** shows the family size of households who live near the Myaung Da Gar Industrial Zone. As social survey results, most of the families have 4 to 7 family members in both villages and there are 22 and 21 households who have 4 to 7 family members in Kan Kalay Village and Kone Kalay Village respectively. Secondly, there are 12 households in Kan Kalay Village and 7 households in Kone Kalay Village who have 1 to 3 family members and there are 4 and 1 households who have more than 8 members respectively.

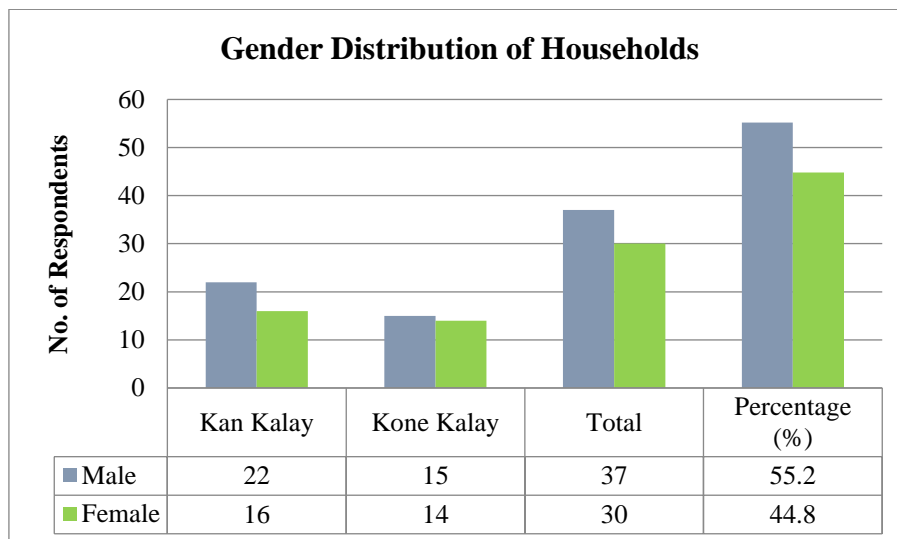


**Figure 5.40 Family Size of Households**



## Gender

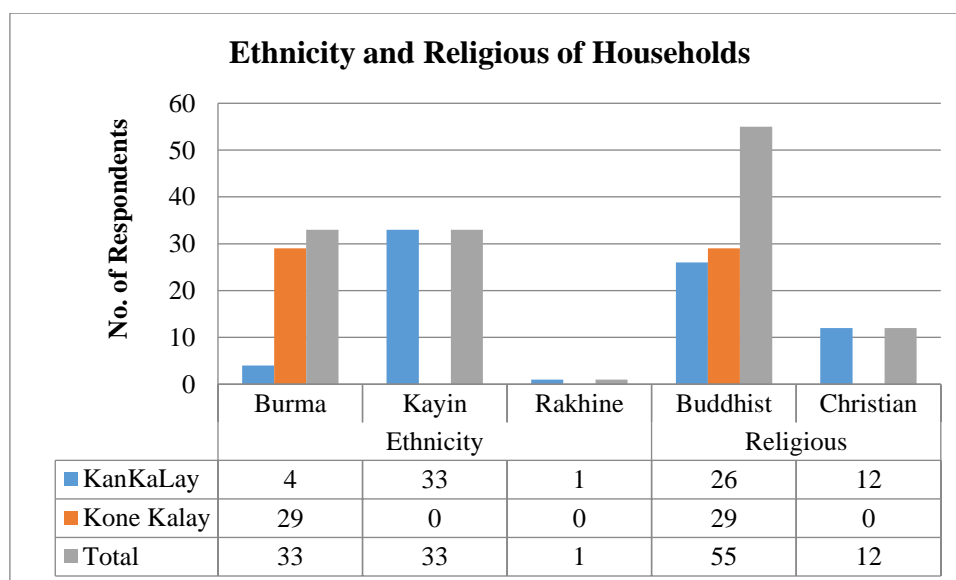
**Figure 5.41** shows the gender distribution of the respondents of the selected households according to the social survey result, 37 persons (55.2%) are male and 30 persons (44.8%) are female.



**Figure 5.41 Gender Distribution of Households**

## Ethnicity and Religious of Households

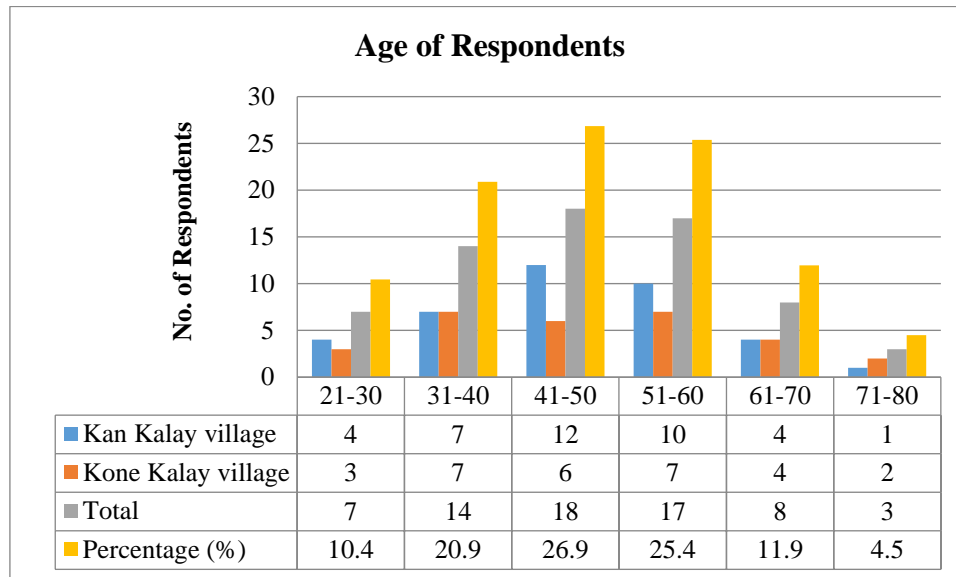
For ethnicity, 33 persons of the total respondents are Burma, 33 persons are Kayin and 1 person is Rakhine. For religion, 55 persons are Buddhist and the rest of total respondents are Christian. According to the household survey, Kayin ethnic live in Kan Kalay Village and most are Christian. The majority of the religion is Buddhism.



**Figure 5.42 Ethnicity and Religious of Households**

### Age of Respondents

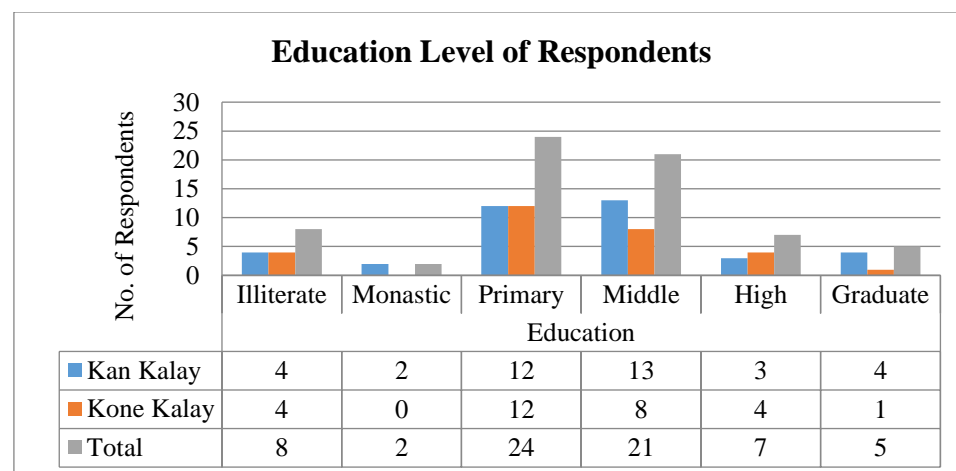
There are divided into 6 groups of age based on the results of social survey in **Figure 5.43**. 7 persons (10.4%) are 21- to 30-year-old, 14 persons (20.9%) are 31- to 40-year-old, 18 persons (26.9%) are 41- to 50-year-old, 17 persons (25.4%) are 51- to 60-year-old, 8 persons (11.9%) are 61- to 70-year-old and 3 persons (4.5%) are 71- to 80-year-old. Among them, most of the respondents are between 40- to 60-year-old.



**Figure 5.43 Age of Respondents**

### Education Level of Respondents

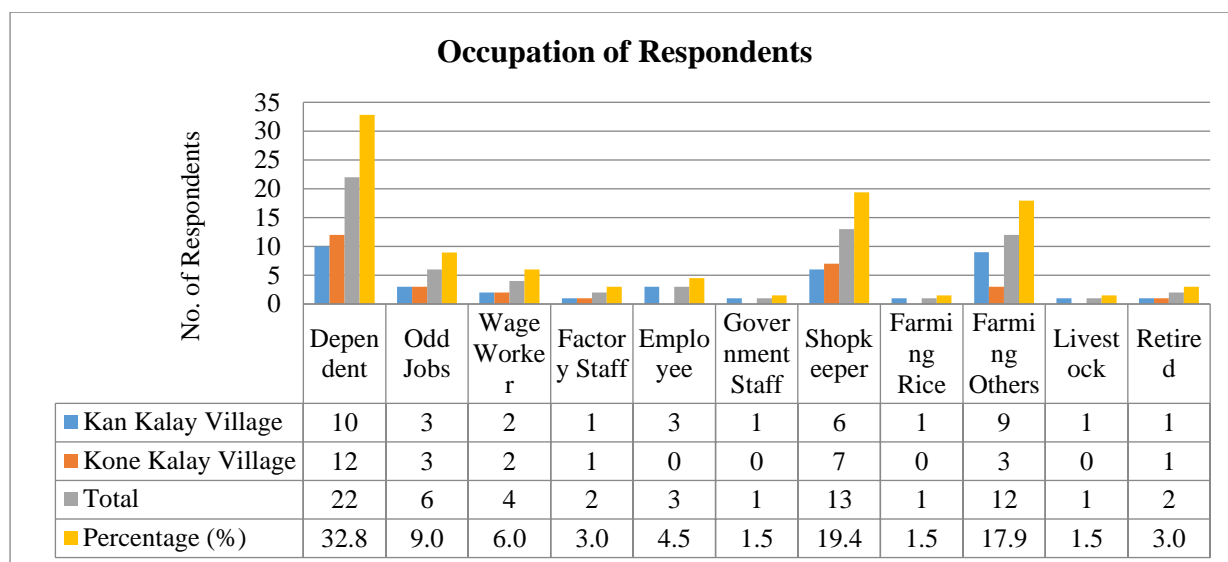
**Figure 5.44** indicates the education level of the respondents. 24 respondents attended the primary school education and 21 respondents have middle (secondary) school education level. 8 persons are illiterate and 7 persons attended the high school education level. 5 persons are graduates and 2 persons have monastic education level. Based on the social survey result, it can be concluded that primary and secondary education level are mostly found in Kan Kalay and Kone Kalay Villages.



**Figure 5.44 Education Level of Respondents**

### Occupation of Respondents

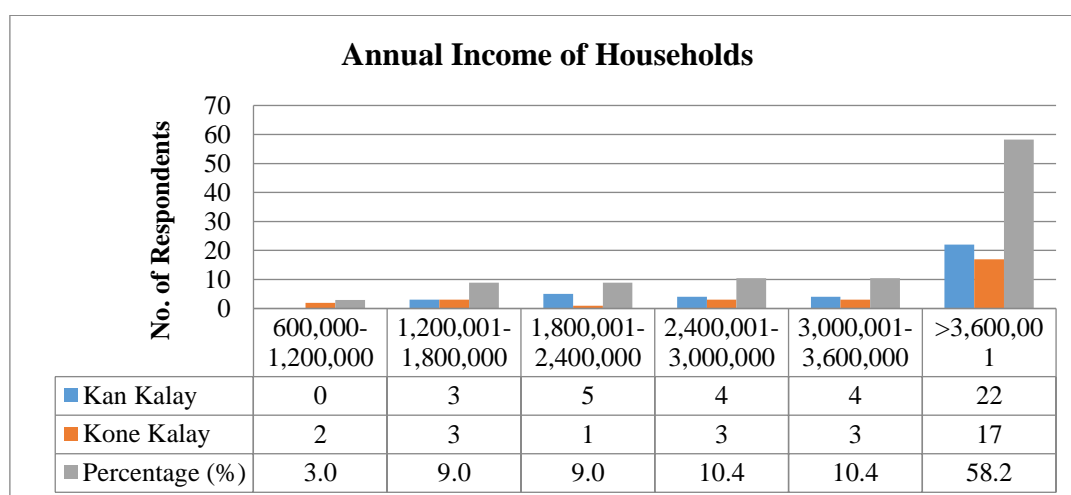
**Figure 5.45** shows the occupation of the respondents who live Kan Kalay and Kone Kalay Villages near the Myaung Da Gar Industrial Zone. Among all of the respondents, 32.8% are dependent because the age of most respondents is between 40- and 60-year-old. 19.4% of the respondents are shopkeepers and 17.9% are farmers who cultivate the other crops especially horticultural crops. 9% of the respondents are doing odd jobs and 3% of the respondents work at factory at Myaung Da Gar Industrial Zone.



**Figure 5.45 Occupation of Respondents**

### Annual Income of Households

The annual income of the households is presented in following **Figure 5.46**. 58.2% of the households earn more than 3,600,000 kyats per year. The 3.0% of the households attain the minimum annual income (600,000-1,200,000 Kyats).



**Figure 5.46 Annual Income of Households**

### *Expenditures of Households*

The expenditures of households per month were displayed in **Table 5-23**. The expenditures of households were categorized by health, education, economic investment, social welfare, household expenses, household maintenance and others. For health, education, social welfare, house maintenance and others especially fuel cost for cooking and vehicles, most of the respondents expense less than fifty thousand kyats per month. 5 persons use between 50,000 and 100,000 kyats per month for economic investment such as cost of agricultural inputs. 23 persons spend between 100,000 and 150,000 kyats per month for household expenses.

**Table 5-23 Expenditures of Households**

Expenditure Categories	Expenditure per Month (Kyats)						
	<50,000	50,001 - 100,000	100,001 - 150,000	151,001- 200,000	200,001- 250,000	250,001- 300,000	>300,000
Health	32	5	1	1	1	0	0
Education	18	7	3	1	1	0	0
Economic Investment	3	5	3	0	1	1	1
Social Welfare	39	8	2	0	0	1	0
Household Expenses	3	17	23	7	6	8	3
House maintenance	5	3	1	0	0	0	1
Others	11	2	2	0	0	0	0

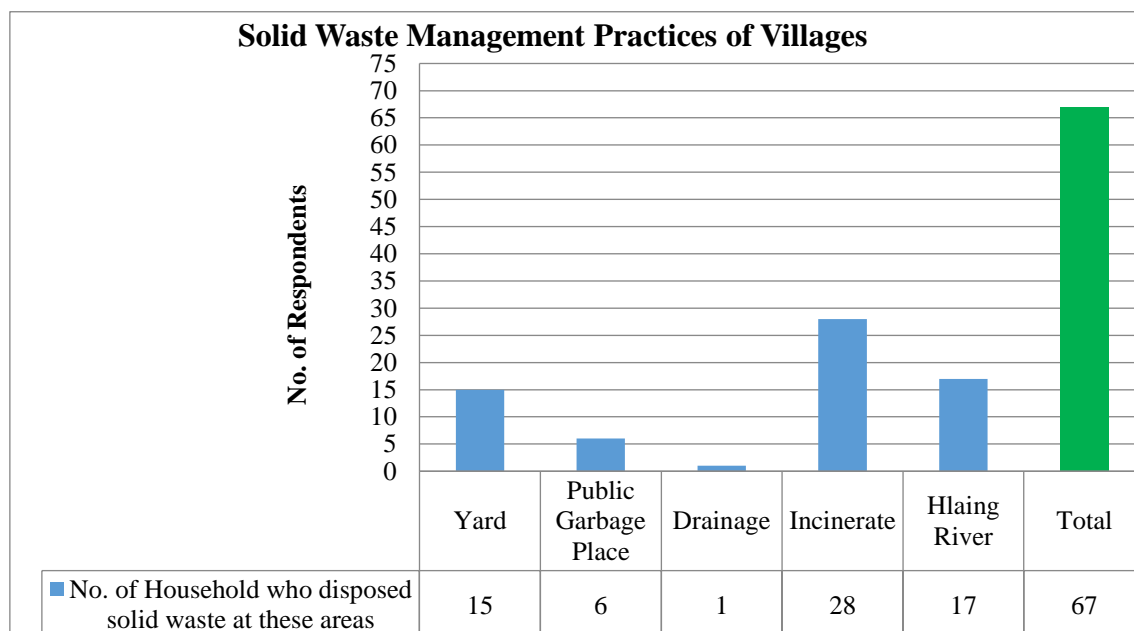
### Occupational Status of Villages near Myaung Da Gar Industrial Zone

**Table 5-24 Occupational Status of Village at Industrial Zone**

	Kan Kalay Village	Kone Kalay Village	Total
<b>Staff in Industry</b>			
Yes	16	10	26
No	22	19	41
<b>Job Position</b>			
Worker	12	5	17
Supervisor	1	0	1
Janitor	2	0	2
Other	1	5	6
<b>Working Experience (year)</b>			
<1year	0	1	1
1-3 years	15	9	24
4-6 years	1	0	1

**Table 5-24** showed the occupational status of villages at Myaung Da Gar Industrial Zone. Among the total households, only 26 households have the persons who work as the staff in Myaung Da Gar Industry. In the number of 26 persons, 17 persons work as workers, 1 person do supervisor, 2 persons employ as janitor and 6 persons work as wage labors at industrial sites respectively. Most of the people who work at the industrial zone have between 1 to 3 years experiences.

### Solid Waste Management Practices of Villages



**Figure 5.47 Solid Waste Management Practices of Villages**

As the result of social survey, solid waste management practices of villages have been know classifying disposed in yard, public garbage place, drainage, incineration in yard and Hlaing



River. Most of the respondents (28 persons) practices incineration their domestic wastes in their yard. 17 persons dispose their domestic waste at the bank of Hlaing River near Village. 15 persons do land filling inside their yard. 6 persons practice disposal of domestic waste to the public garbage place where is situated at the edge of village and 1 person does disposal of domestic waste to the drainage of industries.

## 5.5. Cultural Resources

A desk-based assessment and on-site interview has been under taken. It was observed that there are no known items of heritage significance on the proposed project site that have been listed by local government agency.

### 5.5.1 Infrastructure Facilities

#### 5.5.1.1 Land Use

Information on existing land use of the study area had established using the data based on the township data published by General Administration Department, Ministry of Home Affairs. The project area covers.

- (i) Industrial zone
- (ii) Agriculture land area
- (iii) Urban and build up area

#### (i) Industrial Zone

Total land use area for Myaung Da Gar industrial zone in Hmawbi Township is 1,016 acres which was constructed 2006 – 2008. This includes varieties of manufacturing factories such food and beverages, personal goods, garment factory, wood and wood products furniture, household goods, printing and publishing, plastic materials and plastic goods, foundry factories, drinking water factories and chemical goods. The products from this industrial zone go to both domestic and overseas markets.

#### (ii) Agriculture Land Area

Most of the agriculture land is used for rice cultivation and other agriculture crops such as sunflower, various types of beans, maize, sugarcane, groundnut, sesame, mung bean, the green gram.

#### (iii) Urban and Build up Area

This type of land use covers village area, commercial area and residential area. Land used for the whole township and village is shown in **Table 5-25**.

**Table 5-25 Land Use of Hmawbi Township**

No.	Types of Land Use	Area (acres)
1	Total agriculture land use	66,970
	<i>Farmland area</i>	47,862
	<i>Yar</i>	-
	<i>Land island</i>	379

No.	Types of Land Use	Area (acres)
	<i>Land gardens</i>	18,729
	<i>Taung-yar land</i>	-
2	Vacant land	2,684
3	Grazing land	5,791
4	Industrial used of land	4,089
5	Reserve/ protected forest land	630
6	Wild land	79
7	Unclassified land not suitable for crop land	37,376
	<b>Total</b>	<b>117,619</b>

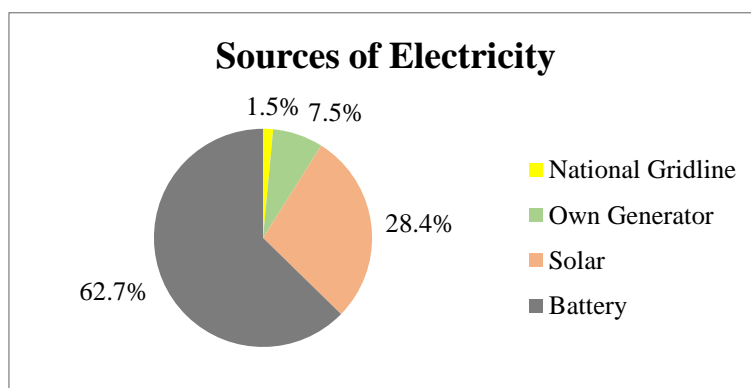
#### 5.5.1.2 Transportation and Communication

Myaung Da Gar Steel Industrial Zone is located beside of Yangon – Pyay highway Road. Major uses of public transportation are bus (Yangon Bus Service, YBS), Yangon – Pyay railway line and water transportation. There are three bus lines with total 43 numbers of vehicles. According to township data, the nearest railway station of project site is Hmawbi train station and the nearest water jetty is Myit Kyo Jetty. Mostly are used by bus for major transportation.

#### 5.5.1.3 Electrical Power Supply

Within Hmawbi Township area, including the areas of proposed Myaung Dagar Industrial Zone, electricity is mainly supplied from National Grid through Yangon City Electric Power Supply Board (YESB).

According to the answers of respondents, the source of electricity is mainly from battery (62.7%), second source is solar (28.4%) and third is own generator (7.5%). Although the electricity is mainly supplied from Myaung Dagar Industrial Zone, the nearest villages, Kan Kalay and Kone Kalay Villages depend mostly on battery and solar for electricity.

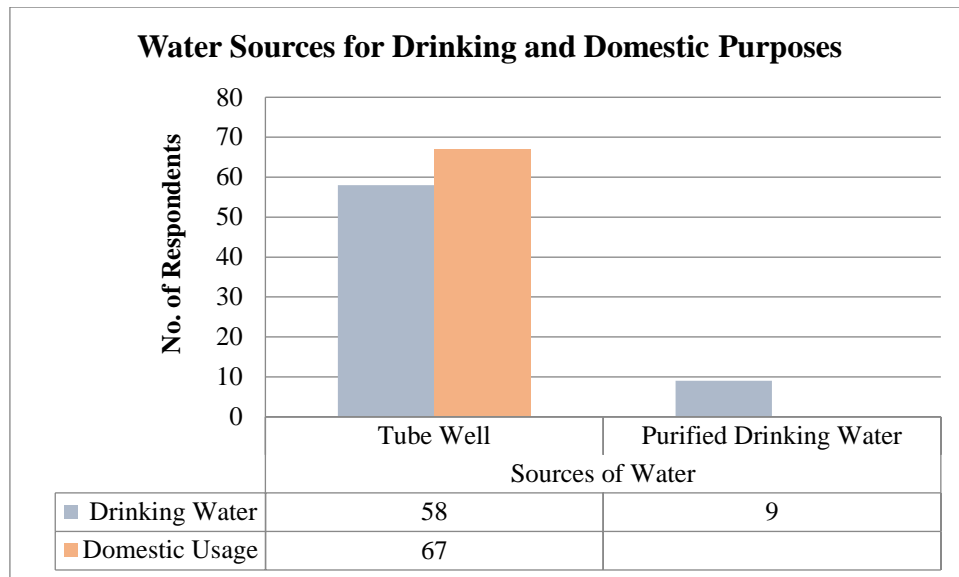


**Figure 5.48 Sources of Electricity**

#### 5.5.1.4 Water Supply

The main water source of proposed Hmawbi Township and its Industrial Zone is groundwater. Most of the households, factories and industries have their own tube wells for their own water supply. The drainage system of the region location the project site and the surrounding area includes Hlaing River.

Based on the result of household survey, all of the respondents use the tube well for domestic usages. 57 persons use drinking water from tube well by keeping in the containers overnight for settling. 9 persons use purified drinking water for drinking.



**Figure 5.49 Water Sources for Drinking and Domestic Purposes**

## 5.6. Visual Characteristics

According to the on-site survey, the proposed construction of the project is located in the industrial zone and some of the industrial blocks are still in vacant land. At the proposed project site, there are no monuments, and tourist attraction and have no visual impact due to the project.

## 6. IMPACTS ASSESSMENT AND MITIGATION MEASURES

This section presents the environmental and social impact assessment methodology and recommended mitigation measures to reduce or avoid potential impacts. The impact assessment methodology provides a basis to characterize the potential environmental and social impacts of the project and is based on models commonly employed in impact assessment, considering international good practices. Potential impacts arising from both planned activities and unplanned events are assessed. Unplanned events are those not anticipated to occur during the normal course of proposed project.

### 6.1. Impact and risk assessment methodology

The purpose of the impact assessment and mitigation is to identify and evaluate the significance of potential impacts on identified receptors and sources according to define assessment criteria and to develop and describe the impact mitigation measures to avoid or minimize any potential adverse effects and to enhance potential benefits.

#### 6.1.1 Impact Types and Definitions

An impact that may change to a source or receptor by the presence of a project component or by the execution of a project related activities. Evaluation of baseline data provides crucial information for the process of evaluating and describing how the project could affect the biophysical and socio-economic environments.

#### 6.1.2 Impact Nature and Types

- a) **Positive Impact:** An impact that is considered as representative of an improvement on the baseline or introduces a positive
- b) **Negative Impact:** An impact that is considered to represent an adverse change from the baseline, or introduces new undesirable factors
- c) **Direct Impact:** Impacts that result from a direct interaction between a planned project activity and receiving environment/ receptors (e.g., between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality)
- d) **Indirect Impact:** Impacts that result from other activities that are encouraged the impacts of the project (e.g., in-migration form employment placing a demand on resources)
- e) **Cumulative Impact:** Impacts that act together with other impacts (including those from concurrent or planned future third-party activities) to affect the same resources and or receptors as the project.

For the development project of production, it has various kinds of activities from the proposed Production and Marketing of TMT Rebars project are likely to occur positive impact as well as negative impact on the environment. Furthermore, operation phase of production of TMT Rebars may have the potential to the environment in many ways but it can differ widely in terms of their design and location, and key issues are likely to vary from site to site. In order to

assess likely significant impacts, possible environmental and social impacts by the project have to be identified based on the project description.

### 6.1.3 Methodology for the Environmental Impact Assessment

The assessment of each impact is based on consideration of the magnitude, duration, spatial and frequency of activities, which are going to be carried out during three phases of the project implementation. The assessment is qualitative and the significance of each impact is classified into five categories in overall.

The significance of impact was assessed by impact assessment methodology adopted by International Association for Impact Assessment (IAIA). The following methodology has been applied to assess the environmental impacts for industrial related project mainly on air, water, soil and including human beings. Each source of impacts has been assessed by four parameters: magnitude, duration, extent and probability and each assess point have five scales as mentioned below:

**Table 6-1 Impact Assessment Parameters and its Scales**

Assessment	Scale				
	1	2	3	4	5
<b>Magnitude (M)</b>	Insignificant	Small and have no effect on environment	Moderate and will result in minor changes on environment	High and will result in minor changes on environment	Very high and will result in permanent change on environment
<b>Duration (D)</b>	0-1 year	2-5 years	6-15 years	Life of operation	Post closure
<b>Extent (E)</b>	Limited to the site	Limited to local area	Limited to region	National	International
<b>Probability (P)</b>	Very improbable	Improbable	Probable	Highly probable	Definite

Then, the significant point (SP) is calculated by following formula.

$$\text{Significant Point (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) * \text{Probability}$$

Impact Significance: Based on calculated significant point, impact significance can be categorized as follows **Table 6-2**.

**Table 6-2 Impact Significance**

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



Identification and assessment of key environmental impacts for project of construction, operation and decommissioning phases have been prepared according to the nature and scope of the project type, site survey and baseline information of environmental and social condition of project site.

## **6.2. Identification of Impacts**

For Production and Marketing of TMT Rebars project, potential impacts are discussed here widely in terms of production process, resource consumption and sensitivity of surrounding environment.

Based on the present environmental status and baseline data, onsite measurement had been done to identify and evaluate the potential impacts on the environment of the study area. The production and marketing of TMT Rebars project may affect the physical and social environment during these phases;

### ➤ ***Construction phase***

This phase includes construction of office buildings, staff quarters, main steel structured building for steel production, warehouse and toilets. There will be sand filled to the land were used to be paddy fields.

### ➤ ***Operation phase***

During the operation phase, the following will be activated:

- Scarp unloading, segregation and handling
- Charging in induction furnace and re-heating furnace
- Pouring molten iron in ladle bucket
- Casting, Cooling and Rolling of Billet

### ➤ ***Decommissioning phase***

After the end of the lifespan of permitted years, the project will terminate according to the investment contract. All the facilities will be demolished and waste production will be handled in lined with the existing authority requirements.

Direct and indirect effect on soil, water, air, climate, landscape, human beings of the industrial zone and the interaction among these factors are to be identified and assessed. Socio-economic issues include social impacts such as local economy, employment and livelihood, utilization of local resources, existing social infrastructures and services, local conflicts of interest and working conditions including occupational health and safety.

**Table 6-3 Impact Identification**

Environmental Parameters	Issues	Construction Phase	Operation Phase	Decommissioning Phase
Air Quality	Fugitive dust and exhaust gas emission from heavy machineries and vehicles	✓	✓	✓
	Dust emissions from drilling, iron scrap handling and segregation and demolishing activities	✓	✓	✓
	Generation of Flue gas (SO <sub>2</sub> , NO <sub>x</sub> , CO), VOC and particulate matter from operation activities especially induction and re-heating activities	-	✓	-
Noise and Vibration	Noise and vibration from construction demolishing and transportation of materials	✓	✓	✓
	Noise from diesel generators and traffic along main transport/ access routes	✓	✓	✓
	Noise from induction, casting, rolling and cutting activities	-	✓	-
Soil Contamination	Excavation of soil for building foundation	✓	-	-
	Spillage of diesel and furnace oil at site	✓	✓	✓
	Amassing the demolished materials at the project site	-	-	✓
Water Quality	Water consumption for construction activities and domestic purpose	✓	✓	✓
	Water usage for cooling process	-	✓	-
Wastewater Effluents	Discharged wastewater from office, toilet facilities and worker camps	✓	✓	✓
Waste Disposal	Domestic waste from office, staff quarter, demolition waste	✓	✓	✓
	Slag form induction melting process and re-heating furnace activities	-	✓	-

Environmental Parameters	Issues	Construction Phase	Operation Phase	Decommissioning Phase
	Effluents from scrubbers and coarse scale, oil and grease from rolling process	-	✓	-
Occupational Health and Safety	Physical and accidental hazards due to handling with heavy machineries during construction activities and scrap handling, loading and unloading activities	✓	✓	✓
	Heat stress and hot liquids exposure to workers	-	✓	-
	Respiratory hazards due to scrap handling, loading and unloading activities	-	✓	-
	Explosion and fire hazards of induction activities	-	✓	-
	Electrical hazards due to deal with heavy-duty electrical equipment	✓	✓	✓
Community Health and Safety	Traffic volume and accidents from transportation of construction material, operation equipment, iron scraps and steel bars from mill	✓	✓	✓
	Communicable diseases during construction activities	✓	✓	✓

### 6.2.1. Potential Environmental and Social Impact during Construction Phase

From the view point of social perceptive, construction of steel mill creates the job opportunity for local community. The expansion will provide either direct or indirect job opportunities or income generation to the local community as far as possible.

During the construction phase, there may be some potential negative impacts on environmental and social issues. The potential impacts will be caused by pile driving, construction of office buildings, staff quarters, main steel structured building for steel production, warehouse and toilets.

#### 6.2.1.1. Impact on Air Quality

During the construction phase, it is anticipated that a certain number of airborne particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) will be generated due to earth moving activities, during excavation and construction activities. The situation will get worse during the dry season. Gaseous emission (CO, SO<sub>2</sub>, NO<sub>2</sub>, and CO<sub>2</sub>) from vehicles for delivering construction materials and machines

that are used for construction will be increased during the construction phase. The impact will, however, be reversible and temporary during construction phase. Proper maintenance of vehicles, sprinkling of water on roads and construction site reduce the potential impacts on air quality.

#### *6.2.1.2. Noise and Vibration*

The use of heavy equipment during the leveling the field and construction of steel buildings using bored pile machinery, earth moving and excavation equipment and construction cranes will generate noise creating a nuisance to the neighboring communities. However, the impact will be short-term and the task that cause noisy will be done in daytime as much as possible. So, it is considered as a non-significant threat to the nearby communities.

#### *6.2.1.3. Impact on Soil Quality*

The physical structure of soil will be destructed by excavation of soil for foundation and landscaping. The accidental spillage and release of diesel and other construction waste at the project site and leakage of engine oils and fuels while using vehicles for construction activities will cause chemical pollutants to the soil. Even though, the impact on soil chemical properties is low and that cannot be any significant changes of the surrounding environment of the proposed project, the physical structure of soil at the project site will be slightly affected by earth moving activities.

#### *6.2.1.4. Impact on Water Quality*

Since the construction of the plant will be more related to mechanical fabrication, assembly and erection, the water requirements would be small and it will be managed by providing drinking water facility and sanitation facilities at the site during construction phase. The overall impact on water environment during construction phase is likely to be short term and insignificant.

#### *6.2.1.5. Waste*

For wastewater effluents, not only disposal of sewage form toilet facilities but also wastewater from worker camps and construction activities (i.e., construction site surface runoff, wastewater form vehicle washing and boring works) would be considered. Generation of construction waste from construction activities, spillage of waste oil form construction vehicles and machines will be the sources of solid waste during the construction phase. The effluent water will be discharged at the wastewater pound throughout the wastewater drainage channel that had already existed at the industrial zone. Temporary sanitation facilities (septic tanks and soak pits) will be implemented for disposal of sanitary sewage generation. After the construction period, the residue of wood scraps will be sold to the market and iron and steel scraps will be raw material for the proposed project. Waste from the proposed project will be recycled and there is no worker camp for construction period so that it can be assessed that impact concerning with the waste will be low.

#### 6.2.1.6. *Impact on Human*

The anticipated impacts on human will be identified based on occupational health and safety and community health and safety. During construction phase, accidental injuries due to slips and falls and electric shock cause physical hazards of the construction workers. Anyhow, the emergency response training will be given to the workers and the site inspector will always check the construction activities. So, the potential impact significant on human will be low.



**Table 6-4 Evaluation and Prediction of Significant Impacts for Construction Phase**

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Impact on Air Quality</b>								
<b>Air</b>	<ul style="list-style-type: none"> <li>✓ Earth moving activities and site preparation</li> <li>✓ Dust emission from drilling, transportation of construction materials at the project site</li> <li>✓ Fugitive dust and exhaust gas emission from heavy machines</li> </ul>	PM <sub>10</sub> , PM <sub>2.5</sub>	2	2	1	3	15	Low
	<ul style="list-style-type: none"> <li>✓ Gaseous emission from vehicles for delivering construction materials and machines that use for construction</li> </ul>	CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub>	3	2	2	3	21	Low
<b>Impact of Noise and Vibration</b>								
<b>Noise and Vibration</b>	<ul style="list-style-type: none"> <li>✓ Construction activities like pile driving, drilling and delivering of construction materials</li> <li>✓ Noise from diesel generators and traffic along main transport/ access routes</li> </ul>	Noise Level (dB(A)) Vibration level (dB)	2	2	1	3	15	Low
<b>Impact on Soil Quality</b>								
<b>Soil Contamination</b>	<ul style="list-style-type: none"> <li>✓ Excavation of soil for foundation and landscaping</li> </ul>	Physical structure of soil	3	2	1	4	24	Low

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
	<ul style="list-style-type: none"> <li>✓ Accidental spillage and release of diesel and other construction waste at the project site</li> <li>✓ Leakage of engine oils and fuels while using vehicles for construction activities</li> </ul>	Chemical pollutants	2	2	1	3	15	Low
<b>Impact on Water Quality</b>								
<b>Groundwater Consumption</b>	✓ Water consumption for construction activities and domestic purpose	Groundwater consumption	3	2	1	2	12	Very Low
<b>Surface Water Contamination</b>	<ul style="list-style-type: none"> <li>✓ Water discharge from construction activities</li> <li>✓ Oil spillage from the construction machines and vehicles</li> </ul>	Chemical pollutants Oil and grease	3	2	2	3	21	Low
<b>Impact of Wastewater Effluents</b>								
<b>Wastewater Effluents</b>	✓ Dispose sewage and discharged wastewater from toilet facilities and worker camps	Organic compounds and heavy metals in wastewater	3	2	2	3	21	Low
<b>Impact of Solid Waste Disposal</b>								
<b>Generation of Hazardous and Non-hazardous Solid Waste</b>	✓ Generation of construction waste from construction activities	Residue of cement, wood scrap, etc.	3	2	1	4	24	Low
	✓ Used oil from machines, maintenance waste oil from construction vehicles and machines	Oil and grease	3	2	1	3	18	Low
<b>Impact on Human</b>								

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Occupational Health and Safety</b>	<ul style="list-style-type: none"> <li>✓ Accidental injuries from falling from elevation associated with ladder</li> <li>✓ Small injuries due to slips and falls, accidents and electric shock</li> </ul>	Physical Hazards	4	2	1	3	21	Low
	<ul style="list-style-type: none"> <li>✓ Operation noise form construction activities</li> <li>✓ Use of vehicles and lifting equipment in the movement of machinery and materials</li> </ul>	Noise	3	2	2	3	21	Low
<b>Community Health and Safety</b>	<ul style="list-style-type: none"> <li>✓ Traffic volume and accidents from transportation of construction materials</li> </ul>	Traffic and accident	3	2	2	3	21	Low
	<ul style="list-style-type: none"> <li>✓ Communicable diseases during construction activities</li> </ul>	Diseases and mortality	3	2	2	3	21	Low

## 6.2.2. Potential Environmental and Social Impact during Operation Phase

### 6.2.2.1. Impact on Air Quality

The proposed steel production mill will have impact on the air quality due to its production rate of 75,000 ton per annual. Raw materials handling, segregation and loading by trucks and conveyors will be the sources of dust emission (PM<sub>10</sub> and PM<sub>2.5</sub>). Induction and reheating process will generate fugitive dust and exhaust gas emission. The vehicles that transport for loading and unloading raw materials also emit exhaust gas to the air.

**Table 6-5 Sources and Types of Environmental Pollutants Released during Operation Phase**

Emission Source	Activities	Pollutants
Raw material/ product storage	Storage and handling, Loading and unloading	PM <sub>10</sub> and PM <sub>2.5</sub> CO, SO <sub>2</sub> , NO <sub>x</sub>
Electric Arc Furnace	Induction and reheating process, continuous casting, slag processing	Heat, SO <sub>2</sub> , NO <sub>x</sub> , VOCs, O <sub>3</sub> and metal fumes
Rolling Mill	Rolling of ingots to re-rolled steel products	Heat, SO <sub>2</sub> , NO <sub>x</sub> , VOCs

The direct smelting of materials which contain iron (mainly scrap) is usually performed in electric arc furnaces which need considerable amount of electrical energy and causes substantial emission to air and solid process residues such as waste and by-products (mainly filter dust and slag). The emissions to air from the furnace consist of a wide range of inorganic compounds (iron oxide dust and heavy metals). The potential sources of sulfur in EAF process include: charging of raw materials (mainly scraps), others auxiliary materials, and the first fusion pig iron. At high temperature, combustion process generates NO<sub>x</sub> emissions which have significant impact on the environment including its contribution to smog and acid rain formation. Due to the high temperature in the EAF, thermal mechanism is the predominant for of creating NO<sub>x</sub>. The potential source of dioxin and furans is off-gas in the EAF. The potential presence of polychlorinated biphenyls (PCB), PVC and other organics in the scrap input (shredded scrap mainly obtained from old equipment) may be a source of concern, due to its high potential for dioxin and furan formation.

The steel industry is responsible for around 7% of CO<sub>2</sub> emission in globally. Energy consumption in steel making is considerable. CO<sub>2</sub> as a greenhouse gas is generated when energy is consumed. There are many emission points of CO<sub>2</sub> in the steel making processes and they are related to three main factors: a) providing the sufficient temperature in order to carry out the chemical reactions and physical treatment needed, b) providing a reductant (mainly CO) to the system in order to reduce the iron oxide, and c) providing the power and steam necessary to run steelworks. Specifically, because the CO<sub>2</sub> which is generated when energy is consumed is a greenhouse gas (GHG), energy saving has undergone a major change in purpose, and are now considered part of the solution to the problem of global warming which is a global-scale environmental issue. The transportation of raw materials to the steel mill and the distribution of finished products can contribute to greenhouse gas emission. Currently, the

availability of electricity is periodically shifted at Myanungtagar Industrial Zone and the operation cannot be fully run as the plan. Based on the energy and electricity consumption by Yangon JR steel mill, the estimated CO<sub>2</sub> emission would be calculated to find out the converted carbon dioxide equivalent, using global warming potentials.

**Table 6-6 Estimation of CO<sub>2</sub> Emission Based on Fuel and Electricity Consumption**

	<b>KWh/month (Usage)</b>	<b>Gallon/month (Usage)</b>	<b>CO<sub>2</sub> Emission Kilo ton/year</b>
Electricity	48,000,000		649.53
Diesel for Generator		118.85	0.0157
Furnace Oil		967.66	0.5

Based on the assessment methodology, this kind of emission will generate throughout the operation period until the decommissioning phase so the impact on air quality will be moderate. Even though the measurable parameters of the baseline air quality under the standard guidelines of the NEQ(E)G, the activities of the TMT rebar making process would be contributed to pollute the air pollution rather than the no project condition. To reduce the negative effects of project activities on air quality, pollution control measures which are described in **Pollution Control System** must be put in place and maintenance and monitoring should be carried out. Efficient logistics and transportation planning can mitigate emission causing by transportation activities.

#### 6.2.2.2. *Noise and Vibration*

Occupational noise is the noise that will be produced when the plant is operating and could have an impact on the workers' health and working conditions. Prolonged exposure to high levels of noise can lead to permanent hearing damage or hearing loss. Steel mill is often noisy environments due to the heavy machinery and processes involved. Workers who are not adequately protected from noise can suffer from hearing-related health issues. Constant exposure to noise and vibration can lead to increased stress and fatigue among workers. This can result in a high risk of accidents and errors. To mitigate the impact of noise and vibration on workers at a steel mill, project proponent should consider implementing the engineering controls, providing personal protective equipment, administrative control, trainings for operation procedures and safety practices, regular health checkups and periodic maintenance of equipment and machinery.

#### 6.2.2.3. *Impact on Soil Quality*

Some of the materials are often used as raw materials in other sectors. Through process optimization, including maximizing the internal recirculation of carbon and iron-bearing dusts, residues that are surplus to the requirements of the integrated steelworks production processes are minimized. A range of uses, including a variety of recovery processes, has been developed for such materials, resulting in a relatively small proportion of total residues requiring disposal. One of the activities with large potential effects on soil and groundwater is accidental spillage of oil from vehicles, waste on land and in landfill sites may percolate through the material and carry contaminants into soil and groundwater.



The slug of about 4000 TPA generated from the process shall be used in road construction and concrete pavement within the premises. The slug from wet scrubber will be treated before land fill by the treated scheme mentioned in **Pollution Control System** and **Solid Waste Management**. Hence, with the implementation, the impacts on the soil environment will be negligible. It is important to ensure that these practices are effectively implemented and monitored to maintain soil quality and prevent any adverse environmental effect.

#### 6.2.2.4. *Impact on Water Quality*

The groundwater consumption is one of the issues that should be considered for the environmental perceptive. For this proposed project, the annual water consumption is 1,514 KL which is used for both operation and domestic uses. For the operation purpose, the coolant water will be recycled to reduce extraction of groundwater resources. The ground water is used for process water which can be led in a close cycle and a small amount of water is lead to a wastewater sediment ponds before discharging. This amount needs to be replenished with fresh water. The causes of surface water contamination will be wastewater discharge from construction activities and storm water pass through oil spillage from the construction machines and vehicles. However, the groundwater consumption and surface water contamination impact will be insignificant because the water usage for operation is recycled. And then, the probability of surface water contamination is low due to the location of proposed project which is far from the Hlaing River.

#### 6.2.2.5. *Impact of Waste Disposal*

Most of the residue arising within an integrated steelworks have a high content of iron, carbon, calcium and other useful components and can replace primary raw materials such as iron ores, slag formers, etc. The presence of high concentrations of unwanted compounds such as alkalis, heavy metals and mineral oil sets limits on the recycling of iron-rich residues. The residue waste (slag) from pollution control system could be recycled and reused at road construction, cement production and fertilizer production.

Total sewage of 2400 liters per day will be generated from the toilet facilities shall be treated in the proposed septic tank. Not only 3400 TPA of Misrolls generated from the re-rolling process but also 1450 TPA of Endbits that are byproducts from cutting process will be recycled to the induction furnace for further re-processing. The 100 TPA of millscale generated from the process will be land-filled within the premises. Nonetheless, 30 TPA of treated slag from wet scrubber is even small; there will be some negative impact on the soil in long term. Hence, it is better to be stored at the containers and transported and/ or sold to the cement plant and fertilizer factory periodically. The plant has a plan to sell the slag to the buyers after land filling within the premise. If so, the solid waste generated from operation process are manageable in long term. The waste management for waste from the raw material handling such as plastic waste and under-graded scraps for steel making would be considered and these wastes should be collected and sold to the buyers.

#### 6.2.2.6. *Impact on Human*

In the steel making process, the workers have to exposure with heat and hot liquids, fire hazard and noise in their working environment. Accidental spillage of hot liquid can cause exposure to hot liquid to the workers who work at the induction process that can cause injuries to the skin and external organs.

The discharge of waste material (stack emission, sewage and solid wastes) from operation process will have potential impact on community health and safety. The impact from discharge of waste products is not expected to be significant. Since, the adverse impacts on ambient air and soil quality are predicted to be low and there will not be any trade effluent discharge from the plant. The community health and safety are dependent on the implementation of control measures suggested for pollution control.

**Table 6-7 Evaluation and Prediction of Significant Impacts for Operation Phase**

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Impact on Air Quality</b>								
<b>Air</b>	<ul style="list-style-type: none"> <li>✓ Dust emission from mechanical action (i.e., scarfing and grinding) and handling of materials (e.g., raw materials, recycled and waste materials)</li> <li>✓ Smelting and refining activities, heating furnace, conveying, charging, and quenching</li> </ul>	PM <sub>10</sub> , PM <sub>2.5</sub>	3	4	1	4	32	Moderate
	<ul style="list-style-type: none"> <li>✓ Nitrogen Oxide emissions are caused by high furnace temperature and the oxidation of nitrogen</li> <li>✓ Emission from the oxidation of the carbon from the metal bath during smelting and refining phases in EAF.</li> <li>✓ Potential source of dioxin and furans emission is off-gas in the EAF.</li> <li>✓ Fugitive dust and exhaust gas emission form induction and reheating activities</li> <li>✓ Generation of flue gas from induction and reheating activities</li> <li>✓ Gaseous emission from vehicles and machines for loading and unloading of iron scraps</li> </ul>	CO, SO <sub>2</sub> , NO <sub>x</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> , Dioxins and Furans	4	4	2	4	40	Moderate

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
	✓ Sources of odor impacts are rolling, cooling and slag handling, particularly if the slag is exposed to moisture							
<b>Impact of Noise and Vibration</b>								
<b>Noise and Vibration</b>	✓ Noise and vibration from operation activities and loading and unloading of iron scrap ✓ Noise from heavy machines and traffic along main transport/ access routes	Noise Level (dB(A))	3	4	1	4	32	Moderate
<b>Impact on Soil Quality</b>								
<b>Soil Contamination</b>	✓ Land filling of treated sludge at the project site	Physical structure of soil	3	4	1	3	24	Low
	✓ Accidental spillage and release of diesel, furnace oil and other related chemicals at the project site ✓ Leakage of engine oils and fuels while transportation vehicles operate	Chemical pollutants	3	4	1	2	16	Low
<b>Impact on Water Quality</b>								
<b>Groundwater Consumption</b>	✓ Water consumption for cooling process and domestic purpose	Groundwater consumption	3	4	1	3	24	Low
<b>Surface Water Contamination</b>	✓ Wastewater discharge from staff quarters and operation activities ✓ Storm water runoff where accidental oil spillage from the machines and vehicles	Chemical pollutants Oil and grease	3	4	2	3	27	Low

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Impact of Wastewater Effluents</b>								
<b>Wastewater Effluents</b>	✓ Dispose sewage and discharged wastewater from toilet facilities and staff quarter	Organic compounds and heavy metals in wastewater	3	5	1	3	27	Low
<b>Impact of Waste Disposal</b>								
<b>Generation of Hazardous and Non-hazardous Solid Waste</b>	✓ Generation of domestic waste from staff quarter	Sludge and slag, domestic waste (Litter), etc.	3	5	1	4	36	Moderate
	✓ Generation of treated sludge from web scrubber							
	✓ Generation of maintenance waste oil from operation vehicles and machines ✓ Byproduct collection and deposition	Oil and grease Mis rolls, end bits and midscale	2	5	1	2	16	Low
<b>Impact on Human</b>								
<b>Occupational Health and Safety</b>	✓ Accidental injuries from falling from elevation associated with ladder ✓ Small injuries due to slips and falls, accidents and electric shock	Physical hazards	3	4	1	2	16	Low
	✓ Operation noise form casting, rolling and cutting process of steel production ✓ Vehicle traffic and use of lifting equipment in the movement of machinery and materials	Noise	3	4	2	4	36	Moderate
	✓ Cardiff fumes emission from induction and melting process	Odor	4	4	1	3	27	Low



Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
	✓ High temperatures and potential contact with hot metal or hot water of induction melting, continuous casting, reheating and rolling processes	Heat and hot liquids	4	4	1	5	45	High
	✓ Fire hazards from accidental contact with other related chemicals and hot liquid iron	Fire hazards	4	4	2	3	30	Moderate
<b>Community Health and Safety</b>	✓ Emission of air pollutants from operation activities such as induction, re-heating process	Dust and gases, VOCs	4	4	2	3	30	Moderate
	✓ Fire hazards from accidental electric shock and other operational activities error	Fire Hazard	3	4	2	3	27	Low

### **6.2.3 Potential Environmental and Social Impact during Decommissioning Phase**

During the decommissioning phase, most of the anticipated impacts on physical environment and human are insignificant. Meanwhile, there will be some impacts due to waste disposal after demolishing the building and dismantling the machinery and equipment.

#### *6.2.3.1. Impact on air quality*

Most construction and decommissioning activities generate dust. The emission of particulates into the atmosphere is through vehicle dust entrainment, demolition, excavation, ground leveling, etc. The main environmental problem with dust that is generated from these activities is that it settles on surrounding properties and land which is often more of a nuisance problem than a health issue. The dust is generally coarse, but may include fine particles (PM<sub>10</sub>) and these are known to be a risk to human health.

Exhaust emissions from construction vehicles and equipment typically include particulates (including PM<sub>10</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), Sulphur dioxide (SO<sub>2</sub>) and volatile organic compounds (VOCs).

The construction and decommissioning activities are typically short lived and the pollutants are released close to ground level with little which limits their dispersion and the potential impacts to the site.

#### *6.2.3.2. Impact of Noise and Vibration*

It is anticipated that the change in ambient noise levels will be negligible. Ambient noise levels are not expected to exceed the guideline at any of the identified receptors, although the decommissioning phase sound levels may impact on the ambient noise levels of the project area. Final decommissioning activities will have a noise impact lower than either the construction or operational phases. This is because decommissioning and closure activities normally take place during the day using minimal equipment (due to the decreased urgency of the Project). While there may be various activities, there is a very small risk for a noise impact.

#### *6.2.3.3. Impact on Human*

The impacts on human health due to air emissions and dust generation will be a direct, negative impact. The duration will be long-term, for the duration of the operation phase. The extent of the impact will be local, as the pollutants will be limited in dispersion, occurring onsite and adjacent to the site, as well as the main transport routes. Therefore, it is anticipated that the significance of the impact will be low.

**Table 6-8 Evaluation and Prediction of Significant Impacts for Decommissioning Phase**

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
Impact on Air Quality								
Air	✓ Dust emission from demolition activities ✓ Delivering and transportation of demolished materials	PM <sub>10</sub> , PM <sub>2.5</sub>	2	1	1	3	12	Very Low
	✓ Gaseous emission from vehicles and machines for decommissioning activities	CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub>	2	1	2	3	15	Low
Impact of Noise and Vibration								
Noise and Vibration	✓ Noise and vibration from decommissioning activities ✓ Noise from heavy machines and traffic along main transport/ access routes	Noise Level (dB(A))	2	1	2	3	15	Low
Impact on Soil Quality								
Soil Contamination	✓ Keeping the demolished materials and iron scraps at the project site	Physical structure of soil	3	1	1	4	20	Low
	✓ Accidental spillage and release of diesel and other related chemicals at the project site	Chemical pollutants	3	5	1	3	27	Low
	✓ Leakage of engine oils and fuels while transportation vehicles operate							
Impact on Water Quality								
Groundwater Consumption	✓ Water consumption for domestic purpose	Groundwater consumption	2	1	1	4	16	Low

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Surface Water Contamination</b>	<ul style="list-style-type: none"> <li>✓ Wastewater discharge from worker camp</li> <li>✓ Storm water runoff where accidental oil spillage from the machines and vehicles</li> </ul>	Chemical pollutants Oil and grease	3	1	2	4	24	Low
<b>Impact of Wastewater Effluents</b>								
<b>Wastewater Effluents</b>	<ul style="list-style-type: none"> <li>✓ Discharge wastewater from toilet facilities and worker camps</li> </ul>	Organic compounds and heavy metals in wastewater	3	1	2	4	24	Low
<b>Impact of Waste Disposal</b>								
<b>Generation of Hazardous and Non-hazardous Solid Waste</b>	<ul style="list-style-type: none"> <li>✓ Dispose of sewage and domestic waste from worker camp</li> </ul>	Residue of cement, organic waste, wood scrap, domestic waste (Litter), etc.	3	6	1	4	40	Moderate
	<ul style="list-style-type: none"> <li>✓ Accidental spillage and disposal of maintenance waste oil from transportation vehicles and machines</li> </ul>	Oil and grease	3	6	1	3	30	Moderate
<b>Impact on Human</b>								
<b>Occupational Health and Safety</b>	<ul style="list-style-type: none"> <li>✓ Accidental injuries from falling from elevation associated with ladder</li> <li>✓ Small injuries due to slips and falls, accidents and electric shock</li> </ul>	Accidents	3	1	1	3	15	Low
	<ul style="list-style-type: none"> <li>✓ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> </ul>	Noise	2	1	2	3	15	Low

Potential Impacts	Activity and Impact Sources	Components	Magnitude	Duration	Extent	Probability	Significant point	Significant Impact
<b>Community Health and Safety</b>	✓ Emission of air pollutants from demolished activities	Dust and gases, VOCs	2	1	2	3	15	Low



### 6.3. Risk Assessment Methodology

Risk assessment is a term used to describe the overall process or method;

- To identify hazards and risk factors that have the potential to cause harm (Hazard identification)
- To analyze and evaluate the risk associated with that hazard (Risk analysis, and risk evaluation)
- Determine appropriate ways to eliminate the hazard, or control the risk when the hazard cannot be eliminated (Risk control)

A risk assessment for steel mill is a thorough look at the farm to identify situation, components and processes, etc. that may cause harm, particularly to people. The known hazards are listed and checked within the risk matrix to grasp the importance of risk, the safeguarding controls/ measures will be described based on the risk ranks and at last the recommendation shall be provided to prevent/ eliminate the potential hazards.

**Table 6-9 Risk Rating – Risk Matrix and Definitions**

LIKELIHOOD	CONSEQUENCE					
		Insignificant	Minor	Moderate	Major	Sever
	Almost certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High
LIKELIHOOD						
Almost certain – will occur in most circumstances when the activity is undertaken (greater than 90% chance of occurring)						
Likely - will probably occur in most circumstances when the activity is undertaken (51 to 90% chance of occurring)						
Possible – might occur when the activity is undertaken (21 to 50% chance of occurring)						
Unlikely – could happen at some time when the activity is undertaken (1 to 20% chance of occurring)						
Rare – may happen only in exceptional circumstances when the activity is undertaken (less than 1% chance of occurring)						
CONSEQUENCE						
Insignificant –First aid treatment, minor injury, no time off work, existing control measures is sufficient						
Minor – Single occurrence of medical treatment, minor injury, no time off work, existing control measures is sufficient						
Moderate – Multiple medical treatments, non-permanent injury, less than 10 days off work, evaluate the existing control measures and additional mitigation is needed						
Major – Extensive injuries requiring medical treatment (e.g., surgery), serious or permanent injury/illness, greater than 10 days off work, evaluate the existing control measures and additional mitigation is needed						
Severe – Severe injury/illness requiring life support, actual or potential fatality, greater than 250 days off work, consider for additional mitigation measures and altering the technology and design used in operation activities						
RISK RATING PRIORITY FOR ACTION						

	Risk Acceptance Guide	Action	Recommended Action Time Frame
Extreme	Not acceptable	Cease or isolate source of risk, implement further risk controls, monitor, review and document controls	Immediate Up to 1 month ongoing
High	Generally (in most circumstances) not acceptable	Implement risk controls if reasonably practicable, monitor, review and document controls	1 to 3 months Ongoing
Medium	Generally (in most circumstances) acceptable	Implement risk controls if reasonably practicable, monitor, review and document controls	3 to 6 months Ongoing
Low	Acceptable	Monitor and review	Ongoing

Source: (Bai & Jin, 2016)

Performing a risk assessment for steel mill is crucial to identify potential hazards and implement appropriate mitigation measures. Here are key steps to conduct a risk assessment for steel mill:

**Identify potential hazards:** Evaluate the process operations, infrastructures, and activities to identify potential hazards. These may include air quality issues, equipment malfunctions, fire hazards, environmental factors and human-related risks.

**Assess the likelihood and consequences:** Determine the likelihood of each identified hazard occurring and the potential consequences if it does happen. Consider factors such as frequency, severity and duration of the hazards.


**Prioritize risks:** Prioritize the identified risk based on their potential impact and likelihood. Focus on the risks that pose the highest potential harm to worker safety and plant operations.

**Evaluate current control measures:** Assess the effectiveness of existing control measures in place to mitigate the identified risks. This includes evaluating the adequacy of standard operation procedures, equipment maintenance protocols and worker training programs.

**Develop mitigation strategies:** Develop specific mitigation strategies for each identified risk. Consider measures such as modifying operation procedures, implementing additional safety protocols, improving equipment maintenance, enhancing air quality management, and enhancing occupational health and safety practices.

**Implement risk control measures:** Implement the identified mitigation strategies and ensure that all relevant personnel are aware of and trained in their proper implementation. This may involve updating standard operation procedures, providing additional training and establishing monitoring systems to ensure compliance.

The Hierarchy of control describes that ranking of methods for controlling risks from the highest level of protection and reliable to the lowest. The level/ method of control should be appropriate to the level of risk. A sever risk activity, if it cannot be eliminated, there would require higher levels of controls than a low-risk activity.

Level 1 (Highest effectiveness)		Elimination	
Elimination	Remove the hazard		
Level 2		Substitution	
Substitution	Substitute the hazard for something safer		
Isolation	Isolate the hazard from people	Isolation	
Engineering	Change the workplace, equipment or work process	Engineering	
Level 3 (Lowest effectiveness)			
Administration	Use administrative control	Administration	
PPE	Use personal protective equipment (PPE)	PPE	

**Table 6-10 Risk Assessment of Occupational Health and Safety for Yangon JR Steel Mill Project**

Hazard	Likelihood	Consequence	Risk Rating	Control Measures
Noise	Possible	Minor	Medium	Engineering and Administrative
Vibration	Possible	Insignificant	Low	
Heat stress	Likely	Moderate	High	Engineering, Administrative, PPE
Chemicals	Unlikely	Minor	Low	
Inhalable agents (gases, vapors, dusts and fumes)	Possible	Minor	Medium	Isolation, Engineering and Administrative
Confined space	Unlikely	Minor	Low	
Work equipment and machinery guarding	Likely	Moderate	High	Engineering, Administrative, PPE
Falling objects	Unlikely	Minor	Low	
Slips, trips and falls	Unlikely	Minor	Low	
Ergonomics	Likely	Minor	Medium	Engineering and Administrative
Handling molten metal, dross or slag	Likely	Minor	Medium	Isolation, Engineering and Administrative
Rolling mill	Possible	Moderate	Medium	Engineering and Administrative
Coating lines	Possible	Insignificant	Low	

### 6.3.1. Potential Risks and Hazards Occurred in Steel Mill

There may be slight increase in noise and vibration levels due to the utilization of compressors, fans, pumps, material handling systems, etc. The community impact due to noise and vibration due to the steel mill would be negligible, since the mill is located at industrial zone. However, onsite workers exposed to excessive noise will be provided with noise protection devices like earplugs, earmuffs, etc. Proper maintenance of the equipment at various processing units can also reduce the noise level in the plant premises.

Heat stress risks arise in special conditions: Temperature and/ or humidity are unusually high, workers are exposed to high radiation heat, high temperatures and/ or humidity occur in combination with heavy protective clothing or a high work rate. If the workers are exposed in

all or some of their tasks to any conditions and the hazards cannot be eliminated, employers should assess the hazards and risks to safety and health from extreme temperatures and determine the controls necessary to remove the hazards or risks or to reduce them to the lowest practicable level.

A chemical substance, a compound or mixture which may be present in the workplace in the form of a liquid, solid (including particles) or gas (vapor), may present a hazard as the result of contact with body or absorption into the body. Chemicals can have acute (short-term) and/or chronic (long-term) health effects. Chemicals may present a safety hazard as a result of their chemical and physical properties. Workers may be exposed to chemicals in production work by addition to the process, as well as to chemicals generated by the process or used in maintenance activities. Material safety data sheets that include advice on the safe handling of any chemical to ensure adequate prevention and protection should be readily available. All those concerned with the storage and handling of chemicals, and with general housekeeping, should be trained and should adopt safe systems of work at all times.

The production of iron and steel involves the consumption and generation of a variety of inhalable agents (heavy metals), comprising health hazards including irritants, chemical asphyxiates, allergens, carcinogens, etc. The assessment of risk should begin with a review of production and maintenance processes in order to understand the content, form and volume of inhalable agents associated with the production of iron and steel, including intermediates, byproducts and waste. The potential for exposure should be assessed according to the provisions of the ILO codes of practice *Safety in the use of chemicals at work and ambient factors in the workplace*. Exposure assessment activities should be conducted by competent persons and employers should provide information to workers and their representatives regarding the risk assessment process, and inform them of the results of risk assessments.

The use of work equipment, including machinery, may result in accidents, many of which are serious and some fatal. Of the many factors that can cause risk, particular areas of concern include:

- A lack of guards or inadequate guards on machines which can lead to accidents caused by crushing, cutting, etc.
- The lack of appropriate safety systems, interlocks or other automatically functioning safety devices and emergency stopping devices
- Failure to provide the right information, instruction and training for the workers using the equipment

The risk of musculoskeletal injuries is common in iron- and steel-making facilities. Manual carrying and lifting of large and/or heavy objects is common despite the high degree of mechanization and remedy devices and can cause musculoskeletal injuries. Long-lasting repetitive work movements and awkward postures may cause musculoskeletal injuries. Maintaining the same posture for extending period causes excessive fatigue. Confusing and/or missing information may lead to errors being made. The conveying of visual and acoustic information may be degraded because of environmental factors, poor design of machinery and

equipment and PPE and may lead to dangerous incidents and accidents. The OHS requirements for repetitive work, working postures, physical load and the handling and transport of materials, particularly manual handling should be established based on the risk assessment, technical standards and medical opinion, taking account of all the relevant conditions in which the work is performed. It should be verified that workers get all necessary information about the process, machinery and their co-workers in correct form and in due time.

Burns may occur at many points in the steel-making process: at the front of the furnace during tapping from molten metal or slag; from spills, spatters or eruption of hot metal from ladles or vessels during processing, teeming (pouring) or transporting; and from contact with hot metal as it is being formed into a final product.

In rolling process, there is a risk of trapping between the rolls. Sever injuries may be caused by shearing, cropping, trimming and injuries may occur, especially in hot-rolling, if workers attempt to cross roller conveyors at unauthorized points. The use of large quantities of oils, rust inhibitors and so on, which are generally applied by spraying is one of the hazards commonly encountered in steel-rolling mills. Even in automated works, accidents occur in conversion work while changing heavy roller in the stands. In hot-rolling, burns, eye injuries or other injuries may be caused by flying mill scale and dust particles. Cuts may occur when workers contact the edge of thin steel strip.

#### **6.4. Social Impact Assessment**

Social impact assessment (SIA) is a proactive tool used to understand the potential impact, adverse or beneficial, that the proposed project could affect on the communities and to recommend effective mitigation measures, to reduce those identified impacts to a lesser degree of significance.

According to the IAIA (International Association for Impact Assessment), SIA is generally defined as a process of analyzing, managing and monitoring the consequence of the project. SIA includes the process of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative of planned interventions (policies, programs, plans, projects).

The evaluation and assessment involve both qualitative and quantitative data with professional judgment and stakeholder consultation. In assessing the characteristics of the individual impact, the following factors are taken into consideration.

- Nature of impact (Beneficial or adverse)
- Duration of impact (Temporary and permanent)
- Likelihood
- Severity
- Significance of impact



**Table 6-11 Social Impact Significance**

Likelihood of Impact	Severity of Impact				
	Minor	Low	Medium	High	Very High
Very Unlikely	Negligible	Negligible	Negligible	Minor	Moderate
Unlikely	Negligible	Negligible	Minor	Moderate	Moderate
Likely	Negligible	Negligible	Minor	Moderate	Major

This following section represents the summary of social impacts of the project with the purpose of mitigation or enhancement to the potential adverse and beneficial impacts identified and evaluated in the assessment.

The objectives of the Social Impact Assessment are

- To describe the project's commitments in managing and mitigating social impacts raised from the existence of project in a defined location and in enhancing identified benefits to communities and stakeholders
- To formulate the mechanism to mitigate and monitor these potential impacts
- To establish a system in which public participation is paramount in setting up strategies for the dealing of identified impacts and benefit throughout the life of the project
- To recommend the additional social control measures

**Table 6-12 Social Impacts due to Steel Mill Project**

No.	Item	Nature	Duration	Likelihood	Severity	Significance
1.	Employment and Skill	Positive	Short	Likely	Medium	Minor
2.	Farming Activities	Negative	Long	Likely	Low	Negligible
3.	Local Economy	Positive	Long	Likely	High	Moderate

#### 6.4.1. Impact to Employment and Skills

**Creation of Employment:** The activities involved in the construction, operation, decommission, maintenance and management of the proposed project will generate local employment. Security services, cleaning and waste collection are some of the services that will benefit indirectly. With the implementation of the project, there will be employment opportunities especially for casual workers from the local community. Besides, the casual labor, the implementation of the project will also require the services of architects, health and safety officers, engineers and it will create more temporary job opportunities. The advanced technical knowledge and experience will be improved by cooperation with international engineers.

During the operation phase, although the project intended to employ over 300 persons at the operation of steel mill, there are 20 persons for management and professionals/ technicians and 22 workers for production process due to the availability of electricity. Thus, people around from project area can obtain job opportunities that could be considered as minor potential positive impacts.

#### 6.4.2. Impact on Farming Activities

As the result of social survey, there are few farmers who cultivate rice, other cereal crops and vegetables near the industrial zone. As increasing the numbers of factories in the industrial zone, the areas of cultivated lands are gradually being shrunk by expending the area of industrial zone. The farmers usually face the soil contamination problems due to the release of waste from the industry near the field.

#### 6.4.3. Impact on Local Economy

**Business Opportunities:** Facilitating of the construction activities need goods and services including raw materials, plumbing services, electrical fittings, transport landscaping and finishing. The construction will provide a ready market for these construction goods and services, leading to several business opportunities for small-scale traders such as food vendors, market around the construction site. In addition, the business opportunities for local businessperson (e.g., subcontractor works) will be increased due to construction. The steel mill is implemented in local area, the foreign import for steel will be reduced and local people can purchase easily, they can save times and the products will be cheaper than other import products. Thus, it could be considered that the potential impact related to the local economy is moderate.

Moreover, to access the perception of the local people on this project, the following items were included in the structural questionnaire. **Table 6-13** states that only 17 persons among the total respondents knew the information of project by means of village head, relatives/ friends, social survey interviewers and stakeholder meeting of scoping stage.

**Table 6-13 Awareness about Yangon J.R Family Steel Production Project**

Villages	Have you known about Yangon J.R Family Steel Production Project	
	Yes	No
Kan Kalay Village	15	23
Kone Kalay Village	2	27
<b>Total</b>	<b>17</b>	<b>50</b>
Sources of Information	Frequency	Percentage
From Village Head	1	1.5
Relatives/ Friends	11	16.4
Social Survey Interviewer	4	6
Stakeholder Meeting	1	1.5
<b>Total</b>	<b>17</b>	<b>25.4</b>

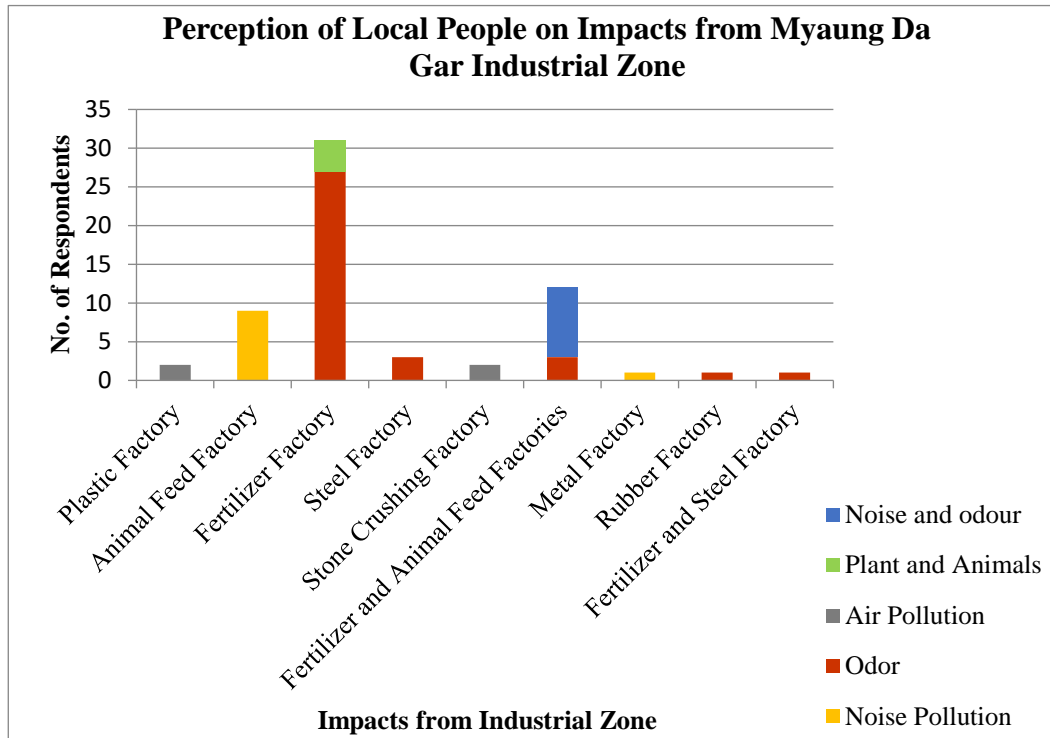
The perception of the local people on the Myaung Da Gar Industrial Zone can be classified as three categories: expected development for community from the project, benefits from industrial zone and drawback of industrial zone.

For **expected development for community form the project**, most of the respondents answered that implementation of new factories in the industrial zone makes developing the local economy and transportation comparing to the previous situation that had not been the industrial zone (see in Error! Reference source not found.). For **benefits form industrial zone**, most of the respondents said that they got more job opportunities after establishing the Myaung Da Gar Industrial Zone. For **drawback of industrial zone**, according to the survey results, bad odor which is generated by releasing the ammonia gas from fertilizer factory is significantly negative impact to the local people. Most of the sensitive receptors such as old people, children and unhealthy person feel suffocating and eye irritation, asthma and dizzy due to that bad odor.

**Table 6-14 Perception of Local People on Myaung Da Gar Industrial Zone**

	Frequency	Percentage (%)
<b>What kind of development do you expect for the community?</b>		
Economy	17	25.4
Transportation	8	11.9
Electricity	1	1.5
<b>Benefits from industrial zone</b>		
Economy	2	3
Health	1	1.5
Job opportunity	22	32.9
<b>Drawback of industrial zone</b>		
Odor	23	34.3
Decreasing air quality	2	3.0
Wastewater	3	4.5
Decreasing grazing area for animals	1	1.5
Lack of CSR	1	1.5
Eye irritation	1	1.5
Increasing rate of disease occurrence	1	1.5
Low chance of job opportunity for over 30-year-old women	1	1.5
Noise	3	4.5

In accordance with the analysis of social survey data, the local people concerned about the different kinds of impacts form the industrial zone which is presented on **Figure 6-1**. Most of the local people who live near industrial zone (Kan Kaly and Kone Kalay villages) complained about significant unpleasant odor from the fertilizer mill. Some people distressed due to the noise pollution which is generated from feed mill.



**Figure 6.1 Preception of Local People on Impacts from Industrial Zone**

## 6.5. Health Impact Assessment

Health impact assessment is a combination of procedures, methods and tools by which a policy, program or a project could be judged to review and/ or provide decision-makers with information on how its potential effects on the health of a population and the distribution of those effects within the population. For occupational health impact assessment is a systematic process used to evaluate the potential health risks and impacts associated with project activities, such as construction and operation of a steel mill. However, in keeping with the global trend of introducing HIAs in the project, an HIA was conducted with the following objectives.

- To establish the baseline of existing health conditions in a project area
- To evaluate the potential health impacts on individuals and communities influenced by a project
- To employ assessment of health impacts, where impact can be neutral, positive or negatives
- To provide a formal mechanism for engaging relevant stakeholders in discussions regarding prevention and mitigation of negative effects on health during project operation and decommissioning phases
- To provide a basis for developing formal mitigation action plans

### 6.5.1. Scope of the Study

The Health Impact Assessment study, focusing on the project area and its vicinity, includes two nearest villages: Kan Kalay and Kone Kalay villages where are adjacent to the Myaung Da Gar Industrial Zone.

- (a) **Scoping:** In the scoping process, specific information such as gender, age group, education and occupation status are collected.
- (b) **Survey:** To obtain the basic health profile survey of the study area was conducted, with structured questionnaires and annual medical checkup record of workers who are working for steel mill.
- (c) **Impact Identification and Assessment:** Anticipated impacts of the project relating to its environment are assessed from baseline health conditions, usage of domestic and drinking water, perception of local community from household survey.
- (d) **Hazard Identification and Risk Assessment:** Identify and assess potential occupational health hazards associated with steel mill operations, e.g., common hazards may include exposure to chemicals, high temperatures, noise, dust and heavy machinery. Evaluate the risks associated with identified hazards and consider the severity of potential health impacts and the likelihood of exposure.
- (e) **Mitigation measures:** Mitigation measures are based on impacts rating and rankings with the aim to enhance predicted positive health impacts and minimize negative ones. Identify and recommend mitigation measures to reduce or eliminate identified health risks. These measures may include engineering controls, personal protective equipment and health and safety training.

### 6.5.2. General Methodology

For the health impact assessment, both introduction to Health Impact Assessment (World Bank, 2009) and World Health Organization (WHO, 2001) recommendations have been utilized. In addition, published HIA from other countries have also been consulted. Other completed HIA for integrated steel mill projects have also been reviewed and utilized in this health impact assessment.

The WHO approach defines a general framework for completing HIA, although it does not develop or present HIA methodology to EIA guidelines or World Bank Safeguard Directives covering the environment (environmental assessment, natural habitats), rural development and social development. The health information nearest receptors of the project site is described based on the volume of knowledge, the reliability of that knowledge, the transferability between projects or regions and quantifiability of the knowledge in term of the social survey and secondary data from Hmawbi Township Information of General Administrative Department (2019).

**Table 6-15 WHO Model of HIA**

Health Issue	Example	Knowledge-base
Communicable disease	Vector-borne	Large, reliable
Non-communicable disease	Pesticide exposure	Reliable, generalizable
Accidents and injuries	Project activities and traffic-related	Reliable, some statistics
Malnutrition	Vitamin A deficiency	Variable, potentially quantifiable
Psychosocial disorder	Substance abuse	Cultural variation
Social well-being	Quality of life, equality	Variable reliability



**Desktop Health Impact Assessment** was applied in this Health Impact Assessment (HIA) for steel mill project. A **desktop HIA** is a qualitative review of potential health impacts and is used to internally inform and interview questionnaire. It is also useful for determining whether a more detailed review is needed. The outcome of the desktop HIA may be definition of scope for the HIA, or even that is required further assessment of health impact is required.

#### *6.5.1.1. Baseline Condition*

Baseline health conditions are the fundamental component of the overall health impact assessment (HIA) process. The baseline health summary provides a point of reference for the health status of a community prior to the development of the proposed project and also describes an overall health profile for an area.

#### *6.5.1.2. Source of Information*

Baseline health studies were conducted through a social survey of 67 households. According to this, the respondents where live near the Myaung Da Gar Industrial Zone answered the questions based on the experiences as well as narrative story and the most common complaint was suffocating and eye irritation, asthma and dizzy due to bad odor.

#### *6.5.1.3. Limitations*

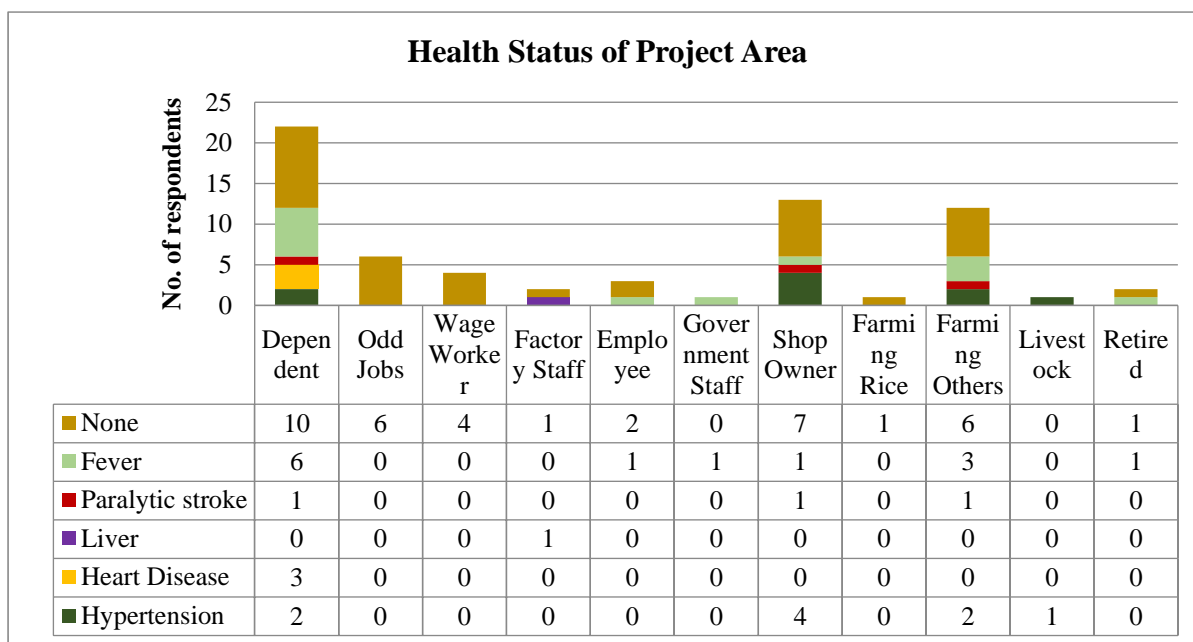
Since the survey was conducted early in the project's development, there are some restrictions on the data that can be collected about the proposed project's potential effects on health. Based on their observations of the effects of the various projects located in the Myaung Da Gar Industrial Zone, the respondents provided answers to the health-related questions.

### **6.5.3. Health Information around the Project area**

To collect the baseline information on the health of the people in and around the Myaung Da Gar Industrial Zone, the present survey was conducted by using questionnaire on 67 representative households. Health condition is determined on the basis of population, level of education, water and sanitation systems and location of health facilities etc.

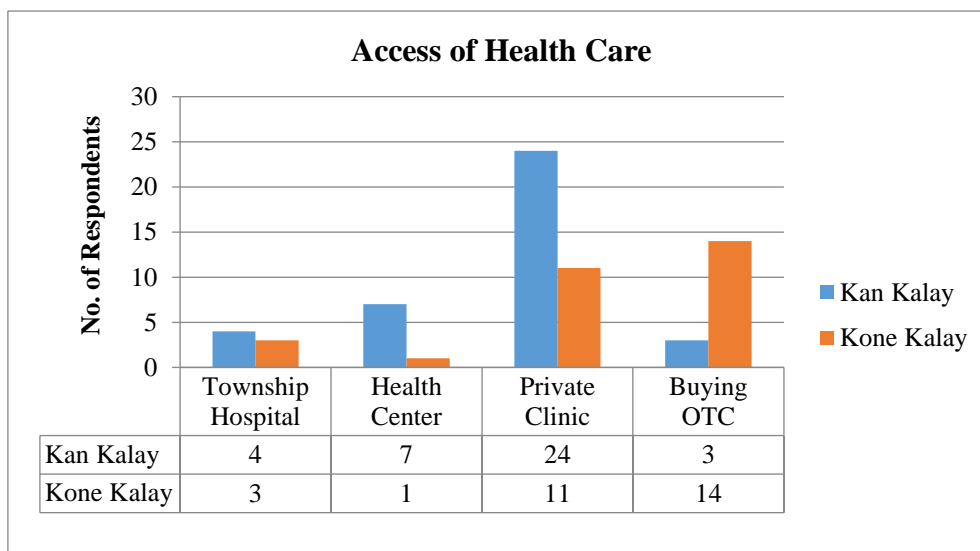
There are 67 respondents, 35 percent of total households in the survey, measure on baseline data of health conditions of the surrounding residential area. Primary data are collected and assessed by qualitative and quantitative measurements.

As the result of primary data collection, the common types of diseases are fever, paralytic stroke, liver disease, heart disease and hypertension. **Figure 6-2** shows the health status of project area based on their occupation. Hypertension disease is likely occurred at the local community (9 persons). Most of the respondents (38 persons) answered that they do not suffer any chronic diseases. To compare with Hmawbi Township health profile, the common diseases found in Hmawbi Township are Diarrhea and TB.



**Figure 6.2 Health Status of Project Area**

Majority of the people in Kan Kalay Village usually go the private clinic where near the industrial zone for their health care but the people from Kone Kalay Village practice buying OTC (over the counter) to relief their pain and fever. According to **Figure 6-3**, the people who live in Kan Kalay Village have higher knowledge for taking proper treatment than the Kone Kalay Village.



**Figure 6.3 Access of Health Care**

The following table expressed how the local people feel and consider that effect to their health condition due to the establishment of industrial zone. The 32 persons of the people who work at different occupations answered that they do not suffer any significant negative impacts from the establishment of industrial zone.

**Table 6-16 Perception of Local People on Impacts from Myaung Da Gar Industrial Zone**

Types of Health Information Occupation	Died most of the workers from stone crushing factory due to lung disease	Ear problem due to noise	Abdomen pain of workers from lead factory	Suffocating and eye irritation	Asthma and dizzy due to bad odor	None
Dependent	2	0	2	7	1	10
Odd Jobs	0	0	0	1	1	4
Wage Worker	0	0	0	2	0	2
Factory Staff	0	0	0	1	0	1
Employee	0	0	0	0	1	2
Government Staff	0	0	0	0	1	0
Shop Owner	2	0	0	2	3	6
Farming Rice	0	0	0	1	0	0
Farming Others	2	1	1	2	2	4
Livestock	0	0	0	0	0	1
Retired	0	0	0	0	0	2
<b>Total</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>16</b>	<b>9</b>	<b>32</b>

The risk assessment has been presented in **Potential Risks and Hazards Occurred in Steel Mill**. Hazard identification and risk assessment should be prioritized in order to address the impact of occupational health and safety. Additionally, occupational health, environmental health and community health professionals should work together on occupational health impact assessments, and affected people and organizations should also contribute. Throughout the life of the project, it is intended to reduce hazards to occupational health and to protect the welfare of both workers and the community. To lessen or eliminate the identified health hazards, the project proponent should adhere to and put into practice the recommended mitigation measures, such as engineering controls, personal protective equipment and health and safety training. Following the implementation of the suggested actions, a system of monitoring and surveillance should be put in place to track the workers' health over time and identify any unfavorable health trends. To improve knowledge of occupational health risks and promote healthy habits, programs for worker health promotion and education should be created.

#### 6.6. Mitigation Measures for Anticipated Impacts of Steel Mill

The following mitigation measures have to be followed to minimize the potential impacts on environment during construction, operation and decommissioning phases.

- Roads are sprinkled with water at regular intervals for which water tankers with sprinkler arrangement are deployed.
- Trucks carrying construction materials and raw materials are covered with tarpaulin to prevent spreading of dust during transportation.
- Green belt and greenery development around storage yards, around plants, either side of roads and around the periphery of the industry.

- The conveyors of fuel are suitably covered with hood or enclosures to control fugitive emissions.
- Dust respirators are provided for the people working dust generating locations.
- All internal roads in the premise are paved /tarred.
- Speed limit of 10 km/h is enforced for vehicles in the plant premises to prevent road dust emission.
- The air pollution control measures will ensure monitoring regularly to meet the standard of NEQG.
- Suitable measures have to be adopted for occupational noise safety in factory and good maintenance of vehicles.
- Safety officer who will co-ordinate and manage occupational health safety will be appointed in the industry
- Good housekeeping must be practiced in the industry.
  - Regular cleaning of plant roads
  - Regular wetting of roads with water
  - Keeping ventilation systems in good working order to avoid accumulation of dust on equipment inside the room
  - Maintaining adequate green belts inside and along the plant for not only suppression of noise and pollutant transportation but also for better aesthetics.
- Regular inspection and maintenance of pollution control plants
- Heat insulation of hot surfaces, wherever necessary, personnel protective appliances will be used by the workers.
- All pollution control and dust suppression systems shall be interlocked with operation of process equipment or are run along with process equipment
- Health and safety related displays will be exhibited at strategic locations in the industry.
- Workers are educated workers on health, hygiene and safety and trained in occupational health safety.
- First aid facilities will be provided at different locations. Further first aiders will be trained from reputed training institute.
- Workers are trained to assist emergency management in case of any such incidences
- The workers exposed to noisy equipment shall be provided with ear muffs. If necessary, the duty hours will be rotated, so that noise exposure time is kept within specified limits.
- Regular health check-up of the workers will be carried out and health records of individual workers. Each worker will have a baseline medical check-up at the time of joining followed by annual medical check-up.

**Table 6-17 Proposed Mitigation Measures for Operation Phase of Steel Mill**

Potential Source of Impact and Components	Recommended Mitigation Measures
<i>Impact on Air Quality</i>	
Air	<ul style="list-style-type: none"> <li>❖ Regular check and maintain fume wet scrubber system installed at chimney</li> <li>❖ Preventive maintenance of valves and other equipment.</li> </ul>

Potential Source of Impact and Components	Recommended Mitigation Measures
<ul style="list-style-type: none"> <li>➤ Dust emission from iron scrap handling and segregation</li> <li>➤ Fugitive dust and exhaust gas emission from induction and reheating activities</li> <li>➤ Generation of flue gas from induction and reheating activities</li> <li>➤ Gaseous emission from vehicles and machines for loading and unloading of iron scraps</li> <li>➤ Sources of odor impacts are rolling, cooling and slag handling, particularly if the slag is exposed to moisture</li> </ul>	<ul style="list-style-type: none"> <li>❖ Ambient air quality and stack/fugitive monitored periodically.</li> <li>❖ A good housekeeping consisting of simple, obvious task of clearing up, removing accumulations and in general keeping things neat and clean will form a part of normal operation and maintenance procedure.</li> <li>❖ Regular inspect and maintain storage room.</li> <li>❖ Encase solid waste storage tanks to prevent odor emission.</li> <li>❖ To minimize dust emission around the project area, spray the water daily if necessary.</li> <li>❖ The project proponent must install proposed pollution control system to reduce adverse impacts of indoor air quality.</li> <li>❖ Replant the trees along the fence of the compound</li> <li>❖ Install and maintain effective ventilation and exhaust systems to capture and remove odorous emission</li> <li>❖ Conduct regular maintenance of equipment and systems and monitor air quality and emission to detect any changes in odor levels or potential issues</li> <li>❖ Develop GRM for addressing the complaints promptly, investigating their causes, and taking corrective action as needed.</li> </ul>
<i>Impact of Noise and Vibration</i>	
<p>Noise and Vibration</p> <ul style="list-style-type: none"> <li>➤ Noise and vibration from operation activities and loading and unloading of iron scrap</li> <li>➤ Noise from heavy machines and traffic along main transport/access routes</li> </ul>	<ul style="list-style-type: none"> <li>❖ Proper maintenance of the equipment at various processing units can also reduce the noise level in the plant. However, the community impact due to noise during construction phase will be negligible, since the plant is located near an industrial estate.</li> <li>❖ Noise generation sources and their platforms would be maintained properly to minimize noise and vibration.</li> <li>❖ Roofs of building of plant will be constructed of reinforced concrete of light weight concrete.</li> <li>❖ Natural ventilation and proper ventilation systems should be installed in the plant.</li> <li>❖ Training would be imparted to plant personnel to generate awareness about damaging effect of noise.</li> <li>❖ The emergency generators must be placed in enclosures or silence-type generator is recommended to use.</li> <li>❖ Make regular check and maintenance to vehicles.</li> <li>❖ To reduce noise pollution, the project proponent has a plan to plant some indigenous species of trees, ornamental trees and grass.</li> </ul>
<i>Impact on Soil Quality</i>	
<p>Soil Contamination</p> <ul style="list-style-type: none"> <li>➤ Land filling of treated sludge at the project site</li> </ul>	<ul style="list-style-type: none"> <li>❖ Install and prepare adequate containment measures particularly in furnace oil storage room and transfer area to minimize risk of soil contamination.</li> </ul>



Potential Source of Impact and Components	Recommended Mitigation Measures
<ul style="list-style-type: none"> <li>➤ Accidental spillage and release of diesel, furnace oil and other related chemicals at the project site</li> <li>➤ Leakage of engine oils and fuels while transportation vehicle operate</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use drip trays under machinery to prevent oil and grease spillage.</li> <li>❖ Modify the process or storage condition to reduce the potential consequences of an accidental off-site release of hazardous chemicals.</li> <li>❖ Formulate and test through exercises for emergency plan to ensure that procedures to prevent or mitigate impacts due to accidents or spillage are in place and operated effectively.</li> <li>❖ The project proponent should establish standard maintenance yard for machines and vehicles and provide oil and lubricant storage facility with paving floor or placing secondary containments.</li> <li>❖ Make regular check and maintenance to vehicles.</li> </ul>
<i>Impact on Water Quality</i>	
<p>Groundwater Consumption</p> <ul style="list-style-type: none"> <li>➤ Water consumption for cooling process and domestic purpose.</li> </ul> <p>Surface Water Contamination</p> <ul style="list-style-type: none"> <li>➤ Wastewater discharges from staff quarters and operation activities</li> <li>➤ Storm water runoff where accidental oil spillage from the machines and vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Water conservation measures have to be implemented for this project.</li> <li>❖ Record the amount of water usage by water meters for production units.</li> <li>❖ Train all staff practices of water usage efficiency in the toilets and other areas of water consumption.</li> <li>❖ Install water saving devices for toilets and kitchen.</li> </ul>
<i>Impact of Wastewater Effluents</i>	
<p>Waste Water Effluents</p> <ul style="list-style-type: none"> <li>➤ Dispose sewage and discharged wastewater from toilet facilities and staff quarter.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste.</li> <li>❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.</li> <li>❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline</li> <li>❖ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site.</li> <li>❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow.</li> <li>❖ Regular inspection and maintenance of vehicles and emergency must be done.</li> </ul>
<i>Impact of waste disposal</i>	

Potential Source of Impact and Components	Recommended Mitigation Measures
<p>Generation of Hazardous and Non-hazardous solid waste</p> <ul style="list-style-type: none"> <li>➤ Generation of domestic waste from staff quarter</li> <li>➤ Generation of treated sludge from web scrubber</li> <li>➤ Generation of maintenance waste oil from operation vehicles and machines</li> <li>➤ By product collection and deposition</li> </ul>	<ul style="list-style-type: none"> <li>❖ Regularly inspection must be carried out of all bulk containment on site prevent leakage and product loss.</li> <li>❖ Train both cleaners and employees for proper good housekeeping practice at production area.</li> <li>❖ Regular check the temporary storage site of generated solid waste from the whole factory.</li> <li>❖ All employee must be followed and practiced by the principle of waste reduction, recycling, recovery and reusing.</li> <li>❖ Solvents and Oil waste must be collected by designated jerry cans</li> <li>❖ Provide appropriate control devices in storage of solvents, diesel to avoid possible leakages.</li> <li>❖ Provide site-specific training to department members who work with chemicals (furnace oil) at laboratory and production area.</li> <li>❖ Dispose at permitted areas in the Myaungdagar Steel Industrial Zone.</li> <li>❖ Regularly check the storage and disposal areas of all hazardous chemical to prevent accidental release.</li> <li>❖ Provide separate storage tank or designated bin for chemical wastes.</li> <li>❖ Regular inspection must be carried out of all bulk containment on site prevent leakage and product loss.</li> <li>❖ Any spillage of hazardous chemicals on land area of plant remise must be avoided with MSDS guideline.</li> <li>❖ All waste must be disposed of any applicable environmental regulation.</li> <li>❖ Dispose the hazardous material to the identified respective place away from the canteen and production area.</li> <li>❖ Ensure that all inside and outside areas, buildings, facilities and equipment are kept clean and in good state to function as intended and to prevent contamination.</li> <li>❖ Monitor the storage area of raw materials, feed additives and drugs storage and disposal area to prevent accidental release.</li> <li>❖ Provide spill mitigation equipment, double wall tanks and diking storage tanks.</li> </ul>
<i>Impact on Human</i>	
<p>Occupational Health and Safety</p> <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling from elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor and strict of employee and workers to wear the uniform and full personal protective equipment (PPE) during working at operation area.</li> <li>❖ Monitor the workplace to determine the levels of grain dust present at production area.</li> <li>❖ Provide the appropriate action to protect employees from dust exposures that exceed the level permitted by OSHA.</li> <li>❖ Arrange appropriate health check-up facilities.</li> </ul>

Potential Source of Impact and Components	Recommended Mitigation Measures
<ul style="list-style-type: none"> <li>➤ Operation noise from casting, rolling and cutting process of steel production</li> <li>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> <li>➤ Acid fumes emission from induction and smelting process</li> <li>➤ High temperatures and potential contact with hot metal or hot water of induction</li> </ul> <p>Community Health and Safety</p> <ul style="list-style-type: none"> <li>➤ Emission of air pollutants from operation activities such as induction, re-heating process.</li> <li>➤ Fire hazards from accidental electric shock and other operational activities error</li> </ul>	<ul style="list-style-type: none"> <li>❖ Instruct and train all employees to use control measures properly and talk about the health risk.</li> <li>❖ Provided the informing and training employees on the use of control measures for exposure of grains dust.</li> <li>❖ Measure the PM 10 and PM2.5 concentration in production area by quarterly and compare with NEQ (emission) guideline.</li> <li>❖ Plant must implement the safety and health program designed to identify, evaluate, monitor and control safety and health hazards.</li> <li>❖ All employee must not be exposed at noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Provide appropriate training for machine handling.</li> <li>❖ Ensure all rooms are well ventilated and lighting.</li> <li>❖ Ensure factory laws are strictly followed.</li> <li>❖ Clearly display warning signs or symbols for dangerous areas at the factory.</li> <li>❖ Monitoring plan must be prepared by accredited professionals.</li> <li>❖ Ensure that all employees are provided with appropriate PPE, including helmets, gloves, safety glasses, ear protection and steel-toed boots</li> <li>❖ Enforce the proper use of PPE at all times</li> <li>❖ Regular maintenance of the road and Use of traffic signs.</li> <li>❖ Regular identify and assess potential hazards in the workplace and prioritize hazards based on severity and likelihood of occurrence.</li> <li>❖ Provide the training programs for industrial vehicles operators in the safe operation of specialized vehicle such as forklifts, including safe loading/unloading, load limits.</li> <li>❖ Keep Material Safety Data Sheet (MSDS) from the manufacturer for flammable combustible liquids indicating their flammable ranges in % per volume</li> <li>❖ Provide spill absorbent material/ equipped with secondary containment facility for storage of hazardous materials.</li> <li>❖ Emergency procedures for hazardous chemical spillage must be implement.</li> <li>❖ Implement of engineering and administrative control measures to avoid or minimize the release of hazardous substance.</li> <li>❖ Work process, engineering, and administrative controls must be designed, maintained, and operated to avoid or minimize release of biological agents into the working environments.</li> </ul>

Potential Source of Impact and Components	Recommended Mitigation Measures
	<ul style="list-style-type: none"> <li>❖ The employee must review and assess known and suspected presence of biological agents at the work place and implement appropriate safety measures, monitoring, training, and training verification programs.</li> <li>❖ Provide comprehensive training for all employees on steel mill safety procedures, including emergency response protocols</li> <li>❖ Implement ergonomic training and adjustments to workstations as needed</li> <li>❖ Conduct regular fire drills and provide fire safety training to employees</li> <li>❖ Ensure that all employees are aware of assembly points and emergency contact information</li> <li>❖ Implement measures to protect workers from heat stress, such as providing shaded rest areas, adequate hydration and acclimatization for new employees</li> <li>❖ Foster a culture of safety where employees are encouraged to report safety concerns without fear of reprisal</li> <li>❖ Recognize and reward safe behavior and practices</li> <li>❖ Conduct regular safety inspections to identify and rectify any safety deficiencies promptly</li> </ul>

**Table 6-18 Proposed Mitigation Measures for Decommissioning Phase of Steel Mill**

Potential Source of Impact and Components	Recommended Mitigation Measures
<i>Impact on Air Quality</i>	
Air <ul style="list-style-type: none"> <li>➤ Dust emission from demolition activities</li> <li>➤ Delivering and transportation of demolished materials</li> <li>➤ Gaseous emission from vehicles and machines for decommissioning activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Ensure that proper notification and sign must be prepared prior to demolition</li> <li>❖ Set up dust barriers at strategic locations</li> <li>❖ Implement and prepare the dust suppression technique, such as applying water or non-toxic chemicals to reduce dust from vehicle movements and demolished activities</li> <li>❖ Provide and enforce the appropriate use of full PPE against dust (i.e., Mask)</li> </ul>
<i>Impact of Noise and Vibration</i>	
Noise and vibration <ul style="list-style-type: none"> <li>➤ Noise and vibration from vehicles and machines for decommissioning activities</li> <li>➤ Noise from heavy machines and traffic along</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use noise control devices, such as temporary noise barriers for workers and exhaust muffling devices for combustion engines</li> <li>❖ Schedule noisy activities during day time period and arrange the work rotation program for heavy machineries and equipment</li> <li>❖ Ensure machineries are well maintained to reduce noise generating</li> </ul>

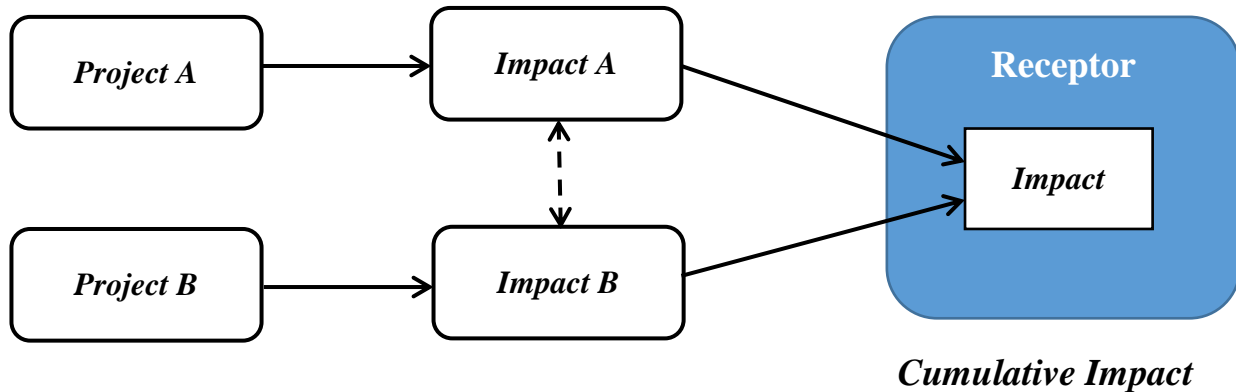
Potential Source of Impact and Components	Recommended Mitigation Measures
main transport/ access routes	❖ Unused equipment will be turned off and the parallel use of noisy equipment/machinery must be avoided
<i>Impact on Soil Quality</i>	
Soil Contamination <ul style="list-style-type: none"> <li>➤ Keeping the demolished materials and iron scraps at the project site</li> <li>➤ Accidental spillage and release if diesel and other related chemicals at the project site</li> <li>➤ Leakage of engine oils and fuels while transportation vehicles operate</li> </ul>	❖ Dispose the iron scraps and residual materials for factory and other construction materials to YCDC's on-call services. ❖ Proper demolition of the sewage system to prevent pollution by contents into the environment and ground water ❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals ❖ Clean the spillages of oil and other chemicals as soon as possible ❖ Well maintain the transportation vehicles and other machineries used in demolition activities regularly.
<i>Impact on Water Quality</i>	
Groundwater Consumption <ul style="list-style-type: none"> <li>➤ Water consumption for domestic purpose</li> </ul> Surface Water Contamination <ul style="list-style-type: none"> <li>➤ Wastewater discharge from worker camp</li> <li>➤ Storm water runoff where accidental oil spillage from the machines and vehicles</li> </ul>	❖ Ensure sewage system is functional during demolition to prevent pollution of nearby underground and surface water sources ❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals must be cleaned up immediately ❖ Dispose hazardous materials to identified landfill
<i>Impact on Wastewater Effluents</i>	
Wastewater Effluents <ul style="list-style-type: none"> <li>➤ Discharge wastewater from toilet facilities and worker camps</li> </ul>	❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste. ❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity. ❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline ❖ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site. ❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow. ❖ Regular inspection and maintenance of vehicles and emergency must be done.
<i>Impact of Waste Disposal</i>	



Potential Source of Impact and Components	Recommended Mitigation Measures
Generation of Hazardous and non-hazardous solid waste <ul style="list-style-type: none"> <li>➤ Dispose of sewage and domestic waste from worker camp</li> <li>➤ Accidental spillage and disposal of maintenance waste oil from transportation vehicles and machines</li> </ul>	<ul style="list-style-type: none"> <li>❖ Enforce segregation of waste at the source to encourage reuse and recycling and use recyclable waste where as possible</li> <li>❖ Disposal of solid waste in compliance with local government policy and good housekeeping practices are essential during the Decommissioning Phase</li> <li>❖ Removes all equipment and debris ready to utilize the site for other uses</li> <li>❖ Demolished materials waste must remove from the site and properly disposed of in designed location</li> <li>❖ Provide the adequate secondary containment for fuel storage tanks and for the temporary storage of the other fluid such as lubricating oils and hydraulic fluids</li> <li>❖ Clean-up the excessive waste debris and liquid spills regularly</li> </ul>
<i>Impact on Human</i>	
Occupational Health and Safety <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> </ul> Community Health and Safety <ul style="list-style-type: none"> <li>➤ Emission of air pollutants from demolished activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor the decommissioning site by assigned person of HSE Officer and use well trained person to identify and remove waste materials from processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation and dismantling or demolition</li> <li>❖ Provide adequate Personal Protective Equipment (PPE) throughout decommissioning phase</li> <li>❖ Training of workings in lifting and materials handling techniques in decommissioning phase</li> <li>❖ Provide the first aid kit at decommissioning site</li> <li>❖ Ensure the planning work site layout to minimize the need for manual transfer of heavy loads</li> <li>❖ Implement good housekeeping practice, such as the sorting and placing loose demolition debris in established area away from the foot paths</li> <li>❖ Set up necessary barriers for not to cause any disturbance for nearby community</li> </ul>

## 7. CUMMULATIVE IMPACT ASSESSMENT

In reference to the scope for an impact assessment, IFC's Performance Standards specify that: "Risks and impacts will be analyzed in the context of the project's area of influence. This area of influence encompasses area potentially impacted by cumulative impacts from further planned development of the project and other project related developments that are realistically defined at the time of Social and Environmental Impact Assessment is undertaken, and areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location" (IFC, 2006).



Impacts directly and indirectly associated with Steel Mill are discussed in the previous chapter. This section deals with cumulative effects of the project and other associated impacts in relation to development are described. During the impact assessment, evaluation of potential cumulative impacts plays an integral part.

Cumulative impacts can be defined as successive and combined impacts of the one or more projects upon the society, economy and the environment. Such impacts may occur due to the accumulation and interaction of other developments, being developed within the same area or over a similar time frame of operation to the project being assessed. The majority of the cumulative impacts associated with steel production project and other proposed projects in the vicinity of the project area. Impacts related to air quality dust generation, groundwater, surface water, noise/ vibration are assessed in the vicinity of the project site.

### 7.1. Methodology

The cumulative impact assessment has been performed based on the following steps:

- Projects that are either proposed or recently approved but not yet operational and located are identified within the vicinity of Steel Mill.
- The spatial boundary of 500m will be used for the cumulative impacts where existing projects are located away from each other cumulative impacts are likely to be less significant.

- The temporal boundary (time-frame) to be used for the initiation of the project is defined where the operation schedule for project is not overlapping, the potential cumulative impacts are likely to be less significant.
- The significance of the cumulative impacts upon the environment is identified on the basis of the significant criteria defined.

#### 7.1.1. Assessment Matrix

The assessment matrix that has been used for the cumulative impact assessment of the project is presented in **Table 7-1**.

**Table 7-1 Cumulative Impact Assessment Matrix**

Aspect	Relevance Factors		
	Low	Medium	High
Probability of cumulative impact	1	2	3
Duration of cumulative impact	1	2	3
Magnitude/ Intensity of cumulative impact	1	2	3
Sensitivity of receiving environment, significance of environmental and social values	1	2	3

The relevance factors have been used to determine impacts in the table on the basis of professional judgment, past experience with similar development projects. Impacts significant criteria used for the cumulative impact assessments are detailed in **Table 7-2**.

**Table 7-2 Cumulative Impact Significant Criteria**

Impact Significance	Sum of Relevance Factors	Consequence
Low	4-6	Negative impacts may occur but can be managed if the proponent implements standard environmental management practices. Special approval conditions unlikely to be necessary. Monitoring to be part of a general project monitoring program.
Medium	7-9	Mitigation measures likely to be necessary and specific management practices to be applied. Specific approvals conditions are likely. Target monitoring program required.
High	10-12	Alternative actions should be considered and/or mitigation measures applied to demonstrate improvement. May require collaboration with other proponents/ parties to monitor and manage impacts. Specific approval conditions required. Target monitoring program necessary.

## 7.2. Environmental Values



**Figure 7.1 Maps Showing the Adjacent Factories of the Proposed Project Site**

- ✓ Air quality impact may be increased from operation of various factories in the vicinity of site of Myaung Da Gar Industrial Zone.
- ✓ Noise levels may be also increased by combining operation activities of adjacent factories and transportation vehicles.
- ✓ Groundwater consumption may also be affected by cumulative operation of factories in future.
- ✓ Risk of fire explosions and other accidental hazards may be potential and road accidents and traffic congestion may be increased by transportation.

Positive impacts of socioeconomic, social infrastructures and livelihoods will arise due to the industrial zone development. Project's contribution relates to potential cumulative impacts.

All of anticipated cumulative impacts relate with proposed development project of steel production and marketing can be reduced and enhanced by using recommended mitigation measures in below;

- ✓ Implement the environmental policy on air emission impact organized by industrial zone committee.
- ✓ Implement collaborative HSE policy by leading the industrial zone committee
- ✓ Properly treat industrial waste from all factories in this industrial zone to minimize the cumulative impacts of the wastewater on nearest water bodies of Hlaing River.
- ✓ Regular samplings of wastewater have to be taken from the inlet and outlet of the common public drainage and effluent levels need to be compliance with the National Environmental Quality (Emission) Guideline.

### 7.3. Project's contribution to Potential Cumulative Impacts

The cumulative assessment defined the spatial and temporal boundary for assessment and review impact significance based on “Cumulative Impact Assessment Matrix” and Cumulative Impact Significance Criteria” and considering the impacts from other projects in the vicinity of steel mill.

The following provides the summary of the findings.

Cumulative Impacts having “Low Significance” which includes:

- Noise and vibration
- Surface water
- Groundwater

Cumulative Impacts having “Medium Significance” includes:

- Air quality
- Risk of fire and accidental hazards
- Waste

**Table 7-3 Cumulative Impact Assessment Matrix**

Nearby Factory	Environmental Quality					
	Air	Noise and Vibration	Risk of Fire and Accidental Hazards	Waste	Surface water	Ground Water
De Hus	✓	✓	✓	X	X	X
Garment	✓	X	✓	✓	X	✓
Toy	✓	X	✓	✓	✓	X
Fan	✓	X	X	✓	X	X
Tissue	✓	X	✓	✓	X	✓
Paper	✓	✓	✓	✓	✓	✓
Steel Mill	✓	✓	✓	✓	X	✓

**Table 7-4 Cumulative Impact Assessment**

Aspect	Air Quality	Noise and Vibration	Fire and Accidental Hazards	Waste	Surface water	Groundwater
Probability of Impact	2	2	2	2	1	2
Duration of Impact	3	2	1	2	1	1
Magnitude/ Intensity of Impact	2	1	2	3	1	1
Sensitivity of Receiving Impact	2	1	2	2	1	1



Aspect	Air Quality	Noise and Vibration	Fire and Accidental Hazards	Waste	Surface water	Groundwater
<b>Total</b>	<b>9</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>4</b>	<b>5</b>
<b>Impact Significance</b>	<b>Medium</b>	<b>Low</b>	<b>Medium</b>	<b>Medium</b>	<b>Low</b>	<b>Low</b>

The above table indicates that among the cumulative impacts, air quality, risk of fire and accidental hazard and waste have medium impact significance while noise and vibration, surface water and groundwater have low impact significance. However, if the implementation of the proposed steel mill is in line with the mitigation measures described in the preceding chapters, the overall impact of steel production project could be manageable.

## **8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **8.1. Project Description by Project Phase**

The Environmental Management Plan (EMP) is a site-specific plan developed to ensure that the project is prepared in an environmentally sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to manage properly that risk.

The Environmental Management Plan (EMP) prepared for the proposed project covers the anticipated impacts of the said project, mitigation measures, management and monitoring plans during each of the phases:

- Construction
- Operation
- Decommissioning

There are five main sections in this EMP plan and detailed EMP plan based on the project activities.

- (1) Impact mitigation measures plan for construction, operation phase and decommissioning phase
- (2) Environmental monitoring plan including with monitoring guidelines and standards for this project
- (3) Emergency preparedness plan and training program
- (4) Budget allocation for Environmental Management Plan (EMP)
- (5) Corporate Social Responsibility (CSR) Plan

### **8.2. Policies and Commitments, Legal requirements and Institutional Arrangement**

In order to implement effectively of the Environmental Management Plan, it will be necessary to define the responsibility of various stakeholders. The environmental management activities should comply with existing environmental policy, laws, rules, procedures, and emission standards of the Republic of the Union of Myanmar.

As part for Environmental Management plan, it is also necessary to have a permanent organization set up charged with the task of ensuring effective implementation. Yangon J.R Family Limited need to organized HSE team to assign responsibilities to officers from various disciplines to co-ordinate the activities concerned with management and implementation of environmental control measures for this TMT rebar production.

### **8.3. Environmental and Social Management Plan by Project Phase**

#### **8.3.1. Objectives of EMP**

- a) Serve as a commitment and reference for the proponent to implement the EMP including the conditions of approval from the Environmental Conservation Department (ECD), Ministry of Natural Resources, and Environmental Conservation (MONREC).
- b) Serve as a guiding document for the environmental and social monitoring activities.
- c) Provide detailed specifications for the management and mitigation of activities that have the potential for negative impacts on the environment.

#### **8.3.2. Responsibilities of the EMP**

In order to ensure the sound development and effective implementation of the EMP, it will be necessary to identify and define the responsibilities. The environmental management practices, procedures, and responsibilities defined herein to get full compliance with the existing environmental policy, laws, rules, and regulations of the Republic of the Union of Myanmar. The following entities should be involved in the implementation of this EMP:

- Yangon J.R Family Limited
- Environmental Conservation Department, ECD (Yangon Region)
- Third-Party Environmental Consultant

#### **Yangon J.R Family Limited**

The proponent will be charged with the responsibility for ensuring that the proposed development has been accomplished in an environmentally sound manner. This can be achieved by inclusion

#### **ECD (Yangon Region)**

The responsibility of ECD is to exercise general supervision and coordinating over all matters relating to the environment and to be instrumental in providing guidance for recognized regulatory frameworks.

#### **Third Party Environmental Consultant**

The environmental consultant will have to ensure that the proposed EMP is up to date and is being followed properly by the proponent. Periodic audits of the EMP will have to be done to ensure that its performance is as expected, by comparing with operating standards so that any corrective actions can be taken.

#### **8.3.3. Environmental Management Plan for the Construction Phase**

In construction phase, there may be some negative impacts on surrounding environment and workers due to the construction of pile driving, main steel structural building, other infrastructure and transportations of heavy equipment and machineries.

Impacts may occur during construction phase:

- Impact on air quality due construction activities and transportation
- Impact on water for improper waste disposal, oil spillage and sewage from workers' camps
- Impact on soil quality due to accidental oil spillage and improper waste disposal.
- Noise and vibration impact due to construction works and traffic.
- Occupational Health and Safety problems for employees and workers injuries and diseases, ill, health and incidents.

Although all these impacts can occur during construction phase, it can reduce by using proper methods and mitigation measures. By restricting the working time and workers in rotation, these can reduce the effects of noise exposures, health and injuries. Oil and fuel tank should store and handle properly and support proper waste disposal to reduce the adverse impacts on environment. So, mitigation plan of operation phase is mentioned in Error! Reference source not found.. These activities shall be carried out to show that the factory operations to compliance with the maximum allowable environmental norms and standards.

**Table 8-1 Environmental Impact Mitigation Plan during Construction Phase**

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Responsible Person
<i>Impact on Air Quality</i>				
Air Pollution <ul style="list-style-type: none"> <li>➤ Earth moving activities and site preparation</li> <li>➤ Dust emission from drilling, transportation of construction materials at the project site</li> <li>➤ Fugitive dust and exhaust gas emission from heavy machines</li> <li>➤ Gaseous emission from vehicles for delivering construction materials and machines that use for construction</li> </ul>	<ul style="list-style-type: none"> <li>❖ Spraying water to the working ground if required</li> <li>❖ Controlling the speed of transportation vehicles for delivering construction materials within the project site</li> <li>❖ Excavation and leveling is limited to short-term</li> <li>❖ Green Shade net fencing must be used to control dust emission from the site to the neighbors/ roads and can reduce the accidents due to falling of heavy objects from the high.</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
<i>Impact of Noise and Vibration</i>				
Noise and Vibration <ul style="list-style-type: none"> <li>➤ Construction activities like pile driving, drilling and delivering of construction materials</li> <li>➤ Noise from diesel generators and traffic along main transport/ access routes</li> </ul>	<ul style="list-style-type: none"> <li>❖ The working time will be 8:30 AM – 5:00 PM during weekdays.</li> <li>❖ Do not use heavy machineries like piling, drilling and loading/unloading of materials during night time</li> <li>❖ Switch off vehicle engines while unloading materials</li> <li>❖ Avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as school and hospitals</li> <li>❖ Should make regular maintenance to construction machineries, vehicles and generators</li> <li>❖ Recommend silent type generator and heavy-duty equipment must be insulated or placed in enclosures to minimize ambient noise levels</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor



Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Responsible Person
	<ul style="list-style-type: none"> <li>❖ The proponent will use bored piling method for foundation, which has lower vibration</li> <li>❖ Should notify to the public for the construction activities which can generate adverse noise and vibration level</li> </ul>			
<i>Impact on Soil Quality</i>				
Soil Contamination <ul style="list-style-type: none"> <li>➤ Excavation of soil for foundation and landscaping</li> <li>➤ Accidents spillage and release of diesel and other construction waste at the project site</li> <li>➤ Leakage of engine oil and fuel while using vehicles for construction activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Impacts on soil can be mitigated by using modernized machineries and must be maintained regularly</li> <li>❖ Isolated maintenance area would be identified with paved ground</li> <li>❖ The project proponent has a plan to plant some indigenous species of trees, ornamental trees and grass which can restore the top soil.</li> <li>❖ Can be reduced through using leak-proof fuel containers with secondary containments in fuel storage area and diesel generators</li> <li>❖ Refilling fuel should be done with great care for preventing spillage</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
<i>Impact on Water Quality</i>				
Groundwater Consumption <ul style="list-style-type: none"> <li>➤ Water Consumption for construction activities and domestic purpose</li> </ul>	<ul style="list-style-type: none"> <li>❖ Tube well water is a main source of water consumption for proposed project.</li> <li>❖ To reduce ground water consumption, close water tab all times when its unnecessary.</li> <li>❖ When in rainy season, collect rain water for spraying ground and construction activities.</li> <li>❖ There are two drainage systems besides project area.</li> <li>❖ Regular maintenance and check the water pipe line.</li> <li>❖ The project proponent must check and maintain drainage system every week.</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
Surface Water Contamination <ul style="list-style-type: none"> <li>➤ Water discharges from construction activities</li> <li>➤ Oil spillage from the construction machines and vehicles</li> </ul>				

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Responsible Person
	<ul style="list-style-type: none"> <li>❖ The proponent must systematically manage to use groundwater to prevent depletion of groundwater.</li> <li>❖ Regular inspection for construction vehicles and machines must be done to prevent oil spillage.</li> </ul>			
<i>Impact on wastewater effluents</i>				
Wastewater effluents <ul style="list-style-type: none"> <li>➤ Dispose sewage and discharged wastewater from toilet facilities and worker camps</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent must have proper management for the discharged wastewater from toilet facilities and worker camps</li> <li>❖ Check regularly any leakage drainage pipes.</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
<i>Impact of solid waste disposal</i>				
Generation of Hazardous and Non-hazardous solid waste <ul style="list-style-type: none"> <li>➤ Generation of construction waste from construction activities</li> <li>➤ Used oil from machines, maintenance waste oil from construction vehicles and machines</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent will conduct with YCDC and third-party waste disposal service in line with YCDC's guideline for disposal of excavated soil.</li> <li>❖ Overloading of excavated soil waste on the truck must be restricted at the traffic time.</li> <li>❖ Solid wastes including stones, wood chips, glasses, plastics, containers, metal rods, pieces of iron sheets, sharp objects and other construction wastes will be disposed by using YCDC's on-call service for wastes.</li> <li>❖ Before final disposal, the project proponent must dispose at the Myaung Da Gar Industrial Zone's disposal site.</li> <li>❖ Recommend that the project proponent should consider the use of recycled or refurbished construction materials.</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
<i>Impact on Human</i>				

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Responsible Person
Occupational Health and Safety <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling from elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Operation noise from construction activities</li> <li>➤ Use of vehicles and lifting equipment in the movement of machinery and materials</li> </ul>	<ul style="list-style-type: none"> <li>❖ The project proponent should prepare health and safety management plan for the construction workers based on the EMP in Myanmar language and any other language that workers can read will be displayed prominently at the site. Personal Protective Equipment (PPEs) such as safety shoes, safety gloves, helmet, safety goggles, earmuffs etc., must be provided to all workers.</li> <li>❖ First aid training, safety training, firefighting training and other essential trainings must be arranged for those who handling the construction machineries. Trained and licensed industrial machine operators will be provided in the safe operation of machinery such as cranes.</li> <li>❖ The project proponent must tag the safety signage at the project site which are shown at EMP.</li> </ul>	Moderate	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor
Community Health and Safety <ul style="list-style-type: none"> <li>➤ Traffic volume and accidents from transportation of construction materials</li> <li>➤ Communicable diseases during construction activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ The proposed project is located in Myaung Da Gar Steel Industrial Zone, so, the project compound has enough space where construction materials transportation vehicles can unload building materials.</li> <li>❖ However, the project proponent must carry out time management for traffic to avoid trucks and vehicles congestion along Yangon-Pyay Highway.</li> <li>❖ Recommend that the construction machines or materials should not put outside the project compound.</li> </ul>	Low	Throughout construction phase	HSE Officer/ Plant Manager/ Contractor

#### **8.3.4. Environmental Management Plan during Operation Phase**

According to the impact assessment of occurred in during the operation phase mentioned in **IMPACTS ASSESSMENT AND MITIGATION MEASURES** and environmental issues associated with the operational phase primarily include the following issues:

1. Impact on air quality including odor
2. Impact on noise and vibration
3. Impact on soil quality
4. Impact on water quality (Resource consumption)
5. Impact of wastewater/ effluent
6. Impact of waste disposal
7. Impact on human (Occupational health and safety/ Community health and safety)

Although the proposed TMT Rebar production has a number of adverse impacts on the surrounding environment, all of impacts may reduce as some extent by using related proper mitigation measures of project proponent. However, the unavoidable impacts would evolve from occupational health and safety of workers in the aspect of physical hazards with long term and short-term working due to inhalation of steel particles and exposure of excessive heat. So, mitigation plan of operation phase is mentioned in **Table 8-2**. These activities shall be carried out to show that the factory operations to compliance with the maximum allowable environmental norms and standards.

**Table 8-2 Environmental Impact Mitigation Plan during Operation Phase**

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
<i>Impact on Air Quality</i>					
Air ➤ Dust emission from iron scrap handling and segregation ➤ Fugitive dust and exhaust gas emission from induction and reheating activities ➤ Generation of flue gas from induction and reheating activities ➤ Gaseous emission from vehicles and machines for loading and unloading of iron scraps	<ul style="list-style-type: none"> <li>❖ Regular check and maintain fume wet scrubber system installed at chimney</li> <li>❖ Preventive maintenance of valves and other equipment.</li> <li>❖ Ambient air quality and stack/fugitive monitored periodically.</li> <li>❖ A good housekeeping consisting of simple, obvious task of clearing up, removing accumulations and in general keeping things neat and clean will form a part of normal operation and maintenance procedure.</li> <li>❖ Regular inspect and maintain storage room.</li> <li>❖ Encase solid waste storage tanks to prevent odor emission.</li> <li>❖ To minimize dust emission around the project area, spray the water daily if necessary.</li> <li>❖ The project proponent must install proposed pollution control system to reduce adverse impacts of indoor air quality.</li> <li>❖ Replant the trees along the fence of the compound</li> <li>❖ Install and maintain effective ventilation and exhaust systems to capture and remove odorous emission</li> <li>❖ Conduct regular maintenance of equipment and systems and monitor air quality and emission to detect any changes in odor levels or potential issues</li> <li>❖ Develop GRM for addressing the complaints promptly, investigating their causes, and taking corrective action as needed.</li> </ul>	Low	2000	Throughout operation phase	HSE Officer/ Plant Manager



Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
<i>Impact of Noise and Vibration</i>					
Noise and Vibration <ul style="list-style-type: none"> <li>➤ Noise and vibration from operation activities and loading and unloading of iron scrap</li> <li>➤ Noise from heavy machines and traffic along main transport/access routes</li> </ul>	<ul style="list-style-type: none"> <li>❖ Proper maintenance of the equipment at various processing units can also reduce the noise level in the plant. However, the community impact due to noise during construction phase will be negligible, since the plant is located near an industrial estate.</li> <li>❖ Noise generation sources and their platforms would be maintained properly to minimize noise and vibration.</li> <li>❖ Roofs of building of plant will be constructed of reinforced concrete of light weight concrete.</li> <li>❖ Natural ventilation and proper ventilation systems should be installed in the plant.</li> <li>❖ Training would be imparted to plant personnel to generate awareness about damaging effect of noise.</li> <li>❖ The emergency generators must be placed in enclosures or silence-type generator is recommended to use.</li> <li>❖ Make regular check and maintenance to vehicles.</li> <li>❖ To reduce noise pollution, the project proponent has a plan to plant some indigenous species of trees, ornamental trees and grass.</li> </ul>	Low	1200	Throughout operation phase	HSE Officer/ Plant Manager
<i>Impact on Soil Quality</i>					
Soil Contamination <ul style="list-style-type: none"> <li>➤ Land filling of treated sludge at the project site</li> <li>➤ Accidental spillage and release of diesel, furnace oil and other</li> </ul>	<ul style="list-style-type: none"> <li>❖ Install and prepare adequate containment measures particularly in furnace oil storage room and transfer area to minimize risk of soil contamination.</li> <li>❖ Use drip trays under machinery to prevent oil and grease spillage.</li> </ul>	Very Low	500	Throughout operation phase	HSE Officer/ Plant Manager

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
related chemicals at the project site ➤ Leakage of engine oils and fuels while transportation vehicle operate	❖ Modify the process or storage condition to reduce the potential consequences of an accidental off-site release of hazardous chemicals. ❖ Formulate and test through exercises for emergency plan to ensure that procedures to prevent or mitigate impacts due to accidents or spillage are in place and operated effectively. ❖ The project proponent should establish standard maintenance yard for machines and vehicles and provide oil and lubricant storage facility with paving floor or placing secondary containments. ❖ Make regular check and maintenance to vehicles.				
<i>Impact on Water Quality</i>					
Groundwater Consumption ➤ Water consumption for cooling process and domestic purpose. Surface Water Contamination ➤ Wastewater discharges from staff quarters and operation activities ➤ Storm water runoff where accidental oil spillage from the machines and vehicles.	❖ Water conservation measures have to be implemented for this project. ❖ Record the amount of water usage by water meters for production units. ❖ Train all staff practices of water usage efficiency in the toilets and other areas of water consumption. ❖ Install water saving devices for toilets and kitchen.	Low	600	Throughout operation phase	HSE Officer/ Plant Manager
<i>Impact of Wastewater Effluents</i>					
Waste Water Effluents	❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or		1000		

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
<ul style="list-style-type: none"> <li>➤ Dispose sewage and discharged wastewater from toilet facilities and staff quarter.</li> </ul>	contamination of land, nearest surface water and ground waste. <ul style="list-style-type: none"> <li>❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.</li> <li>❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline</li> <li>❖ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site.</li> <li>❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow.</li> <li>❖ Regular inspection and maintenance of vehicles and emergency must be done.</li> </ul>				
<i>Impact of waste disposal</i>					
Generation of Hazardous and Non-hazardous solid waste <ul style="list-style-type: none"> <li>➤ Generation of domestic waste from staff quarter</li> <li>➤ Generation of treated sludge from web scrubber</li> <li>➤ Generation of maintenance waste oil from operation vehicles and machines</li> </ul>	<ul style="list-style-type: none"> <li>❖ Regularly inspection must be carried out of all bulk containment on site prevent leakage and product loss.</li> <li>❖ Train both cleaners and employees for proper good housekeeping practice at production area.</li> <li>❖ Regular check the temporary storage site of generated solid waste from the whole factory.</li> <li>❖ All employee must be followed and practiced by the principle of waste reduction, recycling, recovery and reusing.</li> <li>❖ Solvents and Oil waste must be collected by designated jerry cans</li> <li>❖ Provide appropriate control devices in storage of solvents, diesel to avoid possible leakages.</li> </ul>	Moderate	800	Throughout operation phase	HSE Officer/ Plant Manager

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
➤ By product collection and deposition	<ul style="list-style-type: none"> <li>❖ Provide site-specific training to department members who work with chemicals (furnace oil) at laboratory and production area.</li> <li>❖ Dispose at permitted areas in the Myaungdagar Steel Industrial Zone.</li> <li>❖ Regularly check the storage and disposal areas of all hazardous chemical to prevent accidental release.</li> <li>❖ Provide separate storage tank or designated bin for chemical wastes.</li> <li>❖ Regular inspection must be carried out of all bulk containment on site prevent leakage and product loss.</li> <li>❖ Any spillage of hazardous chemicals on land area of plant remise must be avoided with MSDS guideline.</li> <li>❖ All waste must be disposed of any applicable environmental regulation.</li> <li>❖ Dispose the hazardous material to the identified respective place away from the canteen and production area.</li> <li>❖ Ensure that all inside and outside areas, buildings, facilities and equipment are kept clean and in good state to function as intended and to prevent contamination.</li> <li>❖ Monitor the storage area of raw materials, feed additives and drugs storage and disposal area to prevent accidental release.</li> <li>❖ Provide spill mitigation equipment, double wall tanks and diking storage tanks.</li> </ul>				
<i>Impact on Human</i>					

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
Occupational Health and Safety <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling from elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Operation noise from casting, rolling and cutting process of steel production</li> <li>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> <li>➤ Acrid fumes emission from induction and melting process</li> <li>➤ High temperatures and potential contact with hot metal or hot water of induction</li> </ul> Community Health and Safety <ul style="list-style-type: none"> <li>➤ Emission of air pollutants from operation activities such</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor and strict of employee and workers to wear the uniform and full personal protective equipment (PPE) during working at operation area.</li> <li>❖ Monitor the workplace to determine the levels of grain dust present at production area.</li> <li>❖ Provide the appropriate action to protect employees from dust exposures that exceed the level permitted by OSHA.</li> <li>❖ Arrange appropriate health check-up facilities.</li> <li>❖ Instruct and train all employees to use control measures properly and talk about the health risk.</li> <li>❖ Provided the informing and training employees on the use of control measures for exposure of grains dust.</li> <li>❖ Measure the PM 10 and PM2.5 concentration in production area by quarterly and compare with NEQ (emission) guideline.</li> <li>❖ Plant must implement the safety and health program designed to identify, evaluate, monitor and control safety and health hazards.</li> <li>❖ All employee must not be exposed at noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Provide appropriate training for machine handling.</li> <li>❖ Ensure all rooms are well ventilated and lighting.</li> <li>❖ Ensure factory laws are strictly followed.</li> <li>❖ Clearly display warning signs or symbols for dangerous areas at the factory.</li> </ul>	Moderate	2500	Throughout operation phase	HSE Officer/ Plant Manager



Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
<p>as induction, re-heating process.</p> <p>➤ Fire hazards from accidental electric shock and other operational activities error</p>	<ul style="list-style-type: none"> <li>❖ Monitoring plan must be prepared by accredited professionals.</li> <li>❖ Ensure that all employees are provided with appropriate PPE, including helmets, gloves, safety glasses, ear protection and steel-toed boots</li> <li>❖ Enforce the proper use of PPE at all times</li> <li>❖ Regular maintenance of the road and Use of traffic signs.</li> <li>❖ Regular identify and assess potential hazards in the workplace and prioritize hazards based on severity and likelihood of occurrence.</li> <li>❖ Provide the training programs for industrial vehicles operators in the safe operation of specialized vehicle such as forklifts, including safe loading/unloading, load limits.</li> <li>❖ Keep Material Safety Data Sheet (MSDS) from the manufacturer for flammable combustible liquids indicating their flammable ranges in % per volume.</li> <li>❖ Provide spill absorbent material/ equipped with secondary containment facility for storage of hazardous materials.</li> <li>❖ Emergency procedures for hazardous chemical spillage must be implement.</li> <li>❖ Implement of engineering and administrative control measures to avoid or minimize the release of hazardous substance.</li> <li>❖ Work process, engineering, and administrative controls must be designed, maintained, and operated to avoid or minimize release of biological agents into the working environments.</li> </ul>				

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Estimated Budget (USD)	Time Frame	Responsible Person
	<ul style="list-style-type: none"> <li>❖ The employee must review and assess known and suspected presence of biological agents at the work place and implement appropriate safety measures, monitoring, training, and training verification programs.</li> <li>❖ Provide comprehensive training for all employees on steel mill safety procedures, including emergency response protocols</li> <li>❖ Implement ergonomic training and adjustments to workstations as needed</li> <li>❖ Conduct regular fire drills and provide fire safety training to employees</li> <li>❖ Ensure that all employees are aware of assembly points and emergency contact information</li> <li>❖ Implement measures to protect workers from heat stress, such as providing shaded rest areas, adequate hydration and acclimatization for new employees</li> <li>❖ Foster a culture of safety where employees are encouraged to report safety concerns without fear of reprisal</li> <li>❖ Recognize and reward safe behavior and practices</li> <li>❖ Conduct regular safety inspections to identify and rectify any safety deficiencies promptly</li> </ul>				

### 8.3.5. Environmental Management Plan for Decommissioning Phase

In this phase, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. Because of proposed plant closure, various environmental and social aspects may be affected.

Environmental Impact during the Decommissioning Phase;

- Generate of demolishing wastes, electrical cables, electronic device waste and hazardous waste (chemical containers, storage tanks, drums)
- Significant noise and vibration from all demolishing activities
- Occupational Health and Safety for employees and workers

**Table 8-3 Environmental Impact Mitigation Plan during Decommissioning Phase**

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Estimated Budget (USD)	Responsible Person
<i>Impact on Air Quality</i>					
Air <ul style="list-style-type: none"> <li>➤ Dust emission from demolition activities</li> <li>➤ Delivering and transportation of demolished materials</li> <li>➤ Gaseous emission from vehicles and machines for decommissioning activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Ensure that proper notification and sign must be prepared prior to demolition</li> <li>❖ Set up dust barriers at strategic locations</li> <li>❖ Implement and prepare the dust suppression technique, such as applying water or non-toxic chemicals to reduce dust from vehicle movements and demolished activities</li> <li>❖ Provide and enforce the appropriate use of full PPE against dust (i.e., Mask)</li> </ul>	Moderate	Throughout decommissioning phase	500	HSE Officer/ Plant Manager
<i>Impact of Noise and Vibration</i>					
Noise and vibration <ul style="list-style-type: none"> <li>➤ Noise and vibration from vehicles and</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use noise control devices, such as temporary noise barriers for workers and exhaust muffling devices for combustion engines</li> </ul>	Moderate	Throughout decommissioning phase	300	HSE Officer/ Plant Manager

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Estimated Budget (USD)	Responsible Person
machines for decommissioning activities ➤ Noise from heavy machines and traffic along main transport/ access routes	❖ Schedule noisy activities during day time period and arrange the work rotation program for heavy machineries and equipment ❖ Ensure machineries are well maintained to reduce noise generating ❖ Unused equipment will be turned off and the parallel use of noisy equipment/machinery must be avoided				
<i>Impact on Soil Quality</i>					
Soil Contamination ➤ Keeping the demolished materials and iron scraps at the project site ➤ Accidental spillage and release if diesel and other related chemicals at the project site ➤ Leakage of engine oils and fuels while transportation vehicles operate	❖ Dispose the iron scraps and residual materials for factory and other construction materials to YCDC's on-call services. ❖ Proper demolition of the sewage system to prevent pollution by contents into the environment and ground water ❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals ❖ Clean the spillages of oil and other chemicals as soon as possible ❖ Well maintain the transportation vehicles and other machineries used in demolition activities regularly.	Low	Throughout decommissioning phase	300	HSE Officer/ Plant Manager
<i>Impact on Water Quality</i>					

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Estimated Budget (USD)	Responsible Person
Groundwater Consumption ➤ Water consumption for domestic purpose Surface Water Contamination ➤ Wastewater discharge from worker camp ➤ Storm water runoff where accidental oil spillage from the machines and vehicles	<ul style="list-style-type: none"> <li>❖ Ensure sewage system is functional during demolition to prevent pollution of nearby underground and surface water sources</li> <li>❖ Prevent the accidental spillage and any spillages of fuel, oil and other chemicals must be cleaned up immediately</li> <li>❖ Dispose hazardous materials to identified landfill</li> </ul>	Low	Throughout decommissioning phase	300	HSE Officer/ Plant Manager
<i>Impact on Wastewater Effluents</i>					
Wastewater Effluents ➤ Discharge wastewater from toilet facilities and worker camps	<ul style="list-style-type: none"> <li>❖ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste.</li> <li>❖ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.</li> <li>❖ Regular monitoring the sewage treatment facilities and follow the NEQ guideline</li> <li>❖ Adequate wastewater treatment facilities must be provided so that the treated effluents</li> </ul>	Low	Throughout decommissioning phase	500	HSE Officer/ Plant Manager



Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Estimated Budget (USD)	Responsible Person
	conform to the regulatory standards of NEQ (emission) guideline at the project site. ❖ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow. ❖ Regular inspection and maintenance of vehicles and emergency must be done.				
<i>Impact of Waste Disposal</i>					
Generation of Hazardous and non-hazardous solid waste ➤ Dispose of sewage and domestic waste from worker camp ➤ Accidental spillage and disposal of maintenance waste oil from transportation vehicles and machines	❖ Enforce segregation of waste at the source to encourage reuse and recycling and use recyclable waste where as possible ❖ Disposal of solid waste in compliance with local government policy and good housekeeping practices are essential during the Decommissioning Phase ❖ Removes all equipment and debris ready to utilize the site for other uses ❖ Demolished materials waste must remove from the site and properly disposed of in designed location ❖ Provide the adequate secondary containment for fuel storage tanks and for the temporary storage of the other fluid such as lubricating oils and hydraulic fluids ❖ Clean-up the excessive waste debris and liquid spills regularly	Low	Throughout decommissioning phase	700	HSE Officer/ Plant Manager
<i>Impact on Human</i>					

Potential Source of Impact and Components	Recommended Mitigation Measures	Residential Impacts	Time Frame	Estimated Budget (USD)	Responsible Person
Occupational Health and Safety <ul style="list-style-type: none"> <li>➤ Accidental injuries from falling elevation associated with ladder</li> <li>➤ Small injuries due to slips and falls, accidents and electric shock</li> <li>➤ Vehicle traffic and use of lifting equipment in the movement of machinery and materials</li> </ul> Community Health and Safety <ul style="list-style-type: none"> <li>➤ Emission of air pollutants from demolished activities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monitor the decommissioning site by assigned person of HSE Officer and use well trained person to identify and remove waste materials from processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation and dismantling or demolition</li> <li>❖ Provide adequate Personal Protective Equipment (PPE) throughout decommissioning phase</li> <li>❖ Training of workings in lifting and materials handling techniques in decommissioning phase</li> <li>❖ Provide the first aid kit at decommissioning site</li> <li>❖ Ensure the planning work site layout to minimize the need for manual transfer of heavy loads</li> <li>❖ Implement good housekeeping practice, such as the sorting and placing loose demolition debris in established area away from the foot paths</li> <li>❖ Set up necessary barriers for not to cause any disturbance for nearby community</li> </ul>	Moderate	Throughout decommissioning phase	1000	HSE Officer/ Plant Manager

### 8.3.6. Environmental Management Sub-plan

#### 8.3.6.1. Air & Odor Quality Management Sub-Plan

##### (i) Objectives

The purposes of air & odor quality management plan are-

- To minimize pollutants and odor from the project.
- To monitor ambient air quality and odor of the project of surrounding environment within 1 km AOI of the project site.

##### (ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

##### (iii) Action Plan

During operation phase

- Regular check and maintain fume wet scrubber system installed at chimney
- Preventative maintenance of valves and other equipment
- Ambient air quality and stack/ fugitive monitored regularly
- A good housekeeping consisting of simple, obvious task of clearing up, removing accumulations and in general keeping things neat and clean will form a part of normal operation and maintenance procedure
- Regular inspect and maintain storage room
- Encase solid waste storage tanks to prevent odor emission
- To minimize dust emission around the project area, spray the water daily
- The project proponent must install good exhaust system at the kitchen to reduce adverse impacts of indoor air quality

During decommissioning phase

- Ensure that proper notification and sign must be prepared prior to demolition
- Set up dust barriers at strategic locations
- Implement and prepare the dust suppression technique, such as applying water or non-toxic chemicals to reduce dust from vehicle movements and demolished activities
- Provide and enforce the appropriate use of full PPE against dust (i.e., Mask)

##### (iv) Implementation Schedule

This Air & Odor Quality Management Plan will be conducted throughout the lifespan of the Project.

##### (v) Monitoring Plans

The Environmental Monitoring Report will include the items listed in the following table.

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Air & Odor Quality (OP)	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, CO <sub>2</sub> , NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , O <sub>3</sub> , VOC,	Biannually	Project site of downwind direction and	Environmental monitoring report

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Air & Odor Quality (DP)	ammonia, Cadmium, HF, HCl, HS, Lead, Nickel, Polychlorinated dibenzodioxin and dibenzofuran	Once during decommissioning phase	inside the production area 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N 95°58'43.386"E	Environmental monitoring report
	CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>		Project site of downwind direction and inside the production area 17° 9'29.39"N 95°58'27.92"E 17°09'19.138"N 95°58'43.386"E	

(vi) Budget Allocation

Estimated budget allocation for Air & Odor Quality Management Plan is already included in budget estimation for EMPs.

### 8.3.6.2. Noise & Vibration Quality Management Sub-Plan

(i) Objectives

The purposes of the noise and vibration quality management plan are-

- To monitor noise and vibration from the project of surrounding environment within 1 km AOI of the project site.

(ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

(iii) Action Plan

During operation phase

- Proper maintenance of the equipment at various processing units can also reduce the noise level in the plant. However, the community impact due to noise during construction phase will be negligible, since the plant is located near an industrial estate.
- Noise generation sources and their platforms would be maintained properly to minimize noise and vibration.
- Roofs of building of plant will be constructed of reinforced concrete of light weight concrete.
- Natural ventilation and proper ventilation systems should be installed in the plant.

- Training would be imparted to plant personnel to generate awareness about damaging effect of noise.
- The emergency generators must be placed in enclosures or silence-type generator is recommended to use.
- Make regular check and maintenance to vehicles.
- To reduce noise pollution, the project proponent has a plan to plant some indigenous species of trees, ornamental trees and grass.

During decommissioning phase

- Use noise control devices, such as temporary noise barriers for workers and exhaust muffling devices for combustion engines
- Schedule noisy activities during day time period and arrange the work rotation program for heavy machineries and equipment
- Ensure machineries are well maintained to reduce noise generating
- Unused equipment will be turned off and the parallel use of noisy equipment/machinery must be avoided

(iv) Implementation Schedule

This Noise and Vibration Quality Management Plan will be conducted throughout the lifespan of the Project.

(v) Monitoring Plans

The Environmental Monitoring Report will include the items listed in the following table.

<b>Project Activity/ Environmental Aspect</b>	<b>Monitoring Measures</b>	<b>Frequency</b>	<b>Location</b>	<b>Reporting</b>
Noise & Vibration Quality (OP)	Noise Level (dB level)	biannually	At Project Site and at the nearest village 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N 95°58'43.386"E	Environmental monitoring report
Noise & Vibration Quality (DP)	Noise Level (dB level)	Once (During decommissioning phase)	At Project Site and at the nearest village 17° 9'29.39"N 95°58'27.92"E 17°09'19.138"N 95°58'43.386"E	Environmental monitoring report

(vi) Budget Allocation

Estimated budget allocation for Noise and Vibration Quality Management Plan is already included in budget estimation for EMPs.

### 8.3.6.3. Soil Quality Management Sub-Plan

#### (i) Objectives

The objectives of soil quality management plan are

- To monitor soil quality of surrounding environment within 1 km AOI of the project site.

#### (ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

#### (iii) Action Plan

During operation phase

- Install and prepare adequate containment measures particularly in furnace oil storage room and transfer area to minimize risk of soil contamination.
- Use drip trays under machinery to prevent oil and grease spillage.
- Modify the process or storage condition to reduce the potential consequences of an accidental off-site release of hazardous chemicals.
- Formulate and test through exercises for emergency plan to ensure that procedures to prevent or mitigate impacts due to accidents or spillage are in place and operated effectively.
- The project proponent should establish standard maintenance yard for machines and vehicles and provide oil and lubricant storage facility with paving floor or placing secondary containments.
- Make regular check and maintenance to vehicles

During decommissioning phase

- Dispose the iron scraps and residual materials for factory and other construction materials to YCDC's on-call services.
- Proper demolition of the sewage system to prevent pollution by contents into the environment and ground water
- Prevent the accidental spillage and any spillages of fuel, oil and other chemicals
- Clean the spillages of oil and other chemicals as soon as possible
- Well maintain the transportation vehicles and other machineries used in demolition activities regularly

#### (iv) Implementation Schedule

This Soil Quality Management Plan will be conducted throughout the lifespan of the Project.

#### (v) Monitoring Plans

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Soil Quality (OP)	pH, As, Pb, Cd, Cu, Zn, Mn, Fe	biannually	At Project Site 17° 9'28.88"N 95°58'28.34"E	Environmental monitoring report

#### (vi) Budget Allocation

Estimated budget allocation for Soil Quality Management Plan is already included in budget estimation for EMPs.



#### 8.3.6.4. Water Quality Management Sub-Plan

##### (i) Objectives

The purposes of the water quality management plan are-

- Not to disturb the water quality of surrounding environment by releasing pollutants and sediment directly into the waterbody nearby the project site.
- To ensure that the concentration values of discharged effluent are not exceed the NEQE Guideline values.

##### (ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

##### (iii) Action Plan

During operation phase

- Water conservation measures have to be implemented for this project.
- Record the amount of water usage by water meters for production units.
- Train all staff practices of water usage efficiency in the toilets and other areas of water consumption.
- Install water saving devices for toilets and kitchen.

During decommissioning phase

- Ensure sewage system is functional during demolition to prevent pollution of nearby underground and surface water sources
- Prevent the accidental spillage and any spillages of fuel, oil and other chemicals must be cleaned up immediately
- Dispose hazardous materials to identified landfill

##### (iv) Implementation Schedule

This Water Quality Management Plan will be conducted throughout the lifespan of the Project.

##### (v) Monitoring Plans

The Environmental Monitoring Report will include the items listed in the following table.

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Water Quality (OP)	Ground Water Parameter and Waste Water Effluent (see in Chapter 5)	biannually	Tube well water 17° 9'26.20"N 95°58'24.11"E	Environmental monitoring report

##### (vi) Budget Allocation

Estimated budget allocation for Water Quality Management Plan is already included in budget estimation for EMPs.

#### 8.3.6.5. Wastewater Quality Management Sub-Plan

##### (i) Objectives

The purposes of the wastewater quality management plan are-

- Not to disturb the water quality of surrounding environment by releasing pollutants and sediment directly into the waterbody nearby the project site.
- To ensure that the concentration values of discharged effluent are not exceed the NEQE Guideline values.

(ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3.**

(iii) Action Plan

During operation phase,

- ✓ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste.
- ✓ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.
- ✓ Regular monitoring the sewage treatment facilities and follow the NEQ guideline
- ✓ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site.
- ✓ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow.
- ✓ Regular inspection and maintenance of vehicles and emergency must be done.

During decommissioning phase,

- ✓ Properly designed and installed the sewage effluents treatments facilities to prevent any hazard to public health or contamination of land, nearest surface water and ground waste.
- ✓ Ensure that lines and sewage system of factory drainage and the nearest public drainage are watertight and sufficient capacity.
- ✓ Regular monitoring the sewage treatment facilities and follow the NEQ guideline
- ✓ Adequate wastewater treatment facilities must be provided so that the treated effluents conform to the regulatory standards of NEQ (emission) guideline at the project site.
- ✓ Clean the factory's drainage to avoid odor emission and to avoid the block of water flow.
- ✓ Regular inspection and maintenance of vehicles and emergency must be done.

(iv) Implementation Schedule

This Water Quality Management Plan will be conducted throughout the lifespan of the Project.

(v) Monitoring Plans

The Environmental Monitoring Report will include the items listed in the following table.

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Wastewater Quality (Operation)	pH, Color, Iron Turbidity, Chloride, Manganese, Total suspended Solids, COD, BOD, Oil and Grease, Total Coliform Count, Total Phosphorus,	Biannually	Effluent from Wastewater Discharge 17° 9'28.89"N 95°58'21.14"E	Environmental monitoring report
Wastewater Quality (Decommissionin g)	Total Nitrogen, Zinc, DO, Arsenic, Chromium, Cadmium, Lead, Dissolved Solids	Once (After Decommissioni ng phase)	Effluent from Wastewater Discharge 17° 9'28.89"N 95°58'21.14"E	Environmental monitoring report

(vi) Budget Allocation

Estimated budget allocation for Wastewater Quality Management Plan is already included in budget estimation for EMPs.

### 8.3.6.6. Solid Waste Disposal Management Sub-Plan

(i) Objectives

The objectives of solid waste management sub plan are

- To ensure that classification of wastes and waste disposal are done properly
- To provide clear directions on waste management
- To ensure all personal involved with waster perform their roles and responsibilities as outlined

(ii) Legal Requirement

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

(iii) Action Plan

During operation phase

- ✓ Regularly inspection must be carried out of all bulk containment on site prevent leakage and product loss.
- ✓ Train both cleaners and employees for proper good housekeeping practice at production area.
- ✓ Regular check the temporary storage site of generated solid waste from the whole factory.
- ✓ All employee must be followed and practiced by the principle of waste reduction, recycling, recovery and reusing.
- ✓ Solvents and Oil waste must be collected by designated jerry cans
- ✓ Provide appropriate control devices in storage of solvents, diesel to avoid possible leakages.
- ✓ Provide site-specific training to department members who work with chemicals (furnace oil) at laboratory and production area.
- ✓ Dispose at permitted areas in the Myaungdagar Steel Industrial Zone.

- ✓ Regularly check the storage and disposal areas of all hazardous chemical to prevent accidental release.
- ✓ Provide separate storage tank or designated bin for chemical wastes.
- ✓ Regular inspection must be carried out of all bulk containment on site prevent leakage and product loss.
- ✓ Any spillage of hazardous chemicals on land area of plant remise must be avoided with MSDS guideline.
- ✓ All waste must be disposed of any applicable environmental regulation.
- ✓ Dispose the hazardous material to the identified respective place away from the canteen and production area.
- ✓ Ensure that all inside and outside areas, buildings, facilities and equipment are kept clean and in good state to function as intended and to prevent contamination.
- ✓ Monitor the storage area of raw materials, feed additives and drugs storage and disposal area to prevent accidental release.
- ✓ Provide spill mitigation equipment, double wall tanks and diking storage tanks.

#### During decommissioning phase

- ✓ Enforce segregation of waste at the source to encourage reuse and recycling and use recyclable waste where as possible
- ✓ Disposal of solid waste in compliance with local government policy and good housekeeping practices are essential during the Decommissioning Phase
- ✓ Removes all equipment and debris ready to utilize the site for other uses
- ✓ Demolished materials waste must remove from the site and properly disposed of in designed location
- ✓ Provide the adequate secondary containment for fuel storage tanks and for the temporary storage of the other fluid such as lubricating oils and hydraulic fluids
- ✓ Clean-up the excessive waste debris and liquid spills regularly

#### (iv) Implementation Schedule

This solid waste management sub plan will be conducted throughout the lifespan of the project.

#### (v) Monitoring Plans

The Environmental Monitoring Report will include the items listed in the following table.

<b>Project Activity/ Environmental Aspect</b>	<b>Monitoring Measures</b>	<b>Frequency</b>	<b>Location</b>	<b>Reporting</b>
Solid Waste Disposal (Operation)	Domestic Waste from staff quarter and sludge from scrubber	Daily	At Project Site and surrounding 17° 9'28.88"N 95°58'28.34"E	Environmental monitoring report
Solid Waste Disposal (Decommissioning)	Demolition debris, including concrete, metal, drywall, wood, glass and other hazardous demolished materials	Daily	At Project Site and surrounding 17° 9'28.88"N 95°58'28.34"E	Environmental monitoring report

#### (vi) Budget Allocation

Estimated budget allocation for solid waste management sub plan is already included in budget estimation for EMPs.

#### **8.3.6.7. Occupational and Community Health and Safety Management Sub-Plan**

##### **(i) Objectives**

To ensure that all individuals working on Yangon JR are appropriately protected from the Occupational Health and Safety hazards associated with the work.

- Management of occupational health risk
- Identification, assessment and control of occupational health hazards
- Communication of health hazards and the protective measures required

##### **(ii) Legal Requirement**

The project shall adopt the requirements of local and international legislation as provided in **Chapter 3**.

##### **(iii) Action Plan**

During operation phase

- ✓ Monitor and strict of employee and workers to wear the uniform and full personal protective equipment (PPE) during working at operation area.
- ✓ Monitor the workplace to determine the levels of grain dust present at production area.
- ✓ Provide the appropriate action to protect employees from dust exposures that exceed the level permitted by OSHA.
- ✓ Arrange appropriate health check-up facilities.
- ✓ Instruct and train all employees to use control measures properly and tell about the health risk.
- ✓ Provided the informing and training employees on the use of control measures for exposure of grains dust.
- ✓ Measure the PM 10 and PM2.5 concentrations in production area by quarterly and compare with NEQ (emission) guideline.
- ✓ Plant must implement the safety and health program designed to identify, evaluate, monitor and control safety and health hazards.
- ✓ All employee must not be exposed at noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Provide appropriate training for machine handling.
- ✓ Ensure all rooms are well ventilated and lighting.
- ✓ Ensure factory laws are strictly followed.
- ✓ Clearly display warning signs or symbols for dangerous areas at the factory.
- ✓ Monitoring plan must be prepared by accredited professionals.
- ✓ Regular maintenance of the road and Use of traffic signs.
- ✓ Provide the training programs for industrial vehicles operators in the safe operation of specialized vehicle such as forklifts, including safe loading/unloading, load limits.

- ✓ Keep Material Safety Data Sheet (MSDS) from the manufacturer for flammable combustible liquids indicating their flammable ranges in % per volume?
- ✓ Provide spill absorbent material/ equipped with secondary containment facility for storage of hazardous materials.
- ✓ Emergency procedures for hazardous chemical spillage must be implement.
- ✓ Implement of engineering and administrative control measures to avoid or minimize the release of hazardous substance.
- ✓ Work process, engineering, and administrative controls must be designed, maintained, and operated to avoid or minimize release of biological agents into the working environments.
- ✓ The employee must review and assess known and suspected presence of biological agents at the work place and implement appropriate safety measures, monitoring, training, and training verification programs.

During decommissioning phase

- ✓ Monitor the decommissioning site by assigned person of HSE Officer and use well trained person to identify and remove waste materials from processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation and dismantling or demolition
- ✓ Provide adequate Personal Protective Equipment (PPE) throughout decommissioning phase
- ✓ Training of workings in lifting and materials handling techniques in decommissioning phase
- ✓ Provide the first aid kit at decommissioning site
- ✓ Ensure the planning work site layout to minimize the need for manual transfer of heavy loads
- ✓ Implement good housekeeping practice, such as the sorting and placing loose demolition debris in established area away from the foot paths
- ✓ Set up necessary barriers for not to cause any disturbance for nearby community

(iv) Implementation Schedule

This occupational and community health and safety management sub plan will be conducted throughout the lifespan of the project.

(v) Monitoring Plans

The environmental monitoring report will include the items listed in the following table.



Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Location	Reporting
Occupational Health and Safety (Operation)	Zero accident cases, Safety Training for workers and accident reports, community consultations	Yearly (medical examination)	Workers working at risk areas (Noisy workplace, Dusty workplace)	Environmental monitoring report
Social aspects and Community Health and Safety	Perception of the project, Health status	Biannually	Nearest receptor (Kan Kalay and Kone Kalay Villages)	

#### (vi) Budget Allocation

Estimated budget allocation for occupational and community health and safety sub management plan is already included in budget estimation for EMPs.

### 8.4. Environmental Monitoring Plan

Monitoring of the anticipated environmental and social impacts in the receiving environments is important in evaluating the effectiveness of mitigation plan and compliance with the regulatory measures in place. During the operation phase and decommissioning phase monitoring will be undertaken to ensure that proposed mitigation measures for negative impacts and enhancement measures for positive impacts are implemented.

Main objectives of environment monitoring plan include;

- To identify and resolve environmental issues and other functions that may arise during the operation phase
- To implement water quality, air quality and noise impact monitoring plan during the operation phase
- To check and quantify the overall environmental performance, implement action plans and recommend and implement remedial actions
- To conduct regular reviews of monitored data as the basis for assessing mitigation measures are identified, designed and implemented;
- To assess and interpret all environmental monitoring, data to ascertain whether environmental control measures and practices are functioning in accordance to specifications
- To Predict the unforeseen impacts

### 8.4.1 Environmental Monitoring Plan during Operation Phase

**Table 8-4 Environmental Monitoring Plan during Operation Phase**

Component	Parameter	Target Level	Measurement Method	Area to be Monitored	Monitoring Frequency	Responsible Person
<b>Environmental Impacts</b>						
Air Quality Ambient Air Quality Indoor Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, CO <sub>2</sub> , NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , O <sub>3</sub> , VOC, ammonia, Cadmium, HF, HCl, HS, Lead, Nickel, Polychlorinated dibenzodioxin and dibenzofuran	Within NEQ Guideline and International Standards	Relevant Air Quality Monitoring Equipment	Project site of downwind direction and inside the production area 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N 95°58'43.386"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Water Quality 1. Ground Water 2. Drainage Water 3. Drinking Water	Ground Water Parameter and Waste Water Effluent (see in Chapter 5)	Within NEQ Guideline and WHO Standards National Drinking Water Quality Standards	Relevant Laboratory	Tube well water 17° 9'26.20"N 95°58'24.11"E Effluent from Wastewater Discharge 17° 9'28.89"N 95°58'21.14"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Soil Quality	pH, As, Pb, Cd, Cu, Zn, Mn, Fe	-	Relevant Laboratory	At Project Site 17° 9'28.88"N 95°58'28.34"E	Biannually	Yangon J.R Family Limited/ Environmental Officer
Noise and Vibration	Noise Level (dB level)	Within NEQ Guideline and International Standards	Relevant Noise Meter Equipment	At Project Site and at the nearest village 17° 9'29.39"N 95°58'27.92"E 17° 9'26.61"N 95°58'26.55"E 17°09'19.138"N	Biannually	Yangon J.R Family Limited/ Environmental Officer

Component	Parameter	Target Level	Measurement Method	Area to be Monitored	Monitoring Frequency	Responsible Person
				95°58'43.386"E		
Solid Waste (Generation of Hazardous and Non-hazardous)	Domestic Waste from staff quarter and sludge from scrubber	Volume of solid waste (ton)	Co-ordination with YCDC and Hmawbi CDC	At Project Site and surrounding 17° 9'28.88"N 95°58'28.34"E	Daily	Yangon J.R Family Limited/ YCDC
Occupational Health and Safety	Accidents and incidents, Periodic medical examination	Zero accident cases, Safety Training for workers and accident reports, community consultations	The Occupational Health and Safety Plan of the Government of Union of Myanmar, Ministry of Industry (1) and IFC General HSE Guidelines	Workers working at risk areas (Noisy workplace, Dusty workplace)	Monthly Yearly (medical examination)	Yangon J.R Family Limited/ HSE Office
Social aspects and Community Health and Safety	Perception of the project, Health status	Within Standard Limit levels and Grievance Redress Mechanism	Random Sampling	Nearest receptor (Kan Kalay and Kone Kalay Villages)	Biannually	Yangon J.R Family Limited/ HSE Office

#### 8.4.2 Environmental Monitoring Plan during Decommissioning Phase

**Table 8-5 Environmental Monitoring Plan during Decommissioning Phase**

Component	Parameter	Target Level	Measurement Method	Area to be monitored	Monitoring Frequency	Responsible Person
Air Quality	CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Within NEQ Guideline and International Standards	Relevant Air Quality Monitoring Equipment	Project site of downwind direction and inside the production area 17° 9'29.39"N 95°58'27.92"E 17°09'19.138"N 95°58'43.386"E	Once (During decommissioning phase)	Yangon J.R Family Limited/ Environmental Officer/ Contractor

Component	Parameter	Target Level	Measurement Method	Area to be monitored	Monitoring Frequency	Responsible Person
Waste Water Quality	Site Runoff wastewater discharges parameter	Within NEQ Guideline	As NEQ Guidelines	At project site	Once (During decommissioning phase)	Yangon J.R Family Limited/ Environmental Officer/ Contractor
Solid Waste	Demolition debris, including concrete, metal, drywall, wood, glass and other hazardous demolished materials	Volume of solid waste (ton)	Co-ordination with YCDC and Hmawbi CDC	Disposal Sites of decommissioning phase of project site	Daily	Yangon J.R Family Limited/ Environmental Officer/ Contractor
Socio-economic aspects	Local Economy, Employment's compensation, Gender Issues	Within Standard Limit levels and Grievance Redress Mechanism	Samples	At project site	Once (During decommissioning phase)	Yangon J.R Family Limited/ Contractor
Noise Pollution	Noise Level (dB scale)	Within NEQ Guideline	Relevant Noise Meter Equipment	At project site and receptor	Once (During Decommissioning phase)	Contractor/ Yangon J.R Family Limited/ Environmental Officer





**Figure 8.1 Proposed Environmental Quality Monitoring Points**

## **8.5. Disaster Management and Emergency Response Plan**

### **8.5.1. Objectives of Disaster Management Plan**

It is presumed that the proposed facilities in the 80,000 TPA in Yangon JR Steel Mill will be designed and engineered with all possible safety measures and standard code of practices. In spite of this, there may be some design deficiency or due to operation and maintenance faults, which may lead to accidental events causing damaging to life and property. This section presents an overview of environmental risks associated with various production facilities, suggested remedial measures and an outline of the emergency preparedness.

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the Disaster Management plan, it should be widely circulated and personnel training through rehearsals/ drills.

The objective of the Disaster Management Plan is to make use of the combined resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for the need of relatives;
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the Emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

### **8.5.2. Emergency Response Plan**

The emergencies that could be envisaged in the plant and fuel storage are as follows:

- A situation of fire at the tank forms of all storages;
- Slow isolated fires;
- Fast spreading fires;
- Structural failures;
- Contamination of food/ water and
- Sabotage/ social disorder

Fire consequences can be disastrous, since they involve hung quantities of fuel either stored or in dynamic inventory in pipe lines or nearby areas. Toxic releases can affect persons working around. During the study of risk assessment, the nature of damages is worked out and probability of occurrences of such hazards is also drawn up.

#### *8.5.2.1. Emergency organization*

It is recommended to setup an emergency organization and general manager is designated as the incident controller. In the case of stores, utilities, open areas, which are not under the control



of the production heads, senior executive responsible for maintenance of utilities would be designated as incident controller. All the incident controllers would be reporting to the site controller. All the incident controllers would be reporting to the site controller, who organizes a team responsible for controlling the incidence with the personnel under his control. Shift in-charge would be the reporting officer, who would bring the incidence to the notice of the incidence controller and site controller.

Emergency Coordinators would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, security in-charge, personnel department, Essential services personnel would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, electrical fitters, pump hours in-charge, and other maintenance staff would be drafted for emergency operations. Whoever notices an emergency situation such as fire, growth of fire, leakage etc., would inform his immediate superior and Emergency Control Center. A place nearer to the Gate House shall be identified as Emergency Control Center. The person on duty in the Emergency Control Center would appraise the site Controller, who verifies the situation from the incident Controller of that area or the shift in-charge and tanks a decision about an impending on site emergency. This would be communicated to all incident controllers, emergency coordinators. Simultaneously, the emergency warning system would be activated on the instruction of the site controller. Simultaneously, the emergency warning system would be activated on the instruction of the site controller.

The responsibilities of the key personnel appended below:

**Site Controller:** On reviving information about emergency, the site controller would:

- Assess the magnitude of the situation on the advice of incident controller and decide whether the affected areas need to be evacuated as well as whether personnel who are at assembly points need to be evacuated
- Declare emergency and orders for operation of emergency siren,
- Organize announcement by public address system about location of emergency
- Assess which areas are likely to be affected or need to emergency
- Maintains a continuous review of possible development and assess the situation in consultation with incident controller and other key personnel as to whether shutting down the plant or any section of the plant required and if evacuation of person is required
- Directs personnel for rescue, rehabilitation, transport, fire brigade, medical and other designated mutual support systems locally available, for meeting emergencies
- Control evacuation of affected areas, if the situation is likely to go out of control or effects are likely to go beyond the premises of the factory, inform to Authority from Myaung Da Gar Industrial Zone, policies, Township General Hospital and other statutory authorities
- Keep record of chronological events and prepare an investigation report and preserve evidences

- On completion of On-site emergency and restoration of normalcy, declare all clear and order for all clear warning.

**The incident controller's** duties should be as follows:

- Assemble the incident control team
- Direct operations within the affected areas with the priorities for safety to personnel minimize damage to the plant, property and environment
- Direct the shutting down and evacuation of plant and areas likely to be adversely affected by the emergency
- Provide advice and information to the fire and security officer and the local fire services as and when they arrive
- Ensure that all non-essential workers/ staff of the affected areas evacuated to the appropriate assembly points, and the areas are searched for casualties
- Has regard to the needs for preservation of evidence so as to facilitate any inquiry into the caused and circumstances, which caused or escalate the emergency
- Coordinate with emergency services at the site
- Provide tools and safety equipment to the team members
- Keep in touch with the team and advise them regarding the method of control to be used

The duties of **Emergency Coordinator – Rescue, Fire Fighting** should be as follows:

- On knowing about emergency, rushes to ECC
- Helps the incidence controller in containment of emergency
- Ensure fire pumps in operating conditions and instruct pump house operator to ready for any emergency with standby arrangements
- Guide the firefighting crew i.e., firemen, trained planned personnel and security staff
- Take guidance of the incident controller for firefighting as well as assess the requirement of outside help
- Arrange to control the traffic at the gate and the incident area
- Direct the security the staff to the incident site to take part in the emergency operations under his guidance and supervision
- Evacuate the people in the plant or in the nearby areas as advised by site controller
- Searchers for casualties and arranges proper aid for them
- Arrange for safety equipment for the members of this team
- Decides which paths the evacuated workers should follow

The **Emergency Coordinator – Medical, First Aid, Rehabilitation, Transport and Communication** should be as follows:

- Organize medical treatment to the injured and if necessary, will shift the injured to nearby hospitals
- Mobilize extra medical help, if necessary
- Keep a list of qualified first aid providers of the factory and seek emergency team
- Maintain first aid and medical emergency requirements
- Make sure that all safety equipment is made available to the emergency team

- Assist site controller with necessary data and to coordinate the emergency activities
- Assist site controller in updating emergency plans, organizing drills, verification of inventory of emergency facilities and furnishing report to site controller

During an emergency, it becomes more enhanced and pronounced, when an emergency warning is raised, the workers if they are in-charge of process equipment should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, the employees should adopt a safe course to assembly point and await instruction and must assist emergency personnel towards objective of Disaster Management Plan.

#### 8.5.2.2. *Emergency Control Center (ECC)*

The following information and equipment would be provided at the Emergency Control Center (ECC): Safe contained breathing apparatus, fire suit/ gas tight goggle/ gloves/ helmets, hand tools, public telephone directory, factory layout, site plan, emergency lamp/ torch light, plan indicating locations of hazard inventories, plant control room, sources safety equipment work road plan, assembly points, rescue location, vulnerable zones, escape routes, emergency shut down procedures, list of key personnel, list of essential employees, list of emergency coordinator, duties of key personnel, address with telephone numbers and key personnel, emergency coordinator, essential employees

#### 8.5.2.3. *Assembly Point*

Number of assemblies depending upon the location would be identified wherein employees who are not directly connected with the disaster management would be assembled for safety and rescue.

Emergency breathing apparatus, minimum facilities like water etc. would be organized. In view of size of plant, different locations are ear marked as assembly points. Depending upon the location of hazard, the assembly points are to be used.

### 8.5.3. **Fire Emergency Response Plan**

For fire safety plan, Yangon JR Family Limited, that include team members, providing of firefighting training, practice, regular instruction, installation of sufficient amount of fire extinguishers and firefighting system for the whole project site by following the instructions, techniques, and guidelines in concern with fire emergency matters of Myanmar Fire Services Department. A simple fire action sign and contact numbers of Myanmar Fire Services Department should be posted in positions where staff and relevant persons can read it and become familiar with its contents. In addition, getting the fire safety approval **Appendix VI** for this factory and the smoking inside the building is strongly prohibited to avoid unwanted fire problems.

The fire prevention and protection program must address the following topics:

**Prevention** \_ policies, practices and procedures designed to keep the conditions necessary for a fire from coming together

- Hot work permits
- Lockout/ tagout permits
- Design specifications for storage of flammable materials

**Severity reduction** \_ policies, practices and procedures designed to reduce the spread of fire and bring the fire to a quick end.

- Emergency plans
- Alarm systems
- Portable fire extinguishers
- Fire Protection Equipment

**Cleanup** \_ policies, practices and procedures designed to return the affected area to an operational level and reduce other losses created by improper cleanup

- First aid
- Removal of debris to an appropriate waste site
- Equipment and facility repair

#### *8.5.3.1. Firefighting*

The first steps in fighting a fire are determining the contents or materials burning in the fire and the extent (size) of the fire. The following are basic considerations for firefighting:

- Equipment that is operating should be shut down.
- Portable extinguishing equipment should be available in areas where the potential for fire is high.
- Employees must be trained in the use of any firefighting equipment that they are expected to use.
- Appropriate alarm systems should be in place
- A fire should be isolated. If personnel cannot isolate the fire, they should evacuate the area.
- Extinguishing methods must be appropriate for the fire
- Warm or burning materials must be removed as soon as possible
- Equipment should be restarted only after the fire area has been inspected and cleared by qualified personnel.

#### *8.5.3.2. Fire Safety and Evacuation Plan*

Fire Evacuation plans should include the following information

- Emergency escape routes must be clearly shown on floor plans and workplace maps
- Employers make sure that their employees know the emergency escape routes
- Procedures for employees who must remain to operate critical equipment before evacuating
- Identification and assignment of personnel responsible for rescue or emergency medical aid

Fire Safety Plans should include the following information:

1. Procedure for reporting a fire or other emergency
2. Site plans indicating the following
  - The Occupancy assembly point
  - The locations of fire hydrants
  - The normal routes of fire department vehicles access
3. Floor Plans identifying the locations of the following
  - Exits
  - Primary evacuation routes
  - Secondary evacuation routes
  - Accessible egress routes
  - Areas of refuge
  - Exterior area for assisted rescue
  - Manual fire alarm boxes
  - Portable fire extinguishers
  - Occupant-use hose stations
  - Fire alarm annunciators and controls

**Emergency evacuation drill:** An exercise performed to train staff and occupants and to evaluate their efficiency and effectiveness in carrying out emergency evacuation procedures

**Employee Training and Response Procedures:** Employee shall be trained in the fire emergency procedure described in their fire evacuation and fire safety plans and training should be based on these plans;

**Frequency:** Employee shall receive training in the contents of fire safety and evacuation plans and their duties as part of new employee orientation and at least annually thereafter. Records shall be kept and made available to the fire code official upon request.

**Employee Training Program:** Employee shall be trained in fire prevention, evacuation and fire safety in accordance with the following sections.

- Fire Prevention Training - Employee shall be apprised of the fire hazards of the materials and processes to which they are exposed. Each employee shall be instructed in the proper procedures for preventing fires in the conduct of their assigned duties
- Evacuation Training – Employees shall be familiarized with the fire alarm and evacuation signals, their assigned duties in the event of an alarm or emergency, evacuation routes, areas of refuge, exterior assembly areas and procedures for evacuation
- Fire Safety Training – Employee assigned fire-fighting duties shall be trained to know the locations and proper use of portable fire extinguishers or other manual firefighting equipment and the protective clothing or equipment required for its safe and proper use.

### 8.5.3.3. Site Fire Control

- Alert other people through fire alarm
- If small, control using an extinguisher
- Contact fire brigade if not under immediate control
- Attend to human life in immediate danger
- For electrical fires turn off power before fighting
- Once out of the building, stay out. Do not allow people to go back into the burning building to collect valuables. While evacuating the building, close doors (but do not lock) to slow down the spread of fire
- Obey all instructions
- Proceed to an emergency evacuation area (Muster Point)



Figure 8.2 Warning Signs










In addition, Fire safety is one of the most important factors that are necessary for rebar production to minimize and avoid the loss of life and property. Water storage tanks, voice alarm systems, fire hose reels, manual portable extinguishers and sprinklers also installed since the construction phase and give clear and concise instructions of the routine to be followed in case of fire and the proper calculation of firefighting system, setting prevention measures, and implementing emergency response were also prepared according to their emergency response plan. At project site area, existing ways, emergency exits fire evacuation place also prepared in proposed factory and fire extinguishers, and firehouses sufficient water also performed at project site of Yangon JR Family Limited.

#### 8.5.4. Medical Emergency Response Plan

Operations in the iron and steel industry may expose workers to a wide range of hazards or workplace activities or conditions that could cause incidents, injury, death, ill, health or diseases. Occupational Health for all employees working in this project before operation activities in which risk assessment for this project by using required appropriate design and technology, appropriate respirators and other PPE to control hazards in working area. The workers who exposed to molten metal will also need reflective clothing or insulated clothing with reflected surfaces during exposure to high radiant heat and hot air. The project owner should provide workers' health surveillance program. First-aid boxes should always be clearly marked, be easily accessible and located near areas where accidents could occur. The **Table 8-6** describes PPEs and their functions. Hmawbi Hospital and Myaung Da Gar Clinic would be listed for Nearby Hospitals for emergency response.

**Table 8-6 Functions and Features of PPEs**

Function of PPE	Features and characteristics
Hearing Protection devices	
Ear protection devices worn in or over the ears while exposed to hazardous noise to help prevent noise-induced hearing loss.	
Safety Helmet	
Safety Helmets will protect the user's head against: impact from objects falling from above, by resisting and deflecting blows to the head.	
Foot Protection	
Safety shoes are required where the potential for serious injury to the foot may result from an employee's daily job duties.	
Body Protection	

Function of PPE	Features and characteristics
<p>Reflective clothing can increase the visibility of employees and reduce their chances of being struck by vehicles or machinery.</p> <p>Insulated</p>	
Hand and Arm Protection	
<p>The safety gloves defend the user's hands from general risk and the injury of extreme heat.</p>	
Respiratory Protection	
<p>Respiratory Protection can protect the individual wearer against the inhalation of hazardous substances in the workplace air.</p>	
Face and eye protection	
<p>Face shields should be used in furnace operations and other hot work involving exposure to high-temperature radiation sources. Protection is also necessary against sparks or flying hot objects.</p>	

### 8.5.5. Risk Management Plan

Risk management is the process of identifying and evaluating the risks due to hazards associated with activities and operations of the steel plant, developing a means to control, reduce or eliminate those risks. Generally, the steel plant attempts to eliminate or control these risks through hazard identification and correction, accident prevention, training, implementation of safety system, installation of fire protection systems, and various other measures. On an individual level, risk management is the effort by each worker to make the fullest use of his personal capabilities to eliminate or reduce hazards in his working environment.

#### i. Process Safety

Process safety is a core part of safe and efficient production. Yangon J.R family needs to will follow on safety in the construction and operation of plants to meet high safety standards for the design, construction and operation of plants. In the operation stage, the essential feature is the blast furnace. Furnace may cause glare that can injure the eye unless suitable eye protection is provided. Thus, only authorized person should be allowed near furnaces. There should be suitable and sufficient exhaust ventilation with dust and fume collecting devices incorporated into the design of exhaust ventilation system. A prevention plan for every plant that considers the key aspects of environmental and health protection and safety and stipulate specific protection measures for each where necessary.

## ii. Emergency Response Plan

Yangon J.R Family Co., Ltd. will be able to handle both on-site and off-site incidents to safe product handling in emergency situations, fire prevention and firefighting, transport incident information and support system concepts, emergency and incident response. A new requirement on emergency response planning covers all emergency response responsibilities regarding fires, chemical releases, as well as natural disasters.

All senior staff should be assigned to lead the emergency response team and charged with the duties for well maintained. Instructions of emergency response plan for employees have to follow in emergency case and the alarm plans plus the specification of fire and explosion protection facilities. All staffs that may be exposed to potentially hazardous substances effective personal protective equipment are provided and employees are required to wear all necessary PPE.

## iii. Hazard identification and risk assessments

Risk assessments should be carried out to consider the potential dispersal from non-furnace processes and combustion products, and the potential impact of an explosion on the surrounding area.

By conducting hazard identification and risk assessments of tasks and workplaces, support employees and contractors in becoming aware to potential hazards and thus minimize risks. This also includes assessment of new technologies to ensure that they are handled safely for proposed steel plant.

## iv. Special Protection

**Social protection:** In accordance with national laws and regulations, workers would be entitled to adequate workers' compensation in the event of an occupational injury or disease and be entitled to survivors' and dependents' benefits; and have access to appropriate services for rehabilitation and return to work.

**Alcohol- and drug-related problem:** Alcohol- and drug- related problems should be dealt with in the same way as any other health problem at work. Alcohol and drug policies and programs should promote the prevention, reduction and management of alcohol- and drug-related problems in the workplace. Employers and workers and their representatives should cooperate in developing such programs for the facility. The same restrictions or prohibitions with respect to alcohol should apply to both management personnel and workers.

**HIV/ AIDS:** In workplaces, it is recommended to have an HIV/ AIDS policy and program, the successful implementation of which requires cooperation and trust between employers, workers and their representatives. There should be no disciplinary action nor discrimination against workers on the basis of real or perceived HIV status.

**Smoking at work:** Smoke-free workplace policies should be established, in consultation with workers and their representative, for the enclosed area of the facility. These policies should be

implemented and enforced by the employer in compliance with applicable laws and regulations.

**Personal hygiene:** Suitable toilets should be provided by the employer. Toilets, washing facilities and areas set aside for dining area should be kept clean and in a hygienic condition by the employer. Changing facilities should be situated and designed so as to prevent the spread of contamination from protective clothing to personal clothing. To reduce the risk of ingesting materials hazardous to health, workers should not eat, chew, drink or smoke in a work area contamination of personal clothing by such materials. If it is necessary to prohibit eating or drinking at the workplace, suitable facilities should be set aside for these activities to be carried out in an uncontaminated area, which should be conveniently accessible to the work area. Floors should be slip-resistant and well drained. Spillage, leaks and splashes should be promptly cleaned up.

### 8.6. Budget Estimation for EMP Plan

The following table shows the expenditures for the implementation of Environmental Management Plan for operation phase annually. It can change according to the situation and **Table 8-7** mentioned the allocation of budget for mitigation measures and monitoring plan throughout the life cycle of 50 years.

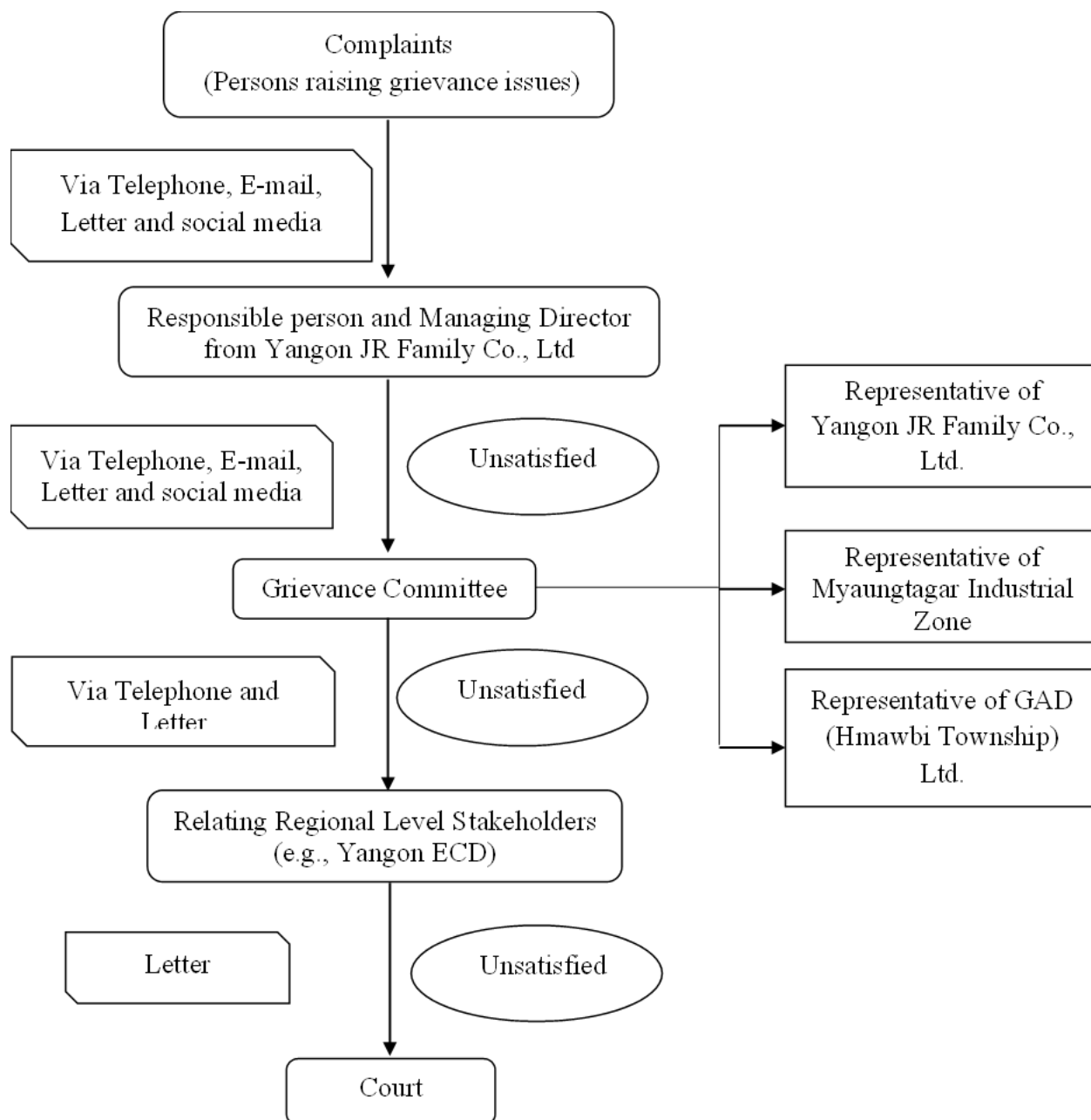
**Table 8-7 Allocation of Budget for Mitigation Measures and Monitoring Plan**

No.	Item	Unit	Frequency/ times	Unit Cost (USD)	Cost (USD)
(A)Mitigation Measures					
1.	Maintenance air pollution control system		annually	Lump sum	3,500
2.	Purchase of Personal Protective Equipment (PPE)	Nos.	annually	Lump sum	4,000
3.	Medical Check-up and Health Insurances		annually	Lump sum	3,500
4.	Hazardous Disposal Cost		annually	Lump sum	3,500
Emergency Preparedness for fire hazards					
5.	Fire Extinguishers			Lump sum	3,000
6.	PPE and First Aids Kits				
7.	Fire Alarm System				
8.	Solid waste disposal	Month	12	10	120
9.	Training Program	As per required	annually	Lump sum	800
	Subtotal				18,420
(B) Monitoring					
1.	Air Quality	Year	2	700	1,400
2.	Noise and vibration Quality	Year	2	300	600
3.	Water Quality 1. Ground water	Year	2		

No.	Item	Unit	Frequency/ times	Unit Cost (USD)	Cost (USD)
	2. Waste water				
4.	Soil Quality	Year	1	200	110
5.	Environmental auditing	Year	1	1500	1,500
	Subtotal				3,610
(C) Environmental Supervision and Advisors					
1.	HSE Coordinator	1	permanent	400	4,800
Grand Total					26,830

### 8.7. Grievance Redress Mechanism

People who live in the project affected area or stakeholder can complain about the impacts that they suffer through Grievance Committee, which includes the responsible persons of Yangon JR Family Co., Ltd., administrator of Myaung Da Gar Industrial Zone and representative of General Administration Department (GAD) of Hmawbi Township. If there have no satisfaction in solving problem through the Grievance Committee level, it can be submitted to higher responsible authorities and finally decided by the court in legal terms. **Figure 8-3** shows the steps of Grievance Redress Mechanism Yangon JR Family Co., Ltd.



**Figure 8.3 The Steps of Grievance Redress Mechanism**



## 8.8. Emergency Preparedness Plan and Training Programs

Emergency preparedness plan is necessary to reduce serious injury or loss of life and extensive damage. The proposed factory of production of TMT Rebar will be used excessive heat for smelting, casting and reheating processes. So, a good practice must be taken during operation process in order to reduce man-made errors and the accidental damage, injury, fire hazards and unexpected adverse impacts. During the emergency situation, it is generally seen that chaos and confusion rules leading to more damage. In Emergency Management, just like in normal operations where there are managers, engineers, supervisors and operators etc., who are assigned specific tasks to run the business.

Common emergency situation may involve:

- Fire
- Handling of hot metal or slag
- Mechanical injury to body parts
- Flammable liquid or gas leakage and chemical release or spill

The emergency response plans should be established for handling all foreseeable emergency situations in the workplace and must provide the following;

- i Assignment of responsibilities
- ii Emergency procedures

**1. Assignment of Responsibilities:** All senior staff such as a line/production manager or safety officer should be assigned to lead the emergency response team and charged with the duties of

- (1) Assessing the emergency situation and taking necessary actions
- (2) Overseeing the implementation of the emergency response plan
- (3) Organizing regular drill
- (4) Ensuring all emergency equipment is well maintained.

**2. Emergency Procedures:** Emergency procedures are operating instructions for employees to follow in emergency case.

In regard to work safety in the concerned processing, the management team should

- (1) Identify and list out all possible emergency situations in the workplace
- (2) Assess the effects and impacts of the emergency situations
- (3) Establish emergency response plans
- (4) Provide and maintain emergency equipment and other necessary resources
- (5) Ensure that staffs are familiarized with the arrangements in case of emergencies by providing procedural instructions and employee training and organizing drills.

### 8.8.1. Training for Emergencies

The type, amount and frequency of training varies, depending upon the tasks employees are expected to perform. Although training must be provided to employees at least annually, safety

meetings and drills should be conducted at more frequent intervals. Regardless of the specific type of facility, training should include, though not be limited to the following;

- Hazard recognition and prevention (fire, explosion, etc.)
- Proper use of fire extinguishers
- Emergency reporting procedures
- Preventive maintenance
- Hazardous materials spill response
- First Aid

**Table 8. 1 Action plan for Emergency**

Sr. No.	Emergency	Actions to mitigate the emergency	Responsibility to Respond
1.	Fire/Explosion	Raising emergency alarm	One who observes fire or explosion
		Shut down machines and main power supply	One who observes fire or explosion/ prod in charge
		Evacuation, assembly at assembly point	All employees
		Fire fighting	All employees
		Rescue operation	All employees
		First aid	All employees
		Fire fighting	Firefighting team
2.	Major spillage of flammable/ hazardous oils	Raising emergency alarm	One who observes the major spill
		Switch off Power Supply of the equipment	Concerned supervisor, maintenance engineer
		Evacuation, assembly at assembly point	All employees
		Isolate and barricade the area of spill	Security
		Control the spillage to avoid spread	Department Head
		Stop all the work of welding, electrical etc	Department Head
		Fire fighting	Firefighting team
3.	Burns and injury	First aid	All employees
		Send to the nearest clinic or hospital	All employees

## 8.9. Corporate Social Responsibility (CSR) Plan

Yangon J.R Family Limited has a plan to implement and donate two percent of the profit (2%) per year for Corporate Social Responsibility (CSR) and Employee Welfare Arrangement.

**Table 8. 2 CSR Plan at Yangon J.R Family Limited**

Area	Priority Item	Detailed Targets
Community Involvement and Development	Donation to local community	<ul style="list-style-type: none"> <li>• Donate to local charities with a worthy cause</li> <li>• Actively participate in community events and Myaung Da Gar Industrial Zone</li> <li>• Encourage staff to participate, and to form a community engagement team to actively support community events</li> <li>• Embedding understanding and consciousness about human rights issues among the employees</li> <li>• Development of sexual harassment and power harassment (workplace bullying &amp; harassment) prevention efforts</li> </ul>
Human Rights	Raising awareness of human rights	<ul style="list-style-type: none"> <li>• Establish a workplace culture where human rights issues do not arise</li> </ul>
Compliance to law	CSR Procurement	<ul style="list-style-type: none"> <li>• Sharing values regarding the production of CSR activities with business partners and avoiding procurement risks with key partners</li> <li>• Effect extensive compliance and adherence to laws and regulations with regard to procurement tasks</li> <li>• Continuous compliance to environmental regulations</li> </ul>

## 9. PUBLIC CONSULTATION AND DISCLOSURE

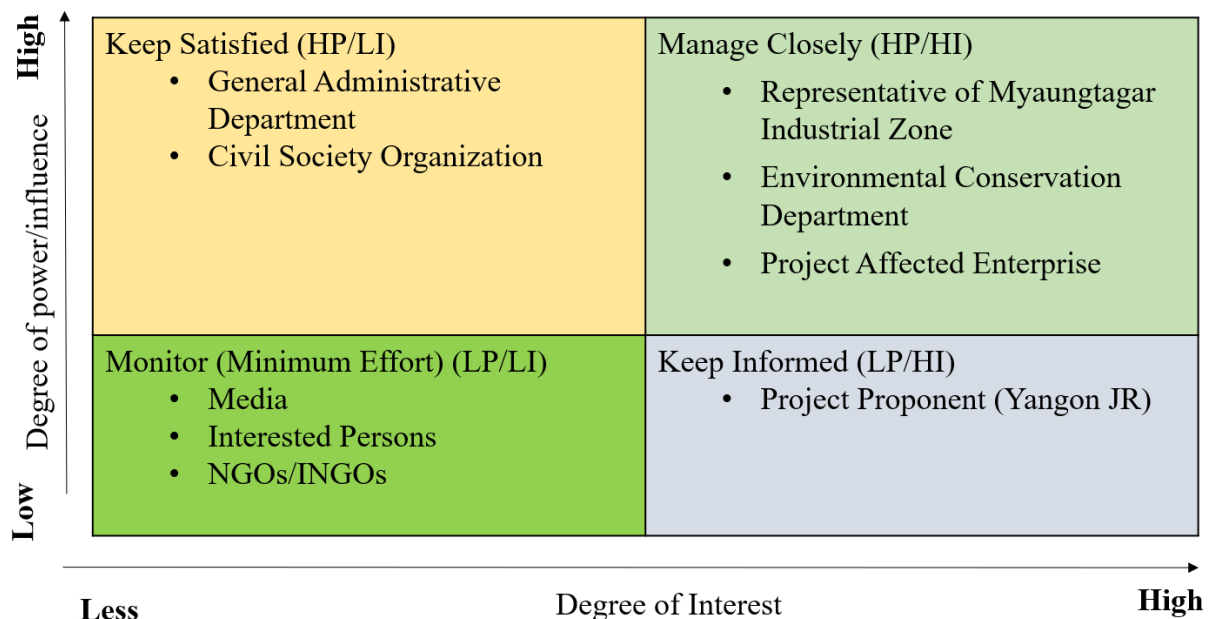
### 9.1. Necessity of Public Consultation

According to the Environmental Impact Assessment Procedure (2015), public consultation is one of the necessities processes to perform EIA study. Stakeholder engagement and analysis are required to hold in the scoping stage of EIA process through the local media and public notification at the project site and arrangements for meeting with all project stakeholders. The public consultation indicated the transparency of proposed project to local people.

### 9.2. Public Consultation Identification and Analysis

The aim of public consultation analysis process is to develop a strategic view of the human and institutional landscape, and the relationships between different stakeholders and the issues they care about most. It is important to understand that not all stakeholders will have the same influence or effect on a project nor they will be affected in the same manner. Way of determining stakeholder is to identify those who are directly impacted by the project activities and those who may be indirectly affected.

- **High power, highly interested people (Manage Closely):** you must fully engage these people, and make the greatest efforts to satisfy them.
- **High power, less interested people (Keep Satisfied):** put enough work in with these people to keep them satisfied, but not so much that they become bored with your message.
- **Low power, highly interested people (Keep Informed):** adequately inform these people, and talk to them to ensure that no major issues are arising. People in this category can often be very helpful with the detail of your project.
- **Low power, less interested people (Monitor):** again, monitor these people, but don't bore them with excessive communication.



**Figure 9.1 Stakeholder Mapping**

An outcome of identifying stakeholders should be a project stakeholder register. This is where the project team captures the names, contact information, titles, organization and other pertinent information of all stakeholders. This is a necessary tool during Stakeholder Engagement and will provide significant value for the project team to communicate with stakeholders in an organized manner.

### 9.3. Public Consultation Process

Public participation can be considered as the required element of the EIA process. In this EIA study, couples of stakeholder's participations were made. On 30<sup>th</sup> July 2019, a public consultation and disclosure ceremony was held at Dhamma Yay Aye Monastery, Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon Region in order to disclose the project information to the following personnel:


- Institutions (Local or Government Authorities at Hmawbi Township)
- Individuals (Groups with special interests, business community etc.)
- Project affected people near Myaung Da Gar Industrial Zone
- Interested persons

**Table 9-1 Activities during Stakeholder Engagement and Public Consultation**

Date	Location	Stakeholder	Purpose of Engagement
2 <sup>nd</sup> August, 2018	Dhamma Yay Aye Monastery, Myaung Da Gar Steel Industrial Zone, Hmawbi Township	6 persons of government officials, 18 persons from local and private sector of Myaung Da Gar Steel Industrial Zone	<ul style="list-style-type: none"> <li>• Present information about the project.</li> <li>• Seek an understanding of the requirements and plan for authority presence/ participation in the consultation process.</li> <li>• Gather information on Potential Affected Communities and People.</li> </ul>
30 <sup>th</sup> July, 2019	Dhamma Yay Aye Monastery, Myaung Da Gar Steel Industrial Zone, Hmawbi Township	Local people from Kan Kalay village and Kone Kalay village, Representative of Myaung Da Gar Steel Industrial Zone, Representative of NGOs/INGOs, Representative of Project Proponent, Representative from local media, Private sectors	<ul style="list-style-type: none"> <li>• Present information about the project.</li> <li>• Disclose the baseline results of environmental quality and socio-economic status of the surrounding of the project.</li> <li>• Explain about the impacts, mitigation measures, environmental</li> </ul>

Date	Location	Stakeholder	Purpose of Engagement
			management plan and monitoring. • Gather information on Potential Affected Communities and People.

It is aimed at disclosing the findings of environmental and social studies and the likely impacts upon them as well as mitigation and monitoring schemes to remediate the impacts caused by the project activities. The impacts were studied for all activities to be carried out in three phases: construction phase, operation phase and decommissioning phase it is also aimed at receiving public recommendations, feedbacks upon the studies. Presentation activity photos of public hearing and consultation, ceremony is mentioned in the **Photo 9-1**. The public consultation meeting's agenda was held according to the following program:

<b>E Guard Environmental Services</b>  <b>Meeting Minutes</b> 	
<b>Subject:</b> Environmental Impact Assessment for Yangon J.R Family Limited	<b>Date:</b> 30 <sup>th</sup> July 2019
<b>Venue:</b> Dharma Yay Aye Monastery	<b>Time:</b> 10:00 AM -12:00 PM
<b>Attendees:</b> <b>Government</b> - 1 Persons <b>Private Company</b> - 11 Persons <b>Local</b> – 7 Persons <b>Total</b> - 19 Persons	
<b>Note Taker:</b> Daw Nway Phyu Pyar Oo, Daw Ei Ei Phyo (Project Assistant, E Guard Environmental Services)	

The Stakeholder meeting was held in following Agenda:

1. Opening Ceremony
2. Presentation of project description, about Yangon J.R Family Ltd. by Mr. Ramkant Shukla (General Manager).
3. Presentation about the Environmental Impact Assessment by Daw Yadanar Swam Htet Kyaw and U Kaung Htet Swan, Consultant of E Guard Environmental Services.
4. Question and Answer Section
5. Closing Remarks by Mr. Ramkant Shukla, General Manager, Yangon J.R Family Ltd.
6. Closing Ceremony



## **Opening Ceremony**

### **Presentation of project description of Yangon JR Steel production by Mr. Ramkant Shukla (General Manager).**

He presented about project description of the Yangon J.R Family Ltd.

### **Presentation about the Environmental Impact Assessment by Daw Yadanar Swam Htet Kyaw and U Kaung Htet Swan, Consultant of E Guard Environmental Services.**

Daw Yadanar Swam Htet Kyaw explained about the requirements for Environmental Impact Assessment procedure, objectives of public consultation, related laws and regulation, background environmental conditions of the related area (Receptor) and project site (Source). U Kaung Htet Swan presented the anticipated environmental and social impacts, mitigation measures and processes that will be mentioned and prepared in the report.

## **Question, Recommendation and suggestion by Attendances**

### **Question (1): U Lin Lin Aung (Assistant Project Engineer, Mindhama Construction Company)**

This region is in the heavy rain area. If consumption of groundwater is exceeded normal usage, this can be affected on the environment. Is there any plan for using surface water more than using groundwater?

#### **Answer (1.1): U Kaung Htet Swan (Consultant, E Guard Environmental Services)**

The groundwater is used in construction stage. If project proponent uses surface water, they have to provide the required amount of water tanks for storage.

#### **Answer (1.2): U Tin Aung Moe (Director, E Guard Environmental Services)**

We only assess the Environmental Impact due to this project. The advice you suggested is more relevant to the consumption of the natural resources. Industrial Zone committee and YCDC should restrict on the usage of groundwater. The usage of surface water is more suitable for all conditions but on the other side, we need to provide the large water storage tanks and it will take the space that can effect on the environment.

### **Question (2): Daw Thet Hnin Hnin Su (Staff Officer, Environmental Conservation Department)**

I advised to attach layout plan of project site in the project description of the PowerPoint slides. In the 1-kilometer scope of project, Hlaing River is also included. So, biodiversity of the Hlaing River needed to inform in this report.

#### **Answer (2.1): Daw Yadanar Swam Htet Kyaw (Consultant, E Guard Environmental Services)**

The project area is located in the Myaung Da Gar Industrial Zone, so we didn't consider about the biodiversity in this report and the scoping of this report is approved by Environmental Conservation Department (ECD).

**Answer (2.2): U Tin Aung Moe (Director, E Guard Environmental Services)**

There are three reasons that we didn't consider about the biodiversity in this project.

1. This project is not near the Hlaing River and the effect on the river is not directly concerned with this project only.
2. This Myaung Da Gar Industrial Zone had been established for about 15 years and the observation on biodiversity is too late at this time.
3. Furthermore, there is no significant mangrove and costal line forest in Hlaing River. And also, there is no forest cover in this industrial zone. Thus, we didn't consider about biodiversity in this report.

**Question (3): U Thaung Tun (Local People, Kankalay Village)**

The livelihood of local people depends on the agriculture so I advised that project proponent should be mitigated carbon dioxide emissions from production process.

**Answer (3.1): U Tin Aung Moe (Director, E Guard Environmental Services)**

Carbon dioxide emission from this production process is within NEQ (Emission) Guideline. So, there is no effect on the agricultural land of project area.

**Closing Ceremony**

Closing Remark by Mr. Ramkant Shukla, General Manager, Yangon J.R Family Ltd. He thanked to all attendees for this public consultation. And also, they will follow all these advices and they will do environmentally friendly system.



**Registration**



**Presentation of project description, about Yangon J.R Family Ltd. by Mr. Ramkant Shukla (General Manager)**



**Presentation about the Environmental Impact Assessment Procedure by Daw Yadanar Swam Htet Kyaw, Consultant of E Guard Environmental Services**



**Presentation about the impacts, mitigation measures and processes by U Kaung Htet Swam, Consultant of E Guard Environmental Services**



**Questions and Answers Section**



**Questions and Answers Section**

**Photo 9-1 Presentation activity photos of public hearing and consultation, ceremony**

## 10. CONCLUSION AND RECOMMENDATION

### 10.1. Conclusion

The Environmental Impact Assessment (EIA) report has been prepared for production and marketing of TMT Rebars project is located at plot No. 340, 343, 338, 345, 339 and 344, Myaung Da Gar Steel Industrial Zone, Hmawbi Township, Yangon Region, Myanmar. The main objective of the study is to identify the major environmental impacts due to the implementation of the project activities in all three phases (construction phase, operation phase and decommissioning phase). However, the construction phase of proposed project initiated in April 2018 and commercial running operation stage is July 2020. Therefore, assessment of potential environmental impacts and preparing of environmental management plan with recommended impact mitigation measures were prepared for operation phase and decommissioning according to the compliance with environmental impact assessment procedure (2015) and National Environmental (Emission) Guidelines. In this EIA report study, the following activities were held on these days.

**Table 10. 1 Activities for EIA report study**

Date	Activities
20.7.18	Secondary Data Collection
2.8.18	Stake Holder Meeting for Scoping Report
30.8.18 -31.8.18	Environmental Quality Monitoring for Wet Season
5.11.18 to 7.11.18	Environmental Quality Monitoring for Dry Season
12.11.18 to 13.11.18	Social Survey

According to the data interpretation of ambient air quality, noise level, ground water and waste water quality results were compared with National and Environmental Quality (Emission) guideline and international guideline standards.

Results for ambient air quality of SO<sub>2</sub>, CO, CO<sub>2</sub>, O<sub>3</sub>, PMs, NO<sub>2</sub> and VOCs are within the NEQ (emission) guidelines. Therefore, the generated emission of proposed factory should be controlled by the implementation of proponent as recommended the engine regular maintenance programs, good driving practices, installing and maintain emissions control systems, and implementing a regular vehicle maintenance and repair programs. For water quality baseline data, ground water from tube well, wastewater from factory's drainage and Hlaing river water were collected at proposed steel mill during construction phase. According to the laboratories analysis results, most of parameters for ground water quality and river water quality are within the WHO drinking water quality but, level of color, turbidity, iron, manganese, total suspended solids, total phosphorus, chromium and cadmium are little higher than the NEQ Guidelines and WHO Guidelines.

However, tube well water will be treated by passing through into chlorine system. And then the obtained treated water will be provided for the whole factory use of production purposes, general office facilities such as canteen, toilets and other general purpose. For wastewater analysis results of drainage site that shown **Table 5.11**. Most of the water parameters are within the NEQ (emission) guideline. However, the levels of color, turbidity, iron, manganese, total



suspended solid, chromium and cadmium are little exceed than NEQ (emission) Guidelines and WHO guidelines. Nevertheless, the waste water from drainage water is from other industries because the project is still not operated yet. Besides, Yangon J.R Family Limited should install effective wastewater treatment system by discussing with Waste Water Treatment Company. In addition, all of wastewater effluents from production area and office facilities in line with National Environmental Emission Guidelines.

For Noise level measurement for 24 hours at project site during construction phase, the noise level of source is within the noise level of NEQ (emission) guideline. However, the noise level of receptor (at Dhamma Yay Aye Monastery) is little higher than guidelines because the generator is used for the purpose of power the equipment and for domestic uses of local houses. Therefore, the noise level is not a major problem of this project but noise reduction system and facilities should be prepared at production area to overcome the noise impact that may impact on all employees and workers for working environment.

The assessment of each impact is based on consideration of the magnitude, duration, extent and probability of activities which are going to be carried out during operation and decommissioning phases. In operation phase, there are moderate impacts on air quality, noise and vibration, waste disposal, Occupational Health and Safety on heat, noise, Community health and safety on air pollution and flame impacts and detail impact assessment for operation phases can be seen in **Table 6.6**. During the decommissioning phase, there are some moderate impacts on noise and vibration, waste disposal to environment and human.

All of the impacts during construction, operation and decommissioning phases can be minimized by using mitigation measures and implementing Environmental Management Plan (EMP). EMP is a site-specific plan developed to ensure that the project is implemented in and environmentally sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage those risks. Moreover, CSR program of Yangon J.R Family Limited will provide in management and it is important to CSR program should be accomplish not only by financial assistance but also by technical assistance and manpower to improve good relationship with local communities. All of the CSR activities and contribution programs should be declared to public by means of local media, company annual report or company's website on a regular basis. The effective implementation of the mitigation measures proposed will ensure towards good environmental monitoring plan prepared as part of the EMP will provide adequate opportunities to address any residual impacts during the operation phase. In conclusion, it has been figured out that, the proposed steel mill is going to generate local employment opportunities and enhance capabilities and working skills of employees. The study further concluded that positive impacts will be of immense benefit to the local community and national development as well.



## **10.2. Recommendations for Future Works**

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

- Follow the comments and suggestion made by ECD after reviewing this EIA report.
- Once EIA is approved by concerned authorities, strict implementation is essential.
- For full and proper implementation of EMP, well understanding and supports by proponent and authority is deem necessity.
- Well experienced and knowledgeable HSE Officer shall be appointed.
- Daily, monthly and annual action plan shall be formulated based on the EMP and practiced at operation level and environmental management system should be updated by evaluating the effectiveness of mitigation measures and reviewing the emerging techniques.
- Necessary care and environmentally sound practices should be taken for activities out of factory site particularly on raw material collection and transport.
- Keep full records of environmental management activities and present to annual independent third-party environment audit.
- Follow the audit report and comments.
- Abide environmental policy, laws rules and instructions of the Republic of the Union of Myanmar.

Finally, the proponent should follow the comments and suggestions made by ECD after reviewing this EIA report. Once EIA is approved by concerned authorities, effective implementation of EMP by the project proponent is essential. The proponent should abide environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar.

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## **12. APPENDICIES**

Appendix I MIC Permit for Yangon JR Family Limited  
Appendix II Company Registration License from DICA  
Appendix III License from Hmawbi City Development Committee  
Appendix IV Confirmation Letter from MIC  
Appendix V Building Completion Certificate from Hmawbi City Development Committee  
Appendix VI Fire Safety Certificate  
Appendix VII Electrical Instrumentation Certificate  
Appendix VIII Water Quality Results  
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Appendix X Layout Plan for Yangon JR Family Limited  
Appendix XI Description of Metal Analyzer  
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Appendix XV Announcement for Public Consultation  
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Appendix XX Comment Response Table for ECD's Comment



THE REPUBLIC OF THE UNION OF MYANMAR

Myanmar Investment Commission

PERMIT



Permit No. 093/2018

Date 7 July 2018

This Permit is issued by the Myanmar Investment Commission according to the section 25, sub-section (c) of the Myanmar Investment Law-

- (1) Name of Investor MR. RAM CHANDER SINGH NARAYAN SINGH
- (2) Citizenship INDIAN
- (3) Residence Address NO. (85/1), TH ROAD, KALADIPET, CHENNAI-600019 TAMILNADU, INDIA
- (4) Name and Address of Principle Organization
- (5) Place of Incorporation
- (6) Type of Business PRODUCTION AND MARKETING OF IRON AND STEEL
- (7) Place(s) at which investment is permitted PLOT NO. 338,339,340,343,344, 345, MYAUNG DA GAR STEEL INDUSTRIAL ZONE, HMAWBI TOWNSHIP, YANGON REGION
- (8) Amount of Foreign Capital US\$ 4.95 MILLION
- (9) Period for Foreign Capital to be brought in WITHIN ONE YEAR FROM THE DATE OF ISSUANCE OF MIC PERMIT
- (10) Total amount of capital (Kyat) EQUIVALENT IN KYAT OF US\$ 4.95 MILLION
- (11) Construction Period 2 (TWO) YEARS
- (12) Validity of investment permit 50 YEARS
- (13) Form of investment WHOLLY FOREIGN OWNED
- (14) Name of Company incorporated in Myanmar YANGON J.R FAMILY LIMITED

*Thawng Tun*

Chairman

Myanmar Investment Commission

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ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်  
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်  
ခွင့်ပြုမိန့်



ခွင့်ပြုမိန့်အမှတ် ၀၉၃/၂၀၁၈

၂၀၁၈ ခုနှစ် ဇူလိုင်လ ၇ ရက်

မြန်မာနိုင်ငံနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်သည် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ ဥပဒေပုဒ်မ ၂၅ ပုဒ်မခွဲ (ဂ) အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည် -

- (၁) ရင်းနှီးမြှုပ်နှံသူ/ကမကထပြုသူအမည် MR. RAM CHANDER SINGH  
NARAYAN SINGH
- (၂) နိုင်ငံသား INDIAN
- (၃) နေရပ်လိပ်စာ NO.(85/1), TH ROAD, KALADIPET, CHENNAI-600019  
TAMILNADU, INDIA
- (၄) ပင်မအဖွဲ့အစည်းအမည်နှင့်လိပ်စာ -
- (၅) ဖွဲ့စည်းရာအရပ် -
- (၆) ရင်းနှီးမြှုပ်နှံသည့်လုပ်ငန်းအမျိုးအစား သံနှင့်သံမဏိထုတ်လုပ်ရောင်းချခြင်းလုပ်ငန်း
- (၇) ရင်းနှီးမြှုပ်နှံသည့်အရပ်ဒေသ(များ) မြေကွက်အမှတ်-၃၃၈၊ ၃၃၉၊ ၃၄၀၊ ၃၄၁၊ ၃၄၂၊ ၃၄၃၊ ၃၄၄၊ ၃၄၅၊  
မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး
- (၈) နိုင်ငံခြားမတည်ငွေရင်းပမာဏ အမေရိကန်ဒေါ်လာ ၄.၉၅ သန်း
- (၉) နိုင်ငံခြားမတည်ငွေရင်းယူဆောင်လာရမည့်ကာလ ကော်မရှင်ခွင့်ပြုမိန့် ရရှိပြီးနေ့မှ  
၁ နှစ်အတွင်း
- (၁၀) စုစုပေါင်း မတည်ငွေရင်းပမာဏ(ကျပ်) အမေရိကန်ဒေါ်လာ ၄.၉၅ သန်းနှင့် ညီမျှသော  
မြန်မာကျပ်ငွေ
- (၁၁) တည်ဆောက်မှုကာလ ၂ နှစ်
- (၁၂) ရင်းနှီးမြှုပ်နှံမှုခွင့်ပြုသည့်သက်တမ်း ၅၀ နှစ်
- (၁၃) ရင်းနှီးမြှုပ်နှံမှုပုံစံ ရာခိုင်နှုန်းပြည့်နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှု
- (၁၄) မြန်မာနိုင်ငံတွင်ဖွဲ့စည်းမည့်ကုမ္ပဏီအမည် YANGON J.R FAMILY LIMITED

*Thawng Tun*

ဥက္ကဋ္ဌ

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၇၆

၃

၈၆



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၂၀၁၈ ခုနှစ်၊ ဇူလိုင်လ ၇ ရက်စွဲပါ ခွင့်ပြုမိန့်အမှတ် (၀၉၃/၂၀၁၈) တွင်ပြင်ဆင်ချက်

၂၀၂၂ ခုနှစ်၊ ဇူလိုင်လ ၁၁ ရက်နေ့တွင် ကျင်းပပြုလုပ်ခဲ့သော မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်၏ (၃/၂၀၂၂) ကြိမ်မြောက် အစည်းအဝေးဆုံးဖြတ်ချက်အရ သံနှင့်သံမဏိထုတ်လုပ် ရောင်းချခြင်းလုပ်ငန်းဆောင်ရွက်လျက်ရှိသော Yangon J.R Family Limited ၏ ရင်းနှီးမြှုပ်နှံသူ/ ကမကထပြုသူအမည်ကို Mr. Ram Chander Singh Narayan Singh မှ Mr. Kanishk Singh Narayan Singh သို့လည်းကောင်း၊ နေရပ်လိပ်စာကို No.85/1, TH Road, Kaladipet, Chennai- 600019, Tamilnadu, India မှ No.85/1, T.H Road, Kaladipet, Tiruvottiyur Township, Chennai District, Tami Nadu State, India, Postal Pin No. 600019 သို့လည်းကောင်း ပြင်ဆင်လိုက်သည်။

- (၁) ရင်းနှီးမြှုပ်နှံသူ/ကမကထပြုသူအမည် MR. KANISHK SINGH NARAYAN SINGH
- (၂) နေရပ်လိပ်စာ NO.85/1, T.H ROAD, KALADIPET, TIRUVOTTIYUR TOWNSHIP, CHENNAI DISTRICT, TAMI NADU STATE, INDIA, POSTAL PIN NO. 600019



ဥက္ကဋ္ဌ(အယ်ဒါး)

(သန့်စင်လွင်၊ အတွင်းရေးမှူး)

ရက်စွဲ၊ ၂၀၂၂ ခုနှစ်၊ ဩဂုတ်လ ၃ ရက်

နေရာ၊ ရန်ကုန်မြို့





# THE REPUBLIC OF THE UNION OF MYANMAR

## Myanmar Investment Commission

### Amendment on Permit No.093/2018 dated 7<sup>th</sup> July 2018

The Myanmar Investment Commission, at its meeting 3/2022 held on 11<sup>th</sup> July 2022, approved the name of investor of Yangon J.R Family Limited which is carrying out production and marketing of iron and steel be changed from Mr. Ram Chander Singh Narayan Singh to Mr. Kanishk Singh Narayan Singh and the name of address be amended from No.85/1, TH Road, Kaladipet, Chennai-600019, Tamilnadu, India to No.85/1, T.H Road, Kaladipet, Tiruvottiyur Township, Chennai District, Tamil Nadu State, India, Postal Pin No. 600019.

- (1) **Name of Investor** \_\_\_\_\_ MR. KANISHK SINGH NARAYAN SINGH \_\_\_\_\_
- (3) **Residence Address** \_\_\_\_\_ NO.85/1, T.H ROAD, KALADIPET, TIRUVOTTIYUR TOWNSHIP, \_\_\_\_\_  
CHENNAI DISTRICT, TAMI NADU STATE, INDIA, POSTAL PIN NO. 600019 \_\_\_\_\_

for Chairman

(Thant Sin Lwin, Secretary)

zw

b

Date : 3 August 2022

Location : Yangon







ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်  
Certificate of Incorporation

**YANGON J.R FAMILY LIMITED**  
Company Registration No. 106318506

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ

**YANGON J.R FAMILY LIMITED**

အား ၂၀၁၈ ခုနှစ် ဇန်နဝါရီလ ၂၂ ရက်နေ့တွင်

အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ  
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that  
**YANGON J.R FAMILY LIMITED**  
was incorporated under the Myanmar Companies Act 1914 on 22 January  
2018 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ

Registrar of Companies

ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

Directorate of Investment and Company Administration



Former Registration No. 988FC/2017-2018(YGN).





ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
ရန်ကုန်တိုင်းဒေသကြီးအစိုးရအဖွဲ့

ဘ(စမ)/၀၀၃၇

ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးဝန်ကြီးဌာန  
(ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးအဖွဲ့)

မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

ခရိုင်၊ ဘဏ္ဍာရေးနှင့် ဘေးအန္တရာယ်လုပ်ငန်းလိုင်စင်

၁။ စက်ရုံအမည်

Yanngon J. R Family Co. Ltd.

၂။ ကမကထပြုသူ၏အမည်

Mr. Naxayan Singh Kanishk Singh

၃။ လုပ်ငန်းတည်ရှိသည့်နေရာ

ဧရာဝတီ ၃၃၈၊ ၃၃၉၊ ၃၄၀၊ ၁၈၇ မြို့၊ ပုသိမ်၊ မြောက်ဧရာဝတီတိုင်းဒေသကြီး

၄။ လုပ်ကိုင်ခွင့်ပြုသည့်လုပ်ငန်းအမျိုးအစား

သစ်ရည်ကျိုက်မှု

၅။ နှစ်စဉ်လိုင်စင်ကြေးငွေ

၅၀၀၀၀၀/-

၆။ ငွေပေးသွင်းသည့်ရက်စွဲ

၂၀၂၁.၁၂.၁၅

၇။ လိုင်စင်သက်တမ်းကုန်ဆုံးသည့်နေ့

၂၀၂၁.၁၂.၁၅ - ၂၀၂၂.၁၂.၁၅

လိုက်နာရန်စည်းကမ်းချက်များ

- ၁။ လုပ်ငန်းလိုင်စင်အား မြင်သာသောနေရာတွင် မှန်ဘောင်ဖြင့် ချိတ်ဆွဲထားရမည်။  
လိုင်စင်အား တဆင့်လွှဲပြောင်းခြင်း၊ ငှားရမ်းခြင်း၊ ပေးကမ်းခြင်း လုံးဝမပြုလုပ်ရ။
- ၂။ လိုင်စင်ရရှိသူသည် အများပြည်သူအား ဘေးအန္တရာယ်ဖြစ်စေသည့် သို့မဟုတ် စက်ဆုပ်ရွံရှာဖွယ်ဖြစ်စေသည့် အလုပ်အကိုင်နှင့်ကူးသန်းရောင်းဝယ်ခြင်းလုပ်ငန်းများ၊ စားသောက်ဖွယ်ရာများထုတ်လုပ်ခြင်း၊ တည်ခင်းရောင်းချခြင်းဆိုင်ရာ စည်းကမ်း(Bye-Laws)များနှင့် အခါအားလျော်စွာ ထုတ်ပြန်သည့်အမိန့် ညွှန်ကြားချက်များကို တိကျစွာ လိုက်နာရမည်။
- ၃။ လိုင်စင်ရရှိသူသည် လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းစေရန်နှင့် မီးဘေးကြိုတင်ကာကွယ်ရေးအတွက် ကြိုတင်တိကျစွာ လိုက်နာရမည်။
- ၄။ လိုင်စင်ရရှိသူသည် မိမိလုပ်ငန်းမှထွက်ရှိသည့် အမှိုက်သရိုက်၊ အညစ်အကြေးနှင့်ဓါတုဗေဒပစ္စည်းများအား အမှိုက်ကင်းမဲ့စီမံချက်နှင့်အညီ စနစ်တကျစွန့်ပစ်ရမည်။ လိုအပ်ပါက မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့တွင် စီးပွားရေးအမှိုက်ခွန်ပေးသွင်း၍ အမှိုက်သိမ်းယာဉ်အကူအညီ တောင်းခံရမည်။
- ၅။ လိုင်စင်တွင် ရောင်းချခွင့်ပြုထားသည့် ကုန်ပစ္စည်းများကိုသာ ရောင်းချခွင့်ပြုသည်။ သက်ဆိုင်ရာအာဏာပိုင်များက တားမြစ်သည့် ကုန်ပစ္စည်းများကို ရောင်းချခြင်းမပြုရ။
- ၆။ နှစ်စဉ် အဖွဲ့မှသတ်မှတ်သည့်လိုင်စင်ခကို လုပ်ငန်းအမျိုးအစားအလိုက် သတ်မှတ်သည့်နှုန်းထားအတိုင်း ပေးဆောင်ရမည်။
- ၇။ လုပ်ငန်းရှင်များသည် ရှေ့လာမည့်ဘဏ္ဍာရေးနှစ်တွင် မိမိလုပ်ငန်းအား ဆက်လက်လုပ်ကိုင်လိုပါက အဖွဲ့မှသို့ ကြိုတင်လျှောက်ထားရမည်။
- ၈။ လုပ်ငန်းရှင်များသည် မိမိလုပ်ငန်းအား ပိတ်သိမ်းသည်အခါ အဖွဲ့မှသို့ ကြိုတင်အကြောင်းကြားရမည်။
- ၉။ အထက်ပါစည်းကမ်းတစ်ရပ်ရပ်ကို လိုက်နာခြင်းမရှိပါက လိုင်စင်ကို ပြန်လည်ရုပ်သိမ်း၍ စည်ပင်သာယာရေးအဖွဲ့များဥပဒေအရ ထိရောက်စွာအရေးယူခြင်းခံရမည်။

၄. 5. 2023

အမှုဆောင်အရာရှိ  
မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်  
ရန်ကုန်တိုင်းဒေသကြီးရင်းနှီးမြှုပ်နှံမှုကော်မတီ  
မြေကွက်အမှတ် ၄၉၊ စိမ်းလဲ့မေ လမ်းသွယ်၊  
ကမ္ဘာအေးဘုရားလမ်း၊ ၊ ရန်ကင်းမြို့နယ်၊ ရန်ကုန်မြို့

၀၁-၆၅၈၂၆၃  
၀၁-၆၅၈၂၆၄  
သို့

စာအမှတ်၊ရကတ/ရနမ-၂ /၂၀၁၈ ( ၂၃ )  
ရက်စွဲ၊ ၂၀၁၈ ခုနှစ် မေ လ ၁၁ ရက်

ညွှန်ကြားရေးမှူး

ရင်းနှီးမြှုပ်နှံမှုဌာနခွဲ(၂)

ရင်းနှီးမြှုပ်နှံမှုနှင့် ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

အကြောင်းအရာ။ အတည်ပြုလျှောက်ထားလွှာ လွှဲပြောင်းပေးခြင်းကိစ္စ

ရည်ညွှန်းချက် ။ (၁) Yangon J.R Family Limited ၏ ၂၀-၄-၂၀၁၈ ရက်စွဲပါစာ

(၂) ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဦးစီးဌာန၊ တိုင်းဒေသကြီးညွှန်ကြားရေးမှူး  
ရုံး၊ ရန်ကုန်တိုင်း ဒေသကြီး ၏ ၃-၅-၂၀၁၈ ရက်စွဲပါ စာအမှတ်၊ ရက-  
၁/၃-၄(အီးအိုင်အေ)(၄၆၈/၂၀၁၈)

၁။ Yangon J.R Family Limited မှ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီ မြို့နယ်၊  
မြေတိုင်းရပ်ကွက်အမှတ် (မြောင်းတကာသံမဏိစက်မှုဇုန်)၊ မြေကွက်အမှတ် (၃၄၀၊ ၃၄၂၊ ၃၄၈၊  
၃၄၅၊ ၃၄၉၊ ၃၄၄) တွင် Production and Marketing of TMT Rebars လုပ်ငန်း  
ဆောင်ရွက်လိုကြောင်း ရည်ညွှန်းပါစာဖြင့် တင်ပြလာခြင်းအား ၂၀၁၈ ခုနှစ် ဧပြီ လ ၂၃ ရက်စွဲပါ  
စာအမှတ်၊ ရကတ/ရနမ-၂/၂၀၁၈/(၁၈၅)ဖြင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာနသို့ သဘောထား  
တောင်းခံခဲ့ပါသည်။

၂။ ကုမ္ပဏီ၏ အတည်ပြုလျှောက်ထားလွှာအား ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာနသို့  
သဘောထားတောင်းခံခဲ့ရာ ရည်ညွှန်း(၂) ပါစာဖြင့် သဘောထားပြန်ကြားလာပါသည်။  
အဆိုပါဌာနမှ အဆိုပြုလုပ်ငန်းကြောင့် ပတ်ဝန်းကျင်ဆိုင်ရာထိခိုက်မှုများ ဖြစ်ပေါ်လာနိုင်ကြောင်း  
အောက်ပါအတိုင်း သုံးသပ်ချက်ဖြင့်အကြောင်းကြားလာပါသည်-

(က) Thermo Mechanically Treated Rebars များအား အရည်ကျိုခြင်း၊  
ပုံသွန်းလောင်းခြင်း တို့မှ သံအောက်ဆိုင်၊ ဆာလဖာဒိုင်အောက်ဆိုင်၊ ဟိုက်ဒရို  
ကာဗွန်နှင့် ကာဗွန်ပါဝင်သည့် ခြပ်ပေါင်းများ ထွက်ရှိနိုင်ပြီး ပတ်ဝန်းကျင် လေထု၊  
မြေထုနှင့် ရေထုညစ်ညမ်းမှုများ ဖြစ်ပေါ်လာခြင်း၊

(ခ) ထုတ်လုပ်ခြင်းလုပ်ငန်း ခြံအဆင့်ဆင့်မှ ဖြတ်စွန့်ပစ်ပစ္စည်းများ၊ Thermo  
Mechanically Treated Rebars များထုတ်လုပ်ခြင်းလုပ်ငန်းတွင် မဂ္ဂနီဆီယမ်  
ပါဝင်များသော ဒီလီကွန်များကို အရည်ကျိုခြင်းမှ မီးခိုးငွေ့များနှင့် အမှုန်အမွှားများ

၄/၆/၁၉  
၁၈၊ သတ္တ



J

ထွက်ရှိခြင်းကြောင့် စက်ရုံအတွင်းအလုပ်သမားများနှင့် စက်ရုံဧရိယာအနီး ပတ်ဝန်းကျင်ရှိ ပြည်သူများ၏ အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ရောဂါများနှင့် အရေပြားရောဂါများ ဖြစ်စေနိုင်ခြင်းတို့ကြောင့် ကျန်းမာရေး ထိခိုက်မှု ဖြစ်ပေါ်စေနိုင်သည့် အပြင် ပတ်ဝန်းကျင်ရှိ လေထုကို ညစ်ညမ်းမှုများ ဖြစ်ပေါ်စေနိုင်ခြင်း၊

(ဂ) ကုန်ကြမ်းများ အရည်ကျိုရာမှ ထွက်ရှိသော ပစ္စည်းများမှာ မီးလောင်လွယ်သော ပစ္စည်းများဖြစ်သည့်အတွက် အကာအကွယ်ပစ္စည်းများ စနစ်တကျတပ်ဆင်ထားခြင်း မရှိပါကမီးဘေးအန္တရာယ်များ ဖြစ်စေနိုင်ခြင်း၊

(ဃ) လုပ်ငန်းလည်ပတ်ခြင်းမှ ထွက်ရှိလာသည့် ဆူညံသံများကြောင့် အသံညစ်ညမ်းမှုများ ဖြစ်ပေါ်နိုင်ပြီး စိမ့်ကိန်းစက်ရုံဧရိယာ အနီးတဝိုက်ရှိ ပြည်သူများ၏ ကျန်းမာရေးဆိုင်ရာ ထိခိုက်မှုများ၊ လူမှုရေးဆိုင်ရာ ထိခိုက်ခံစားရမှုများ ဖြစ်ပေါ်စေနိုင်ခြင်း၊

၃။ သို့ဖြစ်ပါ၍ အဆိုပြုလုပ်ငန်းသည် ပတ်ဝန်းကျင်နှင့် လူမှုရေးထိခိုက်မှု မရှိစေရေး(သို့) ထိခိုက်မှု အနည်းဆုံး ဖြစ်စေရေးအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း(Environmental Impact Assessment-EIA) ဆောင်ရွက်ရမည်ဖြစ်ပါသဖြင့် ဖြန့်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ ၃၆ အရ အတည်ပြုလျှောက်ထားလွှာအား သက်ဆိုင်ရာသို့ လွှဲပြောင်းပေးပို့အပ်ပါသည်။



မျိုးခိုင်ဦး

ညွှန်ကြားရေးမှူး



မိတ္တူကိုင်

Yangon J.R Family Limited.

ရုံးလက်ခံ/မျှောစာတွဲ



မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့  
အဆောက်အအုံပြီးစီးကြောင်းနှင့်အသုံးပြုခွင့်လက်မှတ်

စာအမှတ်၊ ၀၈၀၃ / ဆ-၆ / မဘ-၂(၀၀၂)

ရက်စွဲ ၂၀၂၂ခု ဇွန် လ ၉ရက်

၁။ မှော်ဘီမြို့၊ မြောင်းတကာစက်မှုဇုန် ကျေးရွာ/ရပ်ကွက်၊ ကံကလေး(အမ်) လမ်း၊  
အမှတ်( - )နေ ဦးစိုးလှိုင်+၃ဦး အားဖော်ပြပါ မြေကွက်၌ ပူးတွဲပါ အဆောက်အအုံ ပုံစံအရ  
အဆောက်အအုံကို ၂၀၁၉-၂၀၂၀ အမှုတွဲအမှတ်( ၃ )ဖြင့်( ၂-၁၂-၂၀၁၉ )ရက်နေ့တွင် ခွင့်ပြုမိန့်ချမှတ်ခဲ့ရာ  
ဆောက်လုပ်ပြီးစီးသွားပြီ ဖြစ်ပါသည်။

မြေကွက်အလားလေးရပ်

အရှေ့ - စက်မှု(၂)လမ်း

အနောက် - အနောက်ပတ်လမ်း

တောင် - ယပ်တောင်စက်ရုံလမ်း

မြောက် - ၈၈-၃၄၁

၂။ အဆိုပါအဆောက်အအုံသည်ဆောက်လုပ်ပြီးစီးသွားပြီဖြစ်သဖြင့် အောက်ပါရည်ရွယ်ချက်များအတိုင်း  
အထပ်လိုက်အသုံးပြုခွင့်ပြုလိုက်ပါသည်။

(က) အောက်ထပ် (၅၃၂'-၇" x ၇၈'-၈")+(၅၇၀'-၄" x ၃၉၂'-၉")၊(၁)ထပ် Steel Structure

(ခ) ပထမထပ် -----

(ဂ) ဒုတိယထပ်နှင့်အခြားထပ်များ-----

(ဃ) အပေါ်ဆုံးထပ်-----

၃။ ဤလက်မှတ်သည် အိမ်ပိုင်ဆိုင်မှုမြေပိုင်ဆိုင်မှုနှင့် သက်ဆိုင်ခြင်းမရှိဘဲ ဤလက်မှတ် အပိုဒ်(၂)ပါ  
ရည်ရွယ်ချက်တစ်ခုခုကို ပြောင်းလဲအသုံးပြုလိုပါက မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့သို့ ချက်ချင်း  
အကြောင်းကြားရမည် ဖြစ်ပါသည်။

ခေတ္တအမှုဆောင်အရာရှိ

မိတ္တူကို

- ဒဦးစီးမှူး(အခွန်)၊ မှော်ဘီမြို့နယ်စည်ပင်သာယာရေးအဖွဲ့ထံသို့ပေးပို့ပါသည်။

- အုပ်ချုပ်ရေးမှူး၊ မြောင်းတကာစက်မှုဇုန် ရပ်ကွက်/ကျေးရွာအုပ်စု၊

- လက်ခံစာတွဲ/မျှောစာတွဲ။



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

ပြည်ထဲရေးဝန်ကြီးဌာန

မီးသတ်ဦးစီးဌာန



မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်

အမှတ်စဉ်( ၁၉၀ )

၁။ ရန်ကုန်-တိုင်းဒေသကြီး/ပြည်နယ်၊ မှော်ဘီ-မြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်-ရပ်ကွက်/  
ကျေးရွာ၊ (-) လမ်း၊ အမှတ်-မြေကွက်အမှတ်( ၃၃၈+၃၄၅ )၊ ( ၃၄၀+၃၄၃ )၊ ( ၃၄၄၊ ၃၃၉ ) ရှိ  
ပိုင်ရှင် ဦး/ဒေါ် ဦးစိုးလှိုင် + ဦးရွှေလှိုင် + ဦးတင်ထွန်း၏ Steel Structure ( ၁ )ထပ်( သံရည်ကျိုစက်ရုံ )၊  
RCC ( ၃ )ထပ် ( ဝန်ထမ်းအိပ်ဆောင် )၊ RCC ( ၁ )ထပ် ( ရုံး )၊ RCC ( ၁ )ထပ် ( Store ) ( ၂ )လုံး

အဆောက်အဦအတွက် ဤဌာန၏ ( ၃-၁၂-၂၀၁၉ ) ရက်စွဲပါ စာအမှတ်၊ ၁၉၆၆/ ၁၀၀ / ၅၂ / ဦး ၁ ဖြင့်  
သတ်မှတ်ပေးထားသည့် မီးဘေးလုံခြုံရေးဆိုင်ရာ ပြဌာန်းချက်များအား ( ၁၅-၅-၂၀၂၂ ) ရက်နေ့တွင်  
စစ်ဆေးသည့်အခါ ပြည့်စုံစွာဆောင်ရွက်ထားကြောင်း စစ်ဆေးတွေ့ရှိရသည်။

၂။ ဤထောက်ခံချက်သည် စစ်ဆေးသည့်နေ့မှစ၍ (၃)နှစ်အထိသာ အကျိုးဝင်သည်။

၃။ ထို့ပြင် မီးသတ်ဦးစီးဌာနမှ အခါအားလျော်စွာ ထပ်မံစစ်ဆေးချိန်တွင် မီးဘေးလုံခြုံရေးဆိုင်ရာ  
ပြဌာန်းချက်များကို လိုက်နာဆောင်ရွက်ခြင်းမရှိပါက ဤထောက်ခံချက်ကို ပြန်လည်ရုတ်သိမ်းသွားမည်ဖြစ်ပြီး  
အဆောက်အဦအားအသုံးပြုသူ(သို့မဟုတ်)ပိုင်ရှင်သည် မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေအရအရေးယူခြင်းခံရမည်။

**မှတ်ချက်။** ဤထောက်ခံချက်အား လွှဲပြောင်းသုံးစွဲခြင်းမပြုရ။ အဆောက်အဦအား မူလရည်ရွယ်ချက်မှ  
ပြောင်းလဲအသုံးပြုပါက ထောက်ခံချက်အသစ် ထပ်မံလျှောက်ထားရမည်။

၂၄/၅/၂၀၂၂

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)  
(သိန်းထွန်းဦး၊ ညွှန်ကြားရေးမှူး)

၀၃/၂



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
ပြည်ထဲရေးဝန်ကြီးဌာန  
မီးသတ်ဦးစီးဌာန

စာအမှတ်၊ ၂၅ / ၁၀၀ / ၅၅ / ဦး ၁  
ရက် စွဲ၊ ၂၀၂၂ ခုနှစ်၊ မေလ ၂၄ ရက်

သို့

ဦးစိုးလှိုင်+ဦးရွှေလှိုင်+ဦးတင်ထွန်း

မြေကွက်အမှတ်(၃၃၈+၃၄၅)၊ (၃၄၀+၃၄၃)၊ (၃၄၄၊ ၃၃၉)

မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မှော်ဘီမြို့နယ်

အကြောင်းအရာ။ ဆောက်လုပ်ပြီးသောအဆောက်အဦအတွက် မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက်  
(Fire Safety Certificate)

ရည် ညွှန်း ချက်။ (၁) မီးသတ်ဦးစီးဌာန၏ (၃.၁၂.၂၀၁၉)ရက်စွဲပါစာအမှတ်၊ ၁၉၆၆ / ၁၀၀ / ၅၂ /  
ဦး ၁

(၂) သက်ဆိုင်သူ၏(၂၁.၃.၂၀၂၂)ရက်စွဲပါလျှောက်လွှာ

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မြေကွက်အမှတ်  
(၃၃၈ + ၃၄၅)၊ (၃၄၀ + ၃၄၃)၊ (၃၄၄၊ ၃၃၉)တွင် ဦးစိုးလှိုင် + ဦးရွှေလှိုင် + ဦးတင်ထွန်း အမည်ဖြင့်  
Steel Structure (၁)ထပ် (သံရည်ကျိုစက်ရုံ)၊ RCC (၃)ထပ် (ဝန်ထမ်းအိပ်ဆောင်)၊ RCC (၁)ထပ် (ရုံး)၊  
RCC (၁)ထပ် (Store) (၂)လုံး အဆောက်အဦမီးဘေးလုံခြုံရေးဆောင်ရွက်ထားရှိမှုနှင့်စပ်လျဉ်း၍ ဤဌာန၏  
ရည်ညွှန်းချက်(၁)ပါ အကြံပြုချက်(၉)ချက်ကို လိုက်နာဆောင်ရွက်မှုရှိကြောင်း စစ်ဆေးတွေ့ရှိသည့်  
အတွက် မီးဘေးလုံခြုံရေးစစ်ဆေးထောက်ခံချက် (Fire Safety Certificate)ကို ထုတ်ပေးလိုက်ပါသည်။

၂၄/၅/၂၀၂၂

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)  
(သိန်းထွန်းဦး၊ ညွှန်ကြားရေးမှူး)

၀၃၃

မိတ္တူကို

ရန်ကုန်တိုင်းဒေသကြီးမီးသတ်ဦးစီးမှူးရုံး၊

မြောက်ပိုင်းခရိုင်မီးသတ်ဦးစီးမှူးရုံး၊ လှိုင်သာယာမြို့နယ်၊

မြို့နယ်မီးသတ်ဦးစီးမှူးရုံး၊ မှော်ဘီမြို့နယ်၊

မျှောစာတွဲ၊ လက်ခံစာတွဲ။





စက်မှုဝန်ကြီးဌာန  
ရန်ကုန်တိုင်းဒေသကြီး စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန  
လျှပ်စစ်စစ်ဆေးရေးဌာန

အမှတ် - ၁၉၂၊ ကမ္ဘာအေးဘုရားလမ်း၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်မြို့

စာအမှတ် ၊ ၁၅၁၅(၇)ရက-လဆရ/၀၃/၂၀၂၂(၄၉၁၄ )  
ရက်စွဲ ၊ ၂၀၂၂ ခုနှစ် ဇူလိုင် လ ၂၉ ရက်

အကြောင်းအရာ။ အဆောက်အဦအတွင်း လျှပ်စစ်သွယ်တန်း တပ်ဆင်အသုံးပြုမှုများ စစ်ဆေးခြင်း

ရည်ညွှန်းချက်။ Yangon JR Family Limited ၏ လျှောက်ထားချက်အရ

၁။ အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ အမှတ် (၃၃၈၊၃၃၉၊၃၄၀၊၃၄၁၊၃၄၄၊၃၄၅) ရှိ Yangon JR Family Limited ၏ သံရည်ကျိုစက်ရုံ အဆောက်အဦ အတွင်း လျှပ်စစ်သွယ်တန်းတပ်ဆင်မှုများ အား ပူးတွဲပါ လျှပ်စစ်ပုံစံ ကို အခြေခံ၍ ဤတိုင်းဒေသကြီးဦးစီးဌာန၊ လျှပ်စစ်စစ်ဆေးရေးဌာန မှ (၂၈.၆.၂၀၂၂) ရက်နေ့တွင် သွားရောက် စစ်ဆေးပြီး ဖြစ်ပါသည်။

၂။ စစ်ဆေးတွေ့ရှိချက်များအရ အဆိုပါ Yangon JR Family Limited ၏ သံရည်ကျိုစက်ရုံ အဆောက်အဦ အတွင်း ဓာတ်အားဆက်သွယ်အသုံးပြုမှု အတွက် ကန့်ကွက်ရန်မရှိကြောင်း အကြောင်းကြားပါသည်။

*Handwritten signature in blue ink.*

တိုင်းဒေသကြီးဦးစီးဌာနမှူး ( *Signature* )  
ခိုင်မြင့် - ဒုတိယညွှန်ကြားရေးမှူး  
ရန်ကုန်တိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး  
*✓* *K*

မြို့လျှပ်စစ်မန်နေဂျာ  
ရန်ကုန်လျှပ်စစ်ဓာတ်အားပေးရေးကော်ပိုရေးရှင်း  
မြောင်းတကာမြို့။

မိတ္တူကို *✓* Mr Narayan Singh Kanishk Singh ၊ အမှတ်(၃၃၈၊၃၃၉၊၃၄၀၊၃၄၁၊၃၄၄၊၃၄၅)၊

မြောင်းတကာစက်မှုဇုန်၊မှော်ဘီမြို့နယ်။

- ရုံးလက်ခံ၊
- မျှောစာတွဲ။



စက်မှုဝန်ကြီးဌာန  
ရန်ကုန်တိုင်းဒေသကြီး စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန  
လျှပ်စစ်စစ်ဆေးရေးဌာန

အမှတ် - ၁၉၂၊ ကမ္ဘာအေးဘုရားလမ်း၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်မြို့



စာအမှတ် ၊ ၁၅၁၅(၇)ရက-လဆရ/၀၃/၂၀၂၂(၄၉၁၄ )  
ရက်စွဲ ၊ ၂၀၂၂ ခုနှစ် ဇူလိုင် လ ၂၉ ရက်

အကြောင်းအရာ။ အဆောက်အဦအတွင်း လျှပ်စစ်သွယ်တန်း တပ်ဆင်အသုံးပြုမှုများ စစ်ဆေးခြင်း

ရည် ညွှန်း ချက်။ Yangon JR Family Limited ၏ လျှောက်ထားချက်အရ

၁။ အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ အမှတ် (၃၃၈၊၃၃၉၊၃၄၀၊၃၄၁၊၃၄၄၊၃၄၅) ရှိ Yangon JR Family Limited ၏ သံရည်ကျိုစက်ရုံ အဆောက်အဦ အတွင်း လျှပ်စစ်သွယ်တန်းတပ်ဆင်မှုများ အား ပူးတွဲပါ လျှပ်စစ်ပုံစံ ကို အခြေခံ၍ ဤတိုင်းဒေသကြီးဦးစီးဌာန၊ လျှပ်စစ်စစ်ဆေးရေးဌာန မှ (၂၈.၆.၂၀၂၂) ရက်နေ့တွင် သွားရောက် စစ်ဆေးပြီး ဖြစ်ပါသည်။

၂။ စစ်ဆေးတွေ့ရှိချက်များအရ အဆိုပါ Yangon JR Family Limited ၏ သံရည်ကျိုစက်ရုံ အဆောက်အဦ အတွင်း ဓာတ်အားဆက်သွယ်အသုံးပြုမှု အတွက် ကန့်ကွက်ရန်မရှိကြောင်း အကြောင်းကြားပါသည်။

တိုင်းဒေသကြီးဦးစီးဌာနမှူး (  )  
ခိုင်မြင့် - ဒုတိယညွှန်ကြားရေးမှူး  
ရန်ကုန်တိုင်းဒေသကြီး လျှပ်စစ်စစ်ဆေးရေးမှူး  


✓ မြို့လျှပ်စစ်မန်နေဂျာ  
ရန်ကုန်လျှပ်စစ်ဓာတ်အားပေးရေးကော်ပိုရေးရှင်း  
မြောင်းတကာမြို့။

မိတ္တူကို - Mr Narayan Singh Kanishk Singh ၊ အမှတ်(၃၃၈၊၃၃၉၊၃၄၀၊၃၄၁၊၃၄၄၊၃၄၅)၊  
မြောင်းတကာစက်မှုဇုန်၊မှော်ဘီမြို့နယ်။  
- ရုံးလက်ခံ၊  
- မျှောစာတွဲ။



## LABORATORY



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

WTL-RE-001

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### WATER QUALITY TEST RESULTS FORM

Client	Yangon J.R Family Limited
Nature of Water	Ground Water
Location	Myaungdakar Industrial Zone
Date and Time of collection	30.8.2018
Date and Time of arrival at Laboratory	30.8.2018
Date and Time of commencing examination	31.8.2018
Date and Time of completing	5.9.2018


#### Results of Water Analysis

#### WHO Drinking Water Guideline (Geneva - 1993)


Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate (N.NO <sub>3</sub> )		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH <sub>3</sub> )		mg/l	
Ammonium (NH <sub>4</sub> )		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	32	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	8	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (Si)		mg/l	

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

#### Tested by

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

#### Approved by

Signature:   
Name: **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.

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## LABORATORY



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

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

**M0818 085**

### WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	Yangon J.R Family Limited
Nature of Water	Ground Water
Location	Myaungdakar Industrial Zone
Date and Time of collection	30.8.2018
Date and Time of arrival at Laboratory	30.8.2018
Date and Time of commencing examination	30.8.2018
Date and Time of completing	31.8.2018

#### Results of Water Analysis

#### WHO Drinking Water Guideline (Geneva - 1993)


Total Coliform Count	3 CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	Not detected (<1) CFU/100ml	Not detected
pH	7.2	6.5 - 8.5
Turbidity	133 NTU	5 NTU
Colour (True)	90 TCU	15 TCU
Free Chlorine	Nil mg/l	
Total Chlorine	Nil mg/l	

Remark : Unsatisfactory for drinking purpose.


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

: < - Less than

#### Tested by

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

#### Approved by

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

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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)

**W0818 761**

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

## WATER QUALITY TEST RESULTS FORM

Client Yangon J.R Family Limited  
Nature of Water Ground Water  
Location Myaungdakar Industrial Zone  
Date and Time of collection 30.8.2018  
Date and Time of arrival at Laboratory 30.8.2018  
Date and Time of commencing examination 31.8.2018  
Date and Time of completing 5.9.2018


### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

pH	7.2	6.5 - 8.5
Colour (True)	90 TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO <sub>3</sub>	500 mg/l as CaCO <sub>3</sub>
Calcium Hardness	mg/l as CaCO <sub>3</sub>	
Magnesium Hardness	mg/l as CaCO <sub>3</sub>	
Total Alkalinity	mg/l as CaCO <sub>3</sub>	
Phenolphthalein Alkalinity	mg/l as CaCO <sub>3</sub>	
Carbonate (CaCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Bicarbonate (HCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Iron	7.50 mg/l	0.3 mg/l
Chloride (as CL)	7 mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO <sub>4</sub> )	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Suspended Solids	140 mg/l	
Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

Tested by

Signature:   
Name: Zaw Hein Oo  
B.Sc (Chemistry)  
Sr. Chemist

ISO TECH Laboratory

(a division of WEG Co., Ltd.)

Approved by

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

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

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## 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)

**W0818 762**

**WTL-RE-001**

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

### WATER QUALITY TEST RESULTS FORM

Client Yangon J.R Family Limited  
Nature of Water Wastewater  
Location Myaungdakar Industrial Zone  
Date and Time of collection 30.8.2018  
Date and Time of arrival at Laboratory 30.8.2018  
Date and Time of commencing examination 31.8.2018  
Date and Time of completing 5.9.2018


#### Results of Water Analysis

#### WHO Drinking Water Guideline (Geneva - 1993)

pH	7.1	6.5 - 8.5
Colour (True)	80 TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO <sub>3</sub>	500 mg/l as CaCO <sub>3</sub>
Calcium Hardness	mg/l as CaCO <sub>3</sub>	
Magnesium Hardness	mg/l as CaCO <sub>3</sub>	
Total Alkalinity	mg/l as CaCO <sub>3</sub>	
Phenolphthalein Alkalinity	mg/l as CaCO <sub>3</sub>	
Carbonate (CaCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Bicarbonate (HCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Iron	5.40 mg/l	0.3 mg/l
Chloride (as CL)	5 mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO <sub>4</sub> )	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Suspended Solids	125 mg/l	
Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

**Tested by**

Signature:   
Name: Zaw Hein Oo  
B.Sc (Chemistry)  
Sr. Chemist

**Approved by**

Signature:   
Name: Soe Thit  
B.E (Civil) 1980,  
Technical Officer  
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WTL-RE-001

Issue Date - 01-1-2016

Effective Date - 01-1-2016

Issue No - 1.0/Page 1 of 1

**M0818 086**

### WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	Yangon J.R Family Limited
Nature of Water	Wastewater
Location	Myaungdakar Industrial Zone
Date and Time of collection	30.8.2018
Date and Time of arrival at Laboratory	30.8.2018
Date and Time of commencing examination	30.8.2018
Date and Time of completing	31.8.2018

#### Results of Water Analysis

#### WHO Drinking Water Guideline (Geneva - 1993)


Total Coliform Count	12	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	2	CFU/100ml	Not detected
pH	7.1		6.5 - 8.5
Turbidity	120	NTU	5 NTU
Colour (True)	80	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

#### Tested by

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

#### Approved by

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

(a division of WEG Co.,Ltd.)

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

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**W0918 029**

**WTL-RE-001**

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

## WATER QUALITY TEST RESULTS FORM

Client Yangon J.R Family Ltd.  
Nature of Water River Water  
Location Myaungdagar Industrial Zone  
Date and Time of collection 2.9.2018  
Date and Time of arrival at Laboratory 3.9.2018  
Date and Time of commencing examination 4.9.2018  
Date and Time of completing 9.9.2018

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

pH	7.5	6.5 - 8.5
Colour (True)	150 TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO <sub>3</sub>	500 mg/l as CaCO <sub>3</sub>
Calcium Hardness	mg/l as CaCO <sub>3</sub>	
Magnesium Hardness	mg/l as CaCO <sub>3</sub>	
Total Alkalinity	mg/l as CaCO <sub>3</sub>	
Phenolphthalein Alkalinity	mg/l as CaCO <sub>3</sub>	
Carbonate (CaCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Bicarbonate (HCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Iron	5.80 mg/l	0.3 mg/l
Chloride (as CL)	4 mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO <sub>4</sub> )	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Suspended Solids	mg/l	
Dissolved Solids	388 mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

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

**Tested by**

Signature: 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**

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

Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com





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

**W0918 029**

## WATER QUALITY TEST RESULTS FORM

Client	Yangon J.R Family Ltd.
Nature of Water	River Water
Location	Myaungdagar Industrial Zone
Date and Time of collection	2.9.2018
Date and Time of arrival at Laboratory	3.9.2018
Date and Time of commencing examination	4.9.2018
Date and Time of completing	9.9.2018

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate (N.NO <sub>3</sub> )		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH <sub>3</sub> )		mg/l	
Ammonium (NH <sub>4</sub> )		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	64	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	18	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (Si)		mg/l	

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

### Tested by

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

### Approved by

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

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

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

**M0918 002**

## WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client	Yangon J.R Family Ltd.
Nature of Water	River Water
Location	Myaungdagar Industrial Zone
Date and Time of collection	2.9.2018
Date and Time of arrival at Laboratory	3.9.2018
Date and Time of commencing examination	3.9.2018
Date and Time of completing	4.9.2018

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

Total Coliform Count	20	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	3	CFU/100ml	Not detected
pH	7.5		6.5 - 8.5
Turbidity	295	NTU	5 NTU
Colour (True)	150	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

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

: < - Less than

#### Tested by

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

#### Approved by

Signature:   
Name: Soe Thut  
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, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com





## SUPREME GROUP OF COMPANIES

### SUPREME WATER DOCTOR COMPANY

No.19-C, Nawaday Garden, Yangon-Pathein Road,  
Hlaing Tharyar Township, Yangon, Republic of the Union of Myanmar  
Tel : 01-689376, 689377, 689378, 689718, 689719. Fax : 01-685237

### WATER ANALYSIS RESULT

Result Form No.	0804/ PED / SWDC / 18
Client	Yangon J.R Family Ltd
Location	Myaungdagar Industrial Zone
Nature of Water	Tube Well
Date of Sample Received	31.8.2018
Tested on	31.8.2018

	UNIT	ANALYSIS RESULT	WHO GUIDELINE
Dissolved Oxygen	mg/L	9.3	-
Total Nitrogen	µs / cm	1.3	-
Arsenic	mg/L	0.03	0.01
Chromium	mg/L as CaCO <sub>3</sub>	0.24	0.05
Cadmium	mg/L as CaCO <sub>3</sub>	0.11	0.003
Manganese	mg/L	1.76	0.1~0.5

Remark :

Approved By



Tin Moh Moh Hlaing  
M.Sc (Chem:), M.S (Biotech:)  
Head of R&D Dept;  
Supreme Water Doctor Group  
Supreme Group of Companies



## SUPREME GROUP OF COMPANIES

### SUPREME WATER DOCTOR COMPANY

No.19-C, Nawaday Garden, Yangon-Pathein Road,  
Hlaing Tharyar Township, Yangon, Republic of the Union of Myanmar  
Tel : 01-689376, 689377, 689378, 689718, 689719. Fax : 01-685237

### WASTE ANALYSIS RESULT

Result Form No.	0805/ PED / SWDC / 18
Client	Yangon J.R Family Ltd
Location	Myaungdagar Industrial Zone
Nature of Water	Waste
Date of Sample Received	31.8.2018
Tested on	31.8.2018

	UNIT	ANALYSIS RESULT	WHO GUIDELINE
Dissolved Oxygen	mg/L	7.1	-
Total Nitrogen	µs / cm	3.2	-
Arsenic	mg/L	0.008	0.01
Chromium	mg/L as CaCO <sub>3</sub>	0.23	0.05
Cadmium	mg/L as CaCO <sub>3</sub>	0.087	0.003
Manganese	mg/L	0.8	0.1~0.5

Remark :

Approved By



Tin Moh Moh Hlaing  
M.Sc (Chem:), M.S (Biotech:)  
Head of R&D Dept;  
Supreme Water Doctor Group  
Supreme Group of Companies



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

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

**W0818 762**

## WATER QUALITY TEST RESULTS FORM

Client	Yangon J.R Family Limited
Nature of Water	Wastewater
Location	Myaungdakar Industrial Zone
Date and Time of collection	30.8.2018
Date and Time of arrival at Laboratory	30.8.2018
Date and Time of commencing examination	31.8.2018
Date and Time of completing	5.9.2018


### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)	Nil	mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate (N.NO <sub>3</sub> )		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH <sub>3</sub> )		mg/l	
Ammonium (NH <sub>4</sub> )		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	96	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	28	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)	Nil	mg/l	3 mg/l
Copper (Cu)	Nil	mg/l	2 mg/l
Silica (Si)		mg/l	

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

#### Tested by

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

#### Approved by

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

(a division of WEG Co.,Ltd.)

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Hlaing Tharyar Township, Yangon, Republic of the Union of Myanmar  
Tel : 01-689376, 689377, 689378, 689718, 689719. Fax : 01-685237

### WATER ANALYSIS RESULT

Result Form No. 0812/ PED / SWDC / 18  
Client Yangon J.R Family Ltd  
Location မြင်းတက်ကံ၊ မှော်ဘီ  
Nature of Water မြစ်ရေ (လှေမြစ်)  
Date of Sample Received 3.9.2018  
Tested on 3.9.2018

	UNIT	ANALYSIS RESULT	WHO GUIDELINE
Dissolved Oxygen	mg/L	8.1	-
Total Nitrogen	µs / cm	3.1	-
Chromium	mg/L as CaCO <sub>3</sub>	0.15	0.05
Cadmium	mg/L as CaCO <sub>3</sub>	0.145	0.003
Manganese	mg/L	0.67	0.1~0.5

Remark :

Approved By

  
Tin Moh Moh Hlaing  
M.Sc (Chem:), M.S (Biotech:)  
Head of R&D Dept;  
Supreme Water Doctor Group  
Supreme Group of Companies



## ANALYSIS REPORT

**ORIGINAL**

Job Ref: 2000240/18

Date: 06/09/2018

Page 1 of 1

Sample Described as : Ground Water  
Client Name : Yangon J.R Family Ltd  
Sample Received Date : 30 August 2018  
Sample Brought By : Client  
Sample Marking : GW  
Sample Location : Myaungdagar industrial Zone  
Analysed Date : 03 September 2018  
Lab Code No. : 139/18

No	Test Parameter	Method	LOQ	Result	Unit
1	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	0.01	0.372	mg/L
2	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	5	<5	mg/L

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

**SGS (Myanmar) Limited**

*(Nu Nu Yi)*  
Manager

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SGS (Myanmar) Limited

Minerals Services, 79/D, Bo Chein Street, 6 ½ Mile, Hlaing Township, Yangon, Myanmar  
t +95(1) 654 795, 654 796, 654 864, 654 865 e [sgs.myanmar@sgs.com](mailto:sgs.myanmar@sgs.com)

Member of SGS Group(SGS SAI)





## ANALYSIS REPORT

**ORIGINAL**

Job Ref: 2000240/18

Date: 06/09/2018

Page 1 of 1

Sample Described as : **Waste Water**  
Client Name : **Yangon J.R Family Ltd**  
Sample Received Date : **30 August 2018**  
Sample Brought By : **Client**  
Sample Marking : **WW**  
Sample Location : **Myaungdagar industrial Zone**  
Analysed Date : **03 September 2018**  
Lab Code No. : **140/18**

No	Test Parameter	Method	LOQ	Result	Unit
1	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	0.01	0.128	mg/L
2	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	5	<5	mg/L

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

**SGS (Myanmar) Limited**

*(Signature)*  
**(Na Nu Yi)**  
**Manager**

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## ANALYSIS REPORT

**ORIGINAL**

Job Ref: 2000241/18

Date: 06/09/2018

Page 1 of 1

Sample Described as : Environmental Water  
Client Name : Yangon J.R Family Ltd  
Sample Received Date : 03 September 2018  
Sample Brought By : Client  
Sample Marking : -  
Sample Location : Myaungdagar industrial Zone  
Analysed Date : 04 September 2018  
Lab Code No. : 141/18

No	Test Parameter	Method	LOQ	Result	Unit
1	Total Phosphorus	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	0.01	0.06	mg/L
2	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	5	<5	mg/L

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

SGS (Myanmar) Limited

*(Signature)*  
(Nu Nu Yi)  
Manager

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**DEPARTMENT OF AGRICULTURE (LAND USE)**  
**SOIL ANALYTICAL DATA SHEET**

Division – Yangon

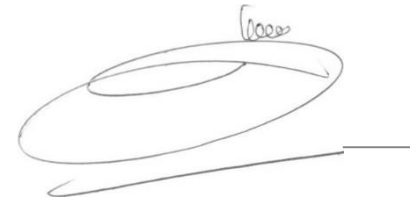
Yangon J.R Family Ltd. (31.8.2018)

Sheet No. 1

Township – ဝေပျာဒုံတန်း

Sr. No. S -1/18-19

Sr. No.	Sample plot	pH Soil : Water 1 : 2.5	Water Soluble Cl <sup>-</sup> me/100gm	Zinc ppm	Copper ppm	Manganese ppm	Iron ppm	Lead ppm	SOIL INTERPRETATION OF RESULTS	
									pH	Water Soluble Cl <sup>-</sup>
1	ဝေပျာဒုံတန်း	5.05	0.13	3.44	4.51	285.00	386.2 1	9.45	Strongly acid	Low

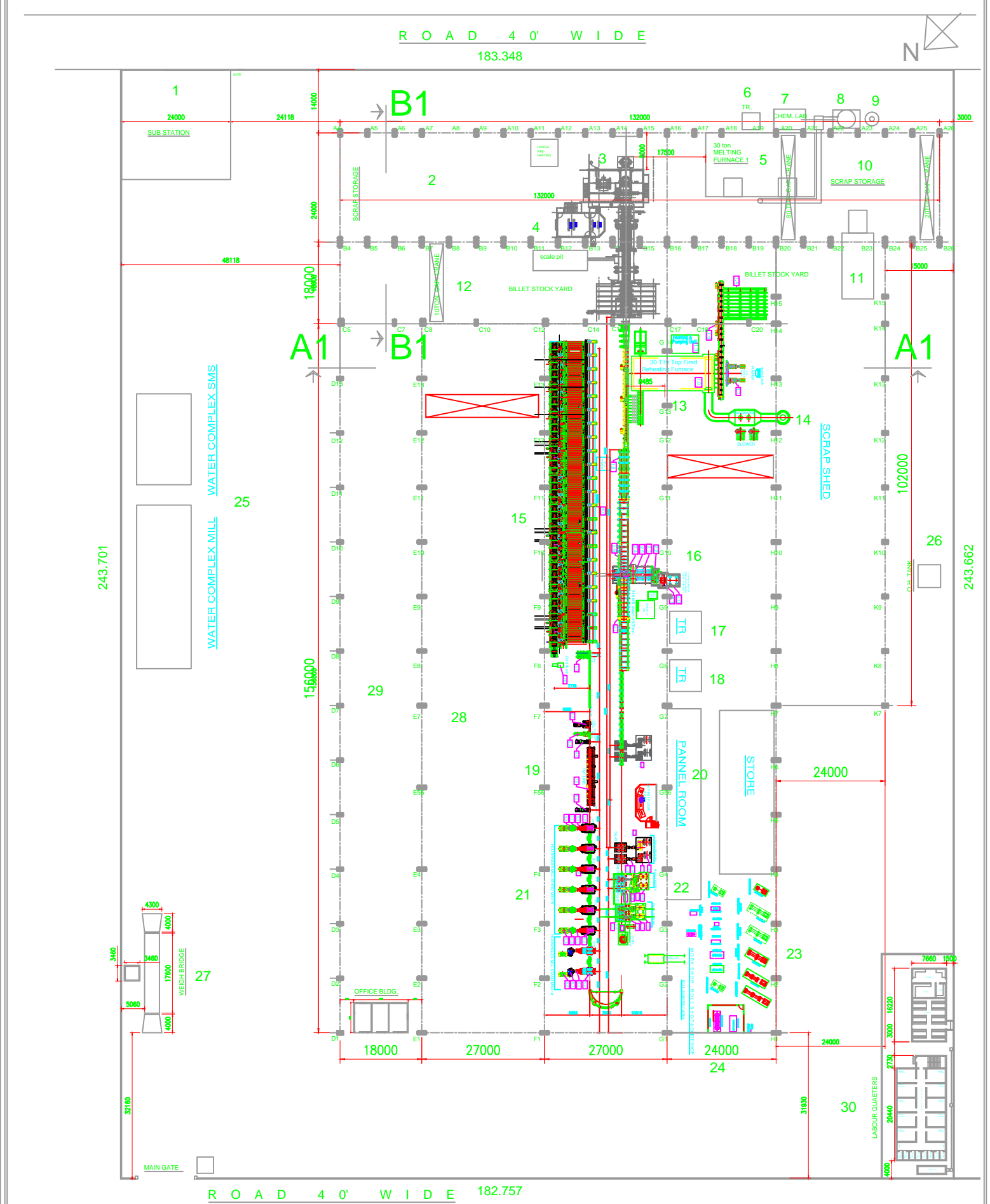


ခင်စန်းမာ

ဒု-ဥက္ကဋ္ဌကော်မရှေး

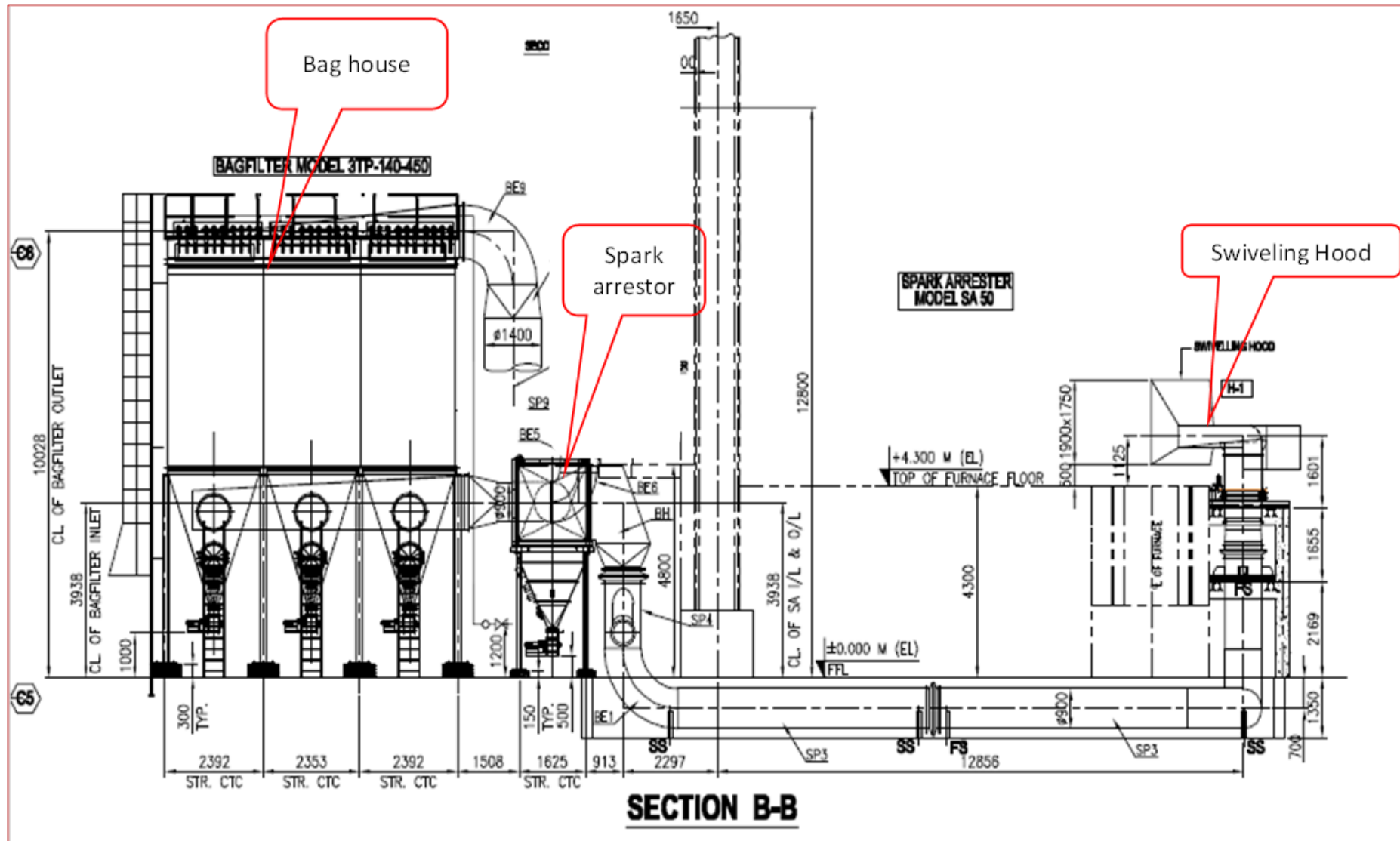
စာကြွေခန်းတာဝန်

ဝေပျာဒုံတန်းခရိုင်

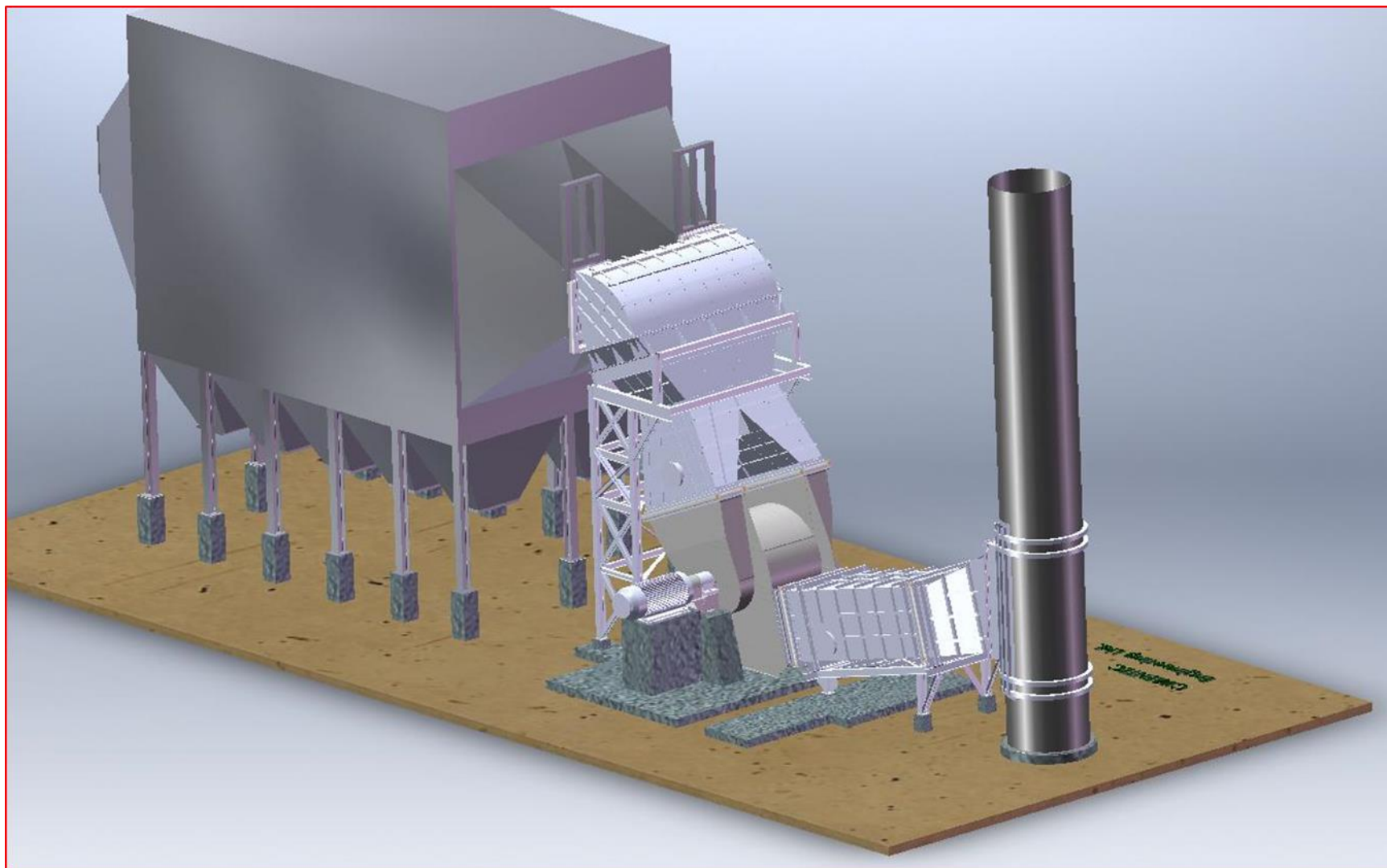


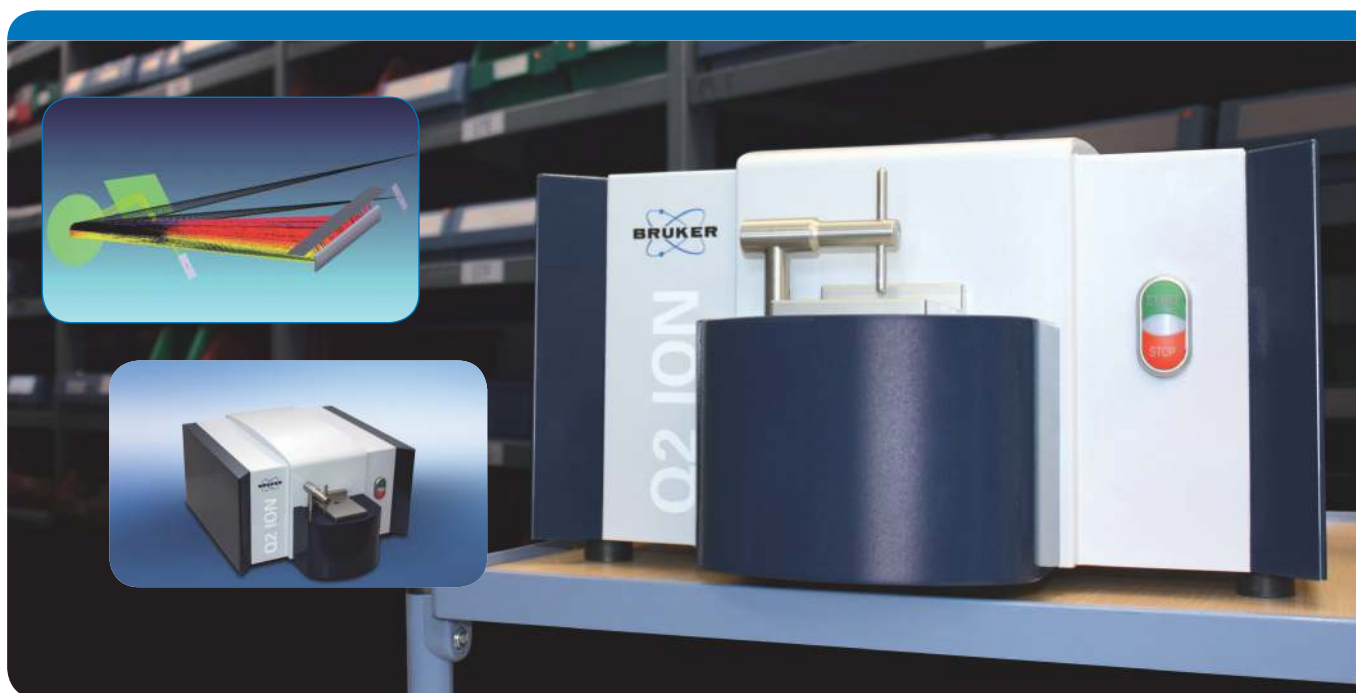
NO.	DESCRIPTION	10	SCRAP STORAGE AREA	21	MILL STANDS
1	SUB STATION	11	SHEARING MACHINE	22	MILL STANDS
2	SCRAP STORAGE AREA	12	BILLET STORAGE AREA	23	WORK SHOP
3	CONTINUOUS CASTING MACHINE	13	RE-HEATING FURNACE	24	C.N.C. MACHINE
4	CONTROL ROOM	14	CHIMNEY	25	WATER STORAGE TANKS
5	INDUCTION MELTING FURNACE	15	COOLING BED	26	O.H. WATER TANK
6	FURNACE TRANSFORMER	16	ROUGHING MILL	27	WEIGH BRIDGE
7	CHEMICAL LAB	17	TRANSFORMER	28	FIN. GOODS AREA
8	SCRUBBER	18	TRANSFORMER	29	LOADING AREA
9	CHIMNEY	19	TMT. BOX	30	LABOUR QUARTERS
		20	ELECTRICAL PANEL ROOM		

PROPOSED LAYOUT PLAN  
FOR  
YANGON J.R. FAMILY LTD,









## Flyer OES 001

# Q2 ION

### ● Ultra-Compact Spark-OES Metals Analyzer

Bruker Elemental's all-new spark spectrometer Q2 ION elevates metals analysis to new levels of simplicity and ease-of-use. Today Q2 ION is the smallest and lightest ultra-compact spark emission spectrometer for metals analysis available. It is a versatile multi-matrix system for comprehensive incoming material inspection and quality assurance of metal alloys. Its affordable price and low operational costs make it the ideal tool for small- and medium-size businesses.

Q2 ION analyzes all major alloying elements in applications such as ferrous alloys, aluminium, copper, and many more. It perfectly fits the require-

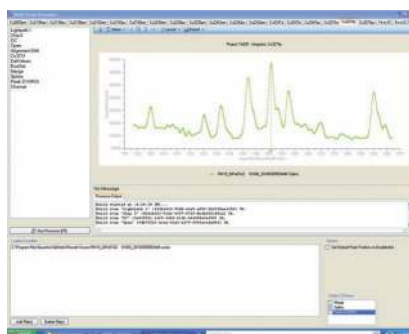
ments of foundries, metal processing plants, fabricators, quality control departments, warehouses, metal recyclers, and even inspection companies.

#### **Q2 ION - Metals Analysis Made Easy**

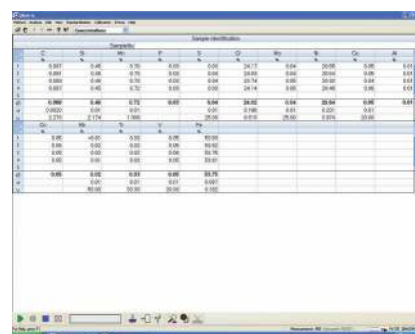
Its design makes Q2 ION ultra light (less than 44 lbs/20 kg) so it can easily be handcarried even to a nearby site for analysis. An optional case is also available. Despite its low weight, it is suitable for applications in rugged environments. Q2 ION also defines new standards in ease-of-use. Place your sample onto the spark stand and press the start button. In less than thirty seconds you get the complete elemental composition of your metal.

## Q2 ION - Patented Optical System

The new patented Flat Field CCD optics is a masterpiece of optics design and mechanical engineering. Active Ambient Compensation (AAC) provides maximum stability in a temperature range between 10 and 45° C (50 and 113° F). The high-definition CCD detector together with well-proven ClearSpectrum® technology provide best-in-class analytical performance.



Detector with ClearSpectrumTechnology



Typical Analysis Screen

### Technical Specifications

<b>Patented Optical System</b>	Un-coated CCD detector with lowest dark current Flat field grating Full spectrum coverage: 170 - 411 nm (685 nm) Resolution: 30 pm Argon purged for best transparency ClearSpectrum® technology for advanced spectra deconvolution Active Ambient Compensation (AAC) for operation between 10 and 45°C (50 and 113°F)
<b>Analytical Solution Packages (ASPs)</b>	Different matrix calibration packages available ASPs cover all major elements and alloy groups Upgradable for future expansion
<b>Source Generator</b>	Maintenance-free, two phase PWM generator Frequency 50 to 1000 Hz Spark and arc-like discharges from 10 µs to 2 ms
<b>Sparkstand</b>	Nearly maintenance-free Argon consumption 2.5 l/min. during measurement Argon quality 4.8 specified for spectrometry or better
<b>Software</b>	Intuitive Windows® based software for simple routine operation Various user levels for secure and task-specific operations Functions for qualitative and quantitative analysis Elemental Suite Software including analysis database and interfaces to Office software Grade Library functions
<b>Electrical Data</b>	100 to 240 V (50/60 Hz) 200 W during measurement, 50 W during standby 16 A (240 V) or 25 A (100 V) slow blow fuse
<b>Dimensions and Weight</b>	Width 440 mm (17 in.) Height 220 mm (9 in.) Depth 390 mm (15 in.) Weight ~ 19 kg (~ 42 lbs.)
<b>Temperature</b>	Temperature 0 - 45°C (50 -113°F) Humidity 10- 90 % no condensation
<b>Options</b>	Wire adapter, tube adapter Sample preparation Carrying case Notebook, Desktop, or All-in-One Touch PC

#### ● Bruker AXS GmbH ●

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✉ info@dts-india.com 🌐 [www.dts-india.com](http://www.dts-india.com)

(a) Equipment used to measure ambient air and noise measurement

<p><b>Davis Vantage Pro2 Wireless Weather Station</b> Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.</p>	
<p><b>Haz-Scanner EPAS</b> PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, Temperature, and Relative Humidity</p>	
<p><b>Digital Sound Level Meter</b> Noise and Vibration</p>	
<p><b>Aeroqual S500</b> VOC, O<sub>3</sub></p>	



(b) Equipment for water sampling

**HORIBA U-50, Multiparameter Water Quality Meter**

Multiple sensors allow for the measurement of 11 parameters simultaneously. (pH, pH(mv), ORP, DO, Salinity, TDS, Seawater Specific Gravity, Temperature, Turbidity, Water depth)

Patented auto-calibration features provide hassle free calibration of pH, dissolved oxygen, conductivity and turbidity.

Ultra-sensitive Turbidity Sensors (Models U-50) Precision has been improved over conventional instruments.

Improved stability of the dissolved oxygen sensor has been achieved with a new 3 electrode design for fast response and polarographic sensor for ease of maintenance.

pH and ORP electrodes can be replaced individually to reduce replacement costs.



**Wildco Water Sampling Field Kit**

For obtaining samples of water and plankton organisms, determining water transparency index, and measuring water depth to 20m. Includes one 1-liter horizontal style clear acrylic water bottle, thermometer (-40°C to +120°C in 1° graduations), 153μ mesh plankton net, standard secchi disc with black and white quadrants, and one 20m nylon line (can be marked with indelible ink).



**Water Mark Horizontal Polycarbonate Water Bottle**

Specifically designed for thin-layer stratification and near bottom studies. Collects water samples at any depth.

Constructed from clear polycarbonate, polyethylene and silicone, this bottle is EPA approved for “ultra-clean” analysis of water, including trace metals and organics.



**Proactive Environmental Products Tornado Sampling Pump**

Ideal for continuous sampling or purging of groundwater wells, this pump can fit into a 2” dia. or larger well. The computer-engineered bottom debris screen separates debris from water and helps prevent damage to the pump motor. Capable of pumping up to 100’ from ground level. Flow rate at maximum depth: 0.25 gpm. Power consumption: 210 watts (maximum). Maximum amp output: 14 amps. Dimensions: 27”L x 1.82” dia.





(c) Equipment for soil sampling

<p><b>Soil Sampler (One Piece Auger)</b></p> <p>Augers are used for sampling to depths of 8'. These soil augers use snap pins to lock the cross handle, two concentric extendable extension pieces, and the bucket auger together. It is designed for easy transport and storage. Telescoping augers are just 5' 4" long and weigh between 5 to 8 lbs.</p>	
<p><b>Energy dispersive X-ray fluorescence spectrometers (EDX 8000)</b></p> <p>Energy dispersive X-ray fluorescence spectrometers detect fluorescent X-rays discharged by irradiating a sample with X-rays, thereby allowing the qualitative and quantitative analysis of elements included within the sample. The EDX-7000/8000 systems' new state-of-the-art semiconductor (SDD) detector offers a high fluorescent X-ray count per unit time. They are used in a wide range of industries and settings, for everything from ensuring compatibility to environmental regulations such as the EU's RoHS Directive to materials analysis for research purposes.</p> <p>EDX-7000/8000 Energy Dispersive X-ray Fluorescence Spectrometers Features:</p> <ul style="list-style-type: none"> <li>• EDX-7000 measurement range: 11Na to 92U.</li> <li>• EDX-8000 measurement range: 6C to 92U.</li> <li>• Functional Design – Large Sample Chamber with Small Footprint (accommodates 210 mm x 297 mm x approx. 100 mmH, with little to no sample pretreatment.)</li> <li>• High Sensitivity – Lower Limit of Detection Improved 1.5 to 5 Times.</li> <li>• High Speed – Throughput Increased by up to a Factor of 10.</li> <li>• No Liquid Nitrogen Required.</li> <li>• The EDX-8000 features an SDD detector with a special ultra-thin-film window material that is able to detect ultra-light elements such as carbon (C), oxygen (O), and fluorine (F).</li> <li>• Automatic collimator switching in four stages: 1, 3, 5, and 10 mm diameter.</li> <li>• Sample observation camera included standard.</li> <li>• Incorporate five primary filters as standard (six, including the open position), which can be automatically changed using the software.</li> <li>• The collimators and primary filters are driven independently and can be combined to address specific requirements.</li> </ul>	 

(a) Ferro Silicon

**Safety Data Sheet****Material Name: FERROSILICON****SDS ID: 00223973****\*\*\* Section 1 - PRODUCT AND COMPANY IDENTIFICATION \*\*\*****Material Name: FERROSILICON****Manufacturer Information**

CMC Cometals  
CONTACT: EMERGENCY  
2050 Center Avenue, Suite 250  
Ft. Lee, NJ 07024  
Mfg Contact: CMC Cometals

**Chemical Family**

metal, alloy

**Synonyms**

FERRO SILICON (74% Si); IRON-SILICON; UN 1408; RTECS: LK1400000

**Product Use**

Ferro Silicon is classed as a non-hazardous item and not subject to UN 1408 provided that it meets Special Provision 39 and 223 of the Dangerous Goods List. The Dangerous Goods exemption is valid upon presentation of: A) A signed statement by the supplier that the referenced shipment was stored under cover, but in the open air, in the size in which it was packed, for not less than 3 days prior to shipment. B) A certificate from an accredited laboratory stating that the referenced shipment was tested in accordance with 1) The IMDG Code 2) The United Nations recommendations on the transport of Dangerous Goods, Manual of Tests and Criteria Part III-33.4.1.4. Whose Test results indicate that the cargo form which the sampling was done shows that it is non-dangerous cargo.

**\*\*\* Section 2 - HAZARDS IDENTIFICATION \*\*\*****EMERGENCY OVERVIEW****Physical Form:** crystals**Odor:** odorless

**Physical Hazards:** Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode. Reacts violently with water to generate toxic and/or flammable gases.

**POTENTIAL HEALTH EFFECTS****Inhalation****Short Term:** irritation, metal fume fever**Long Term:** difficulty breathing, lung damage**Skin****Short Term:** irritation**Long Term:** no information is available**Eye****Short Term:** irritation, glaucoma**Long Term:** same as effects reported in short term exposure**Ingestion****Short Term:** vomiting, diarrhea**Long Term:** no information on significant adverse effects**\*\*\* Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS \*\*\***

## Safety Data Sheet

**Material Name: FERROSILICON**
**SDS ID: 00223973**

CAS	Component	Percent	Symbol(s)	Risk Phrase(s)
8049-17-0	FERROSILICON	100.0	---	---

### \* \* \* Section 4 - FIRST AID MEASURES \* \* \*

**Inhalation**

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

**Skin**

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**Eyes**

Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**Ingestion**

If a large amount is swallowed, get medical attention.

### \* \* \* Section 5 - FIRE FIGHTING MEASURES \* \* \*

See Section 9 for Flammability Properties

**NFPA Ratings: Health: 1 Fire: 3 Reactivity: 2**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**Flammable Properties**

Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

**Extinguishing Media**

regular dry chemical, dry sand, lime, soda ash

Large fires: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn.

**Fire Fighting Measures**

Do not use water. Do not use foam. Move container from fire area if it can be done without risk. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

**Thermal Decomposition Products**

**Water or Moisture:** arsine, hydrogen, phosphine

### \* \* \* Section 6 - ACCIDENTAL RELEASE MEASURES \* \* \*

**Occupational spill/release**

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Do not get water directly on material. Do not get water inside container. Small spills: Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Only personnel trained for the hazards of this material should perform clean up and disposal. Keep unnecessary people away, isolate hazard area and deny entry.

### \* \* \* Section 7 - HANDLING AND STORAGE \* \* \*

**Handling Procedures**

Use methods to minimize dust.

## Safety Data Sheet

Material Name: FERROSILICON

SDS ID: 00223973

### Storage Procedures

Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

### \*\*\* Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION \*\*\*

#### Component Exposure Limits

ACGIH, NIOSH, EU, OSHA (US) and Mexico have not developed exposure limits for any of this product's components.

#### Ventilation

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

#### Eyes/Face

Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

#### Protective Clothing

Wear appropriate chemical resistant clothing.

#### Glove Recommendations

Wear appropriate chemical resistant gloves.

#### Respiratory Protection

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Consider warning properties before use.

Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any air-purifying full-facepiece respirator equipped with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any powered, air-purifying respirator with a high-efficiency particulate filter.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

#### For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

### \*\*\* Section 9 - PHYSICAL AND CHEMICAL PROPERTIES \*\*\*

## Safety Data Sheet

**Material Name: FERROSILICON**
**SDS ID: 00223973**

<b>Physical State:</b>	Solid	<b>Appearance:</b>	Not available
<b>Physical Form:</b>	crystals	<b>Odor:</b>	odorless
<b>Odor Threshold:</b>	Not available	<b>Melting Point:</b>	Not available
<b>Boiling Point:</b>	Not applicable	<b>Flash Point:</b>	flammable
<b>Vapor Pressure:</b>	Not applicable	<b>Vapor Density (air = 1):</b>	Not applicable
<b>Density:</b>	Not available	<b>Specific Gravity (water = 1):</b>	5.4
<b>Water Solubility:</b>	reacts	<b>Coeff. Water/Oil Dist:</b>	Not available

### \*\*\* Section 10 - STABILITY AND REACTIVITY \*\*\*

#### Chemical Stability

Reacts violently with water to generate toxic and/or flammable gases.

#### Conditions to Avoid

Dangerous gases may accumulate in confined spaces. Keep out of water supplies and sewers.

#### Materials to Avoid

acids, bases, oxidizing materials

FERROSILICON:

ACIDS: May evolve highly toxic and flammable arsine, phosphine, and acetylene gases if impurities present.

ALKALIS: May evolve highly toxic and flammable arsine, phosphine, and acetylene gases if impurities present.

CAUSTIC SODA: May release flammable hydrogen gas.

OXIDIZING MATERIALS: May react.

#### Decomposition Products

miscellaneous decomposition products

#### Thermal Decomposition of Products

**Water or Moisture:** arsine, hydrogen, phosphine

No data available.

#### Possibility of Hazardous Reactions

Will not polymerize.

### \*\*\* Section 11 - TOXICOLOGICAL INFORMATION \*\*\*

#### Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

**FERROSILICON (8049-17-0)**

Dermal LD50 Rabbit: &gt;20 g/kg

#### RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

**FERROSILICON (8049-17-0)**

Skin: &gt;20 gm/kg skin rabbit LD50

#### Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.

#### RTECS Irritation

The components of this material have been reviewed and RTECS publishes no data as of the date on this document.



## Safety Data Sheet

**Material Name: FERROSILICON****SDS ID: 00223973**

### HEALTH EFFECTS

#### Inhalation - Acute Exposure

SILICON: Dust may cause respiratory and mucous membrane irritation and cough. Intratracheal administration of 25 mg in rabbits produced slight pulmonary lesions. IRON: Dust may cause mucous membrane and respiratory irritation due to mechanical action. Metal fume fever, an influenza-like illness, may occur due to the inhalation of freshly formed iron oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns. Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes. Lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Tolerance to fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours.

#### Inhalation - Chronic Exposure

SILICON: Inert dust may cause excessive production of mucous, mucous gland hypertrophy, and increased airway resistance and may contribute to chronic bronchitis. IRON: Prolonged or repeated exposure may cause a mottling of the lungs, a condition called siderosis which is considered to be a benign pneumoconiosis that does not cause significant physiologic impairment. Symptoms may include chronic bronchitis, emphysema, and dyspnea on exertion.

#### Skin Contact - Acute Exposure

SILICON: May cause mechanical irritation. IRON: Dust may cause irritation. Penetration of iron particles in the skin may cause an exogenous siderosis which may be characterized by a red-brown pigmentation of the affected area.

#### Skin Contact - Chronic Exposure

SILICON: No data available. IRON: May cause same effects as reported in acute exposure.

#### Eye Contact - Acute Exposure

SILICON: Silicon dust may cause irritation. IRON: May cause irritation due to mechanical action. Iron particles imbedded in the eye may cause ocular siderosis. Effects may include discoloration of the cornea and iris, and pupillary effects including poor reaction to light and accommodation. If a particle enters the lens there may be cataract formation. Glaucoma occurs rarely in some cases of ocular siderosis.

#### Eye Contact - Chronic Exposure

SILICON: No data available. IRON: Repeated and prolonged contact may cause conjunctivitis and other effects reported in acute exposure.

#### Ingestion - Acute Exposure

SILICON: May cause digestive tract irritation. IRON: There are no reports available on poisoning from metallic iron, which is poorly absorbed. The principal manifestations of poisoning with iron compounds are vomiting, diarrhea, and circulatory collapse.

#### Ingestion - Chronic Exposure

SILICON: No data available. IRON: Repeated or prolonged exposure may cause hemosiderosis or hemochromatosis.

<b>*** Section 12 - ECOLOGICAL INFORMATION ***</b>
----------------------------------------------------

#### Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

## Safety Data Sheet

Material Name: FERROSILICON

SDS ID: 00223973

### \*\*\* Section 13 - DISPOSAL CONSIDERATIONS \*\*\*

#### Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262.

Hazardous Waste Number(s): D001, D003.

#### Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

### \*\*\* Section 14 - TRANSPORT INFORMATION \*\*\*

#### US DOT Information

**Shipping Name:** Ferrosilicon**UN/NA #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, 6.1

#### TDG Information

**Shipping Name:** Ferrosilicon**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, (6.1)

#### ADR Information

**Shipping Name:** Ferrosilicon**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, 6.1

#### ADR Tunnel Code Restrictions

This list contains tunnel restriction codes for those substances and/or chemically related entries which are found in chapter 3.2 of the ADR regulations.

**FERROSILICON (8049-17-0)**

#### RID Information

**Shipping Name:** Ferrosilicon**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, 6.1

#### IATA Information

**Shipping Name:** Ferrosilicon**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, 6.1

#### ICAO Information

**Shipping Name:** Ferrosilicon**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III**Required Label(s):** 4.3, 6.1

## Safety Data Sheet

**Material Name:** FERROSILICON

**SDS ID:** 00223973

**IMDG Information**
**Shipping Name:** Ferrosilicon

**UN #:** UN1408 **Hazard Class:** 4.3 **Packing Group:** III

**Required Label(s):** 6.1

### \* \* \* Section 15 - REGULATORY INFORMATION \* \* \*

**U.S. Federal Regulations**

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA Section 311/312 (40 CFR 370 Subparts B and C)**
**Acute Health:** No **Chronic Health:** No **Fire:** Yes **Pressure:** No **Reactive:** Yes

**U.S. State Regulations**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
FERROSILICON	8049-17-0	No	No	No	Yes	No	No

Not regulated under California Proposition 65

**Canada**
**Canada WHMIS**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

**FERROSILICON (8049-17-0)**

1 %

**Safety Phrases**
**S8** Keep container dry. **S30** Never add water to this product.

**Component Analysis - Inventory**

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
FERROSILICON	8049-17-0	No	No	No	Yes	Yes	No	No	No	Yes

## Safety Data Sheet

Material Name: FERROSILICON

SDS ID: 00223973

### \* \* \* Section 16 - OTHER INFORMATION \* \* \*

#### Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

#### Other Information

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End of Sheet 00223973

(b) Scrap Iron

## Safety Data Sheet

**Product Identifier:** Iron Scrap

**SDS ID :** FE-0105

### \*\*\*Section 1 - Identification\*\*\*

**Product Identifier:** Iron Scrap

**Chemical Family:** Mixture

**Recommended Use:** Scrap metal usage.

**Manufacturer Information**

The David J. Joseph Company  
300 Pike Street  
Cincinnati, OH 45202

Non-Emergency Contact: Safety Department  
Non-Emergency Phone: 513-419-6200  
Emergency Contact: DJJ  
Emergency Phone: 513-562-1699

### \*\*\*Section 2 - Hazard(s) Identification\*\*\*

**Classification in accordance with 29 CFR 1910.1200.**

Product is supplied as scrap metal consisting of iron. This alloy is a non-combustible, non-reactive solid material. Solid material, as supplied, is not hazardous. Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). Dust, particles or powder generated during processing would have the following classification:

Acute Toxicity (Oral), Category 4

Skin Corrosion/Irritation, Category 2

**GHS LABEL ELEMENTS**

**Symbol(s)**



**Signal Word**

WARNING

**Hazard Statement(s)**

Harmful if swallowed

Causes skin irritation

**Precautionary Statement(s)**

**Prevention**

Do not eat, drink, or smoke when using this product. Wear appropriate protective gloves/clothing and eye/face protection if contact is possible. Wash thoroughly after handling.

**Response**

IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.

**Storage**

None needed according to classification criteria.



## Safety Data Sheet

**Product Identifier: Iron Scrap**
**SDS ID : FE-0105**
**Disposal**

Dispose of material in accordance with all local, regional, national and international regulations.

**Hazard(s) Not Otherwise Classified**

Dust may present an explosion hazard if allowed to accumulate in an industrial or manufacturing environment. Coatings and oils applied to the product may enhance flammability.

**\*\*\*Section 3 - Composition / Information on Ingredients\*\*\***

CAS	Component	Percent
7439-89-6	Iron	>94
7440-44-0	Carbon	<5
7440-21-3	Silicon	<1

**Component Related Regulatory Information**

This product may be regulated, have exposure limits or other information identified as the following: Iron oxide (1309-37-1).

**Component Information/Information on Non-Hazardous Components**

Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

May contain trace amounts of vanadium, zirconium, tin, calcium, boron, cobalt, aluminum, niobium, titanium, arsenic, lead, molybdenum, nickel, copper, and chromium.

This data sheet is prepared as a guideline for typical uses of scrap materials. The user should be aware that the composition of the scrap can vary based upon the raw materials, processes used, and protective coatings that may have been applied to the original materials. The list of ingredients above are typical ingredients thought to be present in the scrap material. This list includes contaminants that may or may not be present. The percentages given vary from shipment to shipment and may not be entirely accurate for a given shipment.

Protective coatings, including paints, lubricants, corrosion inhibitors, etc., may have been applied to the material before it came under the control of the recycler. These coatings may contain hazardous materials. Typical hazardous materials contained in these coatings include: lead, zinc, chromium, and cadmium. Some organic materials may also be present. The supplier (recycler) may have no specific knowledge of the particular contaminant. However, it is anticipated that the hazardous materials present in the coatings would generally represent less than 0.1% of the total material present. The health hazards presented by these contaminants would produce their greatest potential for exposure during processes such as melting, cutting, welding. These processes could generate metal fumes that might produce the health hazards identified in section 2 of this MSDS.

It is suggested that the user protect employees by utilizing engineering controls that reduce exposures to acceptable concentrations. Where engineering controls are not feasible, appropriate personal protective equipment should be utilized.

**\*\*\*Section 4 - First Aid Measures\*\*\***
**Description of Necessary Measures**
**Inhalation**

If adverse effects occur during processing, remove to uncontaminated area. Get immediate medical attention.

**Skin Contact**

Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

## Safety Data Sheet

**Product Identifier:** Iron Scrap**SDS ID :** FE-0105**Eye Contact**

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

**Ingestion**

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek immediate medical attention. Do not induce vomiting unless directed to do so by medical personnel.

**Most Important Symptoms/Effects****Acute**

Processing by-products: Harmful if swallowed. Symptoms/effects may include skin irritation.

**Delayed**

No information on significant adverse effects.

**Indication of immediate Medical Attention and Special Treatment Needed**

Treat symptomatically and supportively.

**\*\*\*Section 5 - Fire Fighting Measures\*\*\*****Extinguishing Media**

Media to use includes regular dry chemical and dry sand.

**Unsuitable Extinguishing Media**

Molten metal may react violently with water.

**Specific Hazards Arising from the Chemical**

Coatings and oils applied to the product may enhance flammability. Dust or fine particles may present a flammability hazard if allowed to accumulate in an industrial or manufacturing environment.

**Hazardous Combustion Products**

This product may release metal oxide fumes by thermal decomposition.

**Fire fighting measures**

Fight fire with normal precautions from a reasonable distance. Cool materials with water spray until well after the fire is out.

**Special Protective Equipment and Precautions for Firefighters**

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

**\*\*\*Section 6 - Accidental Release Measures\*\*\*****Personal Precautions, Protective Equipment and Emergency Procedures**

If dusts or particulates are generated, eliminate sources of ignition. Wear personal protective clothing and equipment, see Section 8.

**Methods and Materials for Containment and Cleaning Up**

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition. Small pieces of this product may be collected with a broom and shovel. Collect spilled material in appropriate container for reuse or disposal.

**\*\*\*Section 7 - Handling and Storage\*\*\*****Precautions for Safe Handling**

Observe good hygiene and safety practices when handling this product. Processing of this material may produce hazardous vapors, fumes, mists, and dusts. Avoid inhaling dusts or fumes produced during product processing. Handle with adequate ventilation during processing. Wash thoroughly after handling.

**Condition for Safe storage, Including any incompatibilities**

Store in a secure area.

## Safety Data Sheet

**Product Identifier: Iron Scrap****SDS ID : FE-0105****Incompatibility**

Hot iron wire burns in chlorine gas, iron reacts with chlorine trifluoride and calcium hypochlorite, powdered iron reacts with fluorine below redness with incandescence, violent decomposition of hydrogen peroxide may be caused by contact with iron, reduced iron decomposes nitrogen dioxide at ordinary temperatures with incandescence.

<b>* * *Section 8 - Exposure Controls / Personal Protection* * *</b>
----------------------------------------------------------------------

**Exposure Limits**

Follow all applicable exposure limits. Keep formation of dusts, particulates and fumes to a minimum.

## Safety Data Sheet

Product Identifier: Iron Scrap

SDS ID : FE-0105

### Component Exposure Limits

#### Iron (7439-89-6)

<b>ACGIH:</b>	5 mg/m <sup>3</sup> TWA (respirable fraction, related to Iron oxide)
<b>OSHA:</b>	10 mg/m <sup>3</sup> TWA (fume); 15 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable fraction, related to Iron oxide)
<b>NIOSH:</b>	5 mg/m <sup>3</sup> TWA (as Fe, dust and fume, related to Iron oxide)
<b>Alberta:</b>	5 mg/m <sup>3</sup> TWA (respirable, related to Iron oxide)
<b>British Columbia:</b>	10 mg/m <sup>3</sup> TWA (total particulate matter containing no Asbestos and <1% Crystalline silica, total particulate); 3 mg/m <sup>3</sup> TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable particulate); 5 mg/m <sup>3</sup> TWA (as Fe, dust and fume, related to Iron oxide) 10 mg/m <sup>3</sup> STEL (as Fe, fume, related to Iron oxide)
<b>Manitoba:</b>	5 mg/m <sup>3</sup> TWA (respirable fraction, related to Iron oxide)
<b>New Brunswick:</b>	5 mg/m <sup>3</sup> TWA (as Fe, particulate matter containing no Asbestos and <1% Crystalline silica, dust and fume); 10 mg/m <sup>3</sup> TWA (regulated under Rouge, particulate matter containing no Asbestos and <1% Crystalline silica, related to Iron oxide)
<b>NW Territories:</b>	5 mg/m <sup>3</sup> TWA (respirable mass); 10 mg/m <sup>3</sup> TWA (total mass, related to Iron oxide)
<b>Nova Scotia:</b>	5 mg/m <sup>3</sup> TWA (respirable fraction, related to Iron oxide)
<b>Nunavut:</b>	5 mg/m <sup>3</sup> TWA (respirable mass); 10 mg/m <sup>3</sup> TWA (total mass, related to Iron oxide)
<b>Ontario:</b>	5 mg/m <sup>3</sup> TWA (respirable, related to Iron oxide)
<b>Quebec:</b>	5 mg/m <sup>3</sup> TWAEV (as Fe, dust and fume); 10 mg/m <sup>3</sup> TWAEV (containing no Asbestos and <1% Crystalline silica, regulated under Rouge, total dust, related to Iron oxide)
<b>Saskatchewan:</b>	5 mg/m <sup>3</sup> TWA (as Fe, dust and fume); 10 mg/m <sup>3</sup> TWA (regulated under Rouge, related to Iron oxide) 10 mg/m <sup>3</sup> STEL (as Fe, dust and fume); 20 mg/m <sup>3</sup> STEL (regulated under Rouge, related to Iron oxide)
<b>Yukon:</b>	5 mg/m <sup>3</sup> TWA (as Fe <sub>2</sub> O <sub>3</sub> , fume); 30 mppcf TWA (regulated under Rouge); 10 mg/m <sup>3</sup> TWA (regulated under Rouge, related to Iron oxide) 10 mg/m <sup>3</sup> STEL (fume); 20 mg/m <sup>3</sup> STEL (regulated under Rouge, related to Iron oxide)

#### Silicon (7440-21-3)

<b>OSHA:</b>	15 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable fraction)
<b>NIOSH:</b>	10 mg/m <sup>3</sup> TWA (total dust); 5 mg/m <sup>3</sup> TWA (respirable dust)
<b>British Columbia:</b>	10 mg/m <sup>3</sup> TWA (total dust); 3 mg/m <sup>3</sup> TWA (respirable fraction)
<b>New Brunswick:</b>	10 mg/m <sup>3</sup> TWA
<b>NW Territories:</b>	5 mg/m <sup>3</sup> TWA (respirable mass); 10 mg/m <sup>3</sup> TWA (total mass)
<b>Nunavut:</b>	5 mg/m <sup>3</sup> TWA (respirable mass); 10 mg/m <sup>3</sup> TWA (total mass)
<b>Ontario:</b>	10 mg/m <sup>3</sup> TWA (total dust)
<b>Quebec:</b>	10 mg/m <sup>3</sup> TWAEV (containing no Asbestos and <1% Crystalline silica, total dust)
<b>Saskatchewan:</b>	10 mg/m <sup>3</sup> TWA 20 mg/m <sup>3</sup> STEL
<b>Yukon:</b>	30 mppcf TWA; 10 mg/m <sup>3</sup> TWA 20 mg/m <sup>3</sup> STEL

### Appropriate Engineering Controls

## Safety Data Sheet

**Product Identifier: Iron Scrap**
**SDS ID : FE-0105**

For outdoor applications, special ventilation is not required under normal conditions of use. Under normal conditions of use, no special ventilation equipment is needed. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

**Individual Protection Measures, such as Personal Protective Equipment**
**Eyes/Face Protection**

Eye protection not required under normal conditions. Wear appropriate eye protection if eye contact is possible.

**Skin Protection**

Wear gloves and other clothing as required to avoid contact.

**Respiratory Protection**

Consult with a health and safety professional for specific respirators appropriate for your use. When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH approved respiratory protection must be provided. Where concentrations exceed exposure limits or airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate for the material and its components.

**General Information**

Use good industrial hygiene practices in handling this material. Eye wash fountain and emergency showers are recommended.

### \* \* \*Section 9 - Physical and Chemical Properties\* \* \*

<b>Appearance:</b> Depends upon scrap composition, most often appears as a silver-white metal.  <b>Physical State:</b> Solid <b>Melting /Freezing Point:</b> 2700 °F (1500 °C) <b>Flash Point:</b> Not applicable <b>OSHA Flammability Class:</b> Non-flammable <b>LFL:</b> Not available <b>Vapor Density:</b> Not applicable <b>Bulk Density:</b> Not available <b>Auto Ignition:</b> Not applicable	<b>Odor:</b> Not available   <b>pH:</b> Not applicable <b>Boiling Point:</b> 5400 °F (3000 °C) <b>Evaporation Rate:</b> Not applicable <b>UFL:</b> Not available <b>Vapor Pressure:</b> Not applicable <b>Specific Gravity:</b> Not applicable <b>Solubility (H<sub>2</sub>O):</b> Insoluble <b>Viscosity:</b> Not available
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### \* \* \*Section 10 - Chemical Stability & Reactivity Information\* \* \*

**Reactivity**

No reactivity hazard is expected.

**Chemical Stability**

Stable under normal conditions.

**Possibility of Hazardous reaction**

Will not occur.

**Conditions to Avoid**

Molten metal may react violently with water. Fine particles, dust or fumes may be flammable or explosive.

**Incompatible Materials**

Hot iron wire burns in chlorine gas, iron reacts with chlorine trifluoride and calcium hypochlorite, powdered iron reacts with fluorine below redness with incandescence, violent decomposition of hydrogen peroxide may be caused by contact with iron, reduced iron decomposes nitrogen dioxide at ordinary temperatures with incandescence.

**Hazardous Decomposition Products**

Decomposition of this product may yield metallic oxides.



## Safety Data Sheet

Product Identifier: Iron Scrap

SDS ID : FE-0105

### \* \* \*Section 11 - Toxicological Information\* \* \*

**Acute Dose Effects**

No information available for the product. Operations which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Exposure to dusts or fumes from some metals including iron, chromium, cobalt and copper can produce a condition known as metal fume fever, a flu-like illness generally lasting 24 hours or less including symptoms of nausea, vomiting, chest tightness, muscle aches and weakness. Iron dust can irritate the eyes and respiratory tract by mechanical action. Acute iron poisoning may involve hemorrhagic vomiting and diarrhea, abdominal pain, acidosis, coagulaopathy, shock, coma and convulsions followed by hepatic and renal failure and perhaps cardiovascular collapse. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment.

**Component Analysis - LD50/LC50**
**Iron (7439-89-6)**

Oral LD50 Rat 984 mg/kg

**Carbon (7440-44-0)**

Oral LD50 Rat &gt;10000 mg/kg

**Information on Likely Routes of Exposure**

Product contains trace levels (<0.1%) of components that may cause the following.

**Inhalation**

May cause allergic respiratory sensitization and cancer. Overexposure to processing fumes may cause metal fume fever which is an influenza like illness. Symptoms include headache, metallic taste in the mouth, cough, thirst, throat irritation, shortness of breath, fever, sweating and pain in the limbs. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, anorexia, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

**Ingestion**

Ingestion is not a likely route of exposure. Harmful if swallowed. May cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma..

**Skin**

Causes skin irritation. May cause allergic skin reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

**Eye**

Dust or powder may irritate eye tissue. Rubbing may cause abrasion of cornea.

**Immediate Effects**

Processing by-products: Symptoms/effects may include skin irritation.

**Delayed Effects**

No information on significant adverse effects.

**Medical conditions Aggravated by Exposures**

No data available.

**Irritation/Corrosivity Data**

Causes skin irritation.

**Respiratory Sensitizer**

No information available for the product.

## Safety Data Sheet

**Product Identifier:** Iron Scrap

**SDS ID :** FE-0105

**Dermal Sensitization**

No information available for the product.

**Carcinogenicity**

No information available for the product.

**Component Carcinogenicity**
**Iron (7439-89-6)**
**ACGIH:** A4 - Not Classifiable as a Human Carcinogen (related to Iron oxide)

**IARC:** Supplement 7 [1987]; Monograph 1 [1972] (Group 3 (Not classifiable), related to Iron oxide)

**Mutagenicity**

No information available for the product.

**Reproductive Toxicity**

No information available for the product.

**Specific Target Organ Toxicity - Single Exposure**

No target organs identified.

**Specific Target Organ Toxicity - Repeated Exposure**

No target organs identified.

**Aspiration Hazard**

No data available.

**Other Toxicological Information**

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

**\*\*\*Section 12 - Ecological Information\*\*\***

**Ecotoxicity**

Processing by-products: May be harmful to aquatic life.

**Component Analysis - Ecotoxicity - Aquatic Toxicity**

No ecotoxicity data are available for this product's components.

**Environmental Fate**

No information available for the product.

**Persistence & Degradability**

No information available for the product.

**Bioaccumulation**

No information available for the product.

**Mobility**

No information available for the product.

**\*\*\*Section 13 - Disposal Considerations\*\*\***

**Disposal Methods**

Byproducts and residues from this product may be reprocessed or recycled. Recycle if possible. Upon disposal, collected dusts and other similar wastes could contain a constituent identified as a hazardous waste. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes. See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

**US EPA Waste Number & Descriptions**
**Component Waste Numbers**

No EPA Waste Numbers are applicable for this product's components.

**Disposal of Contaminated Packaging**

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

## Safety Data Sheet

Product Identifier: Iron Scrap

SDS ID : FE-0105

### \*\*\*Section 14 - Transportation Information\*\*\*

**USDOT Information**

Certain forms of this material (i.e. powders, borings, shavings, turnings, cuttings, dross, etc.) may be subject to U.S. DOT hazardous material shipping requirements. If the products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements of DOT hazardous materials.

**TDG Information**

Not regulated as a hazardous material.

### \*\*\*Section 15 - Regulatory Information\*\*\*

**U.S. Federal Regulations**

Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). The following component analysis applies only to those facilities that are required to report under applicable regulations.

**U.S. Federal Regulations**

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA 311/312 Hazardous Categories (40 CFR 370 Subparts B and C)**

**Acute Health** Yes (dust/fumes) **Chronic Health** No **Fire** No **Pressure** No **Reactive** No

**U.S. State Regulations**

Other state regulations may apply. Check individual state requirements.

WARNING! This product may contain a chemical known to the state of California to cause cancer.

WARNING! This product may contain a chemical known to the state of California to cause reproductive/developmental effects.

**Component Analysis - State**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Iron (related to: Iron oxide)	7439-89-6	Yes	No	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes

No component(s) regulated under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

**Canada Regulation**

This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

**Canadian WHMIS Information**

Processing by-products: WHMIS CLASSIFICATION: D2B.

**Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

**Iron (7439-89-6)**

1 % (related to Iron oxide)

**Additional Regulatory Information**

All components are on the U.S. EPA TSCA Inventory List.

## Safety Data Sheet

**Product Identifier: Iron Scrap**
**SDS ID : FE-0105**
**Component Analysis - Inventory**

Component	CAS #	TSCA	CAN
Iron	7439-89-6	Yes	DSL
Carbon	7440-44-0	Yes	DSL
Silicon	7440-21-3	Yes	DSL

**\* \* \*Section 16 - Other Information\* \* \***

**Summary of Changes**

Updated: 5/12/2015

**NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**Key/Legend**

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NFPA = National Fire Protection Association; HMIS = High Efficiency Particulate Air; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act.

**Other Information**

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

**MSDS History:**

New MSDS: 7/8/1998

Revision 2/Regulatory Update: 7/19/2002

Revision 3/Regulatory Update: 10/6/2005

Revision 4/Regulatory Update: 8/7/2008

Revision 5/Regulatory Update: 1/26/2010

Revision 6 / Regulatory Update: 11/4/11

End of Sheet FE-0105

## (c) Silico-Manganese



**The David J. Joseph Company**  
 Metals Group

**1. Identification**

<b>Product identifier</b>	<b>SILICOMANGANESE</b>
<b>Other means of identification</b>	
<b>Product code</b>	SiMn
<b>Recommended use</b>	Metal Alloys Steel Manufacture
<b>Recommended restrictions</b>	None known.
<b>Manufacturer/Importer/Supplier/Distributor information</b>	
<b>Supplier</b>	
<b>Company name</b>	David J Joseph Company
<b>Address</b>	300 Pike St, Cincinnati, OH 45202
<b>Website</b>	www.DJJ.com
<b>Non-Emergency Contact</b>	DJJ Safety Department
<b>Non-Emergency Phone Number</b>	(513) 419-6200
<b>Emergency Contact</b>	DJJ
<b>Emergency Phone Number</b>	(513) 562-1699

**2. Hazard(s) identification**

<b>Physical hazards</b>	Not classified.
<b>Health hazards</b>	Not classified.
<b>OSHA defined hazards</b>	Not classified.
<b>Label elements</b>	
<b>Hazard symbol</b>	None.
<b>Signal word</b>	None.
<b>Hazard statement</b>	The product does not meet the criteria for classification.
<b>Precautionary statement</b>	
<b>Prevention</b>	Not applicable.
<b>Response</b>	Not applicable.
<b>Storage</b>	Not applicable.
<b>Disposal</b>	Not applicable.
<b>Hazard(s) not otherwise classified (HNOC)</b>	None known.
<b>Supplemental information</b>	None.

**3. Composition/information on ingredients**
**Mixtures**



Chemical name	CAS number	%
Manganese	7439-96-5	> 60
Iron	7439-89-6	10 - 20
Silicon	7440-21-3	10 - 20
Carbon	7440-44-0	< 3
Phosphorus	7723-14-0	< 1

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

#### 4. First-aid measures

<b>Inhalation</b>	In case of exposure to fumes or particulates: Move to fresh air. Get medical attention if discomfort persists.
<b>Skin contact</b>	Contact with dust: Wash with soap and water. Get medical attention if irritation develops or persists.
<b>Eye contact</b>	Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.
<b>Ingestion</b>	Rinse mouth thoroughly if dust is ingested. Do not induce vomiting. Get medical attention if any discomfort continues.
<b>Most important symptoms/effects, acute and delayed</b>	No specific symptoms noted.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Special powder against metal fires. Dry sand.
<b>Unsuitable extinguishing media</b>	Do not use water or halogenated extinguishing media.
<b>Specific hazards arising from the chemical</b>	Fire or high temperatures create: Metal oxides.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Move container from fire area if it can be done without risk. Cool containers with flooding quantities of water until well after fire is out.
<b>General fire hazards</b>	Fine dust may form explosive mixtures with air but the powder is not combustible.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.
<b>Methods and materials for containment and cleaning up</b>	Avoid the generation of dusts during clean-up. Sweep up or vacuum up spillage and collect in suitable container for disposal. Vacuums used for this purpose should be equipped with HEPA filters.
<b>Environmental precautions</b>	None.

#### 7. Handling and storage

<b>Precautions for safe handling</b>	Avoid inhalation of dust and contact with skin and eyes. Avoid generation and spreading of dust. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid feeding dusty or wet alloy to steelmaking / alloymaking furnaces.
<b>Conditions for safe storage, including any incompatibilities</b>	Store away from incompatible materials (See Section 10). Store in a cool, dry, well-ventilated place.

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## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m <sup>3</sup>	Fume.
Phosphorus (CAS 7723-14-0)	PEL	0.1 mg/m <sup>3</sup>	
Silicon (CAS 7440-21-3)	PEL	5 mg/m <sup>3</sup> 15 mg/m <sup>3</sup>	Respirable fraction. Total dust.

#### US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value	Form
Carbon (CAS 7440-44-0)	TWA	5 mg/m <sup>3</sup> 15 mg/m <sup>3</sup>	Respirable fraction. Total dust.

#### US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0.1 mg/m <sup>3</sup> 0.02 mg/m <sup>3</sup>	Inhalable fraction. Respirable fraction.

#### US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	STEL	3 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.
Phosphorus (CAS 7723-14-0)	TWA	0.1 mg/m <sup>3</sup>	
Silicon (CAS 7440-21-3)	TWA	5 mg/m <sup>3</sup> 10 mg/m <sup>3</sup>	Respirable. Total

#### Biological limit values

No biological exposure limits noted for the ingredient(s).

#### Appropriate engineering controls

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment if high dust/air concentrations are possible.

#### Individual protection measures, such as personal protective equipment

##### Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact.

##### Skin protection

##### Hand protection

Wear suitable protective gloves to prevent cuts and abrasions. Suitable gloves can be recommended by the glove supplier.

##### Other

Wear suitable protective clothing. Wear suitable protective gloves to prevent cuts and abrasions.

##### Respiratory protection

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter.

##### Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

#### General hygiene considerations

Wash hands after handling. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

### Appearance

#### Physical state

Solid.

#### Form

Metallic lumps.

#### Color

Silver.

#### Odor

Odorless.

#### Odor threshold

Not applicable.

#### pH

Not applicable.

#### Melting point/freezing point

2462 °F (1350 °C)

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Initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Non flammable.
<b>Upper/lower flammability or explosive limits</b>	
Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Vapor pressure	Not available.
Vapor density	Not applicable.
Relative density	6.3 (20 °C)
<b>Solubility(ies)</b>	
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water)	Not applicable for inorganic substances.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not applicable.
<b>Other information</b>	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

## 10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Massive metal is stable and non reactive under normal conditions of use, storage and transport.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Dust generation. Avoid heat, sparks, open flames and other ignition sources.
Incompatible materials	Oxidizing agents. Peroxides. Acids. Alkalis. Water.
Hazardous decomposition products	During combustion: Metal oxides.

## 11. Toxicological information

<b>Information on likely routes of exposure</b>	
Inhalation	High concentrations of dust and fumes may irritate the throat and respiratory system and cause coughing.
Skin contact	Dust may irritate skin.
Eye contact	Dust may irritate the eyes.
Ingestion	May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.
Symptoms related to the physical, chemical and toxicological characteristics	No specific symptoms noted.

### Information on toxicological effects

Acute toxicity	Expected to be a low hazard for usual industrial or commercial handling by trained personnel.
----------------	-----------------------------------------------------------------------------------------------

Components	Species	Test Results
Carbon (CAS 7440-44-0)		
<u>Acute</u>		
Oral		
LD50	Rat	> 10000 mg/kg

Components	Species	Test Results
Manganese (CAS 7439-96-5)		
<u>Acute</u>		
Inhalation		
LC50/LC90	Rat	> 1500 mg/m³, 4 hours
Oral		
LD50	Rat	9000 mg/kg
Silicon (CAS 7440-21-3)		
<u>Acute</u>		
Oral		
LD50	Rat	3160 mg/kg
Skin corrosion/irritation	May cause irritation through mechanical abrasion.	
Serious eye damage/eye irritation	May cause irritation through mechanical abrasion.	
Respiratory or skin sensitization		
Respiratory sensitization	Due to lack of data the classification is not possible.	
Skin sensitization	Due to lack of data the classification is not possible.	
Germ cell mutagenicity	Due to lack of data the classification is not possible.	
Carcinogenicity	Due to lack of data the classification is not possible.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
Not listed.		
NTP Report on Carcinogens		
Not listed.		
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
Not regulated.		
Reproductive toxicity	Due to lack of data the classification is not possible.	
Specific target organ toxicity - single exposure	Due to lack of data the classification is not possible.	
Specific target organ toxicity - repeated exposure	Due to lack of data the classification is not possible.	
Aspiration hazard	Due to the physical form of the product it is not an aspiration hazard.	
Further information	Chronic exposure or exposure to high concentrations to some manganese compounds via inhalation has been reported to affect the central nervous system. Symptoms can include hand tremors, behavioral changes and slower reaction times.	

## 12. Ecological information

<b>Ecotoxicity</b>	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.		
<b>Components</b>	<b>Species</b>		<b>Test Results</b>
Phosphorus (CAS 7723-14-0)			
<b>Aquatic</b>			
Crustacea	EC50	Water flea (Daphnia magna)	0.025 - 0.037 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	0.002 - 0.006 mg/l, 96 hours
			0.001 - 0.004 mg/l, 96 hours
<b>Persistence and degradability</b>	Not relevant for inorganic substances.		
<b>Bioaccumulative potential</b>	The product is not bioaccumulating.		
<b>Mobility in soil</b>	This product has very low solubility in water and low mobility in the environment.		
<b>Mobility in general</b>	This product has a very low solubility in water and will sediment in water systems.		
<b>Other adverse effects</b>	None known.		

## 13. Disposal considerations

<b>Disposal instructions</b>	Dispose of in accordance with all applicable regulations.
<b>Hazardous waste code</b>	Not regulated.

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Waste from residues / unused products Recover and recycle, if practical. Dispose of in accordance with local regulations.

Contaminated packaging Dispose in accordance with all applicable regulations.

#### 14. Transport information

##### DOT

UN number	UN3077
UN proper shipping name	Environmentally hazardous substances, solid, n.o.s.
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Label(s)	9
Packing group	III
Environmental hazards	
Marine pollutant	Yes
Special precautions for user	Not available.
Special provisions	8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33
Packaging exceptions	155
Packaging non bulk	213
Packaging bulk	240

##### IATA

Not regulated as dangerous goods.

##### IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable. This product is a solid. Therefore, bulk transport is governed by IMSBC code.

MARPOL Annex V: This product is not considered harmful to the marine environment (HME).

#### 15. Regulatory information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

##### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

##### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

##### CERCLA Hazardous Substance List (40 CFR 302.4)

Manganese compounds (CAS -)	LISTED
Phosphorus (CAS 7723-14-0)	LISTED

##### Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
-------------------	--------------------------------------------------------------------------------------------------------------------

##### SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Phosphorus	7723-14-0	1	100		

SARA 311/312 Hazardous chemical No

##### SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Manganese	7439-96-5	> 60
Phosphorus	7723-14-0	< 1

##### Other federal regulations

##### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Manganese (CAS 7439-96-5)

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(a) Public Questionnaire for Yangon J.R Family Ltd

မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

လူမှုစီးပွားရေးစစ်တမ်းကောက်ယူလွှာ

(ဆောက်လုပ်ရေးလုပ်ငန်းသုံးသံမဏိချောင်းများ ထုတ်လုပ်ရောင်းချမည့်စက်ရုံစီမံကိန်း)

စစ်တမ်းကောက်ယူသည့်ရက်စွဲ -     /     လ/ ၂၀၁၈ ခုနှစ်

စစ်တမ်းကောက်ယူသူအမည် - .....

GPS အမှတ် - .....

စစ်တမ်းကောက်ယူသည့်လိပ်စာ - .....

ရပ်ကွက် - ..... မြို့နယ် .....

လူမှုစီးပွားရေးဆိုင်ရာ အခြေခံ အချက်အလက်များ

၁။ ဖြေဆိုသူ၏အခြေခံအချက်အလက်

အမည် .....

လူမျိုး .....

ကိုးကွယ်သည့်ဘာသာ .....

အသက် .....

ပညာအရည်အချင်း .....

အလုပ်အကိုင် .....

ဖြေဆိုသူ၏ အိမ်ထောင်ဦးစီးအမည် .....

အိမ်ထောင်ဦးစီးနှင့်တော်စပ်ပုံ .....

ဆက်သွယ်ရန်ဖုန်း .....

ဆက်သွယ်ရန်လိပ်စာ .....

.....

Prepared by E Guard Environmental Services Co., Ltd

မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

၂။ အိမ်ထောင်စု၏ အခြေခံအချက်အလက်

စဉ်	မိသားစုဝင် အမည်များ	အိမ်ထောင်ဦးစီး နှင့်တော်စပ်ပုံ	အသက်	လိင်	ပညာ အရည်အချင်း	အလုပ်အကိုင်	တစ်လဝင်ငွေ
၁							
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၁၀							
အိမ်ထောင်ဦးစီးနှင့်တော်စပ်ပုံ			၁။ အိမ်ထောင်ဦးစီး ၂။ ဇနီး၊ ခင်ပွန်း ၃။ သား၊ သမီး ၄။ ဖခင်၊ မိခင် ၅။ အခြား (တိတိကျကျဖော်ပြပေးရန်)				
လိင်			၁။ ကျား ၂။ မ				
ပညာအရည်အချင်း			၁။ တက္ကသိုလ်၊ ကောလိပ် ၂။ အထက်တန်း ၃။ အလယ်တန်း ၄။ မူလတန်း ၅။ ဘုန်းတော်ကြီးကျောင်း ၆။ စာမတတ်သူ				
အလုပ်အကိုင်			၁။ စက်ရုံဝန်ထမ်း ၂။ အစိုးရဝန်ထမ်း ၃။ ကုမ္ပဏီဝန်ထမ်း ၄။ ပွဲစား ၅။ ကျပန်း ၆။ ဈေးရောင်း ၇။ အခြား (တိတိကျကျဖော်ပြပေးရန်)				

၃။ အိမ်ထောင်စု၏ အသုံးစရိတ်များ

စဉ်	အကြောင်းအရာ	တစ်လ ထွက်ငွေ	မှတ်ချက်
၁	ကျန်းမာရေး		
၂	ပညာရေး		
၃	စီးပွားရေး		
၄	လူမှုရေး		
၅	စားဝတ်နေရေး		

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

၆	အိမ်ပြုပြင်စရိတ်		
၇	အခြား (.....)		
၈	အခြား (.....)		
၉	အခြား (.....)		
၁၀	အခြား (.....)		

၄။ သင်္ဃာတင်စာတွင် စိုက်ပျိုးရေးလုပ်ငန်း၊ မွေးမြူရေးလုပ်ငန်းလုပ်ဆောင်ခြင်းရှိပါသလား။ (ရှိပါက စိုက်ပျိုးရေးနှင့် မွေးမြူရေးလုပ်ငန်းလုပ်ကိုင်ပါက ဧက နှင့် အရေအတွက်ကိုဖော်ပြပါ။)

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၅။ သင်္ဃာတင်စာအသုံးပြုနေသော ရေအရင်းမြစ်များကို ဖော်ပြပါ။

အရင်းအမြစ်	သောက်ရေ			သုံးရေ		
	နွေ	မိုး	ဆောင်း	နွေ	မိုး	ဆောင်း
မြစ်၊ ချောင်း						
အင်္ဂါစိုက်						
မိုးရေ						
အခြား						

၆။ လူနေအိမ် ဖွဲ့စည်းပုံနှင့် အိမ်ထောင်မှုပစ္စည်းများ

၁) အဆောက်အအုံ၊ အိမ်အမျိုးအစား: .....

(က) နေအိမ် (ခ) ဈေးဆိုင်နှင့်နေအိမ် (ဂ) ဈေးဆိုင် (ဃ) စက်ရုံ၊ အလုပ်ရုံ (င) အခြား

၂) မြေပိုင်ဆိုင်မှု .....

(က) ဂရမ် (ခ) ပါမစ် (ဂ) လိုင်စင် (ဃ) အခြား

၃) အကျယ်အဝန်း: .....

၄) အခြားသောပိုင်ဆိုင်မှုများ

စဉ်	ပစ္စည်းအမျိုးအစားများ	အရေအတွက်
၁	ဖုန်း	
၂	စက်ဘီး/ဆိုင်ကယ်/ထော်လာဂျီ	/ /
၃	တီဗီ/ရေခဲသေတ္တာ	/
၄	မီးစက်	

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

၅	အခြား	
၆	အခြား	

၇။ အိမ်ထောင်စုတွင် စက်ရုံ၌ အလုပ်လုပ်ကိုင်သူရှိပါသလား။

☐ ရှိ

☐ မရှိ

၈။ မည်ကဲ့သို့သော ရာထူးတွင် လုပ်ကိုင်ပါသနည်း။

စဉ်	အလုပ်အကိုင်ရာထူး		လုပ်သက်
၁။	စက်ရုံ အလုပ်သမား	<input type="checkbox"/>	
၂။	စက်ရုံကြီးကြပ်	<input type="checkbox"/>	
၃။	သန့်ရှင်းရေး	<input type="checkbox"/>	
၄။	အခြား.....	<input type="checkbox"/>	
၁။ ဝန်ထုပ်အောက်၊ ၂။ ဝန်ထုပ်နှင့် ၂နှစ်ကြား၊ ၃။ ၂နှစ်နှင့် ၃နှစ်ကြား၊ ၄။ ၃နှစ်နှင့်အထက်			

### လျှပ်စစ်စွမ်းအင်အသုံးပြုမှု

၁။ သင်၏အိမ်တွင် အသုံးပြုသောလျှပ်စစ်စွမ်းအင် အရင်းအမြစ်များကိုဖော်ပြပါ။

☐ အစိုးရလျှပ်စစ်လိုင်း

☐ နေရောင်ခြည်စွမ်းအင်

☐ ကိုယ်ပိုင်မီးစက်

☐ အခြား (.....)

☐ အများပိုင်မီးစက်

၂။ သင်၏အိမ်တွင် အသုံးပြုနေသောလျှပ်စစ်မီးရရှိမှု

အရင်းအမြစ်	တစ်နေ့ ရရှိသောကြာချိန် (နာရီ)
အစိုးရလျှပ်စစ်လိုင်း	
ကိုယ်ပိုင်မီးစက်	
အများပိုင်မီးစက်	
နေရောင်ခြည်စွမ်းအင်	
အခြား	

### အိမ်သုံးစွန့်ပစ်စွင်းများ စွန့်ပစ်မှုအခြေအနေနှင့် မိလ္လာစနစ်

၁။ ဤရပ်ကွက်၊ မြို့နယ်တွင် အမှိုက်များကို မည်သို့ စွန့်ပစ်ပါသနည်း။

☐ အိမ်နောက်ဘေး

☐ ရေမြောင်း

☐ ရပ်ကွက်အမှိုက်ပုံ

☐ အခြား (.....)

☐ အမှိုက်ကား

၂။ မိမိနေအိမ်တွင် မည်သည့်မိလ္လာစနစ်အား အသုံးပြုသနည်း။

☐ ယင်လုံအိမ်သာ

☐ အများသုံးအိမ်သာ

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Yangon J.R Family Limited

☐ ကျင်းအိမ်သာ

☐ အခြား (.....)

**ကျန်းမာရေး**

၁။ ဤရပ်ကွက်၊ မြို့နယ်တွင် ကျန်းမာရေးအထောက်အကူပြုဆေးပေးခန်း၊ ဆေးရုံများပါသလား။

.....

.....

၂။ မိသားစုဝင်များအတွင်း မည်ကဲ့သို့သော ရောဂါများဖြစ်ခဲ့ဖူးပါသလဲ။ မည့်သည့်အချိန်ကစတင်ဖြစ်ခဲ့ပါသလဲ။ (ဥပမာ - ဆီးချို၊ သွေးတိုး၊ နှလုံး၊ ကင်ဆာ၊ အသည်းခြောက်၊ လေဖြတ်ခြင်း)

.....

.....

၃။ ဖျားနာ၍ဆေးခန်းပြပါက မည့်သည့်ဆေးခန်းသို့သွားပါသလဲ။

(က) မြို့နယ်ဆေးရုံ (ခ) ကျန်းမာရေးဌာန (ဂ) ပုဂ္ဂိုလ်ကဆေးခန်း (ဃ) တိုင်းရေးဆေးခန်း  
(င) ဆေးဆိုင် (စ) အခြား

၄။ မိသားစုဝင်များဆေးရုံတက်ရခြင်းကြံ့ဖူးပါသလား။ (သို့) ဆေးခန်း၊ ဆေးရုံသို့ ပုံမှန်သွားရတာမျိုးရှိပါသလား။ (ရောဂါအမည်၊ ကြာချိန်၊ ဆေးရုံအမည်၊ လက်ရှိအခြေအနေ တို့ကိုဖော်ပြရန်)

.....

.....

**သယ်ယူပို့ဆောင်ရေးအခြေအနေ**

၁။ သယ်ယူပို့ဆောင်ရေးအတွက် မည့်သည့်သယ်ယူပို့ဆောင်ရေးမှုမျိုးကို အသုံးပြုသနည်း။

ခရီးဝေး .....

ခရီးနည်း.....

**စီမံကိန်းအပေါ်အသစ်တို့၏သဘောထား**

၁။ ဤဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ ထုတ်လုပ်ရောင်းချမည့် စက်ရုံစီမံကိန်းအကြောင်း သင်ပါသလား။

☐ သိပါသည်။

☐ မသိပါ။

၂။ ဤဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ ထုတ်လုပ်ရောင်းချမည့် စက်ရုံစီမံကိန်းအကြောင်း သင်ဘယ်လို သိပါသလဲ။

☐ အစိုးရအဖွဲ့အစည်း

☐ မိသားစု၊ မိတ်ဆွေ

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

☐ ရပ်ကွက်ခေါင်းဆောင်၊ အုပ်ချုပ်ရေးမှူး

☐ စစ်တမ်းကောက်ယူသူ

☐ သတင်းမီဒီယာ

☐ လူထုတွေ့ဆုံဆွေးနွေးပွဲ

၃။ စီမံကိန်းကြောင့် မြို့နယ်အတွက် မည်သည့်ဖွံ့ဖြိုးတိုးတက်မှုများ ရှိလာနိုင်သည်ဟု ထင်မြင်မိပါသလဲ။

☐ ကျန်းမာရေး

☐ ပညာရေး

☐ လူမှုရေး

☐ လမ်းပန်းဆက်သွယ်ရေး

☐ စီးပွားရေး

☐ လျှပ်စစ်မီး

☐ စားဝတ်နေရေး

☐ အခြား

၄။ စက်မှုဇုန်အတွင်း စက်ရုံများတိုးချဲ့ဆောက်လုပ်ငန်းခြင်းနှင့်ပတ်သတ်၍ ကောင်းကျိုး (သို့) ဆိုးကျိုးများရှိနိုင်သည်ဟု ထင်ပါသလား။ (အကြောင်းပြချက်ရေးရန်။)

.....

၅။ အနီးပတ်ဝန်းကျင်၏ လက်ရှိလည်ပတ်နေသောစက်ရုံများနှင့်ပတ်သတ်ပြီး ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများ (ဆူညံသံ၊ အနံ့ဆိုး၊ ရေဆိုးထုတ်လွှတ်မှု၊ လေထုညစ်ညမ်းမှုများ၊ အပင်နှင့်သတ္တဝါ) စသည့် အခြေအနေများ ခံစားနေရမှု အခြေအနေများရှိပါသလား။ (မည်သည်တို့မှ ထိခိုက်ကြောင်းနှင့် အခြေအနေများမေးမြန်းရန်။)

.....

၆။ ဤစီမံကိန်းကြောင့်ပတ်ဝန်းကျင် (လေထု၊ မြေထု၊ ရေထု၊ အပင်နှင့်သတ္တဝါ) စသည်တို့အပေါ် မည်သည့်ထိခိုက်မှုမျိုး ရှိနိုင်သည်ဟုထင်ပါသလဲ။

.....

၇။ ယခင်စက်ရုံများမှ ဤသို့ စစ်တမ်းကောက်ယူခြင်းမျိုးကြုံဖူးပါသလား။

.....

၈။ စက်မှုဇုန်အတွင်း စက်ရုံများတိုးချဲ့တည်ထောင်ခြင်းများကြောင့် အနီးပတ်ဝန်းကျင်ရှိဒေသခံများအပေါ် ကျန်းမာရေးထိခိုက်ခံစားရမှုများ ကြုံဖူးပါသလား။ ကြုံဖူးလျှင် မည်သည့်ရောဂါများခံစား ရပါသလဲ။

.....

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

.....  
.....

၉။ စီမံကိန်းနှင့်ပတ်သတ်၍ အကြံပြုစရာများရှိပါသလား။

.....  
.....  
.....



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(b) Industrial Questionnaire for Yangon J.R Family Ltd

မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

စက်ရုံအနီးပတ်ဝန်းကျင်ရှိစက်ရုံများအားလူမှုစစ်တမ်းကောက်ယူလွှာ  
(ဆောက်လုပ်ရေးလုပ်ငန်းသုံးသံမဏိချောင်းများ ထုတ်လုပ်ရောင်းချမည့်စက်ရုံစီမံကိန်း)

စစ်တမ်းကောက်ယူသည့်ရက်စွဲ -                      /                      လ/ ၂၀၁၈ခုနှစ်  
စစ်တမ်းကောက်ယူသူအမည် .....  
စစ်တမ်းကောက်ယူသည့် .....ရပ်ကွက်၊ .....မြို့နယ်

**ဖြေဆိုသူ၏ အချက်အလက်များ**

အမည် .....  
အသက် .....  
ရာထူး .....  
စက်ရုံအမည် .....  
မြေကွက်အမှတ် .....

**စက်ရုံလည်ပတ်မှုအခြေအနေ**

၁။ စက်ရုံ၏ အဓိကထုတ်ကုန်နှင့်လုပ်ဆောင်ချက်များကဘာဖြစ်ပါသလဲ။  
.....  
.....  
.....

၂။ တစ်နေ့ကုန်ထုတ်လုပ်မှုပမာဏမည်မျှထုတ်လုပ်ပါသလဲ။  
.....  
.....  
.....

၃။ စက်ရုံရှိ ဝန်ထမ်း/အလုပ်သမား အရေအတွက် မည်မျှရှိပါသလဲ။ မည့်သည့်ဒေသမှ လာရောက်  
လုပ်ကိုင်ကြပါသလဲ။  
.....

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

၄။ စက်ရုံလည်ပတ်ရေးအတွက် ရေ/လျှပ်စစ် သုံးစွဲရယူမှုအရင်းအမြစ်ကိုမည်သည့်မှရယူပါသလဲ။

၅။ စက်ရုံမှရေဆိုးနှင့်အမှိုက်များ ကိုမည်ကဲ့သို့စီမံခန့်ခွဲပစ်ပါသလဲ။ (မည်သည့်အဖွဲ့အစည်းနှင့် ချိတ်ဆက်စွန့်ပစ်ပါသလဲ။)

၆။ ဤစက်ရုံ (သို့) စက်မှုဇုန်အတွင်းတွင် အရေးပေါ်အခြေအနေကြုံဖူးပါသလား။ (ဥပမာ - မီးဘေးအန္တရာယ်၊ ရေကြီးခြင်းနှင့် အခြားအကြောင်းအရာများ) (ရိုပါက-ဖြစ်ပွားခဲ့သည့် ခုနှစ်အကြောင်းအရာများနှင့် မည်သို့ ဆောင်ရွက်ခဲ့သည်ကို ဖော်ပြပါ။)

၇။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ ဆောင်ရွက်မှုရှိ/မရှိ။ (ဥပမာ-ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်ရေးဆွဲခြင်း)

၈။ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်ကြည့်ရှုစစ်ဆေးခြင်း ဆောင်ရွက်မှုရှိပါသလား။ (တနစ်ကိုပြုလုပ်သည့်အကြိမ်ရေမည်မျှလုပ်ဆောင်ပါသလဲ။လေအရည်အသွေးတိုင်းတာခြင်း၊ ရေအရည်အသွေးတိုင်းတာခြင်း၊ ဆူညံသံနှင့်တုန်ခါမှု၊ မြေအရေအသွေး စသည်တို့တိုင်းတာစစ်ဆေးခြင်း သည်တို့ကို အသေးစိတ်ဖော်ပြပါ)

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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

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၉။ စက်ရုံတွင် မကျေနပ်သည်များကိုတိုင်ကြားနိုင်သည့် လုပ်ထုံးလုပ်နည်းများ ဆောင်ရွက်ထားရှိ  
ပါသလား။ (အကြောင်းအရာနှင့် အကြိမ်ရေဖော်ပြပေးပါရန်။)  
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၁၀။ ဒေသခံလူထုအတွက် လူမှုစီးပွားတာဝန်ယူမှုတာဝန်သိတတ်မှုဆိုင်ရာ လုပ်ငန်းများ (CSR)  
ကူညီဆောင်ရွက်မှုများ လုပ်ဆောင်မှုရှိပါသလား။  
.....  
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မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

**စီမံကိန်းအပေါ်လက်ရှိစက်ရုံတို့၏သဘောထား**

၁။ ဤဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ ထုတ်လုပ်ရောင်းချမည့် စက်ရုံစီမံကိန်းအကြောင်း သိပါသလား။

☐ သိပါသည်။ ☐ မသိပါ။

၂။ ဤဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံမဏိချောင်းများ ထုတ်လုပ်မည့် စက်ရုံစီမံကိန်းအကြောင်း သင်ဘယ်လိုသိပါသလဲ။

☐ အစိုးရအဖွဲ့အစည်း ☐ မိသားစု၊ မိတ်ဆွေ  
☐ ရပ်ကွက်ခေါင်းဆောင်၊ အုပ်ချုပ်ရေးမှူး ☐ စစ်တမ်းကောက်ယူသူ  
☐ သတင်းမီဒီယာ ☐ လူထုထွေဆိုဆွေးနွေးပွဲ

၄။ စက်မှုဇုန်အတွင်း စက်ရုံများတိုးချဲ့ဆောက်လုပ်ခြင်းနှင့် ပတ်သတ်၍ မည်သည့် ကောင်းကျိုး (သို့) ဆိုးကျိုးများ ရှိနိုင်သည်ဟု ထင်ပါသလဲ။ (အကြောင်းပြချက်ရေးရန်။)

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၅။ အနီးပတ်ဝန်းကျင်၏ လက်ရှိလည်ပတ်နေသော စက်ရုံများနှင့်ပတ်သတ်ပြီး ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများ (ဆူညံသံ၊ အနံ့ဆိုး၊ ရေဆိုးထုတ်လွှတ်မှု၊ လေထုညစ်ညမ်းမှု၊ အပင်နှင့်သတ္တဝါ၊ စသည်တို့) ခံစားနေရမှု အခြေအနေများ ရှိပါသလား။ (မည်သည့်တို့မှ တိုက်ခိုက်ကြောင်းနှင့် အခြေအနေများ မေးမြန်းရန်။)

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၆။ ယခင်စက်ရုံများမှ ဤ သို့စစ်တမ်းကောက်ယူခြင်းမျိုးကြုံဖူးပါသလား။

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.....

Prepared by E Guard Environmental Services

မြောင်းတကာစက်မှုဇုန်

Yangon J.R Family Limited

၇။ စက်မှုဇုန်အတွင်း စက်ရုံများတိုးချဲ့တည်ထောင်ခြင်းများကြောင့် အနီးပတ်ဝန်းကျင်ရှိဒေသခံများ အပေါ် ကျန်းမာရေးထိခိုက်ခံစားရမှုများကြုံဖူးပါသလား။ ကြုံဖူးလျှင် မည့်သည့်ရောဂါများခံစားရပါ သလဲ။

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၈။ စီမံကိန်းနှင့်ပတ်သတ်၍ အကြံပြုစရာများရှိပါသလား။

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Prepared by E Guard Environmental Services

### ဖိတ်ကြားလွှာ

ကျွန်တော်များ Yangon J.R Family Limited မှ ရန်ကုန်တိုင်း ဒေသကြီး၊  
 မော်တီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့်  
 သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်ဖြန့်ဖြူးရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍  
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment - EIA)  
 လုပ်ငန်းစဉ်ကို တတိယအဖွဲ့အစည်းဖြစ်သည့် E Guard Environmental Services  
 Co., Ltd မှဆောင်ရွက်လျက်ရှိပါသည်။ သို့ဖြစ်ပါ၍ စီမံကိန်းဆိုင်ရာ  
 အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း  
 အခမ်းအနားသို့ တက်ရောက်ပေးနိုင်ပါရန် လေးစားစွာဖြင့် ဖိတ်ကြားအပ်ပါသည်။

ရက်စွဲ။ ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်၊ အင်္ဂါနေ့။  
 အချိန်။ နေ့လည် ၁၀း၃၀ မှ ၁၂း၃၀ အထိ။  
 နေရာ။ ဓမ္မရေအေးဘုန်းကြီးကျောင်း၊ မြောင်းတကာစက်မှုဇုန်ဝင်း၊ မော်တီမြို့နယ်၊  
 ရန်ကုန်တိုင်းဒေသကြီး။

Yangon J.R Family Limited  
 ဆက်သွယ်ရန်- ၀၉ ၇၅၀၇၀၉၂၀၀၊ ၀၉ ၇၉၆၈၀၉၃၆၀

**၂၄**

**ကြေး**

**ကြေးမုံ**

### ဖိတ်ကြားလွှာ

ကျွန်တော်များ Yangon J.R Family Limited မှ ရန်ကုန်တိုင်း ဒေသကြီး၊  
 မော်တီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့်  
 သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်ဖြန့်ဖြူးရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍  
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment - EIA)  
 လုပ်ငန်းစဉ်ကို တတိယအဖွဲ့အစည်းဖြစ်သည့် E Guard Environmental Services  
 Co., Ltd မှဆောင်ရွက်လျက်ရှိပါသည်။ သို့ဖြစ်ပါ၍ စီမံကိန်းဆိုင်ရာ  
 အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း  
 အခမ်းအနားသို့ တက်ရောက်ပေးနိုင်ပါရန် လေးစားစွာဖြင့် ဖိတ်ကြားအပ်ပါသည်။

ရက်စွဲ။ ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်၊ အင်္ဂါနေ့။  
 အချိန်။ နေ့လည် ၁၀း၃၀ မှ ၁၂း၃၀ အထိ။  
 နေရာ။ ဓမ္မရေအေးဘုန်းကြီးကျောင်း၊ မြောင်းတကာစက်မှုဇုန်ဝင်း၊ မော်တီမြို့နယ်၊  
 ရန်ကုန်တိုင်းဒေသကြီး။

Yangon J.R Family Limited  
 ဆက်သွယ်ရန်- ၀၉ ၇၅၀၇၀၉၂၀၀၊ ၀၉ ၇၉၆၈၀၉၃၆၀

### စီနိုဝင်းနှင့်

▲ ရွှေတောင်ပြုံးပန်းပွင့်ပွင့်(သီး)  
 ▲ ရွှေတောင်ပြုံးပန်းပွင့်ပွင့်(ပန်း) မွှေ  
 ▲ ရွှေတောင်ပြုံးပွင့်ပွင့်(ပန်း) မွှေ  
 ▲ ရွှေတောင်ပြုံး မွှေပွင့် ပြုံးပွင့်၊ ၀၉-၇၈၀၀၅၅၅

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### မိုးကုတ်စက်ဝိုင်း၊


### ဝါတွင်းကာလ (အထွေထွေ)

ပဲခူးတိုင်းဒေသကြီး၊ ပဲခူးမြို့နယ်  
 (ရွှေကျင်) မိုးကုတ်ဝါတွင်းကာလအတွက်  
 ကမ္ဘာ့အသံ ကျေးဇူးအပ်အပ်သော  
 ကျေးဇူးရှင် အရှင်ဟောပုဂ္ဂိုလ်ကြီးတို့  
 နှစ်စဉ်နှစ်တိုင်း ဝါတွင်းကာလ  
 ကျော် (၅)ရက်မှ (၁၅)ရက်အထိ (၁၀  
 ကိုယ်ကိုယ်ကို ကယ်တင်လိုသူ  
 မေတ္တာဖြင့် ကျေးဇူးရှင်များအား မြတ်  
 “မိုးကုတ်စက်ဝိုင်း”  
 ကြိုတင်စာရင်း

ရန်ကုန်တိုင်း ဒေသကြီး၊ မော်ဘီလီနယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့် သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်ဖြန့်ဖြူးရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment – EIA) လုပ်ငန်းစဉ်များ၊ စီမံကိန်းဆိုင်ရာ အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း အခမ်းအနားသို့ တက်ရောက်လာသူများစရင်း

ဌာနဆိုင်ရာအဖွဲ့အစည်းများ








ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်

စဉ်	အမည်	မှတ်တမ်း ဂဏန်း	နေရပ်လိပ်စာ	အလုပ်အကိုင် ဖုန်းနံပါတ်	လက်မှတ်
၁။	စက်မှုဌာနချုပ်	Staff Office	ECB, Ygn	၀၉-၄၀၁၄၈၅၈၄	
၂။					
၃။					
၄။					
၅။					
၆။					
၇။					
၈။					
၉။					
၁၀။					











ရန်ကုန်တိုင်းဒေသကြီး၊ မော်ဘီလီနယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့် သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်ဖြန့်ဖြူးရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment – EIA) လုပ်ငန်းစဉ်များ၊ စီမံကိန်းဆိုင်ရာ အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း အခမ်းအနားသို့ တက်ရောက်လာသူများစရင်း

ရပ်ကွက်အဖွဲ့အစည်းများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်

စဉ်	အမည်	မှတ်တမ်း ဂဏန်း	နေရပ်လိပ်စာ	အလုပ်အကိုင် ဖုန်းနံပါတ်	လက်မှတ်
၁။	ဦးမောင်	၈၂၄	၈၂၄		
၂။	ဦးမောင်	၈၂၄	၈၂၄	၀၉၄၄၈၀၄၄၄၄	
၃။	ဦးမောင်	၈၂၄	၈၂၄	၀၉၄၄၈၀၄၄၄၄	
၄။	ဦးမောင်	၈၂၄	၈၂၄	၀၉၄၄၈၀၄၄၄၄	
၅။	ဦးမောင်	၈၂၄	၈၂၄	၀၉၄၄၈၀၄၄၄၄	
၆။	ဦးမောင်	၈၂၄	၈၂၄		
၇။	ဦးမောင်	၈၂၄	၈၂၄		
၈။					
၉။					
၁၀။					

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့် သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်မြန်မာ့ရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment – EIA) လုပ်ငန်းစဉ်များ၊ စီမံကိန်းဆိုင်ရာ အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း အခမ်းအနားသို့ တက်ရောက်လာသူများစရင်း စက်ရုံမှတာဝန်ရှိသူများ ဗဟိုကုမ္ပဏီများ (private company) ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်

စဉ်	အမည်	မှတ်ပုံတင် ရာဇဝါ	နေရပ်လိမ့်မည် ကုမ္ပဏီအမည်	အလုပ်အကိုင် ဖုန်းနံပါတ်	လက်မှတ်
၁။	U Aung Myo Khin	Survey Supervisor	Mindhama	09-420035408	
၂။	Sandhu Kumar	Side Engineer	Yangon J.R. Family	097 6754105	
၃။	Dharm Singh	Accountant	Yangon J.R. Family Ltd.	09764724855	
၄။	Vipin Singh	Director	Yangon JR family Ltd.	09764724819	
၅။	Natish Singh	Accountant	"	"	
၆။	Vijay Singh		"		
၇။	Lin Lin Aung	Project Engineer	Mindhama Co. Ltd.	09-440018080	
၈။	R.K Shreek	Ct. Manager	J.R. Family Ltd	7999102120	
၉။	ဦးအောင်စိုး		"		
၁၀။	Ko Aye Si		"		

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်တွင် တည်ဆောက်လည်ပတ်မည့် သံ/သံမဏိချောင်းထုတ်လုပ်ခြင်း နှင့်မြန်မာ့ရောင်းချမည့်စက်ရုံ နှင့်ပတ်သက်၍ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment – EIA) လုပ်ငန်းစဉ်များ၊ စီမံကိန်းဆိုင်ရာ အချက်အလက်များအား ရှင်းလင်းတင်ပြခြင်းနှင့် အများပြည်သူသဘောထားရယူခြင်း အခမ်းအနားသို့ တက်ရောက်လာသူများစရင်း စက်ရုံမှတာဝန်ရှိသူများ ဗဟိုကုမ္ပဏီများ (private company) ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀) ရက်

စဉ်	အမည်	မှတ်ပုံတင် ရာဇဝါ	နေရပ်လိမ့်မည် ကုမ္ပဏီအမည်	အလုပ်အကိုင် ဖုန်းနံပါတ်	လက်မှတ်
၁။	ဦး အောင်စိုး	30.7.2019	Y.JR	09-403097333	
၂။					
၃။					
၄။					
၅။					
၆။					
၇။					
၈။					
၉။					
၁၀။					





## Yangon J.R Family Limited

၏

ဆောက်လုပ်ရေးသုံးသံချောင်း ထုတ်လုပ်ခြင်း နှင့် ဖြန့်ဖြူးရောင်းချခြင်း စက်ရုံစီမံကိန်း

ပတ်ဝန်းကျင်နှင့်လူမှုရေးရာထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ဆိုင်ရာ

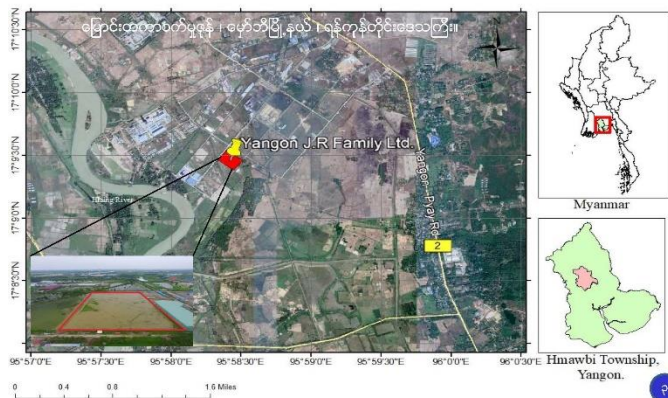
အများပြည်သူသဘောထားခံယူခြင်း

အခမ်းအနား

ဇူလိုင်လ ၃၀ ရက်နေ့၊ ၂၀၁၉ခုနှစ်



### စီမံကိန်းတည်နေရာမြေပုံ



၃



၁။ အခမ်းအနားဖွင့်လှစ်ကြောင်းကြေငြာခြင်း။

၂။ Yangon J.R Family Limited မှ စီမံကိန်းအကျဉ်းချုပ်အား ရှင်းလင်းတင်ပြခြင်း။

၃။ E Guard Environmental Services Co., Ltd မှ စီမံကိန်းနှင့်အနီးပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment-EIA) လုပ်ငန်းများနှင့် ပတ်သက်၍ တင်ပြခြင်း။

၄။ တက်ရောက်ကြသော စီမံကိန်းနှင့်သက်ဆိုင်သူများမှ စီမံကိန်းနှင့် ပတ်သက်၍ သိရှိလိုသည်များကို မေးမြန်းခြင်း နှင့် သဘောထားမှတ်ချက်တောင်းခံခြင်း။

၅။ Yangon J.R Family Limited မှ ကျေးဇူးတင်စကားပြောကြားခြင်း။

၆။ အခမ်းအနားပြီးမြောက်ကြောင်းကြေငြာခြင်း။

၂

E Guard Environmental Services



### စီမံကိန်းတည်နေရာ



၄

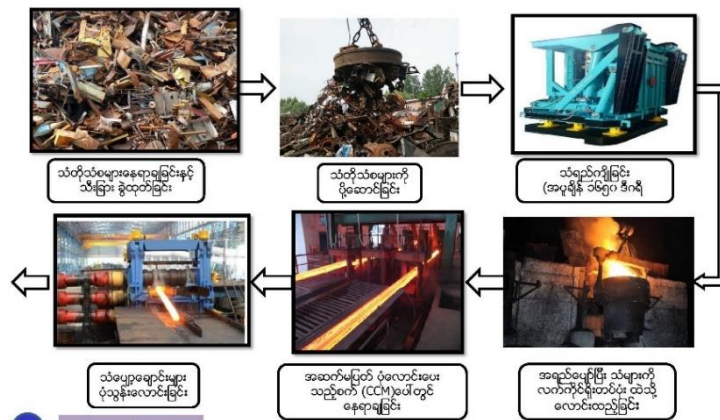
### စီမံကိန်းဆိုင်ရာအချက်အလက်များ

ရင်းနှီးမြှုပ်နှံမှုပုံစံ	- ၁၀၀ ရာခိုင်နှုန်း နိုင်ငံခြားသားရင်းနှီးမြှုပ်နှံမှု
စီမံကိန်းစရိတ်အကျယ်အဝန်း	- ၁၀.၉၇၇ ဧက
ကုမ္ပဏီအမည်	- Yangon J.R Family Limited
ဝန်ထမ်းအင်အား	- (၃၅၈) ယောက်
MIC မှခွင့်ပြုသည့်ရက်စွဲ	- ၁၁ရက် မေလ ၂၀၁၈ခုနှစ်
ဆောက်လုပ်ရေးကာလ	- ၂ နှစ်
လုပ်ငန်းစတင်မည့်ကာလ	- ဇူလိုင်လ ၂၀၂၀ခုနှစ်
စီမံကိန်းအမျိုးအစား	- ဆောက်လုပ်ရေးသုံးသံချောင်း ထုတ်လုပ်ခြင်း နှင့် ဖြန့်ဖြူးရောင်းချခြင်း။

၅

### ထုတ်လုပ်မှုလုပ်ငန်းစဉ်အဆင့်ဆင့်

ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံချောင်းများ ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်



၇

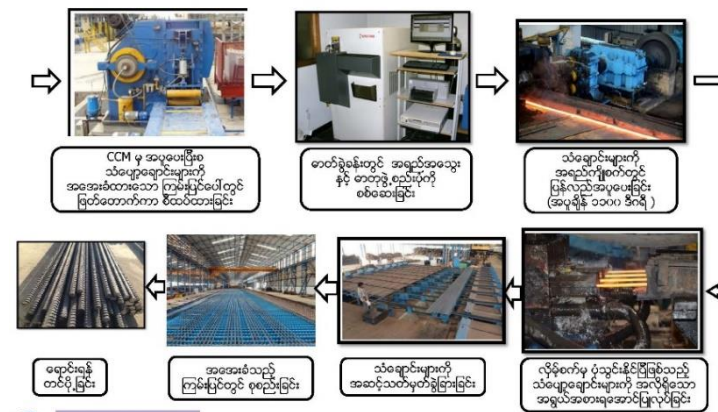
### စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

လုပ်ငန်းတည်ဆောက်ရေး ကာလ	၁။ စက်ရုံအဆောက်အအုံများတည်ဆောက်ခြင်း၊ ၂။ လိုအပ်သောစက်ယန္တရားများဝယ်ယူခြင်းနှင့်စက်ကိရိယာများတပ်ဆင်ခြင်း၊ ၃။ လုပ်ငန်းစတင်လည်ပတ်ခြင်း	
အဓိကကုန်ကြမ်းများ	သံတိုက်များ	
ထုတ်လုပ်မည့်ကုန်ပစ္စည်း အမျိုးအစား	ဆောက်လုပ်ရေးသုံးသံချောင်း၊ ထုတ်လုပ်ခြင်း နှင့် ဖြန့်ဖြူးရောင်းချခြင်း။	
တစ်နှစ်ကုန်ချောထုတ်ရန် လျာထားချက်	၆၀,၀၀၀ မက်ထရစ်တန်	
ကုန်ထုတ်လုပ်ရာတွင် အဓိကအသုံးပြုမည့် အရင်းအမြစ်သုံးစွဲမှု	အရင်းမြစ်သုံးစွဲမှု (တစ်နှစ်)	ပမာဏ (ခန့်မှန်း)
	ရေသုံးစွဲမှု	၄၀၀,၀၀၀ ဂါလံ
	လျှပ်စစ်ဓာတ် သုံးစွဲမှု	၂၀၀,၀၀၀ ကီလိုဝပ်

၆

### ထုတ်လုပ်မှုလုပ်ငန်းစဉ်အဆင့်ဆင့်

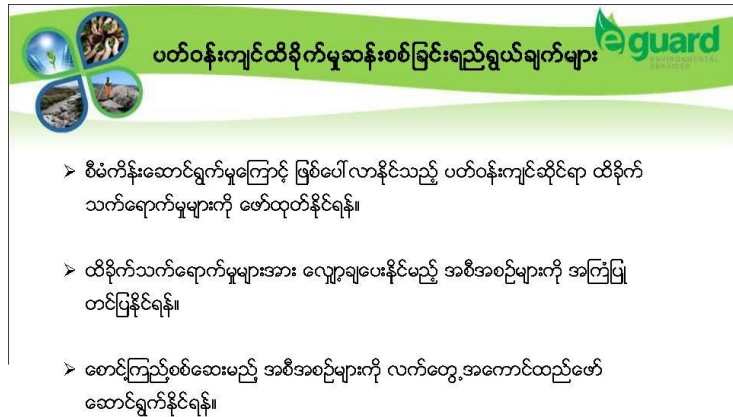
ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံချောင်းများ ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်



၈

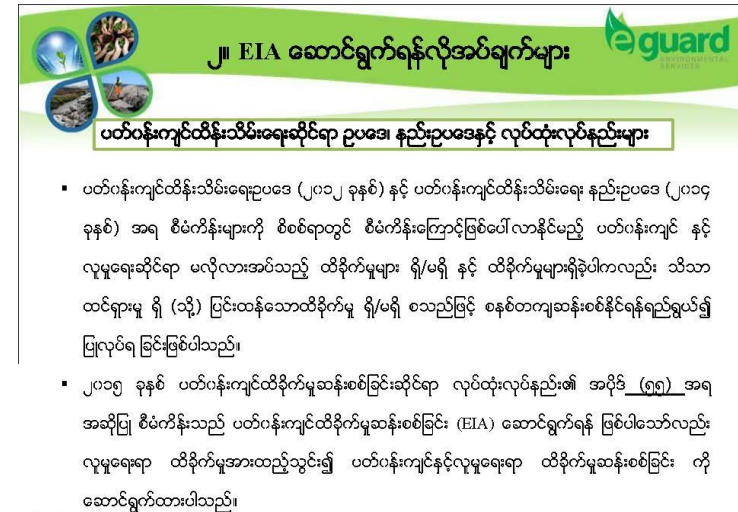


E Guard Environmental Services



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E Guard Environmental Services



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E Guard Environmental Services



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### ၅။ ဥပဒေ၊နည်းဥပဒေဆိုင်ရာမူဘောင်နှင့်ကန့်သတ်ချက်

- ၂၀၀၈ အခြေခံဥပဒေ [EIA / SIA ဆိုင်ရာ ဥပဒေနှင့် လုပ်ထုံးလုပ်နည်းများ]
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂) နှင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ (၂၀၁၄)
- EIA Procedures - ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလုပ်ငန်းလုပ်ထုံးလုပ်နည်းများ (၂၀၁၅)
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေးထုတ်လွှတ်မှု (အစိုးရအဖွဲ့) လမ်းညွှန်ချက်များ (၂၀၁၅)
- စီမံကိန်းနှင့်ပတ်သက်ဆက်နွယ်သော အခြား ဥပဒေ ၊ နည်းဥပဒေနှင့် လုပ်ထုံးလုပ်နည်းများ
  - မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆)
  - မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေ (၂၀၁၇)
  - ပုဂ္ဂလိကစက်မှုလုပ်ငန်းဥပဒေ (၁၉၉၀)
  - မြေအောက်ရေအက်ဥပဒေ (၁၉၃၀)
  - ဓာတုဗေဒနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေ (၂၀၁၃)



### ၆။ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းစဉ်များ



**အစီရင်ခံစာ အပေါ်**  
လုံးဝက် အကဲဖြတ်ခြင်း  
သဘောထားမှတ်ချက်ပြုကြားခြင်း  
နှင့် ECC လက်မှတ်ချေခြင်း  
(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေအရ)

**အသေးစိတ်စစ်ဆေးမှု (နောက်ဆုံး အဆင့်)**

**ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အတွက် စစ်တမ်းကောက်ယူခြင်းနှင့် အစီရင်ခံစာ ပြင်ဆင်ခြင်း**

**အသေးစိတ်စစ်ဆေးမှု (တနည်း အဆင့်)**

**နယ်ပယ်တိုင်းတာသတ်မှတ်ခြင်း အစီရင်ခံစာရေးသားပြုစုခြင်း (Scoping Report)**

**စီမံကိန်းအမျိုးအစားအရလုပ်ငန်းစဉ်များ (screening : IEE/EMP/EIA or Non EIA)**


**အသေးစိတ်စစ်ဆေးမှုတွင် ပါဝင်သောလုပ်ငန်းစဉ်များ**

၁။ စီမံကိန်းဆိုင်ရာအချက်အလက်များထုတ်ဖော်ခြင်း။

၂။ ဆန်းစစ်လေ့လာရရှိသော ပတ်ဝန်းကျင်ဆိုင်ရာနှင့်လူမှုရေးဆိုင်ရာကြောင်းအချက်အလက်များအား ဖော်ထုတ်ဆွေးနွေးခြင်း။


၃။ စီမံကိန်းကြောင့်ထိခိုက်နိုင်သည့်ပတ်ဝန်းကျင်ဆိုင်ရာနှင့်လူမှုရေးအန္တရာယ်များ၊ လူမှုအန္တရာယ်စည်းများ၊ ရပ်ရွာအခြေပြုလူမှုအန္တရာယ်များနှင့်အတွက်ဆိုင်ဆွေးနွေးညှိနှိုင်းမှုများဆောင်ရွက်ခြင်း။





### ၅။ ဥပဒေ၊နည်းဥပဒေဆိုင်ရာမူဘောင်နှင့်ကန့်သတ်ချက်


- ပြည်သူ့ကျန်းမာရေးဥပဒေ (၁၉၇၂)
- မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ဥပဒေ (၂၀၁၅)
- အလုပ်ရုံအက်ဥပဒေ (၁၉၅၁)
- အလုပ်သမားအဖွဲ့အစည်းဥပဒေ (၂၀၁၁)
- အလုပ်သမားအငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ (၂၀၁၂)
- အနည်းဆုံးအခကြေးငွေဥပဒေ (၂၀၁၃)
- အလုပ်သမားလျော်ကြေးငွေအက်ဥပဒေ (၁၉၂၃)
- ခွင့်နှင့်အလုပ်ပိတ်ရက်အက်ဥပဒေ (၁၉၅၁)
- သွင်းကုန်၊ ပို့ကုန်ဥပဒေ (၂၀၁၂)
- ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးဥပဒေ (၂၀၁၈)



### ၇။ အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်းနှင့်အများပြည်သူ ပူးပေါင်းပါဝင်ခြင်းဆိုင်ရာဆွေးနွေးပွဲကျင်းပခြင်း၏ ရည်ရွယ်ချက်

**ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းစဉ်များ (၂၀၁၅) ၊ အပိုဒ် (၆၃၅) အရ**

- ✓ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းအတွက် စုံစမ်းစစ်ဆေးခြင်း (EIA Investigation) များဆောင်ရွက်ရာတွင် အများပြည်သူသဘောထားရယူခြင်းနှင့် သတင်းအချက်အလက်များ ထုတ်ဖော် တင်ပြခြင်းစသည့် အများပြည်သူနှင့် ပူးပေါင်းပါဝင်မှုလုပ်ငန်းစဉ်များ ဆောင်ရွက်ပြီးမှသာ အစီရင်ခံစာ များ တင်ပြရန်ဖြစ်ပါသည်။
- (၁) စီမံကိန်းအချက်အလက်များဖြစ်သော ရည်ရွယ်ချက်၊ အစီအစဉ်၊ ထိခိုက်သက်ရောက် နိုင်မှု အခြေအနေများ၊ သက်ရောက်မှုအား လျော့ချနိုင်မည့် နည်းလမ်းများနှင့် ဆောင်ရွက်မည့် အချိန်ဇယား စသည်တို့အား အသိပေးရန်၊
- (၂) စီမံကိန်းရေးဆွဲကာလအတွင်း စီမံကိန်းနှင့်သက်ဆိုင်သူများထံမှ အကြံဉာဏ်ရယူရန်၊
- (၃) လူထုထွေ့ဆုံပွဲမှ ရရှိသော အကြံဉာဏ်များအား စီမံကိန်းရေးဆွဲရာတွင် ထည့်သွင်း စဉ်းစားရန်၊
- (၄) စီမံကိန်း၏သဘာဝနှင့် လူမှုပတ်ဝန်းကျင်သက်ရောက်မှုများအား လူထုအားအသိပေးရန်၊



**၈။ ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) တွင် လေ့လာမည့် အကြောင်းအရာများ**




**ပတ်ဝန်းကျင်ထိခိုက်မှု လေ့လာမည့်စီမံကိန်း နယ်မြေဧရိယာ**

- ❖ ၁၀၀၀ မီတာ အတွင်းရှိ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင် အပေါ် ထိခိုက်နိုင်မှု အခြေအနေများ ကိုလေ့လာခြင်း (အသေးစိတ်လေ့လာမည့်အကြောင်းအရာများ - လူမှုစီးပွားအခြေအနေ (ကျန်းမာရေး၊ ယဉ်ကျေးမှု၊ စီးပွားရေး၊ လမ်းပန်းဆက်သွယ်ရေးလူမှုရေး)
- ❖ စီမံကိန်းအတွင်းရှိ (လေထုအရည်အသွေး၊ ရေအရည်အသွေး၊ ရာသီဥတု၊ တုန်ခါမှု ဆန်းစစ်ခြင်း)

**E Guard Environmental Services**

**တိုင်းတာကောက်ယူခဲ့သည့်နေရာများနှင့် လက်ရှိပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေးများအား တိုင်းတာခြင်း**



**လေအရည်အသွေး တိုင်းတာခြင်း**

**ရေညီမျှတတိုင်းတာခြင်း**

**စက်ရုံခြင်ပစ်ရေမြောင်းမှ ရေနမူနာကောက်ယူခြင်း**

**မြစ်ရေနမူနာကောက်ယူခြင်း**

**မြေအောက်ရေကောက်ယူခြင်း**

**စက်ရုံတွင်းရှိ မြေအောက်ရေကောက်ယူခြင်း**

**E Guard Environmental Services**

**စီမံကိန်းလုပ်ငန်းများလုပ်ဆောင်မှုအဆင့်ဆင့်**

**တည်ဆောက်ရေးကာလ**

- ✓ Yangon JR Family Co., Ltd ၏ စက်ရုံဒီဇိုင်းအတိုင်းအဆောက်အအုံများဆောက်လုပ်ခြင်းလုပ်ငန်း
- ✓ စက်ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်းနှင့်တပ်ဆင်ခြင်းလုပ်ငန်း

**လုပ်ငန်းလည်ပတ်ရေးကာလ**

- ✓ ကုန်ကြမ်းများ တင်သွင်းခြင်း နှင့် ယင်းတို့အား သတ်မှတ်ချက်များနှင့် အညီ နေထိုင်ကျ စစ်ဆေးသို့လောင်ခြင်း
- ✓ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံချောင်းထုတ်လုပ်ခြင်း လုပ်ငန်းစဉ်အဆင့်ဆင့်
- ✓ ကုန်ချောများယာယီသိုလှောင်ခြင်းနှင့်ပြည်တွင်းရောင်းချမှုကွက် သို့ဖြန့်ဖြူးရောင်းချခြင်း

**စီမံကိန်းပိတ်သိမ်းကာလ**

- ✓ စက်ပစ္စည်းများဖြုတ်သိမ်းခြင်း
- ✓ အဆောက်အအုံများဖျက်သိမ်းခြင်း
- ✓ ဖြိုဖျက်ထားသော အဆောက်အအုံ အပိုင်းအစများအား စနစ်တကျ စွန့်ပစ်သိမ်းဆည်းခြင်း

**E Guard Environmental Services**

**လေအရည်အသွေးတိုင်းတာမှုရလဒ်**

လေအရည်အသွေး ဝန်ဆောင်	ယူနစ်	တိုင်းတာရရှိသည့်တန်ဖိုး		လမ်းညွှန်တန်ဖိုး	လိုက်နာသည့်စံသတ်မှတ်ချက်
		တိုင်းတာသည့်နေရာ-၁: စက်ရုံဝန်းကျင်အတွင်း (Source)	တိုင်းတာသည့်နေရာ-၂: မြေအောက်ရေကျောင်းဝင်း (Receptor)		
PM <sub>10</sub>	μg/m <sup>3</sup>	၁၀.၈၆	၁၁.၉၂	၅၀	NEQG
PM <sub>2.5</sub>	μg/m <sup>3</sup>	၅.၆၈	၆.၅၆	၂၅	NEQG
CO	ppm	၀.၂၈	၀.၄၂	၂၅	ACGIH
CO <sub>2</sub>	ppm	၁၁၃.၆၈	၂၂၄.၃၃	၅၀၀၀	NEQG
NO <sub>2</sub>	μg/m <sup>3</sup>	၁၇.၉၉	၂၃.၈၃	၂၀၀	WHO
SO <sub>2</sub>	μg/m <sup>3</sup>	၁.၀၆	၁.၀၅	၂၀	ACGIH
VOC	ppm	၀.၂၂	၀.၁၀	၂၀	NEQG
O <sub>3</sub>	ppm	၀.၀၀၈၆	၀.၀၀၄၅	၁၀၀	NEQG

**E Guard Environmental Services**



**ဆည်သံတိုင်းတာခြင်းရလဒ်**

**ဆည်သံတိုင်းတာခြင်းရလဒ်**

Location	Season	Measured Values (dB(A))	
		Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Yangon JR Family (Source)	Wet Season	61.10	59.51
Dhamma Yayaye Monastery (Receptor)		58.27	56.70
Applicable Standard Value: NEQEG Guideline	Source	70	70
	Receptor	55	45

**တုန့်ခိုင်းတိုင်းတာခြင်းရလဒ်**

Location	Season	X-Lveq (dB)		Y-Lveq (dB)		Z-Lveq (dB)	
		Day Time 7:00-22:00	Night Time 22:00-6:00	Day Time 6:00-22:00	Night Time 22:00-6:00	Day Time 6:00-22:00	Night Time 22:00-6:00
Point-1 Yangon JR Family	Wet Season	37	35	37	35	38	36
Point-2 Dhamma Yayaye Monastery		39	39	38	37	35	33
Applicable Standard	Residential Area	Day Time (60-65 dB)		Night Time (55-60 dB)			
	Industrial Area	Day Time (65-70 dB)		Night Time (60-65 dB)			

**E Guard Environmental Services**

**ရေနမူနာကောက်ယူရလဒ်များ (လိုင်မြစ်)**

No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
Laboratory Finding (Hlaing River Water near Project Site during Wet Season)				
1	pH	pH	7.5	6-9
2	Color	TCU	150	15
3	Turbidity	NTU	295	5
4	Iron	mg/l	5.8	0.3
5	Chloride	mg/l	4	250
6	Manganese	mg/l	1.76	0.05
7	Total suspended Solids	mg/l	125	35
8	Chemical Oxygen Demand	mg/l	64	250
9	Biochemical Oxygen Demand	mg/l	18	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	20	400
12	Total Phosphorus	mg/l	0.06	0.01
13	Zinc	mg/l	Nil	3
14	Total Nitrogen	mg/l	3.1	n/a
15	Dissolved Oxygen	mg/l	8.1	n/a
16	Arsenic	mg/l	0.03	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.24	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0.11	0.003
19	Dissolved Solids	mg/l	388	1000

Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)

**E Guard Environmental Services**

**မြေအောက်ရေနမူနာကောက်ယူရလဒ်များ (ဝက်ရံတွင်း)**

No.	Parameters	Unit	Water Quality Results	NDWQS
Laboratory Finding (Ground Water at Yangon JR Family Project Site during Wet Season)				
1	pH	pH	7.5	6.5 to 8.5
2	Color	TCU	90	15
3	Turbidity	NTU	133	5
4	Iron	mg/l	7.5	1
5	Chloride	mg/l	7	250
6	Manganese	mg/l	1.76	0
7	Total suspended Solids	mg/l	140	35
8	Chemical Oxygen Demand	mg/l	32	n/a
9	Biochemical Oxygen Demand	mg/l	8	n/a
10	Oil and Grease	mg/l	<5	5
11	Total Coliform Count	CFU/100ml	3	0.05
12	Total Phosphorus	mg/l	0.372	0.01
13	Total Nitrogen	mg/l	1.3	n/a
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	9.3	n/a
16	Arsenic	mg/l	0.03	0.01
17	Chromium	mg/l as CaCO <sub>3</sub>	0.24	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0.11	0.003

Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)

**E Guard Environmental Services**

**ရေနမူနာကောက်ယူရလဒ်များ (ဝက်ရံအနီးရှိရေမြောင်း)**

No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
Laboratory Finding (Wastewater near Yangon JR Family Project Site during Wet Season)				
1	pH	pH	7.1	6-9
2	Color	TCU	80	15
3	Turbidity	NTU	120	5
4	Iron	mg/l	5.4	0.3
5	Chloride	mg/l	5	250
6	Manganese	mg/l	0.8	0.05
7	Total suspended Solids	mg/l	125	35
8	Chemical Oxygen Demand	mg/l	96	250
9	Biochemical Oxygen Demand	mg/l	28	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	12	400
12	Total Phosphorus	mg/l	0.372	2
13	Total Nitrogen	mg/l	3.2	30
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	7.1	n/a
14	Arsenic	mg/l	0.008	0.01
15	Chromium	mg/l as CaCO <sub>3</sub>	0.23	0.05
16	Cadmium	mg/l as CaCO <sub>3</sub>	0.087	0.003
17	Lead	mg/l	Nil	0.2

Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)

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ရေညစ်ညမ်းမှု တိုင်းတာခြင်းရလဒ်

Location	Season	Measured Values (dB(A))	
		Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Yangon JR Family (Source)	Dry Season	62.43	59.08
Dhamma Yayaye Monastery (Receptor)		59.26	55.72
Applicable Standard Value: NEQEG Guideline	Source	70	70
	Receptor	55	45

တုန့်ခံမှုတိုင်းတာခြင်းရလဒ်

Location	Season	X-Lveq (dB)		Y-Lveq (dB)		Z-Lveq (dB)	
		Day Time 7:00-22:00	Night Time 22:00-6:00	Day Time 6:00-22:00	Night Time 22:00-6:00	Day Time 6:00-22:00	Night Time 22:00-6:00
Point-1 Yangon JR Family	Dry Season	36	30	35	30	39	29
Point-2 Dhamma Yayaye Monastery		39	31	39	31	44	39
Applicable Standard	Residential Area	Day Time (60-65 dB)		Night Time (55-60 dB)			
	Industrial Area	Day Time (65-70 dB)		Night Time (60-65 dB)			

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လေအရည်အသွေးတိုင်းတာမှုရလဒ်

လေအရည်အသွေး ဝါဒါတီ	ယူနစ်	တိုင်းတာရရှိသည့်တန်ဖိုး		လမ်းညွှန်တန်ဖိုး	လိုက်နာသည့်စံနှုန်း
		တိုင်းတာသည့်နေရာ-၁: စက်ရုံအတွင်း (Source)	တိုင်းတာသည့်နေရာ-၂: မြေအောက်ကျောင်း (Receptor)		
PM <sub>10</sub>	μg/m <sup>3</sup>	၂၅.၂၉	၂၃.၆၆	၅၀	NEQG
PM <sub>2.5</sub>	μg/m <sup>3</sup>	၁၅.၅၈	၁၂.၄၂	၂၅	NEQG
CO	ppm	၀.၀၀၁၇၇	၀.၀၀၀၀၇	၂၅	ACGIH
CO <sub>2</sub>	ppm	၂၄၀.၁၄	၁၅၃.၀၅	၅၀၀၀	NEQG
NO <sub>2</sub>	μg/m <sup>3</sup>	၂၇.၇၆	၄၂.၉၂	၂၀၀	WHO
SO <sub>2</sub>	μg/m <sup>3</sup>	၃.၃၃	၂.၉၆	၂၀	ACGIH
VOC	ppm	၀.၄၄	၁.၅၇	၂၀	NEQG
O <sub>3</sub>	ppm	၀.၀၀၀၈	၀.၀၀၂၉	၁၀၀	NEQG

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မြေအောက်ရေညစ်ညမ်းမှုကောက်ယူရလဒ်များ (စက်ရုံတွင်း)

No.	Parameters	Unit	Water Quality Result	NEQEG/WHO
Laboratory Finding (Ground Water at Yangon JR Family Project Site during Dry Season)				
1	pH (Lab Result)	pH	6.9	6-9
2	Color	TCU	180	15
3	Turbidity	NTU	78.1	5
4	Iron	mg/l	9.8	0.3
5	Chloride	mg/l	5	n/a
6	Manganese	mg/l	1.01	0.05
7	Total suspended Solids	mg/l	372	35
8	Chemical Oxygen Demand	mg/l	32	n/a
9	Biochemical Oxygen Demand	mg/l	4	n/a
10	Oil and Grease	mg/l	<5	5
11	Total Coliform Count	CFU/100ml	0	0.05
12	Total Phosphorus	mg/l	0.272	0.01
13	Total Nitrogen	mg/l	2.3	n/a
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	5.8	n/a
16	Arsenic	mg/l	0.08	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.46	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
19	Dissolved Solids	mg/l	96	n/a

Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Nov, 2018)

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ရေနမူနာကောက်ယူရလဒ်များ (လိုင်မြစ်)				
No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
Laboratory Finding (Hlaing River Water near Project Site during Dry Season)				
1	pH	pH	7.1	6-9
2	Color	TCU	300	15
3	Turbidity	NTU	281	5
4	Iron	mg/l	8.6	0.3
5	Chloride	mg/l	4	250
6	Manganese	mg/l	0.84	0.05
7	Total suspended Solids	mg/l	650	35
8	Chemical Oxygen Demand	mg/l	96	250
9	Biochemical Oxygen Demand	mg/l	30	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	0	400
12	Total Phosphorus	mg/l	0.038	0.01
13	Zinc	mg/l	Nil	3
14	Total Nitrogen	mg/l	3.4	n/a
15	Dissolved Oxygen	mg/l	55	n/a
16	Arsenic	mg/l	0.01	0.01 - 0.05
17	Chromium	mg/l as CaCO <sub>3</sub>	0.49	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
19	Dissolved Solids	mg/l	109	1000

Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)

**လက်တွေ့ကွင်းဆင်း လေ့လာခြင်း**

လူမှုစီးပွားဝန်းကျင်ဆိုင်ရာ စစ်တမ်းကောက်ယူခြင်း



ကုန်ကလေးကျေးရွာ (၁၂.၁၁.၂၀၁၉)

ကုန်းကလေးကျေးရွာ (၁၂.၁၁.၂၀၁၉)

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ရေနမူနာကောက်ယူရလဒ်များ (စက်ရုံအနီးရှိရေမြောင်း)				
No.	Parameters	Unit	Water Quality Results	NEQEG/ WHO
Laboratory Finding (Wastewater near Yangon JR Family Project Site during Dry Season)				
1	pH	pH	7.1	6-9
2	Color	TCU	400	15
3	Turbidity	NTU	1000	5
4	Iron	mg/l	8.9	0.3
5	Chloride	mg/l	6	250
6	Manganese	mg/l	2.73	0.05
7	Total suspended Solids	mg/l	820	35
8	Chemical Oxygen Demand	mg/l	128	250
9	Biochemical Oxygen Demand	mg/l	48	50
10	Oil and Grease	mg/l	<5	10
11	Total Coliform Count	CFU/100ml	16	400
12	Total Phosphorus	mg/l	0.054	2
13	Total Nitrogen	mg/l	4.7	30
14	Zinc	mg/l	Nil	3
15	Dissolved Oxygen	mg/l	4.7	n/a
16	Arsenic	mg/l	0.03	0.01
17	Chromium	mg/l as CaCO <sub>3</sub>	0.38	0.05
18	Cadmium	mg/l as CaCO <sub>3</sub>	0	0.003
19	Lead	mg/l	Nil	0.2

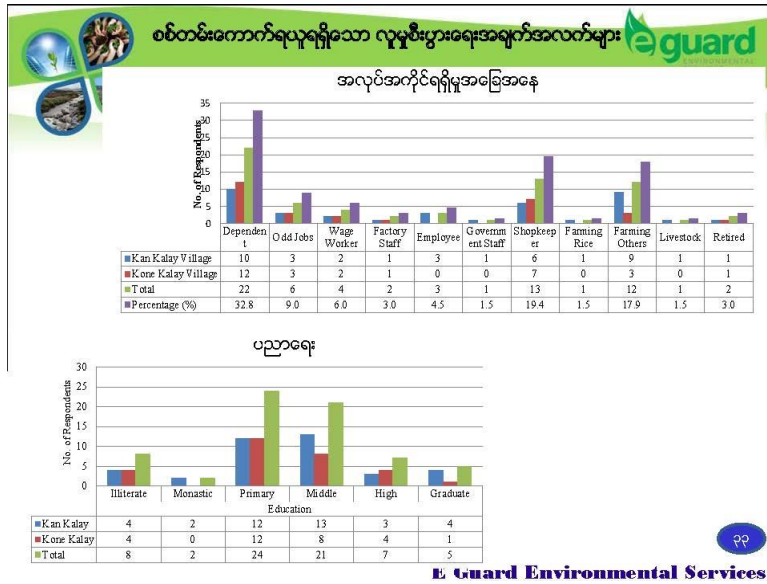
Source: Site Observation, ISO tech Lab, SGS Lab, Supreme Lab (Sept, 2018)

**လူမှုစီးပွားဝန်းကျင်ဆိုင်ရာ စစ်တမ်းကောက်ယူခြင်း**



မြောင်းတကာစက်မှုဇုန် (၁၃.၁၁.၂၀၁၉)

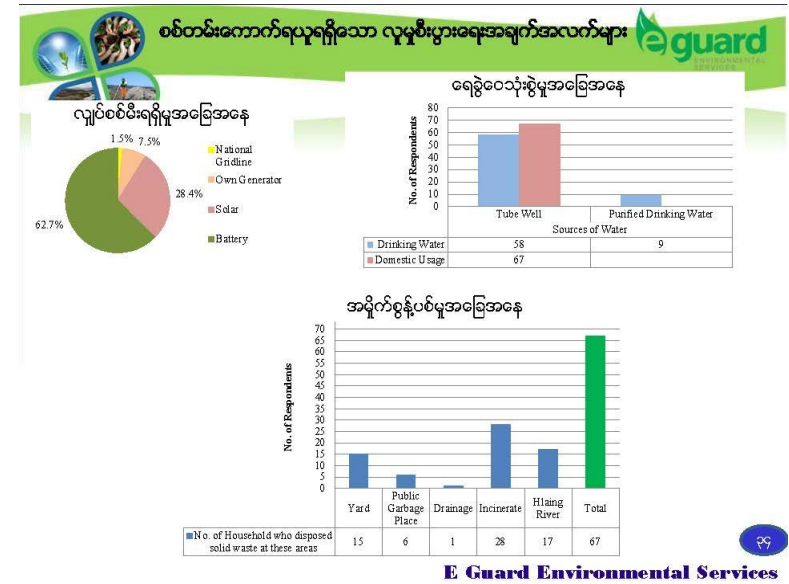
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**ဒေသခံပြည်သူများ၏သဘောထားအမြင်များ**

	ရာခိုင်နှုန်း (%)
<b>ဒေသခံပြည်သူများအတွက် မျှော်လင့်ထားသော ဖွံ့ဖြိုးတိုးတက်မှုအခြေအနေ</b>	
စီးပွားရေး	၂၅.၄
ပို့ဆောင်ရေးကိရိယာ	၁၁.၉
လျှပ်စစ်ဓာတ်အား	၁၅
<b>စက်မှုနှင့် ရရှိသော အကျိုးကျေးဇူးများ</b>	
စီးပွားရေး	၃
ကျန်းမာရေး	၁၅
အလုပ်အကိုင်အခွင့်အလမ်း	၃၂.၉
<b>စက်မှုနှင့် ဖြစ်ပေါ်လာသော ဆိုးကျိုးများ</b>	
အနံ့	၃၄.၃
လေအရည်အသွေးနိမ့်ကျခြင်း	၃
စွန့်ပစ်အမှတ်	၄.၅
တိရစ္ဆာန်များအတွက် စားကျက်မြေလျော့နည်းလာခြင်း	၁၅
လူမှုရေးဆိုင်ရာတာဝန်ခံဆောင်ရွက်မှု ယှဉ်ခြင်း	၁၅
မျက်စိစိပ်ခြင်း	၁၅
ရောဂါဖြစ်ပွားမှု မြင့်တက်လာခြင်း	၁၅
အသက်ပျက်အထက် အမျိုးသမီးများအတွက် အလုပ်အကိုင်အခွင့်အလမ်းရှားပါးခြင်း	၁၅
စုစုပေါင်း	၄၅

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- လုပ်ငန်းလည်ပတ်စဉ်ကာလအတွင်း ဖြစ်ပေါ်လာနိုင်သော သိသာထင်ရှားသည့် ကောင်းကျိုး များ**
- စက်ရုံ လည်ပတ်နိုင်ခြင်းကြောင့် ဒေသခံများအလုပ်အကိုင် ရရှိခြင်းနှင့် ဝန်ထမ်းများ အတွေ့အကြုံများရရှိခြင်း
  - လိုအပ်သောဆောက်လုပ်ရေးသံမဏိများကို ပြည်တွင်းတွင် အလွယ်တကူရရှိ နိုင်သောကြောင့် နိုင်ငံခြားမှ မှာယူတင်သွင်းမှု လျော့နည်းလာနိုင်ခြင်းနှင့် ဈေးနှုန်းသက်သာစွာဖြင့် အချိန်မှီဝယ်ယူရရှိနိုင်ခြင်း
  - နိုင်ငံခြားသားရင်းနှီးမြှုပ်နှံမှုများပိုမိုများပြားလာခြင်းနှင့် နိုင်ငံတော်ဝင်ငွေရရှိခြင်း
  - နောင်အနာဂတ်တွင်နိုင်ငံခြားသို့တင်ပို့ရောင်းချလာနိုင်ခြင်းကြောင့်နိုင်ငံခြားဝင်ငွေရရှိ လာနိုင်ခြင်း
- E Guard Environmental Services**




## စက်ရုံတည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုများနှင့် လျော့ချရေးနည်းလမ်းများ

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အကြောင်းအရာ	တည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်နိုင်သော အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
မြေအရည်အသွေး	<ul style="list-style-type: none"> <li>မြေတူးခြင်း</li> <li>စီမံကိန်းဧရိယာအတွင်း အီဇယ်ယိုစိတ်ခြင်း နှင့် အခြားဆောက်လုပ်ရေးသုံး ဖွန်ပစ်ပစ္စည်းများ</li> <li>လုပ်ငန်းသုံးယာဉ်များမှ အင်ဂျင်စင်နှင့် လောင်စာဆီများယိုစိတ်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>စက်ပစ္စည်းများအား ပုံမှန်စစ်ဆေးမှုပြုလုပ်ခြင်း</li> <li>မြေပြင်ထိန်းသိမ်းရေးနေရာအား သတ်မှတ်၍ ကွန်ကရစ်ခင်းစေခြင်း</li> <li>ဒေသမျိုးရင်းအပင်များ၊ အလှစိုက်အပင်များ နှင့် မြက်ပင်များစိုက်ပျိုးခြင်း</li> <li>ဆီယိုစိတ်မှုမဖြစ်ပေါ်စေရန် စနစ်တကျ အသုံးပြုစေခြင်း</li> </ul>
ရေအရည်အသွေး	<p><b>မြေအောက်ရေအသုံးပြုမှု</b></p> <ul style="list-style-type: none"> <li>တည်ဆောက်ရေးလုပ်ငန်းများအတွက် ရေအသုံးပြုခြင်း</li> </ul> <p><b>မြေပေါ်ရေအသုံးပြုမှု</b></p> <ul style="list-style-type: none"> <li>တည်ဆောက်ရေးလုပ်ငန်းများမှဖွန်ပစ်ရေ ထွက်ရှိခြင်း</li> <li>တည်ဆောက်ရေးလုပ်ငန်းသုံး ယန္တရားများနှင့်ယာဉ်များမှ ဆီယိုစိတ်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>မိုးရာသီတွင် မိုးရေညိုလောင်း၍ ရေမြန်းခြင်းနှင့် တည်ဆောက်ရေးလုပ်ငန်းများတွင်အသုံးပြုခြင်း</li> <li>ရေစိုစွန်းပစ်သည့်ခြင်းများအား ပုံမှန်စစ်ဆေးခြင်း</li> <li>စီမံကိန်းအဆိုပြုရာမှရေမြောင်းအား အပတ်စဉ်စစ်ဆေး၍ ထိန်းသိမ်းခြင်း</li> <li>မြေအောက်ရေအသုံးပြုမှုကို သေချာစစ်ဆေးခြင်း</li> <li>လုပ်ငန်းသုံးယာဉ်များနှင့် စက်ယန္တရားများအား ဆီယိုစိတ်မှုမှ ကာကွယ်ရန် ပုံမှန်စစ်ဆေးခြင်း</li> </ul>

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E Guard Environmental Services

အကြောင်းအရာ	တည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်နိုင်သော အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
လေအရည်အသွေး (PM <sub>10</sub> , PM <sub>2.5</sub> , CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> )	<ul style="list-style-type: none"> <li>မြေယာရှင်းလင်းခြင်း</li> <li>လုပ်ငန်းသုံး စက်ပစ္စည်းများ လည်ပတ်ရာမှ အမှုန်အမွှားများ ထွက်ရှိခြင်း</li> <li>ဆောက်လုပ်ရေးလုပ်ငန်းသုံး ပစ္စည်းများ သယ်ယူသောယာဉ်များ သွားလာခြင်းမှ ဓာတ်ငွေ့များထွက်ရှိခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>စက်ရုံ၏အဓိကလမ်းမအား ရေဖျန်းပေးခြင်း</li> <li>လုပ်ငန်းသုံးယာဉ်များအား စီမံကိန်း ဧရိယာအတွင်း အရှိန်ကိုလျော့ချစေခြင်း</li> <li>မြေတူးခြင်းနှင့် မြေညှိခြင်းလုပ်ငန်းများအား အချိန်ကာနီးသတ်ပြုလုပ်ခြင်း</li> <li>စီမံကိန်းပတ်ဝန်းကျင်သို့ အမှုန်များထွက်ရှိမှု လျော့နည်းစေရန် နေကာမိုကောစိမ်းများ တပ်ဆင်ထားခြင်း</li> </ul>
ဆူညံသံနှင့် တုန်ခါမှု (dB(A))	<ul style="list-style-type: none"> <li>တိုင်ရိုက်သွင်းခြင်း၊ မြေတူးခြင်း၊ ဆောက်လုပ်ရေးလုပ်ငန်းသုံးပစ္စည်းများ သယ်ယူခြင်းစသည့် ဆောက်လုပ်ရေးလုပ်ငန်းများ</li> <li>ဒီဇယ်သုံး ဂျန်ဂျာများနှင့် သယ်ယူပို့ဆောင်ရာတွင် အသုံးပြုသော ယာဉ်များမှ ဆူညံသံဖြစ်ပေါ်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>ညအချိန်တွင် ယန္တရားကြီးများအား မလည်ပတ်စေခြင်း</li> <li>ဆောက်လုပ်ရေးလုပ်ငန်းသုံးပစ္စည်းများ၊ ယာဉ်များနှင့် ဂျန်ဂျာများအား ပုံမှန် စစ်ဆေးမှု ပြုလုပ်စေခြင်း</li> <li>အသုံးပြုသော ဂျန်ဂျာတို့ နှင့် ယန္တရားကြီးများ တပ်ဆင်ထားရှိခြင်း</li> </ul>

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အကြောင်းအရာ	တည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်နိုင်သော အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
ရေဆိုးထွက်ရှိမှု	<ul style="list-style-type: none"> <li>သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှုမှ မိလ္လာအညစ်အကြေးနှင့် ရေဆိုးထွက်ရှိခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှုမှ မိလ္လာအညစ်အကြေးနှင့် ရေဆိုးထွက်ရှိခြင်းကို စီမံခန့်ခွဲမှု ပြုလုပ်စေခြင်း</li> <li>ရေမြောင်းပိုက်လိုက်ပုံမှန်စစ်ဆေးရန် ပုံမှန်စစ်ဆေးခြင်း</li> </ul>
အစိုင်အခံ ဖွန်ပစ်ပစ္စည်းများ	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိ ဖွန်ပစ်ပစ္စည်းနှင့် အန္တရာယ်မရှိ ဖွန်ပစ်ပစ္စည်း</li> <li>တည်ဆောက်ရေးလုပ်ငန်းစဉ်များမှ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး ဖွန်ပစ်ပစ္စည်းများ ထွက်ရှိခြင်း</li> <li>ယန္တရားများမှ ဆီအသုံးပြုခြင်း၊ ဆောက်လုပ်ရေး လုပ်ငန်းသုံး ယာဉ်များနှင့် ယန္တရားများမှ ဖွန်ပစ်ဆီများ</li> </ul>	<ul style="list-style-type: none"> <li>တူးဖော်ပြီးသော မြေများအား YCDC သို့မဟုတ် အမှိုက်သိမ်းဝန်ဆောင်မှုကုမ္ပဏီများနှင့် ချိတ်ဆက်ဖွန်ပစ်ခြင်း</li> <li>ယာဉ်ကြောကြာသည့် အချိန်တွင် မြေသယ် ယာဉ်များ ဝန်ပို့သယ်ဆောင်မှုကို ကန့်သတ်ထားခြင်း</li> <li>အစိုင်အခံဖွန်ပစ်ပစ္စည်းများအား YCDC နှင့် ချိတ်ဆက်ဖွန်ပစ်စေခြင်း၊ မြောင်းတကာ စက်မှုဇုန်ရှိ ဖွန်ပစ်နေရာသို့ သွားရောက် ဖွန်ပစ်စေခြင်း</li> </ul>

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အကြောင်းအရာ	တည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိစေရန် အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
လုပ်ငန်းစဉ် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>အမြင့်မှ ပြုတ်ကျခြင်း စသည့် မတော်တဆ ထိခိုက်မှုများ</li> <li>ချော်ကျခြင်း၊ မတော်တဆနှင့် ဝါယာရှောစသည့် သေးငယ်သော ထိခိုက်မှုများ</li> <li>တည်ဆောက်ရေးလုပ်ငန်းစဉ်မှ ထွက်ရှိလာသော ရုဉ်သံများ</li> <li>ယာဉ်များအသုံးပြုခြင်း နှင့် ယန္တရားများ လည်ပတ်အသုံးပြုခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အစီအစဉ်အား ရေးဆွဲ၍ စီမံကိန်းဧရိယာအတွင်း ဝန်ထမ်းများဖတ်ရှုနိုင်ရန် မြန်မာဘာသာဖြင့် မြင်သာသည့်နေရာတွင် တပ်ဆင်ထားရှိခြင်း</li> <li>✓ လုပ်ငန်းစဉ်အတွင်း ဝန်ထမ်းများအားသင့်တော်သော တစ်ကိုယ်ရေကာကွယ်ရေးပစ္စည်းများ ဝတ်ဆင်အသုံးပြု၍ အလုပ်လုပ်စေခြင်း</li> <li>✓ ဆောက်လုပ်ရေးယန္တရားများ ကိုင်တွယ်သည့် ဝန်ထမ်းများအား သင်တန်းပေးခြင်း</li> <li>✓ သင်တန်းဆင်းနှင့် လိုင်စင်ရဝန်ထမ်းများအား ကိုင်တွယ် အသုံးပြုစေခြင်း</li> <li>✓ စီမံကိန်းအစီအစဉ်မှ စီမံကိန်းဧရိယာအတွင်း လုံခြုံရေး သင်္ကေတများအား မြင်သာစွာတပ်ဆင်ထားစေခြင်း</li> </ul>

အကြောင်းအရာ	တည်ဆောက်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိစေရန် အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
အသံ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>ဆောက်လုပ်ရေးလုပ်ငန်းသုံး ပစ္စည်းများ သယ်ရုံခြင်းကြောင့် ယာဉ်ကြောပိတ်ခြင်းနှင့် မတော်တဆမှုများ</li> <li>တည်ဆောက်ရေးလုပ်ငန်းစဉ်များအတွင်း ကူးစက်ရောဂါများ</li> </ul>	<ul style="list-style-type: none"> <li>✓ ရန်ကုန်-ပြည်ကားလမ်းမတစ်လျှောက် လုပ်ငန်းသုံးယာဉ်များကြောင့် ယာဉ်ကြောကြပ်ပိတ်မှု လျော့နည်းစေရန် စီမံကိန်းအစီအစဉ်မှ အချိန်ခန့်ခွဲမှု ပြုလုပ်စေခြင်း</li> <li>✓ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး ယန္တရားများနှင့် ပစ္စည်းများအား စီမံကိန်းဧရိယာ ပြင်ပတွင် မထားရှိစေခြင်း</li> </ul>

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## စက်ရုံလည်ပတ်ရေးကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုများနှင့် လျော့ချရေးနည်းလမ်းများ

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အကြောင်းအရာ	လည်ပတ်ရေးကာလတွင်ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိစေရန် အကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
လေအရည်အသွေး (PM <sub>10</sub> , PM <sub>2.5</sub> , CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> )	<ul style="list-style-type: none"> <li>သံတိုသံများသယ်ယူခြင်းနှင့်မြန်လည် ခွဲခြားသန့်စင်ခြင်း</li> <li>သံတိုသံများအားအပူပေးခြင်းနှင့် ပုံလောင်းခြင်း</li> <li>သယ်ယူပို့ဆောင်ရေးယာဉ်များ သွားလာခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ မီးခိုးခေါင်းတိုင်တွင်တပ်ဆင်ထားသော wet scraper အားပုံမှန်စစ်ဆေးရန်။</li> <li>✓ စက်ရုံတွင်းရှိ လေအရည်အသွေးအား ပုံမှန်စစ်ဆေးရန်။</li> <li>✓ လုပ်ငန်းစဉ်တွင်းသန့်ရှင်းရေးပုံမှန်လုပ်ပေးရန်။</li> <li>✓ စက်ရုံ၏ အဓိကလမ်းပေါ်တွင် ရေချိုးပေးခြင်း။</li> <li>✓ စက်ရုံတွင်းသင့်လျော်သော လေဝင်လေထွက် ကောင်းမွန်စေရန်စီစဉ်ပေးခြင်း။</li> </ul>
ရုဉ်သံနှင့် တုန်ခါမှု (dB (A))	<ul style="list-style-type: none"> <li>သယ်ယူပို့ဆောင်ရေးယာဉ်များ သွားလာခြင်း</li> <li>စက်ယန္တရားကြီးများလည်ပတ်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ စက်ယန္တရားကြီးများအားပုံမှန်စစ်ဆေးပေးခြင်း။</li> <li>✓ အရေးပေါ်မီးစက်များအားအသံလုံသောခန်းများ တွင်ထားရှိခြင်း</li> </ul>

အကြောင်းအရာ	လုပ်ငန်းစဉ်အကျဉ်းချုပ်နှင့်ပတ်သက်သည့်အကြောင်းအရာများ	လျော့ချစေနိုင်သည့်လမ်းများ
မြေအရည်အသွေး	<ul style="list-style-type: none"> <li>ဒီဇယ်ဆီများ၊ လောင်စာဆီများ၊ ယိုစိတ်ခြင်း၊</li> <li>မော်တော်ယာဉ်များ၊ သွားလာစဉ်တင်ဆောင်ဆီ၊ ဒီဇယ်ဆီများ၊ မတော်တဆ ယိုစိတ်ခြင်း၊</li> </ul>	<ul style="list-style-type: none"> <li>✓ လောင်စာဆီသို့ လောင်စာအဆေးများတွင်သင့်လျော်သောသို့လောင်စာများဖြင့်သိမ်းဆည်းခြင်း၊</li> <li>✓ လောင်စာဆီသို့လောင်စာ အဆေးများအား ပုံမှန်စစ်ဆေးပေးခြင်း၊</li> <li>✓ စက်ယန္တရားများအောက်တွင် ဆီယိုစိတ်များ ထားရှိခြင်း၊</li> <li>✓ စက်ယန္တရားများနှင့် မော်တော်ယာဉ်များအား ပုံမှန်စစ်ဆေးပေးခြင်း၊</li> </ul>
ရေအရည်အသွေး	<ul style="list-style-type: none"> <li>မြေအောက်ရေအသုံးပြုမှု</li> <li>တည်ဆောက်ရေးလုပ်ငန်းများနှင့် လုပ်ငန်းသုံးလုပ်ငန်းစဉ်မှ ရေအသုံးပြုခြင်း</li> <li>မြေပေါ်ရေအသုံးပြုမှု</li> <li>တည်ဆောက်ရေးလုပ်ငန်းများမှ စွန့်ပစ်ရေထွက်ရှိခြင်း</li> <li>တည်ဆောက်ရေးလုပ်ငန်းသုံး ယန္တရားများနှင့်ယာဉ်များမှ ဆီယိုစိတ်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ ရေမီတာများတပ်ဆင်ပြီး ရေအသုံးပြုမှုအား ဖတ်သားထားခြင်း</li> <li>✓ ရေအရင်းအမြစ်အားစနစ်တကျသုံးစွဲတတ်စေရန် ဝန်ထမ်းများအား ညွှန်ကြားထားခြင်း</li> <li>✓ အိမ်သာနှင့်မီးဖိုချောင်တွင် ရေအသုံးအကျိုး အသုံးပြုစေရန် သင့်လျော်သောရေမီတာများ တပ်ဆင်အသုံးပြုစေခြင်း</li> </ul>

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အကြောင်းအရာ	လုပ်ငန်းစဉ်အကျဉ်းချုပ်နှင့်ပတ်သက်သည့်အကြောင်းအရာများ	လျော့ချစေနိုင်သည့်လမ်းများ
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>အမြင့်မှပြုတ်ကျခြင်း စသည့်မတော်တဆ ထိခိုက်မှုများ</li> <li>ရေကူးခြင်း၊ မတော်တဆနှင့် ဝါယာရှော့ စသည့် သေးငယ်သောထိခိုက်မှုများ</li> <li>လုပ်ငန်းလုပ်ကိုင်လည်ပတ်ရာမှ ဆူညံသံများထွက်ပေါ်ခြင်း</li> <li>သတ္တုရည်ပျံမှုများနှင့် ထိတွေ့လုပ်ကိုင် ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ လုပ်ငန်းခွင်အတွင်းသက်ဆိုင်ရာ စည်းကမ်းများ ထုတ်ပြန်ထားရှိခြင်း</li> <li>✓ အလုပ်သမားများအားသင့်တော်သော တစ်ကိုယ်ရေကာကွယ်ရေးပစ္စည်းများ ဝတ်ဆင်အသုံးပြု၍ အလုပ်လုပ်ရန်စည်းကမ်းတင်းကြပ်စေခြင်း</li> <li>✓ အလုပ်သမားများအားကျန်းမာရေး ပုံမှန်စစ်ဆေးစစ်မှုများ ပြုလုပ်စေခြင်း</li> <li>✓ လုပ်ငန်းခွင်တွင်းသင့်လျော်သော လေဝင်လေထွက်ရရှိစေရန် စီမံထားရှိခြင်း</li> <li>✓ လုပ်ငန်းခွင်တွင်း ဝန်ထမ်းများအား ရှေ့ဦးသူနာပြု သင်တန်းများ၊ မီးသတ်အရေးပေါ် သင်တန်းများ နှင့်အခြားလိုအပ်သောသင်တန်းများ ထောက်ပံ့ပေးခြင်း</li> <li>✓ စီမံကိန်းအစီအစဉ်များမှ စီမံကိန်းစနစ်ယာအတွင်း လုံခြုံရေး သင်တန်းများအား ပြင်သစ်တပ်ဆင်ထားစေခြင်း</li> </ul>

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အကြောင်းအရာ	လုပ်ငန်းစဉ်အကျဉ်းချုပ်နှင့်ပတ်သက်သည့်အကြောင်းအရာများ	လျော့ချစေနိုင်သည့်လမ်းများ
ရေဓာတ်ထွက်ရှိမှု	<ul style="list-style-type: none"> <li>သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှု မိလ္လာအညစ်အကြေးနှင့် ရေဓာတ်ထွက်ရှိခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှု မိလ္လာအညစ်အကြေးနှင့် ရေဓာတ်ထွက်ရှိခြင်းကို စီမံခန့်ခွဲမှု ပြုလုပ်စေခြင်း</li> <li>✓ ရေမြောင်းပိုက်ယိုစိတ်မှုနှင့် ပုံမှန်စစ်ဆေးခြင်း</li> <li>✓ စက်ရုံဝန်ထုပ်ရုံ ရေမြောင်းများအား ပိတ်ဆို့မှုမရှိစေရန် ပုံမှန်သန့်ရှင်းပေးခြင်း</li> </ul>
အပူအပူစွန့်ပစ်ပစ္စည်းများ	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းနှင့် အန္တရာယ်မရှိ စွန့်ပစ်ပစ္စည်း</li> <li>ဝန်ထမ်းဆောင်မှုများမှ အိမ်သုံးအပူပေးစနစ်များ ထွက်ရှိခြင်း</li> <li>ယန္တရားများမှ ဆီအသုံးပြုခြင်း၊ လုပ်ငန်းသုံး ယာဉ်များနှင့် ယန္တရားများမှ စွန့်ပစ်ဆီများ</li> <li>စက်ရုံလုပ်ငန်းများမှ ဘေးထွက်စွန့်ပစ်ပစ္စည်း များထွက်ရှိခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ အပူအပူစွန့်ပစ်ပစ္စည်းများအား YCDC နှင့် ဖျိတ်ဆက်စွန့်ပစ်စေခြင်း</li> <li>✓ မြောင်းတကာစက်မှုရရှိသည့်ပတ်ဝန်းကျင်သော စွန့်ပစ်နေရာသို့သွားရောက်စွန့်ပစ်စေခြင်း</li> <li>✓ အပူပေးစနစ်ပစ်ပစ္စည်းများအား ပြန်လည်အသုံးပြုစေခြင်း</li> <li>✓ အန္တရာယ်ရှိသောစွန့်ပစ်ပစ္စည်းများအား MSDS လမ်းညွှန်မှုအတိုင်းစွန့်ပစ်စေခြင်း</li> </ul>

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အကြောင်းအရာ	လုပ်ငန်းစဉ်အကျဉ်းချုပ်နှင့်ပတ်သက်သည့်အကြောင်းအရာများ	လျော့ချစေနိုင်သည့်လမ်းများ
အသစ်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> <li>အပူပေးခြင်းနှင့်ပုံလောင်းခြင်း လုပ်ငန်းစဉ်များတွင် လေထုထဲသို့ သံမှန်များလွှင့်စင်စေနိုင်ခြင်း</li> <li>လုပ်ငန်းလည်ပတ်စဉ်တွင် မတော်တဆမီးဘေးအန္တရာယ်ဖြစ်ပေါ်နိုင်ခြင်း</li> </ul>	<ul style="list-style-type: none"> <li>✓ စက်ရုံလုပ်ငန်းခွင်အားပုံမှန်စစ်ဆေးပေးခြင်း</li> <li>✓ လုပ်ငန်းခွင်အနီးတွင်လေထုအရည်အသွေးအားပုံမှန် စစ်ဆေးပေးခြင်း</li> <li>✓ လုပ်ငန်းခွင်အနီးတွင် သတိပေးဆိုင်သံများ တပ်ဆင်ထားခြင်း</li> </ul>

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## စက်ရုံပိတ်သိမ်းချိန်ကာလတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုများနှင့် လျော့ချရေးနည်းလမ်းများ

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အကြောင်းအရာ	ပိတ်သိမ်းချိန်ကာလတွင်ပတ်ဝန်းကျင်ထိခိုက်နိုင်သောအကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
မြေအရည်အသွေး	<input type="checkbox"/> ဖျက်သိမ်းပြီးပစ္စည်းများနှင့် သံတိုက်များထွက်ရှိခြင်း <input type="checkbox"/> မော်တော်ယာဉ်များသွားလာစဉ်တောင်ဆီ၊ ဖိတ်ဆီများ မတော်တဆ ယိုစိတ်ခြင်း။	✓ YCDCနှင့်ချိတ်ဆက်၍ သံတိုက်များနှင့် ဖျက်သိမ်းပြီးအမှိုက်များအာရုံစိုက်ပစ်ပစ်ခြင်း ✓ မတော်တဆဆီယိုစိတ်မှုမဖြစ်စေရန် ပုံမှန်စစ်ဆေးပေးခြင်း ✓ စက်ယန္တရားများနှင့် မော်တော်ယာဉ်များအား ပုံမှန်စစ်ဆေးပေးခြင်း။
ရေအရည်အသွေး	<b>မြေအောက်ရေအသုံးပြုမှု</b> <input type="checkbox"/> ဖျက်သိမ်းရေးလုပ်ငန်းများနှင့် လုပ်ငန်းသုံးလုပ်ငန်းစဉ်မှ ရေအသုံးပြုခြင်း <b>မြေပေါ်ရေအသုံးပြုမှု</b> <input type="checkbox"/> ဖျက်သိမ်းရေးလုပ်ငန်းများမှစွန့်ပစ်ရေထွက်ရှိခြင်း <input type="checkbox"/> တည်ဆောက်ရေးလုပ်ငန်းသုံး ယန္တရားများနှင့် ယာဉ်များမှဆီယိုစိတ်ခြင်း	✓ မြေပေါ်မြေအောက်ရေအားမထိခိုက်စေရန် ရေမြောင်းများအားသန့်ရှင်းပေးခြင်း ✓ မတော်တဆဆီယိုစိတ်မှုဖြစ်ပေါ်ပါက အလျင်အမြန်ရှင်းလင်းပေးခြင်း ✓ အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများအား သက်ဆိုင်ရာအမှိုက်ပုံများတွင် စွန့်ပစ်ပေးခြင်း

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အကြောင်းအရာ	ပိတ်သိမ်းချိန်ကာလတွင်ပတ်ဝန်းကျင်ထိခိုက်နိုင်သောအကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
လေအရည်အသွေး (PM <sub>10</sub> , PM <sub>2.5</sub> , CO, SO <sub>2</sub> , NO <sub>2</sub> , CO <sub>2</sub> , VOC, O <sub>3</sub> )	<input type="checkbox"/> စက်ရုံပိတ်သိမ်းချိန်ကာလတွင် ဖုန်မှုန့်များလွှင့်စင်နိုင်ခြင်း <input type="checkbox"/> စက်ယန္တရားများနှင့် သယ်ယူပို့ဆောင်ရေးယာဉ်များ သွားလာခြင်း	✓ စီမံကိန်းဧရိယာဝန်းကျင်တွင် လုံခြုံရေးသင်္ကေတများအား မြင်သာစွာ တပ်ဆင်ထားပေးခြင်း ✓ စီမံကိန်းဧရိယာဝန်းကျင်တွင် သင့်လျော်သော အကာအရံများထားရှိခြင်း ✓ အလုပ်သမားများအား သင့်တော်သောတစ်ကိုယ်ရေ ကာကွယ်ရေးပစ္စည်းများ ဝတ်ဆင်အသုံးပြု၍ အလုပ်လုပ်စေခြင်း
ဆူညံသံနှင့် တုန်ခါမှု (dB (A))	<input type="checkbox"/> သယ်ယူပို့ဆောင်ရေးယာဉ်များ သွားလာခြင်း <input type="checkbox"/> စက်ယန္တရားကြီးများလည်ပတ်ခြင်း	✓ ယာယီအသံထိန်းအကာအကွယ်များထားရှိခြင်း ✓ နေ့အချိန်တွင်သာလုပ်ငန်းလုပ်ကိုင်ရန် အချိန်ဇယားဖြင့်လုပ်ကိုင်စေခြင်း ✓ စက်ယန္တရားကြီးများအားပုံမှန်စစ်ဆေးပေးခြင်း။ ✓ အသုံးမပြုသောစက်ယန္တရားများအားပိတ်ပေးခြင်း

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E Guard Environmental Services

အကြောင်းအရာ	ပိတ်သိမ်းချိန်ကာလတွင်ပတ်ဝန်းကျင်ထိခိုက်နိုင်သောအကြောင်းအရာများ	လျော့ချရေးနည်းလမ်းများ
ရေဆိုးထွက်ရှိမှု	<input type="checkbox"/> သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှု မိလ္လာအညစ်အကြေးနှင့် ရေဆိုးထွက်ရှိခြင်း	✓ သန့်စင်ခန်းနှင့် ဝန်ထမ်းဆောင်မှု မိလ္လာအညစ်အကြေးနှင့် ရေဆိုးထွက်ရှိခြင်းကို စီမံခန့်ခွဲမှု ပြုလုပ်ပေးခြင်း ✓ ရေမြောင်းကိုလုံခြုံစွာပိတ်ဆို့ပေးရန် ပုံမှန်စစ်ဆေးခြင်း
အစိုင်အခဲ စွန့်ပစ်ပစ္စည်းများ	<b>အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းနှင့် အန္တရာယ်မရှိ စွန့်ပစ်ပစ္စည်း</b> <input type="checkbox"/> ဖျက်သိမ်းရေးလုပ်ငန်းစဉ်များမှ လုပ်ငန်းသုံး စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိခြင်း <input type="checkbox"/> ယန္တရားများမှ ဆီအသုံးပြုခြင်း၊ လုပ်ငန်းသုံး ယာဉ်များနှင့် ယန္တရားများမှစွန့်ပစ်ဆီများ	✓ အမှိုက်များအားခွဲခြားစွန့်ပစ်ပေးခြင်း ✓ သင့်လျော်သောအမှိုက်ကန်များထားရှိပေးခြင်း ✓ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများအား YCDC နှင့် ချိတ်ဆက်စွန့်ပစ်ပေးခြင်း၊ မြောင်းတကာ စက်မှုဇုန်ရှိ စွန့်ပစ်နေရာသို့ သွားရောက် စွန့်ပစ်ပေးခြင်း

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E Guard Environmental Services



အကြောင်းအရာ	ပိတ်သိမ်းချိန်ကာလတွင်းပတ်ဝန်းကျင် ထိခိုက်နိုင်သောအကြောင်းအရာများ	လျော့ချစေရန်လမ်းညွှန်များ
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<input type="checkbox"/> အမြင့်မှပြုတ်ကျခြင်း စသည့်မတော်တဆ ထိခိုက်မှုများ <input type="checkbox"/> ရေပြိုကျခြင်း၊ မတော်တဆနှင့် ဝါယာရော့ စသည့် သေးငယ်သောထိခိုက်မှုများ	✓ လုပ်ငန်းခွင်အတွင်းသက်ဆိုင်ရာ စည်းကမ်းများ ထုတ်ပြန်ထားရှိခြင်း ✓ စေးပစ္စည်းများအားထောက်ပံ့ပေးခြင်း ✓ အလုပ်သမားများအားသင့်တော်သော တစ်ကိုယ်ရေကာကွယ်ရေးပစ္စည်းများ ဝတ်ဆင်အသုံးပြုခြင်း ✓ အလုပ်လုပ်ရန်စည်းကမ်းတင်ကျပ်စေခြင်း ✓ အလုပ်သမားများအားကျန်းမာရေး ပုံမှန်စောစစ်မှုများ ပြုလုပ်စေခြင်း ✓ စီမံကိန်းဇရိယာအတွင်း လုံခြုံရေးသင်တန်းများအား ပြင်သောစွာ တပ်ဆင်ထားစေခြင်း
ကွန်ပျူတာ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	<input type="checkbox"/> အမူပေးခြင်းနှင့်ပုံလောင်းခြင်း လုပ်ငန်းစဉ်များတွင် လေထုထဲသို့ သံမှန်များလွှင့်ပစ်စေနိုင်ခြင်း	<input type="checkbox"/> စက်ရုံလုပ်ငန်းခွင်အားပုံမှန်စစ်ဆေးပေးခြင်း <input type="checkbox"/> လုပ်ငန်းခွင်အနီးတွင်လေထုအရည်အသွေးအားပုံမှန် စစ်ဆေးပေးခြင်း <input type="checkbox"/> လုပ်ငန်းခွင်အနီးတွင် သတိပေးဆိုင်းဘုတ်များ တပ်ဆင်ထားခြင်း

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**E Guard Environmental Services**



### အရေးပေါ်တုံ့ပြန်မှုအစီအစဉ်

- မတော်တဆမီးဘေးအန္တရာယ်မှကာကွယ်နိုင်ရန်သက်ဆိုင်ရာအလုပ်သမားများအား သင်တန်းများပေးခြင်း။
- လုံလောက်သောမီးသတ်ပစ္စည်းကိရိယာများထောက်ပံ့ပေးခြင်း။
- မီးသတ်ဌာန၏စုံစမ်းစစ်ကြည့်မှုများသတိပေးဆိုင်းဘုတ်များအားဝန်ထမ်းများအလွယ်တကူမြင်နိုင်သောနေရာများတွင်ကပ်ထားပေးခြင်း









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**E Guard Environmental Services**

ပတ်ဝန်းကျင်အရည်အသွေး	တိုင်းတာမည့်နည်းလမ်း	စောင့်ကြည့်မည့်ကာလ	တာဝန်ရှိပုဂ္ဂိုလ်
လေအရည်အသွေး	သက်ဆိုင်ရာလေထုတိုင်းတာခြင်းစက်ပစ္စည်းများ	လေ တစ်ကြိမ်	Yangon J.R Family Ltd./ ပတ်ဝန်းကျင်ဆိုင်ရာတာဝန်ရှိသူ
ရေအရည်အသွေး	သက်ဆိုင်ရာဓာတ်ခွဲခန်းများ	လေ တစ်ကြိမ်	Yangon J.R Family Ltd./ ပတ်ဝန်းကျင်ဆိုင်ရာတာဝန်ရှိသူ
မြေနေရာကောက်ယူခြင်း	သက်ဆိုင်ရာဓာတ်ခွဲခန်းများ	လေ တစ်ကြိမ်	Yangon J.R Family Ltd./ ပတ်ဝန်းကျင်ဆိုင်ရာတာဝန်ရှိသူ
အသံဆူညံမှုတိုင်းတာခြင်း	သက်ဆိုင်ရာ အသံတိုင်းတာမှုကိရိယာများ	လေ တစ်ကြိမ်	Yangon J.R Family Ltd./ ပတ်ဝန်းကျင်ဆိုင်ရာတာဝန်ရှိသူ
အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများ	YCDC နှင့် မေုဘီ CDC	နေ့စဉ်	Yangon J.R Family Ltd./ YCDC
လူထုကျန်းမာရေးနှင့်ဘေးကင်းလုံခြုံမှု	စက်မှုဝန်ကြီးဌာန မှထုတ်ပြန်ထားသော လူထုကျန်းမာရေးနှင့်ဘေးကင်းလုံခြုံမှုအစီအစဉ်	လစဉ်	Yangon J.R Family Ltd./ HSE တာဝန်ရှိသူများ

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**E Guard Environmental Services**



### လိုအပ်သောPPEများ





အသံကာကွယ်မှုကိရိယာ

ဦးထုပ်

ဘွတ်ဖိနပ်





အပူကာကွယ်ရုံ

Mask

မျက်နှာကာကွယ်ပေးသည့်ပစ္စည်း

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**E Guard Environmental Services**

**အရေးယူဆောင်ရွက်မှုအစီအစဉ်**

မီးဘေးအန္တရာယ် နှင့် မတော်တဆပေါက်ကွဲမှုများ	<ul style="list-style-type: none"> <li>အချက်ပေးခေါင်းလောင်းတီးရန်</li> <li>မီးသတ်ဌာနအားဖုန်းဆက်အကြောင်းကြားရန်</li> <li>စက်ယန္တရားများပိတ်ခြင်း</li> <li>အဓိကဓာတ်အားပေးလှိုင်းများဖြတ်တောက်ခြင်း</li> <li>မီးငြိမ်းသတ်ခြင်းနှင့်ကယ်ဆယ်ရေးလုပ်ငန်းများ</li> <li>ရှေးဦးသူနာပြုလုပ်ငန်းများ</li> </ul>
အန္တရာယ်ရှိသော (သို့) မီးလောင်လွယ်သောဆီများယိုဖိတ် ခြင်း	<ul style="list-style-type: none"> <li>အချက်ပေးခေါင်းလောင်းတီးရန်</li> <li>အဓိကဓာတ်အားပေးလှိုင်းများဖြတ်တောက်ခြင်း</li> <li>ယိုဖိတ်သောနေရာများကိုကာရံထားရန်</li> <li>ဆီယိုဖိတ်သောအနီးအနားရှိစက်ယန္တရားများအာလည်ပတ်ခြင်းမပြုရန်</li> </ul>
မတော်တဆထိခိုက်မှုများ နှင့် အပူလောင်မှုများ	<ul style="list-style-type: none"> <li>ရှေးဦးသူနာပြုလုပ်ငန်းများ</li> <li>နီးစပ်ရာဆေးရုံ၊ ဆေးခန်းများသို့ပို့ဆောင်ပေးခြင်း</li> </ul>

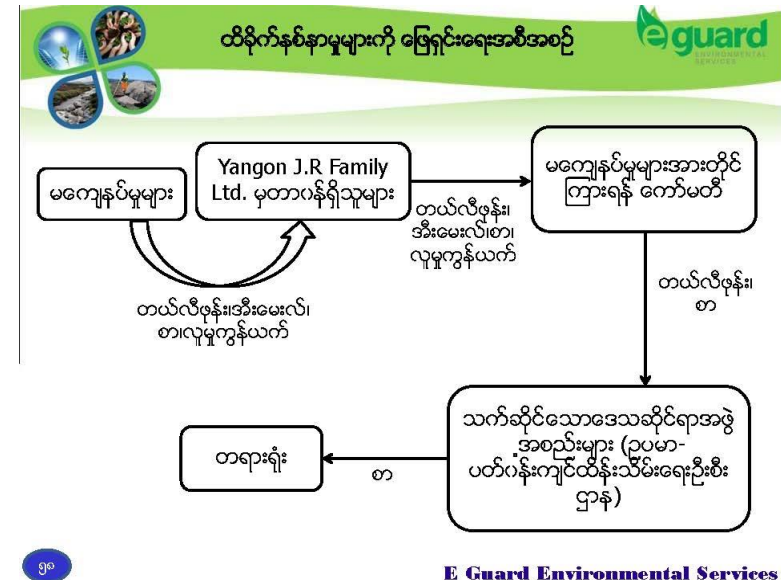
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**လူမှုရေးဆိုင်ရာတာဝန်ဆောင်ရွက်မှုအစီအစဉ် (CSR Plan)**

Yangon J.R Family Ltd သည်လူမှုရေးဆိုင်ရာတာဝန်ဆောင်ရွက်မှုအစီအစဉ်(CSR Plan) တွက်တစ်နှစ်လျှင်အမြတ်၏ ၂%အားအသုံးပြုပါမည်။

- မြောင်းတကာစက်မှုဇုန်ဖွံ့ဖြိုးတိုးတက်စေရန်ပါဝင်ဆောင်ရွက်ခြင်း
- အနီးအနားရှိဒေသခံများ၏လူနေမှုဘဝတိုးတက်ရေးတွင်ပါဝင်ကူညီခြင်း
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးလုပ်ငန်းစဉ်များတွင်အခြေတစ်စုံတစ်ရာပါဝင်ခြင်းနှင့်ပတ်ဝန်းကျင်ဆိုင်ရာစည်းမျဉ်းစည်းကမ်းများအား စဉ်ဆက်မပြတ်လိုက်နာခြင်း

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**စီမံကိန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန် ဆောင်ရွက်ပေးမည့်လျော့ချရေး အစီအမံများ**

- လုပ်ငန်းလည်ပတ်စဉ်ကာလအတွင်းဖြစ်ပေါ်လာနိုင်သည့်ပတ်ဝန်းကျင်နှင့်အခြားထိခိုက်မှုဆိုင်ရာများအားပြန်လည်ဖြေရှင်းပေးရန်။
- အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများ (စွန့်ပစ်ပစ္စည်းနှင့်အခြားပစ္စည်း) ကိုလည်း ပြည်တွင်းရှိ အသိမှတ်ပြု အမှိုက်သိမ်းအဖွဲ့အစည်းနှင့်ချိတ်ဆက်ကာ စွန့်ပစ်ခြင်း (ဥပမာ- YCDC, Dowa) ။
- အနီးအငွေ့ထွက်ရှိမှုများလျော့နည်းစေရန် ထိန်းချုပ်စက်ကိရိယာ (Wet Scrubber) တပ်ဆင်အသုံးပြု ဆောင်ရွက်ထားရှိခြင်း။
- စီမံကိန်းနှင့်ပတ်သက်၍ ဒေသခံများအနေဖြင့် သိလိုသည်များ၊ပြောကြားလိုသည်များ အချိန်မီ သိရှိနိုင်ရန်နှင့်တိုင်ကြားနိုင်ရန် ဆက်သွယ်မေးမြန်းနိုင်သည့် Grievance Mechanisms (ထိခိုက်နစ်နာမှုများကို ဖြေရှင်းရေးအစီအစဉ်) စီမံချက်ထားရှိပေးခြင်း။

၆၀ E Guard Environmental Services





### အရေးပေါ်ကိစ္စရပ်များတွက်သင်တန်းများ



- ဘေးအန္တရာယ်ချိန်တွင်အရေးပေါ်ပြင်ဆင်ချက်များနှင့်ကာကွယ်မှုများ
- မီးသတ်ကိရိယာများအသုံးပြုပုံ
- အရေးပေါ်သတင်းပို့ခြင်းလုပ်ငန်းစဉ်များ
- ကြိုတင်ကာကွယ်ထိန်းသိမ်းမှုများ
- အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများဖိတ်စင်မှုအတွက်တုံ့ပြန်မှု
- ရှေးဦးသူနာပြုသင်တန်းများ




တက်ရောက်လာကြသော သက်ဆိုင်ရာပုဂ္ဂိုလ်များမှ  
စီမံကိန်း နှင့် စီမံကိန်း၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း  
လုပ်ငန်းများနှင့်ပတ်သက်၍ သိရှိလိုသည်များအား မေးမြန်းခြင်း

Here are the mediafire link and QR code for PRODUCTION AND MARKETING OF TMT  
REBARS

[https://www.mediafire.com/folder/p93rpd0i83lh/EIA\\_Report](https://www.mediafire.com/folder/p93rpd0i83lh/EIA_Report)



**Table 6. 1 Summary of the Stakeholder Meeting**

<b>Project Name</b>	Yangon JR Family Co., Ltd
<b>Agenda</b>	(1) Opening (2) Presentation of project description, about Yangon JR Family Co., Ltd by U Zin Wai, the responsible person. (3) Presentation of the scoping stage of EIA procedures by Dr Phyto Naing Zay, Consultant of E Guard Environmental Services (4) Question and Answer Session (5) Closing Remarks by U Zin Wai, the responsible person of Yangon JR Family Co., Ltd (6) Closing
<b>Date</b>	2/August/2018
<b>Time</b>	12:30 am to 2:00 pm
<b>Venue</b>	Dhamma Yay Aye Monastery, Myaungtagar Steel Industrial Zone, Hmawbi Township, Yangon Region
<b>Attendees</b>	6 persons of Governmental organization 18 persons of Private sector Total attendance = 24 persons
<b>Materials Provided</b>	- Agenda - Explanation of Project Background, Objectives, Necessity - Explanation of scoping stage of the EIA procedures - Power-point presentation document on project brief and environmental and social considerations

**Questions: U Maung Zaw (Village Administrator)**

I am the village administrator of Kan Ka Lay village. Factories and workplaces are being constructed and gain job opportunities. But, not satisfied with throwing waste beside the roads, which can harm people's health. And I would like to discuss to act strictly from the responsibilities.

**Answer: Dr Phyo Naing Zay (Consultant, E Guard Environmental Services)**

Thank you for your discussion. The compliance of EIA procedures make the project proponent to take their responsibility. The procedures of EIA already stated that the detailed points how to throw the waste systematically by the project proponents. These facts are included in EIA report. If they do not follow the procedures, the related departments and organizations will take action. The project proponent has to follow the procedures. This would be the least harm if the new factory will be built under the rules and regulations of EIA. Thank you.

**Questions: Daw Zin New Htwe (ECD)**

According to the EIA procedures, did the project proponent inform via MIC to ECD that cooperate with third party to carry out EIA?

**Answer: Dr Phyo Naing Zay (Consultant, E Guard Environmental Services)**

Yes, we have already informed the submission form of selected consultant for EIA, application form for project proposal, ECD registration together with the project proponent and selection of third party by Yangon JR Family Co., Ltd.

**Questions: U Kyaw Phay (Administrator, Myaungtagar Steel Industrial Zone)**

I am **U Kyaw Phay**, the administrator who manages the largest part of Myaungtagar Steel Industrial Zone. I want to talk about that we take part basically when a project is implemented. So, I would like to advise companies and organizations to make the project legally. We have problems to warn these unsystematic projects. This is difficult in practical when we are facing the illegal to the international laws. The local people can complain. The intruders living in the area of industrial zone is a big problem. So, I want to advise the project proponents to do systematically. So, they cannot be harmed. Thank you all for this invited meeting with the surroundings and local people.

**Answer: Dr Phyo Naing Zay (Consultant, E Guard Environmental Services)**

Thank you for attending. These projects relate with from the rural and wards to the government. We need your help when we do social survey. We will not be fine when we interview local people as unknown persons. I want to request you to help us at that time. Thank you so much.

**Questions: Daw Myat Su Mon (ECD)**

Is mitigation measure plan included?

**Answer: Dr Phyo Naing Zay (Consultant, E Guard Environmental Services)**

Yes. It will be.

**Table 6. 2 SHM Activities Photos Recorded for Scoping Stage**



Attendee Registration



Attendee Registration



Attendee Registration



Presentation by project proponent





Presentation by Consultant, E Guard



Question by Stakeholders



Question by ECD



Answer by Consultant, E Guard



Sample: F 01Material:

Method: Fe110Heat No: 01

Analysis Time: 2023-09-06 11:34:21Unit: [%]

	C	Si	Mn	P	S	Cr	Mo
Ø	0.263	0.203	0.591	0.036	0.042	0.266	0.022
1	0.263	0.203	0.591	0.036	0.042	0.266	0.022
	Ni	Cu	Al	Co	Nb	Ti	V
Ø	0.062	0.156	0.0093	0.0065	<0.0050	<0.0020	<0.0030
1	0.062	0.156	0.0093	0.0065	<0.0050	<0.0020	<0.0030
	W	B	Sn	Fe			
Ø	<0.020	<0.0010	0.022	98.32			
1	<0.020	<0.0010	0.022	98.32			



Sample: E 03Material:

Method: Fe110Heat No: 03

Analysis Time: 2023-09-06 11:55:01Unit: [%]

	C	Si	Mn	P	S	Cr	Mo
Ø	0.277	0.219	0.696	0.041	0.040	0.214	0.022
1	0.277	0.219	0.696	0.041	0.040	0.214	0.022
	Ni	Cu	Al	Co	Nb	Ti	V
Ø	0.055	0.144	0.0046	0.0062	<0.0050	<0.0020	<0.0030
1	0.055	0.144	0.0046	0.0062	<0.0050	<0.0020	<0.0030
	W	B	Sn	Fe			
Ø	<0.020	0.0016	0.030	98.25			
1	<0.020	0.0016	0.030	98.25			

Yangon JR Family Limited ၏ ဆောက်လုပ်ရေးလုပ်ငန်းသုံး သံချောင်းများ (TMT Rebar) ထုတ်လုပ်ခြင်းလုပ်ငန်းအတွက်  
ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာအပေါ် စိစစ်သုံးသပ်ချက်နှင့် အကြံပြုချက်များအား ပြန်လည်ဖြည့်စွက်တင်ပြခြင်း

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<b>အကျဉ်းချုပ်အစီရင်ခံစာ</b>		
၁။	အကျဉ်းချုပ်အစီရင်ခံစာအား ယေဘုယျသော ဖော်ပြထားကြောင်း၊ သက်ဆိုင်ရာ အခန်းများကို ညွှန်းဆိုထားကြောင်း၊ Chapter တစ်ခုချင်းအလိုက် အကျဉ်းချုပ်ဖော်ပြထားခြင်းမရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	အကျဉ်းချုပ်အစီရင်ခံစာအား Chapter တစ်ခုချင်းအလိုက် အကျဉ်းချုပ် ပြန်လည်ပြင်ဆင်ဖော်ပြရန်။	အကျဉ်းချုပ်အစီရင်ခံစာအား Chapter တစ်ခုချင်းအလိုက် အကျဉ်းချုပ် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။
	<b>နိဒါန်း</b>		
၂။	အခန်း(၂)တွင် Background of the Study, Detail Information of the Project Proponent နှင့် Study Team for Environmental and Social Studies တို့ကို ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။ စီမံကိန်းဆောင်ရွက်ရသည့် ရည်ရွယ်ချက်၊ ရင်းနှီးမြှုပ်နှံမှုပမာဏနှင့် ထုတ်လုပ်မှုပမာဏတို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။	စီမံကိန်းဆောင်ရွက်ရသည့် ရည်ရွယ်ချက်၊ ရင်းနှီးမြှုပ်နှံမှု ပမာဏ၊ ထုတ်လုပ်သည့် TMT Rebar အရွယ်အစားအများနှင့် ထုတ်လုပ်မှုပမာဏတို့ကို ထည့်သွင်းဖော်ပြရန်။	အခန်းခွဲ ၂.၂ တွင် ပြင်ဆင်ဖော်ပြထားပါသည်။
	<b>မူဝါဒ၊ ဥပဒေနှင့်အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်</b>		
၃။	အခန်း(၃.၁) တွင် "Corporate Environmental and Social Policies" ဟု ခေါင်းစဉ်တပ်ထားသော်လည်း ၎င်း၏အောက်တွင် မြန်မာနိုင်ငံ၏ ဥပဒေ၊ နည်းဥပဒေများကို ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။	"Corporate Environmental and Social Policies"ခေါင်းစဉ် အောက်တွင် ပတ်ဝန်းကျင်နှင့် လူမှုရေးကိစ္စရပ်များအတွက် စီမံကိန်းအဆိုပြုသူ၏ ပတ်ဝန်းကျင်နှင့် လူမှုကာကွယ်စောင့်ရှောက်မှု ဆိုင်ရာမူဝါဒများကို ဖော်ပြရန်။	ခေါင်းစဉ်ခွဲ (၃.၁) တွင် ပြင်ဆင်ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>"Corporate Environmental and Social Policies"ခေါင်းစဉ် အောက်တွင် ပတ်ဝန်းကျင်နှင့် လူမှုရေးကိစ္စရပ်များအတွက် စီမံကိန်း အဆိုပြုသူ၏ ပတ်ဝန်းကျင်နှင့် လူမှုကာကွယ် စောင့်ရှောက်မှု ဆိုင်ရာမူဝါဒများကို ဖော်ပြရန်လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။</p>		
၄။	<p>အခန်း(၃.၂) Policy and Legal Framework ဖော်ပြချက်တွင် အဆိုပြုစီမံကိန်းနှင့် ဆက်စပ်သည့် ဥပဒေ၊နည်းဥပဒေများကို ဖော်ပြထားသော်လည်း စီမံကိန်းအဆိုပြုသူမှ သက်ဆိုင်ရာ ပုဒ်မ၊ နည်းဥပဒေ တစ်ခုချင်းအလိုက် လိုက်နာ ဆောင်ရွက်မည့် ကတိကဝတ်ပြု ရေးသားထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။</p> <p>အဆိုပြုစီမံကိန်းနှင့် ဆက်စပ်သည့် ဥပဒေ၊ နည်းဥပဒေများနှင့် ပတ်သက်၍ တစ်ဖက်ဖော်ပြပါ ဇယားပုံစံအတိုင်း ကတိကဝတ် ဖော်ပြချက် ရေးသားရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။</p>	<ul style="list-style-type: none"> <li>➢ စီမံကိန်းနှင့် သက်ဆိုင်သည့် ဥပဒေ၊ နည်းဥပဒေ၊ လုပ်ထုံးလုပ်နည်း ဖော်ပြချက် များတွင် သက်ဆိုင်ရာ ဥပဒေ၊ နည်းဥပဒေပါ အပိုဒ်များကို ကူးယူဖော်ပြခြင်း မပြုဘဲ သက်ဆိုင်ရာ ဥပဒေပုဒ်မ တစ်ခုချင်း အလိုက်/ နည်းပဒေတစ်ခုချင်း အလိုက် စီမံကိန်း အဆိုပြုသူမှ လိုက်နာ ဆောင်ရွက် မည့် ကတိကဝတ်အား ဖော်ပြရန်၊</li> <li>➢ "The Rights of National Races Law (2015)" ဟု ဖော်ပြချက်သည် ဥပဒေအမည် မှားယွင်းနေသဖြင့် "The Ethnic Rights Protection Law 2015"ဟု ပြင်ဆင် ဖော်ပြရန်</li> <li>➢ စီမံကိန်းနှင့် ဆက်စပ်သော ဥပဒေ၊ နည်းဥပဒေများအား ထပ်မံဖြည့်စွက် ဖော်ပြရန်။ (ဥပမာ- လုပ်ငန်းခွင်ဘေး အန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေး</li> </ul>	<p>ဇယား ၃-၃ တွင် ကတိကဝတ်များကို ဖော်ပြထားပါသည်။</p> <p>ပြင်ဆင်ဖော်ပြထားပါသည်။</p> <p>စီမံကိန်းနှင့်ဆက်စပ်သော ဥပဒေ၊ နည်းဥပဒေများကို ထပ်မံဖြည့်စွက် ဖော်ပြထားပါသည်။</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
		ဆိုင်ရာဥပဒေ (၂၀၁၉)၊ စက်မှုဇုန်ဥပဒေ (၂၀၂၀) ဥပဒေ၊ နည်းဥပဒေများအား <a href="http://www.mlis.gov.mm">www.mlis.gov.mm</a> တွင် ဝင်ရောက် ကြည့်ရှုနိုင်ပါသည်။	
	ဥပဒေ၊ နည်းဥပဒေ၊ လုပ်ထုံးလုပ်နည်းများနှင့်ပတ်သက်၍ ဖော်ပြရမည့် ကတိကဝတ် နမူနာပုံစံ		
	<b>Laws and Regulations</b>	<b>Relevant Articles</b>	<b>Commitments</b>
	Environmental Conservation Rules	Section 56, 69 (a, b)	<p>Project Proponent commits to:</p> <ul style="list-style-type: none"> <li>• Provide a qualified third person or organization accepted by the Ministry to conduct EIA for the Project.</li> <li>• Not to emit, ask to emit, not to dispose, ask to dispose, pile nor ask to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly.</li> <li>• Not to carry out any activity that can damage the ecosystem and the</li> </ul>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
		natural environment, which is influenced due to such system, except for carrying out with the permission of the Ministry for the interest of the people.	
၅။	<p>အခန်း(၃)အား "POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK" ဟု ခေါင်းစဉ် တပ်ထားသော်လည်း Institutional Framework အား ဖော်ပြထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။</p> <p>EIA တွင်ဖော်ပြချက်များအား လိုက်နာဆောင်ရွက်ရေး စီမံကိန်းအဆိုပြုသူ၏ အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်နှင့် စီမံကိန်းအကောင်အထည်ဖော်မှုနှင့် ဆက်စပ်လျက်ရှိသော မြန်မာနိုင်ငံအစိုးရဌာနများ၏ အဖွဲ့အစည်းဆိုင်ရာမူဘောင်တို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။</p>	<p>➢ EIA တွင်ဖော်ပြချက်များအား လိုက်နာဆောင်ရွက်ရေး စီမံကိန်းအဆိုပြုသူ၏ အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်နှင့် စီမံကိန်းအကောင်အထည်ဖော်မှုနှင့် ဆက်စပ်လျက်ရှိသော မြန်မာနိုင်ငံ အစိုးရဌာနများ၏ အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်တို့ကို ထည့်သွင်း ဖော်ပြရန်။</p> <p>➢ EIA အစီရင်ခံစာတွင် ပါဝင်သည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးကိစ္စရပ်များအတွက် အဖွဲ့အစည်းဆိုင်ရာ ဖွဲ့စည်းပုံ၊ အုပ်ချုပ်မှု၊ တာဝန်ယူဆောင်ရွက်မှုများနှင့် လုပ်ငန်းတာဝန်များကို ဖော်ပြရန်။</p>	အခန်းခွဲ (၃.၁) တွင် ဖော်ပြထားပါသည်။
၆။	<p>အခန်း(၃)တွင် အဆိုပြုစီမံကိန်းနှင့် ဆက်စပ်သည့် မြန်မာနိုင်ငံမှ လက်မှတ်ရေးထိုးထားသော International Conventions နှင့် International Guidelines/Standards တို့ကို ထည့်သွင်း ဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်။</p> <p>Scoping Report အတည်ပြုပြန်ကြားစာ အပိုဒ် ၄ (က)တွင်လည်း "သံချောင်းများထုတ်လုပ်ရာ၌</p>	<p>➢ အခန်း (၃) တွင် အဆိုပြုစီမံကိန်းနှင့် ဆက်စပ်သည့် မြန်မာနိုင်ငံမှ လက်မှတ်ရေးထိုးထားသော International Conventions နှင့် International Guidelines ကို ထည့်သွင်းဖော်ပြရန်။</p> <p>➢ စီမံကိန်းအကောင်အထည် ဖော်စဉ်အတွင်း လိုက်နာဆောင်ရွက်မည့် ပတ်ဝန်းကျင်နှင့်</p>	ခေါင်းစဉ်ခွဲ (၃.၂) နှင့် ဇယား (၃-၁) တွင် ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	နိုင်ငံတကာလမ်းညွှန်ချက်များနှင့် စပ်လျဉ်း၍ ထည့်သွင်းဖော်ပြရန်"ဟု သဘောထားမှတ်ချက် ပေးထားပါသည်။	လူမှုရေးဆိုင်ရာစံနှုန်း (Guiding Standard/ Values)များကို ကြိုတင် သတ်မှတ် ဖော်ထုတ်တင်ပြရန်။ ➢ ကျန်းမာရေးဆိုင်ရာ စံချိန်စံညွှန်းများ ထည့်သွင်းဖော်ပြရန်။	ဇယား (၃-၃) ရှိ Environmental Monitoring Plan အပိုင်းတွင် ထည့်သွင်းဖော်ပြထားပါသည်။
၇။	စီမံကိန်းအဆိုပြုသူမှ စီမံကိန်းနှင့်ဆက်စပ်သည့် ဥပဒေများ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများ၊ International Conventions၊ International Guidelines/ Standards နှင့်အညီ လိုက်နာ ဆောင်ရွက်နိုင်ရေး ယင်း၏အဖွဲ့အစည်းအတွင်း သင့်တော်သည့် စနစ် သို့မဟုတ် လုပ်ငန်းစဉ်များ ချမှတ်ထားခြင်း ရှိ/မရှိ ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်။	စီမံကိန်းအဆိုပြုသူမှ စီမံကိန်းနှင့်ဆက်စပ်သည့် ဥပဒေများ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများ၊ International Conventions၊ International Guidelines/ Standards နှင့်အညီ လိုက်နာဆောင်ရွက်နိုင်ရေး ယင်း၏ အဖွဲ့အစည်းအတွင်း သင့်တော်သည့် စနစ် သို့မဟုတ် လုပ်ငန်းစဉ်များ ချမှတ်ထားခြင်း ရှိ/မရှိ ထည့်သွင်း ဖော်ပြရန်။	စီမံကိန်းအဆိုပြုသူမှ အစီရင်ခံစာတွင် ကတိကဝတ်ပါ အချက်များကို လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။
၈။	ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၂ အရ စီမံကိန်း အဆိုပြုသူ၏ အတည်ပြုဝန်ခံချက် ထည့်သွင်း ဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်။ Scoping Report အတည်ပြုပြန်ကြားစာ အပိုဒ် ၄ (c)တွင်လည်း "ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ် ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၂ အရ စီမံကိန်းအဆိုပြုသူမှ လိုက်နာဆောင်ရွက်ရမည့် ကတိကဝတ်နှင့် အစီရင်ခံစာရေးသားပြုစုသည့် တတိယအဖွဲ့အစည်းမှ လိုက်နာထားရှိသည့်	➢ စီမံကိန်းအဆိုပြုသူမှ အောက်ပါ အချက် အလက်များ မှန်ကန်ကြောင်း အတည်ပြု ဝန်ခံချက် ထည့်သွင်းဖော်ပြရန်- (က) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း၏ တိကျမှုနှင့် ပြည့်စုံမှု ရှိကြောင်း၊ (ခ) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းကို ဤလုပ်ထုံးလုပ်နည်း အပါအဝင် သက်ဆိုင်ရာ ဥပဒေများ၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ပြုလုပ်ရန် လုပ်ငန်းတာဝန်များနှင့် အညီ တိကျစွာလိုက်နာပြုစုကြောင်း၊	အခန်း (၃) တွင် ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	ကတိကဝတ်များကို ထည့်သွင်းဖော်ပြရန်"ဟု သဘောထားမှတ်ချက် ပြုထားပါသည်။	<p>(ဂ) စီမံကိန်းက ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ချက် အစီရင်ခံစာပါ ကတိကဝတ်၊ ပတ်ဝန်းကျင်ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများနှင့် အစီအစဉ်များကို အပြည့်အဝ အစဉ်အမြဲ လိုက်နာဆောင်ရွက်မည် ဖြစ်ကြောင်း။</p> <p>➢ တတိယ အဖွဲ့အစည်းမှ လိုက်နာထားရှိသည့် ကတိကဝတ်များကို ထည့်သွင်း ဖော်ပြရန်။</p>	တတိယအဖွဲ့အစည်းမှ လိုက်နာထားရှိသည့် ကတိကဝတ်များကို ထည့်သွင်းဖော်ပြထားပါသည်။
<b>စီမံကိန်းအကြောင်းအရာဖော်ပြချက်နှင့် အခြားနည်းရွေးချယ်ခြင်း</b>			
၉။	အခန်း(၄.၂) တွင် အဆိုပြုစီမံကိန်း၏ တည်နေရာ အား Lat/Long အမှတ်များနှင့် Google Earth မြေပုံတို့နှင့်တကွ ဖော်ပြထားသော်လည်း စီမံကိန်းကြောင့် သက်ရောက်မှုရှိသည့် ဧရိယာပြမြေပုံကို ဖော်ပြရန်လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်။	စီမံကိန်းကြောင့် သက်ရောက်မှုရှိသည့် ဧရိယာ ပြမြေပုံကို ဖော်ပြရန်။	အခန်းခွဲ ၅.၁ ရှိ ပုံ ၅-၁ တွင် ဖော်ပြထားပါသည်။
၁၀။	အခန်း(၄.၃) Project Development and Implementation Time Schedules ဖော်ပြချက်တွင် Project History နှင့် Construction Schedule တို့ကိုသာ ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။	Project Phase အလိုက် Schedule အား ထည့်သွင်းဖော်ပြရန်။	အခန်းခွဲ ၄.၃ တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
၁၁။	အခန်း(၄.၄) Fig 4.3 တွင် Factory Layout Plan အား ဖော်ပြထား သော်လည်း Label/Legend မပါရှိကြောင်း စိစစ်တွေ့ရှိရသည်။ သို့သော် Appendix IV စာမျက်နှာ ၂၀၁ တွင် Layout Plan ဖော်ပြချက်များကို ဇယားဖြင့်လည်းကောင်း၊ စာမျက်နှာ ၂၀၂ တွင် Layout Plant ကို Label များတပ်ထားသည်ကိုလည်းကောင်း စိစစ်တွေ့ရှိရသည်။	<ul style="list-style-type: none"> <li>➢ Fig 4.3 အား Appendix IV စာမျက်နှာ ၂၀၁ နှင့် ၂၀၂ အတိုင်း ပြင်ဆင်ဖော်ပြရန်။</li> <li>➢ Appendix IV စာမျက်နှာ ၂၀၁ နှင့် ၂၀၂ တို့သည် Hard Copy တွင်သာပါရှိပြီး Report Softcopy တွင်မပါရှိသဖြင့် Report Softcopy တွင်ပါ အဆိုပါ စာမျက်နှာများ အား ထည့်သွင်းဖော်ပြရန်။</li> </ul>	ပုံ ၄-၃ အား Appendix IV အတိုင်းပြင်ဆင် ဖော်ပြထားပြီး ဖြစ်ပါသည်။ Appendix IV အား Report Softcopy တွင် ထည့်သွင်းဖော်ပြ ထားပါသည်။
၁၂။	အခန်း(၄.၅.၁) တွင် ကုန်ကြမ်းပစ္စည်းများကို Local Suppliers နှင့် MEC တို့ထံမှ ဝယ်ယူကြောင်း ဖော်ပြ ထားသော်လည်း အဆိုပါ ကုန်ကြမ်းပစ္စည်းများ သယ်ယူသည့်နည်းလမ်းနှင့် သိုလှောင်ထားရှိမှု စနစ် တို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း စိစစ် တွေ့ရှိရသည်။ Scoping Report အတည်ပြုပြန်ကြားစာ အပိုဒ် ၄ (ဂ)တွင်လည်း "ကုန်ကြမ်းများသယ်ယူ ပို့ဆောင်မှု နှင့် ကုန်ချောများသယ်ယူ ပို့ဆောင်မှုတို့နှင့် စပ်လျဉ်း၍ အသေးစိတ် ထည့်သွင်းဖော်ပြရန်"ဟု သဘောထားမှတ်ချက် ပြုထားပါသည်။	<ul style="list-style-type: none"> <li>➢ ကုန်ကြမ်းပစ္စည်းများ သယ်ယူသည့် နည်းလမ်းနှင့် သိုလှောင်ထားရှိမှု စနစ်တို့ကို ထည့်သွင်းဖော်ပြရန်။</li> <li>➢ ကုန်ချောများ သိုလှောင်ထားရှိမှုနှင့် ပို့ဆောင်မှုနည်းလမ်းတို့ကို ပြည့်စုံစွာ ထည့်သွင်းဖော်ပြရန်။</li> </ul>	အခန်းခွဲ ၄.၅.၁ တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။
၁၃။	အခန်း(၄.၅.၂) Water Consumption ဖော်ပြချက် တွင် Bore Well မှ တစ်နေ့လျှင် ရေ 10 KL ရယူ သုံးစွဲမည်ဖြစ်ကြောင်း ဖော်ပြထားပါသည်။	မြေအောက်ရေရယူသုံးစွဲမှုနှင့် စပ်လျဉ်း၍ သက်ဆိုင်ရာ ဌာန၏ ခွင့်ပြုချက် ရယူထားရှိမှု ဖော်ပြရန်။	သက်ဆိုင်ရာဌာန၏ ခွင့်ပြုချက် ရယူရန် ဆက်လက်ဆောင်ရွက်ပါမည်။



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	မြေအောက်ရေရယူသုံးစွဲမှုနှင့် စပ်လျဉ်း၍ သက်ဆိုင်ရာဌာန၏ ခွင့်ပြုချက် ရယူရန်လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။		
၁၄။	အခန်း(၄.၅.၃) Fuel Requirement ဖော်ပြချက်တွင် Reheating Furnace နှင့် Burning Rate of F.O တို့အတွက် F.O Requirement ကို ဖော်ပြထားသော်လည်း အဆိုပြုစီမံကိန်းအတွက် တစ်ရက်လျှင် သုံးစွဲရသည့် F.O ပျမ်းမျှပမာဏကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်။	<ul style="list-style-type: none"> <li>➢ အဆိုပြုစီမံကိန်းအတွက် တစ်ရက်လျှင် သုံးစွဲရသည့် F.O ပျမ်းမျှ ပမာဏကို ထည့်သွင်းဖော်ပြရန်။</li> <li>➢ F.O များကို သယ်ယူသည့် နည်းလမ်းနှင့် သိုလှောင်ထားရှိမှုစနစ် တို့ကို ထည့်သွင်းဖော်ပြရန်။</li> <li>➢ Diesel ဆီ သုံးစွဲမှုပမာဏနှင့် သိုလှောင်ထားရှိမှုစနစ်တို့ကို ထည့်သွင်းဖော်ပြရန်။</li> </ul>	ခေါင်းစဉ်ခွဲ ၄.၅.၃ တွင် ဖြည့်စွက်ဖော်ပြထားပြီး ဓာတ်ပုံ ၄-၃ နှင့် ဇယား ၄-၆ တို့ကို ဖော်ပြထားပါသည်။
၁၅။	အခန်း(၄.၅.၅) Manpower Requirement ဖော်ပြချက်၌ ပြည်တွင်း လုပ်သား (၃၅၃) ဦးနှင့် နိုင်ငံခြားသား ကျွမ်းကျင်ပညာရှင် (၅)ဦးအား ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရသည်။ တည်ဆောက်ရေးကာလတွင် အသုံးပြုသော လုပ်သားအရေအတွက်၊ လည်ပတ်ရေးကာလတွင် အသုံးပြုသော လုပ်သားအရေအတွက် စသည်ဖြင့် စီမံကိန်းအဆင့်အလိုက် လုပ်သားအရေအတွက်ကို ခွဲခြားဖော်ပြရန်နှင့် အလုပ်သမားများအတွက် နေထိုင်ရေးအစီအစဉ် (Workers' Accommodation) ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ် ရရှိပါသည်။	တည်ဆောက်ရေးကာလတွင် အသုံးပြုသော လုပ်သားအရေအတွက်၊ လည်ပတ်ရေးကာလတွင် အသုံးပြုသော လုပ်သားအရေအတွက် စသည်ဖြင့် စီမံကိန်းအဆင့်အလိုက် လုပ်သားအရေအတွက်ကို ခွဲခြားဖော်ပြရန်နှင့် အလုပ်သမားများအတွက် နေထိုင်ရေးအစီအစဉ် (Workers' Accommodation) ကို ထည့်သွင်းဖော်ပြရန်။	တည်ဆောက်ရေးကာလသည် ၂၀၂၀ ခုနှစ်တွင် ပြီးစီးဆောင်ရွက်ခဲ့ပြီး ဖြစ်သောကြောင့် တည်ဆောက်ရေးကာလတွင် အသုံးပြုသော လုပ်သားအရေအတွက်နှင့် နေထိုင်ရေးအစီအစဉ်အား ထည့်သွင်းဖော်ပြနိုင်ခြင်းမရှိပါ။ လုပ်ငန်းလည်ပတ်ရေးကာလအတွက် လုပ်သားအရေအတွက်နှင့် ဝန်ထမ်းများအတွက် နေထိုင်ရေးအစီအစဉ်ကို အခန်းခွဲ

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			၄.၅.၅ တွင် ထည့်သွင်းဖော်ပြထားပါသည်။
၁၆။	အခန်း(၄.၆) တွင် Laboratory နှင့်စပ်လျဉ်း၍ "The liquid metal will be tested in the laboratory for carbon content etc., and..." ဟုဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။ Scoping Report အတည်ပြုပြန်ကြားစာ အပိုဒ် ၄ (ဃ) တွင်လည်း "Laboratory နှင့်စပ်လျဉ်း၍ အသေးစိတ် ထည့်သွင်းဖော်ပြရန်"ဟု သဘောထားမှတ်ချက်ပြုထားပါသည်။	Laboratory တွင် အသုံးပြုသည့် Instruments နှင့် Chemical များ၊ Laboratory မှ ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းအမျိုးအစားများနှင့် ပမာဏ စသည်တို့အား ပြည့်စုံစွာ ထည့်သွင်းဖော်ပြရန်။	Spectrometer ဖြင့် ထုတ်ကုန်သံမဏိ၏ ဓာတုပါဝင်မှုကို စစ်ဆေးခြင်းဖြစ်ပြီး အသုံးပြုသည့် Instrument အား ဇယား ၄-၉ နှင့် Instrument ၏ လုပ်ဆောင်ချက်များကို နောက်ဆက်တွဲ (၁၁) တွင် လည်းကောင်း၊ ထုတ်ကုန်အရည်အသွေး စစ်ဆေးမှုရလဒ်များကို နောက်ဆက်တွဲ (၁၈) တွင် လည်းကောင်း ဖော်ပြထားပါသည်။
၁၇။	အဆိုပြုစီမံကိန်း၏ တည်ဆောက်ရေးအဆင့် အတွက် အောက်ပါတို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရသည်- ➢ လုပ်သားအရေအတွက် ➢ ယာဉ်ယန္တရားအရေအတွက် ➢ ရေ၊ လောင်စာဆီနှင့် လျှပ်စစ်သုံးစွဲမှုပမာဏ ➢ စွန့်ပစ်ပစ္စည်း အမျိုးအစားအလိုက် ထွက်ရှိမှု ပမာဏနှင့် စွန့်ပစ်သည့်နေရာ	အဆိုပြုစီမံကိန်း၏ တည်ဆောက်ရေးအဆင့် အတွက် အောက်ပါတို့ကို ထည့်သွင်းဖော်ပြရန်- ➢ လုပ်သားအရေအတွက် ➢ ယာဉ်ယန္တရားအရေအတွက် ➢ ရေ၊ လောင်စာဆီနှင့် လျှပ်စစ်သုံးစွဲမှုပမာဏ ➢ စွန့်ပစ်ပစ္စည်း အမျိုးအစားအလိုက် ထွက်ရှိမှု ပမာဏနှင့် စွန့်ပစ်သည့်နေရာ	အစီရင်ခံစာ ရေးဆွဲသည့် ကာလ၌ စီမံကိန်းသည် တည်ဆောက်ရေး အဆင့်တွင်ရှိပြီး ယခုအချိန်တွင် စီမံကိန်းသည် လည်ပတ်သည့် အဆင့်သို့ ရောက်ရှိနေပြီ ဖြစ်၍ ၎င်းအား ထပ်မံဖော်ပြခြင်း မရှိတော့ခြင်းဖြစ်ပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
၁၈။	Domestic အတွက် ရေအသုံးပြုမှုနှင့် စပ်လျဉ်း၍ အခန်း (၄.၅.၂) Water Consumption ဖော်ပြချက်တွင် "5 KLD of water will be provided for domestic"ဟုလည်းကောင်း၊ အခန်း (၄.၈) Sewage and Solid Waste ဖော်ပြချက်တွင် "During the operation phase, about 3000 liters of water per day will be used for domestic purposes." ဟုလည်းကောင်းဖော်ပြထားရာ ဖော်ပြချက်များသည် ရှေ့နောက်ညီညွတ်မှု မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	Domestic အတွက် ရေအသုံးပြုမှုပမာဏ ဖော်ပြချက်များအား ပြန်လည်ဆန်းစစ်ရန်။	ပြင်ဆင် စစ်ဆေးဖော်ပြထားပါသည်။
၁၉။	အခန်း(၄.၈) တွင် အဆိုပြုစီမံကိန်းမှ ထွက်ရှိသည့် Sewage နှင့် Solid Waste ဖြစ်သည့် Misrolls, Endbits, Mill Scale စသည်တို့ကိုသာ ဖော်ပြထားပြီး Industrial Process Wastewater, GHG Emission နှင့် Hazardous Waste ထွက်ရှိမှု အား ဖော်ပြထားခြင်းမရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	<ul style="list-style-type: none"> <li>➢ Industrial Process Wastewater ထွက်ရှိမှု ပမာဏ၊ သန့်စင်သည့် နည်းလမ်း၊ နောက်ဆုံးစွန့်ပစ်သည့်နေရာတို့ကို ဖော်ပြရန်။</li> <li>➢ အဆိုပြုစီမံကိန်းမှ GHG Emission ထွက်ရှိမှု ပမာဏအား တွက်ချက်ဖော်ပြရန်။</li> <li>➢ အဆိုပြုစီမံကိန်းမှ Hazardous Waste ထွက်ရှိမှုပမာဏ၊ သိုလှောင်ထားရှိမှု နည်းလမ်း၊ နောက်ဆုံးစွန့်ပစ်သည့်နေရာတို့ကို ဖော်ပြရန်။</li> </ul>	<ul style="list-style-type: none"> <li>➢ စီမံကိန်းလုပ်ငန်းစဉ်၏ အအေးခံသည့် အဆင့်တွင် အသုံးပြုသော ရေအား ဓာတ်ပုံ ၄-၄ တွင် ဖော်ပြထားသည့်အတိုင်း ကန်များတွင် သိုလှောင်ထိန်းသိမ်းထားပြီး ပြန်လည် အသုံးပြုလည်ပတ်စေပါသည်။</li> <li>➢ အခန်းခွဲ ၆.၂.၂.၁ တွင် တွက်ချက်ဖော်ပြထားပါသည်။</li> <li>➢ အခန်းခွဲ ၄.၇ နှင့် အခန်းခွဲ ၄.၈ တွင် ဖော်ပြထား ပါသည်။</li> </ul>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	အနီးပတ်ဝန်းကျင်အကြောင်းအရာဖော်ပြချက်		
၂၀။	Fig 5.2 တွင် Environmental Quality Sampling Point မြေပုံကို ဖော်ပြထားသော်လည်း မြေပုံပါ Label/Legend များသည် ရှင်းလင်းပြတ်သားမှုမရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	Figure 5. 2 Locations of Environmental Quality Sampling Points ပြမြေပုံအား Label/Legend များ ရှင်းလင်းပြတ်သားစွာဖြင့် ဖော်ပြရန်။	Figure 5.2 Locations of Environmental Quality Sampling Points ပြမြေပုံအား ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။
၂၁။	အခန်း(၅.၂.၃) Water Quality ဖော်ပြချက်တွင် Water Sample ကောက်ယူရာတွင် အသုံးပြုသည့် Equipment များနှင့် ပတ်သက်၍ "On-site water quality measurements, water samplings are conducted using the following equipment as shown in the APPENDIX II" ဟု Appendix II အား ညွှန်းဆိုထား သော်လည်း Appendix II တွင် Lab Results နှင့် Analysis Report တို့ကိုသာ စိစစ်တွေ့ရှိရသည်။	Water Sample ကောက်ယူရာတွင် အသုံးပြုသည့် Equipment များ ထည့်သွင်းဖော်ပြရန်။	Water Sample ကောက်ယူရာတွင် အသုံးပြုသည့် Equipment များအား နောက်ဆက်တွဲ (၇) တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။
၂၂။	အခန်း(၅.၃.၇) Earthquake Intensity of Myanmar ဖော်ပြချက်တွင် Fig 5.36 ၌ မြန်မာနိုင်ငံ၏ ငလျင်ဇုန်များပြမြေပုံကို ဖော်ပြထားသော်လည်း မြေပုံပါ စာများသည် ရှင်းလင်းမှု မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	Fig 5.36 အား ရှင်းလင်းသောမြေပုံဖြင့် ပြန်လည် Update ပြုလုပ်ရန်။	Fig 5.36 အား ရှင်းလင်းသောမြေပုံဖြင့် ပြန်လည် Update ပြုလုပ်ထားပါသည်။
	ပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှုနှင့် ဘေးအန္တရာယ်ရှိမှုဆန်းစစ်ခြင်းနှင့် လျော့နည်းစေရေးလုပ်ငန်းများ		
၂၃။	အခန်း(၆.၂.၁) တွင် Construction Phase ၌ ဖြစ်ပေါ်နိုင်သော Impact on Air Quality, Noise and Vibration, Impact on Soil Quality, Impact on Water Quality, Impact on Human	Construction Phase ရှိ Potential Impact တစ်ခုချင်းစီအတွက် Mitigation Measures ကို ထည့်သွင်းဖော်ပြရန်။	အစီရင်ခံစာ ရေးဆွဲသည့် ကာလ၌ စီမံကိန်းသည် တည်ဆောက်ရေး အဆင့်တွင်ရှိပြီး တည်ဆောက်ရေးကာလသည် ၂၀၂၀

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	စသည်ဖြင့် သက်ရောက်မှုများကို ဆန်းစစ်ဖော်ပြထားသော်လည်း သက်ရောက်မှု တစ်ခုချင်းစီအတွက် လျော့နည်းစေရေး နည်းလမ်းများကို ဖော်ပြထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။ (မှတ်ချက်- အခန်း(၆.၃) Mitigation Measures for Anticipated Impacts of Steel Mill ပါ ဖော်ပြချက်များသည် ပြည့်စုံမှုမရှိပါ။)		ခုနှစ်တွင် ပြီးစီးဆောင်ရွက်ခဲ့ပြီ ဖြစ်သောကြောင့် Construction Phase ၏ Mitigation measures များကို ထပ်မံထည့်သွင်း ရေးဆွဲရန် မလိုအပ်ပါ။
၂၄။	အခန်း(၆.၂.၂) တွင် Operation Phase ၌ ဖြစ်ပေါ်နိုင်သော Impact on Air Quality, Noise and Vibration, Impact on Soil Quality, Impact on Water Quality, Impact of Waste Disposal, Impact on Human စသည်ဖြင့် သက်ရောက်မှုများကို ဆန်းစစ် ဖော်ပြထားသော်လည်း သက်ရောက်မှု တစ်ခုချင်းစီအတွက် လျော့နည်း စေရေး နည်းလမ်းများကို ဖော်ပြထားခြင်း မရှိကြောင်း၊ အခန်း(၈.၃.၄) Environmental Management Plan during Operation Phase တွင် Impact of dust and gases emission၊ Impact of odor from storage of raw materials, steel particles၊ Impact of noise from operation of equipment and heavy machineries၊ Impact of Resource consumption (Ground Water and Electricity)၊	<ul style="list-style-type: none"> <li>➢ Operation Phase ၏ Potential Impact တစ်ခုချင်းစီအတွက် Mitigation Measures ကို ထည့်သွင်းဖော်ပြရန်။</li> <li>➢ အခန်း(၆.၂.၂)တွင် အောက်ပါ Impact များကို ဖြည့်စွက်ဖော်ပြရန်- <ul style="list-style-type: none"> <li>❖ Impact of odor from storage of raw materials, steel particles</li> <li>❖ Impact of Resource consumption (Ground Water and Electricity)</li> <li>❖ Occupational Health and Safety for employees and workers due to long term exposure of extreme heat</li> </ul> </li> </ul>	Operation Phase ၏ Potential impact တစ်ခုချင်းစီအတွက် Mitigation Measures ကို ဇယား ၆-၁၇ တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ အခန်း (၆.၂.၂) တွင်လည်းကောင်း၊ အခန်း (၆.၃) တွင်လည်းကောင်း ဖြည့်စွက်ဖော်ပြထားပါသည်။



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>Impact of Waste Disposal (hazardous and non-hazardous waste) and Wastewater Discharge၊ Occupational Health and Safety for employees and workers due to long term exposure of extreme heat တို့ကို ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိ ရသည်။</p> <p>အခန်း(၆.၂.၂) ပါ Impact ဖော်ပြချက်များနှင့် အခန်း(၈.၃.၄) Environmental Management Plan during Operation Phase ပါ Impact ဖော်ပြချက်များသည် Consistent ဖြစ်ရန် လိုပါသည်။</p>		
၂၅။	<p>အခန်း(၆) တွင် Project Phase အလိုက် Potential Impact များကို ဆန်းစစ်ဖော်ပြထားသော်လည်း ဘေးအန္တရာယ်ရှိမှု သတ်မှတ်ခြင်း၊ ဆန်းစစ်ခြင်းနှင့် လျော့နည်းစေခြင်းတို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း စိစစ်တွေ့ရှိရပါသည်။</p> <p>ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း အပိုဒ် ၆၃ (စ)၊ အပိုဒ်ခွဲ(၂)အရ အကြို တည်ဆောက်ခြင်း၊ တည်ဆောက်ခြင်း၊ လုပ်ငန်း လည်ပတ်ဆောင်ရွက်ခြင်း၊ ရပ်ဆိုင်းခြင်း၊ ပိတ်သိမ်း ခြင်းနှင့် ပိတ်သိမ်းပြီးကာလစသည့် စီမံကိန်း လုပ်ငန်းအဆင့်တစ်ခုချင်းစီအတွက် သက်ရောက်မှု နှင့် ဘေးအန္တရာယ်ရှိမှု သတ်မှတ်ခြင်း၊ ဆန်းစစ်ခြင်း</p>	<p>ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (စ)၊ အပိုဒ်ခွဲ(၂)အရ စီမံကိန်းအဆင့်အလိုက် ဘေးအန္တရာယ်ရှိမှု ဆန်းစစ်ခြင်း (Risk Assessment) ကို ထည့်သွင်းဖော်ပြရန်။</p>	<p>အခန်း (၆.၃) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	နှင့် လျော့နည်းစေခြင်းတို့ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။		
၂၆။	အခန်း(၆.၅.၁) Scop of the study ဖော်ပြချက်၌ လေ့လာမှု နယ်ပယ်နှင့်ပတ်သက်၍ "The Health Impact Assessment study, focusing on the project area and its vicinity, includes two nearest villages: Kan Kalay and Kone Kalay villages where are adjacent to the Myaungtagar Industrial Zone" ဟုဖော်ပြထားသော်လည်း အခန်း (၆.၅.၂) တွင် စီမံကိန်းဝန်းကျင်ရှိ ကျေးရွာ (၂) ရွာ၏ Health Information များကိုသာ ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရပါသည်။ အဆိုပြုစီမံကိန်းကြောင့် လုပ်ငန်းခွင်ရှိ လုပ်သား များ၏ ကျန်းမာရေးအပေါ် သက်ရောက်နိုင်မှု (Occupational Health Impact) ကို Assessment ပြုလုပ်ရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။	Occupational Health Impact Assessment အား ပြည့်စုံစွာ ဆန်းစစ် ဖော်ပြရန်။	အခန်းခွဲ (၆.၅)နှင့် အခန်းခွဲ (၆.၃) တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။
	<b>ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်</b>		
၂၇။	အခန်း(၈.၂) တွင် "The organization chart of Yangon J.R Family Limited is as follow." ဟုဖော်ပြထားသော်လည်း Organization Chart အား ထည့်သွင်းဖော်ပြထားခြင်းမရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	Yangon J.R Family Limited ၏ Organization Chart အား ထည့်သွင်း ဖော်ပြရန်။	Yangon J.R Family Limited ၏ Organization Chart အား ပုံ (၂-၁) တွင် ပြန်လည်ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
၂၈။	Table 8.1, Table 8.2 နှင့် Table 8.3 တို့တွင် Project Phase အလိုက် Impact တစ်ခုချင်းစီ၏ Mitigation Measures များကို ဖော်ပြထားကြောင်းနှင့် Table 8.11 (A) တွင် Project Phase အလိုက် Impact များကို ခွဲခြားဖော်ပြထားခြင်း မရှိဘဲ Mitigation Measures များနှင့် ၎င်းတို့အတွက် Budget များအား ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရ သည်။	Project Phase အလိုက် Impact တစ်ခုချင်းစီ၏ Mitigation Measuresအတွက် Budget အသီးသီးအား Table 8.1 , Table 8.2 နှင့် Table 8.3 တို့တွင် Budget အတွက် Column တစ်ခုဖြင့် ဖြည့်စွက် ဖော်ပြရန်။	အစီရင်ခံစာ ရေးဆွဲသည့် ကာလ၌ စီမံကိန်းသည် တည်ဆောက်ရေး အဆင့်တွင်ရှိပြီး ယခုအချိန်တွင် စီမံကိန်းသည် လည်ပတ်သည့်အဆင့် သို့ ရောက်ရှိနေပြီဖြစ်၍ တည်ဆောက် ရေးအဆင့်အတွက် ထည့်သွင်းဖော်ပြ ခြင်း မပြုတော့ဘဲ လည်ပတ်ရေး အဆင့်နှင့် ပိတ်သိမ်းခြင်းအဆင့်တို့ တွင်သာ ဖော်ပြထားပါသည်။
၂၉။	အခန်း(8.4) Environmental Monitoring Plan တွင် Operation Phase အတွက် Monitoring Plan ကို Table 8.4 နှင့် Decommissioning Phase အတွက် Monitoring Plan ကို Table 8.5 တို့တွင် ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။ Construction Phase အတွက် Monitoring Plan ကို ထည့်သွင်းဖော်ပြရန်၊ Project Phase အလိုက် Monitoring Plan တွင် စောင့်ကြပ်ကြည့်ရှုမည့် နေရာအသီးသီး၏ တည်နေရာအား Coordinate အမှတ်များနှင့်တကွ မြေပုံဖြင့် ထည့်သွင်း ဖော်ပြရန် နှင့် Project Phase အလိုက် Monitoring Plan Table အသီးသီးတွင် Budget အား Column တစ်ခု ဖြင့် ဖြည့်စွက်ဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိ ပါသည်။	<ul style="list-style-type: none"> <li>➢ Construction Phase အတွက် Monitoring Plan ကို ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ Project Phase အလိုက် Monitoring Plan တွင် စောင့်ကြပ်ကြည့်ရှုမည့်နေရာ အသီးသီး ၏ တည်နေရာအား Coordinate အမှတ် များနှင့်တကွမြေပုံဖြင့် ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ Project Phase အလိုက် Monitoring Plan Table အသီးသီးတွင် Budget အား Column တစ်ခုဖြင့် ဖြည့်စွက်ဖော်ပြရန်။</li> </ul>	<ul style="list-style-type: none"> <li>➢ အစီရင်ခံစာ ရေးဆွဲသည့် ကာလ၌ စီမံကိန်းသည် တည်ဆောက်ရေး အဆင့်တွင်ရှိပြီး ယခုအချိန်တွင် စီမံကိန်းသည် လည်ပတ်သည့် အဆင့်သို့ ရောက်ရှိနေပြီဖြစ်၍ Construction Phase အတွက် Monitoring Plan အား ထည့်သွင်း ဖော်ပြခြင်းမရှိတော့ခြင်း ဖြစ်ပါ သည်။</li> <li>➢ Project Phase အလိုက် Monitoring Plan တွင် စောင့်ကြပ် ကြည့်ရှုမည့်နေရာ အသီးသီး၏ တည်နေရာပါဝင်သည့် မြေပုံအား ပုံ ၈-၁ တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</li> </ul>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			<ul style="list-style-type: none"> <li>စီမံကိန်း လည်ပတ်သည့်ကာလနှင့် ပတ်သိမ်းသည့် ကာလအတွက် Monitoring Plan Table အသီးသီး ဌာန Budget အား ဇယား ၈-၂၊ ဇယား ၈-၃နှင့် ဇယား ၈-၇ တို့တွင် ဖော်ပြထားပါသည်။</li> </ul>
၃၀။	<p>Sub-plan များနှင့်စပ်လျဉ်း၍ အခန်း (၈) တွင် Fire Emergency Response Plan, Medical Emergency Response Plan, Risk Management Plan, Fire Safety and Evacuation Plan, Grievance Redress Mechanism နှင့် CSR Plan တို့ကို ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။</p> <p>Sub-plan များဖော်ပြရာတွင် အစီအစဉ်ခွဲအလိုက် ပါဝင်ရမည့် အကြောင်းအရာများအား ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (ဇ) အပိုဒ်ခွဲ(၆) ပါ အချက်များနှင့်အညီ ဖော်ပြရန်နှင့် Air Quality Management Plan နှင့် Waste Management Plan တို့ကို ဖြည့်စွက် ဖော်ပြရန်လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။</p>	<ul style="list-style-type: none"> <li>Sub-plan များဖော်ပြရာတွင် အစီအစဉ်ခွဲ အလိုက် ပါဝင်ရမည့် အကြောင်းအရာများ အား ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (ဇ) အပိုဒ်ခွဲ (၆) ပါ အချက်များနှင့်အညီ ဖော်ပြ ရန်။</li> <li>Air Quality Management Plan နှင့် Waste Management Plan တို့ကို ဖြည့်စွက် ဖော်ပြ ရန်။</li> </ul>	<ul style="list-style-type: none"> <li>Sub-plan များအား ခေါင်းစဉ်ခွဲ ၈.၃.၆ တွင် ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း အပိုဒ် ၆၃ (ဇ) အပိုဒ်ခွဲ (၆) ပါ အချက်များနှင့်အညီ ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါ သည်။</li> </ul>
အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်များ ထုတ်ဖော်တင်ပြခြင်း			
၃၁။	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းလုပ်ငန်း အတွက် ရွေးချယ်ထားသည့် နည်းစနစ်နှင့် ချဉ်းကပ် မှုနည်းလမ်းများအား ဖော်ပြထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းလုပ်ငန်း အတွက် ရွေးချယ်ထားသည့် နည်းစနစ်နှင့် ချဉ်းကပ်မှုနည်းလမ်းများအား ထည့်သွင်းဖော်ပြ ရန်။	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေး ခြင်းလုပ်ငန်းအတွက် ရွေးချယ်ထား သည့် နည်းစနစ်နှင့် ချဉ်းကပ်မှု နည်းလမ်းများအား ခေါင်းစဉ်ခွဲ ၉-၁

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။
၃၂။	<p>အခန်း(၉) တွင် ၂၀၁၉ ခုနှစ်၊ ဇူလိုင်လ (၃၀)ရက်နေ့တွင် ကျင်းပပြုလုပ်သည့် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းကို ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။</p> <p>Scoping Stage တွင် ဆောင်ရွက်ခဲ့သော Public Consultation Meeting နှင့် အနာဂတ်အတွက် ရှေ့ဆက်ဆောင်ရွက်မည့် အစီအစဉ်ကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ကြောင်း သုံးသပ်ရရှိပါသည်။</p>	<p>➢ Scoping Stage တွင် ဆောင်ရွက်ခဲ့သော Public Consultation Meeting နှင့် ပတ်သက်သည့် အချက်အလက်များ (ဥပမာ။ နေ့ရက်၊ နေရာ၊ တက်ရောက်သူများစာရင်း၊ ဆွေးနွေးသည့် ခေါင်းစဉ်များ၊ အစည်းအဝေး မှတ်တမ်းများ) ကို ထည့်သွင်းဖော်ပြရန်။</p> <p>➢ Public Consultation Meeting နှင့် ပတ်သက်၍ ရှေ့ဆက်ဆောင်ရွက်မည့် အစီအစဉ်ကို ထည့်သွင်းဖော်ပြရန်။</p>	<p>➢ Scoping Stage တွင် ဆောင်ရွက်ခဲ့သော Public Consultation Meeting နှင့် ပတ်သက်သည့် အချက်အလက်များ (ဥပမာ။ နေ့ရက်၊ နေရာ၊ တက်ရောက်သူများစာရင်း၊ ဆွေးနွေးသည့် ခေါင်းစဉ်များ၊ အစည်းအဝေး မှတ်တမ်းများ) ကို ဇယား ၉-၁ နှင့် နောက်ဆက်တွဲတွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</p> <p>➢ Public Consultation Meeting နှင့်ပတ်သက်၍ ရှေ့ဆက်ဆောင်ရွက်မည့် အစီအစဉ်ကို ခေါင်းစဉ်ခွဲ ၈.၅.၃ Grievance Redress Mechanism (မကျေလည်မှုများကို ပြန်လည်ဖြေရှင်းပေးမည့် အစီအစဉ်) အတိုင်း ဆောင်ရွက်ရန် စီစဉ်ထားပါသည်။</p>
	အကြံပြုချက်နှင့်နိဂုံး		



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
၃၃။	အခန်း(၁၀.၂) တွင် "Follow the comments and suggestion made by ECD after reviewing this IEE report." ဟု ဖော်ပြချက်၌ Report Type အား မှားယွင်းစွာ ဖော်ပြထားကြောင်း စိစစ်တွေ့ရှိရသည်။	Report Type အား ပြန်လည်ပြင်ဆင်ဖော်ပြရန်။	အခန်း (၁၀.၂) တွင် “Follow the comments and suggestion made by ECD after reviewing this EIA Report” ဟူ၍ ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။
	အထွေထွေအကြံပြုချက်		
၃၄။	<ul style="list-style-type: none"><li>➢ စာမျက်နှာ ၂၇ တွင် "Environmental Quality Emission Guideline (2015)" ဖော်ပြချက်အား "National Environmental Quality Emission Guideline (2015)" ဟု ပြင်ဆင်ဖော်ပြရန်။</li><li>➢ List of Abbreviation ဖော်ပြချက်တွင် အစီရင်ခံစာပါ TMT, KLD နှင့် NDWQS တို့အား ရှင်းလင်းဖော်ပြရန်။</li><li>➢ Page 50, (3) Charging in Induction Furnace ဖော်ပြချက်၌ " to control chemistry of the medal" ဟု ဖော်ပြချက်အား " to control chemistry of the metal" ဟု ပြင်ဆင်ဖော်ပြရန်။</li><li>➢ Page 50, (4) Pouring molten iron into ladle bucket ဖော်ပြချက်၌ "After checking chemistry of molten metal and adjusting carbon, desired quantity of Silico Manganese is added to molten metal" ဟု Double Typing ပြုလုပ်ထားသည်ကို ပြင်ဆင်ဖော်ပြရန်။</li></ul>		<ul style="list-style-type: none"><li>➢ "National Environmental Quality Emission Guideline (2015)" ဟု ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။</li><li>➢ List of Abbreviation ဖော်ပြချက်တွင် အစီရင်ခံစာပါ TMT, KLD နှင့် NDWQS တို့အား ရှင်းလင်းဖော်ပြထားပါသည်။</li><li>➢ Charging in Induction Furnace ဖော်ပြချက်၌ " to control chemistry of the metal" ဟု ပြင်ဆင်ဖော်ပြထားပါသည်။</li><li>➢ Pouring molten iron into ladle bucket ဖော်ပြချက်၌ Double Typing ပြုလုပ်ထားသည်ကို</li></ul>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<ul style="list-style-type: none"> <li>➢ Page 51, (8) Billet tested in Spectro Lab ဖော်ပြချက်၌ " The tested billets are marked and stacked with batch number marked on the billets" အား Double Typing ပြုလုပ်ထားသည်ကို ပြင်ဆင်ဖော်ပြရန်။</li> <li>➢ အခန်း(၄.၇) Treatment Scheme to Induction Furnace ဖော်ပြချက်၌ Strike through ပြုလုပ်ထားမှုအား ပြင်ဆင်ဖော်ပြရန်။</li> <li>➢ အစီရင်ခံစာတွင် Page Number လွဲနေမှုများအား ပြန်လည်စိစစ်ရန်။</li> <li>➢ ယခုအကြံပြုချက်များအား ပြင်ဆင်တင်ပြရာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ သက်ဆိုင်ရာအပိုင်းအလိုက် ပြန်လည် ပြင်ဆင်ရန်နှင့် မည်သည့်စာပိုဒ်၊ ဇယား၊ ပုံတို့တွင်ပြင်ဆင်ထားကြောင်းအား Comment - Response ဇယားဖြင့်ပူးတွဲတင်ပြရန်။</li> </ul>		<p>ပြန်လည်ပြင်ဆင်ဖော်ပြ ထားပါသည်။</p> <ul style="list-style-type: none"> <li>➢ Billet tested in Spectro Lab ဖော်ပြချက်၌ Double Typing ပြုလုပ်ထားသည်ကို ပြင်ဆင်ဖော်ပြထားပါသည်။</li> <li>➢ အခန်း(၄.၇.၁) Treatment Scheme to Induction Furnace ဖော်ပြချက်၌ ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။</li> <li>➢ အစီရင်ခံစာတွင် Page Number လွဲနေမှုများအား ပြန်လည်စိစစ်၍ ဖော်ပြထားပါသည်။</li> <li>➢ အထက်ပါအကြံပြုချက်များအား ပြင်ဆင်တင်ပြရာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ သက်ဆိုင်ရာအပိုင်းအလိုက် ပြန်လည်ပြင်ဆင်၍ နောက်ဆက်တွဲ (၁၉) ရှိ Comment Response</li> </ul>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			ဇယားနှင့်အတူ ပူးတွဲတင်ပြထားပါသည်။
	ကဏ္ဍအလိုက် နည်းပညာဆိုင်ရာ သဘောထားမှတ်ချက်များ		
၃၅။	<p><b>ဥပဒေရေးရာကဏ္ဍ</b></p> <p>(က) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၁၄) တွင် နည်းဥပဒေ ၆၈ (က)နှင့် (ခ) တို့ကို ဖော်ပြထားရာ ညွှန်းဆိုထားသည့် နည်းဥပဒေသည် မှန်ကန်မှုမရှိသဖြင့် ပတ်ဝန်းကျင်ကို ညစ်ညမ်းစေသည့် ပစ္စည်းများကို လည်းကောင်း၊ ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်း သို့မဟုတ် ဘေးအန္တရာယ်ရှိ ပစ္စည်းများကိုလည်းကောင်း အများ ပြည်သူအား တိုက်ရိုက်ဖြစ်စေ၊ သွယ်ဝိုက်၍ဖြစ်စေ ထိခိုက်စေနိုင်မည့် နေရာတစ်ခုခုတွင် တစ်နည်းနည်းဖြင့် ထုတ်လွှတ်ခြင်း၊ ထုတ်လွှတ်စေခြင်း၊ စွန့်ပစ်ခြင်း၊ စွန့်ပစ်စေခြင်း၊ စုပုံခြင်း၊ စုပုံစေခြင်း မပြုပါကြောင်း၊ အများပြည်သူအကျိုးငှာ ဂေဟစနစ်နှင့် ယင်းစနစ်ကြောင့် ဖြစ်ပေါ် ပြောင်းလဲနေသော သဘာဝပတ်ဝန်းကျင်ကို ထိခိုက်ပျက်စီးစေနိုင်သည့် ပြုလုပ်မှုများကို ဆောင်ရွက်ခြင်း မပြုပါကြောင်းများကို ကတိကဝတ်ပုံစံ ဖော်ပြရန်</p>	<p>(က) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၁၄) တွင် နည်းဥပဒေ ၆၈ (က) နှင့် (ခ) တို့ကို ဖော်ပြထားရာ ညွှန်းဆိုထားသည့် နည်းဥပဒေသည် မှန်ကန်မှုမရှိသဖြင့် ပတ်ဝန်းကျင်ကို ညစ်ညမ်းစေသည့် ပစ္စည်းများကို လည်းကောင်း၊ ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်း သို့မဟုတ် ဘေးအန္တရာယ်ရှိ ပစ္စည်းများကိုလည်းကောင်း အများပြည်သူအား တိုက်ရိုက်ဖြစ်စေ၊ သွယ်ဝိုက်၍ဖြစ်စေ ထိခိုက်စေနိုင်မည့် နေရာတစ်ခုခုတွင် တစ်နည်းနည်းဖြင့် ထုတ်လွှတ်ခြင်း၊ ထုတ်လွှတ်စေခြင်း၊ စွန့်ပစ်ခြင်း၊ စွန့်ပစ်စေခြင်း၊ စုပုံခြင်း၊ စုပုံစေခြင်း မပြုပါကြောင်း၊ အများပြည်သူအကျိုးငှာ ဂေဟစနစ်နှင့် ယင်းစနစ်ကြောင့် ဖြစ်ပေါ်ပြောင်းလဲနေသော သဘာဝပတ်ဝန်းကျင်ကို ထိခိုက်ပျက်စီးစေနိုင်သည့် ပြုလုပ်မှုများကို ဆောင်ရွက်ခြင်း မပြုပါကြောင်းများကို နည်းဥပဒေ</p>	ဥပဒေရေးရာကဏ္ဍ၏ သဘောထားမှတ်ချက် (က) မှ (င) အထိစပ်လျဉ်း၍ ဇယား (၃-၃) တွင် ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>မှာ နည်းဥပဒေ ၆၉ (က) နှင့် (ခ) ကို ရည်ညွှန်းဖော်ပြရမည်ဖြစ်ပါသည်။</p> <p>(ခ) စီမံကိန်းပိုင်ရှင်သည် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေးနှင့် ရပိုင်ခွင့်များကို ခိုင်လုံသောအကြောင်းပြချက် မရှိဘဲ ပိတ်ပင်တားဆီးခြင်း မပြုရသဖြင့် ယင်းတို့၏ အခွင့်အရေးများကို ကာကွယ်စောင့်ရှောက်ပါမယ်ဆိုသည့် ကတိကဝတ်ကို တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ ၂၀၁၅ ပုဒ်မ ၅ သာမက တိုင်းရင်းသား လူမျိုးများ၏ အခွင့်အရေးကာကွယ် စောင့်ရှောက်သည့် နည်းဥပဒေများ နည်းဥပဒေ ၂၀ နှင့် ၂၁ တို့အရ တိုင်းရင်းသား လူမျိုးများ နေထိုင်ရာဒေသအတွင်း ဖော်ဆောင်မည့် စီမံကိန်းနှင့် စပ်လျဉ်း၍ စီမံကိန်း အဆိုပြုသူသည် လိုက်နာရမည့် တာဝန်များကို ကတိကဝတ်များအဖြစ် ဖော်ပြရမည်။</p> <p>(ဂ) “The Motor Vehicles law (2015)” ကို “ယာဉ်အန္တရာယ် ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ် စီမံခန့်ခွဲမှုဥပဒေ၊ ၂၀၂၀” ဖြင့် ရုပ်သိမ်းထားပြီးဖြစ်၍ တည်ဆဲဥပဒေများပါ ပြဋ္ဌာန်းချက်များကို လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရမည်။ ထို့ပြင် “the Motor</p>	<p>၆၉ (က) နှင့် (ခ) တို့ကို ရည်ညွှန်း၍ ကတိကဝတ်ပုံစံ ဖော်ပြရန်။</p> <p>(ခ) စီမံကိန်းပိုင်ရှင်သည် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေးနှင့် ရပိုင်ခွင့်များကို ခိုင်လုံသော အကြောင်းပြချက်မရှိဘဲ ပိတ်ပင်တားဆီးခြင်း မပြုရသဖြင့် ယင်းတို့၏ အခွင့်အရေးများကို ကာကွယ်စောင့်ရှောက်ပါမည် ဆိုသည့် ကတိကဝတ်ကို တိုင်းရင်းသား လူမျိုးများ၏ အခွင့်အရေးကာကွယ် စောင့်ရှောက်သည့် ဥပဒေ ၂၀၁၅ ပုဒ်မ ၅ သာမက တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေးကာကွယ် စောင့်ရှောက်သည့် နည်းဥပဒေများ နည်းဥပဒေ ၂၀ နှင့် ၂၁ တို့အရ တိုင်းရင်းသား လူမျိုးများ နေထိုင်ရာဒေသအတွင်း ဖော်ဆောင်မည့် စီမံကိန်းနှင့် စပ်လျဉ်း၍ စီမံကိန်းအဆိုပြုသူသည် လိုက်နာရမည့် တာဝန်များကို ကတိကဝတ်များအဖြစ် ဖော်ပြရန်။</p> <p>(ဂ) “The Motor Vehicles law (2015)” ကို “ယာဉ်အန္တရာယ် ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ် စီမံခန့်ခွဲမှုဥပဒေ၊ ၂၀၂၀” ဖြင့် ရုပ်သိမ်းထားပြီးဖြစ်၍ တည်ဆဲဥပဒေ များပါ ပြဋ္ဌာန်းချက်များကို</p>	

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>Vehicles Rules (1987) ကိုလည်း “ယာဉ်အန္တရာယ် ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ် စီမံခန့်ခွဲမှုနည်းဥပဒေ၊ ၂၀၂၂” ဖြင့် ရုပ်သိမ်းထားပြီးဖြစ်သဖြင့် တည်ဆဲ နည်းဥပဒေများပါ ပြဋ္ဌာန်းချက်များကို လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရမည်။</p> <p>(ဃ) စီမံကိန်းဆောက်လုပ်ရာတွင် အသုံးပြုမည့် ရေအတွက် ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေးနှင့် မြေအောက်ရေ ထိန်းသိမ်းနိုင်ရေးအတွက် ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ၊ Underground Water Act တို့ အပြင် ရေအရင်းအမြစ်နှင့်မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေး နည်းဥပဒေပါ သက်ဆိုင်သည့် ပြဋ္ဌာန်းချက်များကို တစ်ချက်ချင်း လိုက်နာမည်ဖြစ်ကြောင်း ကတိကဝတ် ပြုရမည် ဖြစ်ပါသည်။</p> <p>(င) ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်စောင့်ရှောက်ရေး ဥပဒေ (၁၉၉၈) ကို ယဉ်ကျေးမှု အမွေအနှစ်ဒေသများ ကာကွယ်စောင့်ရှောက်ရေး ဥပဒေ၊ ၂၀၁၉ ဖြင့်ရုပ်သိမ်းပြီးဖြစ်သဖြင့် တည်ဆဲဥပဒေပါ သက်ဆိုင်သည့်ပြဋ္ဌာန်းချက်များကို စီမံကိန်းပိုင်ရှင်က</p>	<p>လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရန်နှင့် “the Motor Vehicles Rules (1987) ကိုလည်း “ယာဉ်အန္တရာယ် ကင်းရှင်းရေး နှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုနည်းဥပဒေ၊ ၂၀၂၂” ဖြင့် ရုပ်သိမ်းထားပြီးဖြစ်သဖြင့် တည်ဆဲ နည်းဥပဒေများပါ ပြဋ္ဌာန်းချက်များကို လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရန်။</p> <p>(ဃ) စီမံကိန်းဆောက်လုပ်ရာတွင် အသုံးပြုမည့် ရေအတွက် ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေးနှင့် မြေအောက်ရေ ထိန်းသိမ်းနိုင်ရေးအတွက် ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ၊ Underground Water Act တို့အပြင် ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ဖွံ့ဖြိုးတိုးတက်ရေး နည်းဥပဒေပါ သက်ဆိုင်သည့် ပြဋ္ဌာန်းချက်များကို တစ်ချက်ချင်း လိုက်နာမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြရန်။</p> <p>(င) ယဉ်ကျေးမှု အမွေအနှစ်ဒေသများ ကာကွယ်စောင့်ရှောက်ရေး ဥပဒေ (၁၉၉၈) ကို ယဉ်ကျေးမှု အမွေအနှစ်ဒေသများ ကာကွယ်စောင့်ရှောက်ရေး</p>	



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>လိုက်နာမည့် ကတိကဝတ်အဖြစ် ဖော်ပြသင့်ပါသည်။</p> <p>(စ) The Underground Water Act ပါ စီမံကိန်းနှင့် သက်ဆိုင်သည့် အချက်များကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြတွင် “will obtain” အစား “commits to obtain” သို့မဟုတ် “has to obtain” ဟု ဖော်ပြရမည်။ အလားတူ ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီး ကာကွယ်ရေး ဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၁၅ (က)၊ (ခ)၊ ၁၆ (ခ)မှ (ည) အထိ၊ ၁၇၊ ၂၂၊ ၂၇ (က)) နှင့် The Petroleum Rules (1937) တို့ပါ “will” ဆိုသည့် အသုံးအနှုန်းများကိုလည်း ပြင်ဆင်ဖော်ပြရမည်။</p> <p>(ဆ) The Myanmar Fire Force Law (2015) ကို ပြင်ရန် ဥပဒေအမည် မှန်ကန်စေရန် “The Myanmar Fire Brigade Law (2015)” ဟု ပြင်ဆင်ဖော်ပြရမည်။</p> <p>(ဇ) လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် စပ်လျဉ်း၍ ဖော်ပြထားခြင်း မရှိသဖြင့် လုပ်ငန်းခွင်ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးဆိုင်ရာဥပဒေ၊ ၂၀၁၉ (ပုဒ်မ ၁၂၊ ၁၄၊ ၁၆၊ ၁၇၊ ၁၈၊ ၂၆၊ ၂၇၊ ၃၄၊ ၃၆) တို့ကို</p>	<p>ဥပဒေ၊ ၂၀၁၉ ဖြင့်ရုပ်သိမ်းပြီးဖြစ်သဖြင့် တည်ဆဲဥပဒေပါ သက်ဆိုင်သည့် ပြဋ္ဌာန်းချက်များကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့်ကတိကဝတ် အဖြစ်ဖော်ပြရန်။</p> <p>(စ) The Underground Water Act ပါ စီမံကိန်းနှင့် သက်ဆိုင်သည့် အချက်များကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြတွင် “will obtain” အစား “commits to obtain” သို့မဟုတ် “has to obtain” ဟု ဖော်ပြရန်နှင့် အလားတူ ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီး ကာကွယ်ရေးဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၁၅ (က)၊ (ခ)၊ ၁၆ (ခ)မှ (ည) အထိ၊ ၁၇၊ ၂၂၊ ၂၇ (က)) နှင့် The Petroleum Rules (1937) တို့ပါ “will” ဆိုသည့်အသုံးအနှုန်းများကိုလည်း ပြင်ဆင်ဖော်ပြရန်။</p> <p>(ဆ) The Myanmar Fire Force Law (2015) ကို ပြင်ရန် ဥပဒေအမည် မှန်ကန်စေရန် “The Myanmar Fire Brigade Law (2015)” ဟု ပြင်ဆင်ဖော်ပြရန်။</p> <p>(ဇ) လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့်စပ်လျဉ်း၍ ဖော်ပြထားခြင်းမရှိသဖြင့် လုပ်ငန်းခွင်ဘေးအန္တရာယ် ကင်းရှင်းရေး</p>	

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	<p>စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရမည်။</p> <p>(ဈ) စီမံကိန်းတွင် အသုံးပြုမည့် လျှပ်စစ်ဓာတ်အားနှင့်စပ်လျဉ်း၍ လျှပ်စစ်ဥပဒေ၊ ၂၀၁၄ (ပုဒ်မ ၂၀၊ ၂၁ (က)၊ ၂၄၊ ၂၇၊ ၂၉၊ ၃၃၊ ၄၀၊ ၆၈) နှင့် ဘွိုင်လာအသုံးပြုခြင်း နှင့်စပ်လျဉ်း၍ ဘွိုင်လာဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၁၂၊ ၁၉၊ ၂၉ (ခ)၊ ၄၀) တို့ကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြ ရမည်။</p> <p>(ည) စီမံကိန်းတည်နေရာသည် စက်မှုဇုန်အတွင်း ကျရောက်သဖြင့် စက်မှုဇုန်ဥပဒေ ၂၀၂၀ ပါ စီမံကိန်းနှင့်သက်ဆိုင်သည့် အချက်များကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရမည်။</p> <p>(ဋ) စီမံကိန်းတွင်အသုံးပြုမည့် ပေါက်ကွဲစေတတ်သော ဝတ္ထုပစ္စည်းများကို သုံးစွဲခြင်းရှိပါက လုပ်ငန်းခွင်သုံး ပေါက်ကွဲစေတတ်သော ဝတ္ထုပစ္စည်းများဆိုင်ရာဥပဒေ၊ ၂၀၁၈ (ပုဒ်မ ၆ (ဂ)၊ ၇ (ဂ)၊ ၁၁ (ခ)၊ ၁၃၊ ၁၄ (ခ)၊ ၁၅၊ ၁၆၊ ၁၈၊ ၁၉၊ ၂၀၊ ၂၁) နှင့် Explosive Substances Act, 1908 (ပုဒ်မ ၃၊ ၄၊ ၅) တို့ပါ အချက်များကို လိုက်နာ မည်ဖြစ်ကြောင်း ကတိကဝတ်ပြုရမည်။</p>	<p>နှင့် ကျန်းမာရေးဆိုင်ရာဥပဒေ၊ ၂၀၁၉ (ပုဒ်မ ၁၂၊ ၁၄၊ ၁၆၊ ၁၇၊ ၁၈၊ ၂၆၊ ၂၇၊ ၃၄၊ ၃၆) တို့ကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရန်။</p> <p>(ဈ) စီမံကိန်းတွင် အသုံးပြုမည့် လျှပ်စစ်ဓာတ်အားနှင့်စပ်လျဉ်း၍ လျှပ်စစ်ဥပဒေ၊ ၂၀၁၄ (ပုဒ်မ ၂၀၊ ၂၁ (က)၊ ၂၄၊ ၂၇၊ ၂၉၊ ၃၃၊ ၄၀၊ ၆၈) နှင့် ဘွိုင်လာအသုံးပြုခြင်း နှင့်စပ်လျဉ်း၍ ဘွိုင်လာဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၁၂၊ ၁၉၊ ၂၉ (ခ)၊ ၄၀) တို့ကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရန်။</p> <p>(ည) စီမံကိန်းတည်နေရာသည် စက်မှုဇုန်အတွင်းကျရောက်သဖြင့် စက်မှုဇုန်ဥပဒေ ၂၀၂၀ ပါ စီမံကိန်းနှင့်သက်ဆိုင်သည့် အချက်များကို စီမံကိန်းပိုင်ရှင်က လိုက်နာ မည့် ကတိကဝတ်များအဖြစ် ဖော်ပြရန်။</p> <p>(ဋ) စီမံကိန်းတွင် အသုံးပြုမည့် ပေါက်ကွဲစေတတ်သော ဝတ္ထုပစ္စည်းများကို သုံးစွဲခြင်းရှိပါက လုပ်ငန်းခွင်သုံး ပေါက်ကွဲစေတတ်သော ဝတ္ထုပစ္စည်းများဆိုင်ရာဥပဒေ၊ ၂၀၁၈ (ပုဒ်မ ၆ (ဂ)၊ ၇ (ဂ)၊ ၁၁ (ခ)၊ ၁၃၊ ၁၄ (ခ)၊ ၁၅၊ ၁၆၊ ၁၈၊ ၁၉၊ ၂၀၊ ၂၁) နှင့်</p>	

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	<p>(၄) အစီရင်ခံစာပါ ဥပဒေများအနက် အောက်ဖော်ပြပါ ဥပဒေများပါ ပုဒ်မများကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖြည့်စွက်ဖော်ပြရန် အကြံပြုအပ်ပါသည်-</p> <p>(၁) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေများ၊ ၂၀၁၇ (နည်းဥပဒေ ၂၁၂)</p> <p>(၂) ပုဂ္ဂလိက စက်မှုလုပ်ငန်းဥပဒေ၊ ၁၉၉၀ (ပုဒ်မ ၁၁ (ဃ)၊ (စ)၊ ၁၃ (ဃ)၊ (ဇ)၊ ၂၇)</p> <p>(၃) ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေ ၂၀၁၃ (၂၇ (ခ) မှ (ဃ) အထိ)</p> <p>(၄) အလုပ်သမားရေးရာ အငြင်းပွားမှု ဖြေရှင်းရေးဥပဒေ၊ ၂၀၁၂ (ပုဒ်မ၃၈-က၊ ၄၃)၊</p>	<p>Explosive Substances Act, 1908 ( ပုဒ်မ ၃၊ ၄၊ ၅) တို့ပါ အချက်များကို လိုက်နာမည် ဖြစ်ကြောင်း ကတိကဝတ်ပြု ဖော်ပြရန်။</p> <p>(၄) အစီရင်ခံစာပါ ဥပဒေများအနက် အောက်ဖော်ပြပါ ဥပဒေများပါ ပုဒ်မများကို စီမံကိန်းပိုင်ရှင်က လိုက်နာမည့် ကတိကဝတ်များအဖြစ် ဖြည့်စွက် ဖော်ပြရန်-</p> <p>(၁) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေများ၊ ၂၀၁၇ (နည်းဥပဒေ ၂၁၂)</p> <p>(၂) ပုဂ္ဂလိက စက်မှုလုပ်ငန်းဥပဒေ၊ ၁၉၉၀ (ပုဒ်မ ၁၁ (ဃ)၊ (စ)၊ ၁၃ (ဃ)၊ (ဇ)၊ ၂၇)</p> <p>(၃) ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ် ရေး ဥပဒေ ၂၀၁၃ (၂၇ (ခ) မှ (ဃ) အထိ)</p> <p>(၄) အလုပ်သမားရေးရာ အငြင်းပွားမှု ဖြေရှင်းရေးဥပဒေ၊ ၂၀၁၂ (ပုဒ်မ၃၈-က၊ ၄၃)၊</p>	

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၃၆။	<p><b>ကျန်းမာရေးကဏ္ဍ</b></p> <p>(က) စာမျက်နှာ-၈၃၊ သောက်သုံးရေအရည်အသွေး စမ်းသပ်စစ်ဆေးခြင်း ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ မြန်မာနိုင်ငံ အမျိုးသား သောက်သုံးရေ အရည်အသွေးစံချိန်စံညွှန်း (National Drinking Water Quality Standards) နှင့်အညီ ရာသီအလိုက် တစ်နှစ် လျှင် (၃) ကြိမ် (ဇန်နဝါရီ၊ ဧပြီ၊ စက်တင်ဘာ) ပုံမှန် စမ်းသပ်စစ်ဆေးရန် လိုအပ်ပါသည်။</p> <p>(ခ) စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲခြင်း နှင့်စပ်လျဉ်း၍ Domestic Waste များသာမက Industrial Waste (အထူးသဖြင့် Chemical Waste) များ စွန့်ပစ်ရာတွင် သတ်မှတ်ထားသော စည်းမျဉ်း စည်းကမ်းများနှင့်အညီ စနစ်တကျ ဖြစ်စေရန် ဆောင်ရွက်ရန် လိုအပ်ပါသည်။</p> <p>(ဂ) စာမျက်နှာ-၉၅၊ Health Profile ဖော်ပြချက် နှင့်စပ်လျဉ်း၍ စီမံကိန်းနှင့်နီးနွယ်ပတ်သက်မှု ရှိနိုင်သော ကျန်းမာရေး ပြဿနာများကိုသာ ထုတ်နှုတ်ဖော်ပြရန်၊ စီမံချက်ဧရိယာရှိ ကျေးလက်ကျန်းမာရေးဌာနမှ အချက်အလက်များ ထုတ်နှုတ်ဖော်ပြရန် ဖြစ်ပါသည်။ ရွှေ့ပြောင်းလုပ်သားများ လာရောက် အလုပ်လုပ်ကိုင်မှုကြောင့် သက်ရောက်မှုရှိနိုင်သော</p>	<p>(က) စာမျက်နှာ-၈၃၊ သောက်သုံးရေ အရည်အသွေး စမ်းသပ်စစ်ဆေးခြင်း ဖော်ပြချက် နှင့်စပ်လျဉ်း၍ မြန်မာနိုင်ငံ အမျိုးသား သောက်သုံးရေ အရည်အသွေး စံချိန်စံညွှန်း (National Drinking Water Quality Standards) နှင့်အညီ ရာသီအလိုက် တစ်နှစ်လျှင် (၃) ကြိမ် (ဇန်နဝါရီ၊ ဧပြီ၊ စက်တင်ဘာ) ပုံမှန် စမ်းသပ်စစ်ဆေးရန်။</p> <p>(ခ) စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲခြင်းနှင့်စပ်လျဉ်း၍ Domestic Waste များသာမက Industrial Waste (အထူးသဖြင့် Chemical Waste) များ စွန့်ပစ်ရာတွင် သတ်မှတ်ထားသော စည်းမျဉ်း စည်းကမ်းများနှင့်အညီ စနစ်တကျ ဆောင်ရွက်ရန်။</p> <p>(ဂ) စာမျက်နှာ-၉၅၊ Health Profile ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ စီမံကိန်းနှင့် နီးနွယ်ပတ်သက်မှု ရှိနိုင်သော ကျန်းမာရေး ပြဿနာများကိုသာ စီမံချက်ဧရိယာရှိ ကျေးလက်ကျန်းမာရေး ဌာနမှ အချက်အလက်များ ထုတ်နှုတ်ဖော်ပြရန်၊ ရွှေ့ပြောင်းလုပ်သားများ လာရောက် အလုပ်လုပ်ကိုင်မှုကြောင့်</p>	<p>(က) စာမျက်နှာ-၈၃၊ သောက်သုံးရေ အရည်အသွေး စမ်းသပ်စစ်ဆေးခြင်း ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ ဇယား ၈-၄ရှိ Monitoring Plan တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</p> <p>(ခ) စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲခြင်းနှင့် စပ်လျဉ်း၍ ခေါင်းစဉ်ခွဲ (၄.၈) တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</p> <p>(ဂ) စာမျက်နှာ-၉၅၊ Health Profile ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ မှော်ဘီမြို့နယ်ဒေသဆိုင်ရာ အချက်အလက်များကို ကိုးကားဖော်ပြထားခြင်းဖြစ်ပြီး စီမံကိန်းဧရိယာရှိ ကျေးလက်ကျန်းမာရေးဌာနမှ</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>ကျန်းမာရေး ပြဿနာများ (ဥပမာ - လူနေထူထပ်မှုကြောင့် ဖြစ်ပေါ်လာနိုင်သော တီဘီ ရောဂါကဲ့သို့ အသက်ရှူ လမ်းကြောင်းပိုင်းဆိုင်ရာရောဂါများ၊ အမျိုးသမီးများအတွက် ကိုယ်ဝန်ဆောင် စောင့်ရှောက်မှု လိုအပ်ချက်များ၊ ကလေးငယ်များအတွက် ကာကွယ်ဆေးထိုးနှံပေးနိုင်မှု လိုအပ်ချက်များ၊ အလုပ်သမားများအတွက် ကိုဗစ်ရောဂါ ကာကွယ်ဆေးထိုးနှံပေးနိုင်ရန် လိုအပ်ချက်များ၊ ရေနံနှင့် နှီးနွယ်ပတ်သက်သော ဝမ်းပျက်ဝမ်းလျှော၊ ငှက်ဖျား၊ သွေးလွန်တုပ်ကွေး၊ အရေပြားရောဂါအစရှိသော ကျန်းမာရေး ပြဿနာများကိုပါ ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဃ) စာမျက်နှာ-၁၂၄၊ Occupational Hazards and Mitigation Measures ဖော်ပြချက်နှင့် စပ်လျဉ်း၍-</p> <p>(၁) လုပ်ငန်းခွင်ဘေးအန္တရာယ်များ တစ်ခုချင်းစီအလိုက် Mitigation measures များကို သေချာစွာ ဖော်ပြရန် ဖြစ်ပါသည်။ ဥပမာ - Heat နှင့် ပတ်သက်၍ Protection မည်ကဲ့သို့ ဆောင်ရွက်မည်၊ Prevention အနေဖြင့် heat-related disorders, first-aid measures စသည်တို့ကို မည်ကဲ့သို့ ဆောင်ရွက်</p>	<p>သက်ရောက်မှု ရှိနိုင်သော ကျန်းမာရေး ပြဿနာများ (ဥပမာ - လူနေထူထပ်မှုကြောင့် ဖြစ်ပေါ်လာနိုင်သော တီဘီ ရောဂါကဲ့သို့ အသက်ရှူလမ်းကြောင်းပိုင်းဆိုင်ရာရောဂါများ၊ အမျိုးသမီးများအတွက် ကိုယ်ဝန်ဆောင် စောင့်ရှောက်မှု လိုအပ်ချက်များ၊ ကလေးငယ်များအတွက် ကာကွယ်ဆေးထိုးနှံပေးနိုင်မှု လိုအပ်ချက်များ၊ အလုပ်သမားများအတွက် ကိုဗစ်ရောဂါ ကာကွယ်ဆေးထိုးနှံပေးနိုင်ရန် လိုအပ်ချက်များ၊ ရေနံနှင့် နှီးနွယ်ပတ်သက်သော ဝမ်းပျက်ဝမ်းလျှော၊ ငှက်ဖျား၊ သွေးလွန်တုပ်ကွေး၊ အရေပြားရောဂါအစရှိသော ကျန်းမာရေး ပြဿနာများကိုပါ ထည့်သွင်းဖော်ပြရန်။</p> <p>(ဃ) စာမျက်နှာ-၁၂၄၊ Occupational Hazards and Mitigation Measures ဖော်ပြချက်နှင့် စပ်လျဉ်း၍-</p> <p>(၁) လုပ်ငန်းခွင် ဘေးအန္တရာယ်များ တစ်ခုချင်းစီအလိုက် Mitigation measures များကို သေချာစွာ ဖော်ပြရန်နှင့် Noise, Dust, Mechanical hazards, Electrical hazards တို့ကိုလည်း hazard</p>	<p>အချက်အလက်များကို ရရှိခြင်းမရှိပါ။ ဒေသဆိုင်ရာ အချက်အလက်များမှ ကိုးကားရရှိသော အချက်အလက်များနှင့် လူမှုစီးပွားစစ်တမ်းကောက်ယူခြင်းမှ ရရှိသော အခြေခံအချက်အလက်များအပေါ်အခြေတည်၍ ဆန်းစစ်လေ့လာချက်ကို ခေါင်းစဉ်ခွဲ (၆.၅) တွင် ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</p> <p>Occupational Hazards and Mitigation Measures ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ ဇယား ၆-၁၀၊ ခေါင်းစဉ်ခွဲ (၆.၃.၁)၊ ခေါင်းစဉ်ခွဲ (၆.၆) နှင့်တွင်လည်းကောင်း၊ ဇယား (၈-၁)၊ ဇယား (၈-၂)နှင့် ဇယား (၈-၃) တွင်လည်းကောင်း ပြန်လည်ပြင်ဆင် ဖော်ပြ ထားပါသည်။</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>မည်။ ထိုနည်းတူစွာ Noise, Dust, Mechanical hazards, Electrical hazards တို့ကိုလည်း hazard တစ်ခုချင်းစီအလိုက် Mitigation measures များကို သေချာစွာဖော်ပြရန် ဖြစ်ပါသည်။ (မည်သူက ဆောင်ရွက်မည်၊ မည်သည့်မှ အလုပ်သမားများအတွက် ဆောင်ရွက်မည်၊ မည်သည့်အချိန်တွင် ဆောင်ရွက်မည်၊ မည်ကဲ့သို့ ဆောင်ရွက်မည် စသည်ဖြင့်)</p> <p>(၂) လုပ်ငန်းခွင်များတွင် အသုံးပြုသော ဓာတုပစ္စည်းများနှင့် ပတ်သက်၍ မြန်မာနိုင်ငံစံချိန်စံညွှန်းကောင်စီမှ ထုတ်ပြန်ထားသော စံချိန်စံညွှန်း ၁၄ ခုအနက် မိမိတို့ လုပ်ငန်းနှင့်သက်ဆိုင်သော ဓာတုပစ္စည်းများအလိုက် စံချိန်စံညွှန်းများနှင့် ကိုက်ညီမှုရှိအောင် လုပ်ငန်းရှင်များမှ မိမိတို့၏ လုပ်ငန်းခွင်များအား ပြင်ဆင်ရန် လိုအပ်ပါသည်။(ဥပမာ - Dust, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, CO စသည်ဖြင့်)</p> <p>(၃) Occupational Hazards များတွင် Shift Work နှင့်နီးနွယ် ပတ်သက်သော ကျန်းမာရေးဆိုင်ရာ ပြဿနာများကိုပါ ထည့်သွင်းစဉ်းစားပြီး Occupational</p>	<p>တစ်ခုချင်းစီအလိုက် Mitigation measures များကို သေချာစွာ ဖော်ပြရန်။ (မည်သူက ဆောင်ရွက်မည်၊ မည်သည့်မှ အလုပ်သမားများအတွက် ဆောင်ရွက်မည်၊ မည်သည့်အချိန်တွင် ဆောင်ရွက်မည်၊ မည်ကဲ့သို့ ဆောင်ရွက်မည် စသည်ဖြင့်)</p> <p>(၂) လုပ်ငန်းခွင်များတွင် အသုံးပြုသော ဓာတုပစ္စည်းများနှင့် ပတ်သက်၍ မြန်မာနိုင်ငံ စံချိန်စံညွှန်းကောင်စီမှ ထုတ်ပြန်ထားသော စံချိန်စံညွှန်း ၁၄ ခုအနက် မိမိတို့ လုပ်ငန်းနှင့်သက်ဆိုင်သော ဓာတုပစ္စည်းများအလိုက် စံချိန်စံညွှန်းများနှင့် ကိုက်ညီမှုရှိအောင် လုပ်ငန်းရှင်များမှ မိမိတို့၏ လုပ်ငန်းခွင်များအား ပြင်ဆင်ရန်။ (ဥပမာ - Dust, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, CO စသည်ဖြင့်)</p> <p>(၃) Occupational Hazards များတွင် Shift Work နှင့် နီးနွယ်ပတ်သက်သော ကျန်းမာရေးဆိုင်ရာ ပြဿနာများကိုပါ ထည့်သွင်းစဉ်းစားပြီး Occupational Health and Safety Plan တွင် ဖော်ပြရန်။</p>	<p>လုပ်ငန်းခွင်များတွင် အသုံးပြုသော ဓာတုပစ္စည်းများနှင့် ပတ်သက်၍ မြန်မာနိုင်ငံ စံချိန်စံညွှန်းကောင်စီမှ ထုတ်ပြန်ထားသော စံချိန်စံညွှန်း ၁၄ ခုအနက် မိမိတို့လုပ်ငန်းနှင့်သက်ဆိုင်သော ဓာတုပစ္စည်းများအလိုက် စံချိန်စံညွှန်းများနှင့် ကိုက်ညီမှုရှိအောင် လုပ်ငန်းရှင်များမှ မိမိတို့၏ လုပ်ငန်းခွင်အား ပြင်ဆင်ပါမည်။</p> <p>Occupational and Community Health and Safety Management Sub-plan တွင် ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>Health and Safety Plan တွင် ဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(င) စာမျက်နှာ-၁၄၃၊ Occupational Health and Safety Management ဖော်ပြချက် နှင့်စပ်လျဉ်း၍ Periodic Medical Examination ဆောင်ရွက်ရာတွင် Risk Areas (Noisy Workplace, Dusty Workplace) များတွင် အလုပ်လုပ်ကိုင်မည့် အလုပ်သမားများအတွက် Special Medical Examination ကိုပါ ထည့်သွင်းစီမံထားရှိရန် လိုအပ်ပါသည်။ မြောင်းတကာစက်မှုဇုန်သည် မှော်ဘီမြို့နှင့် တိုက်ကြီးမြို့ အကြားတွင် တည်ရှိသောကြောင့် မှော်ဘီမြို့နယ်ဆေးရုံ နှင့် တိုက်ကြီးမြို့နယ် ဆေးရုံများတွင် ကျန်းမာရေးစောင့်ရှောက်မှု ရယူနိုင်ပြီး လိုအပ်ပါက အင်းစိန်ပြည်သူ့ဆေးရုံကြီး၊ မြောက်ဥက္ကလာပ ပြည်သူ့ဆေးရုံကြီးတို့သို့ လည်း လွှဲပို့ကုသမှု ခံယူနိုင်ပါသည်။ ထိုကဲ့သို့ မြို့နယ်ဆေးရုံများနှင့် လွှဲပြောင်းကုသမှု ခံယူရန်လိုအပ်သော လူနာများအတွက် စက်ရုံမှ Transportation စီစဉ်ဆောင်ရွက် ပေးထားမှု ကြိုတင်ပြင်ဆင်ရန် လိုအပ်ပါသည် (ဥပမာ - လူနာသယ်ပို့ရန် အရံသင့် ကားစီစဉ်ခြင်း) ထို့အပြင် Rule 1960 OH</p>	<p>(င) စာမျက်နှာ-၁၄၃၊ Occupational Health and Safety Management ဖော်ပြချက်နှင့်စပ်လျဉ်း၍ Periodic Medical Examination ဆောင်ရွက်ရာ တွင် Risk Areas (Noisy Workplace, Dusty Workplace) များတွင် အလုပ်လုပ် ကိုင်မည့် အလုပ်သမားများအတွက် Special Medical Examination ကိုပါ ထည့်သွင်းစီမံ ထားရှိရန်၊ မြို့နယ်ဆေးရုံ များနှင့် လွှဲပြောင်းကုသမှုခံယူရန် လိုအပ် သော လူနာများအတွက် စက်ရုံမှ Transportation စီစဉ်ဆောင်ရွက် ပေးထားမှု ကြိုတင်ပြင်ဆင်ထားရှိရန်နှင့် Rule 1960 OH Services အရ စက်ရုံဝန်ထမ်း ၅၁-၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦး ရှိရန် လိုအပ်ပြီး၊ ဝန်ထမ်း ၁၀၀-၁၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦး ရှိရန် လိုအပ်ပြီး၊ ဝန်ထမ်း ၁၀၀-၁၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦး၊ အချိန်ပိုင်း ဆရာဝန် (၁)ဦး ထားရှိရမည့် အစီအစဉ်အား ဆောင်ရွက်သွားပါမည်။</p> <p>(စ) စာမျက်နှာ-၁၆၀၊ Emergency Management Plan ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ ဆေးရုံ၊ ဆေးခန်းအမည် ဖော်ပြရုံ သာမကဘဲ ထိုကျန်းမာရေးဌာန</p>	<p>Occupational and Community Health and Safety Management Sub-plan တွင်လည်းကောင်း၊ Emergency Response Plan တွင်လည်းကောင်း ဖော်ပြထားပါသည်။ စီမံကိန်းသည် လက်ရှိအခြေအနေအရ ဝန်ထမ်းနှင့် အလုပ်သမား စုစုပေါင်း (၄၂) ဦးသာ ခန့်ထားနိုင်ပြီး ဝန်ထမ်းနှင့် လုပ်သားဦးရေ တိုးမြှင့်ခန့်ထားသည့်အခါတွင် Rule 1960 OH Services အရ စက်ရုံဝန်ထမ်း ၅၁-၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦး ရှိရန် လိုအပ်ပြီး၊ ဝန်ထမ်း ၁၀၀-၁၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦး၊ အချိန်ပိုင်း ဆရာဝန် (၁)ဦး ထားရှိရမည့် အစီအစဉ်အား ဆောင်ရွက်သွားပါမည်။</p> <p>Emergency Response Plan နှင့် Emergency Preparedness Plan and Training Programs တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>Services အရ စက်ရုံဝန်ထမ်း ၅၁-၉၉ ဦး ရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပိုင်း Nurse (၁)ဦးရှိရန် လိုအပ်ပြီး၊ ဝန်ထမ်း ၁၀၀-၁၉၉ ဦးရှိလျှင် အချိန်ပြည့် First Aider (၁)ဦး၊ အချိန်ပြည့် Nurse (၁)ဦး၊ အချိန်ပိုင်း ဆရာဝန် (၁)ဦး ရှိရန် လိုအပ်ပါသည်။</p> <p>(စ) စာမျက်နှာ-၁၆၀၊ Emergency Management Plan ဖော်ပြချက်နှင့် စပ်လျဉ်း၍ ဆေးရုံ၊ ဆေးခန်းအမည် ဖော်ပြရုံသာမက ဘဲ ထိုကျန်းမာရေးဌာနသို့ မည်သို့ ပို့ဆောင်မည်၊ မည်သည့်အစီအမံများ ဆောင်ရွက်ထားမည်၊ မည်သူက ဦးဆောင်၍ ဆောင်ရွက်မည် စသည်တို့ကို အသေးစိတ် ရေးဆွဲဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဆ) စာမျက်နှာ ၁၂၇-၁၃၀၊ Health Impact Assessment ဖော်ပြချက်နှင့်စပ်လျဉ်း၍-</p> <p>(၁) Research methodology ကို သေချာစွာဖော်ပြရန် ဖြစ်ပါသည်။ (Sampling method ရွေးချယ်ရာတွင် Representative ဖြစ်သော အိမ်ထောင်စုပေါင်း ၆၇ စုကို မည်ကဲ့သို့ ရွေးချယ်ခဲ့သည်၊ မည်သည့် sampling method ကို အသုံးပြုခဲ့သည် စသည်ဖြင့်)</p>	<p>သို့ မည်သို့ပို့ဆောင်မည်၊ မည်သည့် အစီအမံများ ဆောင်ရွက်ထားမည်၊ မည်သူက ဦးဆောင်၍ ဆောင်ရွက်မည် စသည်တို့ကို အသေးစိတ် ရေးဆွဲဖော်ပြရန်။</p> <p>(ဆ) စာမျက်နှာ ၁၂၇-၁၃၀၊ Health Impact Assessment ဖော်ပြချက်နှင့်စပ်လျဉ်း၍-</p> <p>(၁) Research methodology ကို သေချာစွာဖော်ပြရန်။ (Sampling method ရွေးချယ်ရာတွင် Representative ဖြစ်သော အိမ်ထောင်စုပေါင်း ၆၇ စုကို မည်ကဲ့သို့ ရွေးချယ်ခဲ့သည်၊ မည်သည့် sampling method ကို အသုံးပြုခဲ့သည် စသည်ဖြင့်)</p> <p>(၂) Health Impact Assessment သည် data collection and data displaying သက်သက်မဟုတ်ဘဲ ထို data များအပေါ် မူတည်၍ မည်သည့် အစီအမံများ ရေးဆွဲမည်၊ ထိုအစီအမံများကို မည်ကဲ့သို့ ဆောင်ရွက်မည် စသည့် အချက်များကိုပါ ထည့်သွင်း စဉ်းစားပြီး ရေးဆွဲဖော်ပြရန်။</p>	<p>Health Impact Assessment တွင် (၁), (၂) နှင့် (၃) ပါ သုံးသပ်အကြံပြုချက်အတိုင်း ပြန်လည်ပြင်ဆင် ဖော်ပြထားပါသည်။</p>

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	<p>(၂) Health Impact Assessment သည် data collection and data displaying သက်သက်မဟုတ်ဘဲ ထို data များ အပေါ်မူတည်၍ မည်သည့်အစီအမံများ ရေးဆွဲမည်၊ ထိုအစီအမံများကို မည်ကဲ့သို့ ဆောင်ရွက်မည် စသည့်အချက်များကိုပါ ထည့်သွင်းစဉ်းစားပြီး ရေးဆွဲဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(၃) Health Impact Assessment သည် worker health အတွက်ရော၊ community health ပါ ထည့်သွင်းဆန်းစစ်ရန် လိုအပ်ပါသည်။</p> <p>မှတ်ချက်။ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာများ ရေးသားပြုစုရာတွင် ကျန်းမာရေး ထိခိုက်မှုဆန်းစစ်ခြင်းအပိုင်းကို ရေးသားပြုစုရန် အတွက် ဆေးပညာဘွဲ့နှင့် ပြည်သူ့ကျန်းမာရေးဘွဲ့ နောက်ခံရှိသော Health Personnel တစ်ဦးဦးကို အစီရင်ခံစာ ရေးသားပြုစုရေးအဖွဲ့တွင် ထည့်သွင်းကာ ရေးသားပြုစုသင့်ပါကြောင်း အကြံပြုအပ်ပါသည်။</p>	<p>(၃) Health Impact Assessment သည် workers health အတွက်ရော၊ community health ပါ ထည့်သွင်းဆန်းစစ်ရန်။</p>	
၃၇။	<p><b>တိုင်းရင်းသားအခွင့်အရေးကဏ္ဍ</b></p> <p>(က) Executive Summary တွင် တိုင်းရင်းသား လူမျိုးများ၏ အခွင့်အရေးကာကွယ် စောင့်ရှောက်သည့်ဥပဒေ (၂၀၁၅) ကို "The Rights</p>	<p>(က) Executive Summary တွင် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ</p>	<p>တိုင်းရင်းသားအခွင့်အရေးကဏ္ဍ၏ သဘောထားမှတ်ချက် (က)၊ (ခ)၊ (ဂ)နှင့်စပ်လျဉ်း၍ သက်ဆိုင်ရာ</p>

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	<p>of National Races Law (2015)" ဟု ဖော်ပြချက်အား " The Ethnic Rights Protection Law (2015)" ဟု ပြင်ဆင်ဖော်ပြရန်နှင့် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် နည်းဥပဒေများကို (၂၀၁၉) တွင် ထုတ်ပြန်ပြီးဖြစ်သဖြင့် ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ခ) စီမံကိန်းအဆိုပြုသူသည် တိုင်းရင်းသားလူမျိုး များ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက် သည့် ဥပဒေ ပုဒ်မ ၅ နှင့် နည်းဥပဒေများပါ နည်းဥပဒေ ၂၀၊ ၂၁ တို့နှင့်အညီ လိုက်နာ ဆောင်ရွက်ရမည်ဖြစ်ပါသည်။</p> <p>(ဂ) တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ၊ နည်းဥပဒေများပါ ပြဋ္ဌာန်းချက်များအား လေးစား လိုက်နာမည်ဖြစ်ကြောင်း ကတိကဝတ် ဖော်ပြရန်လိုအပ်ပါသည်။</p> <p>(ဃ) Public Consultation နှင့်ပတ်သက်၍ Scoping အဆင့်တွင် ဆောင်ရွက်ခဲ့သည့် အစည်းအဝေးမှတ်တမ်းများ၊ တက်ရောက်သူများ မှတ်တမ်း၊ မှတ်တမ်းဓာတ်ပုံများအား ပူးတွဲ တင်ပြထားခြင်းမရှိသဖြင့် ပူးတွဲတင်ပြရန် လိုအပ်ပါသည်။</p>	<p>(၂၀၁၅) ကို "The Rights of National Races Law (2015)" ဟု ဖော်ပြချက်အား " The Ethnic Rights Protection Law (2015)" ဟု ပြင်ဆင်ဖော်ပြရန်နှင့် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် နည်းဥပဒေများကို (၂၀၁၉) တွင် ထုတ်ပြန်ပြီးဖြစ်သဖြင့် ထည့်သွင်းဖော်ပြရန်။</p> <p>(ခ) စီမံကိန်းအဆိုပြုသူသည် တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ ပုဒ်မ ၅ နှင့် နည်းဥပဒေများပါ နည်းဥပဒေ ၂၀၊ ၂၁ တို့နှင့် အညီ လိုက်နာ ဆောင်ရွက်ရန်။</p> <p>(ဂ) တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ် စောင့်ရှောက်သည့် ဥပဒေ၊ နည်းဥပဒေများပါ ပြဋ္ဌာန်းချက်များအား လေးစားလိုက်နာမည် ဖြစ်ကြောင်း ကတိကဝတ် ဖော်ပြရန်။</p> <p>(ဃ) Public Consultation နှင့်ပတ်သက်၍ Scoping အဆင့်တွင် ဆောင်ရွက်ခဲ့သည့် အစည်းအဝေးမှတ်တမ်းများ၊ တက်ရောက်သူများ မှတ်တမ်း၊ မှတ်တမ်းဓာတ်ပုံများအား ပူးတွဲတင်ပြထားခြင်း မရှိသဖြင့် ပူးတွဲတင်ပြရန်။</p>	<p>ကတိကဝတ်များတွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p> <p>(ဃ) Scoping အဆင့်တွင် ဆောင်ရွက်ခဲ့သည့် အစည်းအဝေးမှတ်တမ်းများ၊ တက်ရောက်သူများမှတ်တမ်း၊ မှတ်တမ်းဓာတ်ပုံများအား Scoping စာအုပ်တွင်</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>(င) EIA အဆင့်တွင် လူထုတွေ့ဆုံပွဲကို ၃၀-၇-၂၀၁၉ တွင် မှော်ဘီမြို့နယ်၊ မြောင်းတကာ စက်မှုဇုန်ဝန်းအတွင်းရှိ ဓမ္မရေအေးဘုန်းကြီးကျောင်းတွင် ကျင်းပခဲ့ပြီး တက်ရောက်သူ ဒေသခံများမှာ ကန်ကလေးရွာမှ (၇)ဦးသာ တက်ရောက်သည်ကို စိစစ်တွေ့ရှိရပါသည်။ စီမံကိန်း အကျိုးသက်ရောက်မှုရှိသည့် ကျေးရွာ (၂) ရွာ ရှိသည်ဟု ဖော်ပြပါရှိပြီး အဆိုပါ ကျေးရွာများရှိ လူဦးရေစာရင်းအား ဖော်ပြထားခြင်း မရှိပါ။ ကျေးရွာ (၂) ရွာ ရှိ သော်လည်း EIA အဆင့် လူထုတွေ့ဆုံပွဲ တက်ရောက်သူ ဒေသခံ (၇)ဦးသာ တက်ရောက်သည်ကို တွေ့ရပါသည်။ သို့ဖြစ်ပါ၍ စီမံကိန်းကြောင့် အကျိုးသက်ရောက်မှု ရှိသည့် ကျေးရွာများရှိ လူဦးရေစာရင်းကို ဖော်ပြရန် လိုအပ်ပြီး ကျေးရွာများမှ ဒေသခံများပါဝင်သည့် လူထုတွေ့ဆုံပွဲဖြစ်ရန် လိုအပ်ပါသဖြင့် ဒေသခံလူထုများ ပိုမိုပါဝင်သည့် တွေ့ဆုံရှင်းလင်းပွဲများကို ထပ်မံကျင်းပ ပြုလုပ်ရန် လိုအပ်ပါသည်။</p>	<p>(င) EIA အဆင့် လူထုတွေ့ဆုံပွဲ တက်ရောက်သူ ဒေသခံ (၇) ဦးသာ တက်ရောက်သည်ကို တွေ့ရှိရသဖြင့် စီမံကိန်းကြောင့် အကျိုးသက်ရောက်မှုရှိသည့် ကျေးရွာများရှိ လူဦးရေစာရင်းကို ဖော်ပြရန်နှင့် ကျေးရွာများမှ ဒေသခံများပါဝင်သည့် လူထုတွေ့ဆုံပွဲဖြစ်ရန် လိုအပ်ပါသဖြင့် ဒေသခံလူထုများ ပိုမိုပါဝင်သည့် တွေ့ဆုံရှင်းလင်းပွဲများကို ထပ်မံကျင်းပပြုလုပ်ရန်။</p>	<p>ဖော်ပြထားပြီးဖြစ်ပြီး ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအဆင့်တွင် ဆောင်ရွက်သော Public Consultation ဆိုင်ရာ အစည်းအဝေးမှတ်တမ်းများ၊ တက်ရောက်သူများမှတ်တမ်းများ၊ မှတ်တမ်းဓာတ်ပုံများကို ဖော်ပြထားခြင်းဖြစ်ပါသည်။</p> <p>(င) EIA အဆင့် လူထုတွေ့ဆုံပွဲ အခမ်းအနားတွင် ဒေသခံ (၇) ယောက် တက်ရောက်ခဲ့သည့် အပြင် စက်မှုဇုန်အတွင်းရှိ ဝန်ထမ်းများလည်း အခမ်းအနားသို့ တက်ရောက်ခဲ့ပါသည်။ စီမံကိန်းသည်စက်မှုဇုန်တွင် တည်ရှိသောကြောင့် စီမံကိန်းကြောင့် သက်ရောက်နိုင်ခြေရှိသော အနီးပတ်ဝန်းကျင်ကျေးရွာရှိ လူအများလာရန် လွယ်ကူသော</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			<p>ဘုန်းကြီးကျောင်းဝင်း အတွင်းတွင် ပြုလုပ်၍ ဖိတ်ကြားခဲ့သော်လည်း ဒေသခံများ၏ အချိန်ရရှိမှုနှင့် ရာသီဥတုအနေအထားကြောင့် အနည်းငယ်သာ တက်ရောက်ခဲ့သည်ကို မှတ်တမ်းတင်ထားခြင်းဖြစ်ပါသ ည်။</p> <p>လူမှုစီးပွားစစ်တမ်းကောက်ယူမှု တွင်လည်း ဒေသခံများ၏ စီမံကိန်းအပေါ် သဘောထားအမြင်များကို ဆွေးနွေးမေးမြန်းခဲ့ပြီး ထိုအချက်အလက်များကို ခေါင်းစဉ်ခွဲ (၆.၄) တွင် ဆန်းစစ်ဖော်ပြထားပြီး ဖြစ်ပါသည်။ ထို့ကြောင့် ဒေသခံ (၇) ဦးသာ တက်ရောက်ခြင်းကြောင့် လူထုတွေ့ဆုံဆွေးနွေးပွဲအား ထပ်မံကျင်းပရန် မလိုအပ်ပါ။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
၃၈။	<p><b>ယဉ်ကျေးမှုအမွေအနှစ်ကဏ္ဍ</b></p> <p>(က) စာမျက်နှာ (၃၇) တွင် The Protection and Preservation of Cultural Heritage Regions Law (1998) ဟု ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသည်။ The Protection and Preservation of Cultural Heritage Regions Law (2019) ဟု ပြင်ဆင်ဖော်ပြရန်လိုအပ်ပါသည်။</p> <p>(ခ) စက်ရုံလည်ပတ်သည့်အခါ Generator မှ တုန်ခါမှု အနည်းငယ် ထွက်ပေါ်မည်ဟု ဖော်ပြထားသည်ကို စိစစ် တွေ့ရှိရပါသည်။ စက်ရုံပတ်ဝန်းကျင်တွင် ယဉ်ကျေးမှု အမွေအနှစ် အဆောက်အအုံများ ရှိ/မရှိ ဖော်ပြသင့်ပါသည်။ ယဉ်ကျေးမှုအမွေအနှစ်များ ရှိပါက စက်ရုံနှင့် အကွာအဝေး၊ အဆိုပါ အဆောက်အအုံများအပေါ် Vibration သက်ရောက်မှု ရှိ/ မရှိ စစ်ဆေးတိုင်းတာရန် လိုအပ်ပါသည်။</p>	<p>(က) စာမျက်နှာ (၃၇) တွင် The Protection and Preservation of Cultural Heritage Regions Law (1998) ဟု ဖော်ပြထားမှုကို The Protection and Preservation of Cultural Heritage Regions Law (2019) ဟု ပြင်ဆင်ဖော်ပြရန်။</p> <p>(ခ) စက်ရုံပတ်ဝန်းကျင်တွင် ယဉ်ကျေးမှု အမွေအနှစ် အဆောက်အအုံများ ရှိ/မရှိ ဖော်ပြသင့်ပါသည်။ ယဉ်ကျေးမှုအမွေအနှစ်များရှိပါက စက်ရုံနှင့် အကွာအဝေး၊ အဆိုပါ အဆောက်အအုံများအပေါ် Vibration သက်ရောက်မှု ရှိ/ မရှိ စစ်ဆေးတိုင်းတာရန်။</p>	<p>(က) စာမျက်နှာ (၃၇) တွင် The Protection and Preservation of Cultural Heritage Regions Law (1998) ဟု ဖော်ပြထားမှုကို The Protection and Preservation of Cultural Heritage Regions Law (2019) ဟု ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။</p> <p>(ခ) စီမံကိန်းသည် မြောင်းတကာ စက်မှုဇုန်အတွင်းတွင် တည်ရှိခြင်းကြောင့် စက်ရုံပတ်ဝန်းကျင်တွင် ယဉ်ကျေးမှု အမွေအနှစ် အဆောက်အအုံများ တည်ရှိသည်ကို မတွေ့ရှိရပေ။</p>
၃၉။	<p><b>ရင်းနှီးမြှုပ်နှံမှုကဏ္ဍ</b></p> <p>(က) Yangon J.R family Ltd. သည် မြန်မာနိုင်ငံကုမ္ပဏီများ ဥပဒေအရ ၂၂-၁-၂၀၁၈ တွင် မှတ်ပုံတင်ထားပြီး လက်ရှိတွင် ကုမ္ပဏီမှတ်ပုံတင် အသက်ဝင်ဆဲကုမ္ပဏီ တစ်ခုဖြစ်ကြောင်း စိစစ်တွေ့ရှိရပါသည်။</p>	<p>(က) Yangon J.R family Ltd. သည် မြန်မာနိုင်ငံကုမ္ပဏီများ ဥပဒေအရ ၂၂-၁-၂၀၁၈ တွင် မှတ်ပုံတင်ထားပြီး လက်ရှိတွင် ကုမ္ပဏီမှတ်ပုံတင် အသက်ဝင်ဆဲ ကုမ္ပဏီ တစ်ခုဖြစ်ကြောင်း စိစစ်</p>	<p>(က) ကုမ္ပဏီ မှတ်ပုံတင် အထောက်အထား(မိတ္တူ) အား နောက်ဆက်တွဲတွင် ပြန်လည်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>အစီရင်ခံစာတွင် ကုမ္ပဏီမှတ်ပုံတင် အထောက်အထား(မိတ္တူ)များ တင်ပြရန် လိုအပ်ပါသည်။</p> <p>(ခ) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုကော်မရှင်မှ Yangon J.R family Ltd. အမည်ဖြင့် ခွင့်ပြုမိန့်အမှတ်၊ ၀၉၃/ ၂၀၁၈(၇-၇-၂၀၁၈) လုပ်ငန်းဆောင်ရွက်ခွင့် ရရှိထားပါသည်။ ရင်းနှီးမြှုပ်နှံမှု ခွင့်ပြုသည့် သက်တမ်း ၅၀ နှစ် ၊ တည်ဆောက်ရေးကာလ ၂ နှစ် ရရှိထားပြီး ပထမအကြိမ် သက်တမ်းတိုးအဖြစ် ၇-၇-၂၀၂၀ မှ ၆-၇-၂၀၂၁ ထိ MIC မှ တိုးမြှင့် ခွင့်ပြုထားပါသည်။ လုပ်ငန်းစီးပွားဖြစ် စတင် မည့်အခြေအနေနှင့်စပ်လျဉ်း၍ MIC သို့ ၂၀၂၂ ခုနှစ် စက်တင်ဘာလ၌ တင်ပြလျှောက် ထားလျက်ရှိကြောင်း သိရှိရပြီး လိုအပ် သည်များ ဆက်လက် ဆောင်ရွက်ရပါမည်။ MIC ခွင့်ပြုချက်ရယူပြီး ဆောင်ရွက် နေသည့် အတွက် EIA Report တင်ပြသည့် Project ၏ MIC Permit မိတ္တူကို အစီရင်ခံစာတွင် ပူးတွဲဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဂ) ဥပဒေပြဋ္ဌာန်းချက်ဆိုင်ရာ ဖော်ပြချက်များ နှင့်စပ်လျဉ်း၍-</p> <p>(၁) အစီရင်ခံစာ အကျဉ်းချုပ်တွင် မြန်မာ့ ရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) နှင့် မြန်မာ့</p>	<p>တွေ့ရှိရသဖြင့် အစီရင်ခံစာတွင် ကုမ္ပဏီ မှတ်ပုံတင် အထောက်အထား(မိတ္တူ)များ တင်ပြရန်။</p> <p>(ခ) လုပ်ငန်းစီးပွားဖြစ် စတင်မည့်အခြေအနေ နှင့်စပ်လျဉ်း၍ MIC သို့ ၂၀၂၂ ခုနှစ် စက်တင်ဘာလ၌ တင်ပြလျှောက်ထား လျက်ရှိကြောင်း သိရှိရသဖြင့် လိုအပ် သည်များ ဆက်လက် ဆောင်ရွက်ရန်နှင့် MIC ခွင့်ပြုချက်ရယူပြီး ဆောင်ရွက်နေ သည့်အတွက် EIA Report တင်ပြသည့် Project ၏ MIC Permit မိတ္တူကို အစီရင်ခံစာတွင် ပူးတွဲဖော်ပြရန်။</p> <p>(ဂ) ဥပဒေပြဋ္ဌာန်းချက်ဆိုင်ရာ ဖော်ပြချက် များနှင့်စပ်လျဉ်း၍-</p> <p>(၁) အစီရင်ခံစာအကျဉ်းချုပ်တွင် မြန်မာ့ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ (၂၀၁၆) နှင့်</p>	<p>(ခ) MIC မိတ္တူအား နောက်ဆက်တွဲ တွင် ပြန်လည်ဖော်ပြထား ပါသည်။</p> <p>(ဂ) ဥပဒေပြဋ္ဌာန်းချက်ဆိုင်ရာ ဖော်ပြချက်များနှင့် စပ်လျဉ်း၍ သက်ဆိုင်ရာ</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>ရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေ (၂၀၁၇) ဟု ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါ သဖြင့် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ဥပဒေ (၂၀၁၆) နှင့် မြန်မာနိုင်ငံရင်းနှီး မြှုပ်နှံ မှုနည်းဥပဒေ (၂၀၁၇) ဟု (မြန်မာ ဘာသာ/အင်္ဂလိပ်ဘာသာ) ဖြင့် အမှန် ပြင်ဆင်တင် ပြရန် လိုအပ်မည် ဖြစ်ပါသည်။</p> <p>(၂) သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဆိုင်ရာ အစီအမံများ နှင့်စပ်လျဉ်း၍ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) ပါ ပုဒ်မနှင့် ပုဒ်မခွဲများဖြစ်သည့် Section 50 (d), 51(b, c, d, g) 65 (g, l, j, k, l, m, o, p, q) ,73 နှင့် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေ (၂၀၁၆) ၏ Rule 202, 203 206 တို့ကို ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိ ရပါသည်။</p> <p>(၃) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) နှင့် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေများ (၂၀၁၇) တို့ကို လိုက်နာ ဆောင်ရွက်မည်ဟူ၍ ထည့်သွင်း ရေးသားပေးရန် လိုအပ်ပါသည်။</p> <p>(၄) သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဆိုင်ရာ အစီအမံများ နှင့်စပ်လျဉ်း၍</p>	<p>မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေ (၂၀၁၇) ဟု ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသဖြင့် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) နှင့် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုနည်း ဥပဒေ (၂၀၁၇) ဟု (မြန်မာဘာသာ/ အင်္ဂလိပ်ဘာသာ) ဖြင့် အမှန်ပြင်ဆင် တင်ပြရန်။</p> <p>(၂) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ (၂၀၁၆) နှင့် မြန်မာနိုင်ငံ ရင်းနှီး မြှုပ်နှံမှုနည်းဥပဒေများ (၂၀၁၇) တို့ ကို လိုက်နာဆောင်ရွက်မည် ဟူ၍ ကတိကဝတ်ထည့်သွင်းရေးသားပေး ရန်။</p> <p>(၄) သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဆိုင်ရာ အစီအမံများ နှင့်စပ်လျဉ်း၍ မြန်မာရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) ပါ ပုဒ်မနှင့် ပုဒ်မခွဲများဖြစ်သည့် Section 36, 50 (d), 51, ,67, 73 နှင့် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု နည်း ဥပဒေများ (၂၀၁၇) ပါ 190, 202, 203, 206, 212 ပါ အချက်များကို လည်း အလေးထား ဖော်ဆောင် ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း</p>	<p>ကဏ္ဍအလိုက်ဖော်ပြချက်များတွင် ပြင်ဆင်ဖော်ပြထားပါသည်။</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>မြန်မာရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) ပါ ပုဒ်မနှင့် ပုဒ်မခွဲများဖြစ်သည့် Section 36, 50 (d), 51, ,67, 73 နှင့် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု နည်းဥပဒေများ (၂၀၁၇) ပါ 190, 202, 203, 206, 212 ပါ အချက်များကိုလည်း အလေးထားဖော်ဆောင် ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း ကတိကဝတ်များကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p>	<p>ကတိကဝတ်များကို ထည့်သွင်းဖော်ပြရန်။</p>	
၄၀။	<p><b>မိုးလေဝသကဏ္ဍ</b></p> <p>(က) Chapter 5.3: Physical Recourses တွင် Air quality/ Air Pollution နှင့်ပတ်သက်၍ survey ကောက်ယူမှုတွင် Wet Season နှင့် Dry Season အတွက် Simple point ၂ခု သတ်မှတ်တိုင်းတာ ဖော်ပြထားကြောင်း တွေ့ရပါသည်။ စာမျက်နှာ ၇၁ မှ ၇၅ အထိ ဖော်ပြထားသော Wind speed and Wind direction တိုင်းတာချက်များအရ ကြိမ်နှုန်း အများဆုံးဖြစ်သည့် လေတိုက်ရာအရပ်နှင့် လေတိုက်နှုန်းအပေါ်မူတည်၍ အနည်းဆုံး ၃ နေရာတိုင်းတာဖော်ပြသင့်ပါသည်။</p> <p>(ခ) 5.3.2 Climate and Meteorology တွင် စီမံကိန်းဒေသဖြစ်သော မှော်ဘီမြို့၏ မိုးလေဝသအချက်အလက်များ (အပူချိန်နှင့်</p>	<p>(က) စာမျက်နှာ ၇၁ မှ ၇၅ အထိ ဖော်ပြထားသော Wind speed and Wind direction တိုင်းတာချက်များအရ ကြိမ်နှုန်း အများဆုံးဖြစ်သည့် လေတိုက်ရာအရပ်နှင့် လေတိုက်နှုန်း အပေါ်မူတည်၍ အနည်းဆုံး ၃ နေရာ တိုင်းတာဖော်ပြရန်။</p> <p>(ခ) မှော်ဘီမြို့၏ မိုးလေဝသအချက်အလက် ဖော်ပြသည့်နှစ်မှာ အနည်းဆုံး (၁၀) နှစ် အတွက် ဖော်ပြရန်နှင့် အမြင့်ဆုံး အပူချိန်၊</p>	<p>AOI အတွင်းကျရောက်သော sourceနှင့် receptorအား ရွေးချယ်၍ တိုင်းတာ၍ သက်ရောက်မှုကို ဆန်းစစ်တွက်ချက်ထားခြင်းဖြစ်ပါသည်။ source တွင် တိုင်းတာရရှိသော လေတိုက်ရာအရပ်သည် receptor အဖြစ်ရွေးချယ်ထားသောနေရာ ဘက်သို့ တိုက်ခတ်ခြင်းမရှိသည်ကို တွေ့ရသည့်အတွက် ရွေးချယ်တိုင်းတာထားသော နေရာမှာ လုံလောက်မှုရှိပါသည်။</p> <p>အခန်းခွဲ (၅.၃.၂) Climate and Meteorology တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>မိုးရေချိန်၊ လေတိုက်နှုန်း) ကို ဇယား 5.13 နှင့် 5.14 တို့တွင် ဖော်ပြထားကြောင်း တွေ့ရပါသည်။ မှော်ဘီမြို့၏ မိုးလေဝသ အချက်အလက် ဖော်ပြသည့်နှစ်မှာ အနည်းဆုံး (၁၀) နှစ်အတွက် ဖော်ပြသင့်ပါသည်။ အမြင့်ဆုံးအပူချိန်၊ အနိမ့်ဆုံးအပူချိန်တို့ကို ဖော်ပြရာတွင် မှတ်တမ်းရရှိသည့် နှစ်များအတွင်းရှိ အမြင့်ဆုံးနှင့်အနိမ့်ဆုံးတန်ဖိုးဖြစ်ရန် လိုအပ်ပါသည်။ ဇယား 5.14 ခေါင်းစဉ်အား Meteorological Data in Hmawbi Township ဟု ပြင်ဆင်သင့်ပါသည်။</p> <p>(ဂ) စီမံကိန်းဒေသတွင် ဖြစ်နိုင်သည့် သဘာဝဘေးအန္တရာယ်များကို ဖော်ပြထားခြင်း မရှိကြောင်း တွေ့ရပါသည်။ သဘာဝဘေးအန္တရာယ်များ နှင့်ပတ်သက်၍ ခေါင်းစဉ်ခွဲတစ်ခုအဖြစ် ဖော်ပြရန်လိုအပ်ပါသည်။ သဘာဝဘေးလျော့ပါးရေး စီမံချက်ကို သင့်တော်ရာအခန်းတွင် ထည့်သွင်းရေးဆွဲရန် လိုအပ်ပါသည်။</p> <p>(ဃ) ရာသီဥတုပြောင်းလဲမှု နှင့်ပတ်သက်၍ စီမံကိန်းကြောင့် ရာသီဥတုပြောင်းလဲမှုအပေါ် သက်ရောက်နိုင်မှု အခြေအနေ ရာသီဥတုပြောင်းလဲမှုကြောင့် စီမံကိန်းအပေါ် သက်ရောက်နိုင်မှု အခြေအနေ တို့ကို ကဏ္ဍခွဲတစ်ခုအနေဖြင့် ထည့်သွင်းဖော်ပြရန်။</p>	<p>အနိမ့်ဆုံးအပူချိန်တို့ကို ဖော်ပြရာတွင် မှတ်တမ်းရရှိသည့် နှစ်များအတွင်းရှိ အမြင့်ဆုံးနှင့် အနိမ့်ဆုံးတန်ဖိုးဖြစ်ရန် လိုအပ်ပါသည်။</p> <p>(ဂ) ဇယား 5.14 ခေါင်းစဉ်အား Meteorological Data in Hmawbi Township ဟု ပြင်ဆင်ဖော်ပြရန်။</p> <p>(ဃ) သဘာဝဘေး အန္တရာယ်များနှင့် ပတ်သက်၍ ခေါင်းစဉ်ခွဲတစ်ခုအဖြစ် ဖော်ပြရန်နှင့် သဘာဝဘေးလျော့ပါးရေး စီမံချက်ကို သင့်တော်ရာ အခန်းတွင် ထည့်သွင်းရေးဆွဲရန်။</p> <p>(င) ရာသီဥတုပြောင်းလဲမှု နှင့်ပတ်သက်၍ စီမံကိန်းကြောင့် ရာသီဥတု ပြောင်းလဲမှုအပေါ် သက်ရောက်နိုင်မှု အခြေအနေ ရာသီဥတုပြောင်းလဲမှုကြောင့် စီမံကိန်းအပေါ် သက်ရောက်နိုင်မှု အခြေအနေ တို့ကို ကဏ္ဍခွဲတစ်ခုအနေဖြင့် ထည့်သွင်းဖော်ပြရန်။</p>	<p>အခန်းခွဲ (၅.၃.၂) Climate and Meteorology တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ (၈.၅) Disaster Management and Emergency Response Plan တွင် ဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ (၅.၃.၉) Exposure and vulnerability to Natural Disaster and Climate Change တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	ရောက်နိုင်မှု အခြေအနေတို့ကို ကဏ္ဍခွဲတစ်ခု အနေဖြင့် ထည့်သွင်းဖော်ပြသင့်ပါသည်။		
၄၁။	<p>ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးကဏ္ဍ</p> <p>(က) Occupational Health and Safety နှင့် ပတ်သက်၍ အောက်ပါ Hazard များကို ဆန်းစစ်ဖော်ပြရန်လိုအပ်ပါသည်-</p> <p>(၁) Physical Hazards (Heat and Hot Liquid များကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazard၊ Radiation ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards)</p> <p>(၂) Respiratory Hazards (Insulation Material ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards၊ Melting and Casting Process များမှ ထွက်ပေါ်လာသည့် Dust and Gases ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards)</p> <p>(၃) Chemical Hazards</p> <p>(၄) Electrical Hazards</p> <p>(၅) Explosion and Fire Hazards</p> <p>(ခ) Table 6. 6 Evaluation and Prediction of Significant Impacts for Operation Phase ဖော်ပြချက်၌ Dioxin/ Furans, Heavy</p>	<p>(က) Occupational Health and Safety နှင့်ပတ်သက်၍ အောက်ပါ Hazard များကို ဆန်းစစ်ဖော်ပြရန်-</p> <p>(၁) Physical Hazards (Heat and Hot Liquid များကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazard၊ Radiation ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards)</p> <p>(၂) Respiratory Hazards (Insulation Material ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards၊ Melting and Casting Process များမှ ထွက်ပေါ်လာသည့် Dust and Gases ကြောင့် ဖြစ်ပေါ်နိုင်သည့် Hazards)</p> <p>(၃) Chemical Hazards</p> <p>(၄) Electrical Hazards</p> <p>(၅) Explosion and Fire Hazards</p> <p>(ခ) Table 6. 6 Evaluation and Prediction of Significant Impacts for Operation Phase ဖော်ပြချက်၌ Dioxin/ Furans,</p>	<p>ခေါင်းစဉ်ခွဲ ၆.၃ Risk Assessment Methodologyနှင့် ၆.၃.၁ Potential Risks and Hazards Occurred in Steel Mill တွင် ဖော်ပြထားပါသည်။</p> <p>Table 6-7 တွင် ပြင်ဆင်ဖြည့်စွက်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>Metals, GHG, Solid Wastes and by-products, Slag, Metallic Waste, Sludges, Wastewater, Industrial Process Wastewater စသည့် အချက်များကို ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဂ) စီမံကိန်းအကြောင်းအရာတွင် စီမံကိန်းအဆင့်အလိုက် Activity များကို ပြန်လည်ဖော်ပြ၍ Impact Identification ပြုလုပ်ရန်နှင့် Significant Impact များကို ပြန်လည်တွက်ချက်ပြီး ရရှိလာသည့် Significant Impact များအပေါ် Management Plan ရေးဆွဲပေးရန် လိုအပ်ပါသည်။</p> <p>(ဃ) အခန်း (၄.၅.၁) Raw Materials ဖော်ပြချက်၌ Iron Scrap ရယူမည့် အရင်းအမြစ် (MEC/ Domestic Market) အား ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရသဖြင့် အဆိုပါ ရယူသည့် Scrap များသည် Hazardous Material၊ Oil ပါဝင်မှု မရှိကြောင်း Commit ပြုလုပ်ရန်လိုအပ်ပါသည်။</p> <p>(င) အခန်း (၄.၅.၂) Water Consumption ဖော်ပြချက်၌ Ground Water Resources သည် Long Term အတွက် လုံလောက်မှု ရှိ/မရှိ Facts &amp; Figures ဖြင့် ဖော်ပြ၍</p>	<p>Heavy Metals, GHG, Solid Wastes and by-products, Slag, Metallic Waste, Sludges, Wastewater, Industrial Process Wastewater စသည့် အချက်များကို ထည့်သွင်းဖော်ပြရန်။</p> <p>(ဂ) စီမံကိန်းအကြောင်းအရာတွင် စီမံကိန်းအဆင့်အလိုက် Activity များကို ပြန်လည်ဖော်ပြ၍ Impact Identification ပြုလုပ်ရန်နှင့် Significant Impact များကို ပြန်လည်တွက်ချက်ပြီး ရရှိလာသည့် Significant Impact များအပေါ် Management Plan ရေးဆွဲ ပေးရန်။</p> <p>(ဃ) အခန်း (၄.၅.၁) Raw Materials ဖော်ပြချက်၌ Iron Scrap ရယူမည့် အရင်းအမြစ် (MEC/ Domestic Market) အား ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရသဖြင့် အဆိုပါရယူသည့် Scrap များသည် Hazardous Material၊ Oil ပါဝင်မှု မရှိကြောင်း Commit ပြုလုပ်ရန်။</p> <p>(င) အခန်း (၄.၅.၂) Water Consumption ဖော်ပြချက်၌ Ground Water Resources သည် Long Term အတွက် လုံလောက်မှု</p>	<p>ခေါင်းစဉ်ခွဲ (၆.၂.၂)နှင့် ဇယား ၆-၇ တွင်လည်းကောင်း၊ ခေါင်းစဉ်ခွဲ (၆.၂.၃) နှင့် ဇယား ၆-၈တွင် လည်းကောင်း impact များကို တွက်ချက်ဖော်ပြထားပါသည်။ ခေါင်းစဉ်ခွဲ ၈.၃.၄ နှင့် ခေါင်းစဉ်ခွဲ ၈.၃.၅တွင် Management plan များ ဖော်ပြထားပြီး ခေါင်းစဉ်ခွဲ ၈.၃.၆ တွင် Sub-plan များကို ရေးဆွဲထားပါသည်။</p> <p>ဇယား ၃-၂ Commitments for Production and Marketing of TMT Rebar Established by Yangon JR Family Limited ရှိ Production Process တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ (၄.၅.၂) နှင့် ခေါင်းစဉ်ခွဲ (၆.၂.၂.၄) တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>ဆန်းစစ်ချက်ကို သက်ဆိုင်ရာအခန်းတွင် ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(စ) Production Process ဖော်ပြချက်၌ Electric Furnace ကို ၁ ရက် နာရီ ၂၀ Run မည်ဖြစ်ကြောင်း ဖော်ပြထားရာ လက်ရှိတွင် မီးသည် ၈ နာရီပဲရှိကြောင်း သိရှိရပါသည်။ လက်ရှိအခြေအနေအရ Furnace Running Condition hour per day ကို ဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဆ) Production Process ဖော်ပြချက်၌ Slag Box သည် ၃ တန် ဆုံကြောင်း ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရသည်။ Slag Type ကို ဖော်ပြရန်၊ စွန့်ပစ်ပုံနည်းလမ်းနှင့် စီမံခန့်ခွဲမည့် အစီအစဉ် ကိုဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဇ) စာမျက်နှာ ၅၃ တွင် Fume Extraction System နှင့် ပတ်သက်၍ Spark Arrestor, Bag Filter, Swiveling Hood, Chimney တို့ တပ်ဆင်ထားမှုအခြေအနေကို မှတ်တမ်း ဓာတ်ပုံနှင့်တကွ ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဈ) အခန်း (၄.၇) Treatment Scheme to Induction Furnace ဖော်ပြချက်၌ "No of Bags - 1272 Nos. (212 per module)" ဟု ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသည်။</p>	<p>ရှိ/မရှိ Facts &amp; Figures ဖြင့် ဖော်ပြ၍ ဆန်းစစ်ချက်ကို သက်ဆိုင်ရာအခန်းတွင် ထည့်သွင်းဖော်ပြရန်။</p> <p>(စ) Production Process ဖော်ပြချက်၌ Electric Furnace ကို ၁ ရက် နာရီ ၂၀ Run မည်ဖြစ်ကြောင်း ဖော်ပြထားရာ လက်ရှိတွင် မီးသည် ၈ နာရီပဲ ရှိကြောင်း သိရှိရပါသည်။ လက်ရှိအခြေအနေအရ Furnace Running Condition hour per day ကို ဖော်ပြရန်။</p> <p>(ဆ) Production Process ဖော်ပြချက်၌ Slag Box သည် ၃ တန် ဆုံကြောင်း ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရသည်။ Slag Type ကိုဖော်ပြရန်၊ စွန့်ပစ်ပုံနည်းလမ်းနှင့် စီမံခန့်ခွဲမည့် အစီအစဉ်ကို ဖော်ပြရန်။</p> <p>(ဇ) စာမျက်နှာ ၅၃ တွင် Fume Extraction System နှင့် ပတ်သက်၍ Spark Arrestor, Bag Filter, Swiveling Hood, Chimney တို့ တပ်ဆင်ထားမှု အခြေအနေကို မှတ်တမ်း ဓာတ်ပုံနှင့်တကွ ထည့်သွင်း ဖော်ပြရန်။</p> <p>(ဈ) အခန်း (၄.၇) Treatment Scheme to Induction Furnace ဖော်ပြချက်၌ "No of Bags - 1272 Nos. (212 per module)"</p>	<p>ခေါင်းစဉ်ခွဲ ၄.၆ နှင့် ခေါင်းစဉ်ခွဲ ၄.၅.၃ တွင် ပြင်ဆင်ဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ (၄.၉) တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ (၄.၇) တွင် ဖြည့်စွက်ဖော်ပြထားပါသည်။</p> <p>ဓာတ်ပုံ ၄-၆ နှင့် ပုံ ၄-၁၀ တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>အဆိုပါ Bag Filter များ တပ်ဆင်ထားသည့် နေရာပြ ဓာတ်ပုံထည့်သွင်း ဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ည) Sub-plan များ ဖော်ပြချက်နှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (ဇ) အပိုဒ်ခွဲငယ် (၆) အရ အခန်း (၈)၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်ခွဲအလိုက် ပါဝင်ရမည့်အချက်များ ဖြစ်သော ဥပဒေဆိုင်ရာ လိုအပ်ချက်များ၊ အကောင်အထည်ဖော် ဆောင်ရွက်မည့် အစီအစဉ်၊ စီမံခန့်ခွဲမှုဆောင်ရွက်ချက်များ (Action Plan) ၊ စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်များ (Sub-Plan တစ်ခုချင်းစီ အတွက် Points, Parameters, Duration, Implementation Body) နှင့် ရန်ပုံငွေ လျာထားချက်(Budget) တို့ကို ထည့်သွင်း ဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဋ) PM ထွက်ရှိမှုနှင့်စပ်လျဉ်း၍ Process Step (Melting, Refining, Heating (Rolling), Mechanical Action, Handling of Materials, Quenching) အလိုက် PM တန်ဖိုး များကို တိုင်းတာဖော်ပြပေးရန် လိုအပ်ပါသည်။</p>	<p>ဟု ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသည်။ အဆိုပါ Bag Filter များ တပ်ဆင်ထားသည့်နေရာပြ ဓာတ်ပုံထည့်သွင်း ဖော်ပြရန်။</p> <p>(ည) Sub-plan များ ဖော်ပြချက်နှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (ဇ) အပိုဒ်ခွဲငယ် (၆) အရ အခန်း (၈) ၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ တစ်ခုချင်းစီတွင် ဥပဒေဆိုင်ရာ လိုအပ်ချက်များ၊ အကောင်အထည်ဖော် ဆောင်ရွက်မည့် အစီအစဉ်၊ စီမံခန့်ခွဲမှုဆောင်ရွက်ချက်များ (Action Plan) ၊ စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်များ (Sub-Plan တစ်ခုချင်းစီ အတွက် Points, Parameters, Duration, Implementation Body) နှင့် ရန်ပုံငွေလျာထားချက် (Budget) တို့ကို ထည့်သွင်းဖော်ပြရန်။</p> <p>(ဋ) PM ထွက်ရှိမှုနှင့်စပ်လျဉ်း၍ Process Step (Melting, Refining, Heating (Rolling), Mechanical Action, Handling of Materials, Quenching) အလိုက် PM တန်ဖိုးများကို တိုင်းတာ ဖော်ပြပေးရန်။</p>	<p>ခေါင်းစဉ်ခွဲ ၈.၃.၆ တွင် ဖော်ပြထားပါသည်။</p> <p>(ဋ) မှ (ထ) အထိ နှင့်စပ်လျဉ်း၍ Parameter များအား ဇယား ၈-၄ Monitoring Plan တွင် ပြန်လည် ထည့်သွင်း ဖော်ပြထားပါသည်။ NEQEG တွင် ဖော်ပြထားသော တိုင်းတာရမည့် Parameter အချို့မှာ</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>(၄) SO<sub>2</sub> ထွက်ရှိမှုနှင့်စပ်လျဉ်း၍ Melting, Quenching, Rolling စသည့် Process Activities တို့မှထွက်ရှိသည့် SO<sub>2</sub> တန်ဖိုးများကို တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(၅) CO ထွက်ရှိမှု နှင့်စပ်လျဉ်း၍ Melting, Refining, Quenching, Rolling စသည့် Process Activities တို့မှထွက်ရှိသည့် CO တန်ဖိုးများကို တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(၆) Melting နှင့် Rolling Process Activities တို့မှ ထွက်ရှိသည့် HF နှင့် HCl တန်ဖိုးများကို တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(၇) VOC and Polynuclear Aromatic Hydrocarbons တို့သည် Off gas နှင့် Electric Induction Furnace တို့မှ ထွက်ရှိနိုင်ပါသည်။ သို့ဖြစ်ပါ၍ Melting, Refining, Heating, Quenching, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိသည့် VOC နှင့် Polynuclear Aromatic Hydrocarbons ကို တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(၈) Dioxin and Furans တို့သည်လည်း Melting, Refining, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိနိုင်သဖြင့် တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p>	<p>(၄) SO<sub>2</sub> ထွက်ရှိမှုနှင့်စပ်လျဉ်း၍ Melting, Quenching, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိသည့် SO<sub>2</sub> တန်ဖိုးများကို တိုင်းတာဖော်ပြရန်။</p> <p>(၅) CO ထွက်ရှိမှုနှင့်စပ်လျဉ်း၍ Melting, Refining, Quenching, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိသည့် CO တန်ဖိုးများကို တိုင်းတာဖော်ပြရန်။</p> <p>(၆) Melting နှင့် Rolling Process Activities တို့မှ ထွက်ရှိသည့် HF နှင့် HCl တန်ဖိုးများကို တိုင်းတာဖော်ပြရန်။</p> <p>(၇) VOC and Polynuclear Aromatic Hydrocarbons တို့သည် Off gas နှင့် Electric Induction Furnace တို့မှ ထွက်ရှိနိုင်ပါသည်။ သို့ဖြစ်ပါ၍ Melting, Refining, Heating, Quenching, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိသည့် VOC နှင့် Polynuclear Aromatic Hydrocarbons ကို တိုင်းတာဖော်ပြရန်။</p> <p>(၈) Dioxin and Furans တို့သည်လည်း Melting, Refining, Rolling စသည့် Process Activities တို့မှ ထွက်ရှိနိုင်သဖြင့် တိုင်းတာဖော်ပြရန်။</p>	<p>လက်ရှိမြန်မာနိုင်ငံတွင် တိုင်းတာနိုင်သော စက်ကိရိယာ မရရှိနိုင်ခြင်းကြောင့် တိုင်းတာနိုင်ခြင်းမရှိသေးပါ။ သို့သော် စီမံကိန်းအား စောင့်ကြပ်ကြည့်ရှုသည့်အချိန်တွင် ထိုနည်းပညာနှင့် ကိရိယာများရရှိပါက တိုင်းတာနိုင်ရန် Monitoring Plan တွင် ထည့်သွင်းရေးဆွဲထားပါသည်။</p> <p>Polynuclear Aromatic Hydrocarbons, Dioxins နှင့် Furans စသည့် Parameter များသည် NEQEGs တွင် မပါရှိခြင်း ကြောင့် တိုင်းတာမှုမပြုလုပ်ခြင်း ဖြစ်ပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>(ထ) Heavy Metal များသည် Thermal Process မှ ထွက်ရှိ လာသည့် Off gas Fumes တွင် ပါဝင်လာနိုင်သဖြင့် Melting, Refining, Rolling, Quenching စသည့် Process Activity အလိုက် Heavy Metal တန်ဖိုးများကို တိုင်းတာဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဒ) GHG Emission နှင့်ပတ်သက်၍ Preheating, Melting, Refining, Rolling, Quenching စသည့် Process Activity အလိုက် GHG Emission ကိုဖော်ပြရန် လိုအပ်ပါသည်။</p> <p>(ဓ) အသုံးပြု ကုန်ကြမ်းပစ္စည်းများဖြစ်သည့် Cast Iron နှင့် Steel Scrap တို့၏ Chemical Composition များကို တိုင်းတာစစ်ဆေးပေးရန်နှင့် သန့်စင်သော၊ ဘေးအန္တရာယ်မရှိသော ကုန်ကြမ်းပစ္စည်းများကိုသာ ထည့်သွင်းအသုံးပြုရန် လိုအပ်ပါသည်။</p> <p>(န) Process Waste Water Treatment ပြုလုပ်ပုံအားထည့်သွင်း ဖော်ပြရန် လိုအပ်ပါသည်။</p>	<p>(ထ) Heavy Metal များသည် Thermal Process မှ ထွက်ရှိ လာသည့် Off gas Fumes တွင် ပါဝင်လာနိုင်သဖြင့် Melting, Refining, Rolling, Quenching စသည့် Process Activity အလိုက် Heavy Metal တန်ဖိုးများကို တိုင်းတာ ဖော်ပြရန်။</p> <p>(ဒ) GHG Emission နှင့်ပတ်သက်၍ Preheating, Melting, Refining, Rolling, Quenching စသည့် Process Activity အလိုက် GHG Emission ကို ဖော်ပြရန်။</p> <p>(ဓ) အသုံးပြု ကုန်ကြမ်းပစ္စည်းများဖြစ်သည့် Cast Iron နှင့် Steel Scrap တို့၏ Chemical Composition များကို တိုင်းတာစစ်ဆေးပေးရန်နှင့် သန့်စင်သော၊ ဘေးအန္တရာယ်မရှိသော ကုန်ကြမ်းပစ္စည်းများကိုသာ ထည့်သွင်းအသုံးပြုရန်။</p> <p>(န) Process Waste Water Treatment ပြုလုပ်ပုံအား ထည့်သွင်းဖော်ပြရန်။</p>	<p>ခေါင်းစဉ်ခွဲ ၆.၂.၁ တွင် ဖော်ပြထားပါသည်။</p> <p>ဇယား ၃-၂ Commitments for Production and Marketing of TMT Rebar Established by Yangon JR Family Limited ရှိ Production Process တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ ၄.၅.၂ တွင် ပုံနှင့်တကွ ဖော်ပြထားပါသည်။</p>
၄၂။	<p><b>အလုပ်ရုံကဏ္ဍ</b></p> <p>အစီရင်ခံစာပါ Table(6.3) Impact Identification တွင် Occupational Health and Safety နှင့်ပတ်သက်၍ Heat Stress နှင့် Respiratory</p>	<p>➤ Table (6.6) Evaluation and Prediction of Significant Impacts for Operation Phase တွင် Occupational Health and Safety</p>	<p>ခေါင်းစဉ်ခွဲ (၆.၃) တွင် အသေးစိတ်ဖော်ပြထားပါသည်။</p>

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	Hazard အား ဖော်ပြထားသော်လည်း Table(6.6) Evaluation and Prediction of Significant Impacts for Operation Phase တွင် Occupational Health and Safety နှင့်ပတ်သက်၍ Heat Stress နှင့် Respiratory Hazard အား တွက်ချက်၍ ထည့်သွင်းဖော်ပြရန်၊ အပိုဒ်ခွဲ(၃.၂) Policy and Legal Framework တွင် 25. Social Security Law အား ဖော်ပြထား၍ Social Security Rules ထည့်သွင်း ဖော်ပြရန်နှင့် The Occupational Health and Safety Law (2019) အား ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။	နှင့်ပတ်သက်၍ Heat Stress နှင့် Respiratory Hazard အား တွက်ချက်၍ ထည့်သွင်းဖော်ပြရန်၊ ➢ အပိုဒ်ခွဲ(၃.၂) Policy and Legal Framework တွင် Social Security Rules ထည့်သွင်း ဖော်ပြရန်နှင့် The Occupational Health and Safety Law (2019) အား ထည့်သွင်း ဖော်ပြရန်	ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။
၄၃။	<b>စက်မှုကြီးကြပ်ရေးကဏ္ဍ</b> စာမျက်နှာ (၈) တွင် "ပုဂ္ဂလိကစက်မှုလုပ်ငန်း ဥပဒေ(၂၀၁၉)" ဟု ဖော်ပြထားရာ ခုနှစ်ကွဲလွဲသဖြင့် "၁၉၉၀" ဟု ပြင်ဆင်ဖော်ပြရန်၊ လျှပ်စစ်သုံးစွဲမှု နှင့်ပတ်သက်၍ Electricity Law အား ထည့်သွင်း ဖော်ပြရန်၊ လျှပ်စစ်စစ်ဆေးရေးဌာနမှ စစ်ဆေးချက် ခံယူမည်ဟု ထည့်သွင်းဖော်ပြရန်၊ စီမံကိန်းနှင့် ပတ်သက်၍ စက်မှုဝန်ကြီးဌာန၏ ခွင့်ပြုမိန့်/ မှတ်ပုံတင်အား နောက်ဆက်တွဲတွင် ဖော်ပြရန်၊ စီမံကိန်းသည် မြောင်းတကာ စက်မှုဇုန်အတွင်းရှိ သည့်အတွက် စက်မှုဇုန်ဥပဒေ (၂၀၂၀) အား ထည့်သွင်းဖော်ပြရန်၊ စီမံကိန်းတွင် Chemical သုံးစွဲမှုနှင့်ပတ်သက်၍ တင်သွင်းခွင့်/ သုံးစွဲခွင့်တို့	➢ စာမျက်နှာ (၈) တွင် "ပုဂ္ဂလိကစက်မှု လုပ်ငန်း ဥပဒေ(၂၀၁၉)" ဟု ဖော်ပြထားရာ ခုနှစ်ကွဲလွဲသဖြင့် "၁၉၉၀" ဟု ပြင်ဆင် ဖော်ပြရန်၊ ➢ လျှပ်စစ်သုံးစွဲမှု နှင့်ပတ်သက်၍ Electricity Law အား ထည့်သွင်းဖော်ပြရန်နှင့် လျှပ်စစ် စစ်ဆေးရေးဌာနမှ စစ်ဆေးချက် ခံယူမည် ဟု ထည့်သွင်းဖော်ပြရန်၊ ➢ စီမံကိန်းနှင့်ပတ်သက်၍ စက်မှုဝန်ကြီးဌာန ၏ ခွင့်ပြုမိန့်/ မှတ်ပုံတင်အား နောက် ဆက်တွဲတွင် ဖော်ပြရန်၊	ပြန်လည်ပြင်ဆင်ဖော်ပြထားပါသည်။  နောက်ဆက်တွဲတွင် လျှပ်စစ် စစ်ဆေးရေးဌာနမှ စစ်ဆေးချက်ကို ထည့်သွင်းဖော်ပြထားပါသည်။  စီမံကိန်းနှင့် ပတ်သက်၍ စက်မှုဝန်ကြီးဌာန၏ ခွင့်ပြုမိန့်/ မှတ်ပုံတင်အား နောက်ဆက်တွဲတွင် ဖော်ပြထားပါသည်။

စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
	<p>အား လိုက်နာမည်ဟု ထည့်သွင်းဖော်ပြရန်၊ Organization Chart အား ထည့်သွင်းဖော်ပြရန်၊ Hazardous Wastes နှင့်ပတ်သက်၍ သိုလှောင်ထားရှိမှုအစီအစဉ်အား ထည့်သွင်းဖော်ပြရန်၊ Raw Material နှင့်ပတ်သက်၍ တင်သွင်းမှုနှင့် သိုလှောင်ထားရှိမှု အစီအစဉ်အား ထည့်သွင်းဖော်ပြရန်၊ PPE နှင့်ပတ်သက်၍ လုံလောက်စွာ ထောက်ပံ့ပေးရန် လိုအပ်ပါသည်။</p>	<ul style="list-style-type: none"> <li>➢ စီမံကိန်းသည် မြောင်းတကာစက်မှုဇုန် အတွင်းရှိသည့်အတွက် စက်မှုဇုန်ဥပဒေ (၂၀၂၀) အားထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ စီမံကိန်းတွင် Chemical သုံးစွဲမှုနှင့် ပတ်သက်၍ တင်သွင်းခွင့်/ သုံးစွဲခွင့်တို့အား လိုက်နာမည်ဟု ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ Organization Chart အား ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ Hazardous Wastes နှင့်ပတ်သက်၍ သိုလှောင်ထားရှိမှု အစီအစဉ်အား ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ Raw Material နှင့်ပတ်သက်၍ တင်သွင်းမှု နှင့်သိုလှောင်ထားရှိမှု အစီအစဉ်အား ထည့်သွင်းဖော်ပြရန်၊</li> <li>➢ PPE နှင့်ပတ်သက်၍ လုံလောက်စွာ ထောက်ပံ့ပေးရန်။</li> </ul>	<p>ပုံ ၂-၁ Organization Chart of Yangon JR Family Limited အား အခန်း(၂) တွင် ဖော်ပြထားပါသည်။</p> <p>ခေါင်းစဉ်ခွဲ ၄.၉ တွင် ဖော်ပြထားပါသည်။</p> <p>အခန်းခွဲ ၄.၅.၁ တွင် ဖော်ပြထားပါသည်။</p> <p>PPE နှင့်ပတ်သက်၍ လုံလောက်စွာ ထောက်ပံ့ပေးပါမည်။</p>
၄၄။	<p><b>နိုင်ငံခြားစီးပွားဆက်သွယ်ရေးကဏ္ဍ</b></p> <p>နိုင်ငံခြားသား ကျွမ်းကျင်ပညာရှင်များ ခန့်အပ်ရာတွင် "ပြည်တွင်းရေးအား ဝင်ရောက်စွက်ဖက်မှု ပြုလုပ်မည် မဟုတ်ကြောင်း" စာချုပ်အား နိုင်ငံခြားသားကျွမ်းကျင်ပညာရှင်များနှင့် စာချုပ်ချုပ်ဆို၍ ထည့်သွင်းဖော်ပြရန် လိုအပ်ပါသည်။</p>	<p>နိုင်ငံခြားသားကျွမ်းကျင် ပညာရှင်များ ခန့်အပ်ရာတွင် "ပြည်တွင်းရေးအား ဝင်ရောက်စွက်ဖက်မှု ပြုလုပ်မည် မဟုတ်ကြောင်း" စာချုပ်အား နိုင်ငံခြားသား ကျွမ်းကျင်ပညာရှင်များနှင့် စာချုပ်ချုပ်ဆို၍ ထည့်သွင်းဖော်ပြရန်။</p>	<p>နိုင်ငံခြားသားကျွမ်းကျင်ပညာရှင်များ ခန့်အပ်ရာတွင် “ပြည်တွင်းရေးအား ဝင်ရောက်စွက်ဖက်မှုပြုလုပ်မည်မဟုတ်ကြောင်း” စာချုပ်အား နိုင်ငံခြားသားကျွမ်းကျင်ပညာရှင်များနှင့် စာချုပ်ချုပ်ဆိုထားပြီးဖြစ်ပြီး</p>



စဉ်	EIA အပေါ် ကနဦးစိစစ်တွေ့ရှိချက်	EIA အပေါ် ကနဦးသုံးသပ်အကြံပြုချက်	ပြန်လည်ဖြည့်စွက်ဖော်ပြချက်
			စာချုပ်အား Confidential Agreement အရ ထည့်သွင်းဖော်ပြနိုင်ခြင်းမရှိပါ။