Environmental Management Plan (EMP)

for

No. (10) Textile Mill (Taungtha)

No. (3) Heavy Industrial Enterprise

Ministry of Industry

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Reported by

Industry & Infrastructure Consultancy

Co., Ltd

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List of Abbreviation

ACR	Air Conditioning Room
BOD	Biological Oxygen Demand
CDC	City Development Committee
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CP	Construction Phase
CT	Current Transformer
CSR	Corporate Social Responsibility
DCP	Dry Chemical Powder
DMP	Disaster Management Plan
DO	Dissolved Oxygen
DOA	Department of Agriculture
DP	Decommissioning Phase
DRMP	Disaster Risk Management Plan
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EOHS	Environmental Occupational Health and Safety
EPRP	Emergency Preparedness and Response Plan
EPO	Emergency Planning Officer
ERP	Emergency Response Plan
ESE	Electricity Supply Enterprise
ESIA	Environmental and Social Impact Assessment
FAO	Food and Agriculture Organization of the United Nations
FO	Furnace Oil
FRI	Forest Research Institute
GAD	General Administrative Department
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GPD	Gallon Per Day
GPS	Global Positioning System
GWP	Global Warming Potential
HIA	Health Impact Assessment
HIV	Human Immunodeficiency Virus
ICSC	International Chemical Safety Cards
IIC	Industry and Infrastructure Consultancy Co., Ltd
IEE	Initial Environmental Examination

IFC	International Finance Corporation
ILO	International Labor Organization
IUCN	International Union for Conservation of Natures
KV	Kilo Volt
LA	Lightning Arrestor
LFL	Low Flammable Limit
MCCP	Myanmar Climate Change Policy
MCCS	Myanmar Climate Change Strategy
MONREC	Ministry of Natural Resources and Environmental Conservation
MSDP	Myanmar Sustainable Development Plan
MSDS	Materials Safety Data Sheets
NaOCI	Sodium Hypochlorite
NCDP	National Comprehensive Development Plan
NEQEG	National Environmental Quality Emission Guidelines
NGO	Non-Governmental Organization
NO	Nitrogen Monoxide
NO_2	Nitrogen Dioxide
NO_x	Nitrous Oxides
NSWQS	National Surface Water Quality Standard
OHC	Occupational Health Centre
OHS	Occupational Health and Safety
OP	Operation Phase
OSHA	Occupational Safety and Health Administration
PC	Public Consultation
PLC	Programmable Logic Controller
PM	Particulate Matter
PP	Public Participation
PPE	Personal Protective Equipment
PT	Potential Transformer
SMMP	Social Management and Monitoring Plan
SO_2	Sulfur Dioxide
SOP	Standard Operation Procedure
SWMS	Solid Waste Management System
TDS	Total Dissolved Solid
TSP	Total Suspended Particulates
WHO	World Health Organization
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
WHWWTP	Water Hyacinth Waste Water Treatment Plant

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အခန်း(၁)
အနှစ်ချုပ်အစီရင်ခံစာ

အခန်း (၁)

အနှစ်ချုပ်အစီရင်ခံစာ

၁.၁. နိဒါန်း

အထည်အလိပ်စက်မှုလုပ်ငန်းသည် ကမ္ဘာတစ်ဝှမ်းရှိ ပြည်သူလူထု၏ လိုအပ်ချက်ဖြစ်သော အဝတ်အထည်များနှင့် အခြားလိုအပ်ချက်များကို ထုတ်လုပ်ပေးနိုင်ခြင်းကြောင့် အရေးပါသော စက်မှုလုပ်ငန်းဖြစ်ပါသည်။ ထို့အပြင်ဒေသခံများအား အလုပ်အကိုင်ပေးနိုင်ခြင်းနှင့် အမျိုးသားအသားတင် ကုန်ထုတ်လုပ်မှုတန်ဖိုး (GDP) တိုးတက်စေရန်လည်း ဆောင်ရွက်နိုင်ပါသည်။ သို့သော် ကုန်ထုတ်လုပ်မှုဆောင်ရွက်ရာတွင် ကုန်ထုတ်လုပ်မှုနည်းစဉ် အမျိုးမျိုးဖြင့် ကုန်ပစ္စည်းများကို ထုတ်လုပ်ပြီးအဆိုပါ ထုတ်လုပ်မှုများကြောင့် ရေဆိုးစွန့်ပစ်မှု၊ အငွေ့ထုတ်လွှတ်မှု၊ အန္တရာယ်ရှိမှု၊ ဆူညံသံဖြစ်ပေါ်စေမှု၊ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများ ထွက်ရှိမှုအစရှိသော သဘာဝပတ်ဝန်းကျင်ကို ထိခိုက်စေသည့် အကြောင်းအချင်းအရာများ ဖြစ်ပွားစေခဲ့ပြီး သန့်စင်မှုပြုလုပ်ခြင်းမရှိဘဲ ရေဆိုးများကို မြစ်ချောင်းများအတွင်း စွန့်ပစ်မှုများကြောင့် သဘာဝပတ်ဝန်းကျင်ထိခိုက်ပျက်စီးစေနိုင်ပါသည်။ အထည်အလိပ်ကဏ္ဍ၏ ကမ္ဘာတစ်ဝှမ်း နည်းပညာဖွံ့ဖြိုးတိုးတက်မှုနှင့်အတူ ပတ်ဝန်းကျင်ထိခိုက်မှုဆိုင်ရာပြဿနာများကိုလည်း များပြားလာစေခဲ့ပါသည်။

မြန်မာနိုင်ငံတွင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေအား ပြည်ထောင်စုလွှတ်တော် ဥပဒေအမှတ် (၂၁)ဖြင့် ၂၀၁၂ ခုနှစ်တွင် ပြဋ္ဌာန်းခဲ့ပြီး အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာထုတ်လွှတ်မှု (အရည်အသွေး) လမ်းညွှန်ချက်များ National Environmental Quality Emission Guideline Values (NEQEG) ကို ၂၀၁၅ ခုနှစ်တွင် သယံဇာတနှင့် သစ်တောရေးရာဝန်ကြီး ဌာနမှ ထုတ်ပြန်ခဲ့ပါသည်။ ထို့ကြောင့် အမှတ်(၁၀) အထည်စက်ရုံ(တောင်သာ) အနေဖြင့် နိုင်ငံတော်ပိုင်စက်ရုံ ဖြစ်သည့် အားလျော်စွာ နိုင်ငံတော် အစိုးရ၏မူဝါဒများနှင့်အညီ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အား ရေးဆွဲပြုစုရန် လိုအပ်လာ ပါသည်။

၁.၂. စက်ရုံနောက်ခံအကြောင်း

၁.၂.၁. စက်ရုံနောက်ခံအကြောင်းအရာ

တရုတ်ပြည်သူ့သမ္မတနိုင်ငံ World Best Company Limited နှင့် စက်မှုဝန်ကြီးဌာန အထည်အလိပ်လုပ်ငန်းတို့စက်ပစ္စည်းပေးသွင်းရေးစာချုပ်ချုပ်ဆို၍စီမံကိန်းအကောင်အထည် ဖော်ဆောင်ရွက်ပြီး၂၀၁၅ ခုနှစ်တွင် စက်ရုံ စတင်ဖွင့်လှစ်လည်ပတ် ခဲ့ပါသည်။ အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ)အဖြစ် ပြင်ဆင်ဖွဲ့စည်းခဲ့ပါသည်။ အမှတ် (၁၀) အထည်စက်ရုံ (တောင်သာ) သည် စက်မှုဝန်ကြီးဌာန၊ အမှတ် (၃) အကြီးစားလုပ်ငန်း၏ အုပ်ချုပ်မှု အောက်တွင် တည်ရှိပါသည်။

ဇယား (၁.၂.၁-၁) စက်ရုံ၏ အချက်အလက်များ

စဉ်	အကြောင်းအရာ	ဖော်ပြချက်
၁	စက်ရုံ/စီမံကိန်း	အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ)
၂	လုပ်ငန်းအမျိုးအစား	စက်ထိုးထည်ထုတ်လုပ်ခြင်း၊ ဆေးဆိုးခြင်း၊ အထည်ချုပ်ခြင်း
၃	တည်နေရာ	အမှတ် (၁၀) အထည်စက်ရုံ (တောင်သာ) သည် တောင်သာမြို့မှ ၁.၃ မိုင်ခန့် အကွာတွင် တည်ရှိပါသည်။
၄	ပိုင်ဆိုင်သည့်အဖွဲ့အစည်း	အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန၊ နေပြည်တော်။ Ph: ၀၆ ၂၅၄၅၅၇၈၈၇
၅	ရင်းနှီးမြှုပ်နှံမှုတန်ဖိုး	ကျပ်သန်းပေါင်း ၂၂၈၀.၈၇၈
၆	ဆက်သွယ်ရမည့်ပုဂ္ဂိုလ်	ဦးကျော်နိုင် စက်ရုံမှူး အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ)၊ တောင်သာမြို့နယ်၊ မန္တလေးတိုင်းဒေသကြီး။ ဖုန်း- ၀၆ ၇၃၁၀၅၈၇
၇	အီးမေးလ်လိပ်စာ	kn7310587@gmail.com

၁.၂.၁.၁. စက်ရုံတည်နေရာ

မန္တလေးတိုင်းဒေသကြီး၊ မြင်းခြံခရိုင်၊ တောင်သာမြို့နယ် မိတ္ထီလာ -မြင်းခြံလမ်းမကြီးအနီး၊ တောင်သာမြို့မှ မြောက်ဘက် ၁.၃ မိုင်ခန့်အကွာတွင် တည်ရှိပါသည်။ မြောက်ဘက် ၁၄ မိုင် အကွာတွင် မြင်းခြံမြို့ တည်ရှိပါသည်။ မြေပုံညွှန်းအရ မြောက်လတ္တီတွဒ် ၂၁° ၁၈' ၀၄.၀၆" နှင့် ၂၁° ၁၇' ၄၉.၄၁" ကြား နှင့် အရှေ့လောင်ဂျီတွဒ် ၉၅° ၂၆' ၃၂.၉၁" နှင့် ၉၅° ၂၆' ၁၅.၂၂" ကြားတွင် တည်ရှိပါသည်။

၁.၂.၂. စီမံကိန်း ရည်ရွယ်ချက်

စက်ရုံတည်ဆောက်ရခြင်း၏ ရည်ရွယ်ချက်မှာ

(၁) ပြည်တွင်းဖြစ် စက်ထိုးထည် ထုတ်လုပ်ခြင်းကို မြှင့်တင်ရန်၊

(၂) သွင်းကုန်အစားထိုးဖြည့်ဆည်းရေးကို ဆောင်ရွက်ရန်၊

(၃) ပြည်တွင်းတွင် အလုပ်အကိုင်အခွင့်အလမ်းများ ဖန်တီးပေးနိုင်ရန်၊

(၄) ဒေသတွင်း လူမှုစီးပွား ဖွံ့ဖြိုးရေးကို အထောက်အကူပြုစေရန်

၁.၂.၃. ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းလုပ်ဆောင်မည့် တတိယအဖွဲ့အစည်းအကျဉ်း

ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းလုပ်ဆောင်မည့် Industry & Infrastructure Consultancy (IIC Co., Ltd) နှင့် သက်ဆိုင်သော အချက်များမှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။

ဇယား (၁.၂.၃-၁) EMP ရေးဆွဲမည့် IIC Co., Ltd. မှ ဝန်ထမ်းအင်အားစာရင်း၊ ပညာအရည်အချင်း၊ ကျွမ်းကျင်မှုနယ်ပယ်နှင့် EMP ရေးဆွဲရာတွင် ပါဝင်ဆောင်ရွက်မှုအခြေအနေ

စဉ်	အမည်	ဘွဲ့	ကျွမ်းကျင်မှု နယ်ပယ်	EMP ရေးဆွဲရာတွင် ပါဝင်ဆောင်ရွက်မှု
၁	<u>အဖွဲ့ခေါင်းဆောင်</u> ဒေါက်တာအောင်ကျော်စိုး အကြီးတန်းအကြံပေး တွဲဖက်အကြံပေးလိုင်စင်အမှတ် ၀၀၅၆/၂၀၂၃ IIC Co., Ltd. EIA CO-007/2024	Doctor of Engineering (Material Science), Kyoto Institute of Technology, Japan B.E (Textile), Professional Engineer (Textile), Reg No. 1140 Myanmar Engineering Council ASEAN Chartered Professional Engineer ACPE 05982/MM	၁။ ရေထုညစ်ညမ်းမှု ကြိုတင် ကာကွယ်ခြင်း၊ ထိန်းချုပ်ခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်းနှင့် ထိခိုက်မှု ကြိုတင်ခန့်မှန်းခြင်း ၂။ စွန့်ပစ်အစိုင်အခဲနှင့် ဘေးအန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲခြင်း	စက်ရုံလေ့လာခြင်း ကိန်းဂဏန်းအချက်အလက်များကောက်ယူခြင်း၊ ပြည်သူလူထုနှင့် တွေ့ဆုံခြင်း အစီရင်ခံစာပြုစုရေးသားခြင်း ၁။ အစီရင်ခံစာအကျဉ်းချုပ် ၂။ အခန်း(၁)မှ (၁၁)ထိ
၂	ဦးသောင်းမြင့် အမှုဆောင်အတွင်းရေးမှူး တွဲဖက်အကြံပေးလိုင်စင်အမှတ် ၀၀၇၄/၂၀၂၄ IIC Co., Ltd. EIA CO-007/2024	B.E (Petroleum)	စွန့်ပစ်အစိုင်အခဲနှင့် ဘေးအန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲခြင်း	စက်ရုံလေ့လာခြင်း ကိန်းဂဏန်းအချက်အလက်များကောက်ယူခြင်း၊ ပြည်သူလူထုနှင့် တွေ့ဆုံခြင်းအစီရင်ခံစာပြုစုရေးသားခြင်း ၁။ အစီရင်ခံစာအကျဉ်းချုပ် ၂။ အခန်း(၇)
၃	ဦးထွန်းမြင့် အတွင်းရေးမှူး တွဲဖက်အကြံပေးလိုင်စင်အမှတ် ၀၀၅၈/၂၀၂၃ IIC Co., Ltd. EIA CO-007/2024	B.Sc. (Zoology)	ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲလေ့လာခြင်း	စက်ရုံလေ့လာခြင်း ကိန်းဂဏန်းအချက်အလက်များကောက်ယူခြင်း၊ ပြည်သူလူထုနှင့် တွေ့ဆုံခြင်း အစီရင်ခံစာပြုစုရေးသားခြင်း ၁။ အစီရင်ခံစာအကျဉ်းချုပ် ၂။ အခန်း (၅၊ ၈၊ ၁၀)

ဇယား (၁.၂.၃-၂) EMP ရေးဆွဲမည့် IIC Co., Ltd. ၏ဆက်သွယ်ရန်လိပ်စာ

စဉ်	အကြောင်းအရာ	
၁။	ကုမ္ပဏီ မှတ်ပုံတင်အမှတ်	၁၀၂၅၈၅၅၈၄
၂။	လိပ်စာ	အာဇာနည်ဗိမာန်လမ်း၊ ရွှေနံ့သာလမ်းသွယ်၊ ရွှေတိဂုံဘုရားအရှေ့ဘက်မုခ်၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး
၃။	ဖုန်းနံပါတ်	၀၉-၄၄၉၆၁၁၁၉၀
၄။	အီးမေး	draungkyawsoetex@gmail.com, fissiicc@gmail.com.
၅။	ဆက်သွယ်ရန်	ဒေါက်တာအောင်ကျော်စိုး ဒါရိုက်တာ/အကြီးတန်းအကြံပေး၊

၁.၃. မူဝါဒ၊ ဥပဒေနှင့် အခြားလိုအပ်ချက်များ

၁.၃.၁. သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ဆက်စပ်ဥပဒေနှင့်နည်းဥပဒေများ

မြန်မာနိုင်ငံပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေအား ၂၀၁၂ ခုနှစ်တွင် ပြဋ္ဌာန်းခဲ့ပြီး နည်းဥပဒေများနှင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ စံချိန်စံညွှန်းများအား ၂၀၁၅ ခုနှစ်တွင် ဆက်လက် ပြဋ္ဌာန်းကြေညာခဲ့ပါသည်။ပြဋ္ဌာန်းထားသောဥပဒေများအနက်မှပတ်၀န်းကျင်ထိန်းသိမ်းရေးနှင့် ဆက်စပ်မှုများအား အခန်း(၃)တွင် ကောက်နှုတ်ဖော်ပြထားရှိပါသည်။

၁.၃.၂. အမျိုးသားအဆင့် ပတ်ဝန်းကျင်ထုတ်လွှတ်မှုဆိုင်ရာ အညွှန်းကိန်းတန်ဖိုး (National Environmental Quality Emission Guideline Values (NEQEG)

အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များအား ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့်သစ်တောရေးရာဝန်ကြီးဌာနမှ ၂၀၁၅ ခုနှစ် ဒီဇင်ဘာလ ၂၉ ရက်နေ့တွင် နိုင်ငံတော်ပြန်တမ်းတွင်ထည့်သွင်းကြေညာခဲ့ပါသည်။အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာအရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက် (National Environmental Quality Emission Guidelines Values, NEQEG)အနေဖြင့်ချည်မျှင်နှင့်အထည်အလိပ်ထုတ်လုပ်ခြင်းလုပ်ငန်း(Textiles Manufacturing) အား၊

စံထားရှိမည်ဖြစ်ပြီး၊ လေစမ်းသပ်ခြင်းလုပ်ငန်းအတွက် (National Environmental Quality Emission Guidelines Values, NEQEG) 2.3.2.1 ချည်မျှင်နှင့်အထည်အလိပ်ထုတ်လုပ်ခြင်း လုပ်ငန်း (Textiles Manufacturing) အားလည်းကောင်း၊ ဆူညံသံ အတွက်(National Environmental Quality Emission Guidelines Values, NEQEG) 1.3 General Guidelines Valuleအားလည်းကောင်း၊ စွန့်ပစ်ရေ(Effluent) စောင့်ကြည့်ခြင်းလုပ်ငန်း အတွက် (National Environmental Quality Emission Guidelines Values, NEQEG) 2.3.2.1 ချည်မျှင်နှင့်အထည်အလိပ်ထုတ်လုပ်ခြင်းလုပ်ငန်း (TextilesManufacturing)အားလည်းကောင်း၊ရေစမ်းသပ်ခြင်း လုပ်ငန်းအတွက်ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့(WHO)၏သောက်သုံးရေသတ်မှတ်ချက် အား လည်းကောင်း စံအဖြစ် ထားရှိသွားမည်ဖြစ်ပါသည်။

၁.၄. စက်ရုံဆိုင်ရာ အချက်အလက်များ

၁.၄.၁. စက်ရုံတည်နေရာ ဆက်စပ်နေရာများနှင့် အဆောက်အဦများ

အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ)သည် မြင်းခြံခရိုင်၊ မန္တလေးတိုင်းဒေသကြီး အတွင်း တောင်သာမြို့မှ မြောက်ဘက် ၁.၃ မိုင်အကွာတွင်တည်ရှိပါသည်။ အရှေ့ဘက်တွင် မလှိုင်မြို့နယ်၊ တောင်ဘက်တွင် ကျောက်ပန်းတောင်းမြို့နယ်၊ အနောက်ဘက် တွင် ပုဂံညောင်ဦးနှင့် ပခုက္ကူမြို့နယ်နှင့်မြောက်ဘက်တွင် မြင်းခြံမြို့နယ်တို့ တည်ရှိကြပါသည်။ စက်ရုံသည် မိတ္ထီလာ-မြင်းခြံ လမ်းနှင့် ပေ ၁၀၀ အကွာတွင် တည်ရှိပါသည်။

စက်ရုံတွင် အဆောက်အဦ (၃၀) လုံးရှိပြီး ၎င်းအဆောက်အဦများကို အမျိုးအစားအားဖြင့် (၄) မျိုးခွဲခြားနိုင်ပါသည်။၎င်းတို့မှာ-စက်မှုစီးပွားရေး၊အုပ်ချုပ်ရေးအဆောက်အဦနှင့်ဝန်ထမ်းအိမ်ရာ တို့ဖြစ်ကြပါသည်။စက်ထိုးစက်ရုံ၊အချောစက်ရုံ၊အထည်ချုပ်လုပ်ခြင်းစက်ရုံများမှာ တစ်ထပ်အဆောက်အဦများဖြစ်ကြပြီး ဗီသုကာပုံများအား အခန်း(၄)တွင် စုစည်းဖော်ပြထားပါသည်။

၁.၄.၂. ကုန်ထုတ်လုပ်မှုနှင့် ကုန်ကြမ်းများ

တောင်သာစက်ရုံသည်တစ်နှစ်လျှင်စက်ထိုးထည်ပေါင်း၁.၆သန်းထုတ်လုပ်နိုင်ပါသည်။ စက်ထိုးထည်ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်တွင်စက်ထိုးခြင်းအဆင့်၊အချောကိုင်ခြင်းအဆင့်နှင့် ချုပ်လုပ်ခြင်းအဆင့်များ ပါဝင်ပါသည်။ ကုန်ကြမ်းချည်ပျော့ကိုတရုတ်နှင့်အိန္ဒိယနိုင်ငံများမှဝယ်ယူတင်သွင်းပါသည်။ နှစ်စဉ်ကုန်ကြမ်းချည်ပျော့လိုအပ်ချက်မှာ ၂.၁၂၈ ပေါင်သန်းဖြစ်ပါသည်။

၁.၄.၃. အထောက်အကူပြုပြဋ္ဌာနများ

ရေအရင်းအမြစ်

စက်ရုံအတွက် လိုအပ်သောရေကို တောင်သာချောင်းအတွင်းရှိရေတိမ်တွင်းမှ ရယူပြီး ဂါလံ ၅၀,၀၀၀ ဆံ့ စက်ရုံရေစုကန်သို့ ပို့ပါသည်။ ချောင်းရေအား သန့်စင်ပြီးနောက် ဂါလံ ၁၅၀,၀၀၀ ဆံ့ မြေအောက်ကန်တွင်သိုလှောင်၍ ၎င်းမှတစ်ဆင့် စုစုပေါင်း ဂါလံ ၆၅,၀၀၀ ဆံ့ Overhead Tank များသို့ ပို့ဆောင်ပါသည်။ ယေဘုယျအားဖြင့် စက်ရုံနှင့် ဝန်ထမ်းအိမ်ရာများမှ ရေသုံးစွဲမှုမှာ တစ်နေ့လျှင် ၃၀,၀၀၀ ဂါလံဖြစ် ပါသည်။

လျှပ်စစ်ဓာတ်အား

စက်ရုံအတွက်လိုအပ်သော လျှပ်စစ်ဓာတ်အားကို စက်ရုံမှ (၁၄) မိုင် အကွာရှိ လျှပ်စစ်စွမ်းအား ဝန်ကြီးဌာန၊ မြင်းခြံဓာတ်အားခွဲရုံမှ (၃၃) ကေဗွီဗို့အားမြင့်ဓါတ်အားလိုင်းများဖြင့် သွယ်တန်းရ ယူပါသည်။ စက်ရုံမှ ထုတ်လုပ်မှု အများဆုံးကာလ ဖြစ်သော ၂၀၁၀-၂၀၁၁ ခုနှစ်၏ လျှပ်စစ်ဓါတ်အား သုံးစွဲမှုမှာ ၂၀၀,၀၀၀ kwh ဖြစ်ပါသည်။

၁.၄.၄. ရေမြောင်းစနစ်နှင့် ရေဆိုးသန့်စင်စက်ရုံ

၁.၄.၄.(က) ရေမြောင်းစနစ်

စက်ရုံဧရိယာအတွင်းတွင် ရေမြောင်းစနစ်နှင့် မြေမြှုပ်ရေဆိုးစွန့်ပိုက်လိုင်းစနစ်များ တပ်ဆင်ထားရှိပါသည်။ ရေမြောင်းစနစ်ထားရှိခြင်းကြောင့် မိုးသည်းထန်စွာရွာသွန်းပါက ရေမြောင်းများမှ တစ်ဆင့်စနစ်တကျ ရေနုတ်နိုင်သည်ဖြစ်၍ စက်ရုံတွင်း ရေနစ်မြှုပ်ခြင်းကိုလည်း ကာကွယ်နိုင်ပါသည်။ မိုးရွာသွန်းမှုကြောင့် ပိုလျှံလာသော မိုးရေများအား ရေမြောင်းစနစ်ဖြင့် စက်ရုံ၏ပြင်ပသို့ စွန့်ထုတ်ပါသည်။

၁.၄.၄.(ခ) ဇေဒါရေဆိုးသန့်စင်စက်ရုံ

စက်ရုံမှထွက်ရှိသော ရေဆိုးများအား ဂါလံ ၂၀၀,၀၀၀ ဆံ့ ဇေဒါရေဆိုးသန့်စင်ကန်သို့ မြောင်းဖြင့် ပို့လွှတ်ပါသည်။ စက်ရုံမှနေ့စဉ် ရေဆိုး ဂါလံ ၄,၀၀၀ ထုတ်လွှတ်ပါသည်။စက်ရုံအနေဖြင့် ဇေဒါပင်ဖြင့်ရေဆိုးများတွင်ပါရှိသောဓါတုဇေဒဓါတ်ကြွင်းများကိုသန့်စင်စေပြီးပတ်ဝန်းကျင် ကိုလည်း အဟာရကြွယ်စေပါသည်။ ၎င်းသန့်စင်စနစ်သည်ကုန်ကျစရိတ်သက်သာစေပြီး၊ထိန်းသိမ်းစရိတ်လည်း လျော့နည်းစေပါသည်။၎င်းသန့်စင်စနစ်သည်ရေဆိုးများမှခဲ၊ကက်ဒမီယမ်၊ပြဒါး၊အာဆင်းနစ်၊တို့ကို ဖယ်ရှားပေးနိုင်ပါသည်။

၁.၄.၅. ဖန်လုံအိမ်ခါတ်ငွေ့ထုတ်လွှတ်မှု

တောင်သာစက်ရုံမှ ၂၀၁၀-၂၀၁၁ထုတ်လုပ်မှုအပေါ်အခြေခံ၍တစ်နှစ်လျှင် ဖန်လုံအိမ်ခါတ်ငွေ့ ၂၅၁၂.၅၄တန်ထုတ်လွှတ်ပါသည်။ ဖန်လုံအိမ်ခါတ်ငွေ့ထုတ်လွှတ်မှုလျှော့ချရန်စွမ်းအင်ထိရောက်စွာသုံးစွဲမှုများဆောင်ရွက်ရန်၊ ပြန်လည်ပြည့်ဖြိုးမြဲစွမ်းအင်သုံးစွဲရန်၊ လုပ်ငန်းခွင်တိုးတက်အောင်ဆောင်ရွက်ရန် ဖြစ်ပါသည်။

၁.၄.၆. အစိုင်အခဲစွန့်ပစ်ခြင်း စီမံခန့်ခွဲမှုစနစ်

အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများအားဘေးအန္တရယ်ရှိအစိုင်အခဲစွန့်ပစ်ပစ္စည်းနှင့် ဘေးအန္တရယ်မရှိအစိုင်အခဲစွန့်ပစ်ပစ္စည်းဟူ၍(၂)မျိုးခွဲခြားနိုင်ပါသည်။ဘေးအန္တရယ်ရှိအစိုင်အခဲစွန့်ပစ်ပစ္စည်းများမှာ (၁) ဓါတုပစ္စည်းများ(၂)ဓါတုဖျော်ရည်များ(၃)စွန့်ပစ်စက်ဆီ၊ချောဆီဟောင်းများ၊(၄) ဘေးအန္တရယ်ရှိ အိပ်ခွံဟောင်းများ၊ PPE အဟောင်းများ၊(၅) ဓါတုပုံးခွံဟောင်းများ (၆) ဘက်ထရီအဟောင်းများ ပါဝင်ပါသည်။ဘေးအန္တရယ်မရှိအစိုင်အခဲစွန့်ပစ်ပစ္စည်းများမှာ(၁)စက်ထိုးထည်ပိတ်နှင့်ချည်အလေအလွင့်များ၊ (၂) ထုပ်ပိုးမှုသုံးပစ္စည်းများ၊(၃)အထွေထွေရုံးသုံးပစ္စည်းများ၊(၄)ဧဝအဆင့်လျှော့ချနိုင်သောပစ္စည်းများ၊ (၅)အမှုန်အမွှားများ၊(၆)အပ်ချုပ်လုပ်ငန်းမှအလေအလွင့်များ၊ဖြစ်ပါသည်။ဘေးအန္တရယ်ရှိအစိုင်အခဲ စွန့်ပစ်ပစ္စည်းများအားအမျိုးအမည်ခွဲခြားသတ်မှတ်ပြီး လုံခြုံစိတ်ချရသောနေရာတွင်သိမ်းဆည်းရမည်။ ဝန်ထမ်းများအားအလေအလွင့်ကိုင်တွယ်ထိန်းသိမ်းနည်းသင်တန်းများပို့ချရမည်။ပတ်ဝန်းကျင် ထိန်းသိမ်းခြင်းဆိုင်ရာဥပဒေများကိုမဖြစ်မနေသိရှိလိုက်နာရမည်။စက်ရုံအနေဖြင့်ထိရောက်သော အစိုင်အခဲစွန့်ပစ်ခြင်းစီမံခန့်ခွဲမှုစနစ်ကိုအကောင်အထည်ဖော်ရန်အတွက်စွန့်ပစ်ပစ္စည်းပြန်လည် အသုံးပြုသူများ၊ နှင့် မြို့နယ်စည်ပင်သာယာရေးကော်မတီများနှင့်ပူးပေါင်းဆောင်ရွက်ရမည်။

၁.၅. စက်ရုံ၏ ပထဝီအနေအထားနှင့်အရည်အသွေးထိန်းချုပ်မှုဆိုင်ရာ ဆန်းစစ်လေ့လာတွေ့ရှိချက်များ၊

၁.၅.၁. ပထဝီအနေအထား

အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)သည် မန္တလေးတိုင်းဒေသကြီး၊ မြင်းခြံခရိုင်၊ တောင်သာမြို့၏ မြောက်ဘက် (၁.၃) မိုင်ခန့်အကွာတွင် တည်ရှိပါသည်။

၁.၅.၂. ရာသီဥတု

တောင်သာမြို့နယ်သည် အပူပိုင်းဒေသ ရာသီဥတုရရှိပါသည်။

၁.၅.၃. မြေငလျင်

တောင်သာမြို့နယ်သည်စစ်ကိုင်းပြတ်ရွှေ့ကြောအနီးတွင်တည်ရှိသောကြောင့် သဘာဝဘေး အန္တရာယ်ကျရောက်နိုင်မှုများအတွက်အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ်များ ကြိုတင်ပြင်ဆင် ထား သင့်ပါသည်။

၁.၅.၄. လူမှုစီးပွားဘဝအခြေအနေ

အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာနမှရရှိသော ကိန်းဂဏန်းအချက်အလက်များအရ တောင်သာမြို့နယ်တွင်လူဦးရေ (၂၅၀,၀၀၀) ခန့်နေထိုင်ကြပြီးအိမ်ထောင်စု (၄၅,၀၀၀) ခန့် မှီတင်းနေထိုင်ကြပါသည်။ လူမှုစီးပွားစစ်တမ်းကောက်ယူချက်အရတောင်သာမြို့နယ်သည်သိသာထင်ရှားသော လူမှုစီးပွားဖွံ့ဖြိုးတိုးတက်မှုများရရှိခဲ့ပါသည်။စက်ရုံမှဒေသခံပြည်သူများအားအလုပ်အကိုင်များဖန်တီးပေးနိုင်ခြင်း ဒုတိယအကျိုးဆက်အနေဖြင့်အလယ်အလတ်စီးပွားရေးလုပ်ငန်းရှင်များ၊ မီးဖိုချောင်သုံးပစ္စည်းရောင်းချသူများ၊လက်လီရောင်းချသူများအားအလုပ်အကိုင်များပွားများရရှိစေပါသည်။ထို့အပြင် စက်ရုံအနေဖြင့် စက်ရုံ၏ အဆောက်အဦ ပြုပြင်ထိန်းသိမ်းခြင်း လုပ်ငန်းများ၊ စိမ်းလန်းစိုပြေရေးလုပ်ငန်းများ၊ သန့်ရှင်းရေးလုပ်ငန်းများ တွင်လည်း ဒေသခံကန်ထရိုက်တာငယ်များအား ခေါ်ယူအလုပ်ပေး ခန့်ထားလျက် ရှိပါသည်။

၁.၅.၅ မြေအသုံးချမှု

စက်ရုံ၏ မြေကေအကျယ်အဝန်းမှာ (၆၁.၁၉) ဧကကျယ်ဝန်းပြီး ၎င်းကို အပိုင်း(၂)ပိုင်း ခွဲခြားနိုင်ပါသည်။ စက်ရုံမှာ (၃၃.၁၇)ဧကရှိပြီး ဝန်ထမ်းအိမ်ရာမှာ (၂၈.၀၂၃)ဧကရှိပါသည်။

၁.၅.၆. ရေအရည်အသွေး

တောင်သာချောင်းအတွင်းရှိ ရေတိမ်တွင်းမှရေနမူနာအား ကောက်ယူပြီး စမ်းသပ်စစ်ဆေးခဲ့ပါသည်။ ဓါတ်ခွဲစမ်းသပ်ချက် ရလဒ်များအရ ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့၏ သောက်သုံးရေစံချိန်စံညွှန်း သတ်မှတ်ချက်အရ ထပ်မံသန့်စင်မှုပြုလုပ်ခြင်းမရှိပါကသောက်သုံးရန်မသင့်တော်ပါ။

၁.၅.၇. လေအရည်အသွေး

စက်ရုံဝင်းတွင်းလေအရည်အသွေးစမ်းသပ်ခြင်းလုပ်ငန်းအတွက်အမျိုးသားပတ်ဝန်းကျင်ဆိုင် ရာအရည်အသွေးထုတ်လွှတ်မှုလမ်းညွှန်ချက် ၂.၃.၂.၁ ချည်မျှင်နှင့်အထည်အလိပ်ထုတ်လုပ်ခြင်း လုပ်ငန်းအားစံထားရှိပြီး စမ်းသပ်ခဲ့ရာ အမိုးနီးယား၊PM_{10}၊$PM_{2.5}$နှင့်Volatile Organic Compound တို့အားစမ်းသပ်နိုင်ခဲ့ပြီးစံသတ်မှတ်ချက်တန်ဖိုးများနှင့်ကိုက်ညီမှုရှိကြောင်းတွေ့ရှိရပါသည်။

၁.၅.၈. မြေအရည်အသွေး

ခါတ်ခွေစမ်းသပ်ချက်များအရ စက်ရုံအနီးရှိမြေမှာ မြေဆီဩဇာကြွယ်ဝခြင်းမရှိပါသဖြင့် စိုက်ပျိုးမြေအဖြစ် အသုံးပြုရန်အတွက် မြေဆီဩဇာများထည့်သွင်း စိုက်ပျိုးရန်လိုအပ်ပါသည်။

၁.၅.၉. ရေဆိုးအရည်အသွေး

စက်ရုံ၏အဓိကကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းများရပ်ထားရပါသဖြင့်ခါတုခါတ်ကြွင်းများ ပါဝင်သောရေဆိုးထွက်ရှိမှုမရှိသောကြောင့်နမူနာကောက်ယူစမ်းသပ်မှုမပြုလုပ်နိုင်ခဲ့ပါ။

၁.၅.၁၀. ဆူညံသံနှင့်တုန်ခါမှု

စက်ရုံတွင်းနေရာများတွင်ဆူညံသံတိုင်းတာမှုများဆောင်ရွက်ခဲ့ရာ ၇၀dBA ထက်လျော့နည်းတိုင်းတာရရှိပါသည်။

၁.၅.၁၁. ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲ

စက်ရုံသည် မြန်မာနိုင်ငံအလယ်ပိုင်း အပူပိုင်းဒေသတွင်တည်ရှိပါသည်။ ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲများကိုလေ့လာသောနေရာအများစုသည်စိုက်ပျိုးမြေများဖြစ်ပါသည်။ ကာကွယ်တောများအတွင်းမကျရောက်ပါ။

အပင်မျိုးစိတ်များ

အပင်မျိုးစိတ် (၂၉)မျိုး တွေ့ရှိခဲ့ပြီး ပင်မမျိုး (၁၅)မျိုးမှ ဆင်းသက်လာကြောင်း လေ့လာတွေ့ရှိရပါသည်။ လေ့လာတွေ့ရှိသော အပင်မျိုးစိတ်များအားလုံးသည် IUCN Red List 2017 တွင် ပါဝင်ခြင်းမရှိပါ။ တမာပင်မှာ လေ့လာတွေ့ရှိရသော သစ်ပင်များအနက် တွေ့ရှိရမှုနှုန်း အများဆုံးဖြစ်ပြီး စက်ရုံမှ ၂၀၀၅ ခုနှစ်မှ စတင်၍ ပြုစုပျိုးထောင် စိုက်ပျိုးခဲ့မှုကြောင့် ဖြစ်ပါသည်။

ကုန်းနေရေနေနှင့်တွားသွားသတ္တဝါမျိုးစိတ်များ

မိခင်မျိုး(၁၅)မျိုးမှ ဆင်းသက်လာသည့် ကုန်းနေရေနေနှင့် တွားသွားသတ္တဝါ(၁၇)မျိုး လေ့လာတွေ့ရှိခဲ့ရပါသည်။ Banded bullfrog မျိုးစိတ်သည် မိခင်မျိုး Microhylidae မှ ဆင်းသက်လာပြီး အများဆုံး တွေ့ရှိ ရသော မျိုးစိတ်ဖြစ်ပါသည်။

ဌက်မျိုးစိတ်များ

မိခင်မျိုး (၇)မျိုးမှ ဌက်မျိုးစိတ် (၇)မျိုး တွေ့ရှိလေ့လာနိုင်ခဲ့ပါသည်။ နွားကျောင်းဗျိုင်း သည် အများဆုံး တွေ့ရှိရသော မျိုးဖြစ်ပြီး စာကလေးဌက် မှာ ဒုတိယအများဆုံး တွေ့ရှိရသော မျိုးစိတ်ဖြစ် ပါသည်။ တတိယအများဆုံး တွေ့ရှိရသော မျိုးစိတ်မှာ ကျီးကန်း ဖြစ်ပါသည်။

ငါးမျိုးစိတ်

စက်ရုံမှ (၅) မိုင်ပတ်လည်အတွင်း မြစ်ချောင်းများစီးဆင်းနေခြင်းမရှိသောကြောင့် ငါးမျိုးစိတ် များအား လေ့လာနိုင်ခြင်းမရှိခဲ့ပါ။

ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲများဆိုင်ရာဆွေးနွေးချက်

စက်ရုံဧရိယာသည် ကာကွယ်ထားသောကြိုးဝိုင်းဧရိယာအတွင်း မပါဝင်ပါ။ ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲများအား စက်ရုံမှ (၃.၁၄၂) စတုရန်းမိုင် အကျယ်အဝန်းတွင် လေ့လာမှု ဆောင်ရွက်ခဲ့ခြင်း ဖြစ်ပါသည်။ ၎င်းဧရိယာတွင် သီးနှံစိုက်ပျိုးမြေများ၊ လယ်မြေများ၊ စသည်တို့ပါဝင်ပါသည်။ လေ့လာမှု အရ အပင်မျိုးစိတ်ပေါင်း (၂၉)မျိုး၊ ကုန်းနေရေနေနှင့်တွားသွားသတ္တဝါမျိုးစိတ်ပေါင်း (၁၇)မျိုး၊ ဌက်မျိုးစိတ်(၇)မျိုးအား လေ့လာတွေ့ရှိဖော်ထုတ်နိုင်ခဲ့ပါသည်။ တမာပင်မှာ အများဆုံးတွေ့ရှိရသော အပင်အမျိုးအစားဖြစ်ပြီး ၂၀၀၅ ခုနှစ်မှစတင်၍ စက်ရုံ၏ ပြုစုပျိုးထောင်မှုများကြောင့်ဖြစ်ကြောင်း သုံးသပ်တွေ့ရှိရပါသည်။

၁.၅.၁၂. တာဝန်သိစောင့်ရှောက်မှုများ (Corporate Social Responsibility, CSR)

စက်ရုံ၏ တာဝန်သိစောင့်ရှောက်မှု အစီအစဉ်သည် လူ့အဖွဲ့အစည်းနှင့်ပတ်ဝန်းကျင် အား ပိုမိုကောင်းမွန်လာစေရေးအတွက် ဖြစ်ပါသည်။ တာဝန်သိစောင့်ရှောက်မှုအစီအစဉ်သည် ပတ်ဝန်း ကျင်လူ့အဖွဲ့အစည်း၊ ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲဆိုင်ရာ အရေးကိစ္စများကို စုစည်းထားခြင်းသာ ဖြစ်ပါသည်။ စက်ရုံ၏တာဝန်သိစောင့်ရှောက်မှုအစီအစဉ်အရ အနီးပတ်ဝန်းကျင် ကျေးရွာများရှိ ဘုန်းတော်ကြီးကျောင်းများသို့ ဝါဆိုသင်္ကန်းနှင့်ကထိန်သင်္ကန်းများ ဆပ်ကပ်လှူဒါန်းခြင်းများ နှစ်စဉ် ဆောင်ရွက်နိုင်ခဲ့ပါသည်။ စက်ရုံမှ အလုပ်အကိုင်များဖန်တီးပေးနိုင်ခြင်းကြောင့် ဒေသတွင်း စီးပွားရေးကိုတိုးတက်စေနိုင်ရုံမက အနီးဝန်းကျင်ဒေသများ၏ လူမှုစီးပွားဘဝကိုလည်း မြှင့်တင် ပေးနိုင်မည်ဖြစ်ပါသည်။ စက်ရုံမှ သဘာဝဘေးအန္တရာယ် စီမံခန့်ခွဲမှုအစီအစဉ် ဆောင်ရွက်ထားရှိပြီး သဘာဝဘေးအန္တရာယ်များကျရောက်လာပါက ပထမဆုံး အရေးပေါ်ကူညီကယ်ဆယ်သူများမှာ စက်ရုံဝန်ထမ်းအိမ်ရာများတွင်နေထိုင်သော စက်ရုံမှဝန်ထမ်းများပင် ဖြစ်ပါသည်။ တာဝန်သိ စောင့်ရှောက်မှုရုံပုံငွေအဖြစ် စက်ရုံအမြတ်ငွေ၏ (၂) ရာခိုင်နှုန်းအားအသုံးပြုရန် ကတိကဝတ် ထားရှိပါသည်။နိုင်ငံပိုင်စက်ရုံဖြစ်သောကြောင့်တောင်သာစက်ရုံသည်အစိုးရထံမှဘတ်ဂျက်ခွဲဝေချထား

ပေးမှုကိုလိုက်နာဆောင်ရွက်ရမည် ဖြစ်ပါသည်။ စက်ရုံမှ အလုပ်အကိုင်များ ဖန်တီးပေးခြင်းကြောင့် အနီးပတ်ဝန်းကျင်ကျေးရွာများ၏ စီးပွားရေးဖွံ့ဖြိုးတိုးတက်မှု သာမက လုပ်သားများ၏ ကျန်းမာရေးနှင့် ဒေသတွင်းလူမှုစီးပွားဖွံ့ဖြိုးတိုးတက်မှုကိုပါ အထောက်အပံ့ ဖြစ်ကြောင်း လေ့လာတွေ့ရှိရပါသည်။

(က) လူမှုစီးပွားဘဝဆောင်ရွက်မှုများ

စက်ရုံမှရာထူးနေရာအဆင့်အတန်းအမျိုးမျိုးအတွက် ဒေသအသီးသီးမှဝန်ထမ်းအင်အား(၃၂၅) ဦးခန့်ထားနိုင်ပါသည်။ အချို့မှာအနီးပတ်ဝန်းကျင်မြို့နယ်များမှ ကျွမ်းကျင်မှုအနည်းငယ်သာရှိသော ဝန်ထမ်းများ၊ လုံးဝကျွမ်းကျင်မှုမရှိသောဝန်ထမ်းများဖြစ်ကြပါသည်။ ထို့ပြင် စက်ရုံမှ ဆင့်ပွားအကျိုးသက်ရောက်မှုအနေဖြင့် အနီးပတ်ဝန်းကျင်ကျေးရွာများမှ ကန်ထရိုက်တာငယ်များအား စက်ရုံစိမ်းလန်းစိုပြေရေး၊ ပြုပြင်ထိန်းသိမ်းရေး၊ သန့်ရှင်းရေးလုပ်ငန်းများတွင် အလုပ်တာဝန်ပေးအပ်ခြင်း၊ ဝါစိုက်ပျိုးသူ တောင်သူများ၊ ရက်ကန်းလုပ်ငန်းငယ်များအား အလုပ်ပေးထားနိုင်ခြင်း စသည့်အကျိုးသက်ရောက်မှုများ ရရှိစေပါသည်။

(ခ) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအတွက်ဆောင်ရွက်မှုများ

သဘာဝပတ်ဝန်းကျင်အားထိန်းသိမ်းရေးအတွက် စိမ်းလန်းသောသစ်တောများ ပြုစုဆောင်ရွက်ခြင်းသည်လည်းပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)အရကုစားခြင်းဖြစ်ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တစ်စိတ်တစ်ပိုင်းကိုဖြည့်ဆည်းသည့်အနေဖြင့်တောင်သာစက်ရုံသည် သီးနှံသစ်တောရောနှောစိုက်ခင်း၊အပူပိုင်းဇုံသစ်ပင်သစ်တောစိုက်ခင်း (Agroforestry system) ဆောင်ရွက်မည်ဖြစ်ပါသည်။စက်ရုံမှၚင်းစိုက်ခင်းကိုဒေသခံတောင်သူလယ်သမားများ၊အပူပိုင်းဇုံစိမ်းလန်းစိုပြေရေးဌာနတို့နှင့်ပူးပေါင်းအကောင်အထည်ဖော်ဆောင်ရွက်မည်ဖြစ်ပါသည်။ပထမနှစ်တွင်သရက်ပင်နှင့် ဆီထွက်သီးနှံများရောနှောစိုက်ခင်း(၁)ဧကပျိုးမည်ဖြစ်ပါသည်။ဒုတိယနှစ်တွင်(၂)ဧကနှင့်ကျန် (၃)ဧကအားကျန်(၃)နှစ်တွင်ဆက်လက်စိုက်ပျိုးမည်ဖြစ်ပါသည်။သီးနှံသစ်တောရောနှောစိုက်ခင်း ထူထောင်ခြင်းအားဖြင့်တောင်သာစက်ရုံအတွက်သာမကဒေသခံတောင်သူများကိုလည်း အကျိုးရှိစေမည်ဖြစ်ပါသည်။ စိုက်ခင်းများကြောင့်ဇီဝမျိုးစုံမျိုးကွဲများထိန်းသိမ်းစောင့်ရှောက်ခြင်းကိုအားပေးခြင်း၊ မြေဆီလွှာကြွယ်ဝမှုကိုအားပေးခြင်း၊ တောင်သူများ ဝင်ငွေတိုးပွားစေခြင်း၊ ကာဗွန်ထုတ်လုပ်မှုကိုလျှော့ချစေနိုင်သည့် ရာသီဥတုပြောင်းလဲမှုကို ကုစားနိုင်ခြင်း စသည့်အကျိုးကျေးဇူးများရရှိစေပါသည်။ ဤအစီအစဉ်ကို ၂၀၂၇-၂၀၂၈ ဘဏ္ဍာရေးနှစ်တွင် စတင်ဆောင်ရွက်နိုင်ရန် မျှော်မှန်းပါသည်။ ဝန်ကြီးဌာနနှင့် နိုင်ငံတော်အစိုးရထံမှ ရန်ပုံငွေရရှိမှုအပေါ်မူတည်ပါသည်။

၁.၆. စက်ရုံ၏အနီးပတ်ဝန်းကျင် ထိခိုက်နိုင်မှုများကို ဆန်းစစ်လေ့လာခြင်း

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ဆိုသည်မှာ စက်ရုံ၏ တည်ရှိမှုနှင့် ကုန်ထုတ်လုပ်ငန်းများကြောင့် ပတ်ဝန်းကျင်အား ထိခိုင်နိုင်မှုများကို လေ့လာခြင်းနှင့် အဆိုပါ ထိခိုက်မှုများကို ပြန်လည်ကုစားခြင်း လုပ်ငန်းစဉ်များ ပါဝင်ခြင်းကို ဆိုလိုပါသည်။ အားလုံးအတွက် ကောင်းမွန်သည့်

ပတ်ဝန်းကျင်နှင့် ရေရှည်ဖွံ့ဖြိုးတိုးတက်သည့်ပတ်ဝန်းကျင် တည်ဆောက်နိုင်ရန်အတွက် အဆိုပါ အချက်များကို ပိုမိုသိရှိနားလည်ဆောင်ရွက်ရန် လိုအပ်ပါသည်။

ပတ်ဝန်းကျင်ကျေးရွာနှင့်လူနေရပ်ကွက်များ

တောင်သာစက်ရုံ၏ အနီးပတ်ဝန်းကျင်တွင် လယ်ကွင်းများ၊ ဝန်ထမ်းရပ်ကွက်၊ ကျေးရွာများ စသည်ဖြင့်တည်ရှိပါသည်။စက်ရုံမှသဘာဝပတ်ဝန်းကျင်အားထိန်းသိမ်း စောင့်ရှောက်ရန် တာဝန်ယူရ မည် ဖြစ်ပါသည်။

အနီးဆုံးရေအရင်းအမြစ်

တောင်သာချောင်းသည် ချောင်းခြောက်အမျိုးအစားဖြစ်ပါသည်။ တောင်သာချောင်းသည် စက်ရုံမှပ.၅မိုင်ခန့်ကွာဝေးပြီး၊ရောဝတီမြစ်အတွင်းသို့စီးဝင်သောဆင်တဲဝချောင်းအတွင်း သို့ စီးဝင်ပါ သည်။

အနီးပတ်ဝန်းကျင်၏ ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲများ

အပင်မျိုးစိတ်များ

စနစ်တကျ ရေမြောင်းစွန့်ထုတ်မှုစနစ်မရှိပါက စက်ရုံအနီးပတ်ဝန်းကျင်ရှိ လယ်ကွင်းများကို ထိခိုက်ပျက်စီးနိုင်ပါသည်။ ပြုပြင်သန့်စင်ခြင်းမရှိသော ရေဆိုးစွန့်ထုတ်မှုနှင့် အခိုးအငွေ့ထုတ်လွှတ်မှု များကြောင့် ပတ်ဝန်းကျင် သီးနှံစိုက်ခင်းများ ၊ လယ်ကွက်များအား ပျက်စီးစေနိုင်ပါသည်။

တိရိစ္ဆာန်မျိုးစိတ်များ

စက်ရုံ၏ အနီးပတ်ဝန်းကျင်တွင် လယ်ကွင်းများ၊ သီးနှံစိုက်ခင်းများ တည်ရှိရာ စက်ရုံကြောင့် အနီးပတ်ဝန်းကျင်၏ ဂေဟစနစ်ကို ထိခိုက်ခြိမ်းခြောက်မှုများ ဖြစ်ပွားနိုင်ပါသည်။ စက်ရုံမှစနစ် ကျသောရေမြောင်းစွန့်ထုတ်မှုစနစ်မရှိခြင်းကြောင့်လည်းကောင်း၊လေအရည်အသွေး ထိန်းသိမ်းခြင်း မရှိခြင်းကြောင့်လည်းကောင်း၊ရေဆိုးသန့်စင်မှုစနစ်ညံ့ဖျင်းခြင်းကြောင့်လည်းကောင်း၊အစိုင်အခဲ စွန့်ပစ်မှုစီမံခန့်ခွဲမှုစနစ် ညံ့ဖျင်းခြင်းကြောင့်လည်းကောင်း၊ နို့တိုက် သတ္တဝါများ၊ ကုန်းနေရေနေနှင့် တွားသွားသတ္တဝါများ၊ ငှက်သတ္တဝါများကိုလည်း ထိခိုက် နိုင်ပါသည်။

၁.၆.၁. ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့်ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

၁.၆.၁.၁.ရေနှင့်သက်ဆိုင်သောပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့်ကုစားရန် နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

၁.၆.၁.၁. (က) မြေပေါ်ရေနှင့် သက်ဆိုင်သော ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှု ဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့် ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

စက်ရုံမှကုန်ထုတ်လုပ်မှုအတွက်လည်းကောင်း၊ မိလ္လာစနစ်အတွက်လည်းကောင်း၊ ဥယျာဉ်စိုက်ပျိုးရေးအတွက်လည်းကောင်း၊ ဝန်ထမ်းအိမ်ရာများတွင် အသုံးပြုရန်အတွက် လည်းကောင်း နေ့စဉ်ရေဂါလန် (၃၀,၀၀၀) အသုံးပြုပြီး ၎င်းရေကို ရေတိမ်တွင်းများမှ ရယူပါသည်။ စက်ရုံတွင်း မိုးအခါစီးဆင်းရေများနှင့် သန့်စင်ပြီးသောဝန်ထမ်းအိမ်ရာသုံးရေများအား စက်ရုံရေမြောင်းစနစ်သို့ ထုတ်လွှတ်ပါသည်။ စက်ရုံကုန်ထုတ်လုပ်ငန်းမှထွက်ရှိသော သန့်စင်ခြင်းမရှိသည့် မည်သည့်ရေဆိုးကိုမျှ အနီးပတ်ဝန်းကျင်ရှိ စိုက်ပျိုးမြေများသို့ ထုတ်လွှတ်ခြင်းမရှိပါ။ စက်ရုံမြေပေါ်ရေနှင့် သက်ဆိုင်သော ပတ်ဝန်းကျင်ထိခိုက်မှု များကို ကုစားနိုင်ရန်အတွက် ကုစားမှုများဆောင်ရွက်ရန် နည်းလမ်းများကို Chapter 6, Table 6.4.1-1. တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၁. (ခ) မြေအောက်ရေနှင့်သက်ဆိုင်သောပတ်ဝန်းကျင်ထိခိုက်နိုင်မှု ဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့် ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

စက်ရုံလုပ်သားများ (၃၂၅ဦး) ၏ မိလ္လာအသုံးပြုမှုမှသာ ရေဆိုးများထွက်ရှိနိုင်ပါသည်။ သို့သော်လည်းအဆိုပါအသုံးပြုမှုကြောင့်ပတ်ဝန်းကျင်ထိခိုက်မှုများရှိလာနိုင်သော်လည်း၊ ၎င်းထိခိုက်မှုများကိုကာကွယ် တားဆီးနိုင်ပါသည်။ မြေအောက်ရေနှင့် သက်ဆိုင်သော ပတ်ဝန်းကျင်ထိခိုက်မှုများကို ကုစား နိုင်ရန်အတွက် ကုစားမှုများဆောင်ရွက်ရန် နည်းလမ်းများကို Chapter 6, Table 6.4.2-1. တွင် ဖော်ပြ ထားပါသည်။

၁.၆.၁.၂.လေထုညစ်ညမ်းမှုကြောင့် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေ ဆန်းစစ်ချက်များနှင့် ကုစားရန် နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

စက်ရုံမှ ကုန်ထုတ်လုပ်ငန်းအတွက် ဘွိုင်လာများအသုံးပြုပါသည်။။။ ယာဉ်အသွားအလာများကြောင့်လည်း အခိုးငွေ့ထုတ်လွှတ်ခြင်းရှိနိုင်ပါသည်။ လေထုညစ်ညမ်းမှုကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှု များကို ကုစားနိုင်ရန်အတွက် ကုစားမှုများဆောင်ရွက်ရန် နည်းလမ်းများကို Chapter 6, Table 6.4.3-3. တွင် ဖော်ပြထားပါသည်။

၁.၆.၁.၃. ဆူညံသံကြောင့် ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှု ဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့် ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

အပ်ချုပ်စက်(၁၀၀)လုံးတစ်ပြိုင်နက်လည်ပတ်ပါက ဆူညံသံထွက်ရှိပါသည်။ ထိုဆူညံသံကြောင့်လုပ်သားများ၏အကြားအာရုံကိုထိခိုက်စေနိုင်သည့်လုပ်ငန်းခွင်ကျန်းမာရေးအတွက် အဓိကခြိမ်းခြောက်မှုဖြစ်လာပါသည်။ဆူညံသံကြောင့်ထိခိုက်မှုများကိုကုစားရန်အတွက်ဆောင်ရွက်မည့် နည်းလမ်းများကို Chapter 6, Table 6.4.4-1. တွင် ဖော်ပြထားပါသည်။

၁.၆.၁.၄.မြေဆီလွှာညစ်ညမ်းမှုကြောင့်ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့်ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

စက်ရုံ၏ကုန်ထုတ်လုပ်မှုအဆင့်တွင်ရေဆိုးများအားရေဆိုးသန့်စင်ကန်သို့သာ ထုတ်လွှတ်သောကြောင့် မြေဆီလွှာထိခိုက်နိုင်မှု ဖြစ်နိုင်ခြေ လွန်စွာနည်းပါးပါသည်။ ပတ်ဝန်းကျင် ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့် ကုစားနိုင်မည့် နည်းလမ်းများကို Chapter 6, Table 6.4.5-1. တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၅.အလင်းရောင်ကြောင့်ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့်ကုစားရန်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

ကောင်းမွန်သောအလုပ်ပတ်ဝန်းကျင်ဖြစ်စေရန်အတွက်အလင်းရောင်ရရှိမှုသည် အရေးပါပါသည်။အလင်းရောင်ကြောင့်ပတ်ဝန်းကျင်ထိခိုက်နိုင်မှုဖြစ်နိုင်ခြေဆန်းစစ်ချက်များနှင့်ကုစားရန်နည်းလမ်း များကို Chapter 6, Table 6.4.6-1 တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၆. အန္တရာယ်ကြောင့်သက်ရောက်နိုင်မှုများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

စက်ရုံမှ အနီးပတ်ဝန်းကျင်သို့ အန္တရာယ်ဆိုးများလွှတ်ထုတ်ခြင်းမရှိပါ။

၁.၆.၁.၇. လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေး ထိခိုက်နိုင်မှု ဆန်းစစ်ချက်များ (ကုန်ထုတ်လုပ်မှုအဆင့်)

ကုန်ထုတ်လုပ်မှုလုပ်ငန်းစဉ်တွင် လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ထိခိုက်နိုင်မှုများ ဆန်းစစ်ဆောင်ရွက်ရန် လုပ်ငန်းစဉ်များ များစွာရှိပါသည်။ ထိုသို့ ထိခိုက်နိုင်သော လုပ်ငန်းစဉ်များမှာ အဓိကအားဖြင့် စက်ပိုင်းဆိုင်ရာကြောင့် လည်းကောင်း၊ အသံကြောင့်လည်းကောင်း၊ လျှပ်စစ်ဓါတ်အားကြောင့်လည်းကောင်း ဖြစ်ပါသည်။ မီးဘေးအန္တရာယ်သည်လည်း အဓိကကျသောခြိမ်းခြောက်မှုတစ်ခုဖြစ်ပါသည်။ကုန်ပစ္စည်းသိုလှောင်ခြင်း၊စက်ပစ္စည်းများကိုင်တွယ်ခြင်းနှင့် အလေအလွင့်ပစ္စည်းများစွန့်ပစ်ခြင်းစသည်တို့ပါဝင်သည့် လုပ်ငန်းခွင်အားဘေးကင်းစေရေးတိုးမြှင့်ဆောင်ရွက်ခြင်းသည်လွန်စွာအရေးကြီးပါသည်။ဘေးအန္တရာယ်ဖြစ်စေသည့်အကြောင်းအရာများ၊နောက်ဆက်

တွဲအကျိုးရလဒ်များနှင့် မတော်တဆ မှုများ ကင်းဝေးစေရေးအတွက် လုပ်ဆောင်ရမည့်အရာများကို Chapter (6) Table 6.4.8-1 တွင် အသေးစိတ် ဖော်ပြထားပါသည်။ လုပ်ငန်းခွင်ဘေးကင်းရေးအတွက် ဖြေလျှော့ကုစားနိုင်မည့် လမ်းများ ကို Chapter (6) Table 6.4.8.1-1 မှ 6.4.8.1-2 ထိ ဖော်ပြထားရှိပါသည်။

၁.၆.၁.၈. ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲများ ထိခိုက်နိုင်မှုနှင့်ကုစားနိုင်မည့် နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

မြန်မာနိုင်ငံတွင် အတွေ့များသော ငှက်မျိုးစိတ်များအား ဤလေ့လာမှုအရ တွေ့ရှိရပါသည်။ ထို့အပြင် တိရိစ္ဆာန်မျိုးစိတ်များ၏ ကျင်လည်ကျက်စားရာနေရာမှာ စက်ရုံပေါ်ပေါက်လာခြင်းကြောင့် လျော့နည်းသွားသော်လည်း ထိခိုက်နိုင်မှုဧရိယာနည်းပါးခြင်း၊ အဆိုပါတိရိစ္ဆာန်များမှာ နေရာအနှံ့ ပျံ့နှံ့မှုရှိနေခြင်းကြောင့် မည်သည့်မျိုးစိတ်ကိုမျှ သိသိသာသာ ထိခိုက်နိုင်ခြင်းမရှိကြောင်း တွေ့ရှိရ ပါသည်။ ကုစားနိုင်မည့် နည်းလမ်းများကို Chapter (6) Table 6.4.9-3 တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၉. ယာဉ်ကြောနှင့် လမ်းအပေါ်ထိခိုက်မှုများနှင့် ကုစားနိုင်မည့်နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

တောင်သာစက်ရုံသည် မိတ္ထီလာ-မြင်းခြံလမ်းမကြီးအနီးတွင် တည်ရှိပြီး စက်ရုံကြောင့် ယာဉ်ကြောပိတ်ဆို့မှုများ မရှိနိုင်ပါ။ ယာဉ်နှင့် လမ်းအသုံးပြုမှုနှင့်ပတ်သက်၍ လိုက်နာရမည့်နည်းလမ်းများကို Chapter 6, Table 6.4.10-1 တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၁၀. အစိုင်အခဲစွန့်ပစ်မှုကြောင့် ထိခိုက်နိုင်မှုများနှင့် ကုစားနိုင်မည့် နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှု အဆင့်)

အစိုင်အခဲ စွန့်ပစ်ပစ္စည်းများကို ထုတ်လုပ်ခြင်း၊ သိုလှောင်ခြင်း၊ သိမ်းဆည်းခြင်း၊ ရွှေ့ပြောင်းခြင်းနှင့် အစိုင်အခဲများကို စွန့်ပစ်ခြင်းလုပ်ငန်းစဉ်များ ပါဝင်ပါသည်။ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းကို (၂) မျိုးခွဲခြားနိုင်ပါသည်။(၁) အန္တရာယ်ရှိသောအစိုင်အခဲစွန့်ပစ်ပစ္စည်းနှင့်(၂)အန္တရာယ်မရှိသော အလေအလွင့်စွန့်ပစ်ပစ္စည်းတို့ ဖြစ်ပါသည်။ကုစားနိုင်မည့် နည်းလမ်းများကို Chapter 6, Table 6.4.11-1. တွင်ဖော်ပြထားပါသည်။

၁.၆.၁.၁၁. 33KV ဗို့အားမြင့်ဓါတ်အားလိုင်းကြောင့် ထိခိုက်နိုင်မှုများနှင့် ကုစားမည့် နည်းလမ်းများ (ကုန်ထုတ်လုပ်မှု အဆင့်)

တောင်သာစက်ရုံသည် 33KV ဗို့အားမြင့် ဓါတ်အားလိုင်းအား မြင်းခြံမြို့ ဓါတ်အားခွဲရုံမှသွယ်ယူထားပါသည်။ လျှပ်စစ်ဓါတ်အားလိုင်းစနစ်မှ ကြိမ်နှုန်းနိမ့်လျှပ်စစ်သံလိုက်လှိုင်းများ ထွက်ရှိပြီး လူသားများ၏ကျန်းမာရေးအပေါ် သက်ရောက်မှုရှိနိုင်သဖြင့် လိုက်နာရန်လိုအပ်သောကာကွယ်ရေးဆိုင်ရာ နည်းလမ်းများကို Chapter 6, Table 6.4.12-1. တွင် ဖော်ပြထားပါသည်။

၁.၆.၂.အကျိုးကျေးဇူးများ (ကုန်ထုတ်လုပ်မှုအဆင့်)

တောင်သာ စက်ရုံသည် ဒေသစီးပွားရေးကို အဓိကတိုးတက်စေသည့် လုပ်ငန်းတစ်ခုဖြစ်ပြီး ဝန်ထမ်း (၃၂၅)ဦး အလုပ်ခန့်ထားနိုင်သည်ဖြစ်ရာ အနီးပတ်ဝန်းကျင်ဒေသနေ ပြည်သူများအား အလုပ်အကိုင် အခွင့်အလမ်းများ ရရှိစေပါသည်။ ထို့အပြင် စက်ရုံအနေဖြင့် အနီးပတ်ဝန်းကျင် ကျေးရွာများ၏ သွယ်ဝိုက်အကျိုးသက်ရောက်မှုအနေဖြင့် ဒေသခံကန်ထရိုက်တာငယ်များကို စက်ရုံ၏ သန့်ရှင်းရေး လုပ်ငန်း၊ စိမ်းလန်းစိုပြေသာယာရေးလုပ်ငန်း၊ အဆောက်အဦပြုပြင်ထိန်းသိမ်းခြင်း လုပ်ငန်းများကို ပြုလုပ်စေခြင်းဖြင့်လည်း အလုပ်အကိုင်များ ရရှိစေနိုင်ပါသည်။

၁.၇. ဘေးအန္တရာယ်ရှိမှု ဆန်းစစ်ခြင်းနှင့် ဘေးအန္တရာယ် စီမံခန့်ခွဲခြင်း

ကုန်ထုတ်လုပ်မှု အဆင့်တွင် လုပ်သားများကိုသော်လည်းကောင်း၊ အခြားပုဂ္ဂိုလ်များကို သော်လည်းကောင်း၊ ဘေးအန္တရာယ် ဖြစ်နိုင်ခြေများကို စနစ်တကျ ကိုင်တွယ်ခြင်းဖြင့် ပေါ်ပေါက်လာနိုင်သော ဘေးအန္တရာယ်ကို ကြိုတင်တားဆီးနိုင်ပါသည်။ ထို့ပြင် အရေးပေါ် အခြေအနေများနှင့် ကြုံတွေ့ရပါက လုပ်ငန်းခွင်အတွင်းသော်လည်းကောင်း၊ လုပ်ငန်းခွင်ပြင်ပတွင်သော်လည်းကောင်း၊ အရေးပေါ်အခြေအနေအတွက် ကြိုတင်ပြင်ဆင်မှုများ ဆောင်ရွက်ထားသင့်ပါသည်။ ဌာနအလိုက် ဘေးအန္တရာယ်ရှိနိုင်သောလုပ်ငန်းများကို စိစစ်ဖော်ထုတ်ဆောင်ရွက်ပြီးဖြစ်ပါသည်။ ထို့ပြင် လုပ်ငန်းအလိုက်ဖြစ်ပွားနိုင်သည့် ဘေးအန္တရာယ်ရှိမှု အဆင့်သတ်မှတ်ချက်များကိုလည်း ဖော်ပြထားပြီး ဖြစ်ပါသည်။ အခန်း(၇)တွင် ဇယားများဖြင့် အသေးစိတ်ဖော်ပြထားရှိပါသည်။

၁.၈. ပြည်သူလူထုနှင့် တွေ့ဆုံဆွေးနွေးခြင်း

ပြည်သူလူထုနှင့်တွေ့ဆုံ ဆွေးနွေးခြင်းဆိုသည်မှာ စက်ရုံနှင့်ပတ်သက်၍ ပြည်သူလူထု၏ အမြင်များကို ဖော်ထုတ်ခြင်းနှင့် ၎င်းတို့၏ စက်ရုံအပေါ် တုံ့ပြန်မှုများကို သိရှိအောင်ပြုလုပ်ခြင်းဖြင့် စက်ရုံအတွက် လိုအပ်သည့် ဆုံးဖြတ်ချက်များချမှတ်ရာတွင် အားလုံးပါဝင်နိုင်သည့် လုပ်ငန်းစဉ် အဆင့်တစ်ခု ဖြစ်ပါသည်။ ပြည်သူလူထုနှင့် တွေ့ဆုံဆွေးနွေးခြင်း၊ Stakeholder များဖြင့် ညှိနှိုင်းဆောင်ရွက်ခြင်းသည် အချိန်ကာလအားဖြင့် ရှည်လျားပြီး စက်ရုံနှင့် ပြည်သူလူထု သို့မဟုတ် Stakeholer အားလုံးပါဝင်သည့် တွေ့ဆုံဆွေးနွေးမှုအစီအစဉ်တစ်ခု ဖြစ်သောကြောင့် စက်ရုံ၏ သက်တမ်းတစ်လျှောက်လုံး ဆောင်ရွက်ရမည့် လုပ်ငန်းစဉ် ဖြစ်ပါသည်။ ပြည်သူလူထုနှင့် တွေ့ဆုံဆွေးနွေးခြင်း အစီအစဉ်အား ကျန်းမာရေးဝန်ကြီးဌာန၏ Covid စည်းကမ်းသတ်မှတ်ချက်များနှင့် အညီ စက်ရုံအစည်းအဝေးခန်းမတွင် ၂၀၂၀ ပြည့်နှစ်၊ ဇွန်လ ၅ ရက်နေ့တွင် ကျင်းပခဲ့ပြီး (၃၀)ဦး တက်ရောက်ခဲ့ပါသည်။ ပြည်သူလူထုနှင့်တွေ့ဆုံဆွေးနွေးခြင်း အစည်းအဝေးရလဒ်များနှင့် ဆက်လက်ဆောင်ရွက်ရမည့် အချက်များကို ဆောက်ပါအတိုင်း စုစည်းဖော်ပြထားပါသည်။

အလုပ်အကိုင်အခွင့်အလမ်းများ ဖော်ထုတ်ခြင်း

စက်ရုံမှ ဒေသခံလူထုအား အလုပ်အကိုင်အခွင့်အလမ်းများ ဖော်ထုတ်ပေးခြင်းဖြင့် ဒေသတွင်း စီးပွားရေးကို အထောက်အကူပြုနိုင်ပါသည်။ နိုင်ငံတော်ပိုင်စက်ရုံဖြစ်သည်နှင့်အညီ ပုဂ္ဂလိကနှင့် ပူးပေါင်းဆောင်ရွက်ရေး အခန်းကဏ္ဍ များကို ရှာဖွေလျက်ရှိပါသည်။

အစိမ်းရောင်ရပ်ဝန်းတည်ဆောက်ရေး

အစိမ်းရောင်ရပ်ဝန်းဖြစ်ပေါ်စေရန်အတွက် စက်ရုံဝန်းကျင်၌ သစ်တောများပိုမိုစိုက်ပျိုး ခြင်းဖြင့် ပိုမိုနှစ်လိုဖွယ်ကောင်းသော အလုပ်ပတ်ဝန်းကျင်ကို ဖြစ်ထွန်းစေပါသည်။

၁.၉. ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုစနစ်၏ ရည်ရွယ်ချက်များမှာ အောက်ပါအတိုင်း ဖြစ်ပါ သည်-

- အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ်အား ကြိုတင်ပြင်ဆင်ရန်
- ပတ်ဝန်းကျင်ထိခိုက်စေနိုင်သော အချက်များအား ရှာဖွေဖော်ထုတ်ရန်
- ထိခိုက်မှုများအား လျော့ချရန် နှင့် ကုစားရန်
- ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုစနစ် အကောင်အထည်ဖော်မှုအား စဉ်ဆက်မပြတ် စောင့်ကြည့်ရန်
- လုပ်ငန်းစဉ် တစ်ခုချင်းအတွက် ရန်ပုံငွေခွဲဝေ သတ်မှတ်ပေးရန်

ဖြစ်နိုင်ခြေရှိသော မတော်တဆဖြစ်ရပ်များအတွက် အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ် ရေးဆွဲထားရှိမည်ဖြစ်ပါသည်။ စက်ရုံ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုများအား ဖော်ထုတ်ရာတွင် တည်ဆောက်ရေးကာလ၊ ကုန်ထုတ်လုပ်မှုကာလ၊ ဖျက်သိမ်းမှုကာလဟူ၍ အဆင့်(၃)ဆင့် သတ်မှတ်၍ ခွဲခြားဆောင်ရွက်ပြီး ကုစားမှုနည်းလမ်းများ သတ်မှတ်၍ ထိခိုက်မှု အနည်းဆုံးဖြစ်အောင် ဆောင်ရွက်ရမည် ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ဆောင်ရွက်ရမည့် ကာလမှာ စက်ရုံသက်တမ်းနှင့်အတူ ဖြစ်ပါသည်။ စဉ်ဆက်မပြတ် စောင့်ကြည့်မှုအစီအစဉ်နှင့် အရေးပေါ် တုန့်ပြန်ရေးအစီအစဉ်များအား စက်ရုံတွင်ဖွဲ့စည်းထားရှိသော ကျန်းမာရေး၊ ဘေးအန္တရာယ် ကင်းရှင်းရေး၊ နှင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအဖွဲ့ (Health , Safety and Environment Team, HSE Team) မှ အကောင်အထည်ဖော် ဆောင်ရွက်မည်ဖြစ်ပါသည်။ ၎င်းအဖွဲ့အား စက်ရုံမှ တာဝန်ရှိပုဂ္ဂိုလ်များ၊ မြို့နယ်စည်ပင်သာယာရေးမှ တာဝန်ရှိပုဂ္ဂိုလ်များ၊ အလုပ်သမား၊ ကျန်းမာရေးနှင့် ပရဟိတအဖွဲ့အစည်းများ စသည်ဖြင့် ပါဝင် မည်ဖြစ်ပါသည်။ နိုင်ငံပိုင်စက်ရုံတစ်ရုံ အနေဖြင့် အဆိုပါ လုပ်ငန်းများဆောင်ရွက်ရန်အတွက်အမှတ်(၃)အကြီးစားစက်မှုလုပ်ငန်းမှတစ်ဆင့် စက်မှုဝန်ကြီးဌာန သို့ ရန်ပုံငွေခွဲဝေ သတ်မှတ် လျာထားပေးရန် တင်ပြရန် လိုအပ်ပါသည်။

လုပ်ငန်းလည်ပတ်ခြင်း အဆင့်တိုင်းအတွက် HSE အဖွဲ့၏ ဖွဲ့စည်းပုံဇယားအား Chapter 9 တွင် Figure 9.1.1-1 မှ Figure 9.1.1-3 အထိ ဖော်ပြထားပါသည်။ စက်ရုံ၏ ကုန်ထုတ်လုပ်မှုအဆင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (Environmental Management Pan) ဇယားအား Chapter 9, Table 9.4-1. တွင် အသေးစိတ်ဖော်ပြထားပါသည်။

၁.၁၀. အဓိကထိခိုက်မှုများအပေါ်စဉ်ဆက်မပြတ်စောင့်ကြည့်မည့်အစီအစဉ် (Monitoring Program)

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အရ စဉ်ဆက်မပြတ် ဆောင်ရွက်ရမည့် ကတိကဝတ်များကို အမျိုးမျိုးသော တိုင်းတာရေး ကိရိယာများ၊ စံနှုန်းများဖြင့် စောင့်ကြပ်ကြည့်ရှုခြင်းသည် အဓိက အရေးပါသော အခန်းမှ ပါဝင်ပါသည်။ စီမံကိန်း (သို့မဟုတ်) စက်ရုံ အကောင်အထည်ဖော်ဆောင်သူများအနေဖြင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် မစတင်မီနှင့် ဆောင်ရွက်ပြီး အခြေအနေ၏ အားနည်းချက်၊ အားသာချက် အခြေအနေများကို နှိုင်းယှဉ်လေ့လာဆုံးဖြတ်နိုင်မည် ဖြစ်ပါသည်။ အဓိက စောင့်ကြပ်ကြည့်ရှုရမည့် စံသတ်မှတ်ချက် (Parameters) များမှာ လေ၊ ရေ၊ မြေဆီလွှာ၊ အန္တရာယ်၊ အသံတို့ ဖြစ်ပါသည်။ ကျန်းမာရေး၊ ဘေးအန္တရာယ်ကင်းရှင်းရေး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအဖွဲ့ (HSE)၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အတိုင်ပင်ခံကုမ္ပဏီတို့မှ စောင့်ကြည့်မည့် အစီအစဉ် (Monitoring Program) အား ဆောင်ရွက်ရမည်ဖြစ်ပါသည်။ အစီအစဉ် အသေးစိတ်ကို အောက်ဖော်ပြပါ ဇယား တွင် ရှင်းလင်းဖော်ပြထားပါသည်။

ဇယား (၁.၁၀.၁) အဓိကထိခိုက်မှုများအပေါ်စဉ်ဆက်မပြတ်စောင့်ကြည့်မည့်အစီအစဉ်

စဉ်	ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်နိုင်မှု Environmental Concern	ပါရာမီတာများ Parameters	အကြိမ်ရေ Frequency	တည်နေရာ Location/ GPS	တာဝန်ရှိအဖွဲ့အစည်း Responsible party
Production Phase ထုတ်လုပ်ခြင်းအဆင့်					
1.	လေအရည်အသွေး Air Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing) (factory premises)	Ammonia, Particulate, Chlorine, Formaldehyde, VOCs, Carbon disulfide, Hydrogen sulfide	၆ လ ၁ ကြိမ်၊ ၅ နေရာ once/every six months, 5 points	<u>စက်ထိုးစက်ရုံအတွင်း Location (1) Inside the knitting factory:</u> 21˚ 18' 01.09" N 95˚ 26' 29.79" E <u>အချောကိုင်စက်ရုံအတွင်း Location (2) Inside the finishing factory:</u> 21˚ 18' 01.05" N 95˚ 26' 27.74" E	တောင်သာစက်ရုံ HSE အဖွဲ့ ၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				အထည်ချုပ်စက်ရုံအတွင်း Location (3) Inside the garment factory: 21˚ 18' 01.07" N 95˚ 26' 25.42" E ဘွိုင်လာများအနီး Location (4) Near boiler house: 21˚ 18' 02.73" N 95˚ 26' 25.80" E ရုံးခန်းအနီး Location (5) Near office: 21˚ 17' 59.50" N 95˚ 26' 30.34" E	
2.	ဆူညံသံ Noise Level (Referred to NEQEG 1.3 General Guidelines)	dB(A)	၁ လ ၁ ကြိမ်၊ ၁၂ နေရာ once/month, 12 points	အထည်ချုပ်စက်ရုံအတွင်း (၄)နေရာ Location (1) Garment Workshop-1: 21°18'00.32" N 95°26'25.43" E Location (2) Garment Workshop-2: 21°18'00.90" N 95°26'25.38" E Location (3) Garment Workshop-3: 21°18'01.59" N 95°26'25.37" E Location (4) Garment Workshop-4: 21°18'00.26" N 95°26'24.92" E စက်ထိုးစက်ရုံအတွင်း (၄)နေရာ Location (5) Knitting Workshop-1: 21°18'00.48" N 95°26'29.79" E Location (6) Knitting Workshop-2: 21°18'00.86" N 95°26'29.76" E	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				Location (7) Knitting Workshop-3: 21°18'01.37" N 95°26'29.77" E Location (8) Knitting Workshop-4: 21°18'00.85" N 95°26'29.75" E အချောသတ်စက်ရုံအတွင်း (၄)နေရာ Location (9) Finishing Workshop-1: 21°18'00.27" N 95°26'28.11" E Location (10) Finishing Workshop-2: 21°18'00.33" N 95°26'27.25" E Location (11) Finishing Workshop-3: 21°18'01.65" N 95°26'27.17" E Location (12) Finishing Workshop-4: 21°18'01.88" N 95°26'28.02" E	
3.	ရေဆိုးအရည်အသွေး Effluent Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	5 days Biological oxygen demand, Adsorbable organic halogens, Ammonia, Cadmium, Chemical oxygen demand, Chromium (hexavalent), Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide,	၆ လ ၁ ကြိမ်၊ ၁ နေရာ once/every six months, one point	ဖေဒါရေဆိုးသန့်စင်ကန် Waterhyacinth Wastewater treatment pond (WWTP): 21° 17' 59.36" N 95° 26' 19.16" E	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

		Temperature increase, Total coliform bacteria, Total nitrogen, Total phosphorous, Total suspended solids, Zinc			
4.	မြေအရည်အသွေး Soil Quality (Referred to WHO suitable soil quality standard)	pH, Texture, Organic matter %, Phosphorous (P ppm), Nitrogen (N ppm), Potassium (K ppm), Calcium (Ca ppm), Sodium (Na ppm), Magnesium (Mg ppm)	၆ လ ၁ ကြိမ်၊ ၁ နေရာ once/six months, one point	ရေဆိုးသန့်စင်ကန်အနီးရှိ စိုက်ပျိုးမြေ Cultivated land near WWTP: 21° 17' 59.81" E 95° 26' 12.61" E	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
5.	အစိုင်အခဲစွန့်ပစ်ပစ္စည်း Solid waste	Rules and regulations issued by MONREC and the local township development committee.	၆ လ ၁ ကြိမ်၊ ၂ နေရာ once/six months, two points	ဝန်ထမ်းများ နေထိုင်ရာဧရိယာ Residential Area: 21° 17' 49.70" N 95° 26' 17.55" E စက်ရုံဧရိယာ Factory Area: 21° 17' 58.68" N 95° 26' 19.70" E	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
6.	ရေအရည်အသွေး Well water quality (Referred to WHO drinking water Standard)	Total alkalinity, Turbidity, pH, Electrical Conductivity, Biochemical Oxygen Demand, Dissolved Oxygen, Chemical Oxygen Demand, Ortho-Phosphorus, Water Temperature, Total Dissolved Solid, Calcium, Magnesium (Mg), Potassium (K),	၆ လ ၁ ကြိမ်၊ ၁ နေရာ once/every six months, one point	တောင်သာချောင်းအနီးရှိ ရေတွင်း Well water near Taungtha creek: 21° 17' 42.69" N 95° 26' 28.46" E	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry.

		Sodium (Na), Ammonium Nitrogen (NH_3-N), Sulphate (SO_4), Nitrate (NO_3), Hardness, Chloride (Cl), Fluoride (F), Copper (Cu), Lead (Pb), Mercury (Hg), Color			
7.	လုပ်ငန်းခွင်ဆိုင်ရာ ကျန်းမာရေးနှင့် လုံခြုံရေး Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health	၆ လ ၁ ကြိမ်၊ ၉ နေရာ Once/every six months, 9 points	စက်ထိုးထည် ဌာန 1. Knitting Workshop: N 21°18'00.48" E 95°26'29.79" အချောကိုင်ဌာန 2. Finishing Workshop: N 21°18'00.27" E 95°26'28.11" အထည်ချုပ်ဌာန 3. Garment Workshop: N 21°18'00.32" E 95°26'25.43" ခါတ်အားခွဲရုံ 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" ဘွိုင်လာ 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" သိုလှောင်ရုံ-၁ မှ ၄ 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4:	တောင်သာစက်ရုံ HSE အဖွဲ့ ၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				N 21° 18' 00.05" E 95° 26' 21.48"	
8.	ယာဉ်အသွားအလာ စီမံခန့်ခွဲရေး Traffic Management	Myanmar Police Act	၆ လ ၁ ကြိမ်၊ ၁ နေရာ Once/every six months, one point	စက်ရုံရှေ့မျက်နှာစာရှိ မိတ္ထီလာ-မြင်းခြံ လမ်းမကြီး Infront of the factory, Meikhtila-Myingyan Road: N 21° 17' 59.40" E 95° 26' 33.92"	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
9.	အရေးပေါ်တုန့်ပြန်ရေး အစီအစဉ် Emergency Response Plan	Natural disaster management law (2013)	၆ လ ၁ ကြိမ်၊ ၁၁ နေရာ once/every six months, 11 points	စက်ထိုးဌာန အရေးပေါ်ထွက်ပေါက် 1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" အချောကိုင်ဌာန အရေးပေါ်ထွက်ပေါက် 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" အထည်ချုပ်ဌာန အရေးပေါ်ထွက်ပေါက် 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" ခါတ်အားခွဲရုံ 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" ဘွိုင်လာ 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" သိုလှောင်ရုံ-၁ မှ ၄ 6. Warehouse-1: N 21° 18' 00.11"	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" ရေလှောင်ကန် 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" ရုံးခန်းရှေ့ စုရုပ် 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	
10.	မီးဘေး စီမံခန့်ခွဲမှု Fire Management	Natural disaster management law (2013),	၆ လ ၁ ကြိမ်၊ ၁၁ နေရာ Once/every six months, 11 points,	စက်ထိုးဌာန 1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" အချောကိုင်ဌာန 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" အထည်ချုပ်ဌာန 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" ခါတ်အားခွဲရုံ 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" ဘွိုင်လာ 5. Boiler house:	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				N 21° 18' 03.34" E 95° 26' 25.69" သိုလှောင်ရုံ-၁ မှ ၄ 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" ရေလှောင်ကန် 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" ရုံးခန်းရှေ့ စုရပ် 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	
11.	ဇီဝမျိုးစုံမျိုးကွဲများ Biodiversity	သစ်ပင် ပန်းမန်များနှင့် တိရိစ္ဆာန်များ Flora and Fauna	၆ လ ၁ ကြိမ်၊ ၃ နေရာ Once/every six months, three points	စက်ရုံ၏ မြောက်ဘက် Location 1: N 21° 18' 04.84" E 95° 26' 23.78" ရေဆိုးသန့်စင်ကန်အနီး Location 2: N 21° 17' 59.28" E 95° 26' 17.80" စက်ရုံ၏ တောင်ဘက် Location 3: N 21° 17' 56.81" E 95° 26' 25.97"	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
Decommission Phase					
1.	လေအရည်အသွေး Air Quality (Referred to NEQEG 2.3.2.1 Textile	Ammonia, Particulate, Chlorine, Formaldehyde,	၆ လ ၁ ကြိမ်၊ ၂ နေရာ Once/every six months,	အချောကိုင်ဌာနနှင့် အထည်ချုပ်ဌာနကြား Between finishing and garment departments:	ဖြိုဖျက်ရေး ကန်ထရိုက်/ ပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ

	Manufacturing Guideline)	VOCs, Carbon disulfide, Hydrogen sulfide	two points	21° 17' 59.28" N 95° 26' 26.53" E ရုံးခန်းနှင့် စက်ထိုးဌာနကြား Between office and knitting department: 21° 17' 59.41" N 95° 26' 30.86" E	Demolishing contractor/ Environmental Consultant Company
2.	ဆူညံသံ Noise (Referred to NEQEG 1.3 Noise Level General Guidelines)	dB(A)	Once/month, four points	အချောကိုင်ဌာနနှင့် အထည်ချုပ်ဌာနကြား 1. Between finishing and garment departments: 21° 17' 59.28" N 95° 26' 26.53" E ရုံးခန်းနှင့် စက်ထိုးဌာနကြား 2. Between office and knitting department: 21° 17' 59.41" N 95° 26' 30.86" E ဘွိုင်လာနှင့် ရေလှောင်ကန်ကြား 3. Between boiler house and ground tank: 21° 18' 02.66" N 95° 26' 26.29" E စက်ထိုးဌာနနှင့် ရေလှောင်ကန်ကြား 4. Between knitting department and ground tank: 21° 18' 02.66" N 95° 26' 30.42" E	ဖြိုဖျက်ရေး ကန်ထရိုက်/ ပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ Demolishing contractor/ Environmental Consultant Company
3.	ရေဆိုးအရည်အသွေး Effluent Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	Biochemical Oxygen Demand (BOD), Absorbable organic halogen, Ammonia, Cadmium, Chemical Oxygen Demand (COD),	၆ လ ၁ ကြိမ်၊ ၁ နေရာ Once/every six months, one point	ဇေဒါရေဆိုးသန့်စင်ကန် Waterhyacinth Wastewater treatment pond (WWTP): 21° 17' 59.36" N 95° 26' 19.16" E	ဖြိုဖျက်ရေး ကန်ထရိုက်/ ပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ Demolishing contractor/ Environmental Consultant Company

		Chromium (hexavalent), Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide, Temperature increase, Total coliform bacteria, Total Nitrogen, Total phosphorous, Total Suspended Solid (TS), Zinc			
4.	မြေအရည်အသွေး Soil Quality (Referred to WHO suitable soil quality)	pH, Total N%, Ava P%, K%, Ca%, OM%, Exchangeable Na, Exchangeable Mg.	၆ လ ၁ ကြိမ်၊ ၁ နေရာ Once/every six months, one point	ရေဆိုးသန့်စင်ကန် အနီးရှိ စိုက်ပျိုးမြေ Cultivated land near WHWWTP: 21° 17' 59.81" E 95° 26' 12.61" E	ဖြိုဖျက်ရေး ကန်ထရိုက်/ ပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ Demolishing contractor/ Environmental Consultant Company
5.	ဇီဝမျိုးစုံမျိုးကွဲများ Biodiversity	သစ်ပင် ပန်းမန်များနှင့် တိရိစ္ဆာန်များ Flora and Fauna	၆ လ ၁ ကြိမ်၊ ၃ နေရာ Once/every six months, three points	စက်ရုံ၏ မြောက်ဘက် Location 1: N 21° 18' 04.84" E 95° 26' 23.78" ရေဆိုးသန့်စင်ကန်အနီး Location 2: N 21° 17' 59.28" E 95° 26' 17.80" စက်ရုံ၏ တောင်ဘက် Location 3: N 21° 17' 56.81" E 95° 26' 25.97"	တောင်သာစက်ရုံ HSE အဖွဲ့၊ အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ စက်မှုဝန်ကြီးဌာန HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

၁.၁၁. နိဂုံး၊ အကြံပြုချက်များ

၁.၁၁.၁ နိဂုံး

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို မန္တလေးတိုင်းဒေသကြီး၊ မြင်းခြံခရိုင်၊တောင်သာမြို့နယ်ရှိသောအမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)အတွက်ပြုစုရေးသားခြင်းဖြစ်ပါသည်။ စက်ရုံမှ

စက်ထိုးထည်ပေါင်း ၁.၆ သန်း ထုတ်လုပ်နိုင်ပါသည်။ စက်ရုံသက်တမ်း (၂၀)နှစ်ကျော် ရှိပြီဖြစ်ပါသည်။ စုစုပေါင်း ရင်းနှီးမြှုပ်နှံမှု တန်ဖိုးမှာ (၂၂၈၀.၈၇၈) ကျပ်သန်းဖြစ်ပါသည်။ အခြေခံကိန်းဂဏာန်းအချက်အလက်များ ကောက်ယူခြင်းကို ၂၀၂၀ ခုနှစ်၊ ဧပြီလ မှ ၂၀၂၄ ခုနှစ် ဧပြီလလ အထိဆောင်ရွက်ခဲ့ပြီး ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏သုံးသပ်ချက်များနှင့်ကိုက်ညီအောင်ဆောင်ရွက်ခဲ့ခြင်း ဖြစ်ပါသည်။ထို့နောက် အဆိုပါကိန်းဂဏာန်းများအား ချည်မျှင်နှင့်အထည်ထုတ်လုပ်ခြင်း လုပ်ငန်းများအတွက် သတ်မှတ်ထားရှိသော အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး (ထုတ်လွှတ်မှု)လမ်းညွှန်ချက် ၂.၃.၂.၁ တန်ဖိုးများနှင့်နှိုင်းယှဉ်စစ်ဆေးခဲ့ပါသည်။ ဆူညံသံ တိုင်းတာခြင်း အတွက် လမ်းညွှန်ချက် ၁.၃ အား စံထားခဲ့ပါသည်။

လေအရည်အသွေး

လေအရည်အသွေးအား စက်ရုံဝန်းအတွင်းတွင် တိုင်းတာစစ်ဆေးမှု ပြုလုပ်ခဲ့ပါသည်။ လေထုထဲတွင် အမှုန်အမွှား ပါဝင်မှုနှုန်း PM_{10} နှင့် $PM_{2.5}$ ၊ VOCsပါဝင်မှုစံနှုန်းမှာ NEQEG 2.3.2.1 လမ်းညွှန်ချက်အတွင်းရှိပါသည်။

ရေအရည်အသွေး

စမ်းသပ်စစ်ဆေးမှုအစီရင်ခံစာအရ သန့်စင်မှုမပြုရသေးသော ရေတိမ်တွင်းမှရေမှာ သောက်သုံးရန် မသင့်တော်ကြောင်း တွေ့ရှိရပါသည်။

မြေအရည်အသွေး

စိုက်ပျိုးမြေအဖြစ်အသုံးပြုရန် မြေဆီဩဇာများထပ်မံအသုံးပြုရန် လိုအပ်ပါသည်။

အန္တရာယ်

စက်ရုံမှ အန္တရာယ်ဒေသများသို့ မည်သည့်အန္တရာယ်ဆိုးမျှ ထွက်ရှိခြင်းမရှိပါ။

ရေဆိုးအရည်အသွေး

စက်ရုံ၏တချို့သောဌာနများ လည်ပတ်ခြင်းမရှိသောကြောင့် ရေဆိုးအရည်အသွေး စမ်းသပ်ခြင်းအား ဆောင်ရွက်နိုင်ခြင်းမရှိခဲ့ပါ။

ဆူညံသံထိခိုက်နိုင်မှု

အထည်ချုပ်စက် (၁၀၀)လုံး တစ်ပြိုင်နက်တည်းလည်ပတ်မည်ဆိုပါက ၎င်းဆူညံသံအား ကုစားနိုင်မည့်နည်းလမ်းများကို လိုက်နာဆောင် ရွက် ရမည်ဖြစ်ပါသည်။

ဇီဝမျိုးစုံမျိုးကွဲများအပေါ်ထိခိုက်မှု

ဤလေ့လာမှု ပြုလုပ်သည့်နေရာသည် ကာကွယ်တောဇရိယာအတွင်း ကျရောက်ခြင်းမရှိပါ။ အန္တရာယ်ရှိသော၊ရှားပါးသော၊မျိုးတုန်းလုနီးပါးဖြစ်နေသော၊ကာကွယ်စောက်ရှောက်ရမည့်တိရိစ္ဆာန်များ၊ အပင်များ၊ မျိုးစိတ်များကို ဤစက်ရုံမှ (၁)မိုင် ပတ်လည် လေ့လာမှုနယ်မြေအတွင်း မတွေ့ရှိပါ။

လူမှုစီးပွားဘဝ

လူမှုစီးပွားဘဝ ဖွံ့ဖြိုးတိုးတက်မှုများအား လေ့လာရာတွင် စက်ရုံကြောင့် လူမှုစီးပွားဘဝ အကျိုးဖြစ်ထွန်းမှုများမှာ သိသာထင်ရှားခဲ့ပြီး ဒေသခံပြည်သူများအား အလုပ်အကိုင်များ ဖန်တီးပေးနိုင်ခဲ့ပါသည်။ ထို့ပြင် ဆင့်ပွားအကျိုးဆက်အနေဖြင့် အသေးစားစီးပွားရေးလုပ်ငန်းများ၊ စားသောက်ကုန်အရောင်းဆိုင်များ၊ တနိုင်တပိုင် မွေးမြူရေးလုပ်ငန်းများ၊ စားသောက်ဆိုင်လုပ်ငန်းများလည်း ပေါ်ပေါက်စေခဲ့ပါသည်။

အန္တရာယ်ရှိသော လုပ်ငန်းများအား စီမံခန့်ခွဲခြင်း

အဓိက အန္တရာယ်ရှိသောလုပ်ငန်းများနှင့် ဇရိယာများကို စုံစမ်းဖော်ထုတ်ခြင်းများ ဆောင်ရွက်နိုင်ခဲ့ပါသည်။ ဌာနအလိုက် ဖြစ်ပွားနိုင်သည့်အကြောင်းအရင်းများ၊ ကုစားနိုင်မည့် နည်းလမ်းများနှင့် အန္တရာယ်ရှိမှုအဆင့် သတ်မှတ်ချက်များကို လေ့လာသုံးသပ်ခဲ့ပါသည်။ စက်ရုံ၏ ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် ဆောင်ရွက်နိုင်မည့် နည်းလမ်းများကို ခန့်မှန်းတွက်ချက်ခြင်းနှင့် အကြံပေးချက်များကြောင့် စက်ရုံ၏ ဘေးအန္တရာယ်လုံခြုံရေးကိစ္စရပ်များအတွက် တိုးတက်မှုရှိစေမည်ဖြစ်ပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီရင်ခံစာ

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်သည် စီမံကိန်းအကောင်အထည်ဖော်သူ၊ လုပ်ငန်းရှင်၊ တစ်ဆင့်ခံ ကန်ထရိုက်များအားလုံး အပါအဝင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး လုပ်ငန်းများအား စက်ရုံ/စီမံကိန်း စတင်တည်ဆောက်သည့်အချိန်မှစတင်ပြီး စက်ရုံကုန်ထုတ်လုပ်မှုလုပ်ငန်းများ ဆောင်ရွက်သည့် အချိန်၊ စက်ရုံပိတ်သိမ်းသည့် အချိန်တိုင်အောင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးလုပ်ငန်းများအား လုပ်ဆောင်နိုင်ရန်အတွက်တာဝန်ဝတ္တရားများခွဲဝေပေးခြင်း၊ လိုအပ်သောစီမံခန့်ခွဲမှုစနစ်၊ သင့်လျော်သောကြိုတင်ကာကွယ်သော စီမံခန့်ခွဲမှုနည်းလမ်းများ၊ စောင့်ကြည့်လေ့လာရေးအစီအစဉ်များ (စောင့်ကြည့်ရမည့်အရာများ၊စောင့်ကြည့်ရမည့်အကြိမ်အရေအတွက်စောင့်ကြည့်ရမည့်သူ)အစရှိသည်များအား သတ်မှတ်ပေးခြင်းတို့ ပါဝင်မည် ဖြစ်ပါသည်။

အဓိကလိုအပ်သော ကုန်ကျမည့်စရိတ်များဖြစ်သော ကျန်းမာရေး၊ ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေးအဖွဲ့ (HSE Team) ကို ဖွဲ့စည်းတည်ထောင်ခြင်း၊ ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာဝတ်စုံများ ဝယ်ယူခြင်း၊သစ်တောသီးနှံရောနှောစိုက်ခင်း များတည်ထောင်ခြင်း၊ သဘာဝဘေးအန္တရာယ်ဆိုင်ရာသင်တန်းများပို့ချခြင်း၊Multimedia-Filtrationစနစ်တပ်ဆင်ခြင်းလုပ်ငန်းများအတွက်ပထမတစ်နှစ်လျှင်ကျပ်(၂၀သန်း)ခန့်မှန်းတွက်ချက်ထားပြီး ဒုတိယတစ်နှစ် လျှင်ကျပ်(၃၀သန်း)၊နောက် ၃ နှစ်အတွက် တစ်နှစ်လျှင်ကျပ်(၂၀သန်း)လျာထားထားရှိပါသည်။

ပြည်သူလူထုနှင့်တွေ့ဆုံဆွေးနွေးခြင်း

စမ်းသပ်တွေ့ရှိချက်အဖြေများကို ပြည်သူလူထုနှင့်တွေ့ဆုံဆွေးနွေးရာတွင် တင်ပြခဲ့ပါသည်။ ပြည်သူလူထုနှင့် တွေ့ဆုံဆွေးနွေးခြင်း ရလဒ်အနေဖြင့် အခမ်းအနားသို့ တက်ရောက်လာသော ပြည်သူများမှ စက်ရုံမှအလုပ်အကိုင်အခွင့်အလမ်းများ ရရှိမှုကြောင့် ကျေးဇူးတင်ကြောင်း ဖော်ထုတ် ဆွေးနွေးခဲ့ကြပါသည်။ အစည်းအဝေး၏ ရလဒ်များအနေဖြင့် အလုပ်အကိုင်အခွင့်အလမ်းများ ဖော်ထုတ်ပေးရန်နှင့် အစိမ်းရောင်သစ်တောများ ပြုစုပျိုးထောင်ပေးရန်တို့ ဖြစ်ပါ သည်။

သဘာဝဘေးအန္တရာယ်စီမံခန့်ခွဲမှုအစီအစဉ်

ထိရောက်သော သဘာဝဘေးအန္တရာယ်စီမံခန့်ခွဲခြင်းနှင့် အရေးပေါ်တုန့်ပြန်ရေး အစီအမံများကို ပြုစုထားခြင်းအကြောင့် ဘေးအန္တရာယ်ရှိမှုကို ကုစားနိုင်ပါသည်။ သင်တန်းများ အဆက်မပြတ် ပြုလုပ်ခြင်းအားဖြင့် တစ်ဦးနှင့် တစ်ဦး ဆက်သွယ်မှုများ အဆင်ပြေထိရောက်လာမည်ဖြစ်ပြီး ၎င်းတို့၏ ကိုယ်စီတာဝန် ဝတ္တရားများကိုလည်း ပိုမိုသိရှိ နားလည်လာမည် ဖြစ်ပါသည်။

စဉ်ဆက်မပြတ်စောင့်ကြည့်လေ့လာရေးစနစ် (Monitoring)

ကျန်းမာရေး၊ ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ပတ်ဝန်းကျင်အဖွဲ့ (HSE Team) နှင့် ပတ်တန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီ သည် အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ်နှင့် စဉ်ဆက်မပြတ်စောင့်ကြည့်လေ့လာရေးစနစ်ကို အားလုံး ပါဝင်နိုင်စေရန် အဓိကဆောင်ရွက်ရမည့် အဖွဲ့အစည်းများဖြစ်ပါသည်။ပတ်ဝန်းကျင်နှင့်သက်ဆိုင်သောလုပ်ငန်းများကိုနမူနာကောက်ယူခြင်းနှင့် ခွဲခြမ်းစိတ်ဖြာခြင်းအတွက်ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏သတ်မှတ်လမ်းညွှန်ချက်ဘောင်အတွင်းမှ ဆောင်ရွက်ရမည်ဖြစ်ပါသည်။ ကုန်ကျစရိတ်အနေဖြင့် တစ်နှစ်လျှင် ကျပ် (၁၅)သန်း ခန့် ကုန်ကျမည်ဖြစ်ပါသည်။ အစီရင်ခံစာအား ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ (၆)လ တစ်ကြိမ် တင်ပြရမည်ဖြစ်ပါသည်။

တာဝန်သိစောင့်ရှောက်မှုများ (CSR)

တောင်သာစက်ရုံသည် မြန်မာ့ရိုးရာ ယဉ်ကျေးမှု ဓလေ့ထုံးတမ်းစဉ်လာအရ နှစ်စဉ် ဝါဆို သင်္ကန်းနှင့် ကထိန်သင်္ကန်း ဆက်ကပ်လှူဒါန်းခြင်းများကို စက်ရုံအနီးပတ်ဝန်းကျင်ရှိ ဘုန်းတော်ကြီး ကျောင်းများသို့လှူဒါန်းခြင်း၊ မြန်မာ့ရိုးရာသင်္ကြန်ပွဲတော်အား ကျင်းပပေးခြင်း၊ စက်ရုံ ရပ်ကွက်ရှိ ကလေးငယ်များအား ပိုလီယိုကာကွယ်ဆေးထိုးနှံပေးခြင်း၊ ကိုဗစ်-၁၉ ရောဂါ ကာကွယ် ဆေးထိုးနှံပေးခြင်း၊ ဘီပိုးကာကွယ်ဆေး ထိုးနှံပေးခြင်းစသည့် တာဝန်သိစောင့်ရှောက်မှုလုပ်ငန်းများ ဆောင်ရွက်ခဲ့ပါသည်။ စက်ရုံအမြတ်ငွေ၏ ၂ ရာခိုင်နှုန်းအား တာဝန်သိစောင့်ရှောက်မှုအတွက် ရန်ပုံငွေအဖြစ် အသုံးပြုမည်ဖြစ်ပါသည်။ စက်ရုံသည် နိုင်ငံပိုင်စက်ရုံဖြစ်သည့်အတွက် ဘဏ္ဍာရေး စည်းမျဉ်စည်းကမ်းများနှင့်အညီ ရန်ပုံငွေ ခွဲဝေလျာထားရန် ကြိုတင်လျှောက်ထားရမည် ဖြစ်ပါသည်။

(က) လူမှုစီးပွားဘဝ ဖွံ့ဖြိုးတိုးတက်မှုအတွက် ဆောင်ရွက်ချက်များ

စက်ရုံမှဝန်ထမ်း ၃၂၅ ဦးအား အလုပ်နေရာအမျိုးမျိုးအတွက် ခန့်ထားပါသည်။ စက်ရုံအနီးပတ်ဝန်းကျင်မြို့နယ်များမှလုပ်ငန်းအနည်းငယ်ကျွမ်းကျင်သူများ၊ ကျွမ်းကျင်မှုမရှိ သူများကိုခေါ်ယူခန့်ထားခြင်းဖြစ်ပါသည်။

(ခ) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအတွက်ဆောင်ရွက်မှုများ

သဘာဝပတ်ဝန်းကျင်အား ထိန်းသိမ်းရေးအတွက် စိမ်းလန်းသောသစ်တောများ ပြုစုဆောင်ရွက်ခြင်း သည်လည်းပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)အရ ကုစားခြင်း ဖြစ်ပါ သည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် တစ်စိတ်တစ်ပိုင်းကိုဖြည့်ဆည်းသည့် အနေ ဖြင့် စက်ရုံသည်သီးနှံသစ်တောရောနှောစိုက်ခင်း၊ (Agroforestry system) ဆောင် ရွက်မည်ဖြစ်ပါသည်။စက်ရုံမှ ၎င်းစိုက်ခင်းကို ဒေသခံတောင်သူလယ်သမားများ၊ အပူပိုင်းဇုံ စိမ်းလန်းစိုပြေရေးဌာနတို့နှင့် ပူးပေါင်းအကောင်အထည်ဖော် ဆောင်ရွက်မည်ဖြစ်ပါသည်။ ပထမနှစ်တွင် သရက်ပင်နှင့်ဆီထွက်သီးနှံများရောနှောစိုက်ခင်း (၁) ဧကပျိုးမည်ဖြစ်ပါသည်။ ဒုတိယနှစ်တွင် (၂)ဧက နှင့်ကျန် (၃)ဧကအားကျန် (၃)နှစ်တွင်ဆက်လက်စိုက်ပျိုးမည်ဖြစ်ပါ သည်။ သီးနှံသစ်တောရောနှောစိုက်ခင်းထူထောင်ခြင်းအားဖြင့်စက်ရုံအတွက်သာမကဒေသခံ တောင်သူများကိုလည်းအကျိုးရှိစေမည်ဖြစ်ပါသည်။ စိုက်ခင်းများကြောင့်ဇီဝမျိုးစုံမျိုးကွဲများ ထိန်းသိမ်းစောင့်ရှောက်ခြင်းကိုအားပေးခြင်း၊ မြေဆီလွှာကြွယ်ဝမှုကိုအားပေးခြင်း၊ တောင်သူ များဝင်ငွေတိုးပွားစေခြင်း၊ ကာဗွန်ထုတ်လုပ်မှုကို လျှော့ချစေနိုင်သည့် ရာသီဥတုပြောင်းလဲမှု ကိုကုစားနိုင်ခြင်းစသည့် အကျိုးကျေးဇူးများရရှိစေပါသည်။ ဤအစီအစဉ်ကို ၂၀၂၇-၂၀၂၈ ဘဏ္ဍာရေးနှစ်တွင် စတင်ဆောင်ရွက်နိုင်ရန်မျှော်မှန်းပါသည်။ ဝန်ကြီးဌာနနှင့် နိုင်ငံတော် အစိုးရ ထံမှရန်ပုံငွေရရှိမှုအပေါ်မူတည်ပါသည်။

ထို့အပြင် ကျန်းမာရေး၊ ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေးအဖွဲ့ (HSE Team) အနေဖြင့် လျှော့ချ၊ ပြန်သုံး၊ တဖန် ပြန်လည်ထုတ်လုပ် 3 Rs (Reduce, Reuse, Recycle)ဟူသောဆောင်ပုဒ်နှင့်အညီစက်ရုံနှင့်ဝန်ထမ်းရပ်ကွက်ပတ်ဝန်းကျင်တွင်အမှိုက် ထွက်ရှိမှုလျှော့ချရေးနှင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအစီအစဉ်များ ချမှတ်ဆောင်ရွက်လျက် ရှိပါသည်။

အကျိုးကျေးဇူးများ

စက်ရုံကြောင့်ဝန်ထမ်းများ အလုပ်အကိုင်ရရှိသကဲ့သို့၊ လူမှုဖူလုံရေး အကျိုးခံစားခွင့်များ၊ နေအိမ်များ ခံစားရရှိခဲ့ကြပါသည်။ ထို့အပြင် စက်ရုံမှ အလုပ်အကိုင်များဖန်တီးပေးနိုင်သကဲ့သို့ ဆင့်ပွားအကျိုးဆက်အနေဖြင့်လည်း အလုပ်အကိုင်များ ပိုမိုဖန်တီးပေးနိုင်ခဲ့ပါသည်။

နိဂုံးချုပ်

နိဂုံးချုပ်အနေဖြင့် အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)သည် ၂၀၀၅ ခုနှစ်မှ စတင်၍ ကုန်ထုတ်လုပ်မှု စတင်ခဲ့ပြီး စက်ရုံသက်တမ်း (၂၀)နှစ်ကျော်ရှိ စက်ရုံဖြစ်ပါသည်။ ပြည်တွင်းအထည်အလိပ် လိုအပ်ချက်အပေါ် ဖြည့်ဆည်းပေးခဲ့သော စက်ရုံတစ်ရုံဖြစ်ခဲ့ပါသည်။ စက်ရုံကြောင့် ပတ်ဝန်းကျင် အပေါ်ထိခိုက်မှု အနည်းငယ်သာရှိပါသည်။ စက်ရုံသည် ဒေသခံပြည်သူများအား အလုပ်အကိုင်အခွင့်အလမ်းများ ဖန်တီးပေးနိုင်ခြင်းကြောင့် တိုက်ရိုက်သော်လည်းကောင်း၊ သွယ်ဝိုက်၍ သော်လည်းကောင်း ၎င်းတို့၏ လူမှုစီးပွားဘဝအတွက် အကျိုးဖြစ်ထွန်းစေပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်၏ ဦးတည်ချက်များကို အကောင်အထည်ဖော်ဆောင်ရွက်ရန်အတွက် စဉ်ဆက်မပြတ် စောင့်ကြည့်ရေးအစီအစဉ်ကို ဆက်လက်ဆောင်ရွက်ရမည်ဖြစ်ပြီး စက်ရုံ၏ သက်တမ်းနှင့်အမျှ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို ဆောင်ရွက်ရမည်ဖြစ်ပါသည်။ ထို့ပြင် အများပါဝင်နိုင်သော တာဝန်သိစောင့်ရှောက်မှု အစီအစဉ်ကိုလည်း ဆက်လက်ဆောင်ရွက်ရန် လိုအပ်ပါသည်။

၁.၁၁.၂. အကြံပြုချက်

အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)သည် နိုင်ငံတော်ပိုင် စက်ရုံဖြစ်သောကြောင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အား ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေများနှင့်အညီ ရေးဆွဲ အကောင်အထည်ဖော်ပြီး စက်မှုဝန်ကြီးဌာနနှင့် အမှတ်(၃)အကြီးစားစက်မှုလုပ်ငန်းတို့၏ ဦးဆောင်လမ်းညွှန်မှုကိုခံယူပြီး ဆောင်ရွက်မည်ဖြစ်ပါသည်။ ထိုသို့ဆောင်ရွက်ရာတွင် စဉ်ဆက်မပြတ် စောင့်ကြည့်လေ့လာမှု၊ လူစွမ်းအားအရည်အသွေးမြှင့်တင်မှု၊ ရန်ပုံငွေခွဲဝေလျာထားမှုများအား မဖြစ်မနေထည့်သွင်းဆောင်ရွက်ပေးရန် လိုအပ်ပါသည်။

၁.၁၂. ကတိကဝတ်များ

အမှတ် (၁၀) အထည်စက်ရုံ (တောင်သာ) မှ အောက်ပါအချက်များအား လိုက်နာ ဆောင်ရွက်ရန် ကတိကဝတ်ပြုပါသည်။

ဇယား (၁.၁၂-၁) ကတိကဝတ်များ

အ ခန်း	ကတိကဝတ်၏အတိုချုပ်အမည်	ကတိကဝတ်အားရှင်းလင်း ဖော်ပြချက်	အစီရင်ခံစာပါ ရည်ညွှန်းချက်
(၂)	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအ စဉ်တွင်ပါဝင်ရမည့်အချက်များ	တောင်သာစက်ရုံနှင့် IIC company တို့သည် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်တွင်ပါဝင်ရမည့်အချက်များပြည့်စုံအောင် ရေးဆွဲရမည် ဖြစ်ပါသည်။	အခန်း (၂) ခေါင်းစဉ်ခွဲ ၂.၂
(၃)	စီမံကိန်းအကောင်အထည်ဖော် ဆောင်ရွက်သူ၊ အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ)၏ ကတိကဝတ်များ	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင်ဖော်ပြထား ရှိသည့် ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဘဝများဖွံ့ဖြိုးတိုး တက်အောင် ဆောင်ရွက်ရမည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		အစီရင်ခံစာတွင်ဖော်ပြထားသည့် စက်ရုံနှင့်သက် ဆိုင်သည့် ဥပဒေ၊ နည်းဥပဒေ၊ လုပ်ထုံးလုပ်နည်း၊ တန်ဖိုးများ ကိုသိရှိလိုက်နာ ဆောင်ရွက်ရမည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		အခြားကုန်ထုတ်လုပ်မှုနည်းစဉ်များကျင့်သုံးခြင်း၊ ထိခိုက်မှု ကိုကုစားဖြင်း၊စောင့်ကြပ်ကြည့်ရှုခြင်းဖြင့်ပတ်ဝန်းကျင် ထိခိုက်မှု လျော့ချခြင်းများကို ဆက်လက် လိုက်နာ ဆောင်ရွက်သွားရမည် ဖြစ်ပါသည်။ကတိကဝတ်တွင် ဖော်ပြထားရှိသည့်အချက်များ ကိုမလိုက်နာမှုကြောင့်ဖြစ်ပေါ်လာသည့် ပတ်ဝန်းကျင် ထိခိုက်မှု များအတွက် တာဝန်ယူရမည် ဖြစ်ပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		စက်ရုံအလုပ်သမားများ၏လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်း ရေးနှင့်ကျန်းမာပျော်ရွှင်ရေးအတွက်အဓိကဦးစားပေး လုပ်ငန်း အဖြစ် ဆောင်ရွက် ရမည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		လူမှုစီးပွားရန်ပုံငွေအဖြစ်လျာထားဖော်ပြထားသည့် ငွေပမာဏ အား အပြည့်အဝသုံးစွဲရန် ကတိပြု ပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		လုပ်ငန်းဆောင်ရွက်နေစဉ်ကာလအတွင်းလုပ်ငန်းများ အားလုံး အတွက်အပြည့်အဝတာဝန်ရှိမည်ဖြစ်ပြီးဆပ်ကန်ထရိုက်တာ များ၊ကြီးကြပ်သူများ၊ ကုမ္ပဏီကိုယ်စားလှယ်များ၏ ပျက်ကွက်မှု	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁

		ကြောင့် ထိခိုက်မှုများ ဖြစ်ပွားပါက စီမံကိန်း ဆောင်ရွက်သူမှ အပြည့်အဝတာဝန်ယူရမည် ဖြစ်ပါ သည်။	
		စီမံကိန်းကြောင်းထိခိုက်မှုခံစားရသူများအတွက် ၎င်းတို့၏ လူမှုဘဝအခြေအနေအား စီမံကိန်း မစတင်မီ ကာလကဲ့သို့ အခြေအနေရောက်ရှိအောင်နှင့်တည်ငြိမ်သော လူနေမှုဘဝ ပုံစံရရှိစေရန်အတွက် ပြန်လည် နေရာချထားမှု၊ပြန်လည် ထူထောင်မှုကိစ္စရပ်များကိုအစိုးရအဖွဲ့အစည်းများ၊ အခြား ဆက်စပ်အဖွဲ့အစည်းများနှင့်ညှိနှိုင်းပေါင်းစပ် ဖွဲ့စည်းပေးရန် စီမံကိန်း အကောင်အထည်ဖော်သူမှ တာဝန်ယူရမည် ဖြစ်ပါ သည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ဖော်ပြထား ရှိသည့် ပတ်ဝန်းကျင်ဆိုင်ရာကတိကဝတ်များ၊ကုစားနိုင်မည့် နည်းလမ်းများ၊ စီမံခန့်ခွဲမှုအစီအစဉ် များအား လိုက်နာရမည်ဖြစ်ပါသည်။ ထို့အပြင်ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ(၂၀၁၂)၊ နည်းဥပဒေ (၂၀၁၄)နှင့်အပြည်ပြည်ဆိုင်ရာ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဆိုင်ရာ စောင့်ရှောက်ရေး နည်းလမ်း များကိုလည်း လိုက်နာရန် တာဝန်ရှိပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		စီမံကိန်း အကောင်အထည်ဖော်ဆောင်ရွက်သူ ဖြစ်သည့် အမှတ် (၁၀) အထည်စက်ရုံ(တောင်သာ) အနေဖြင့် သယံဇာတနှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဦးစီးဌာနနှင့် နိုင်ငံတော်မှ အခါအားလျော်စွာ ထုတ်ပြန် သည့် အမိန့်၊ ညွှန်ကြားချက်နှင့် ဥပဒေများကို လေးစား လိုက်နာ ဆောင်ရွက်ပါမည်။ ထို့အပြင် အဆိုပါ အမိန့်၊ ညွှန်ကြားချက်၊ ဥပဒေများကို လိုက်နာဆောင်ရွက်ရန် ပျက်ကွက်ပါက အရေးယူခံရမည် ဖြစ်ကြောင်း သိရှိ နားလည် သဘောပေါက်ပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၁
		ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ရေးဆွဲရာတွင် ပြည်ထောင်စု သမ္မတ မြန်မာနိုင်ငံတော် အခြေခံဥပဒေ၊ ပတ်ဝန်းကျင် ထိန်းသိမ်းစောင့်ရှောက်ရေး ဥပဒေ၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း၊ အမျိုးသားအဆင့် ပတ်ဝန်းကျင် အရည်အသွေးထုတ်လွှတ်မှုဆိုင်ရာ အရည် အသွေးများနှင့် ကိုက်ညီအောင် ပြုစုထား ရှိပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၂
		အထက်ပါ လမ်းညွှန်ချက်စံနှုန်းများအပြင် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် ရေးဆွဲရာတွင် တည်ဆဲအလုပ်ရုံဥပဒေ၊	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၂

	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပြုစုရေးသားသူမှ လိုက်နာဆောင်ရွက်ရမည့် ကတိကဝတ်များ	အလုပ်သမားဥပဒေ၊ လူမှုဖူလုံ လုံရေးဥပဒေ၊ ပြင်ဆင်ချက်များနှင့် ကိုက်ညီအောင် ပြုစု ရေးသားထားပါသည်။	
		ဤအစီရင်ခံစာတွင် ပါရှိသည့် ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းနှင့် ထိန်းသိမ်းကာကွယ်ရေး လုပ်ထုံးလုပ်နည်းများသည် စီမံကိန်းကြောင့် ထိခိုက်မှု များ လျော့နည်းရှောင်ရှားရေး၊ သက်ရောက်မှုများကို ကုစားရေး၊ ပျက်စီးသွားသောအပိုင်းများကို အစားထိုး ပြင်ဆင်ရေးအတွက် လိုက်နာဆောင်ရွက်ရမည် ဖြစ်ပါ သည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၂
		ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အား ရေးဆွဲ ရာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုကာကွယ်ရေး လုပ်ငန်းစဉ်များ သာမက အရေးပေါ် တုံ့ပြန်ရေးနှင့်လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် လူမှုဘဝပြန်လည် ထူထောင်ရေး လုပ်ငန်းစဉ်များကို ထည့်သွင်း ရေးဆွဲရမည် ဖြစ်ပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၂
		ကောက်ယူထားသော ကိန်းဂဏန်းအချက်အလက်များမှာ အမှန်တကယ် ကောက်ယူထားရှိသော ကိန်းဂဏန်း အချက်အလက်များဖြစ်ပါကြောင်း ဝန်ခံ ကတိပြုပါသည်။ တတိယအဖွဲ့အစည်းအနေဖြင့် ဖော်ပြထားသော အချက်များမှာ မှန်ကန်ကြောင်းတာဝန်ယူပါသည်။	အခန်း (၃) ခေါင်းစဉ်ခွဲ ၃.၄.၂
(၄)	ထုတ်လုပ်မှုအဆင့်များ	လက်ရှိတွင် စက်ရုံလည်ပတ်မှုရပ်တန့်ထားပါသည်။ နောင်တွင် စက်ရုံ ပြန်လည် လည်ပတ်မည်ဆိုပါက သဘာဝ ပတ်ဝန်းကျင်အား ထိန်းသိမ်းခြင်းနှင့်သက်ဆိုင်သော စည်းမျဉ်းစည်းကမ်း ဥပဒေများအား လိုက်နည်မည် ဖြစ်ပါသည်။	အခန်း (၄) အခန်းခွဲ ၄.၁၃
	ရေဆိုးသန့်စင်စက်ရုံ	ရေဆိုးသန့်စင်ကန်မှသန့်စင်ပြီးရေများအားၿငိုးဇ၏ ဇီဝပိုင်းဆိုင်ရာ၊ ဓါတုပိုင်းဆိုင်ရာနှင့် ရုပ်ပိုင်းဆိုင်ရာ အရည်အသွေးများ တိုးတက်ကောင်းမွန်စေရန်နှင့်ပတ်ဝန်းကျင်အပေါ် ထိခိုက်နိုင်မှုများ လျော့နည်းစေရန် Multimedia Filtration System တပ်ဆင်၍ ထပ်မံသန့်စင်မည် ဖြစ်ပါသည်။ ရေဆိုးထွက်ရှိမှုကို စောင့်ကြပ် ကြည့်ရှုမည် ဖြစ်ပြီး NEQEG ၂.၃.၂.၁ တန်ဖိုးနှင့်အညီ သန့်စင်မည်ဖြစ်ပါသည်။	အခန်း (၄) အခန်းခွဲ ၄.၁၃
	ဖန်လုံအိမ်ခါတ်ငွေ့ထုတ်လွှတ်မှု လျော့ချရေး	ဖန်လုံအိမ်ခါတ်ငွေ့ထုတ်လွှတ်မှု လျော့ချရေးအတွက်စွမ်းအင်အကျိုးရှိစွာအသုံးပြုနိုင်မှု၊ ပြည့်ဖြိုးမြဲစွမ်းအင်များအသုံးပြုနိုင်မှု၊	အခန်း (၄) အခန်းခွဲ ၄.၁၉

		စက်ရုံတွင်းလုပ်ငန်းများဆောင်ရွက်ရာတွင်စံနစ်တကျတိုးတက်မှုရှိအောင်ဆောင်ရွက်ရန်ဖြစ်ပါသည်။	
(၅)	ရေအရည်အသွေး	စက်ရုံ၏ လုပ်ဆောင်ချက်များကြောင့် မြေပေါ်မြေ အောက်ရေအရည်အသွေးကို ထိခိုက်စေနိုင်ခြင်းမရှိပါ။ စက်ရုံဝန်းမှ ထွက်ရှိသော စွန့်ပစ်ရေများအား စက်ရုံ၏ ရေဆိုးသန့်စင်ကန်သို့သာ ထုတ်လွှတ်ပါသည်။ ရေဆိုးများအား ၎င်းကန်မှတဆင့် ပြင်ပသို့ ထုတ်လွှတ်ခြင်းမရှိပါ။	အခန်း (၅) အခန်းခွဲ ၅.၆
	လေအရည်အသွေး	အလုပ်အမှာစာများ မှာကြားမှုမရှိသောကြောင့် စက်ရုံရှိ ဘွိုင်လာများ လည်ပတ်မှုမရှိပါ။ စက်ရုံပြန်လည် လည်ပတ်ပါက ဘွိုင်လာများ စစ်ဆေးခြင်းလုပ်ငန်းအား ပုံမှန်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၅) အခန်းခွဲ ၅.၇
	ရေဆိုး အရည်အသွေး	စက်ရုံမှ အန္တရာယ်ရှိပစ္စည်းများအား အနီးဝန်းကျင်မြေထုသို့ စွန့်ပစ်ခြင်းမရှိပါ။	အခန်း (၅) အခန်းခွဲ ၅.၈
	ဆူညံမှု	စက်ရုံ၏ အချောကိုင်ခြင်း ဌာနတွင် အစွန်းချွတ်ဆေးများ၊ အရောင်ဆိုးဆေးများ အသုံးပြုပါသည်။ ရေဆိုးသန့်စင်ကန်မှ သန့်စင်ပြီးရေများအား အနီးဝန်းကျင်သို့ ထုတ်လွှတ်ခြင်း မရှိပါ။ အနာဂါတ်ကာလတွင် စက်ရုံပြန်လည် လည်ပတ်မည်ဆိုပါက Multimedia Filtration စနစ်ကို တည်ဆောက်မည်ဖြစ်ပြီး ရေဆိုးသန့်စင်ကန်မှ သန့်စင်ပြီးရေဆိုးများအား ၎င်းစနစ်ဖြင့် NEQEG ၂.၃.၂.၁ တန်ဖိုးနှင့်အညီ သန့်စင်မည်ဖြစ်ပါသည်။	အခန်း (၅) အခန်းခွဲ ၅.၁၀
	ဇီဝမျိုးစုံမျိုးကွဲများ	အထည်ချုပ်ဌာနတွင် အပ်ချုပ်စက် ၁၀၀ လုံး တပြိုင်နည်တည်း မောင်းနှင်ခြင်းမှ ထွက်ရှိလာမည့်အသံဆူညံမှုသည် လုပ်သားများ၏ ကျန်းမာရေးကိုထိခိုက်စေနိုင်သောကြောင့် လုံခြုံကျန်းမာသော အလုပ်ပတ်ဝန်းကျင်ဖြစ်စေရန် လိုအပ်သော အဆင့်များအားလုံးကို NEQEG 1.3 လမ်းညွှန်ချက်နှင့်အညီ လုပ်ဆောင်သွားမည် ဖြစ်ပါသည်။	အခန်း (၅) အခန်းခွဲ ၅.၁၁
	တာဝန်သိစောင့်ရှောက်မှုများ	စက်ရုံ၏လုပ်ဆောင်ချက်များ ကြောင့် အနီးအနား ပတ်ဝန်းကျင်ရှိဂေဟဗေဒစနစ်ကိုထိခိုက်စေခြင်းမရှိပါ။ ဇီဝမျိုးစုံမျိုးကွဲများအား ထိန်းသိမ်းရန်နှင့် ထိခိုက်မှုများကိုလျှော့ချရန်အတွက် ပြဋ္ဌာန်းထားသော ဇီဝမျိုးစုံမျိုးကွဲဆိုင်ရာထိန်းသိမ်းရေး နှင့် စီမံခန့်ခွဲရေးဆိုင်ရာ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေကို လိုက်နာမည်ဖြစ်ပါသည်။	အခန်း (၅) အခန်းခွဲ ၅.၁၂

	သီးနှံသစ်တောစိုက်ခင်းထူထောင်ခြင်း	စက်ရုံအမြတ်ငွေ၏ ၂ ရာခိုင်နှုန်းအား တာဝန်သိစောင့်ရှောက်မှုအတွက် ရန်ပုံငွေအဖြစ် အသုံးပြုမည် ဖြစ်ပါသည်။	အခန်း (၅) အခန်းခွဲ ၅.၁၃
(၆)	ထိခိုက်မှုများနှင့်ဖြေလျှော့မှုများ	စက်ရုံတာဝန်ရှိသူများနှင့် အကြံပေးကုမ္ပဏီတို့သည် ပတ်ဝန်းကျင်ထိခိုက်မှုများနှင့် ရှောင်လွှဲမရသော ထိခိုက်မှုများကို လျော့ပါးစေခြင်းနည်းလမ်းများဖြင့် သဘာဝပတ်ဝန်းကျင်ကို ထိန်းသိမ်းမည်ဖြစ်ပါသည်။	အခန်း (၆)
	မြေပေါ်ရေနှင့်မြေအောက်ရေညစ်ညမ်းမှုများ	စက်ရုံ၏ လုပ်ဆောင်ချက်များကြောင့် ရှောင်လွှဲမရ နိုင်သော ပတ်ဝန်းကျင် ထိခိုက်မှုများအား ကုစားရန်နှင့် သဘာဝ ပတ်ဝန်းကျင်အားထိန်းသိမ်းရန် စက်ရုံနှင့် အတိုင်ပင်ခံကုမ္ပဏီတို့မှ ဆောင်ရွက်မည်ဖြစ်ပါသည်။ စက်ရုံမှ ထွက်ရှိမည့် ရေဆိုးအား စနစ် တကျစောင့်ကြည့် မည်ဖြစ်ပြီး NEQEG 2.3.2.1 တန်ဖိုးနှင့်ကိုက်ညီအောင် သန့်စင်ပြီးမှ ထုတ်လွှတ်မည်ဖြစ်ပါ သည်။	အခန်း (၆) အခန်း ၆.၄.၁ အခန်း ၆.၄.၂
	လေထုတ်လွှတ်မှု	လေအရည်အသွေးထိခိုက်နိုင်မှုများ ရှိလာပါက လျော့ချနိုင်ရေးနည်းလမ်းများအား ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၆) အခန်း ၆.၄.၃
	ဆူညံသံ	စက်ရုံရှိ စက်များအားလုံး တပြိုင်နက်တည်း လည်ပတ်ခြင်းကြောင့် ထွက်ရှိလာနိုင်သော ဆူညံမှုများအား လျော့ချရန်အတွက် အသံဆူညံမှု ဖြစ်ပွားစေသောစက်များ၏ ဒီဇိုင်းကို အဆင့်မြှင့်တင်စေပါမည်။	အခန်း (၆) အခန်း ၆.၄.၄
	မြေ	ထုတ်လုပ်ခြင်းလုပ်ငန်းတွင် အစွန်းချွတ်ဆေးနှင့် ဆိုးဆေးများအား အသုံးပြုသော်လည်း ထွက်ရှိလာသည့် ရေဆိုးများအား ရေဆိုးသန့်စင်ကန်သို့သာပို့ဆောင်သန့်စင်စေပါသည်။ ရေဆိုးများအား ၎င်းရေဆိုးကန်မှတဆင့် ပြင်ပသို့ ထုတ်လွှတ်ခြင်း မရှိသောကြောင့် အနီးဝန်းကျင်ရှိ မြေအရည်အသွေးအား ထိခိုက်စေနိုင်ခြင်းမရှိပါ။လိုအပ်သော ကုစားနိုင်ရေးနည်းလမ်းများအား လည်း လိုက်နာသွားမည် ဖြစ်ပါသည်။	အခန်း (၆) အခန်း ၆.၄.၅
	အန္ဓ	စက်ရုံမှ အရည်(သို့)အငွေ့များကို သန့်စင်ခြင်းမရှိပဲ မြေထု (သို့) လေထု(သို့) ရေထုများသို့ စွန့်ထုတ်ခြင်း မရှိပါ။ ထို့ကြောင့် စက်ရုံမှ အန္ဓဆိုးများ ထွက်ရှိခြင်း မရှိပါ။	အခန်း (၆) အခန်း ၆.၄.၇
	လုပ်သားများ လုပ်ငန်းခွင်ဘေးအန္တရာယ်နှင့် ကျန်းမာရေး	စက်ရုံဝန်ထမ်းများ၏ လုံခြုံရေးကို စက်ရုံအလုပ်ရုံဥပဒေ၊ လူမှုဖူလုံရေးဥပဒေနှင့် ကျန်းမာရေးဝန်ကြီးဌာနမှ သတ်မှတ်ထားသောစံနှုန်းများနှင့်အညီ ဆောင်ရွက်သွားမည် ဖြစ်ပါ သည်။	အခန်း (၆) အခန်း ၆.၄.၈

	ဇီဝမျိုးစုံမျိုးကွဲများ	စက်ရုံလည်ပတ်ခြင်းကြောင့် မပြောပလောက်သော မျိုးစိတ်အနည်းငယ်ကိုသာ အကျိုးသက်ရောက် နိုင်မည် ဖြစ်ပြီး စက်ရုံတာဝန်ရှိသူများမှ သဘာဝပတ်ဝန်းကျင်ကို ထိန်းသိမ်းရန်အတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုလျော့ပါးစေခြင်းဆိုင်ရာ နည်းလမ်းများကို အကောင်ထည်ဖော်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၆) အခန်း ၆.၄.၉
	ယာဉ်ကြောစီမံခန့်ခွဲမှု	ယာဉ်မတော်တဆဖြစ်မှုများအတွက် အရေးပေါ်ကယ်ဆယ်ရေး အစီအစဉ်များ ဆောင်ရွက်ထား ရှိပါသည်။	အခန်း (၆) အခန်း ၆.၄.၁၀
	အစိုင်အခဲစွန့်ထုတ်မှု	စက်ရုံမှ အစိုင်အခဲစွန့်ထုတ်မှုဆိုင်ရာ လျော့ပါးစေခြင်း နည်းလမ်းများအား အကောင်ထည်ဖော်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၆) အခန်း ၆.၄.၁၁
(၇)	ဘေးအန္တရာယ်ထိခိုက်မှုဆန်းစစ် ခြင်း	စက်ရုံတာဝန်ရှိသူများနှင့် အကြံပေးကုမ္ပဏီတို့သည် ဘေးအန္တရာယ်ထိခိုက်မှု ဆန်းစစ်ခြင်းများ၏ ရည်ရွယ် ချက်များအား အကောင်ထည်ဖော် ဆောင်ရွက်သွား မည် ဖြစ်ပါသည်။	အခန်း (၇) အခန်းခွဲ ၇.၁
(၈)	ပြည်သူလူထုနှင့်တွေ့ဆုံဆွေးနွေးခြင်း	အမှတ် (၁၀) ချည်မျှင်နှင့်အထည်စက်ရုံ (တောင်သာ) နှင့် အတိုင်ပင်ခံကုမ္ပဏီတို့သည် စစ်တမ်းကောက်ယူချိန်အတွင်း ဘက်လိုက်မှုများမရှိပဲ အချက်အလက်များအား ကောက်ယူခဲ့ပါသည်။ ဒေသတွင်း အုပ်ချုပ်ရေးရုံးခန်း များထံမှ ခိုင်မာသေချာသော သတင်းအချက်အလက်များကို စုဆောင်းခဲ့ပါသည်။ လူထုတွေ့ဆုံပွဲမှ ရလဒ်များကို စက်ရုံ၏ HSE အဖွဲ့မှ စောင့်ကြည့်၍ ဖြည့်ဆည်းမည် ဖြစ်ပါသည်။	အခန်း (၈) အခန်းခွဲ ၈.၃
(၉)	ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေးအစီအစဉ်	စက်ရုံတာဝန်ရှိသူများနှင့် အကြံပေးကုမ္ပဏီတို့သည် HSE အဖွဲ့ဖွဲ့စည်းရန်အတွက် လိုအပ်ချက်များအား ဖြည့်ဆည်းဆောင်ရွက်မည် ဖြစ်ပါသည်။	အခန်း (၉)
	HSE အဖွဲ့၏ တာဝန်နှင့်ဝတ္တရားများ	HSE အဖွဲ့သည် အဖွဲ့၏ တာဝန် ဝတ္တရားများအားလုံး ကို လုပ်ဆောင်မည်ဖြစ်ပြီး အရေးပေါ်တုံ့ပြန်ရေးအဖွဲ့ တွင် HSE Team မှ ပါဝင်ဆောင်ရွက်ရမည် ဖြစ်ပါ သည်။	အခန်း (၉) အခန်းခွဲ ၉.၁
	ရေဆိုး စီမံခန့်ခွဲမှု အစီအစဉ်	လက်ရှိအချိန်တွင် စက်ရုံ၏ ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းများအားလုံး ရပ်နားထားပါသည်။ အနာဂါတ်ကာလတွင် စက်ရုံပြန်လည် လည်ပတ်ပါက Multimedia Filtration စနစ်ကို တည်ဆောက်မည်ဖြစ်ပြီး ရေဆိုးသန့်စင်ကန်မှ သန့်စင်ပြီး ရေဆိုးများအား NEQEG ၂.၃.၂.၁ တန်ဖိုးနှင့်အညီ ၎င်းစနစ်ဖြင့် ထပ်မံ သန့်စင်မည်ဖြစ်ပါသည်။ ရေဆိုးအရည်အသွေးအား	အခန်း (၉) အခန်းခွဲ ၉.၅.၄

		စောင့်ကြပ်ကြည့်ရှုရုံကုစားနိုင်ရေးနည်းလမ်းများအား လိုက်နာဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	
	ခန့်မှန်းကုန်ကျငွေစာရင်း	နိုင်ငံတော်ပိုင်စက်ရုံဖြစ်သောကြောင့် ပတ်ဝန်းကျင် ထိခိုက်မှုများကို လျော့ချရန်အတွက် စက်ရုံအမြတ်ဝင်ငွေ၏ (၂) ရာခိုင်နှုန်းကို ရန်ပုံငွေ အဖြစ်သတ်မှတ် ထားပါသည်။ နိုင်ငံတော်ပိုင် စက်ရုံဖြစ်သည်နှင့်အညီ ဘဏ္ဍာရေးစည်းကမ်း များနှင့်အညီ နိုင်ငံတော်ထံမှ တင်ပြ တောင်းခံရန် ဖြစ်ပါသည်။	အခန်း (၉) အခန်းခွဲ ၉.၆
(၁၀)	စောင့်ကြပ်ကြည့်ရှုခြင်း	စက်ရုံတာဝန်ရှိသူများနှင့်ပတ်ဝန်းကျင်ဆိုင်ရာအကြံပေးကုမ္ပဏီတို့သည်စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်များအား အကောင်အထည်ဖော်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၁၀) အခန်းခွဲ ၁၀.၂.၁
	လေအရည်အသွေး	လေအရည်အသွေးအား စောင့်ကြပ်ကြည့်ရှုသွား မည် ဖြစ်ပြီး လိုအပ်ပါက ညစ်ညမ်းမှုနှင့် ပတ်ဝန်းကျင် ထိခိုက်မှုများကို ကာကွယ်ရန်အတွက် ကုစားနိုင်မည့် နည်းလမ်းများကို ဖော်ဆောင်သွားမည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	ဆူညံမှု	ဆူညံသံမြင့်မားမှုကုစားခြင်းအစီအမံများကို စက်ရုံတာဝန်ရှိသူများမှ ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	ရေအရည်အသွေး	စက်ရုံမှ ပတ်ဝန်းကျင်သို့ စွန့်ပစ်ရေများ တိုက်ရိုက် စွန့်ထုတ်ခြင်းမရှိသောကြောင့် ရေအရည်အသွေးအား ထိခိုက်နိုင်ခြင်း မရှိပါ။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	စွန့်ပစ်ရေနှင့် သန့်စင်ပြီးရေဆိုးများ	စက်ရုံသည် လတ်တလောတွင် ကုန်ထုတ်လုပ်ခြင်းလုပ်ငန်းများအား ရပ်တန့်ထားပါသည်။ အကယ်၍ အနာဂါတ်ကာလတွင် စက်ရုံပြန်လည်လည်ပတ်မည်ဆိုပါက Multimedia Filtration စနစ်ကို တည်ဆောက်မည်ဖြစ်ပြီး ရေဆိုးသန့်စင်ကန်မှ သန့်စင်ပြီးရေဆိုးများအား ဇီဝပိုင်းဆိုင်ရာ၊ ဓါတုပိုင်းဆိုင်ရာနှင့် ရုပ်ပိုင်းဆိုင်ရာ ဂုဏ်သတ္တိများ တိုးတက်ကောင်းမွန်စေရန် ၎င်းစနစ်ဖြင့် ထပ်မံသန့်စင်မည် ဖြစ်ပါသည်။ ရေဆိုးထွက်ရှိမှုကို စောင့်ကြပ် ကြည့်ရှုမည် ဖြစ်ပြီး NEQEG ၂.၃.၂.၁ တန်ဖိုးနှင့်အညီ သန့်စင်မည်ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	မြေအရည်အသွေး	စက်ရုံတာဝန်ရှိသူများမှအနီးအနားရှိ စိုက်ပျိုးမြေများကို စောင့်ကြည့်မည်ဖြစ်ပြီး စက်ရုံ၏ လုပ်ဆောင်ချက်များကြောင့် မြေအရည်အသွေး ထိခိုက်မှုမရှိစေရန် ဆောင်ရွက်မည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁

	အစိုင်အခဲအညစ်အကြေးစွန့်ပစ်မှု အစီအမံ	အစိုင်အခဲ အညစ်အကြေး စွန့်ပစ်မှုကို မြို့နယ်စည်ပင် သာယာရေးကော်မတီနှင့် သယံဇာတနှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဝန်ကြီးဌာနမှ ပြဋ္ဌာန်းထားသောဥပဒေ၊ နည်းဥပဒေများနှင့် အညီ လုပ်ဆောင်ပါမည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်လုံခြုံ ရေး	စက်ရုံဝန်ထမ်းများ၏ လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် လုံခြုံရေးကို စက်ရုံအလုပ်ရုံဥပဒေ၊လူမှုလုံခြုံရေးဥပဒေနှင့် ကျန်းမာရေး ဝန်ကြီးဌာနမှ သတ်မှတ်ထားသော စံနှုန်းများနှင့်အညီ ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	ယာဉ်အသွားအလာစီမံခန့်ခွဲမှု အစီအစဉ်ခွဲ	ယာဉ်အသွားအလာ စီမံခန့်ခွဲမှုအစီအစဉ်ကို ယာဉ် မတော်တဆ ဖြစ်ပွားမှု မှတ်တမ်းများကို ကိုးကား၍ စီမံဆောင်ရွက် သွားမည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	အရေးပေါ်တုန့်ပြန်ရေး အစီအစဉ်ခွဲ	အရေးပေါ်တုန့်ပြန်ရေး အစီအစဉ်ခွဲကို အဖွဲ့ခေါင်း ဆောင်၏ ညွှန်ကြားချက်နှင့်အညီ HSE အဖွဲ့မှ ဆောင်ရွက်မည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁
	မီးဘေးဆိုင်ရာ ဆောင်ရွက်ထားရှိမှု အစီအစဉ်ခွဲ	မီးဘေးဆိုင်ရာ ဆောင်ရွက်ထားရှိမှု အစီအစဉ်ခွဲကို HSE အဖွဲ့ဝင်များမှ ဆောင်ရွက်မည် ဖြစ်ပါသည်။	အခန်း (၁၀) ဇယား ၁၀.၂-၁

Chapter 1

Executive Summary

Chapter (1)

Executive Summary

1.1. Introduction

The textile industry is a crucial sector that provides clothing and other basic necessities to people worldwide. It creates job opportunities for local communities and contributes to the national GDP. However, the industry is also known for generating various waste streams such as effluent, gaseous pollutants, odor, noise, and solid waste. The discharge of untreated effluent is one of the primary environmental problems linked to textile manufacturing processes. The sector's development, along with technological advancements, has contributed to the increase of environmental problems globally.

In Myanmar, the government has taken steps to address environmental concerns in the textile industry through the enactment of environmental laws and guidelines. The Environmental Law was passed by the Pyidaungsu Hluttaw as Law No. (21) in 2012. The National Environmental Quality Emission Guidelines Values (NEQEG) was published in 2015, and Environmental Social Impact Assessment (ESIA) procedures were also established. As a state-owned enterprise (SOE), No. (10) Textile Mill (Taungtha) must comply with government policies and prepare an Environmental Management Plan (EMP) to mitigate environmental impacts.

1.2. Background History of the Factory

Taungtha Textile Mill Project was established in 2005 through a contract between Myanmar Textile Industries and World Best Company Limited, China. The factory is currently managed by No. (3) Heavy Industrial Enterprise, which falls under the Ministry of Industry, as part of the ministry's development initiatives in 2021.

1.2.1. Profile of Proposed Factory

Table: 1.2.1-1. Factory profile

No	Content	Description
1.	Project/ Factory	No. (10) Textile Mill (Taungtha)
2.	Type of work	Knitting, Dyeing, Garment
3.	Location	No. (10) Textile Mill (Taungtha) is located 1.3 miles away from Taungtha Town.

4.	Project/Factory Owner, Address	No. (3) Heavy Industrial Enterprise, Ministry of Industry, Office No. (37), Naypyitaw, Ph: 09254557887
5.	Investment	2280.878 million Kyats
7.	Contact Person	U Kyaw Naing Factory General Manager No. (10) Textile Mill (Taungtha) Taungtha Township, Ph: 09 7310587
8.	Email	kn7310587@gmail.com

1.2.1.1. Project Location

No. (10) Textile Mill (Taungtha) is located 1.3 miles away from Taungtha Town. It is in the northern part of Taungtha Township, Myingyan District, Mandalay Region. The factory is 14 miles from Myingyan Town and situated near the Meikhtilar-Myingyan Road. The grid line position of the Taungtha factory is between north Latitude 21˚ 18' 04.06" and 21˚ 17' 49.41" and east Longitude 95˚ 26' 32.91" and 95˚ 26' 15.22".

1.2.2. Objectives of the Project

The objectives of the Taungtha Textile Mill Project were to boost domestic knitted fabrics production, encourage local production for local consumption as import substitution items, create job opportunities for the local people, and contribute to the region's socio-economic development.

1.2.3. Detail information of EMP core working group of IIC Company Limited

Detailed information on the EMP core working group of IIC Company Limited is listed in the table below.

Table: 1.2.3-1. Detail information of EMP core working group of IIC company limited

Sr. No	Name/Designation	Degree	Expertise	Responsibility
1	Team leader Dr. Aung Kyaw Soe Senior Consultant EIA AC 056/2023 IIC Co., Ltd EIA-CO (B) 007/2024	Doctor of Engineering (Material Science), Kyoto Institute of Technology, Japan B.E (Textile),	-Water Pollution Control, Conservation, Monitoring, and Impacts,	Factory Survey, Data Collection, Public Consultation, Report Writing Author Executive summary,

		Professional Engineer P.E. 1140 Myanmar Engineering Council ASEAN Chartered Professional Engineer ACPE 05982/MM	-Solid Waste Management and Hazardous Waste Management,	Chapters (1), (2), (3), (4), (5), (6), (7), (9), (10), (11)
2	U Thaung Myint General Secretary EIA AC 074/2023 IIC Co., Ltd EIA-CO (B) 007/2024	B.E (Petroleum)	-Solid Waste Management and Hazardous Waste Management,	Factory Survey, Data Collection, Public Consultation, Report writing Co-author Chapter (5)(7)
3	U Tun Myint Secretary EIA AC 058/2023 IIC Co., Ltd EIA-CO (B) 007/2024	B.Sc. (Zoo)	- Biodiversity	Factory Survey, Data Collection Public Consultation, Report writing Co-author Chapters (5), (8), (10)

Table: 1.2.3-2. Contact information of IIC company limited

Company Registration No.	102588584
Address	Azarnibeikhman Street, Shwenathar Lane, East Shwedagon Stair way, Bahan Township, Yangon Region
Ph. No	09-449611190,
email	draungkyawsoetex@gmail.com,
Contact Person	Dr. Aung Kyaw Soe Director / Senior Consultant

1.3. Policy, Legal Framework and Other Requirements

1.3.1. Relevant Environmental Laws and Regulations

Myanmar Environmental Law was enacted in 2012, followed by regulations and publications of National Environmental Quality Emission Guideline Values (NEQEG) in 2015. Environmental-related laws are expressed in the Chapter (3) which explains the details of laws defining environmental-related matters.

1.3.2. National Environmental Quality Emission Guideline Values (NEQEG)

As per the Ministry of Natural Resource and Environmental Conservation (MONREC), previously known as the Ministry of Environmental Conservation and Forestry, the National Environmental Quality Emission Guideline (NEQEG) values were made effective on December 29, 2015 after being published in the official gazette. In this study, the NEQEG values, including NEQEG values 2.3.2.1 Effluent for Textile Manufacturing, and Air Emission for Textile Manufacturing, and NEQEG 1.3 Noise for General Guideline values serve as the standard values.

1.4. Factory Description

1.4.1. Factory Location, Surrounding Areas and Buildings

No. (10) Textile Mill (Taungtha) is located 1.3 miles away from Taungtha Town. It is situated at the northern part of Taungtha Township, Myingyan District, Mandalay Region. It is bordered by Mahlaing Township to its east, Kyaukpadaung Township, to its south, Bagan-Nyaung Oo and Pakokku Township to its west and Myingyan Township to its north.

The factory comprises 30 buildings that can be divided into four categories: mechanical buildings (workshop), commercial buildings, administrative buildings, and staff quarters. Among these, the knitting, finishing and garment workshops are single-story buildings. Architectural drawings are compiled in Chapter 4.

1.4.2. Production and Raw Material Usage

According to the information provided, the factory produces knitted fabrics with an annual output capacity of 1.6 million pieces per year. The knitted wears manufacturing process can be classified into knitting process, finishing process and garment manufacturing process. The raw material is soft twist yarn mainly imported from China and India. The annual requirement is 2.128 million lbs. of yarn.

1.4.3. Facilities

Water Resource

The factory uses water from the shallow well in the Taungtha creek. Water is pumped from the shallow well to the ground tanks with a capacity of 50,000 gallons,

and then pump to the ground tank of 150,000 gallons in the factory. Raw water is treated and stored at ground tank of 100,000 gallons capacity from which treated water is pumped onto two overhead tanks of total 130,000 gallons capacity. Generally, the water consumption of the factory and the staff quarters is 30,000 gallons per day.

Electric Power

The factory gets its power from the Myingyan sub-station, which is 14 miles away, by using a 33 KV high tension line supplied by Electricity Supply Enterprise (E.S.E), Ministry of Electric Power. Based on the maximum production period, 2010-2011, annual electric power consumption is 200,000 KWH.

1.4.4. Drainage System and Wastewater Treatment Plant

1.4.4.A. Drainage System

The drainage system is in place to remove excess water, such as floodwater, rainwater, runoff, and sewage. This system includes a channel drain system, which provides an overall open surface area to handle the large volume of runoff. All surface water and rainwater are channeled to the wastewater treatment pond at the outside of the factory compound.

1.4.4.B. Water Hyacinth Wastewater Treatment Plant (WHWWTP)

The factory discharges effluent to the water hyacinth waste water treatment (WHWWTP) collecting pond of 200,000 gallons capacity by using open channel. Production department discharges effluent 4,000 gallons per day. Water hyacinth (*Eichhornia crassipes*) is used in wastewater treatment because of its high efficiency in removing pollutants and its ability to thrive in nutrient-rich environments. It is cost effective and low-cost maintenance. It doesn't require high-tech infrastructure or chemicals in treatment process. Water hyacinth can accumulate lead, cadmium, mercury, and arsenic, helping clean industrial wastewater.

1.4.5. Green House Gas Emission

The recorded greenhouse gas (GHG) emissions for the Taungtha factory were 2512.54 tons per year for 2010-2011. To reduce GHG emissions, the factory needs a

combination of energy efficiency measures, renewable energy adoption, and operational improvements.

1.4.6. Solid Waste Management (SWM) System

There are two types of solid waste: hazardous waste and non-hazardous waste. Hazardous wastes are (1) chemical waste (2) solvent (3) waste oil and lubricant (4) contaminated rags and PPE (5) empty chemical containers (6) batteries. Non-hazardous wastes are (1) fabric and yarn waste (2) packing waste (3) general office waste (4) bio-degradable waste (5) dust and lint (6) sewing waste. Hazardous and non-hazardous waste should be separated at the source. Hazardous waste must be labeled and stored in a secure area. It is essential to provide staff training on proper waste handling techniques. Compliance with environmental regulations is mandatory. The factory should collaborate with recyclers or the township development committee for effective waste management.

1.5. Governing Parameters

1.5.1. Geographical Data

No. (10) Textile Mill (Taungtha) is situated at the nothern part of Taungtha Town, Taungtha Township, Myingyan District, Mandalay Region.

1.5.2. Climatory

Taungtha Township experiences a tropical climate.

1.5.3. Seismicity

Taungtha Township is located on Sagaing Fault and emergency response plans for disasters should be prepared.

1.5.4. Social Environment

According to the data from the general administration department, Taungtha Township has a population of near 250,000 people, with about 45,000 households residing in the area. Based on the conducted socio-economic survey, it was found that the Taungtha factory has significant socio-economic benefits. The factory creates job opportunities for the local people and also provides secondary effects such as creating opportunities for cotton-grown farmers, small weaving factories, small and medium

businessmen, grocery sellers, retail shops, and more. Moreover, the factory was involved in job creation activities for local contractors, such as building maintenance, greening projects, and cleaning works.

1.5.5. Land Use

Total factory compound area is 61.19 acres. It can be divided into two parts- factory area 33.17 acres and quarters 28.02 Acres.

1.5.6. Water Quality

Water sample from the shallow well in Taungtha creek was collected and compared with WHO drinking water standards. According to the lab results, a lot of parameters are outside the range of WHO standard values. It can be concluded that the quality of well water is not suitable for drink without certain treatment.

1.5.7. Air Quality

The concentration of PM_{10}, $PM_{2.5}$ and Volatile Organic Compounds (VOCs) are within the NEQEG 2.3.2.1 Textile Manufacturing guideline values within the factory compound.

1.5.8. Soil Quality

The soil may still need extra nourishment for agricultural use.

1.5.9. Effluent Quality

The factory had stopped operating some sections which mainly produce effluents and there was no collectable sample in the wastewater treatment pond. Therefore, the effluent quality analysis was unable to be conducted.

1.5.10. Noise and Vibration

The noise levels at various locations in each section of the factory were monitored to assess and it was observed that all sections did not exceed 70 dB(A). Integrating sound level meter was used for monitoring.

1.5.11. Biodiversity

The factory is situated at the dry zone in Myanmar. The majority of the study area is covered by cultivated land and doesn't lie in the protected area.

Plant Species

A total of 29 plant species belonging to 15 different families were investigated. None of the species were found on the threatened categories of the IUCN Red List 2017. It is worth mentioning that among the plant species, Tamar (Meliaceae) had the highest number, which can be attributed to the factory's environmental activities since 2005, such as growing Tamar trees that are suitable for the climate inside the factory compound area.

Amphibian and reptile species

17 different species of reptiles and amphibians from 13 distinct families were observed. The Banded bullfrog, which is part of the Microhylidae family, was the most commonly spotted amphibian among the group.

Avifauna, Birds species

In the survey area, there were 7 species of birds belonging to 7 different families that were recorded. The cattle egret was the most frequently observed bird in the survey area, followed by the house sparrow species as the second most frequent. The third most frequent bird was the house crow.

Fish Species

Observation of fish species was not done because the factory is surrounded by cultivated land and there is no rivers in 5-mile radius around the facroty.

Discussion on Biodiversity

Taungtha Township doesn’t lie in the protected area. The survey area encompasses a total of 3.142 square miles, including paddy fields, Taungtha Town and villages. This survey identified 29 plant species, 17 amphibian and reptile species and 7 bird species. It has been found through investigation that the Tamar tree (Meliaceae) has the highest number of trees in the survey area. This is attributed to the factory's relentless efforts in growing trees in the surrounding areas since 2005.

1.5.12. Corporate Social Responsibility (CSR)

The factory's Corporate Social Responsibility (CSR) program contributes to the betterment of society and the environment. The program integrates environmental, social, and biodiversity concerns. As part of the CSR program, factory workers donate Waso robes and Kathina robes to nearby monasteries every year. The factory's job creation not only fuels the economic growth of the region but also enhances the socio-economic well-being of the surrounding areas. The factory has a disaster management program in place, which is crucial as the first responders to any disaster are often the workers in the factory and those living in the residential area. The factory commits to spend 2% of total profit revenue as CSR fund. As per state financial regulations, Taungtha factory needs to apply budget allocation to the government. The factory's commitment to economic growth is commendable, but what is even more noteworthy is its focus on ensuring the safety and well-being of its workers and the surrounding communities.

(a) Social-Economic Contribution

The factory has employed a total of 325 persons for the various job profiles in different sections. Some of those are semi-skilled workers and unskilled workers from nearby townships. In addition to that, the factory also generates huge indirect employment as a secondary effect in nearby villages by appointing local contractors for gardening, sanitation, building maintenance and transportation.

(b) Environmental Activities Contribution

The factory is committed to implementing Environmental Management Plan (EMP) mitigation measures, including the maintenance of greenbelt areas to conserve nature. As part of these initiatives, the Taungtha factory plans to establish an agroforestry system, which will incorporate a mix of trees and vegetables suitable for the tropical zone. This agroforestry system is expected to benefit both the factory and the surrounding communities by enhancing biodiversity, improving soil health, diversifying income sources for farmers, and contributing to climate change mitigation through carbon sequestration in trees. The program is scheduled to commence in the 2027-2028 fiscal year, contingent on financial support from the Ministry and the Government.

Additionally, the factory's commitment to the three R's program for waste minimization and natural resource conservation is commendable.

1.6. Key Potential Impacts on Surrounding Areas of the Factory

The Environmental Management Plan serves the crucial purpose of assessing the impacts generated by the factory's activities and implementing measures to mitigate them. It is important to acknowledge and address the impacts to ensure sustainable development and a healthy environment for all.

Surrounding areas, Wards and Villages

Taungtha factory is surrounded by villages, paddy fields and cultivated areas. The factory will be responsible for the conservation of its natural environment.

Nearest Surface Water

Taungtha Creek, an ephemeral creek, is usually dry and carries water only during rainfall. It is situated 0.5 miles from the factory and flows into Sintewa Creek, which eventually joins the Ayeyarwady River.

Biodiversity of Surrounding Areas

Plant Species

The factory is surrounded by paddy fields poses a significant problem due to the absence of a systematic drainage system. This can result in waste discharge and emissions that could cause damage to the surrounding vegetation and paddy fields.

Animal Species

The factory's location encircled by cultivated land poses a significant threat to the surrounding ecosystem. The absence of a systematic drainage system, the lack of air pollution control, the poor wastewater management system, and the poor solid waste management system might potentially harm the mammals, amphibians, and birds in the area.

1.6.1. Potential Impacts and Mitigation Measures at the Production Stage

1.6.1.1. Impacts on Water Environment at the Production Stage

1.6.1.1.a. Impacts on Surface Water Contamination and Mitigation Measures

The factory uses 30,000 gallons of well water per day. The treated well water is used for various purposes, including sanitation, gardening, and household. The factory's runoff water, stormwater, and treated sewage are discharged to the WHWWTP. The factory has implemented mitigation measures to minimize its environmental impact. Mitigation measures for the impact on surface water contamination at production stage are described in Chapter 6, Table 6.4.1-1.

1.6.1.1.b. Impact on Underground Water Contamination and Mitigation Measures at the Production Stage

The factory, which houses 325 workers, discharges some amount of sewage into the collecting pond for sanitation purposes. These contaminations are preventable. Mitigation measures for the impact of underground water contamination at production stage are described in Chapter 6, Table 6.4.2-1.

1.6.1.2. Potential Impact of Air Emission and Mitigation Measures at the Production Stages

The factory uses boilers in the manufacturing process. Vehicular movement near the factory is unavoidable and becomes a significant source of emissions. Potential impact of air emission and mitigation measures are described in Chapter 6, Table 6.4.3-2.

1.6.1.3. Potential Impact of Noise Environment at the Production Stage

The sewing section has 100 sewing machines and if they operate simultaneously, generating a high level of noise with a sound pressure of approximately 70 dB (A). This poses a significant threat to the health of the employees, such as deafness. To mitigate this problem, some measures have been suggested, which are listed in Chapter 6, Table 6.4.4-1.

1.6.1.4. Potential Impact on Soil Contamination at the Production Stage

There is a low potential for soil contamination during the production stage as effluent is drained into the wastewater treatment pond. Some mitigation measures that can be taken are described in Chapter 6, Table 6.4.5-1.

1.6.1.5. Potential Impact of Light Intensity and Mitigation Measures at the Production Stage

Light intensity is crucial to create a good working environment. Mitigation measures are described in Chapter 6, Table 6.4.6-1.

1.6.1.6. Impact on odor at the Production Stage

There are no adverse impacts on the odor around the factory.

1.6.1.7. Potential Impact on Occupational Health and Safety at the Production Stage

Occupational health and safety aim to improve workplace health and safety standards. The main hazards are mechanical, chemical, electrical and fires. Fire breakouts are also a major concern. Improving workplace safety in all areas, including storage, handling, and disposal, is critical. Chapter 6, Table 6.4.8-1 provides details on the causes of hazards, their potential consequences, and the actions that must be taken to achieve zero accidents in the factory. Additionally, mitigation measures are outlined in Tables 6.4.8.1-1 to 6.4.8.1-2.

1.6.1.8. Potential Impacts on Biodiversity at the Production Stage

All the bird species occurring around the survey area are endemic to Myanmar, but the impact of the factory is considered to be very low due to the small area of habitat affected and the wide distribution of these species. None of the populations of species would be significantly affected by the factory because the area affected is very small. Mitigation measures are stated in Chapter 6, Table 6.4.9-3.

1.6.1.9. Impact on Road Traffic at the Production Stage

Taungtha factory is situated near the Meikhtilar-Myingyan and the mitigation measures are described in Chapter 6, Table 6.4.10-1.

1.6.1.10. Impact on Solid Waste Disposal at the Production Stage

The source of solid waste can be categorized as hazardous waste and non-hazardous waste. Mitigation measures for solid waste are explained in Chapter 6, Table 6.4.11-1.

1.6.1.11. Potential Impact of 33KV High Voltage Power Transmission Line at the Production Stage

A 33 KV line was connected to the factory from Myingyan sub-station. The electricity system produces an extremely low frequency electromagnetic field which comes under non-ionizing radiations that can cause health effects. Necessary measures and protection issues were shown in Chapter 6, Table 6.4.12-1.

1.6.2. Positive Impacts at the Production Stage

Taungtha factory provides employment for 325 people and creates job opportunities in nearby areas. The factory has been working closely with nearby villages to generate maximum indirect employment by giving an opportunity to local contractors for sanitation works, gardening, and building maintenance works. The factory significantly contributes to the local economy through employment, human resource development, and technological transfer.

1.7. Risk Assessment

No. (10) Textile Mill (Taungtha) has taken adequate safety measures to ensure the well-being of its workers and prevent any accidents. The department-wise activities have been identified. Additionally, the consequence severity has been identified as follows: aspects, impacts, and risk scoring of risk factors as shown in Chapter 7, Table 7.2.3-5.

1.8. Public Consultation

Public consultation is a process that involves the public in providing their views and feedback on a proposal to consider in the decision-making process. It is an inclusive and continuous dialogue between a factory and its stakeholders that encompasses a range of activities and approaches and spans the entire life of the factory. On September 1, 2020, the factory held a public consultation meeting at the factory meeting hall with 30 attendees who cautiously followed the precautionary measures issued by the Ministry of Health. The outcomes of the meeting were compiled, and action plans were created based on the following items:

a) Job Creation: The Taungtha factory's contribution to the local economy is significant as it creates job opportunities for the locals. As a state-owned

enterprise, the government factory seeks ways to cooperate with the private sector.

b) Green Belt Zone: It is essential to grow more trees around the factory area to create a green belt zone. This initiative will improve the environment and make the factory a more pleasant place to work.

1.9. Environmental Management Plan

The objectives of the Environmental Management Plan are as follows:

- to prepare emergency response plan (ERP)
- to identify the potential environmental impacts,
- to minimize and mitigate these impacts,
- to continuously monitor the implementation of EMP,
- to allocate the budget for each phase.

The basic function of the emergency response plan (ERP) is to prepare for potential incidents or accidents. The identification of potential environmental impacts was carried out in three different stages: construction stage, production stage, and demolition stage followed up by mitigation measures to minimize these impacts. The life span of EMP is as same as the factory does. Monitoring process and emergency response plan would be conducted by the Health, Safety and Environment (HSE) team which is broadly formed with the responsible persons from the factory, stakeholders, villagers, administrative personnel from nearby villages/ward, environmental experts, township labor officer, township public health officer, township fire brigade and township development committee officer. The purpose of mitigation measures is to minimize the impacts caused by the factory/project, in order to implement these measures, the allocation of budget is very crucial. As State Owned Enterprise (SOE), No. (3) Heavy Industrial Enterprise, the Ministry of Industry needs to ask for budget allocation to the government.

The organization charts for HSE Team of the factory at three different stages are described in Chapter 9, Figure 9.1.1-1 to 9.1.1-3. The Environmental Management Plan for the Taungtha factory is presented in Chapter 9, Table 9.4-1.

1.10. Monitoring

From the monitoring point of view, the important components are air, water, soil, odor, and noise. Environmental Consultancy Company will conduct the monitoring program. Currently the factory has no discharge of effluent and if any, necessary treatment system would be installed and monitored. A detailed environmental monitoring program is given below and in Chapter 10, Table 10.2-1.

Table: 1.10-1. Monitoring Program

Item	Environmental concern	Parameters	Frequency	Location/ GPS	Responsible party
Production Phase					
1.	Air Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing) (factory premises)	Ammonia, Particulate, Chlorine, Formaldehyde, VOCs, Carbon disulfide, Hydrogen sulfide	once/every six months, 5 points	Location (1) Inside the knitting factory: 21˚ 18' 01.09" N 95˚ 26' 29.79" E Location (2) Inside the finishing factory: 21˚ 18' 01.05" N 95˚ 26' 27.74" E Location (3) Inside the garment factory: 21˚ 18' 01.07" N 95˚ 26' 25.42" E Location (4) Near boiler house: 21˚ 18' 02.73" N 95˚ 26' 25.80" E Location (5) Near office: 21˚ 17' 59.50" N 95˚ 26' 30.34" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
2.	Noise Level (Referred to NEQEG 1.3 General Guidelines)	dB(A)	once/month, 12 points	Location (1) Garment Workshop-1: 21°18'00.32" N 95°26'25.43" E Location (2) Garment Workshop-2: 21°18'00.90" N 95°26'25.38" E Location (3) Garment Workshop-3: 21°18'01.59" N 95°26'25.37" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				Location (4) Garment Workshop-4: 21°18'00.26" N 95°26'24.92" E Location (5) Knitting Workshop-1: 21°18'00.48" N 95°26'29.79" E Location (6) Knitting Workshop-2: 21°18'00.86" N 95°26'29.76" E Location (7) Knitting Workshop-3: 21°18'01.37" N 95°26'29.77" E Location (8) Knitting Workshop-4: 21°18'00.85" N 95°26'29.75" E Location (9) Finishing Workshop-1: 21°18'00.27" N 95°26'28.11" E Location (10) Finishing Workshop-2: 21°18'00.33" N 95°26'27.25" E Location (11) Finishing Workshop-3: 21°18'01.65" N 95°26'27.17" E Location (12) Finishing Workshop-4: 21°18'01.88" N 95°26'28.02" E	
3.	Effluent Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	5 days Biological oxygen demand, Adsorbable organic halogens, Ammonia, Cadmium, Chemical oxygen demand, Chromium (hexavalent),	once/every six months, one point	Water Hyacinth Wastewater Treatment pond (WHWWTP): 21° 17' 59.36" N 95° 26' 19.16" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

		Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide, Temperature increase, Total coliform bacteria, Total nitrogen, Total phosphorous, Total suspended solids, Zinc			
4.	Soil Quality (Referred to WHO suitable soil quality standard)	pH, Texture, Organic matter %, Phosphorous (P ppm), Nitrogen (N ppm), Potassium (K ppm), Calcium (Ca ppm), Sodium (Na ppm), Magnesium (Mg ppm)	once/six months, one point	Cultivated land: 21° 17' 59.81" E 95° 26' 12.61" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
5.	Solid waste	Rules and regulations issued by MONREC and the local township development committee.	once/six months, two points	Residential Area: 21° 17' 49.70" N 95° 26' 17.55" E Factory Area: 21° 17' 58.68" N 95° 26' 19.70" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
6.	Shallow well/Surface water quality (Referred to WHO drinking water Standard)	Total alkalinity, Turbidity, pH, Electrical Conductivity, Biochemical Oxygen Demand, Dissolved Oxygen, Chemical Oxygen Demand, Ortho-Phosphorus, Water Temperature,	once/every six months, one point	Well water near Taungtha creek: 21° 17' 42.69" N 95° 26' 28.46" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry.

		Total Dissolved Solid, Calcium, Magnesium (Mg), Potassium (K), Sodium (Na), Ammonium Nitrogen (NH_3-N), Sulphate (SO_4), Nitrate (NO_3), Hardness, Chloride (Cl), Fluoride (F), Copper (Cu), Lead (Pb), Mercury (Hg), Color			
7.	Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health	Once/every six months, 9 points	1. Knitting Workshop: N 21°18'00.48" E 95°26'29.79" 2. Finishing Workshop: N 21°18'00.27" E 95°26'28.11" 3. Garment Workshop: N 21°18'00.32" E 95°26'25.43" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
8.	Traffic Management	Myanmar Police Act	Once/every six months, one point	Infront of the factory, Meikhtilar-Myingyan Road: N 21° 17' 59.40" E 95° 26' 33.92"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

9.	Emergency Response Plan	Natural disaster management law (2013)	once/every six months, 11 points	1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
10.	Fire Management	Natural disaster management law (2013),	Once/every six months, 11 points,	1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	
11.	Biodiversity	Flora and Fauna	Once/every six months, three points	Location 1: N 21° 18' 04.84" E 95° 26' 23.78" Location 2: N 21° 17' 59.28" E 95° 26' 17.80" Location 3: N 21° 17' 56.81" E 95° 26' 25.97"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
Decommission Phase					
1.	Air Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	Ammonia, Particulate, Chlorine, Formaldehyde, VOCs, Carbon disulfide, Hydrogen sulfide	Once/every six months, two points	Between finishing and garment departments: 21° 17' 59.28" N 95° 26' 26.53" E Between office and knitting department: 21° 17' 59.41" N	Demolishing contractor/ Environmental Consultant Company

				95° 26' 30.86" E	
2.	Noise (Referred to NEQEG 1.3 Noise Level General Guidelines)	dB(A)	Once/month, four points	1. Between finishing and garment departments: 21° 17' 59.28" N 95° 26' 26.53" E 2. Between office and knitting department: 21° 17' 59.41" N 95° 26' 30.86" E 3. Between boiler house and ground tank: 21° 18' 02.66" N 95° 26' 26.29" E 4. Between knitting department and ground tank: 21° 18' 02.66" N 95° 26' 30.42" E	Demolishing contractor/ Environmental Consultant Company
3.	Effluent Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	Biochemical Oxygen Demand (BOD), Absorbable organic halogen, Ammonia, Cadmium, Chemical Oxygen Demand (COD), Chromium (hexavalent), Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide, Temperature increase, Total coliform bacteria, Total Nitrogen, Total phosphorous, Total Suspended Solid (TS), Zinc	Once/every six months, one point	Wastewater treatment pond (WWTP): 21° 17' 59.36" N 95° 26' 19.16" E	Demolishing contractor/ Environmental Consultant Company
4.	Soil Quality (Referred to WHO suitable soil quality)	pH, Total N%, Ava P%, K%, Ca%, OM%,	Once/every six months, one point	Cultivated land: 21° 17' 59.81" E 95° 26' 12.61" E	Demolishing contractor/

		Exchangeable Na, Exchangeable Mg.			Environmental Consultant Company
5.	Biodiversity	Flora and Fauna	Once/every six months, three points	Location 1: N 21° 18' 04.84" E 95° 26' 23.78" Location 2: N 21° 17' 59.28" E 95° 26' 17.80" Location 3: N 21° 17' 56.81" E 95° 26' 25.97"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

1.11. Conclusion and Recommendation

1.11.1. Conclusion

The present study focused on No. (10) Textile Mill (Taungtha) located in Taungtha Township, Myingyan District, Mandalay Region. The factory has an annual production capacity of 1.2 million pieces of knitted fabrics and has been operating for over 20 years. The total investment in the factory is 2280.878 million Kyats.

The study was undertaken by IIC Company to compile, collect, validate, and describe primary and secondary environmental data to produce environment verification from April 2020 to April 2025. The study was conducted to meet the Environmental Conservation Department's requirements and reviews and was generated based on the National Environmental Quality Emission Guideline (NEQEG) 2.3.2.1 values for Textile Manufacturing. In addition, NEQEG 1.3 Guideline value (Noise) was applied.

Air Quality: Air quality was observed inside the factory compound. Particulate matter PM_{10}, $PM_{2.5}$ and Volatile Organic Compound (VOCs) met the air quality guidelines for NEQEQ 2.3.2.1 Textile Manufacturing.

Water Quality: As per the water analysis report, it is understandable that the quality of shallow well water is not suitable for drink.

Soil Quality: The soil may still need extra nourishment for agricultural use.

Odor: The factory doesn't emit any odor into the surrounding areas.

Effluent Quality: The factory had stopped operating some sections and the effluent quality analysis was unable to be conducted.

Noise environment: When 100 sewing machines are working simultaneously, noise mitigation measures need to be taken regularly.

Impact on Biodiversity: No protected areas lie in the study area, and neither endangered nor rare threatened plant nor animal species were observed within a 2-mile diameter area of the factory.

Socioeconomic environment: The socio-economic benefits of the factory are prominent, creating jobs for local people, followed by secondary effects, which create opportunities for small and medium businessmen, grocery sellers, retail shops, and more.

Risk Assessment: The study conducted a risk assessment to determine the risk factors and hazard identifications. An effective Disaster Management Plan (DMP) to mitigate the risks involved has been prepared.

Environmental Management Plan (EMP): EMP for effective management of environmental impacts and ensuring overall protection of the environment through appropriate management procedures has been recommended in the report. The amount shall be marked procurement of air and water pollution control devices, noise pollution control, strengthening health safety and environment (HSE) team, green belt zone development, disaster management training, monitoring, multimedia filtration system installation, etc. Budget for mitigation measures for EMP shall be allocated 14 million MMK per year in which spending for the provision of PPE becomes crucial. The factory is aligned with EMP mitigation measures, maintaining greenbelt growth to conserve nature.

Public Consultation: All the test results are disclosed in public consultation meeting. The request arising from public consultation is to create more jobs and green belt zone.

Disaster Management Plan: An effective Disaster Management Plan (DMP) to mitigate the risks involved has been prepared. Training exercises will be held to ensure that all personnel are familiar with their responsibilities and that communication links are functioning effectively.

Monitoring Program: The HSE team associated with Environmental Consultancy Company will be responsible for the environmental monitoring program and emergency response plan in an all-inclusive manner. The sampling and analysis of the environmental attributes will be as per the guidelines of ECD. Annually, the monitoring program will cost 15 million MMK per year with 6 months reporting system for five consecutive years.

Corporate Social Responsibility (CSR): Taungtha factory has been participating in traditional activities such as Warso and Kathina robe offerings to the monasteries in nearby villages, Myanmar New Year (Thingyan festival) celebration, providing schools books and uniform to the local communities, and strong involvement in Hepatitis B vaccination program and Covid-19 vaccination program voluntarily. It was clearly evident that much of these activities had a national character encapsulated within them.

No. (10) Textile Mill (Taungtha) commits to spend 2% of income revenue for CSR program in compliance with environmental conservation regulation. As per government financial regulation, factory needs to apply budget allocation to the Ministry of Industry one year ahead.

(c) Social-Economic Contribution

The factory has employed a total of 325 persons for the various job profiles in different sections. Some of those are semi-skilled workers and unskilled workers from nearby townships.

(d) Environmental Activities Contribution

The factory is committed to implementing EMP mitigation measures such as maintaining greenbelt growth to conserve nature. In order to fulfill the partial requirement of EMP, Taungtha factory plans to implement an agroforestry system, which involves planting a mix of trees and vegetables in the tropical zone. Taungtha factory is committed to launching this program in collaboration with local farmers and the Dry Zone Greening Department, implementing it in phases. Initially, the factory will start by planting one acre of mango trees interspersed with beans. The following year, the plan is to expand to two acres, and over the next three years, an additional three acres will be established. The agroforestry system is expected to benefit both the Taungtha factory and the

surrounding local communities. By establishing this system, both parties can enhance biodiversity, improve soil health, diversify income streams for farmers, and contribute to climate change mitigation through carbon sequestration in trees. The program is set to begin in 2027-2028 fiscal year, contingent upon securing financial support from the Ministry and Government.

The factory's strong commitment to implementing the three R's program for waste minimization and conservation of natural resources is also noteworthy. It's important to continue such efforts towards sustainability and environmental protection.

Positive Impacts: Most of the stakeholders who joined the factory benefit from jobs, social security insurance systems, and housing. In addition to that, the factory generates employment opportunities some through direct employment and more so indirectly through services for the plant.

Conclusion: No. (10) Textile Mill (Taungtha) has been a key player in meeting the national textile demand for the past 15 years. While the factory has had some small impacts, it has made significant efforts to ensure that its operations are sustainable and beneficial to the local community. To continue this positive trend, it's essential to monitor the factory's activities over its long-life span and implement an effective environmental management plan. The factory's commitment to an all-inclusive CSR program is a commendable effort that should be continued and expanded. By taking suggested mitigation measures and implementing an environmental management plan, the factory can significantly reduce its impact on the environment while continuing to benefit the surrounding communities. Therefore, it can be concluded that the No. (10) Textile Mill (Taungtha) will have manageable impacts on the environment, ensuring a sustainable future for all.

1.11.2. Recommendations

In order to comply with Myanmar Environmental Conservation Law, as State Own Enterprise, No. (10) Textile Mill (Taungtha) should implement the EMP objectives in support of No. (3) Heavy Industrial Enterprise, Ministry of Industry. Monitoring, capacity building and budget allocation are inevitable to achieve the EMP objectives.

1.12. Commitments

The factory promises to implement the following commitments.

Chapter 2

No.	Name of Commitment	Description About Commitment	Refer to
1.	EMP Criteria	The factory and the consultancy company promise to fulfill all the criteria of the EMP report.	Chapter 2 Article 2.2

Chapter 3

No.	Name of Commitment	Description About Commitment	Refer to
1.	Commitments of Project Developer, No. (10) Textile Mill (Taungtha)	Comply with the commitments of the environmental and socio-economic development revealed in the Environmental Management Plan report.	Chapter 3 Article 3.4.1
		Acknowledgement and compliance with the laws, regulations, and guidelines associated with the factory, included in the report.	Chapter 3 Article 3.4.1
		Comply and proceed with the alternative methods, mitigation measures, and monitoring plans included in the report for the reduction of the negative environmental impacts; and take responsibility for the environmental impacts due to non-compliance of the commitment.	Chapter 3 Article 3.4.1
		Give priorities for the occupational health and safety of the workers.	Chapter 3 Article 3.4.1
		Utilize the exact amount of funds as stated in the proposed expenditure for corporate social responsibility (CSR) funds.	Chapter 3 Article 3.4.1
		Take responsibility for all of the work and absence of the contractors, sub-contractors, officers, and representatives of the company in operating processes.	Chapter 3 Article 3.4.1
		Take responsibility for support after discussion with the affected people to ensure their stable livelihoods are not lower than before the project; and resettlement and rehabilitate the impacted local people, government organizations, and other related people and organizations.	Chapter 3 Article 3.4.1

		Follow the environmental commitments, mitigation measures, and management plans illustrated in the EMP report. We also commit to follow the Environmental Conservation Laws 2012, Environmental Conservation Rules 2014 as stated in EIA, and International Laws related to environmental conservation.	Chapter 3 Article 3.4.1
		We, No. (10) Textile Mill (Taungtha) commit to comply with occasionally issued laws, procedures, regulation, instructions and orders set forth by MONREC and State. The proponent has signed a pledge to abide by these rules, and failure to do so may result in legal consequences.	Chapter 3 Article 3.4.1
2.	Commitments of the Environmental Assessment Practitioner	The EMP has been designed in compliance with the National Constitution, Environmental Conservation Law, EIA Procedures, the National Environmental Quality Emission Guidelines (NEQEG), and International Convention, Law, and Guidelines.	Chapter 3 Article 3.4.2.
		Beside the above guidelines, this EMP report also adheres to existing labor laws and amendment, occupational health and safety laws, rules, and procedures.	Chapter 3 Article 3.4.2.
		The environmental impact protection procedures in this report aim to assist the project proponent in avoiding incidents, mitigating their effects, and replacing any damage caused. The proponent is committed to following these procedures. This Environmental Management Plan has been systematically designed to address not only environmental impact protection procedures and occupational safety and health but also emergency management planning and social welfare programs.	Chapter 3 Article 3.4.2.
		All the facts and data presented in this report have been systematically surveyed in the project area without bias and are authentic. As a third party, we take full responsibility for all facts mentioned in this report	Chapter 3 Article 3.4.2.

Chapter 4

No.	Name of Commitment	Description of Commitment	Refer to
1.	Production process	Currently, the factory has stopped operating and if it runs in the future, the factory promises to follow rules and regulations regarding with the conservation of natural environment.	Chapter 4. Article 4.13
2.	Wastewater Treatment Plant	A multimedia filtration system would be installed and treated effluent from the wastewater treatment plant would be treated to improve the biological, chemical and physical properties of the effluent and to prevent any negative impact on the environment. Wastewater discharge would be monitored and treated in accordance with the NEQEG 2.3.2.1 Textile Manufacturing guideline values.	Chapter 4 Article 4.18
3.	Reducing Green House Gas (GHG) Emission	The factory is committed to reducing its greenhouse gas (GHG) emissions by implementing energy efficiency initiatives, increasing renewable energy use, and improving operations.	Chapter 4 Article 4.19

Chapter 5

No.	Name of Commitment	Description About Commitment	Refer to
1.	Water quality	The factory guarantees that its operations will not affect the quality of surface water. Any waste discharged from the premises is only goes into the wastewater treatment pond. There will be no discharged of any effluent from the treatment pond.	Chapter 5 Article 5.6
2.	Air quality	All the boilers are shut down due to the lack of work order to the factory. Regular boiler inspection works will be performed with boiler inspector when the factory operates again in the future.	Chapter 5 Article 5.7
3.	Soil quality	The factory doesn't dispose of any hazardous material into the soil.	Chapter 5 Article 5.8
4.	Effluent quality	The factory uses bleach and dyes in its finishing process, and there is no discharge of treated effluent from the wastewater treatment pond to nearby areas. When the factory operates again in the future, a multimedia filtration system must be installed and treated wastewater will be treated again in this system to comply with the NEQEG effluent quality guidelines for textile manufacturing.	Chapter 5 Article 5.9
5.	Noise	There are 100 sewing machines at the garment workshop. The factory will prioritize the safety and well-being of its employees and take significant steps to reduce noise	Chapter 5 Article 5.11

		levels in compliance with NEQEG 1.3 noise level guideline values.	
6.	Biodiversity	The factory's operations will not impact the nearby ecosystem. Myanmar's Environmental Law regarding biological conservation and management, issued by the Ministry of Natural Resources and Environmental Conservation (MONREC), will be adhered to in order to protect biodiversity and reduce negative effects.	Chapter 5 Article 5.12
7.	CSR fund	The factory has pledged to allocate 2% of its income revenue towards its CSR program.	Chapter 5 Article 5.13
8.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 5 Article 5.13

Chapter 6

No.	Name of Commitment	Description about Commitment	Refer to
1.	Impacts and mitigation	The factory and consultancy company are determined to preserve the natural environment by significantly reducing their environmental impact and proactively mitigating any unavoidable impacts resulting from their operations.	Chapter 6
2.	Surface and ground water contamination	The factory and consultancy company take active measures to preserve the natural environment and significantly reduce environmental impact and take proactive steps to mitigate any unavoidable impacts resulting from factory's activities. The effluent would be closely monitored and treated in strict compliance with NEQEG 2.3.2.1 textile manufacturing effluent guideline values. This is not only a responsible approach to environmental preservation, but also a legal obligation that must be upheld.	Chapter 6. Article 6.4.1 Article 6.4.2
3.	Air emission	The factory will perform mitigation measures to reduce or minimize the impact on air quality, if any.	Chapter 6 Article 6.4.3
4.	Noise	The factory will consider to improve the machine design to make the noise reduction if high noise occurs due to the result of all the machines running at the same time.	Chapter 6 Article 6.4.4
5.	Soil	Although the factory uses bleach and dyes in the production process, effluent is discharge only into the treatment pond and treated. Treated effluent are drained into nearby areas. Therefore, soil quality will not be affected by the activities of the factory.	Chapter 6 Article 6.4.5

6.	Odor	There will be no discharge of untreated waste (gaseous and liquid) on land or in air or to any water body, there are no visual adverse impacts made by the factory.	Chapter 6 Article 6.4.7
7.	Occupational Health and Safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 6 Article 6.4.8
8.	Biodiversity	Small numbers of the population of species might be affected by the activities of the factory. The factory will fulfill all of the mitigation measures to conserve the nature of the environment.	Chapter 6 Article 6.4.9
9.	Road traffic	The factory prepares and maintains readiness for implementing an emergency rescue plan to road accidents.	Chapter 6 Article 6.4.10
10.	Solid waste disposal	The factory will fulfill all of the mitigation measures in disposal of solid wastes.	Chapter 6 Article 6.4.11

Chapter 7

No.	Name of Commitment	Description About Commitment	Refer to
1.	Risk Assessment	The factory and the consultancy company are fully dedicated to achieving all the objectives outlined in the risk assessment study.	Chapter 7 Article 7.1

Chapter 8

No.	Name of Commitment	Description about Commitment	Refer to
1.	Public consultation	The factory and consultancy company have made a firm commitment to collect data without any bias, which includes information on socio-economic, biodiversity, and governing parameters during the survey. It's also confirmed that they have taken a rigorous approach to sourcing all secondary data from local administrative offices to ensure reliability. Moreover, the HSE team's full responsibility for monitoring the outcome of the public consultation is praiseworthy.	Chapter 8 Article 8.3.

Chapter 9

No.	Name of Commitment	Description about Commitment	Refer to
1.	EMP	The factory and the consultancy company will fulfill all of the institutional requirements to organize the HSE team.	Chapter 9 Article 9.1
2.	HSE team's duty and responsibility	HSE team will perform all of the responsibilities of the HSE team, will fulfill the objectives of the emergency response	Chapter 9 Article 9.1.1

		team, and will perform the entire sub environmental management plans, i.e., air quality, high noise level, effluent, soil contamination, solid waste, occupational health and safety and traffic management plans, emergency response sub plan, fire management sub plan.	
3.	Effluent management plan	Currently the factory has ceased the operation due to some situations. If the factory operates again in the future, a proper multimedia filtration system must be installed. The effluent will be treated in WHWWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WHWWTP will be filtered again in multimedia filtration system before discarding to the nearby area. Monitoring and mitigation measures would be implemented.	Chapter 9 Article 9.5.4
4.	Estimated cost	As a state own factory, it has a policy that says 2% of income revenue will be kept as fund CSR expenses for the environmental mitigation measures. The factory needs to ask for budget allocation from the government if the fund doesn't cover the cost for mitigation measures.	Chapter 9 Article 9.6
5.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 9 Article 9.10

Chapter (10)

No.	Name of Commitment	Description about Commitment	Refer to
1.	Monitoring	The factory and the consultant company commit to accomplish the monitoring program.	Chapter 10 Table: 10.2-1
2.	Air quality	Air quality will be monitored and if any, the factory will engage the source of impact to mitigate the pollution and prevent further environmental damage.	Chapter 10 Table: 10.2-1
3.	Noise level	Mitigation plans for high noise level will be fulfilled by the factory.	Chapter 10 Table: 10.2-1
4.	Well water quality	The quality of shallow well water will not be affected by the activities of the factory because there is no direct disposal of wastewater into the environment.	Chapter 10 Table: 10.2-1
5.	Effluent and treated wastewater	Currently, the factory has stopped operating and when it resumes operation, a multimedia filtration system needs to be installed. The effluent from the factory will firstly be treated in WWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WWTP will be filtered again in multimedia filtration system in order to improve the biological, physical and chemical qualities of the treated	Chapter 10 Table: 10.2-1

		effluent before discarding to nearby area. Mandatory mitigation measures would be implemented.	
6.	Soil quality	The factory will monitor soil quality in nearby cultivated land and make sure the soil quality won't be affected by the activities of the factory.	Chapter 10 Table: 10.2-1
7.	Solid waste management	Disposal of solid waste will follow the rules and regulations issued by MONREC and the local township development committee.	Chapter 10 Table: 10.2-1
8.	Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 10 Table: 10.2-1
9.	Traffic management plan	Traffic management plan will be performed with HSE team due to accident records.	Chapter 10 Table: 10.2-1
10.	Emergency response sub plan	Emergency response sub plan will be carried out HSE team under the guidance of Incidents commander/ factory general manager.	Chapter 10 Table: 10.2-1
11.	Fire management sub plan	Fire management sub plan will be implemented by HSE team members.	Chapter 10 Table: 10.2-1

Chapter 2

Introduction

Chapter (2)

Introduction

2.1. Background History

Factory Name : No. (10) Textile Mill (Taungtha)

Factory Filing Company : No. (10) Textile Mill (Taungtha)

The purpose of the project is to boost the domestic knitted fabrics production, encourage local production for local consumption as import substitution items, create jobs for the local people and contribute socio-economics development of the region.

The Environmental Conservation Law of 2012 mandates that developers must create an Environmental Management Plan (EMP), Initial Environment Examination (IEE), or Environmental Impact Assessment (EIA). These documents are essential for evaluating the potential environmental impacts of their projects and addressing how to reduce or minimize those effects on both the environment and local communities.

The Industry and Infrastructure Consultancy Company Limited, IIC Company has prepared the EMP report to evaluate the potential environmental impacts of the proposed project and to formulate measures to protect the environment during the construction, operation, and decommissioning phases to reduce its impact. An Environmental Management Plan (EMP) is required to obtain environmental approvals from the Environmental Conservation Department (ECD), which is the government agency responsible for this process. The development must comply with the Environmental Conservation Law (2012), and an assessment of the environmental impacts related to the project is necessary following the Environmental Impact Assessment (EIA) procedures established in 2015.

Table: 2.1-1. Details information of the project

No	Content	Description
1.	Project/ Factory	No. (10) Textile Mill (Taungtha)
2.	Type of work	Knitting, Dyeing, and Garment Manufacturing
3.	Location	No. (10) Textile Mill (Taungtha) is located 1.3 miles away from Taungtha Town.
4.	Project/Factory	No. (3) Heavy Industrial Enterprise,

	Owner, Address	Ministry of Industry, Office No. (38), Naypyitaw, Ph: 09254558888
5.	Investment	2280.878 million kyats
6.	Investment Type	State Own Enterprise
8.	Contact Person	U Kyaw Naing General Manager No. (10) Textile Mill (Taungtha) Taungtha Township, Myingyan District, Mandalay Division Ph: 09 7310587
8.	Email	kn7310587@gmail.com

Table: 2.1-2. Detail information of IIC company limited

No.	Name	Occupation
1.	U Khin Maung Tint Permanent Secretary (Retired), Ministry of Industry	Chairman
2.	Dr. Cho Win Maw Managing Director (Retired), Ministry of Industry, Deputy Chairman, Myanmar Engineering Council,	Senior Consultant
3.	U Zaw Hein Permanent Secretary (Retired), Ministry of Health and Sports	Auditor
4.	U Mg Mg Toe Managing Director (Retired), Ministry of Industry	Treasurer
5.	U Thaung Myint Deputy Director General (Retired), Ministry of Industry	General Secretary
6.	Dr. Aung Kyaw Soe Managing Director (Retired), Ministry of Industry	Senior Consultant
8.	U Tun Myint Deputy Permanent Secretary (Retired), Ministry of Industry	Secretary Pharmaceuticals, Foodstuff, Environmental Sector
8.	U Min Sein Deputy General Manager (Retired), Ministry of Industry	Secretary Civil, Electrical, Mechanical Sector
9.	U Hla Htay General Manager (Retired), Ministry of Industry	Secretary Machine Installation Sector
10.	U Thein Lwin General Manager (Retired), Ministry of Industry	Secretary Textile & Garment Sector
11.	U Khin Maung Tun General Manager (Retired), Ministry of Industry	Secretary Electrical Safety, SME Sector
12.	U Kyaw Zaw	Secretary

	Assistant General Manager (Retired), Ministry of Industry	Admin, Marketing Sector
13.	U Myo Thaw Deputy Permanent Secretary (Retired), Ministry of Industry	Director
14.	U Mg Mg Myint Manager (Retired), Ministry of Industry	Director
15.	U Toe Lwin General Manager (Retired), Ministry of Industry	Director
16.	U Aye Lwin Assistant General Manager (Retired), Ministry of Industry	Director
18.	U Win Ko Ko General Manager (Retired), Ministry of Industry	Director
18.	U Maw Hein Factory Manager (Retired), Ministry of Industry	Director
19.	U Than Win Assistant General Manager (Retired), Ministry of Industry	Director
20.	U Tin Aung Director (Retired), Ministry of Industry	Director
21.	U Sein Win Factory Manager, Ministry of Energy	Director
22.	Daw Amayi Manager (Retired), Ministry of Industry	Director

Table: 2.1-3. Detail information of EMP core working group of IIC company limited

Sr. No	Name/Designation	Degree	Expertise	Responsibility
1	<u>Team leader</u> Dr. Aung Kyaw Soe Senior Consultant EIA AC 056/2023 IIC Co., Ltd EIA-CO (B) 007/2024	Doctor of Engineering (Material Science), Kyoto Institute of Technology, Japan B.E (Textile), Professional Engineer P.E. 1140 Myanmar Engineering Council ASEAN Chartered Professional Engineer ACPE 05982/MM	-Water Pollution Control, Conservation, Monitoring, and Impacts, -Solid Waste Management and Hazardous Waste Management,	Factory Survey, Data Collection, Public Consultation, <u>Report Writing Author</u> Executive summary, Chapters (1), (2), (3), (4), (5), (6), (7), (9), (10), (11)

2	U Thaung Myint General Secretary EIA AC 074/2023 IIC Co., Ltd EIA-CO (B) 007/2024	B.E (Petroleum)	-Solid Waste Management and Hazardous Waste Management,	Factory Survey, Data Collection, Public Consultation, Report writing Co-author Chapter (5)(7)
3	U Tun Myint Secretary EIA AC 058/2023 IIC Co., Ltd EIA-CO (B) 007/2024	B.Sc. (Zoo)	- Biodiversity	Factory Survey, Data Collection Public Consultation, Report writing Co-author Chapters (5), (8), (10)

Table: 2.1-4. Contact address

Company Registration No	102588584
Address	Azarnibeikhman Street, Shwenathar Lane, East Shwedagon Stair Way, Bahan Township, Yangon Region
Ph No.	09-449611190
email	draungkyawsoetex@gmail.com
Contact Person	Dr. Aung Kyaw Soe Director / Senior Consultant

2.2. EMP

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

The EMP report will contain:

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

(b) Identification and evaluation of positive and negative impacts due to the development of the project.

(c) Proposed pollution control measures, environmental management plan (EMP) to be adopted for mitigation of adverse impacts;

(d) Measures for the improvement of the community around the area, and

(e) Post-project environmental quality monitoring program.

2.3. Scope of the EMP Study

This EMP report will cover No. (10) Textile Mill (Taungtha). Firstly, the need for the project, the need for the EMP report, objectives and scope of the EMP report are described. Then, laws and regulations related to the EMP study are described. After that, methodologies for EMP study, data collection system, and public participation process are described. Then, anticipated environmental, social, and health impacts, and mitigation/enhancement measures in the operation and decommissioning phases are reported. Finally, an environmental management system, environmental monitoring program, occupational health and safety management plan, emergency control plan, disaster response plan, and CSR program in the last section are stated.

2.4. Commitment

The factory promises to implement the following commitments.

Table: 2.4-1. Commitment

No.	Name of Commitment	Description about Commitment	Refer to
1.	EMP Criteria	The factory and the consultancy company commit to fulfill all the criteria of the EMP report.	Chapter 2 Article 2.2

Chapter 3
Policy, Legal and Institutional Framework

Chapter (3)

Policy, Legal and Institutional Framework

3. Introduction

The No. (10) Textile Mill (Taungtha), one of the leading knitted factories in Myanmar, proudly upholds its own robust environmental policy. The IIC Co., Ltd seamlessly aligns its operations with the factory's commitment to environmental and social responsibility, ensuring compliance with both Myanmar's regulatory standards and international conventions, guidelines, and best practices. This chapter outlines the essential legal and policy framework, highlighting the environmental and social standards that the factory must adhere to. By committing to these internationally recognized standards, the factory demonstrates its dedication to ethical practices and sustainability.

3.1. National Requirements

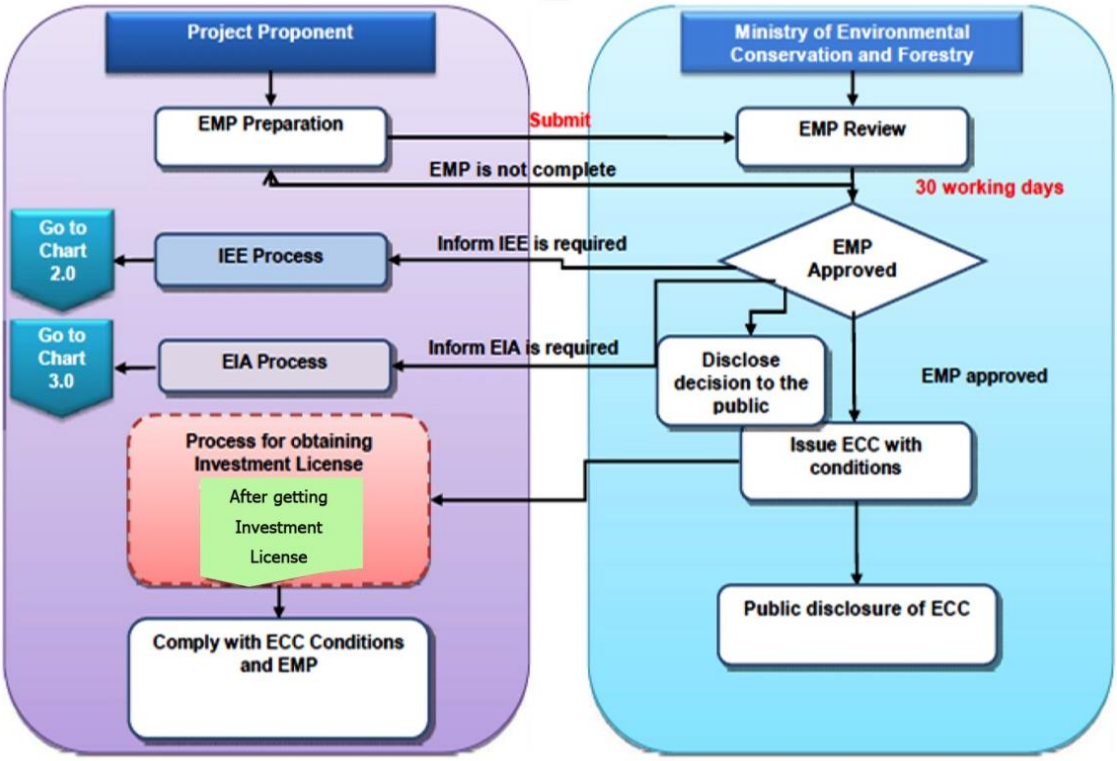
To effectively implement the National Environmental Policy and significantly boost environmental conservation efforts, regional and district-level environmental conservation offices have been established in all states since 2013. These offices play a crucial role in safeguarding the natural resources for future generations.

The Environmental Management Plan (EMP) has been undertaken in accordance with the Environmental Impact Assessment Procedure which was promulgated on December 29th, 2015, and provides legislation for environmental and social governance of economic development in Myanmar under the Environmental Conservation Law 2012 and Environmental Conservation Rule 2014 of the National Environmental Policy for Myanmar 1994.

In addition, the EMP assessment was undertaken by National Environmental Quality (Emission) Guidelines (NEQEG) promulgated on December 29th, 2015. The Guidelines are largely based on the International Finance Corporation (IFC), Environmental Health and Safety (EHS) Guidelines, and provide the basis for regulation and control of various environmental parameters, including noise and

vibration, air emissions, and effluent discharges. In this study, NEQEG 2.3.2.1 Textile Manufacturing, and NEQEG 1.3 General Guideline (Noise) were applied to conduct effluent quality, air quality, and noise. Moreover, the WHO drinking water standard was applied to the treated water quality analysis. An overview of the process (From the EIA Procedure) is shown in Figure 3.1-1.

Figure: 3.1-1. EMP Review and approval process



3.2. Project Proponent's Environmental, Social, and Health Policies

The National Commission of Environmental Affairs (NCEA) was formed in 1990. Myanmar agenda-21 contains social, economic, institutional, and infrastructural improvement programs that were outlined and most of them are environmental conservation programs.

The main policy and commitment of No. (10) Textile Mill (Taungtha) will be identified in the following points:

- The protection of public safety, the health and safety of the workforce, and the local communities;

- The protection and promotion of human rights, the economic and social development of local communities;
- Since its establishment, the factory has always adhered to the principle of maintaining equal emphasis on production management and environmental protection;
- Follow the concept of scientific development, strengthen environment protection, reduce emission efforts, and work hard to achieve effective results.

3.3. Sustainability Policy of the Factory

The sustainability model of the factory is "to operate sustainably means to create value for stakeholders, and to use resources so that the needs of future generations will not be compromised, respecting people, the environment and the society as a whole." Taungtha factory adheres to a sustainability policy, which is composed of the following principles:

- *Stakeholder relations* – "Engaging stakeholders and involving them in the company's business are both prerequisites for sustainability and for the construction of reciprocal value."
- *Human Rights* – "The respect of Human Rights represents the basis for an inclusive growth of societies, of the territories and, consequently, of the companies that work there."
- *Relations with communities and contribution to local development* – "Dialogue, the respect of local communities, the evaluation of impacts" are all preconditions for effective cooperation, targeted at creating territorial value."

3.4. Statement of Commitments

No. (10) Textile Mill (Taungtha) and IIC Co., Ltd together confirm that:

(1) The EMP Report is accurate, consolidated, and complete.

(2) The EMP has been conducted under relevant laws, including the EIA Procedure (2015).

(3) The factory will fully follow the commitments, mitigation measures, and plans set out in this EMP Report.

3.4.1. Commitments of Project Developer, No. (10) Textile Mill (Taungtha)

No. (10) Textile Mill (Taungtha) commits to comply with the following:

a) Comply with the commitments of the environmental and socio-economic development revealed in the Environmental Management Plan report.

b) Acknowledgement and compliance with the laws, regulations, and guidelines associated with the factory, included in the report.

c) Comply and proceed with the alternative methods, mitigation measures, and monitoring plans included in the report for the reduction of the negative environmental impacts; and take responsibility for the environmental impacts due to non-compliance of the commitment.

d) Give priorities for the occupational health and safety of the workers.

e) Utilize the exact amount of funds as stated in the proposed expenditure for cooperate social responsibility funds.

f) Take responsibility for all of the work and absence of the contractors, sub-contractors, officers, and representatives of the company in operating processes.

g) Take responsibility to support after discussion the impacted people to ensure their stable livelihoods are not lower than before the project; and resettlement and rehabilitate the impacted local people, government organizations, and other related people and organizations.

h) Follow the environmental commitments, mitigation measures, and management plans illustrated in the EMP report. We also commit to follow the Environmental Conservation Laws 2012, Environmental Conservation Rules 2014 as stated in EIA, and International Laws related to environmental conservation.

i) We, No. (10) Textile Mill (Taungtha) commits to comply with occasionally issued laws, procedures, regulations, instructions, and orders set forth by MONREC and the State. The proponent has signed a pledge to abide by these rules, and failure to do so may result in legal consequences.





Date: 25.5.2025

3.4.2. Commitments of the Environmental Assessment Practitioner

The EMP report was written by IIC Co., Ltd, and EMP in this report were designed according to the following criteria;

a) The EMP has been designed in compliance with the National Constitution, Environmental Conservation Law, EIA Procedures, the National Environmental Quality Emission Guidelines (NEQEG), and International Convention, Law, and Guidelines.

b) Besides the above guidelines, this EMP also adheres to current and future labor laws, occupational health and safety laws, rules, and procedures.

c) The environmental impact protection procedures in this report aim to assist the project proponent in avoiding incidents, mitigating their effects, and replacing any damage caused. The proponent is committed to following these procedures.

d) This Environmental Management Plan has been systematically designed to address not only environmental impact protection procedures and occupational safety and health but also emergency management planning and social welfare programs.

e) All the facts and data presented in this report have been systematically surveyed in the project area without bias and are authentic. As a third party, we take full responsibility for all facts mentioned in this report.



Dr. Aung Kyaw Soe

Senior Consultant, IIC Company

Date:25-5-2025

3.5. Relevant Environmental Laws and Regulations in Myanmar

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

Table: 3.5-1. Relevant environmental laws and regulations in Myanmar

No.	Laws and Regulations	Year
I	**Environmental Conservation Sector**	
1.1	Constitution of the Republic of the Union of Myanmar (SPDC Law) In the constitution, it is clearly mentioned that the natural environment shall be conserved and protected by not only the union but every citizen. Since 2015, the government has regarded the prevention and control of industrial pollution as the focal point of environmental protection. It has made great progress in this regard. Environmental-related articles are mentioned in the constitution. Chapter 1. Basic Principles Article 24. The Union shall enact necessary laws to protect the rights of workers. Article 45. The Union shall protect and conserve the natural environment. Chapter 8. Citizen, Fundamental Rights and Duties of the Citizens Article 390. Every citizen must assist the Union in carrying out the following matters: (a) preservation and safeguarding of cultural heritage; (b) environmental conservation; (c) striving for the development of human resources; (d) protection and preservation of public property	2008
1.2	Environmental Conservation Law (Pyidaungsu Hluttaw Law No. 9) Myanmar is confronted with the dual task of developing the economy and protecting the environment. Based on the conditions, Myanmar has, in the process of promoting its overall modernization program, made environmental protection one of its basic national policies, and carried out throughout the country large-scale measures for pollution prevention and control as well as ecological environment protection. Chapter II. Objectives Article 3. The objectives of this Law are as follows: (a) to enable to implement the Myanmar National Environmental Policy;	2012

	(b) to enable to lay down the basic principles and give guidance for systematic integration of the matters of environmental conservation in the sustainable development process; (c) to enable the emergence of a healthy and clean environment and to conserve natural and cultural heritage for the benefit of present and future generations; (d) to reclaim ecosystems as may be possible which are starting to degenerate and disappear; (e) to enable management and implementation for the decrease and loss of natural resources and allow the sustainable use beneficially; (f) to enable to implementation for promoting public awareness and cooperation in educational programs for dissemination of environmental perception; (g) to enable to promote international, regional, and bilateral cooperation in matters of environmental conservation; (h) to enable cooperation with Government departments, Government organizations, international organizations, non-government organizations, and individuals in matters of environmental conservation. Chapter VI Environmental Quality Standards Article 10. The Ministry may, with the approval of the Union Government and the Committee, stipulate the following environmental quality standards: (a) suitable surface water quality standards in the usage in rivers, streams, canals, springs, marshes, swamps, lakes, reservoirs and other inland water sources of the public; (b) water quality standards for coastal and estuarine areas; (c) underground water quality standards; (d) atmospheric quality standards; (e) noise and vibration standards; (f) emissions standards; (g) effluent standards; (h) solid wastes standards; (i) other environmental quality standards stipulated by the Union Government.	
1.3	Environmental Conservation Rules (Rules 55,69 (a), (b))	2014
1.4	EIA Procedures (Refer to Article 102 to 110, 113,115,118)	2015
1.5	National Environmental Quality (Emission) Guidelines	2015

	As a reference for the Textile Manufacturing Process, NEQEG values are stated below. 2.3.2 Garments, Textile and Leather Products 2.3.2.1 Textiles Manufacturing This guideline applies to textile manufacturing using natural fibers, synthetic fibers (made entirely from chemicals), and regenerated fibers (made from natural materials by processing these materials to form a fiber structure). It does not include polymer synthesis and natural raw material production. Effluent Levels Air Emission Levels	
II	**National Planning and Economic Development Sector**	
2.1.	Law Amending the Myanmar Investment Law 2016 (Pyidaungsu Hluttaw Law No. 19)	2019
2.2.	Myanmar Investment Rules (Rule No. 202,203,206,212)	2017
2.3	Myanmar Special Economic Zone Law (Pyidaungsu Hluttaw law No.1) When SEZs start functioning in the respective regions, environmental conservation needs to be performed. The expressions are as below: **Chapter 5.** **Article 11.** The functions and duties of the Management Committee are as follows: (d) supervising and carrying out inspection on the development matters of the Special Economic Zone such as implementation of the investment and development projects, land use, environmental conservation, education, health, finance, taxation, municipality, transportation, communication, security, electricity, energy and water supply, and coordinating with the relevant governmental organization departments and organization; (p) supervising and ensuring compliance with the existing laws relating to the conservation and protection of natural environment, scrutinizing the industrial waste disposal system from the factory, ensuring in conformity with the stipulations to the developer or investor in the Special Economic Zone;	2014

III	Industrial Sector	
3.1	The Export and Import Law (Pyidaungsu Hluttaw Law No. 18) Refer to Section 5,6)	2012
3.2	The Law Amending the Factories Act 1951 (Pyidaungsu Hluttaw Law No. 12) Refer to Article 3 (a) to (g)	2016
3.3	Boiler Law (Pyidaungsu Hluttaw Law No.39) The key to success for SMEs requires the selection of an adequately sized low-emission boiler and combustion equipment that can be operated in compliance with emission standards established by the Ministry of Natural Resource and Environmental Conservation. One of the sources of air pollution is caused by air emitted by boilers. The important articles of boiler law are mentioned below: Chapter 2. Article 3. The objectives of this Law are as follows: (b) not to be damaged and lost by the state and public by preventing the risk of boiler accident (f) to enable to use of the boilers for maximum span of life and to reduce the impact on natural social health environment due to such use of boiler.	2015
3.4	Electricity Law (Pyidaungsu Hluttaw Law No.44)	2014
3.5	Private Industrial Enterprise Law (Refer to No.4, 13(b)(f)(g), 15(a), (b)) SLORC Law No.22	1990
3.6	Industrial Design Law (Pyidaungsu Hluttaw law No. 2)	2019
3.7	Trademark Law (Pyidaungsu Hluttaw Law No. 3)	2019
3.8	Patent Law (Pyidaungsu Hluttaw law No. 8)	2019
3.9	The Prevention of Hazard from Chemical and Related Substances Law (Pyidaungsu Hluttaw Law No. 28) To create good occupational health safety and environment, it is necessary to achieve zero accidents in the industry. In addition, chemical hazard needs to be prevented. **Chapter 1.** **Article 1.** This law shall be called the Prevention from Danger of Chemical and Associated Materials Law. **Article 2**. The expressions contained in this law shall have the meanings given hereunder: (c) The Chemical and the Associated Material Business means storing, altering technically, producing economically, using, importing, exporting,	2013

	transporting, keeping, distributing, buying, selling or disposing the chemical or associated material; **Chapter 2.** **Article 3.** The objectives of this law are as follows: (a) to prevent from damaging the environmental resources and from endangering the lively creatures due to the chemical and associated materials; (b) to control systematically for the safety in carrying out in accord with the approval for chemical and associated materials business; (c) to carry out the data information acquiring system and to widely do the educating and research works in order to utilize the chemical and associated materials systematically; (d) to carry out continuous development for worksite safety, health and environmental conservation. **Chapter 4.** **Article 5**: (e) To specify and announce the regulations relating to sticking of danger warning signs; (f) To specify the suitable location for the construction of a warehouse for storing chemical and associated materials and to specify the regulations relating to the warehouse;	
IV	**Cultural Heritage Sector**	
4.1	The Protection and Preservation of Cultural Heritage Regions Law (Pyidaungsu Hluttaw Law No.6) The project proponent needs to understand and abide by the law concerning the protection and preservation of cultural heritage. The important points are referred as follows: **Chapter (2)** **Article 3**. The objectives of this Law are as follows: (a) to implement the protection and preservation policy for the perpetuation of cultural heritage that has existed for many years; (b) to protect and preserve the cultural heritage regions and the cultural heritage therein so as not to deteriorate due to natural disaster or man-made destruction	2019
V	**Biodiversity and Ecology Sector**	

5.1	Forest Law (Pyidaungsu Hluttaw Law No.29)	2018
5.2	Protection of Wildlife and Conservation of Natural Areas Law (SLORC Law no. 6) Refer to Chapter 2 Article 3 (a) to (f), Chapter 11 Article 35 (c) to (f), Article 36 (c), (d)	1994
5.3	The Law Amending the Conservation of Water Resources and Rivers Law (Pyidaungsu Hluttaw Law No.11)	2016
VI	**Land Management Sector**	
6.1	Constitution of the Republic of the Union of Myanmar (SPDC Law) The Union is the ultimate owner of all lands and all natural resources above and below the ground, above and beneath the water, and in the atmosphere in the Union.	2008
6.2	Land Acquisition and Resettlement and Rehabilitation Law (Pyidaungsu Hluttaw Law No.24)	2019
6.3	Farmland Law (Pyidaungsu Hluttaw Law No.2) To tackle the land disputes in the EMP study, it is necessary to understand the Farmland law. The following are some salient points: **Chapter 1** **Article 3**. The following expressions contained in this Law shall have the meaning given here under (d) "right for farming " is defined as the State is the original owner of all lands, permitting farming in conformity with this law and bylaw, rule, and regulation of this law so that agricultural production capacity develops, excluding exploring gems, mines, petroleum, gas and natural resources below and above ground; **Chapter 8** **Article 22**: Land disputes in respect of the right for farming shall be decided by the Ward or Village Tract Farmland Management Body, after opening the case file and making actions such as enquiry and hearing about the land disputes. **Article 23**: (a) Whosoever may appeal to the respective Township Farmland Management Body against within 30 days from the date of the decision made by the Ward or Village Tract Farmland Management Body under section 22 of this law; (b) Township Farmland Management Body may approve (or) revise (or) cancel the decision made by the Ward or Village Tract Farmland Management Body; **Article 24:** (a) Whosoever may appeal to the respective District Farmland Management Body against	2012

	within 30 days from the date of the decision made by the Township Farmland Management Body in accordance with section 23 subsection (b)of this law; (b) District Farmland Management Body may approve (or) revise (or) cancel the decision made by the Township Farmland Management Body; **Article 25**: (a) Whosoever may appeal to the respective Region or State Farmland Management Body against within 60 days from the date of the decision made by the District Farmland Management Body in accordance with section 24 subsection (b)of this law; (b) Region or State Farmland Management Body may approve (or) revise (or) cancel the decision made by the District Farmland Management Body; (c) the decision made by the Region or State Farmland Management Body is final **Chapter 11** **Article 32.** In confiscating farms in the interests of the nation, it is a must to confiscate the required least measurement of the farm. It is necessary to implement projects within the prescribed period as soon as possible. If projects are terminated, farms are to be given back to the original legitimate farm owner (Person/organization) who has the right to farm. **Article 33.** Except order or summons of the Union Government or authorities appointed by the Union Government, pasture land and common village land are to remain unchanged. **Article 34**. In respect of right to do (or) right to utilize land of vacant, fallow and virgin land which was permitted by the Central Committee for the Management of Vacant, Fallow and Virgin land, for Agriculture purpose, and Livestock Poultry Farming and Aquaculture purposes, shall be considered as stable cultivated farmland under this law when crop production is stable.	
6.4	The Law Amending the Farmland Law (Pyidaungsu Hluttaw Law No.2)	2020
6.5	The administration of Vacant, Fallow and Virgin Land Law (Pyidaungsu Hluttaw Law No.10)	2012
VII	**Emergency/Disaster Sector**	
7.1	Myanmar Fire Brigades Law (Pyidaungsu Hluttaw Law No. 11)	2015

Although risk assessment will continue to become increasingly important environmental management tools, it is important to look at what the zero accident can actually be achieved and as importantly, what kinds of preparedness we need. Fire hazards are linked to some specific process or activity in particular occupancies such as spark caused by rotating parts, handling of combustible material, boiler explosion, electrical faults, arson, and bush fire. Myanmar Fire Brigades Law clarifies the fire hazardous materials and duties and responsibilities of fire brigades and reserve brigades.

Chapter I

Title and Definition

Article 1. This Law shall be called the Myanmar Fire Brigade Law.

Article 2. The following expressions contained in this Law shall have the meanings given hereunder:

(a) Fire Brigade means the Myanmar Fire Brigade formed with Fire Services Department personnel. In this expression, auxiliary fire brigade and reserve fire brigade are also included;

(b) Auxiliary Fire Brigade means the fire brigade comprising volunteers who meet the specified qualifications trained and formed by the Department of Fire Services;

(c) Reserve Fire Brigade means the fire brigade formed by the owner or manager of a factory, workshop, bus terminal, airport, port, hotel, motel, lodging, condominium, market, department, organization, or business exposed to fire hazard under the directive or permission of the Department of Fire Services;

(d) Fire safety means performing activities of fire precaution, fire prevention, and firefighting. In this expression, the performance of other safety matters is also included;

(e) Fire safety equipment means fire alarm equipment, fire detection equipment, emergency rescue equipment, fire-extinguisher, fire pump, water pump, different kinds of vehicles, different kinds of flame-resistant suits and firefighting suits, communication apparatus or any other articles that can be used in extinguishing fire. In this expression, rescue equipment used by the Fire brigade and equipment stipulated from time to time by notification by the Department of Fire Services is also included;

	(f) Fire hazardous material means inflammable materials, charcoal, coal, gas, liquefied gas, deteriorated or electricity-conducted electrical instruments, spirit, liquor, acid, cotton and cotton-based materials, wood and wood-based materials, paper, and paper-based materials, rubber and rubber-based materials, plastic and plastic-based materials, petrol and petroleum products, chemicals and heat conditioners. In this expression, materials determined by notification as fire hazardous materials by the Department of Fire Services from time to time are also included; (g) Business exposed to Fire Hazard means business in which fire, fuel, electricity, or fire hazardous materials are used. In this expression, the site, building, or vehicle related to the said business is also included; (h)Explosive Material means chemical substances, explosive substances, gunpowder, or material in which gunpowder is used. In this expression, materials stipulated from time to time by notification, as explosive material by the Department of Fire Services are also included; (i) Inspection on Fire Safety means the inspection of matters on fire safety by the Department of Fire Services or by the assignee of it; Chapter II Objectives Article 3. The objectives of this Law are as follows: (a) to prevent destruction of State-owned property, private property, cultural heritage and the lives and property of the public by fire and other natural disaster; (b) to organize the Fire brigade systematically and to train members of the fire brigade; (c) to carry out extinguishing fire, prevention and search and rescue when fire, other natural disaster, epidemic disease or any kind of sudden disaster occurs; (d) to educate, organize and incite extensively so as to achieve public cooperation when any disaster occurs; (e) to participate and help, if necessary, for the State safety, peace of the public and the rule of law	
7.2	Natural Disaster Management Law (Pyidaungsu Hluttaw Law No. 21)	2013

	The government passed its Natural Disaster Management Law in July 2013, It shows how there is now an opportunity to make disaster management and risk reduction work inclusive and embedded in all sectors such as dangers caused by industrial, chemical, or nuclear accidents. Natural disasters could be defined as follows: Chapter 1: 1. This Law shall be called the Natural Disaster Management Law. 2. The following expressions contained in this Law shall have the meanings given hereunder: (a) State means the Republic of the Union of Myanmar. (b) Natural disaster means the destruction to the life and property, livelihood, infrastructures, safety education, and health of the public or the environment due to natural or man-made accidents or negligence such as fire, landslides, storms, floods, thunderbolts, droughts, earthquakes, tsunamis, avalanches, heat or cold waves, volcanic eruptions, erosion of banks and shores and maritime accidents; or damage to crops caused by pests or plant diseases, starvation and the outbreak of contagious diseases of human or animals; or violence and armed insurgencies; or dangers caused by industrial, chemical or nuclear accidents, oil spills or leakage of natural gas. This expression shall also include any other danger specified as a natural disaster by the National Natural Disaster Management Committee	
VIII	**Health Sector**	
8.1	Myanmar Public Health Law (Revolutionary Council Law No. 1)	1972
8.2	The Law Amending the Prevention and Control of Communicable Diseases Law, (SLORC Law No.16,)	1995
IX	**Transportation Sector**	
9.1	Motor Vehicle Law (Pyidaungsu Hluttaw Law No.55) Vehicle emissions have become one of the sources of air pollution in Myanmar. The Motor Vehicle Law is necessary for the development of effective and sustainable measures and policies to manage vehicle-induced air pollution. Related expressions are as follows: Chapter 1: Name and Definitions Article 1. This law shall be called the “Motor Vehicle Law”. Article 2. The expressions included in this law are defined as follows:	2015

	(v) "Environmental conservation associated with motor vehicles" means taking actions to conserve the green environment and the reduction in pollution of air, water, land, and noises caused by motor vehicles. Chapter 2: Article 3. (e) To reduce environmental pollution caused by motor vehicles. Chapter 8: Article 44. (m) Educating about environmental pollution caused by motor vehicles; researching; cooperating with related government departments, government organizations, and NGOs.	
9.2	Vehicle Safety and Management Law (Pyidaungsu Hluttaw Law No. 6),	2020
X	**Workforce Sector**	
10.1.	Labor Organization Law, (Pyidaungsu Hluttaw Law No. 8), (Refer to Article No.1, 8 to 11)	2011
10.2.	The Second Amended of the Settlement of Labor Dispute Law, (Pyidaungsu Hluttaw Law No. 18)	2019
10.3.	Employment and Skill Development Law, (Pyidaungsu Hluttaw Law No. 29), (Refer to Article No. 5, 14, 30 (a, b))	2013
10.4.	The Leave and Holidays Act	1951
10.5.	Minimum Wages Law (Pyidaungsu Hluttaw Law No. 8), (Refer to Article No. 12,13 (a to g))	2013
10.6.	Payment of Wages Law, (Pyidaungsu Hluttaw Law No. 18) Refer to Chapter 1, Article 2 (a) (b) (c), Chapter 2, Article 4 (a) to (c) Chapter 6, Article 20 (a)	2016
10.7	The Social Security Law (Pyidaungsu Hluttaw Law No. 15) Refer to Chapter 1, Article 2 (d) to (i), Chapter 2 Article 3 (b), Chapter 3, Article 5 (g), (h) Chapter 5, Article 11 (a)	2012
10.8.	The Development of Employment and Skill Law (Pyidaungsu Hluttaw Law No.29)	2013
10.9.	Occupational Health and Safety Law (Pyidaungsu Hluttaw Law No. 8) Work-related accidents and diseases are common in industries and often have many direct and indirect negative consequences for workers and their families. This fact not only has a considerable human dimension but also has a major negative impact on the economy. The Occupational Safety & Health (OSH) conditions in SMEs are very often poorer than in larger enterprises. The enormous economic costs associated with poor safety and health at work inhibit economic growth and affect the competitiveness of SMEs. Therefore, the Occupational Health and Safety Law is vital not only for the country's growth but also for the protection of employers and employees.	2019

	Chapter 1. Article 2. The following expressions in this Law shall have the definitions given hereunder: (b) Worker means a person who makes a living by using his/her physical or intellectual skills in the Workplace to which this Law applies; (c) Employer means a person who is responsible to undertake the duties prescribed for the Employer and benefits granted to Workers who work for a Workplace and Industry/Business to which this Law applies. This expression includes a founder of an Industry/Business, primary contractor or subcontractor, self-employed person, Employer's authorized managing agent, manager who acts on behalf of the Employer, successor of the Employer, authorized receiver of shares or a person who is registered to conduct the duties of the Employer in case of a company, corporation or partnership; (d) Workplace means a place where Processes of any Industries/Businesses prescribed under Chapter III of this Law are carried out; (e) Occupational Accident means an occurrence of death or injury due to work or while work is carried out; (f) Council means the Occupational Safety and Health National Council formed under this Law by comprising the representatives of the Government, Employer and Worker; (g) Occupational Disease means any type of disease determined by the Council by notification in coordination with the Ministry of Health and Sports as a disease that occurs due to exposure with any Hazardous Event while work is carried out; (h) Occupational Contamination means any type of contamination determined by the Council by notification as contamination which occurs due to exposure with any Hazardous Event in the Workplace or while work is carried out; (i) Hazardous Event means any events determined by the Council by notification that are likely to cause diseases or injuries to persons in the Workplace or public; (j) Hazardous Material means any materials specified by the Council by notification under this Law as Hazardous Materials; (k) Hazardous Machine means any machines specified by the Council by notification under this Law as Hazardous Machines;	

	(l) Hazardous Industry/Business and Workplace means any Industries/Businesses and Workplaces specified by the Council by notification as Hazardous Industries/Businesses and Workplaces; (m) Major and Serious Occupational Accident means an explosion, scattering, leakage, combustion or collapse occurring due to a Process, Hazardous Material or Hazardous Machine that can impose grave and serious hazards to persons inside or outside of Workplace or its vicinity immediately or for a certain period; Chapter 2 Article 3. The objectives of this Law are given hereunder: (a) to implement Occupational Safety and Health matters effectively in the respective Industries/Businesses; (b) to determine the duties of relevant persons applicable under this Law including Employers and Workers to lessen and mitigate occurrence of Occupational Diseases and Occupational Accidents; (c) to cause relevant persons applicable under this Law, Employers and Workers to take precaution and prevention against occupational hazards and Occupational Diseases; (d) to improve the productivity and health of Workers by preventing the occurrence of Occupational Accidents and Occupational Diseases for their safety; (e) to create Workplaces that are safe and good for health by prescribing the Occupational Safety and Health standards relevant to the Union's status after considering international and regional standards; and (f) to support and help research activities carried out for the development of Occupational Safety and Health matters. Chapter 3. Article 4. 4. This Law applies to the following Industries/Businesses owned by government departments or organizations, cooperatives, national citizens or foreigners in private or joint venture: (a) factories, workshops and warehouses covered under the Factories Act 1951; (b) Industries/Businesses covered under the Shops and Establishments Law 2016;	

Chapter 6:

Article 13. The functions of the Occupational Safety and Health Committee are given hereunder:

(a) regularly checking any conditions that can impair Occupational Safety and Health and reporting the review of them at the relevant Committee's meeting;

(b) advising the Employer to lay down precautionary and educational plans in order not to occur Occupational Accidents;

(c) improving the coordination between the Employer and Workers to get access to facilities and provide training for developing Occupational Safety and Health conditions;

(d) supervising the relevant risks assessment of Occupational Safety and Health management plan; and

(e) performing Occupational Safety and Health duties assigned by the Ministry and Department.

Chapter 8:

Article 26. The Employer shall be responsible to: -

(a) arrange as required to assess the risks of Workplace, Process and machines and materials used thereat;

(b) arrange as required to assess the likelihood of occurrence of hazards at the Workplace and to the environment;

(c) arrange to have Workers medical checked-up by the Recognized Doctor in accordance with stipulations whether they suffer from any Occupational Disease;

(d) arrange to improve the Workplace until it is safe and good for health based on the findings as per sub-sections (a), (b) and (c);

(e) provide Workers with sufficient number of personal protective clothing, materials and facilities prescribed and approved by the Department on free of charge basis and cause Workers to wear them while working;

(f) prescribe precautionary plans and plans for emergency;

(g) provide a clinic, appoint the Registered Doctors and nurses and provide medicines and supporting equipment for any

	Industry/Business where the number of Workers is not less than the number determined by the Ministry; (h) make necessary arrangements for managers, Workers and members of the Occupational Safety and Health Committee including (Employer) himself/herself to attend Occupational Safety and Health training courses stipulated by the Ministry under their departments or types of work; (i) make necessary arrangements to enable immediate reporting to the Person in charge of Occupational Safety and Health or manager in case where a Worker suffers an Occupational Accident or his/her life or health is likely to be in danger; (j) arrange to prevent any persons in the Workplace from Occupational Safety and Health risks that occur due to materials, machines, or wastes used in the Workplace or Process; (k) immediately stop the Process, evacuate Workers, and conduct necessary rescue plans if any Occupational Accident is about to occur. If possible, Workers will be relocated to another appropriate safe workplace; (l) display Occupational Safety and Health instructions, danger signs, notices, posters, and signage for directions following stipulations; (m) arrange to be complied with precautions when entering restricted hazardous Workplaces; (n) arrange to disseminate Occupational Safety and Health manuals and guidelines issued by the relevant Ministries for knowledge, technology, information, and skills not only to Workers but also to related persons or raise their awareness or knowledge thereof; (o) lay down the fire safety plan, perform fire drilling, and train Workers to use fire extinguishers systematically; (p) allow the Chief Inspection Officer and Inspection Officers to enter Workplaces, inquire, request documents and information or seize exhibits; (q) cause Workers to work only for the specified working hours if they have to work in a Hazardous Industry/Business and Workplace; and (r) Incur the expenses for Occupational Safety and Health matter	
XI	**General Laws**	

11.1	The Ethnic Rights Protection Law (Pyidaungsu Hluttaw Law No.8)	2015
11.2.	Myanmar Engineering Council Law (MEC) (Pyidaungsu Hluttaw Law No. 38) The environmental subject is not often used but since 2015 Yangon Technological University has started opening the postgraduate diploma in environmental engineering as a new formation of engineering education. The objective of this course is to give knowledge for understanding basic aspects of environmental impacts, governing parameters, biodiversity, and waste management systems for engineers. MEC law highlights the importance of environmental issues in engineering education. **Chapter 1.** **Article 2.** The expressions contained in this law shall have the meanings given hereunder: **(a)** Engineering Subject means a subject dealing with the design, construction, and maintenance of buildings, equipment, vehicles, machinery, apparatus, energy, and materials and with production processes - based on knowledge and technical know-how gained by studying, learning, and practicing mathematics, science, commerce, and sociology - which are beneficial to mankind with the least impact on the environment, natural resources, and human resources; **Chapter 2.** **Article 3**. **(b)** to explore beneficial, useful, and good methods to research and develop the State's natural resources and human resources with the least environmental impact by a combination of engineering technology and information technology;	2013
11.3.	Amended Myanmar Engineering Council Law (Pyidaungsu Hluttaw Law No. 12)	2019
11.4.	The Law Amending Myanmar Engineering Council Law (State Administration Council Law No. 40)	2022
XII	**Finance and Revenue Sector**	
12.1.	The Law Amending the Insurance Permission Law (Pyidaungsu Hluttaw Law No. 69)	2015
12.2.	The Income Tax Law Amended up to 2011	2011
12.3.	The Commercial Tax Law Amended in 2014(Pyidaungsu Hluttaw Law No. 16)	2014
12.4.	Amended Consumer Protection Law (Pyidaungsu Hluttaw law No.9)	2019
XIII	**City/Regional Development Law**	

13.1.	Village Regional Development Law (Pyidaungsu Hluttaw Law No. 39)	2019
13.2.	State/Regions Municipal Laws	2012
XIV	**Administrative Sector**	
14.1.	The Fourth Amendment of Ward or Village Tracts Administration Law (State Administrative Council Law No.3/2021)	2021
14.2	Myanmar Police Act (State Administrative Council Law No.4/2022)	2022

3.6. Myanmar Climate Change Policy (MCCP)

In 2019, Myanmar adopted a National Climate Change Policy and a related Strategy and Master Plan (2018-2030) to guide long-term, coordinated action towards a low-carbon and resilient future, focusing on sustainable development and inclusive growth.

3.6.1. Purpose

The purpose of this Policy is to provide long term direction and guidance to:

(a) Take and promote climate change action on adaptation and mitigation in Myanmar;

(b) Integrate climate change adaptation and mitigation considerations into Myanmar's national priorities and across all levels and sectors in an iterative and progressive manner; and

(c) Take decisions to create and maximize opportunities for sustainable, low carbon, climate resilient development, ensuring benefits for all.

3.6.2. Guiding Principles

In actions to achieve the purpose of this Policy, Myanmar will be guided, inter alia, by the following guiding principles:

(a) Sustainable development - Develop sustainably to meet the needs of the present without compromising the ability of future generations to meet their own needs, by ensuring the promotion of an economically, socially and environmentally sustainable future and a fair and equitable society;

(b) Precaution - Take cost-effective measures to avoid, minimize and protect from environmentally harmful consequences where there are threats of serious or irreversible damage even if there is a lack of full scientific certainty;

(c) Prevention - Take anticipatory action to prevent or minimize environmental damage before it occurs by avoiding, prohibiting or controlling threatening activities;

(d) Environmental integrity - Promote, protect and conserve the natural environment and recognize its complete and intrinsic value, whether tangible or non-tangible, economic or non-economic, to the natural, cultural and spiritual heritage of Myanmar;

(e) Shared responsibility and cooperation - Encourage, support and embrace the common and shared responsibility of all people for the protection, conservation, and equitable sharing of benefits and resources of the environment, and encourage wide cooperation across sectors and stakeholders at all levels, including the private sector.

(f) Inclusiveness - Engage all people at all levels in decision-making and action, by supporting and embracing their diverse social, economic and cultural perspectives, participation and contributions without discrimination, particularly with respect to gender, ethnicity and age, in order to equitably share the benefits and opportunities of climate change adaptation, mitigation and low-carbon, climate-resilient development;

(g) Good governance - Adopt transparent, participatory, and responsive processes to ensure that decision-making at all levels is inclusive, equitable, and accountable to all people in Myanmar, in accordance with the rule of law;

(h) Climate justice and equity - Promote and protect the rights of the people of Myanmar, in particular the poorest, most vulnerable and marginalized segments of society, including indigenous peoples, all ethnic groups, local communities, women, children, the elderly, and persons with disabilities to live in a healthy environment and a fair, equitable and sustainable society;

(i) Gender equality and women's empowerment - Promote and protect gender equality and women's equal rights through strengthening gender-responsive climate change policy concerning adaptation, mitigation, finance, technology development and transfer and capacity-building, and ensuring full and equal participation of women in decision-making.

3.6.3. Policy Recommendations

The Government of the Republic of the Union of Myanmar will take sector-relevant measures to implement this Policy and achieve its purpose by taking the following actions primarily in the six sectoral clusters. Among these clusters, policy recommendation for **low carbon emission** is specified as follows:

(d) Low carbon and resilient growth

i. Ensure that actions undertaken under Myanmar's Green Economy Framework and energy policies integrate climate change adaptation and mitigation considerations, are complementary to and/or support actions under this Policy, and encourage public-private partnerships to support a green economy;

ii. Ensure that the energy, transport and industry sectors, including infrastructure, are well-integrated among each other, reliable, sustainable and resilient to current and future climate change impacts, recognizing that they are vital to Myanmar's economic growth;

iii. Decouple Myanmar's continued growth from increasing greenhouse gas emissions and contribute to the global climate change mitigation effort through sustainable, low-carbon energy, transport, industrial, and waste management systems, while ensuring that Myanmar's social and economic development needs are met;

iv. Promote and prioritizes sustainable and renewable energy sources and energy efficiency, in order to meet Myanmar's growing energy needs and ensure energy security in a low-carbon manner;

v. Ensure equitable access to affordable, reliable, sustainable, and modern energy for all as a pathway to inclusive and sustainable development and eradicating poverty;

vi. Promote sustainable natural resource extraction through transparent and responsible investments which are consistent with climate change adaptation and mitigation priorities, while generating local employment and economic benefits and protecting the environment and public health;

vii. Ensure that urban and inter-city transportation networks and infrastructure are sustainable, low-carbon and climate-resilient for all modes of transport, in particular for mass transit;

viii. Increase the productivity and resource-efficiency of the industrial sector, an important sector for Myanmar's economy, through low-carbon growth and by developing competitive and innovative green industries, recognizing the relative importance of this sector for Myanmar's economy, including its potential for job creation;

3.6.4. Myanmar Climate Change Strategy (2018-2030)

3.6.4.1. Executive Summary

Myanmar has achieved significant growth in recent years, and projections indicate that growth will accelerate due to lower levels of political uncertainty and strong investment (WEF 2016). However, the impacts of climate change have already undermined development outcomes and will continue to do so for future development outcomes if these impacts are not managed or addressed.

The observed and projected changes in climate include a general increase in temperature, variation in rainfall and an increased occurrence and severity of extreme weather events such as cyclones, floods, droughts, intense rains and extreme high temperatures. The country is also experiencing a decrease in the duration of the southwest monsoon season due to its late onset and early retreat (NAPA 2013). Current patterns of socioeconomic development rely on climate-sensitive sectors and regions. For example, agriculture is the largest economic sector, contributing to 30 percent of

GDP and employing to 61 percent of the labor force (MOAI 2014). An increase in the frequency and severity of extreme weather events has caused a decline in agricultural productivity, which has resulted in a decrease in GDP and household income and rising food insecurity (MOAI 2015). Myanmar's population and economic activities are concentrated in disaster risk-prone areas such as the Delta, Coastal and Central Dry Zones, which are highly exposed to hazards and have both high poverty levels and low response capacity. Coastal regions are particularly at risk from sea level rise and cyclones, while the lowlands and Central Dry Zone are vulnerable to the impacts of floods and droughts, respectively. Communities and businesses located in at-risk regions and reliant on climate-sensitive economic activities are particularly vulnerable to the impacts of climate change (NAPA 2013; IPCC 2014).

Due to its exposure and sensitivity to current and projected weather patterns, Myanmar is extremely vulnerable to the impacts of climate change. In the past 20 years (1995–2014), it has been exposed to 41 extreme weather events resulting in a death toll of 7, 146 (annual average) inhabitants and an annual average of 0.74 percent loss per unit in GDP – making it the second-most affected country to extreme weather events (Kreft et al. 2016).

Myanmar's contribution to greenhouse gas emissions (GHG) is low — for example, GHG contributions from its industry and construction sectors combined was 10 percent of total emissions in 2000 (INC 2012). However, unplanned growth in the industry, energy, transport and urban sectors could increase its GHG emission levels. Climate-smart responses can provide opportunities for current and future development in Myanmar. The Paris Climate Agreement has strengthened international and national political will, policy direction and financial investment in climate-resilient and low-carbon development. Myanmar's economy is undergoing structural transformation.

The sectoral composition of GDP is changing: primary sectors such as agriculture and forestry are contributing less to employment, productivity and manufacturing and the service sector is contributing more. Investment in a climate-

resilient, low-carbon development pathway and adopting environmentally sound technologies at an early stage can provide sustainable and resource-efficient opportunities for socio-economic development, including green jobs and long-lasting business models. Myanmar is also undergoing a democratization process, giving diverse national and local-level actors the opportunity to shape and benefit from inclusive and climate-resilient development.

Recognizing these circumstances, the Government of the Republic of the Union of Myanmar formulated and adopted its Myanmar Climate Change Policy (MCCP) to provide long-term direction and guidance for government, civil society, and the private sector to undertake and promote climate change actions in adaptation and mitigation in Myanmar and to create opportunities for sustainable and low-carbon development.

To this end, the MCCP mandates the adoption of actionable short, medium and long-term strategies and plans to address climate change, and in particular the adoption and implementation of the Myanmar Climate Change Strategy (MCCS) 2018-2030. In compliance with the recommendation, the MCCS 2018-2030 has been formulated and adopted to provide a roadmap for Myanmar to strategically address climate-related risks, and also seize opportunities, over the next 13 years and beyond.

The MCCS fully builds on the Myanmar Climate Change Policy' (MCCP) principles and also upholds principles of:

(a) Inclusive development that allows poor, landless, marginalized and vulnerable women, men and geographic regions to shape and benefit from opportunities provided by climate-resilient and low-carbon development;

(b) Driving action to deliver resource-efficient development that will incentivize investment in a green economy to achieve growth targets with minimal environmental harm and carbon emissions;

(c) Integrated development to direct government, development partners, civil society, private sector entities and communities to align, harmonize and coordinate policies and programs to support the strategy's overall objectives; and

(d) Supporting results-oriented development through a time-bound goal and objectives to achieve this vision and strategic priorities to help the priority sectors implement the strategy.

The MCCS contributes to materialize the MCCP Vision for the Country to be a climate-resilient, low-carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations. It aims to guide action to achieve its strategic vision, goal and objectives. It was prepared in close consultation with national and local stakeholders representing a cross-section of government institutions, national non-governmental organizations (NGOs), communities, the private sector, development partners, professionals and academia, covering a wide range of sectors. The government engaged with stakeholders through bilateral discussions, four national workshops and five sub-national workshops in five of Myanmar's climate-vulnerable states/regions.

Thousands of participants from local government, civil society organizations, communities and the private sector were involved.

In line with the vision above, Myanmar aims to become a climate-resilient country, while also contributing to global efforts to curb GHG emissions, reducing its contribution to climate change within a realistic timeline of 13 years. Myanmar wishes to develop in a sustainable way to ensure it does not deplete its rich environmental capital beyond its capacity, and to create economic opportunities for everyone in an inclusive manner.

The long-term goal to achieve this vision is that by 2030, Myanmar has achieved climate-resilience and pursued a low-carbon growth pathway to support inclusive and sustainable development.

`To achieve its goal as set out above, Myanmar needs to direct its development actions (specifically in the priority sectors of its economy) along two strategic pathways that represent the two objectives of this strategy:

(a) To increase the adaptive capacity of vulnerable communities and sectors so they are resilient to the impacts of climate change, and

(b) To create and maximize opportunities for potential sectors to follow a low carbon development pathway ensuring development benefits to households and all economic sectors.

Action areas

To increase Myanmar's adaptive capacity and maximize opportunities from low carbon development, the strategy will focus on the six action areas outlined below. Actions will enable the government and its development partners, private sector entities, civil society and households to invest in climate-resilient and low-carbon development in priority social and economic development sectors.

(a) Policy: Build a climate-responsive policy environment that integrates climate-smart initiatives into sectoral and development policies and plans and provides the knowledge needed to achieve this.

(b) Institutions: Establish operational institutional arrangements and a coordination mechanism to monitor progress against achieving objectives and enable an inclusive approach to implementing climate-smart investments in priority sectors.

(c) Finance: Build a conducive financial environment and mechanisms that can mobilize and allocate resources, enabling sectors to access and channel climate finance opportunities for inclusive investment in climate-resilient and low-carbon development.

(d) Capacity and technology: Increase access to adequate capacity and technology across sectors and actors to enable the delivery of climate-smart responses.

(e) Awareness: Build awareness and capacities at all levels of society to enable climate-smart decision making.

(f) Partnerships: Build functional multi-stakeholder partnerships in the public, private and civil society sectors across local, national and international levels to support and promote investment in and implementation of climate-smart initiatives.

Sectoral outcomes

To increase the adaptive capacity of and maximize opportunities from low carbon and climate resilient development, the strategy will guide investment in the six-priority social and economic development sectors that contribute to current and planned economic and social development in Myanmar. These six sectors are: agriculture, fisheries and livestock sector; natural resource management; energy, transport and industrial systems; towns and cities; disasters, risks and health impacts; and education, awareness and technological systems.

The action areas identified above will deliver significant transformation in priority sectors to ensure that current and future investments are resilient to the impacts of climate change and can unlock opportunities from climate-resilient and low-carbon development, including opportunities related to green and inclusive job creation, sustainable revenue generation and innovative business models.

Sector-specific outcomes that will help achieve the objectives above and enable Myanmar to reach its goal for a climate resilient and low carbon society by 2030 include:

(a) Climate-resilient productivity and climate-smart responses in the agriculture, fisheries and livestock sectors to support food security and livelihood strategies while also promoting resource-efficient and low-carbon practices.

(b) Natural resource management that enhances the resilience of biodiversity and ecosystem services that support social and economic development and deliver carbon sequestration.

(c) Climate-resilient and low-carbon energy, transport and industrial systems that support inclusive and sustainable development and economic growth.

(d) All township and city dwellers, including the most vulnerable, are safe from increased risks of rapid- and slow-onset natural disasters and live in sustainable, inclusive, low-carbon, climate-resilient towns.

(e) Communities and economic sectors are able to respond to and recover from climate-induced disasters, risks and health impacts and build a healthy society, and

(f) Strengthened education, awareness and technological systems that foster a climate-responsive society and human capital to design and implement climate-resilient and low-carbon development solutions for inclusive and sustainable development.

Implementation pillars

The strategy will be implemented through five pillars. These are:

(a) An overarching policy framework to guide coherent investment in climate resilient and low-carbon development

(b) A multi-stakeholder institutional mechanism to coordinate action across actors and scales

(c) A financial mechanism to mobilize and allocate finance for inclusive investment in climate-resilient and low-carbon development

(d) A capacity-strengthening framework to enhance the capacity of actors across scale to plan and implement climate-resilient and low-carbon development initiatives, and (e) A monitoring evaluation and learning framework to guide evidence-based and iterative solutions for climate-resilient and low-carbon development.

3.6.4.2. Master Plan

The MCCS is aligned with Myanmar's development policies — supporting the National Comprehensive Development Plan (NCDP), Myanmar Sustainable Development Plan (MSDP) and National Sustainable Development Strategy — and is mandated by the Myanmar Climate Change Policy (MCCP) as well as the National Adaptation Programs of Action (NAPA)and the Nationally Determined Contribution (NDC). The MCCS also complements the country's Green Growth Strategy and emerging Reducing Emissions from Deforestation and Forest Degradation (REDD)+

strategy which is currently under preparation. The MCCS contains detailed sectoral plans that identify time-bound priority actions to achieve sector outcomes.

Part I: Development in the context of climate change

1. National circumstances
2. Myanmar's development vision
3. Implications of climate change on development
4. Readiness and capabilities for addressing climate change

Part II: The Strategy

3.6.4.3. Myanmar Climate Change Strategy

Strategic Vision

To ensure the country can continue to develop and maintain the conditions for the wellbeing and safety of its people, Myanmar as a society and country must adopt a strategic vision to transform Myanmar into a climate-resilient, low-carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations. With this vision as a beacon over the next 13 years, Myanmar can organize and maximize the efforts of its government, regions, local communities, public and private sectors and civil society.

2030 Goal

In line with the vision above, Myanmar aims to become a climate-resilient country, while also contributing to global efforts to curb GHG emissions, reducing its contribution to climate change within a realistic timeline of 13 years. Myanmar wishes to develop in a sustainable way to ensure it does not deplete its rich environmental capital beyond its capacity, and to create economic opportunities for everyone in an inclusive manner. The long-term goal of this strategy to achieve this vision is: By 2030, Myanmar has achieved climate-resilience and pursued a low-carbon growth pathway to support inclusive and sustainable development.

Objectives

To achieve its goal as set out above, Myanmar needs to direct its development actions (specifically in the key social, infrastructure and economic sectors) along two strategic pathways:

One pathway is building resilience so that communities, the economy and all assets (whether industrial, urban, educational, domestic and so on) are adapted to current and projected climate change, in a way that allows them to continue to perform and thrive under the adverse climate change impacts already being felt and those that are projected to intensify in the coming decades.

Second pathway is making development choices that are low-carbon whereby development opportunities are pursued in line with the global effort to combat climate change and provide the correct balance between development and environmental sustainability.

These two pathways reflect the parallel adaptation and mitigation requirements where Myanmar needs to concentrate its efforts to ensure it is a climate-resilient nation pursuing a low-carbon development pathway by 2030. They are expressed as two separate but parallel objectives the country needs to achieve to meet the long-term goal:

(1) Increase the adaptive capacity of vulnerable communities and sectors so that they are resilient to the adverse impacts of climate change, and

(2) Create and maximize opportunities for sectors to pursue a low-carbon growth pathway by ensuring development benefits to communities and all economic sectors.

Action Areas

To increase adaptive capacity and maximize opportunities from low-carbon development in a way that achieves the objectives above, Myanmar needs to make key improvements to realize the following enabling conditions under six broad action areas:

(1) Policy: A climate-responsive policy environment that integrates climate smart initiatives into sectoral and development policies and plans and provides the knowledge to achieve this.

(2) Institutions: Operational institutional arrangements and a coordination mechanism that monitor progress against achieving objectives and enable an inclusive and effective approach to identifying and implementing climate smart investments in priority sectors.

(3) Finance: Conducive financial environment and mechanisms that mobilize and allocate resources so that sectors can access and channel climate finance opportunities for inclusive investment in climate-resilient and low-carbon development.

(4) Capacity and technology: Increased access to adequate capacity and technology across sectors and actors that enable the delivery of climate smart responses.

(5) Awareness: Building awareness and capacities at all levels of society to enable climate-smart decision making.

(6) Partnerships: Functional multi-stakeholder partnerships between public, private and civil society sectors across local, national and international levels that support and promote investment in and implementation of climate smart initiatives.

Priority Sectors and Outcomes

As highlighted in the problem statement, all the sectors that are crucial for Myanmar's continued development are also highly vulnerable to the adverse effects of climate change. Climate change considerations are currently not integrated into sectoral development in a way that aligns with the pathways described above and responds to the action areas necessary for enabling change along the desired development pathways. Six priorities social, infrastructure and economic sectors were identified through the strategy formulation process. If Myanmar is to reach its long-term desired goal of achieving climate-resilient development and pursuing a low-carbon development pathway to support inclusive and sustainable development, it

must first generate the following six sectoral outcomes, which encapsulate these changes. Sectoral expected results. Each of the six priority sectors needs to generate specific results to build the foundation for the desired sectoral outcomes. These are some of the entry points identified by the MCCS under each priority sector to deliver the actions needed to deliver inclusive climate-resilient and low-carbon development outcomes.

By achieving the expected results, Myanmar will advance along the road to achieving its adaptation and mitigation objectives. Three expected results are proposed under each sectoral outcome. These are described below and also included in the overall master plan under Table 9.

Climate-Smart Agriculture, Fisheries and Livestock for Food Security

Agriculture, fisheries and livestock enable food security and are still the predominant source of livelihood for many in Myanmar, although very vulnerable to slow-onset changes in climate and extreme events. Myanmar needs to create conditions to maintain growth and productivity of agricultural and food systems — for example, by applying new technologies and modifying existing ones to enable the adoption of climate-smart agricultural practices that can withstand changes in climate and contribute to the reduction of GHG emissions. The sector must integrate climate change into its policies and plans to strategies actions on climate-smart farming systems and improve the adaptive capacity of smallholder, marginalized and landless households. For this reason, Myanmar must “achieve climate-resilient productivity and climate-smart responses in the agriculture, fisheries and livestock sectors to support food security and livelihood strategies while also promoting resource-efficient and low carbon practices” as a sectoral outcome.

By achieving the expected results, Myanmar will advance along the road to achieving its adaptation and mitigation objectives. The three expected results to achieve the sectoral outcomes are:

(1) The agriculture, fisheries and livestock sectors have integrated climate change into their relevant policies, planning and budgeting procedures and have put these into practice, taking into account gender considerations.

(2) The agriculture, fisheries and livestock sectors have adopted climate-resilient and environmentally sound adaptation technologies and climate-smart management practices, supported by international and domestic finance.

(3) Institutional coordination and multi-stakeholder engagement framework have been established and support the implementation of climate-smart responses in the agricultural, fisheries and livestock sectors, including innovative business models and gender-sensitive approaches.

Sustainable Management of Natural Resources for Healthy Ecosystem

Natural resources and the environment provide eco-system services that are crucial to people's livelihoods and wellbeing. Communities are highly dependent on the quality and availability of ecosystem services. Ecosystem services must be enhanced and protected from unsustainable exploitation. They can also help communities use ecosystem-based adaptation to build resilience to climate impacts and carbon sequestration for mitigation of GHG emissions.

For this reason, Myanmar must engage in “natural resource management that enhances the resilience of biodiversity and ecosystem services that support social and economic development and deliver carbon sequestration” as a sectoral outcome. The three expected results to achieve the sectoral outcome are:

(1) Climate change dimensions are incorporated and enforced in environmental and natural resource management policies, rules and regulations, including gender considerations.

(2) Environmentally sound technologies and good management practices are adopted to improve and maintain forest, water, land and coastal ecosystems, health and services.

(3) Framework for institutional coordination and multi-stakeholder engagement is established and supports access to finance and implementation of responses for health, environment and natural resource management.

Resilient and Low-carbon Energy, Transport and Industrial Systems for Sustainable Growth

Energy Transport and industry are the backbone of development and economic growth, and the projected source of income and jobs in future years. It is important that they grow in a way that is resilient to the changes in climate, while contributing to the global effort of reducing carbon emissions. For this reason, Myanmar must plan for “climate-resilient and low-carbon energy, transport and industrial systems that support inclusive and sustainable development and economic growth” as a sectoral outcome. The three expected results to achieve the sectoral outcome are:

(1) Energy security for the country is based on generating a large share of its energy from renewable sources and high energy efficiency in domestic, industrial and other use.

(2) Transport systems are adapted to heightened risks of disasters from new climatic conditions and sustainable through to efficiency and low-carbon technologies.

(3) Industrial systems are highly productive and competitive due to their climate resilient, sustainable, low-carbon and green characteristics.

Resilient, Inclusive and Sustainable Cities and Towns where People Can Live and Thrive

Cities and human settlements are now home to 29 percent of the population. More people will move into cities in the future as the population rises and a greater concentration of people in unplanned settlements will increase the risk of disaster, unsustainable resource use and carbon emissions, especially through the construction of new infrastructure to accommodate an increased urban population. Cities and townships need to be safe, resilient, environmentally viable and carbon-efficient, without sacrificing development.

For this reason, Myanmar must plan in a way that “all township and city dwellers, including the most vulnerable, are safe from increased risks of rapid- and slow onset natural disasters and live in sustainable, inclusive, low-carbon, climate-resilient towns” as a sectoral outcome. The three expected results to achieve the sectoral outcome are:

(1) Town and city residents have access to resilient infrastructure and services that protect them from natural hazards of increased intensity, continue to perform during and after shocks and are best adapted to the new climatic context.

(2) Climate change resilience, low-carbon development and socially inclusive approaches are defining elements of urban planning and development, providing mitigation and adaptation co-benefits.

(3) New buildings are designed and constructed to be energy and resource efficient and resilient to natural hazards and disasters, so that they emit less carbon and produce savings from reduced energy consumption, providing equity and affordability.

Climate Risk Management for People’s Health and Wellbeing

Health, disaster risk management and social protection: Climate-smart health, disaster risk management and social protection systems can help secure and sustain Myanmar's social and economic development, putting it on a climate-resilient pathway.

Such systems will enable individuals, households and national and local actors to absorb, adapt and transform in response to climate-induced risks. Health is directly related to climatic conditions, especially in a country that is largely dependent on nature for livelihoods and wellbeing. The human dynamics of climate change indicate high risks for people from new diseases, higher stress and heightened risk of disasters. To protect people, the sector must strengthen climate-responsive health systems, disaster risk reduction through early warning systems and other mechanisms and climate risk information.

For this reason, Myanmar must plan in a way that “communities and economic sectors are able to respond to and recover from climate-induced disasters, risks and health impacts and build a healthy society” as a sectoral outcome. The three expected results to achieve the sectoral outcome are:

(1) Climate risk management system is well established, robust and nationally integrated to respond effectively to increased intensity and impact of risks and hazards on people's health and wellbeing.

(2) Myanmar has improved social protection, gender consideration and risk finance capacity to prepare for and recover from potential loss and damage resulting from climate change.

(3) Myanmar's health system is improved and can deal with climate-induced health hazards and support climate-vulnerable communities to respond effectively to disaster and health hazards from climate change.

Education, Science and Technology for a Resilient Society

Education, science and technology are the crucial areas for building a smart, knowledgeable, climate responsive society. Myanmar has prioritized investment in these sectors through formal education at all levels to increase the country's research and innovation capacity, professional development and training and awareness-raising on climate change. But changes in climate which could lead, for example, to more frequent and more intense disasters will affect the quality of, and people's access to, education. This, in turn, could result in deteriorating livelihoods. Education is often one of the first expenditures households cut to cope with the effects of economic or hazard stressors. Children are often the hardest hit, and if their access to education is restricted, this could make them more vulnerable. A knowledge base on climate change and access to education are pre-conditions for Myanmar to become resilient to climate change impacts and continue to cultivate technology to achieve a climate-resilient and carbon-efficient economy.

For this reason, Myanmar must “strengthen education, awareness and technological systems that foster a climate-responsive society and human capital to

design and implement climate-resilient and low-carbon development solutions for inclusive and sustainable development" as a sectoral outcome. The three expected results to achieve the sectoral outcome are:

(1) The capacity of actors in the education sector is developed to integrate principles of sustainability, low-carbon development and resilience into the curricula at primary, secondary and tertiary levels.

(2) Capacity of actors in the science, technology and education sectors is developed to generate research and build and use climate information systems.

(3) Institutional capacity and multi-stakeholder partnership are enhanced to access and manage climate financing to ensure climate-responsive education, science and technology.

Strategic Indicators

To assess progress, a number of strategic indicators for each of the expected results has been suggested. These are general and inspirational indicators to orient the country in what it can measure to assess — rather than quantify — the degree of progress as the quantification of progress may not be realistic over 13 years and at this level of complexity. The master plan attached to this strategy contains more specific indicators to monitor progress against each action area. The overall master plan presented in Table 9 includes expected results and strategic indicators. It is a working document that will need adjusting and validating as the country works towards its ultimate goal. The expected results and indicators are immensely ambitious, but this is what Myanmar needs reach its goal of achieving climate-resilience and pursuing a low-carbon growth pathway to support inclusive and sustainable development by 2030.

Achieving Sectoral Outcomes

The rationale for selecting each sector as well as the desired sectoral outcome and set of associated sectoral expected results to help generate sectoral outcomes are described below. Planning actions under the six action areas identified in Section 6.4 will deliver significant transformation in these six priority sectors to ensure that current

and future investments are resilient to the impacts of climate change and can unlock opportunities from climate-resilient and low-carbon development. This includes opportunities related to green and inclusive job creation, sustainable revenue generation and innovative business models.

Phases

The timeline for achieving the desired goal is around 13-years, divided into the following phases:

Within 3 years: Achieving all policy and institutional objectives; initiating the capacity-building and financial mechanisms that are essential to achieving the goal

Within 8 years: Major achievements made in all action areas; financial mechanisms exist that enable expected results; capacities have been created or are well underway; all development choices are informed by sustainability concerns, and

Within 13 years: The capacities created operate in the country effectively; finance is channeled to building ongoing resilience and adaptation; all key milestones have been achieved.

The ultimate outcome is for Myanmar to be a climate-resilient country, and at the same time contribute to global efforts to curb its GHG emissions, reducing its contribution to climate change within a realistic timeline of 13 years.

To implement Myanmar's climate change strategy (2018-2030), Taungtha factory must create an Environmental Management Plan (EMP) as part of a resilient, low-carbon energy, transport, and industrial system to promote sustainable growth.

Figure: 3.6.4.3-1 Myanmar climate change strategy



3.7. Institutional Arrangement for Environmental Management

3.7.1. Institutional Arrangement during Operation Phase

During the operation phase, the project proponent, the No. (10) Textile Mill (Taungtha) is fully responsible for the implementation of environmental management, mitigation, and monitoring activities and submission of environmental monitoring reports to the Environmental Conservation Department (ECD) under MONREC. The Health Safety and Environment Team is in charge of environmental, security, and safety-related issues throughout the operation stage.

3.7.2. Institutional Arrangement during Decommissioning Phase

During the decommissioning phase, the demolition contractor will establish a temporary project office to implement demolition works. The demolition contractor is responsible for implementing environmental management, mitigation, and monitoring activities and submission of environmental monitoring reports to the project proponent, the No. (10) Textile Mill (Taungtha). The project proponent is responsible for the supervision of overall environmental management activities done by the demolition contractor and for the submission of an environmental monitoring report to the Environmental Conservation Department (ECD) under MONREC.

3.8. Key Commitment of Proponent for Environmental Management

The commitments made by No. (10) Textile Mill (Taungtha) involves complying with all Myanmar laws, rules, and regulations, including the Environmental Conservation Law of 2012. The factory also promises to ensure that legal requirements are incorporated into the design and production procedures and that contractors and sub-contractors adhere to relevant legal requirements during the construction phase. Additionally, the factory will ensure that all legally required documents are readily available on-site and conduct annual environmental compliance audits during the operational phase. Furthermore, the factory will implement its CSR program, comply with its Occupational Safety and Health (OSH) policy, and submit a biannual environmental monitoring report to the Environmental Conservation Department (ECD). The No. (3) Heavy Industrial Enterprise and the Ministry of Industry (MOI) have

made commitments regarding environmental, social, and health-related considerations, which are described in detail in the table below.

Table: 3.8-1. List of Key Commitment

Sr. No	Field	No.	Commitment	EMP Reference	Responsible Organization	
					Taungtha Factory	Contractor
1.	Environmental Conservation Sector	1.	The relevant Myanmar laws, rules, and regulations as follows will be complied with: - Constitution of the Republic of the Union of Myanmar (SPDC Law, 2008) - Environmental Conservation Law (Pyidaungsu Hluttaw Law No. 9, 2012) - Environmental Conservation Rules, 2014 - EIA Procedures, 2015 - National Environmental Quality (Emission) Guidelines, 2015	Chapter 3	√	√
		2.	Taungtha factory and IIC company will conduct the air quality, effluent quality, noise level in compliance with NEQEG 2.3.2.1 Textile Manufacturing and NEQEG	Chapter 5	√	√

			1.3 General guideline values for noise level.			
		3.	Taungtha factory and IIC company will comply with and implement the Environmental Management Plan (EMP), mitigation measures, and monitoring plan formulated from this EMP for the operation and decommissioning phases.	Chapter 6, Chapter 9, and Chapter 9 and Chapter 10.	√	√
II	Air Quality	1	Taungtha factory sets the target values of ambient air quality in accordance with the NEQEG 2.3.2.1 Textile Manufacturing guideline values.	Chapter 3 and Chapter 5	√	√
		2	To prevent air contaminants such as dust, particulate matter, and exhaust gases during operation and decommissioning phases, the adequate mitigation measures will be implemented at both operation and decommissioning phases of the project.	Chapter 6 and Chapter 10.	√	√
		3	Due to the EMP, air quality monitoring will be conducted during both the operation and decommissioning phases,	Chapter 10.	√	√

			and monitoring reports will be submitted to ECD.			
III	Effluent Quality	1.	Wastewater quality should comply with NEQEG 2.3.2.1 guidelines values if there is any discharge of them.	Chapter 3, Chapter 4, and Chapter 5, Chapter 10,	√	√
		2.	To prevent water pollution, soil contamination, and bad odor from effluent discharge, mitigation measures must be implemented during both the operating and decommissioning phases as part of the Environmental Management Plan (EMP) procedure.	Chapter 5	√	√
		3.	Due to the EMP, air quality monitoring will be conducted during both the operation and decommissioning phases, and monitoring reports will be submitted to ECD.	Chapter 10.	√	
IV	Noise and Vibration	1.	Noise level should be complied with NEQEG 1.3 guidelines values.	Chapter 5 and Chapter 6	√	√
		2.	In order to meet the NEQEG 1.3 standard, the factory needs to implement necessary mitigation measures	Chapter 6	√	√

			throughout the operation and decommissioning stages.			
		3.	Monitoring of noise quality will be carried out during both operational and decommissioning phases due to the EMP procedure, and comprehensive monitoring reports will be submitted to ECD every six months.	Chapter 10	√	√
V	Soil Quality	1.	In order to meet the standard values, the factory should implement necessary mitigation measures throughout the operation and decommissioning stages.	Chapter 6	√	√
		2.	Monitoring of soil quality will be carried out during both operational and decommissioning phases due to the EMP procedure, and comprehensive monitoring reports will be submitted to ECD for every six months.	Chapter 10	√	√
VI	Wastes Management	1.	According to the Environmental Management Law of 2012, the Taungtha factory is dedicated to adhering to the waste management plan throughout its	Chapter 6 and Chapter 8	√	

			operational and decommissioning phases. In terms of waste disposal, it's important to follow the ECD guidelines to ensure that waste is handled and disposed of safely. Disposing of waste through authorized waste collectors and selling to recyclers for recycling is a responsible and sustainable way to manage waste.			
		2.	For the decommissioning phase, the contractor will follow the waste segregation plan, waste disposal plan, and waste handling procedures described in EMP.	Chapter 6 and Chapter 10.	√	√
VII	Economy and Social	1.	The Taungtha factory has been instrumental in creating job opportunities for the local communities while significantly contributing to the secondary effects experienced by the locals. In accordance with labor laws, the factory is steadfast in its commitment to ensuring the welfare of its employees throughout the project. It is	Chapter 4, Chapter 5, Chapter 6 and Chapter 8	√	

			imperative that during the decommissioning stage, the proponent compensates employees for any suffering they may experience.			
VIII	Corporate Social Responsibility (CSR)	1.	Donations and social welfare programs provided to nearby wards and villages will be recorded on an annual basis. This will help track the impact of the contributions and ensure transparency in the distribution of resources.	Chapter 9	√	√
IX	Occupational Health and Safety (OHS)	1.	The relevant laws, regulations and rules of labors' rights, health and safety as follows will be complied with: - The Workmen's Compensation Act (1923, Amendment in 2011) - The Leave and Holiday Act,1951, Partially Amendment in 2014. - The Labor Organization Law,2011 - The Labor Organization Rule, 2012 - The Labor Dispute Settlement Law,2012, Amendment in 2019.	Chapter 3, Chapter 6, Chapter 8 and Chapter 9	√	√

			➢ The Social Security Law, 2012 ➢ The Employment and Skill Development Law, 2013 ➢ The Minimum Wage Law/Rules, 2013 ➢ The Social Security Rules, 2014 ➢ The Payment of Wages Law, 2016 ➢ The Occupational Health and Safety Law, 2019, (2019)			
		2.	To comply with laws and regulations, as well as international practices for occupational health and safety, the factory is committed to implement adequate measures and plans in accordance with EMP during both the operation and decommissioning phases.	Chapter 6, Chapter 8, Chapter 9 and Chapter 10.	√	√
			It's important to maintain proper records of all accidents and incidents, OHS training and drills, health check-ups, and other related issues. To ensure that all necessary precautions are taken and everyone involved in the project is protected, the project will prepare yearly	Chapter 6 and Chapter 10	√	√

			reports on these issues. Additionally, monthly reports will be prepared during the operation stage for any claims from workers. This will help the project to identify and address any potential problems or concerns related to the health and safety of staff and factory workers.			
X	Traffic Safety		It's important to make sure that vehicles are delivering materials during the weekend and off-peak hours when traffic volume is low. Additionally, materials should be properly covered during transportation. It's also important to strictly enforce on-site speed controls to ensure everyone's safety.	Chapter 6 and Chapter 10	√	√
XI	Emergency Risks	1	The factory is committed to keeping a record of natural disaster occurrences like floods, fires, and earthquakes. This will help in monitoring and assessing the impact of these events on the environment and people. Including this	Chapter 8 and Chapter 9	√	√

			information in the monitoring report to be submitted to ECD, is definitely a good practice.			
		2	It's essential to have suitable firefighting systems and emergency response teams established to ensure safety in case of fires and natural disasters. This proactive approach will help prevent and minimize damages to property and people.	Chapter 8 and Chapter 9	√	√
XII	Training and Education	1	Implementing a training program for new workers and a capacity-building program for skilled workers is a great way to ensure that all workers are equipped with the necessary skills and knowledge to perform their jobs safely and efficiently. Additionally, providing emergency response training to all workers for fire, flood, earthquake, and natural emergencies is crucial in ensuring the safety of everyone in the factory in case of an emergency. The factory takes a proactive	Chapter 8 and 10	√	

			approach towards safety and preparedness.			
XIII	Reporting	1	The factory and demolition contractor are committed to submitting the monitoring reports to the ECD, during the operation and decommissioning phases. This is a crucial step in ensuring that the factory adheres to the EIA procedure and that any necessary actions are taken promptly. There is a system in place to monitor the project regularly and make sure that it is being carried out in an environmentally responsible and safe manner.	Chapter 10	√	√

3.9. National Environmental Quality Emission (NEQEG) Guidelines for the Project

In the examination mentioned, all the parameters are referred to NEQEG 2.3.2.1 Textile Manufacturing guidelines values, and NEQEG 1.3 General guideline values are applied in case of noise level.

3.9.1. Air Quality

NEQEG guidelines 2.3.2.1 for Textile Manufacturing is applied.

Table: 3.9.1-1. Air Emission Levels (NEQEG 2.3.2.1 Textile Manufacturing) for Operation and Decommissioning Phases

Sr.	Parameter	Unit	NEQEG 2.3.2.1 Guideline value
1.	Ammonia	mg/Nm^{3a}	30
2.	Particulates	mg/Nm^3	50^b
3.	Carbon disulfide	mg/Nm^3	150
4.	Chlorine	mg/Nm^3	5
5.	Formaldehyde	mg/Nm^3	20
6.	Hydrogen sulfide	mg/Nm^3	5
7.	Volatile Organic Compound (VOC_s)	mg/Nm^3	$2/20/50/85/100/150^{c,d}$

[a] Milligrams per normal cubic meter at specified temperature and pressure

[b] As the 30-minutes mean for stack emissions

[c] Calculated as Total carbon

[d] As the 30 minutes mean for stack emission: 2 mg/Nm^3 for volatile organic compounds classified as carcinogenic or mutagenic with mass flow greater than or equal to 10g/hour; 20 mg/Nm^3 for discharges of halogenated volatile organic compound with a mass flow equal or greater than 100 g/hour; 50 mg/Nm^3 for waste gases from drying of large installations (solvent consumption > 15 tons/years); 85 mg/Nm^3 for coating application process for large installation (solvent consumption > 15 tons/years); 100 mg/Nm^3 for coating application process for large installation (solvent consumption > 15 tons/years); if solvent is recovered from emissions and reused, the guideline value is 150 mg/Nm^3

3.9.2. Effluent Level (NEQEG 2.3.2.1 Textile Manufacturing)

In this study, NEQEG 2.3.2.1 Textile Manufacturing effluent level is adopted.

Table 3.9.2-1 Effluent Level (NEQEG 2.3.2.1 Textile Manufacturing)

Sr. No.	Parameter	Unit	Guideline Values
1.	5-day biochemical oxygen demand	mg/l	30
2.	Adsorbable organic halogens	mg/l	1
3.	Ammonia	mg/l	10
4.	Cadmium	mg/l	0.02
5.	Chemical Oxygen Demand	mg/l	160
6.	Chromium (hexavalent)	mg/l	0.1
7.	Chromium (total)	mg/l	0.5
8.	Cobalt	mg/l	0.5

9.	Color	m^{-1}	8 (436mn[a], yellow) 5 (525nm, red) 3 (620nm, blue)
10.	Copper	mg/l	0.5
11.	Nickle	mg/l	0.5
12.	Oil and Grease	mg/l	
13.	Pesticides	mg/l	0.05-0.10[b]
14.	pH	-	6-9
15.	Phenol	mg/l	0.5
16.	Sulfide	mg/l	1
17.	Temperature increase	°C	<3[d]
18.	Total Coliform Bacteria	100 ml	400
19.	Total Nitrogen	mg/l	10
20.	Total phosphorous	mg/l	2
21.	Total Suspended Solid (TSS)	mg/l	50
22.	Zinc	mg/l	2

3.9.3. Water Quality (WHO Standard)

To check water quality, the WHO drinking water standard is used as a reference due to the lack of NEQEG guideline values.

Table: 3.9.3-1. WHO Drinking Water Quality Standard

Sr. No.	Quality Parameter	Result Units	WHO Drinking Water Standard	Remark
1.	pH	_	6.5-8.5	Normal
2.	Color (True)	TCU	15 TCU	_
3.	Turbidity	NTU	5 NTU	
4.	Conductivity	micro S/cm	400	
5.	Total Hardness	mg/l as $CaCO_3$	500 mg/l	
6.	Calcium Hardness	mg/l as $CaCO_3$	250 mg/l	
7.	Magnesium Hardness	mg/l as $MgCO_3$	150 mg/l	
8.	Total Alkalinity	mg/l as $CaCO_3$	400 mg/l	
9.	Phenolphthalein Alkalinity	mg/l as $CaCO_3$	200 mg/l	
10.	Carbonate (CaO_3)	mg/l as $CaCO_3$	10-500 mg/l	
11.	Bicarbonate (HCO_3)	mg/l as HCO_3	30-400 mg/l	
12.	Iron	mg/l	0.3 mg/l	
13.	Chloride (as CL)	mg/l	250 mg/l	
14.	Sodium chloride NaCL	mg/l	200 mg/l	

15.	Sulphate (as SO_4)	mg/l	500 mg/l
16.	Total Solid (TS)	mg/l	500 mg/l
17.	Total Suspended Solid (TSS)	mg/l	300 mg/l
18.	Total Dissolved Solid	mg/l	300 mg/l
19.	Manganese	mg/l	0.05 mg/l
20.	Phosphate	mg/l	1 mg/l

3.9.4. Noise and Vibration

The NEQEG 2.3.2.1 for Textile Manufacturing, which is expressed for air emission and effluent levels only, is being followed by the Taungtha factory. However, since the factory uses machinery to produce Knitted Fabric, the NEQEG 1.3 Noise General guideline has been adopted for this study.

Table: 3.9.4-1. Noise level (NEQEG 1.3 Noise General Guideline) for Production and Decommissioning Phases

Receptor	One Hour LAeq (dBA)[a]	
	Day Time 08:00-22:00 (10:00-22:00 for public holidays)	Night Time 22:00-08:00 (22:00-10:00 for public holidays)
Residential Institutional educational	55	45
Industrial Commercial	80	80

[a] equivalent continuous sound level in decibels.

3.9.5. Light Intensity (Lux)

The NEQEG guideline 2.3.2.1 for Textile Manufacturing, which is expressed for air emission and effluent levels only, is being followed by the Taungtha factory. However, since the factory uses machinery and extensive labor forces to produce Knitted Fabric the lux level standards typically vary based on specific work tasks and areas. Generally, textile production demands adequate lighting conditions which lie 300-500 lux.

3.10. International Agreements and Conventions

In addition to the domestic laws listed above, Myanmar has signed or ratified not less than 30 international treaties, conventions, and protocols concerning the environment. Myanmar is also a signatory to the following international conventions, and these may have relevance to the proposed survey activities referring to the following table.

Table: 3.10-1. International agreements and conventions relevant to the proposed project

International Agreements and Conventions	Status	Proposed
Vienna Convention for the Protection of the Ozone Layer, 1985, Myanmar ratified the Vienna Convention in 1993.	1998	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone-depleting substances.
Montreal Protocol on Substances that deplete the Ozone Layer,1989	1993	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone depleting substances.
Basel Convention,1989	2015	The Convention regulates the transboundary movements of hazardous wastes and provides obligations to its parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.
United Nations Framework Convention on Climate Change (UNFCCC), New York,1992 and Kyoto Protocol 1998 Myanmar ratified the UNFCCC in 1994 and Kyoto Protocol in 2003.	1995 and 2015	Provide a framework for intergovernmental efforts to tackle climate change, recognizing that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases.
Convention on Biological Diversity, Rio de Janeiro,1992	1994	Aims to promote national policies for the conservation of wild flora, fauna and habitat that needs to be included in planning policies. The three main goals are: (1) the conservation of biological diversity; (2) the sustainable use of its components; and (3) fair and equitable sharing of the benefits.

Asia Least Cost Greenhouse Gas Abatement Strategy (1998 ALGAS)	1998	Develop national and regional capacity for the preparation of GHG inventories. Assist in identifying GHG abatement options and preparation of a portfolio of abatement projects for each country.
Under United Nations Framework Convention on Climate Change (UNFCCC), Paris Agreement was signed on April 22, 2016 (Earth Day) at the United Nations Headquarters in New York. Myanmar ratified in 2017.		Key Goals of the Paris Agreement: 1. Limit global temperature rise to well below 2°C, with efforts to keep it at 1.5°C. 2. Reduce greenhouse gas (GHG) emissions through nationally determined contributions (NDCs). 3. Increase climate resilience and adaptation efforts. 4. Provide financial support to developing nations for climate action, with a goal of mobilizing $100 billion per year. 5. Enhance transparency through a system of reporting and review
United Nations Agenda 21	1998	Formed by the National Commission for Environmental Affairs (NCEA) in Myanmar, provides a framework of programs and actions for achieving sustainable development in the country. Building on the National Environment Policy of Myanmar considers principles contained in the Global Agenda 21, Myanmar Agenda 21 also aims at strengthening and promoting systematic environmental management in the country.
Relevant ILO Conventions in force in Myanmar ▪ C14 Weekly Rest (Industry) ▪ C18 Workmen's Compensation ▪ C 19 Equality of Treatment (Accident Compensation) ▪ C 26 Minimum Wage Fixing Machinery ▪ C 29 Forced Labor Convention ▪ C 42 Workmen's Compensation ▪ C 52 Holidays with pay		Sets out legal instruments drawn up by the ILO's constituents (governments, employers, and workers) and sets out basic principles and rights for workers.

3.11. National and International Guidelines for Proposed Project

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

1. Environmental Impact Assessment Procedure (2015)
2. National Environmental Quality (Emission) Guidelines (NEQEG) (2015)
3. World Health Organization Guidelines (WHO)
4. IFC Guidelines for Waste Management Facilities, 2008
5. IFC Guidelines for Water and Sanitation, 2008
6. IFC Guidelines for Community Health and Safety
7. IFC Guidelines for Occupational, Health, and Safety

Table: 3.11-1. Penalties and other administrative punishment granted in EIA procedures

No.	Non-compliance	Penalties	Specific Administrative Punishment of the Ministry
1.	Failure or delay in timely submission of reports within the period prescribed by the Ministry	100 to 500 US$ or equivalent Myanmar Kyat + 10-25 US$/day unit cured or equivalent Myanmar Kyat	- Issue Enforcement Notice
2.	Obstruction or interference with an official in the course of their duties	250 to 5,000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice - Criminal prosecution
3	Failure to provide information to the Ministry or any representative	1000 to 5000 US$ or equivalent Myanmar Kyat	- Suspension of Approval of EMP, EMP-CP, EMP-OP in whole or in part
4.	Failure to provide information to the Ministry Inspector or any representative when	250 to 5000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice

	requested in regard to inspection and monitoring		
5.	Undertaking or allowing any preparatory or other construction works without the prior approval by the Ministry of a reserved EMP or EMP-CP	1,000 to 5,000 US$ or equivalent Myanmar Kyat +50 to 500 US$/ day unit cured or equivalent Myanmar Kyat	- Criminal prosecution -
6.	Operating/implementing without a permit, or approval by the Ministry of an EMP or EMP-OP	1,000 to 5,000 US$ or equivalent Myanmar Kyat +50 to 500 US$/ day unit cured or equivalent Myanmar Kyat	- Criminal prosecution
7.	Non-compliance with an Enforcement Notice or Suspension Notice issued by the Ministry	2,000 to 10,000 US$ or equivalent Myanmar Kyat +100 - 500 US$/ day unit cured or equivalent Myanmar Kyat	- Suspension of Approval of EMP, EMP- CP, or EMP-OP in whole or in part - Revocation of Approval of EMP, EMP-CP or EMP-OP in whole or in part
8.	Failure to notify the Ministry of any knowledge of any event of imminent Environmental damage	1,000 to 5,000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP, or EMP-OP in whole or in part - Revocation of Approval of EMP, EMP-CP, or EMP-OP in whole or in part
9.	Failure to take reasonable steps to prevent an imminent threat of damage to the Environment, social,	2,500 to 10,000 US$ or equivalent Myanmar Kyat	- Issue Enforcement Notice - Suspension of Approval of EMP, EMP-CP, or EMP-OP in whole or in part

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

- Note:
- All penalty amounts set forth in this Annex are denominated in United States dollars (US$) and are subject to annual inflation adjustment
- Abbreviations are as follows;

EMP = Environmental Management Plan

EMP-CP = Environmental Management Plan – Construction Phase

EMP-OP = Environmental Management Plan – Operational Phase

Chapter 4

Description of the Project

Chapter (4)

Description of the No. (10) Textile Mill (Taungtha)

4.1. Introduction

The contract between Myanmar Textile Industries and World Best Company Limited, China was signed to supply machineries for Taungtha Knitting Factory Project in 2002. It was commissioned on 21st, April, 2005.

The objectives of the Taungtha Knitting Factory Project were; to boost the domestic knitted fabrics production, to encourage local production for local consumption as import substitution items, to create jobs opportunities for the local people, to contribute socio-economics development of the region.

The factory was formerly administered by Myanmar Textile Industries, Ministry of Industry No (1). Recently, it has been operated by No. (3) Heavy Industry Enterprise, Ministry of Industry, under the Ministries emerging program in 2021.

4.2. Location & Infrastructure

No. (10) Textile Mill (Taungtha) is located 1.3 miles away from Taungtha Town. It is situated at the northern part of Taungtha Township, Myingyan District, Mandalay Region. It is bordered by Mahlaing Township to its east, Kyaukpadaung Township, to its south, Bagan-Nyaung Oo and Pakokku Township to its west and Myingyan Township to its north.

Grid Line Position: Between north latitude 20° 17' 45.52" and 21° 18' 04.82" and east longitude 96° 26' 12.66" and 96° 26' 34.29". (Shown in Figure: 4.2-1)

Total Factory Compound Area	61.19 Acres
Factory Area	33.17 Acres
Quarters	28.02 Acres

Figure: 4.2-1. Location map with grid line position



4.3. Surrounding Areas

Taungtha factory is bordered by cultivated land, Thaphanpin village, No. (3) ward of Taungtha Town, Oak-taik-taw village, Htantaw village, Chaung-Nar village and Myingyan-Taungtha road. Factory area and its location in Mandalay Region are illustrated in Figure 4.3-1. - 4.3-2.

Figure: 4.3-1. Surrounding area

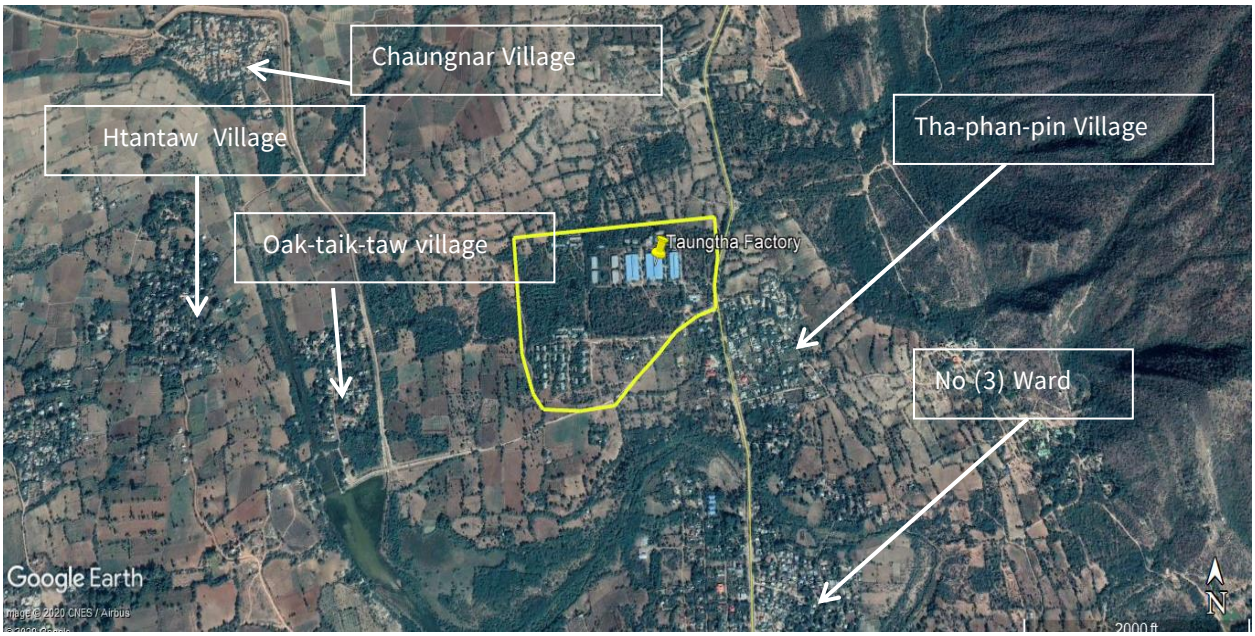
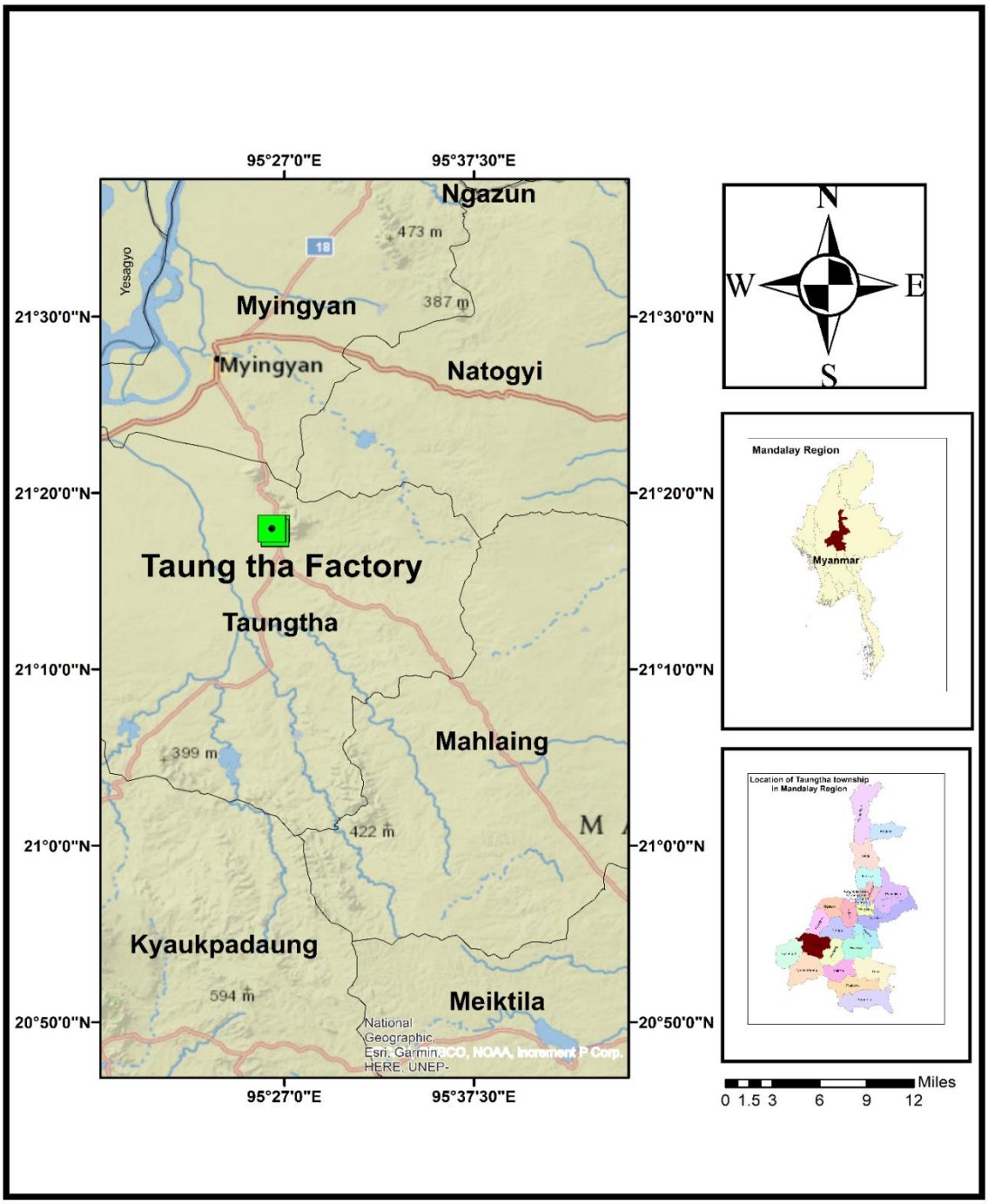


Figure: 4.3.2. Factory's location map



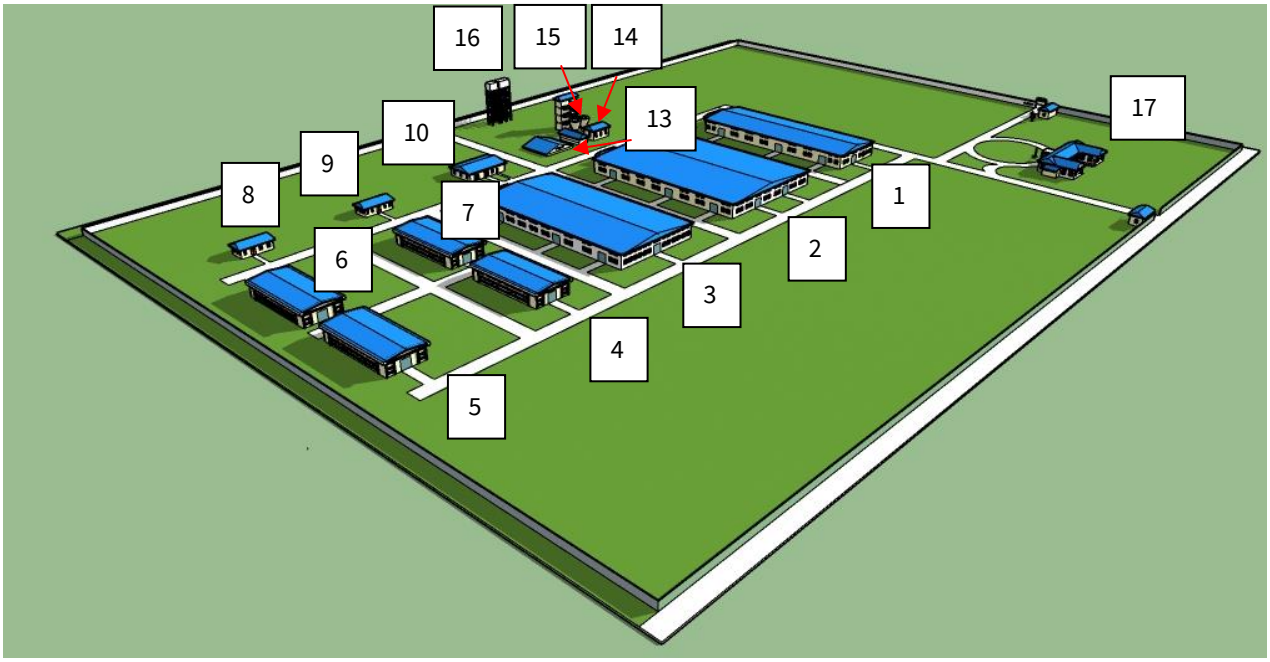
4.4. Building

The building list is shown in Table: 4.4-1. Three-dimensional drawings for the factory are illustrated in Figures: 4.4-1 to 4.4-3.

Table: 4.4-1. Building list

Sr.No.	Name of the Building	Length (Ft)	Width (Ft)	Height (Ft)	Numbers
I	**Mechanical Buildings (Workshops)**				
1.	Knitting Workshop	240	80	18	1
2.	Finishing Workshop	240	160	22	1
3.	Garment Workshop	240	120	18	1
4.	Transformer House	50	40	14	1
5.	E & M Workshop	50	40	14	1
6.	Boiler House	65	40	21	1
7.	Fire station	60	25	15	1
8.	Pump House	43	10	12	1
9.	Ground Tank (Gal	22	15	8	1
10.	Raw Water Ground Tank (150000 Gal)	55	55	8	1
11.	Pure Water Ground Tank (150000 Gal)	55	55	8	1
12.	Over Head Tank (Water) (20000 Gal)	20	13	125	1
13.	Over Head Tank (Soft Water) (30000 Gal)	32	13	125	1
14.	Warehouse	100	50	17	4
15.	Water Treatment Workshop	30	12	12	1
16.	Office	150	100	18	1
17.	4 Storyed Building	18	20	42	1
	Sub-Total				**20**
	Quarters (Staff Quarters)				
1.	Deputy General Manager House	44	24	10	6
2.	Supervisor House	54	18	10	7
3.	Other Rank	42	20	10	7
4.	Woman Dormitories	108	20	20	4
5.	Gentleman Dormitories	108	20	20	3
6.	Dining Hall	40	30	10.6	2
7.	Temporary Dinning Hall	50	31	13	1
	Sub- Total				
	Total				**30**

Figure: 4.4-1. No. (10) Textile Mill (Taungtha) (Bird's Eye View)



Legend

1. Knitting Factory	5. Warehouse	9. Workshop	13. Pump house
2. Dyeing Factory	6. Warehouse	10. Sub-station	14. Water treatment
3. Garment Factory	7. Warehouse	11. Boiler house	15. Clarifier
4. Warehouse	8. Fire station	12. Ground Tank	16. Overhead tank
			17. Office

Figure: 4.4-2. No. (10) Textile Mill (Taungtha) (Bird's Eye View)

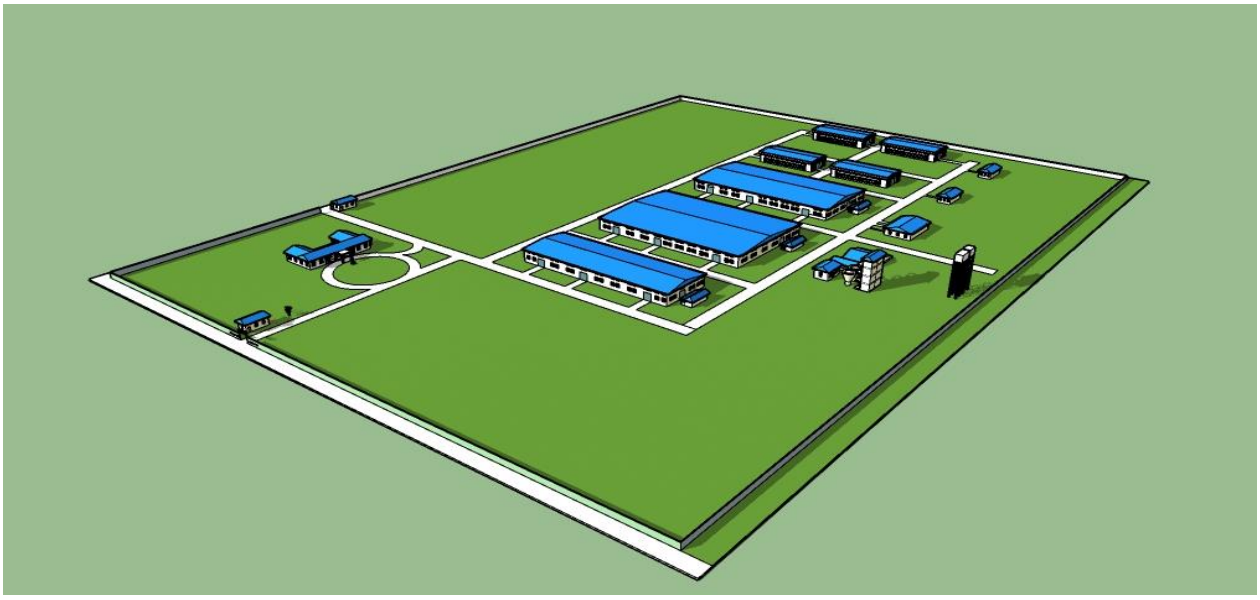
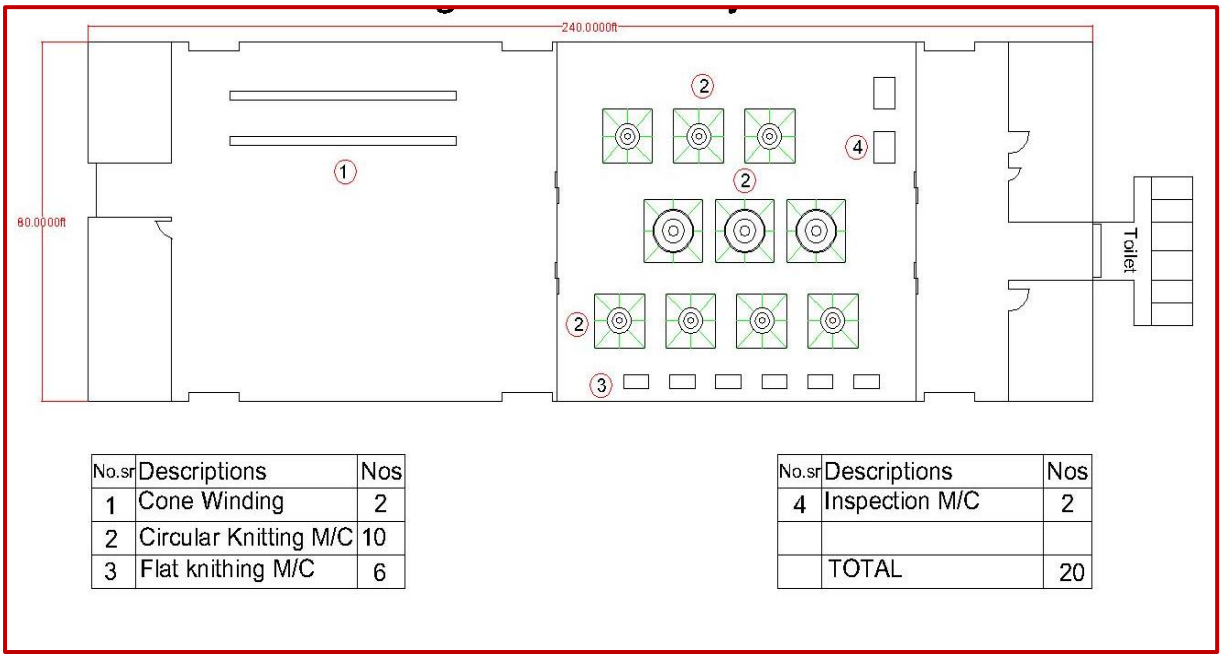


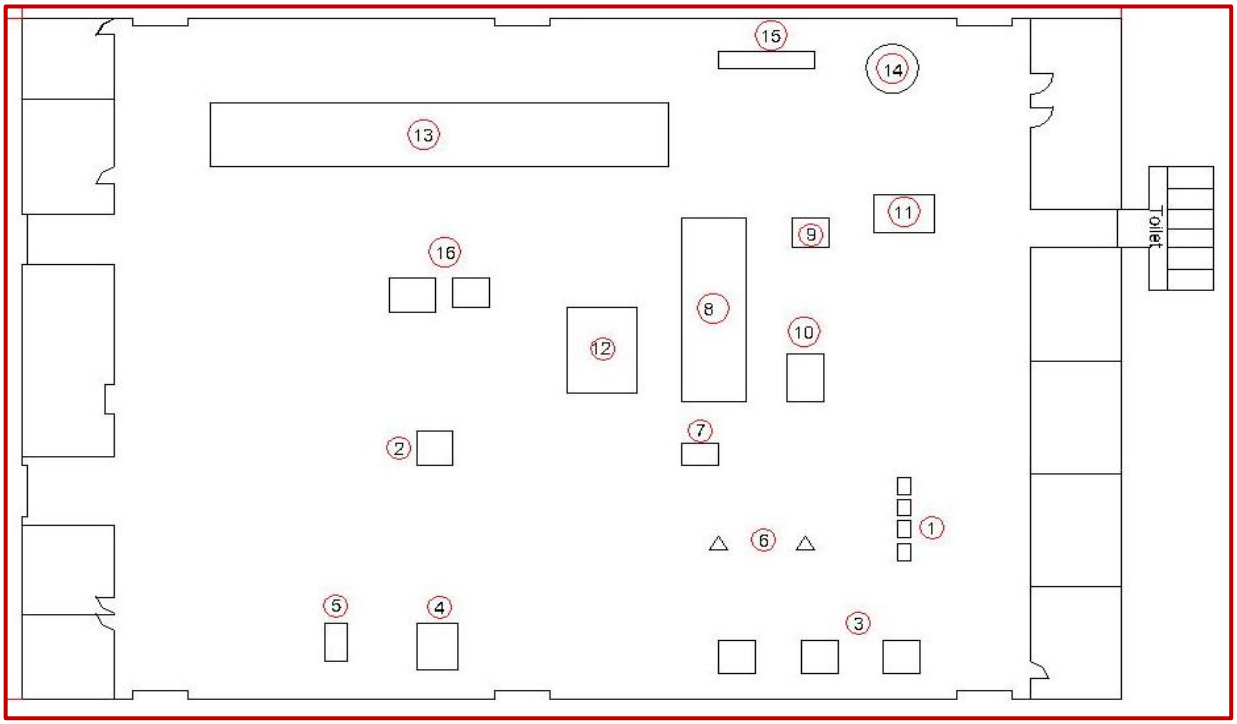
Figure: 4.4-3. Knitting workshop machine lay out plan



No.sr	Descriptions	Nos
1	Cone Winding	2
2	Circular Knitting M/C	10
3	Flat knithing M/C	6

No.sr	Descriptions	Nos
4	Inspection M/C	2
	TOTAL	20

Figure: 4.4-4. No (10) Finishing workshop machine lay out plan

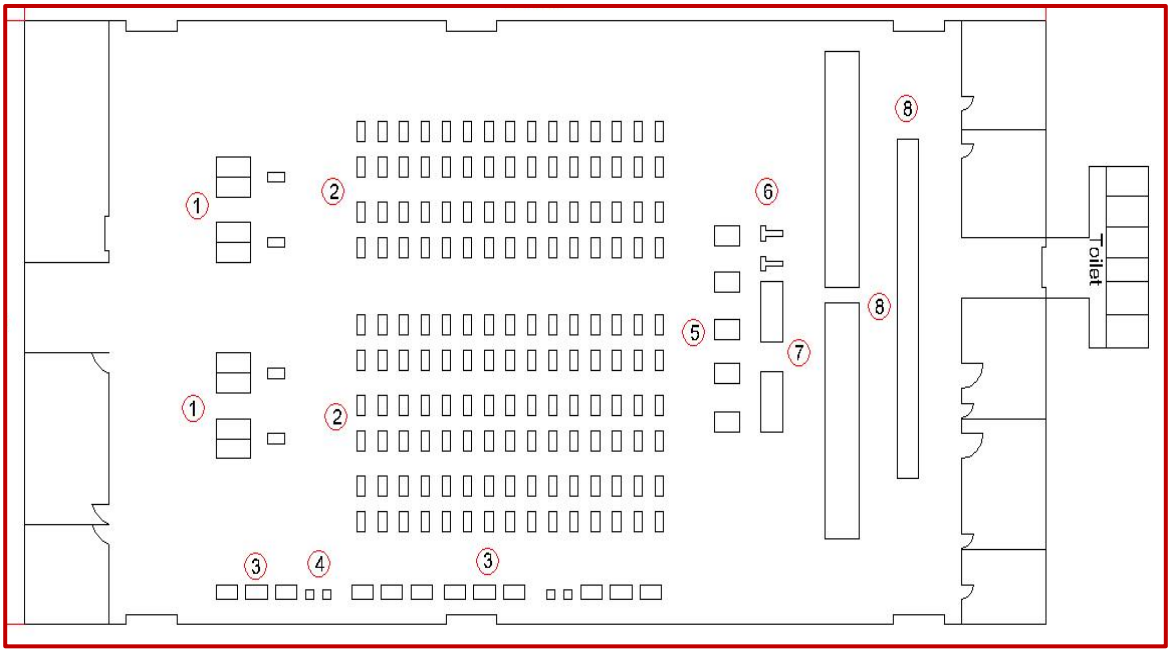


No	Name	Nos
1.	Three Thread Overlock M/C	4
2.	Turning M/C	1
3.	Atmospheric Over-flow	3
4.	Model FQ High Treamperature OverFlow Dyeing M/C	1
5.	Sample Dyeing M/C	1
6.	Hydro Extractor	2

No	Name	Nos
7.	Wet Expanding M/C	1
8.	Tensioniess Dryer	1
9.	Over Feed Expanding M/C	1
10.	Pre Shrinking M/C	1
11.	Tubular Calender Knitted Fabrics	1
12.	Plaiter M/C	1

No	Name	Nos
13.	Slitting M/C	1
14.	Inspection M/C	2
15.	Heat Setter	1
16.	Auto Rotary Printing M/C	1

Figure: 4.4-5. Garment workshop machine lay out plan

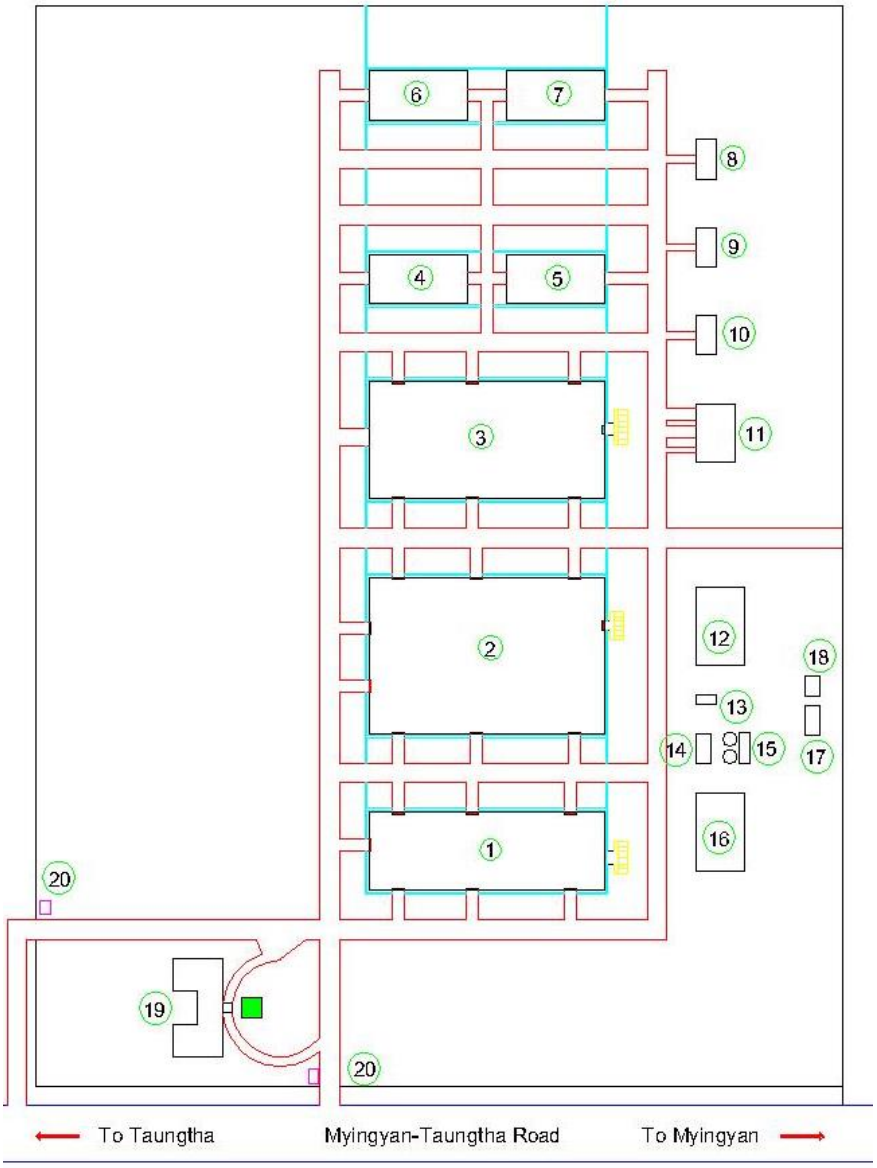


No.sr	Descriptions	Nos
1	Packing Table	4
2	Sewing M/C	150
3	Full Steam Ironing	12

No.sr	Descriptions	Nos
4	Bar Tacking Sewing	4
5	Bniding interlock	5
6	Cuff	2

No.sr	Descriptions	Nos
7	Band knife cutting	2
8	Cutting	3
	Total	182

Figure: 4.4-6. Factory lay out plan



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

4.5. Social Review

Early 2000, Textile Industry was one of the most labor-intensive industries in Myanmar. Taungtha factory produced knitted fabrics with over 325 strong workforces, of which over 90% are from nearby villages such as Thaphanpin village, No. (3) & No. (6) ward, Oak-taik-taw village, Htan-taw village, Chaung-nar village and Myay-phyu-kone village. It is ensured that establishment of Taungtha factory guarantees the well-being of the surrounding communities.

4.6. Machinery List

There are three production workshops: knitting workshop, finishing workshop and garment workshop. Machine layout plan is expressed in Figure 4.4-3 to 4.4-6. Production machineries are expressed in following table.

Table: 4.6-1. Machinery list

Item	Description		Model	Unit
I	**Production Equipment**			
	Knitting Section			
1	High Speed Cone Winder	GA014MD 120	Set	2
2	Four-track Single Open-Width Knitting Machine (Center Weight Adjustment)	WS/3FA-B3090	Set	3
3	Four-track Single High Feeder Knitting Machine (Center Weight Adjustment)	WS/5FA-30150	Set	2
4	Computerized Single Knitting M/C Series with Auto-stripper (Six-color)	PA-1- 4F-3042x6	Set	1
5	(2+4) Track Double Machine (Inner Girder High Speed Type)	WDTL/2.1F-3484	Set	3
6	(2+4) Track Rib Machine (Inner Girder High Speed Type)	WDTL/1.8F-3054	Set	1
7	Computerized Flat Knitting Machine	KH-313J	Set	6
8	Inspection Machine	YL-2000	Set	2
II	**Belching, Dyeing & Finishing Section**			
1	Turning Machine for Tubular Knitted Fabric	ME-601	Set	1
2	Plater	YL-2200	Set	1
3	Slitting Machine	YL-2200	Set	1
4	Atmospheric Overflow Dyeing Machine	SN4-2T	Set	3
5	Model FQ High-Temperature Overflow, Dyeing Machine	FQ-250A	Set	1
6	Dyeing Sample Machine	FQ-50	Set	1
7	High-Temperature Sample Dyeing Machine	HS-12	Set	1
8	Atmospheric Sample Dyeing Machine	DY-12	Set	1
9	Stainless Steel Hydro extractor (with Motorized Fabric Loading and Unloading Device)	Z751-1000	Set	2

10	Wet Expanding Machine	DS1300	Set	1
11	Tensionless Dryer	ME 346 A-2200	Set	1
12	Overfeed Expanding Machine	ME 691	Set	1
13	Woolen Blanket Pre-Shrinkage m/c	ME 692	Set	1
14	Tubular Calendar Knitted Fabric	ME-651	Set	1
15	Heat Setter for Tubular Knitted Fabric	ME 724 A-3200	Set	1
16	Heat-setting Stenter	M 5469-2400 X 5	Set	1
17	Auto-Rotary Printing Machine	M6	Set	1
18	Plate Making System		Set	1
19	Three Threads Over lock Machine	ZJ752-17	Set	4
20	Inspection Machine	YL-1800/ YL-2600	Set	2
III	**Garment Section**			
1	Cutting Table	6.5’ x 24	Set	2
2	Cutting Table	8’ x 24’	Set	2
3	Single Needle Straight Lock Stitch m/c	SL -7340	Set	69
4	Three Threads Over lock Machine	C 11 - 0151	Set	20
5	Four Threads Over lock Machine	C21-4151	Set	10
6	Five Threads Over lock Machine	C 31-6351	Set	13
7	High-speed Cylinder Bed Interlock Sewing Machine	ZJW 122-356/CH-CI	Set	19
8	High-speed Cylinder Bed Interlock Sewing Machine	ZJ-w 222-248	Set	5
9	High Speed Lockstitch Straight Buttonhole Sewing Machine	GF 11018	Set	4
10	Button Attaching Sewing Machine	GE 2108	Set	4
11	High Speed Bar Tacking Sewing m/c	GD 2308	Set	4
12	Strip-Cloth Cutting Machine	GBC 1-1	Set	2
13	Electric Heating Vacuum Table	YTT-BIV-1	Set	12
14	Electric Stream Generator	DZG-12D	Set	4
15	Full Stream Iron	QZ-A	Set	14
16	Auto Cloth Layer for Tubular Knit And Cutting Table	XL-T	Set	1
17	Automatic End Cutter	CDZ 2000	Set	1
18	Straight Linear Fusing Press	NHG-500 A	Set	4
19	Straight Knife Cutting Machine	ZCD – 210 – M	Set	8
20	Band Knife Cutting Machine	BKM – 900	Set	2

4.7. Production

Taungtha factory was designed to produce knitted wears made of soft-twist yarn. It has been operating for over 20 years. As a State Own Enterprises (S.O.E), it was necessary to review and downgrade the production capacity due to the unavoidable circumstances; insufficient yearly allocated capital budget which caused improper machine maintenance followed up by lower production capacity and poor quality, fierce market competition caused by open door economic policy importing quality knit wears. As compared below, the following table shows that the rated production capacity for knitted fabrics is 80 % of installed production capacity.

Table: 4.7-1. Production capacity

Sr. No.	Particular	Installed Production Capacity Per / Year	Installed Production Capacity Per / Month	Rated Production Capacity Per / Year	Rated Production Capacity Per / month
1.	**Knitted Fabrics**	2000000 Pcs	166666 Pcs	1600000 Pcs	133333 Pcs

Based on these facts, IIC tried to identify the amount of production into two groups which have potential influence to the environmental concerns. First, the peak production period is defined as 2010-2011 fiscal year and secondly, referred actual production period is as regarded as 2019 October to 2020 March.

Table: 4.7-2. Production Capacity Comparison Statements

Sr. No.	Particular	2010-2011 Production Per Year	2010-2011 Production Per Month	2019 Oct to 2020 March Production 6 months	2019 Oct to 2020 March Production Per Month
1.	Knitted Fabircs	1,200,000 Pcs	100000 Pcs	31333 Pcs	5222 Pcs

It is understandable that 2019-2020 production is only 5.22 % compared to 2010-2011 production capacity.

4.8. Products

Factory produces three kinds of products: (1) T-shirt (2) Sport-shirt (3) Vest.

4.9. Brand

There is no brand for No. (10) Textile Mill (Taungtha).

4.10. Workforce & Salaries

Total staff strength is 472 of which 325 are appointed as of July 2020, with 45 male and 280 female. The factory operation is driven by five department heads collectively they accumulated more than 15 years of work experience in their respective fields (organization chart is drawn in Figure 4.10-1). They involved in the production department which includes knitting section, finishing section, and garment section, planning department, finance department, quality control department and administration department. Information for working hours is stated in Table 4.10-1.

Figure: 4.10-1. Organization structure

Table: 4.10-1. Working Hours

Sr No.	Department	Shift	Working hours
1.	Production Division	A+B shift	8:30 am to 4:30 pm
2.	Office	One shift	8:30 am to 4:30 pm

As a State Own Enterprise (S.O.E), based on their positions, all permanent staff receive a fixed regular payment made by the government every month. For the Minimum Wages Law (2013) and Notification (1/2018), all temporary staff are paid 6000 kyats as their daily wages. Working days per year is 246 days.

Table: 4.10-2. Staff and salaries

Sr. No.	Particular	Male	Female	Total
1.	Permanent staff	45	279	324
2.	Temporary staff	-	1	1
		45	280	325
Total monthly salary 48.720 million kyats				

4.11. Raw Material and Chemicals Consumption

Raw material consumptions are compiled in the following table. It is understandable that raw material consumption varies according to the structure of fabrics. Raw material consumption depends on knitted fabrics structure, course per inch and wales per inch. The factory's raw materials sources are mainly from India and China. The annual soft twist yarn requirement is 2.128 million lbs.

Table: 4.11-1. Raw material consumption

Sr. **No.**	Type of Product	Finished Goods Per Unit **(lb)**	Raw Material Requirement **(lb)**	Waste Consumption
1.	T-shirt	1	1.33	33 %
2.	Sport shirt	1	1.34	34%
3.	Vest	1	1.26	26%

Different kinds of chemicals are used for scouring, bleaching and dyeing process. List of chemicals usage is attached in Appendix. All the chemicals are stored in chemical warehouse.

4.12. Packing

Finished goods are packed with poly bags.

4.13. Production Processes

Textile manufacturing encompasses various processes such as yarn and woven fabrics manufacturing, yarn and fabric dyeing bleaching and printing manufacturing, garment manufacturing, garment manufacturing with washing, garment manufacturing with printing process, and knitting, dyeing, and garment manufacturing.

In Taungtha factory, there are three main steps to produce knitted wears from yarn stage to garment stage: (a) knitted fabrics manufacturing process (b) finishing process (c) garment manufacturing process.

4.13.1. Knitted Fabrics Manufacturing

Soft Cone Winding

This is the beginning of the knitted fabrics manufacturing process. In this process, yarn rewinding process is carried out as a preparatory process for circular knitting.

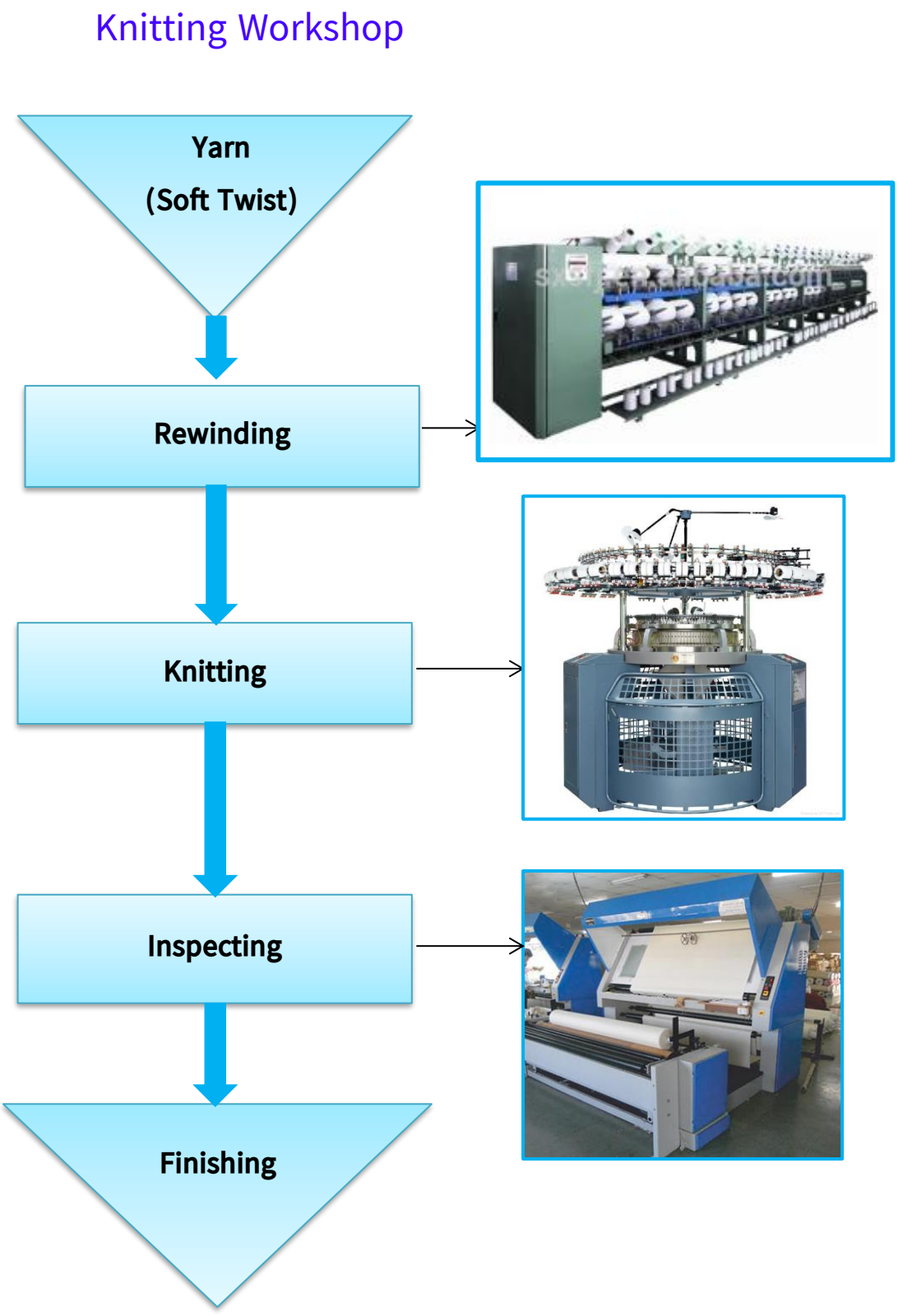
Circular Knitting

Upon customer request, course per inch and wales per inch is determined. The working principle of circular knitting is done by the following parts. Creel is used to the yarn from where the yarn is supplied to machine through pipe. Yarn guide is necessary for maintaining proper tension on yarn during knitting. Yarn tensioner is required to grip yarn by needles. Feeder position is important for machine production. Selecting machine gauge is an important parameter. Different types of needles are used in knitting machine. It is impossible to knit garment without needles. Knitting cams are arranged according to the design. Sinker is essential for knitting garments. Sinker is used to hold & support the thread during the loop formation. In knitting different shape of sinkers are used.

Turning

It can be used for face and back cloth turning of knitted tubular fabrics of cotton, silk, and chemical fiber.

Figure: 4.13.1-1. Knitted fabrics manufacturing process flow chart



4.13.2. Finishing Process

Scouring, Bleaching and Dyeing

The objective of scouring is to lessen the amount of contamination such as, fats, waxes, pectin, heavy metals, amino acids, oils, gums and lubricants. If impurities remain in the fabrics, uniform absorption of dyes and finishing agents will not take place. Alkalization reaction is occurred in this process.

Bleaching process is essential prior to dyeing cotton fabric in which remaining impurities and natural coloration need to be taken off for the requirement of whiteness. Dilute hydrogen peroxide agent is applied. When customers request deep color shade, low level bleaching is done. But for white bed sheets, the highest level of whiteness is crucial.

Dyeing is also the process of coloring knitted fabrics by immersing them in an aqueous solution of dye, called dye liquor. Normally the dye liquor consists of dye, water and an auxiliary chemical. To improve the effectiveness of dyeing, heat is usually applied to the dye liquor. The maximum working temperature for atmospheric over flow dyeing jigger is 98°C which is suitable for cotton knitted fabric. The high temperature overflow dyeing m/c is selected to dye polyester knitted fabrics with the maximum temperature of 140°C. The property of color fastness depends upon two factors- selection of proper dye according to the material to be dyed and selection of the method for dyeing fabric.

Hydro-extracting

It is important to dehydrate the dyed fabrics prior to the heat setting stenter.

Heat Setting Stenter

Heat setting can be carried out at two different stages in a fabrics finishing processing sequence i.e., after scouring and after dyeing process. The purpose of heat setting is to get excellent dimensional stability of the fabrics and good crease-proof properties.

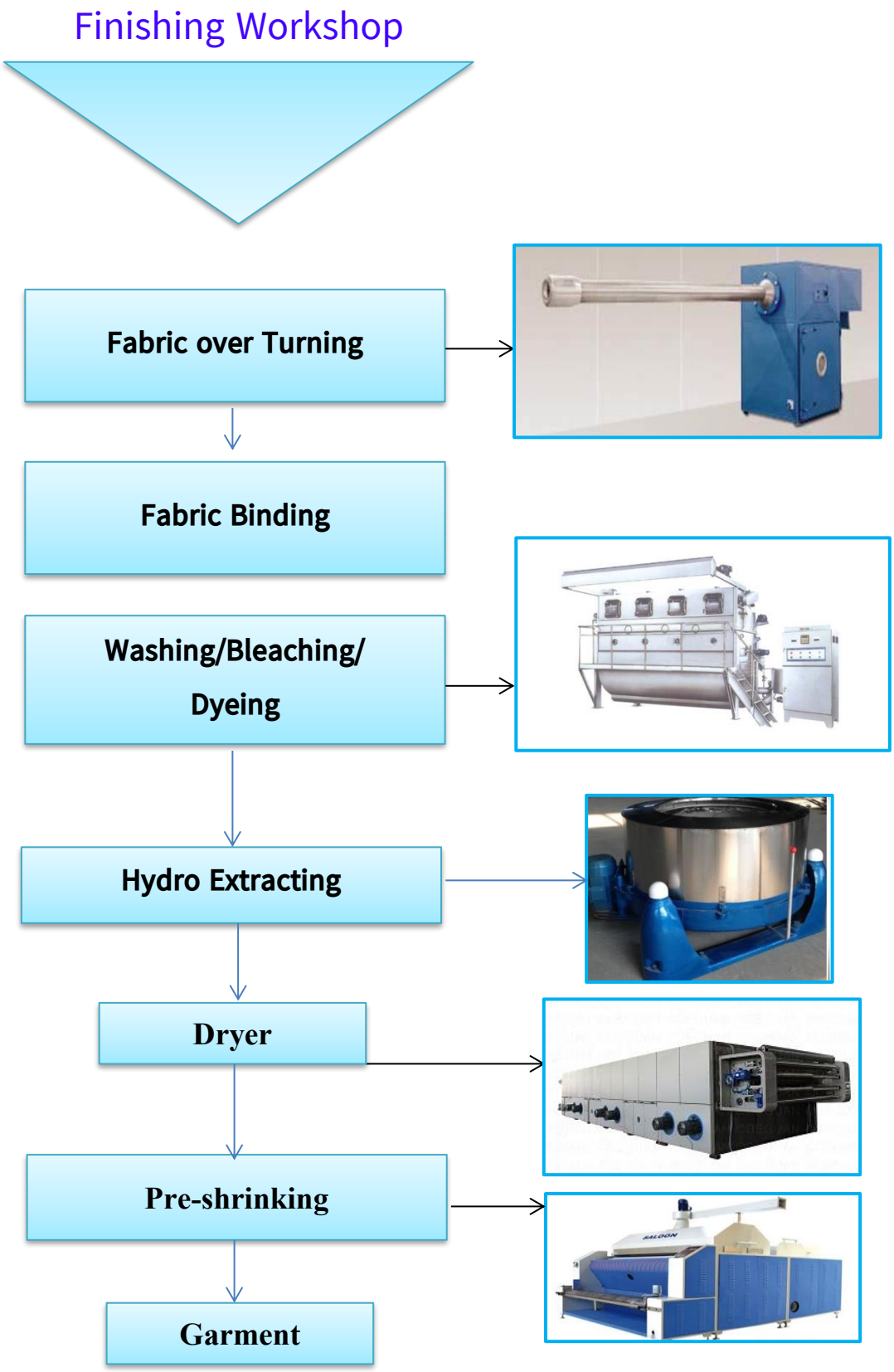
Pre-shrinking Machine

Pre-shrink machine is the key equipment to improve the quality of knitted fabrics as a final process. The tubular knitted fabrics handling is soft, smooth and dimensionally stable. The desired dimension is less than 5%.

Inspection

The fabric is inspected and folded. Imperfections are mended as required. The fabric is then graded and sent to garment workshop.

Figure: 4.13.2-1. Finishing process flow chart



4.13.3. Garment Manufacturing Process

Garment manufacturing is an assembly-oriented activity with a great range of raw materials, product types, production volumes, supply chains, retail markets and associated technologies. It consists of sampling section, spreading and cutting section, sewing section, quality control section, finishing and packing section.

Sample Section

Sampling section is responsible to clarify the style in details, to check pattern's workability, to prepare different samples and get the buyer's approval, to minimize operation and consumption.

Spreading and Cutting Section

In this section, spreading, markers and production are carried out simultaneously. Spreading is done by manual. Nap one way and face one way spreading is the most common spreading method that can also be done manually. Simultaneously, marker is manually prepared. Manual marker created on marker paper or directly on fabric ply. It is time consuming process and accuracy depends on individual's skill. Cutting is done by machine; straight hand knife and stationary cutter or band knife. Ticketing and bundling are the preparation for sewing section. Tickets carry details: style no, size, ply no, bundle no., date issued. Small batches of garments move from one work station to another in a controlled way.

Sewing Section

Conventional bundle system is used in this sewing section. Sewing machines are arranged in lines. The work flows from the central area to the first machine, from the first machine back to the store, and then on to the next machine, and so forth. The work in progress is in the form of bundles.

Quality Control Section

The responsibilities of quality control section are: to impart quality in the product, and to ensure that the quality has achieved the quality parameters of buyers.

Finishing and Packaging Department

Finishing is the last stage of garment production where garment gets its final look. It undergoes for quality check for several number of time which sets the garment free from defects.

Figure: 4.13.3-1. Garment workshop flow chart

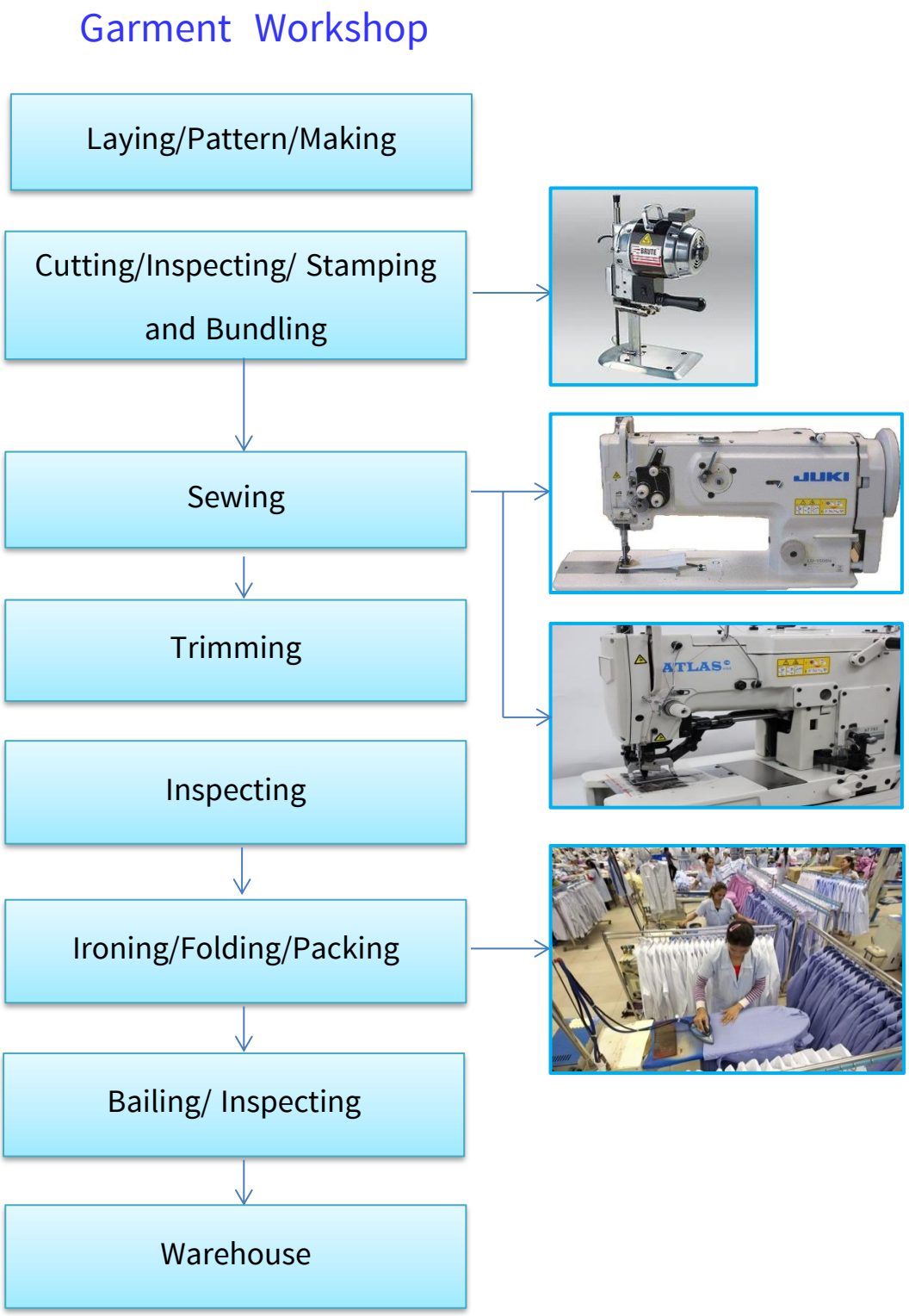


Figure: 4.13.3-2. Garment manufacturing process flow chart

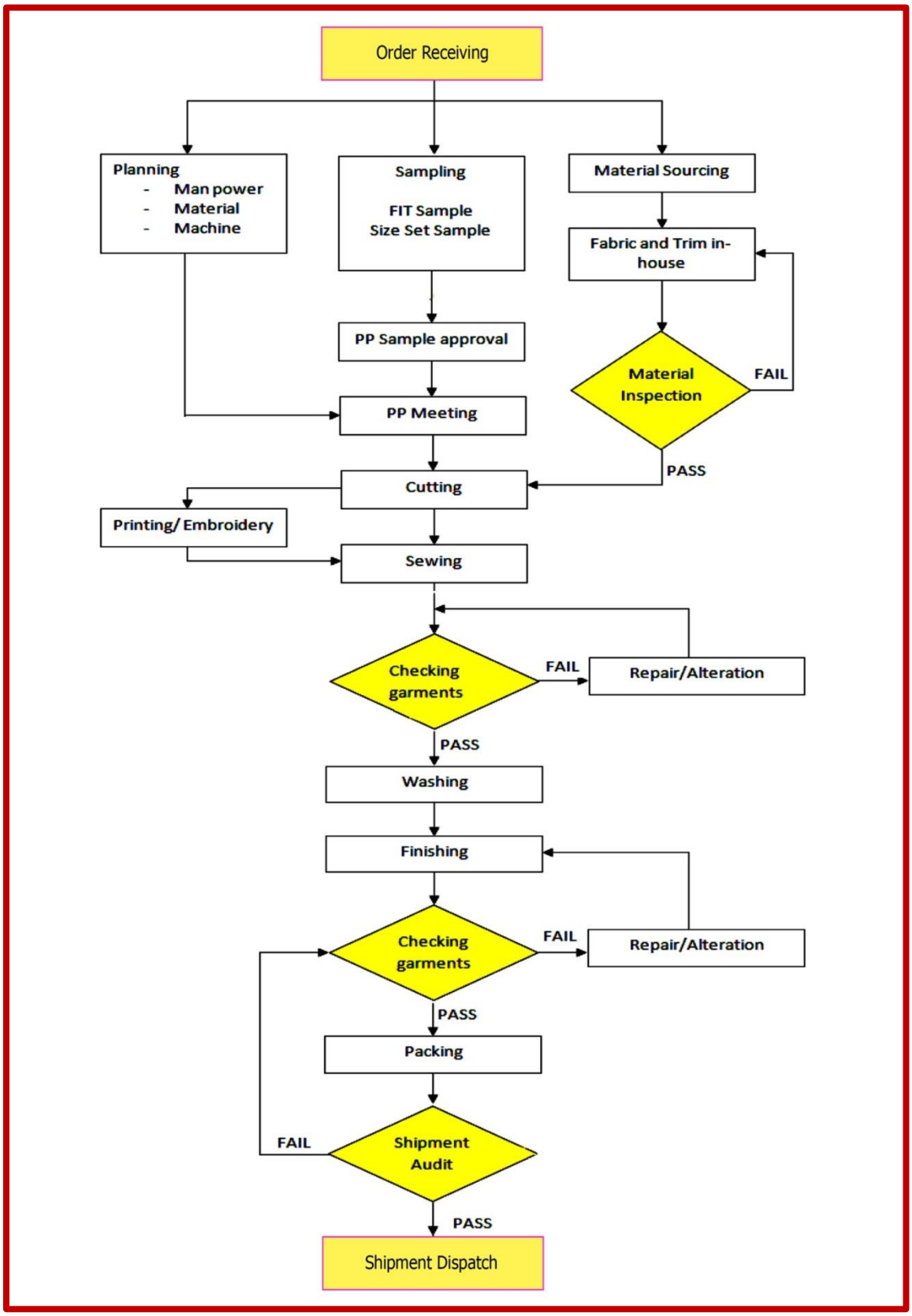


Figure: 4.13.3-3. Process Photos

Cone winding



Knitting



Turning



Dyeing



Hydro extractor



Wet Expanding



Stitching



Buttom Hole



Ironing



Sewing



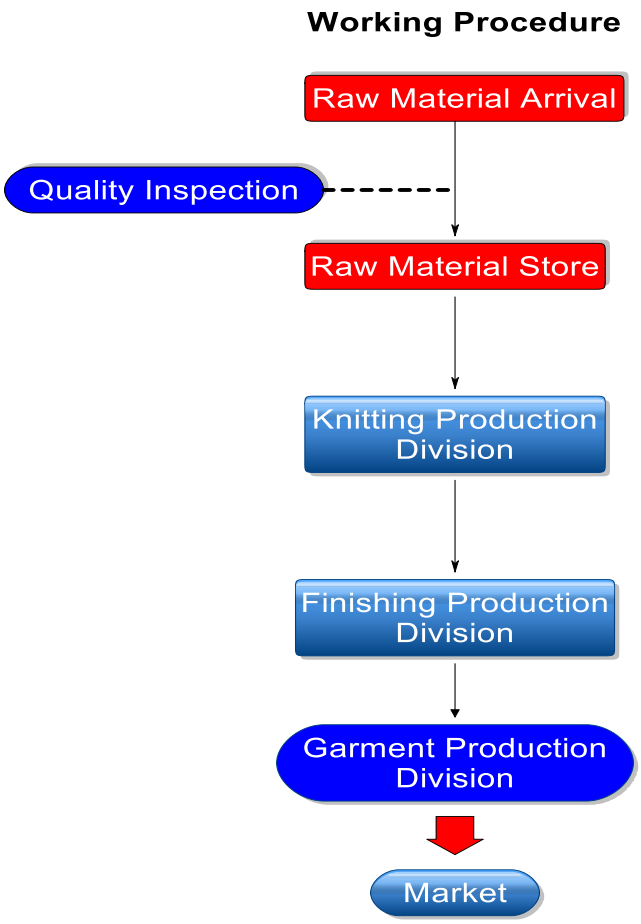
Fishing



4.14. Working Procedure

Based on the work order, there are different raw materials requirements for the factory in which production department needs grey yarn. When raw materials arrive to the warehouse, quality control department takes responsibility to check the quality of different raw material and classified it. Upon request by production division, raw material warehouse issues those raw materials. Process quality control system is applied for all production processes. Generally, knitted workshop uses soft twist yarn to make different fabric structure which is limited two to three. When new order prescribes different yarn type with new style, factory needs to order these yarns. Working procedure flow diagram is illustrated in the following figure.

Figure: 4.14-1. Working procedure flow chart



4.15. Water Consumption

4.15.1. Water Resource

Taungtha factory is located in the middle of dry zone in Myanmar where water resources are very limited. Factory receives water from Taungtha creek where shallow wells are dug and pumped to the collecting pond beside the creek with the storage capacity of 50000 gallons. Raw water is pumped to the collecting pond of the factory and treated in water treatment system.

Factory use	23500 gallons per day
Staff quarters	6500 gallons per day
Total	30000 gallons per day

Figure: 4.15.1-1. Water treatment facility

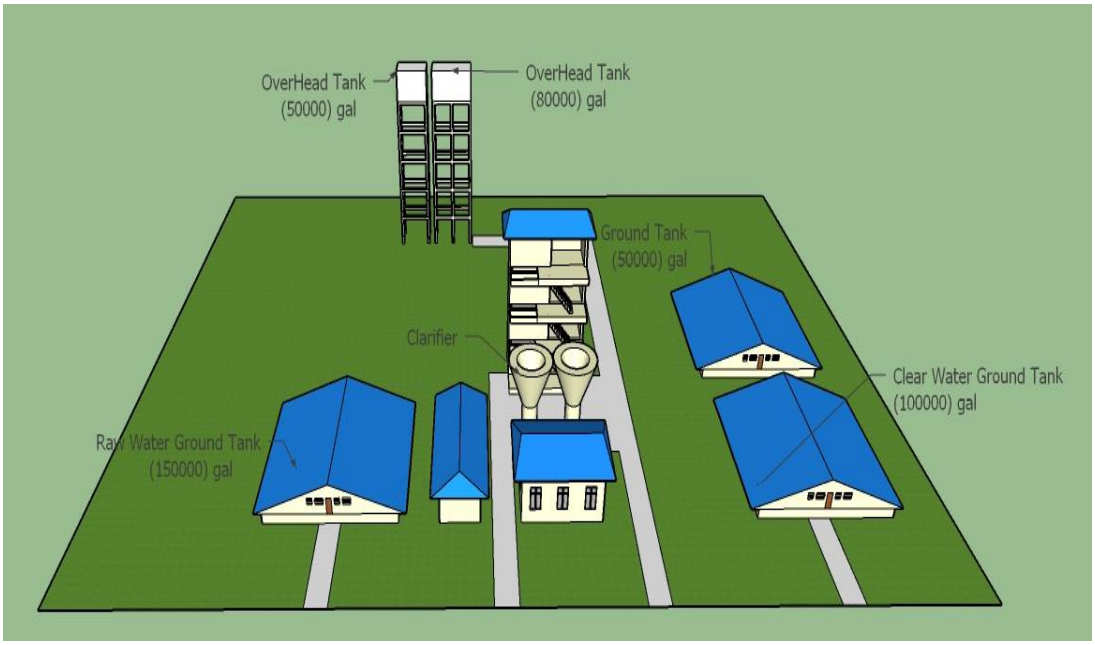
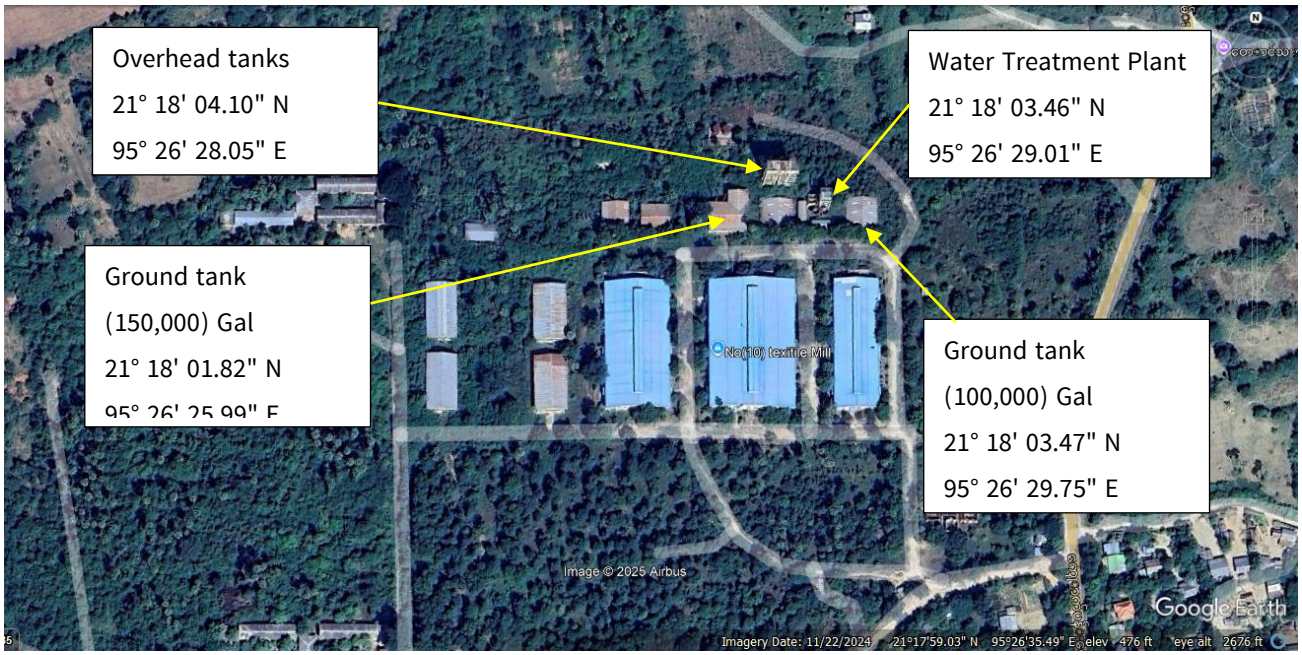


Figure: 4.15.1-2. Overhead tank and ground tank positions with GPS points



4.16. Electric Power Consumption

Taungtha factory draws power from Myingyan sub-station, which is 13 miles far from the factory, with 33 KV high tension line, supplied by Electricity Supply Enterprise (E.S.E), Ministry of Electric Power. A substation in which one 2 MVA transformer was installed, and receives the high voltage power and step-down voltage level from 33 KV to 11 KV and interconnect to low voltage transformers. The transformers' information is listed below.

Table: 4.16-1. Transformer list

Sr. No.	Description	Model	Country	Installed Date	No; of M/C
1.	2000 KVA	YTE	Myanmar	2005	1
2.	1600 KVA	-	China	2005	1
3.	315 KVA	YTE	Myanmar	2005	1

To comply with the Myanmar Electricity Law of 2014, it is crucial for the factory's transformers to be thoroughly inspected by the Electrical Inspection Department. This process is managed by the Department of Industrial Supervision and Inspection within

the Ministry of Industry. It ensures safety, regulatory compliance, and ultimately safeguarding the factory's operations and the surrounding community.

Based on maximum production period, 2010-2011, consumption is as follows;

Electric Kilowatt Hour Requirement per annual 200,000 KWH

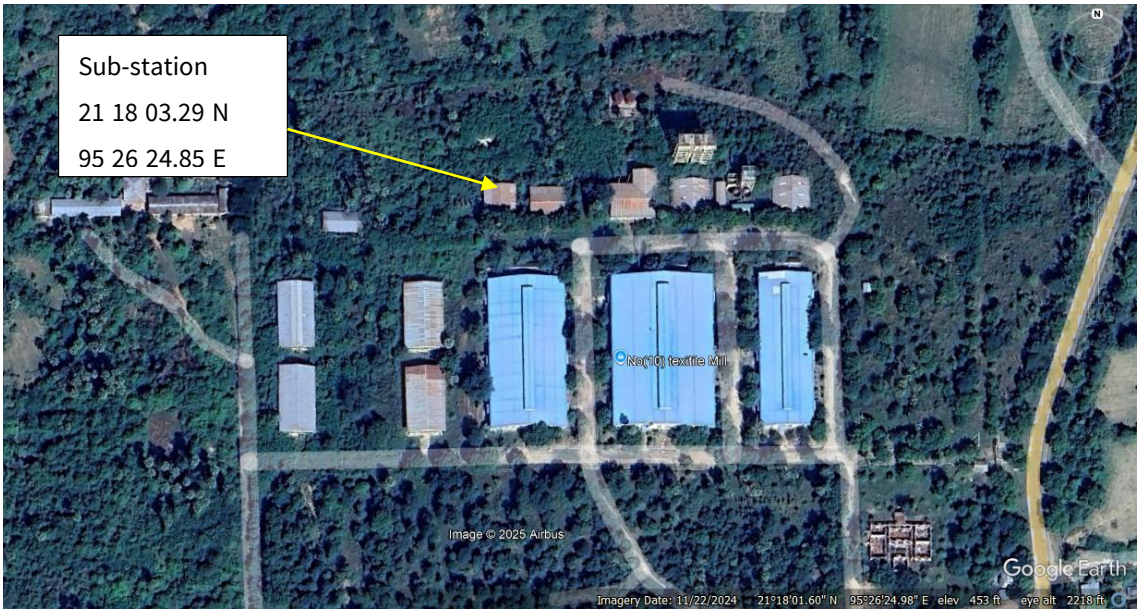
Electric Kilowatt Hour Requirement per month 16666 KWH

Electric Kilowatt Hour Requirement per month 13250 KWH. (For 2019-2020)

Figure: 4.16-1. 2 MVA sub-station photo



Figure: 4.16-2. 2 MVA sub-station location GPS point



4.17. Energy Consumption

Generally, there are 2 evaporated ton boilers (3-ton x 2) which provide steam for dyeing process. The fuel used for thermal energy is furnace oil which was supplied by Ministry of Energy. According to the Boiler law (39/2015), boiler needs to be inspected by Boiler Inspection department, Ministry of Industry. Boilers are listed as shown in the table.

Table: 4.17-1. Boilers List

Sr. No.	Description	Evaporated Ton/Hour	Installation Date	No. of Machine	Manufacturer
	Finishing Division				
1.	Horizontal Flue Type Boiler	3 ton	2005	2	Masa 4781 Mas 4782

Based on maximum production period, 2010-2011, Energy Consumption is as follows;

Furnace oil requirement per year 240,000 gallons

Furnace oil requirement per month 20000 gallons

Figure: 4.17-1. 3-ton Boiler photo

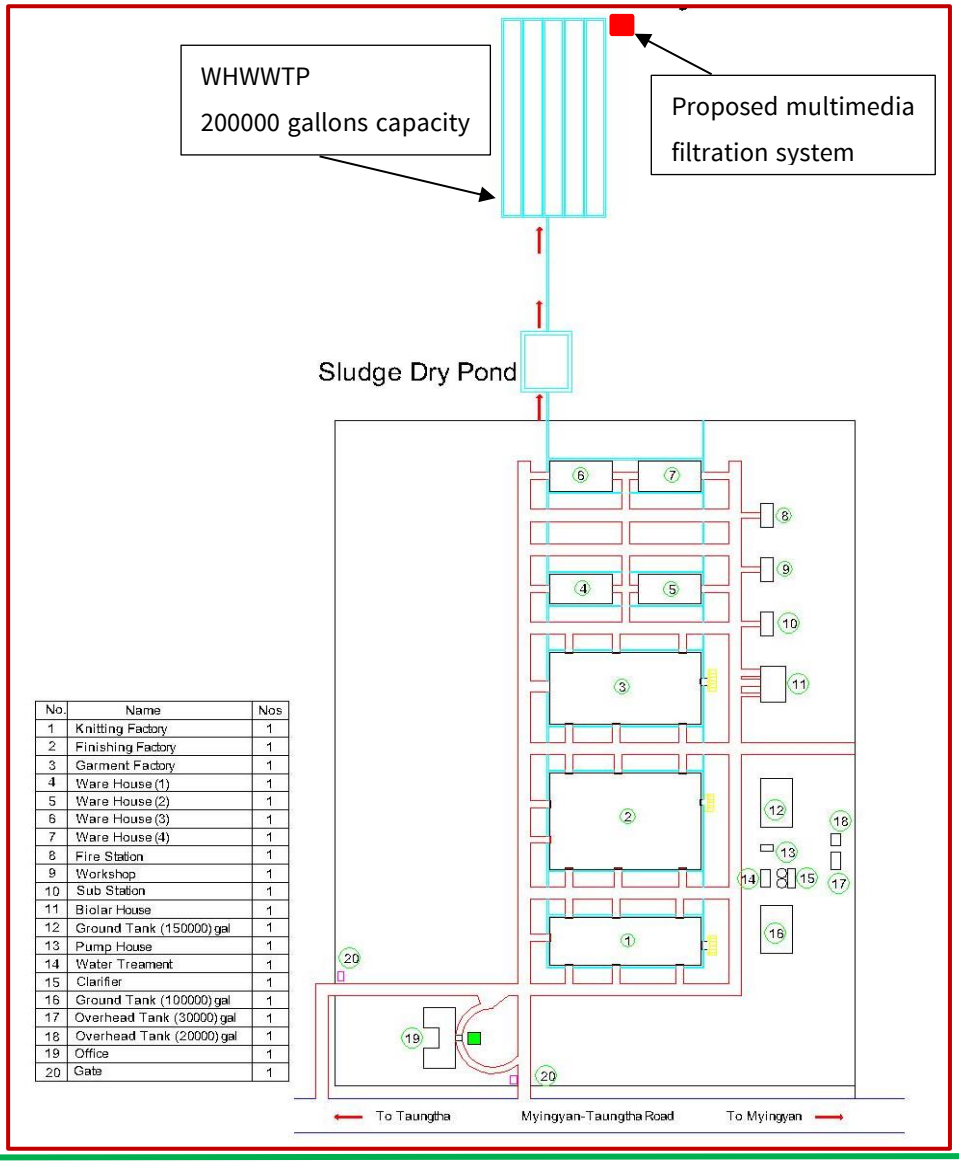


4.18. Drainage System and Wastewater Treatment Plant (WWTP)

4.18.1. Drainage System

In general, drainage system is in place to remove the excess water such as floodwater, rainwater, runoff, and sewage effectively. Channel drain system provides overall open surface area to handle the large volume of runoff. All surface water and rain water are channeled to the outside of the factory compound. Sewage water flows to the septic tank through DN 6" diameter pipe. Aerobic septic system is applied in these septic tanks in which the system injects oxygen into sewage waste, stimulating the growth of aerobic bacteria, which break down and filter the wastewater and solids. Aerobic systems generally produce cleaner effluent. This is useful in environmentally delicate locations and areas.

Figure: 4.18-1. Drainage system and Water Hyacinth wastewater treatment plant (WHWWTP)



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

4.18.2. Water Hyacinth Wastewater Treatment Plant (WHWWTP)

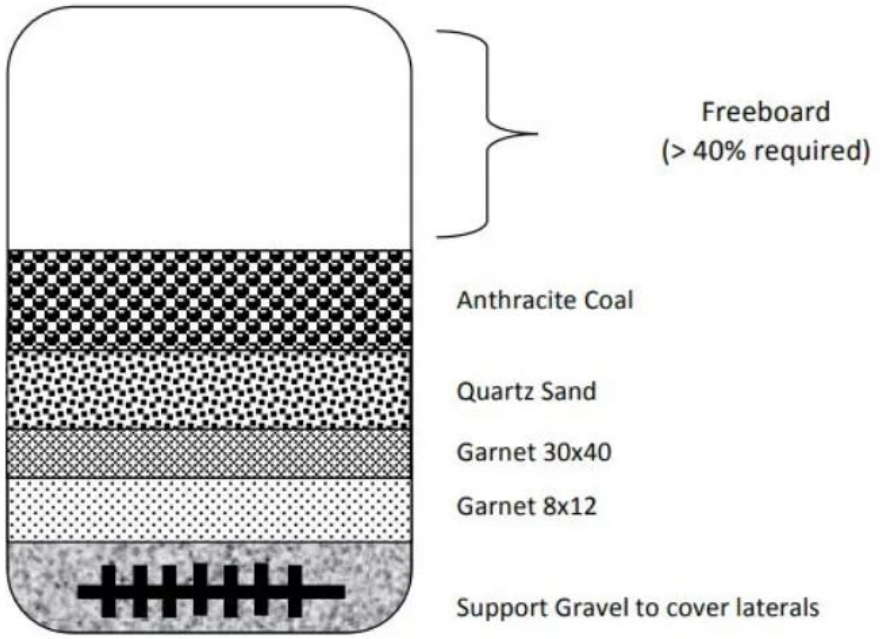
Main source of water pollution is wet process of the textile mill. The finishing workshop of the factory generates liquid effluents which is the utmost concern because of its high volume and pollution potentials. Quality and nature of waste generated depends on the fabrics being processed, chemical being used, technology being employed and operating practices. The factory discharges effluent to the Water Hyacinth Wastewater Treatment Plant (WHWWTP) water collecting pond of 200,000 gallons capacity by using open channel.

Water hyacinth (*Eichhornia crassipes*) is used in wastewater treatment because of its high efficiency in removing pollutants and its ability to thrive in nutrient-rich environments. It absorbs nitrogen (N) and phosphorus (P), which are common pollutants in wastewater and contribute to eutrophication (excessive nutrient buildup in water bodies). It takes up heavy metals and other toxic substances through its roots. The large root system offers a big surface area for microbial growth that assist in breaking down organic pollutants. The plant supports aerobic bacteria on its roots that help degrade organic matter in the wastewater. This symbolic relationship enhances the biological treatment process. It is cost effective and low-cost maintenance. It doesn't require high-tech infrastructure or chemicals in treatment process. Water hyacinth can accumulate lead, cadmium, mercury, and arsenic, helping clean industrial wastewater.

Daily effluent output is 4,000 gallons per day. Treatment period takes 30 to 40 days. If the effluent level goes beyond the maximum containment capacity of waste water collecting pond, it would spill over to the surrounding areas.

To enhance treatment, a multimedia filtration system, as a secondary treatment, should be designed and constructed according to the specifications illustrated in Figure: 4.18-1 and 4.18-2. The treated effluent from the multimedia filtration system should be monitored, and controlled to meet the NEQEG 2.3.2.1 guideline value.

Figure: 4. 18-2. Typical multimedia filtration system



Reference: https://www.bm.com.sa/what-is-multi-media-filtration/

4.19. Green House Gas (GHGs) Emission

The Taungtha factory uses various production machinery and utilities, including transformers, emergency diesel generator, boilers and vehicles to manufacture different types of factory products. Energy consumption is essential for meeting production goals. However, this energy usage results in greenhouse gas emissions, which contribute to the depletion of the ozone layer. The informative greenhouse gas emissions for the Taungtha factory are explained below:

Energy Consumption

In Myanmar's electricity generation mix, natural gas and hydropower are the dominant sources, followed by coal and solar, with natural gas accounting for around 50% of installed capacity, hydropower around 45%, solar around 3%, and coal around 2% as shown below.

Table: 4.19-1. Myanmar electricity generation mix and emission factor

Sr. No	Sources	Installed Generation Capacity (MW)	(%)	CO_2 Emission g/Kw hour
1.	Natural Gas	3567	50.1	403-513
2.	Hydropower	3225	45.3	11-150
3.	Solar	192	2.7	13-37
4.	Coal	138	1.9	751-1095
	Total	7122		284.5

Reference: Power Sector Challenges in Myanmar | August 2023, The WORLD BANK, IBRD,

The World Bank Group,

: U.S. Energy Information Administration (EIA)

Electricity transmission and distribution (T&D) losses can range from 10-20% in Myanmar. If it is assumed that 15% loss, actual delivered electricity is 85% of the generated power. Therefore, CO_2 emission per kw hr. becomes 334.70 g/kw hour.

Table: 4:19-2. Taungtha factory's energy consumption

Sr. No.	Year	Electricity			FO			Total CO_2 Emission ton/year
		Electricity KW/hour	CO_2 Emission g/Kw hr	CO_2 Emission ton/year	Usage Gallons	CO_2 Emission g/gallon	CO_2 Emission ton/year	
1.	2010-2011	200,000	334.70	66.94	240,000	10190	2445.6	2512.54

Reference: 1. Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) – GWP values for greenhouse gases.

2. U.S. Environmental Protection Agency (EPA) Greenhouse Gas Emissions Data – Regulatory and industry guidance on refrigerant emissions.

3. European Environment Agency (EEA) Fluorinated Greenhouse Gases Report – Covers the impact and regulations of HFCs, including HFC-134a.

Action Plan for Reducing Green House Gas Emission

To reduce GHG emissions, the Taungtha factory needs a combination of energy efficiency measures, renewable energy adoption, and operational improvements.

1. Improve Energy Efficiency of the Mill

(a) LED Lighting: Replace all conventional lighting with LED.

(b) High-Efficiency Motors: Upgrade to IE3 or IE4-rated motors for spinning machines.

(c) Power Factor Correction: Install capacitors to improve power factor and reduce losses.

(d) Energy Monitoring System: Implement a system to track real-time energy consumption.

2. Shift to Renewable Energy Sources

If feasible, install solar panels to offset grid electricity for chillers.

3. Process Optimization & Employee Training

(a) Optimize Machine Operation: Reduce idle time and unnecessary running of machines.

(b) Train Employees: Encourage energy-conscious behavior among staff.

4. Carbon Footprint Calculation and Offsetting

(a) Calculate GHG Emissions: Use the formula:

(b) Carbon Offsetting: Invest in carbon offset programs like afforestation or renewable energy credits.

After the Taungtha factory was commissioned, an afforestation program was launched on previously non-forested land within the factory compound. The total area designated for the plantations is about 15 acres as shown in the following figure.

Figure: 4.19-1. No.10 Textile Mill (Taungtha), plantation areas



4.20. Transportation

Taungtha factory is linked by road, south to Mahlaing and north to Myingyan. It lies on Meikhtilar-Myingyan road, is 45 miles far from Meikhtilar, 13 miles far from Myangyan and 313 miles far from Yangon.

4.21. Solid Waste Management (SWM) System

Solid waste management refers to the practices involved in the control of solid waste, including its generation, storage, collection, transfer, processing, and disposal. The primary objectives of an effective solid waste management system are to minimize any negative impacts on public health and the environment, to create reliable and socially acceptable waste management systems, and to maximize the reuse, recycling, and reduction of waste.

Reducing production waste is a key objective of the Solid Waste Management (SWM) program, as it can lead to lower production costs and less environmental impact. The solid waste management includes hazardous waste and non-hazardous waste. Hazardous materials are categorized as follows:

1.Chemical waste

- Discarded synthetic dyes (especially azo dyes)

- Fixing agents (e.g., formaldehyde-based)
- Binders, resins, and cross-linking agents
- Fabric softeners and flame retardants (with toxic additives)

2. Solvents

- Cleaning solvents (e.g., acetone, toluene, methanol)
- Solvent-based inks or printing pastes

3. Waste Oils and Lubricants

- Used machine oil
- Hydraulic fluids and lubricants

4. Contaminated Rags and PPE

- Rags soaked with oils, solvents, or dye chemicals
- Used gloves, masks, or aprons contaminated with chemicals

5. Empty Chemical Containers

- Residual chemical containers (plastic or metal drums)
- Contaminated packaging for dyes, bleaches, or fixatives

6. Batteries

The Non-Hazardous materials are classified as follows:

These do not pose significant risks and are often recyclable or reusable.

1. Fabric and Yarn Waste

- Off-cuts and trimmings
- Rejected or faulty garments
- Waste yarn or cones

2. Packaging Waste

- Cardboard boxes
- Plastic films and wrappers
- Paper waste

3. General Office Waste

- Paper, old documents, and packaging
- Plastic bottles and food containers

4. Biodegradable Waste

- Food waste from canteens
- Garden or landscaping waste

5. Dust and Lint

- Collected from knitting and sewing sections
- Generally non-toxic unless contaminated

6. Sewing Waste

- Threads, buttons, zippers, labels

Hazardous and non-hazardous waste should be separated at the source. Hazardous waste must be labeled and stored in a secure area. It is essential to provide staff training on proper waste handling techniques. Compliance with environmental regulations is mandatory. The factory should collaborate with recyclers or the township development committee for effective waste management.

Hazardous materials, such as chemical containers, used poly bags, corrugated carton boxes, and broken plastic spare parts, are sent to the warehouse, separately packed, and sold to authorized users. Used oil and lubricant are sold for reprocessing.

Each department meticulously tracks and categorizes its waste, ensuring it is effectively sorted for recycling and reuse. Biodegradable waste such as kitchen waste generated from the factory's canteen, glass, rubber, wood, dust, and textiles, is sorted, packed, and dumped in the waste disposal area approved by the Township Development Committee twice a week.

Table: 4.21-1. Amount of collected non-reusable waste

Sr. No.	Type of Waste	2010-2011 Output per annum	2010-2011 Output per month	2019-2020 Output per month	2023-2024 Output per month
	Non-reusable				
1.	Defected fabrics	192000 lbs	16000 lbs	450 lbs	-
2.	Biodegradable waste and Office waste				1 ton

4.22. Factory's Administrative Structure

The strength of the factory's administrative structure is shown in the following table.

Table: 4.22-1. Administrative structure of the factory

Sr. No.	Particular	Male	Female	Total
	Production Department	**16**	**224**	**240**
	Knitted Division	**4**	**35**	**39**
1.	Operator	4	26	30
2.	Helper	-	8	8
3.	Supervisor	-	1	1
	Finishing Department	**7**	**29**	**36**
1.	Officer	6	25	31
2.	Helper	1	1	2
3.	Supervisor	-	3	3
	Garment Division	**5**	**160**	**165**
1	Operator	4	152	156
2.	Helper	1	5	6
3.	Supervisor	-	3	3
	Planning Department	**17**	**17**	**34**

1.	Supervisor	3	5	8
2.	Staff/Helper	12	10	22
3.	Officer	2	2	4
	Finance Department	**-**	**8**	**8**
1.	Supervisor	-	1	1
2.	Staff/Helper	-	6	6
3.	Officer	-	1	1
4.	Quality Control Department	-	17	17
5.	Supervisor	-	2	2
6.	Staff/Helper	-	14	14
7.	Officer	-	1	1
	Administrative Department	12	21	33
1.	Supervisor	1	2	3
2.	Staff/Helper	9	18	27
3.	Officer	2	1	3
	Total	**45**	**279**	**324**

4.23. Commitment

The factory promises to fulfill the all commitments.

Table: 4.23-1. Commitment by the factory

No.	Name of Commitment	Description of Commitment	Refer to
1.	Production process	Currently, the factory has stopped operating and if it runs in the future, the factory promises to follow rules and regulations regarding with the conservation of natural environment.	Chapter 4. Article 4.13
2.	Wastewater Treatment Plant	A multimedia filtration system would be installed and treated effluent from the wastewater treatment plant would be treated to improve the biological, chemical and physical properties of the effluent and to prevent any negative impact on the environment. Wastewater discharge would be monitored and treated in accordance with the NEQEG 2.3.2.1 Textile Manufacturing guideline values.	Chapter 4 Article 4.18
3.	Reducing Green House Gas (GHG) Emission	The factory is committed to reducing its greenhouse gas (GHG) emissions by implementing energy efficiency initiatives, increasing renewable energy use, and improving operations.	Chapter 4 Article 4.19

Chapter 5
Governing Parameters

Chapter (5)

Governing Parameters

5.1. Geographical Data

No. (10) Textile Mill (Taungtha) is situated at the northern part of Taungtha Town, Taungtha Township, Myingyan District, Mandalay Region. The approximate coordinates of the Taungtha Township are north latitude 21° 00' 20" and 21° 24' and east latitude 95° 06' 05" and 95° 08' 05".

5.2. Taungtha Township's Topographical Data

Topographical features are mixture of plain areas and mountains in which Taungtha mountain is the highest, 1788 feet, followed by Nanmyint mountain, 1315 feet and Myinsaing mountain, 1316 feet. Sintewa creek is entering through Taungtha Township, 18 miles long, from south to north and joins with Ayeyarwady River. Taungtha Township is surrounded by Mahlaing Township to its east, Kyaukpadaung Township, to its south, Bagan Nyaung-U and Pakokku Township and Ayeyarwady River to its west and Myingyan Township to its north. It is located 654 feet above sea level.

Figure: 5.2-1. Location Map of Taungtha Township in Mandalay Region



5.3. Climatology

Most of Myanmar has a tropical monsoon climate which is greatly modified by its geographic position and its relief. Taungtha Township also has a tropical climate.

5.3.1. Rainfall and Temperature

Taungtha Township lies in the middle of dry zone in Myamar. There is not much rainfall in Taungtha Township all year long. The highest precipitation was 8.47 inches in May, 2017. The total rainfall throughout the year was 47.67 inches in 2016, 35.59 inches in 2017 and 20.84 inches in 2018, 23.11 inches in 2019.

Rainfall in Taungtha Township shows a distributed behavior with rainy season, starting in April, peaking in May, June, July, August and September, starts receding from September to till October. During this season, strong wind blows from the South-West, causing rain falls and thunderstorms. Owing to the geographical condition, the region receives the rain fall less than 50 inches. The following table shows the cyclones history landed in Myanmar. Due to the meteorological data shown in Table 5.3.1-2 and 5.3.1-3, the highest rain fall is 8.47 inches for the month of May, 2017.

The winter season begins in November and lasts till January. The summer lasts for 4 months, from February to May. As referred to topographical position, Taungtha factory lies on dry zone in Myanmar. The hottest month and coldest month are April, 2019 and January in 2019. The temperature records starting from 2016 – 2020 are illustrated in Table 5.4.

Based on the Figure 5.3.1-3. and Figure 5.3.1-4, it is evident that monsoon onset days were late as compared to 1961 to 1990 period and 1981 to 2010. However, monsoon withdraw date was earlier as compared to 1961 to 1990 period to 1981 to 2010. It is important to note that, based on recent meteorological data, the rainy season in Myanmar is becoming shorter. This is evidenced by the fact that the monsoon onset days have been later and the monsoon withdrawal dates have been earlier compared to previous decades.

Table: 5.3.1-1. Cyclone history in Myanmar

Cyclone	Period	Max Wind Speed miles/hr	Surge Height	Causality
Sittway	17 May, 1884			
Kyaukphyu	26 April, 1936			1000
Sittwe	10 May, 1968		4.25 m	1037
Pathein	7 May, 1975		3.00 m	304
Gwa	4 May, 1982		3.7 m	31
Maungdaw	2 May, 1994		3.66 m	10
Sittwe	19 May, 2004	100		-
Mala	29 April, 2004	120	4.57 m	1
Nagris	2 May, 2008	120	5.61 m	138373
Giri	20-23 Oct, 2010	120	-	27
Mocha	9-23, May, 2023	175		

Table: 5.3.1-2. Rainfall record and max, min temperature.

Sr. No.	Year	Raining Days	Total Rainfall	Max Temp (˚C)	Min Temp (˚C)
1.	2016	54	34.34	45.00	9.00
2.	2017	52	36.77	43.30	9.80
3.	2018	39	20.15	40.50	9.70
4.	2019	25	14.59	43.30	9.80

[Source: Taungtha Township GAD]

Table: 5.3.1-3. Rainfall data from 2016 to 2020 (Inches)

Yr:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	De:	Total
2016	-	-	-	-	2.13	4.09	4.64	7.60	5.52	14.52	3.11	-	47.67
2017	-	-	0.28	2.63	8.47	2.07	4.52	4.37	6.42	5.36	1.29	0.24	35.59
2018	2.44	-	-	0.28	5.1	4.06	0.59	2.68	3.26	2.17	-	0.80	20.87
2019	1.93	-	-	-	1.14	1.97	2.48	5.98	6.54	1.53	1.46	0.08	23.11
2020	0.16	-	-	0.67	4.05	2.48	2.68						

[Source: Myingyan Observation Station, DMH]

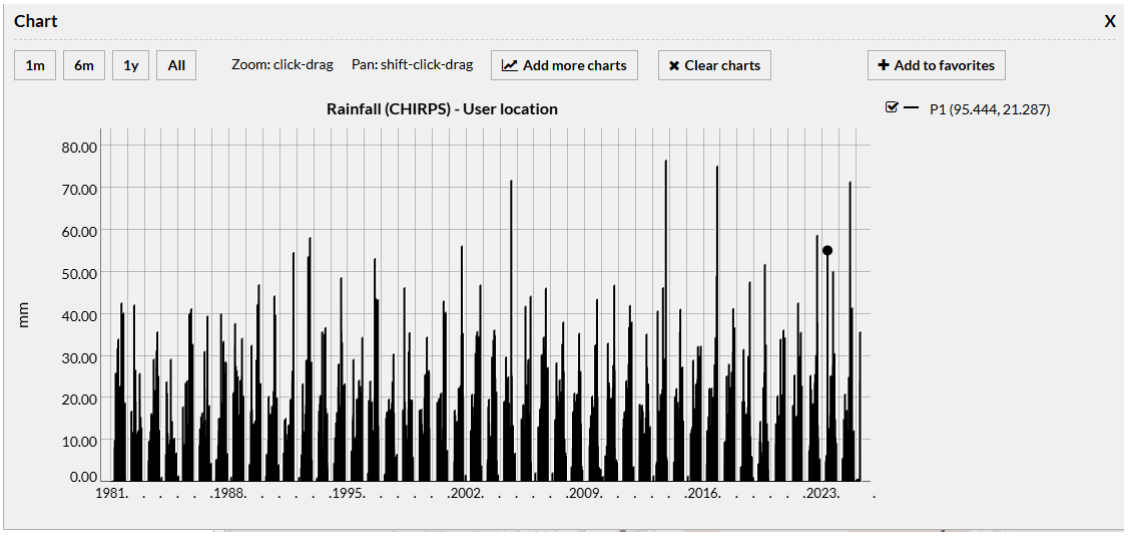
Table: 5.3.1-4. Mean temperature data from 2016 to 2019 (°C)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean
2016	28.2	38.6	40.1	46.0	45.3	40.0	39.2	36.3	36.2	34.0	30.6	29.0	36.96
	9.6	12.5	18.5	20.6	23.0	24.8	23.6	24.2	23.5	23.2	15.2	14.5	19.43
2017	32.6	37.0	39.5	43.3	42.6	39.6	37.0	36.5	37.6	35.3	34.7	30.0	37.14

2018	9.8	13.5	15.5	20.1	22.5	25.5	25.0	24.4	24.8	21.0	16.8	10.2	19.09
	31.2	36.4	40.2	42.5	41.4	37.8	39.0	37.2	39.6	36.0	36.2	38.8	38.03
2019	10.0	11.2	16.6	20.0	22.2	24.5	26.2	24.8	23.5	20.4	13.8	10.3	18.66
	32.0	37.8	40.8	44.2	45.8	42.6	39.8	37.0	38.0	38.0	38.4	33.0	38.95
2020	10.0	11.3	14.0	20.0	23.5	21.7	21.5	22.0	20.0	27.0	18.2	10.7	18.32
	37.6	35.0	42.0	43.9	44.0	41.6	41.6						
	7.5	8.3	15.0	20.4	22.0	22.5	24.0						

[Source: Myingyan Observation Station, DMH]

Figure: 5.3.1-1. Rainfall data for No. 10 Textile Mill, Taungtha (1981-2024)



Source: https://www.flooddroughtmonitor.com

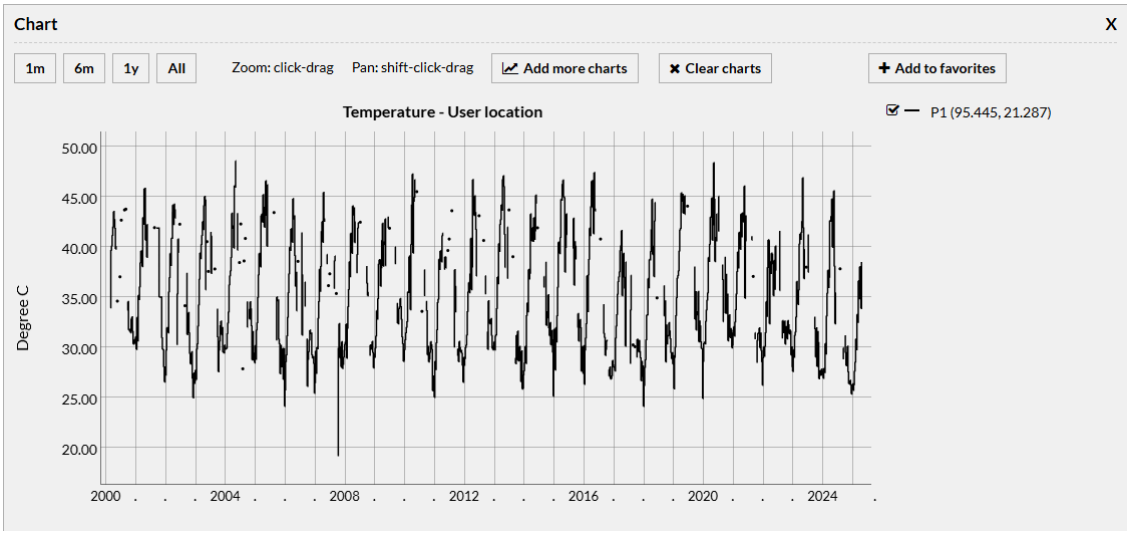
Rainfall Trend Analysis

Over the past 30 years, rainfall has shown considerable inter-annual variability. There are clear seasonal spikes each year, indicating a monsoon-influenced climate with distinct rainy and dry seasons. Rainfall levels do not show a clear increasing or decreasing linear trend overall. However, some shifts are noticeable: from 1993 to 2003, rainfall appears more stable and moderate, with occasional high peaks, between 2004 and 2014, continued variability, but fewer extremely high rainfall years, from 2015 to 2023, noticeable increase in rainfall extremes, with more frequent and higher peaks — possibly indicating climate variability or extreme weather events becoming more common.

Some recent years (e.g., around 2016 and 2023) show significantly higher rainfall — possibly due to climate anomalies or shifting monsoon patterns. On the other hand, periodic low rainfall years are present, especially in the early 2000s and mid-2010s. According to the data, the timing and strength of the southwest monsoon can greatly influence yearly rainfall totals.

As a town located in dry-zone of Myanmar, for water resource planning, it needs to be prepared for both droughts and heavy rainfall years. This requires adaptable water storage and flood management systems. For agricultural adjustment, cropping calendars and crop varieties may need to be adjusted for changing rainfall patterns.

Figure: 5.3.1-2. Temperature data for No. 10 Textile Mill, Taungtha (2000-2024)



Source: https://www.flooddroughtmonitor.com

Temperature Trend Analysis

According to the chart in the above figure, slight upward trend in maximum temperatures can be observed over the 20-year period. In the early 2000s (2004–2010), most temperature peaks hover around 40–43°C. In the recent years (2015–2024), peaks often approach or exceed 45°C, indicating rising heat extremes. Minimum temperatures also show a slight increase, though less pronounced than maximums.

Hotter years are becoming more frequent, particularly after 2015. This may point to increased heatwaves and greater risk of heat stress on crops, people, and livestock. The most intense temperature fluctuations seem to appear more in recent years, with higher variability in some months.

For public health risks, higher maximum temperatures can increase heat-related illnesses. For agricultural stress, crops sensitive to heat may face reduced yields or crop failure without adaptation. For water demand, increased evaporation and crop water needs can strain local water supplies.

The area needs some Adaptation Measures such as promoting heat-tolerant crops and developing early warning systems for heatwaves. It also needs to improve green cover and water management to mitigate local heating.

Figure: 5.3.1-3. Comparison between normal monsoon onset values

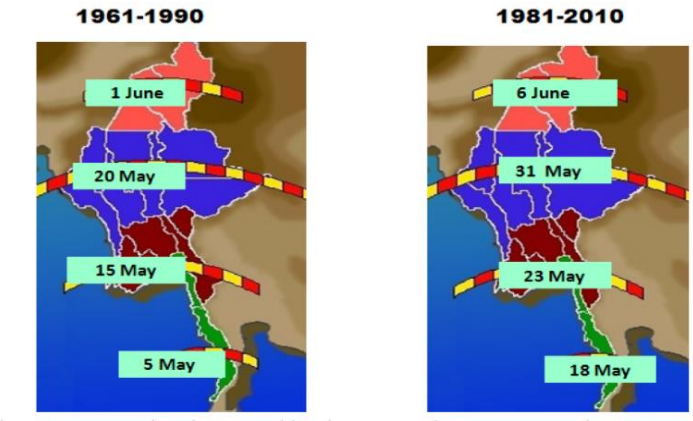
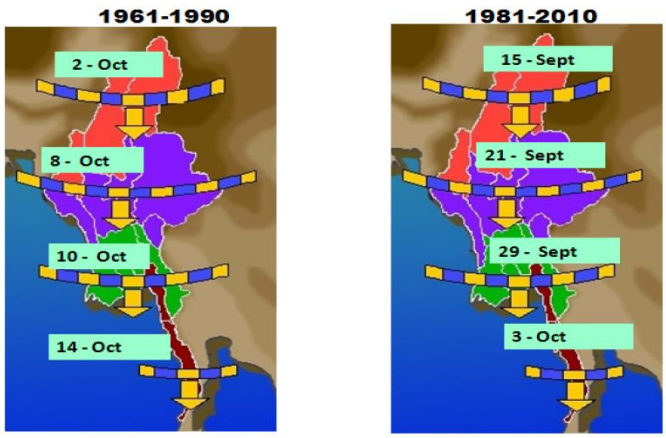


Figure: 5.3.1-4. Comparison between normal monsoon withdraw values



[Source: Myanmar Climate Report No.9/2017, (DMH)]

5.3.2. Wind

Monsoon onsets in the middle of Myanmar on 20 May. During the pre-monsoon season, wind blows from the southeast, south, and southwest directions all over Myanmar. When the monsoon is kicked off in Myanmar, wind direction is slightly changed from the west, southwest, and south together with different intensities of cyclones coming from the Bay of Bengal. During post-monsoon season, the wind blows from the northeast for the winter months. Winter lasts from November to February. Towards the end of February, they swing around to come from the South for summer. The date at which this changeover occurs varies each year.

5.3.3. Seismicity

Myanmar is located on two tectonic plates, the Burma Plates and Sunda Plate, which makes it prone to earthquakes as shown in Figure 5.3.3-1. Table 5.3.3-1 shows that Myanmar has experienced earthquakes of different magnitudes in the past century. The Sagaing Fault, a continental transform plate boundary, is an active dextral strike slip fault that separates the two plates. It runs for over 1000 km along the length of Myanmar and has many small segments that have been ruptured in the past, causing historical earthquakes. There are 30 faults in Myanmar, including Indawgyi, Indaw, Htichaing, Thabeikkyin, Singu, Yega, Yamethin, Pyinmana, Swa, Phyu, Shwedan, Zwegeik, Kabauk, and coastal segments, as expressed in Figure 5.3.3-2 to 5.3.3-4.

On 28 March 2025 at 12:50:54 MMT (06:20:54 UTC), a Magnitude 7.7–7.9 earthquake struck the Sagaing Region of Myanmar, with an epicenter close to Mandalay, the country's second-largest city (shown in Figure: 5.3.3-3. And Figure: 5.3.3-4). The strike-strip shock achieved a maximum Modified Mercalli intensity of X (Extreme). It was the most powerful earthquake to strike Myanmar since 1912, and the second deadliest in Myanmar's modern history, surpassed only by upper estimates of the 1930 Bago earthquake. The earthquake caused extensive damage in Myanmar and significant damage in neighboring Thailand. Hundreds of homes were also damaged in Yunan, China, while more than 400 apartments were

affected in Ho Chi Minh City, Vietnam. The Sagaing Fault, a major right-lateral strike-slip fault, runs through Myanmar and is responsible for many earthquakes that impact Myanmar.

Figure: 5.3.3-1. Tectonic plate in Myanmar

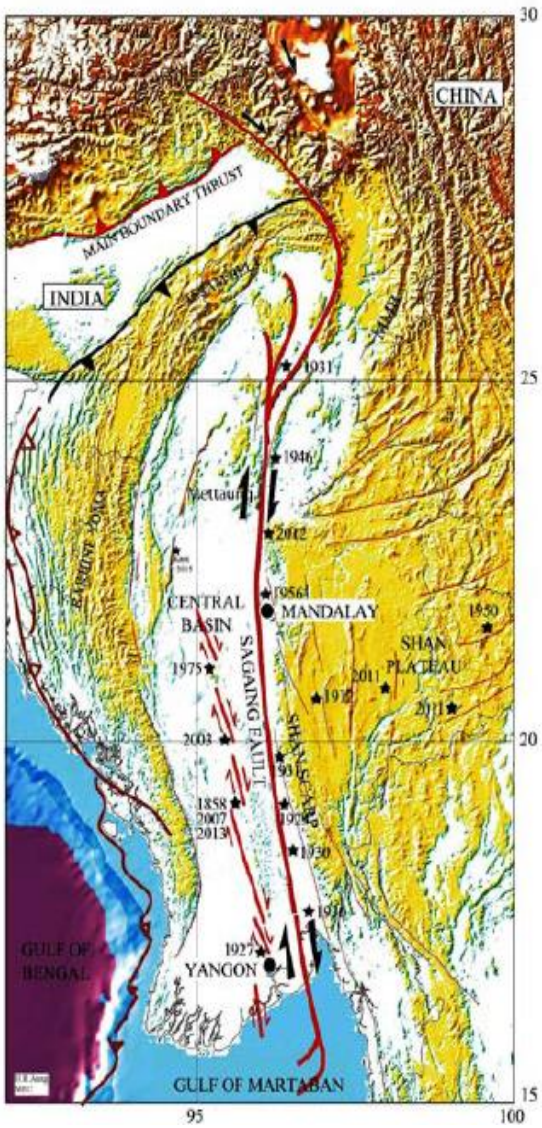


Figure: 5.3.3-2. Burma plate, Sunda plate and Sagaing fault

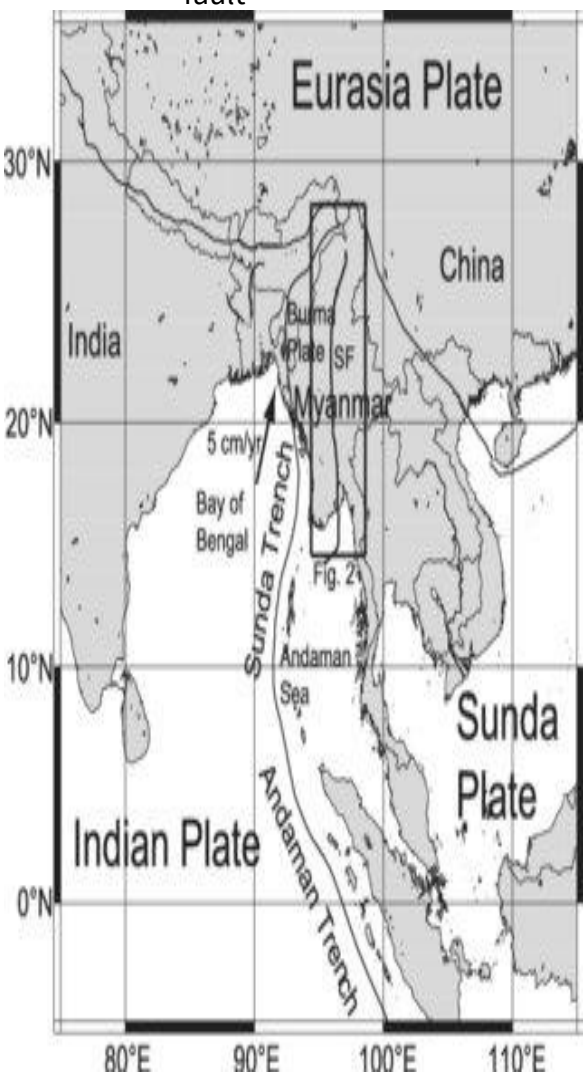
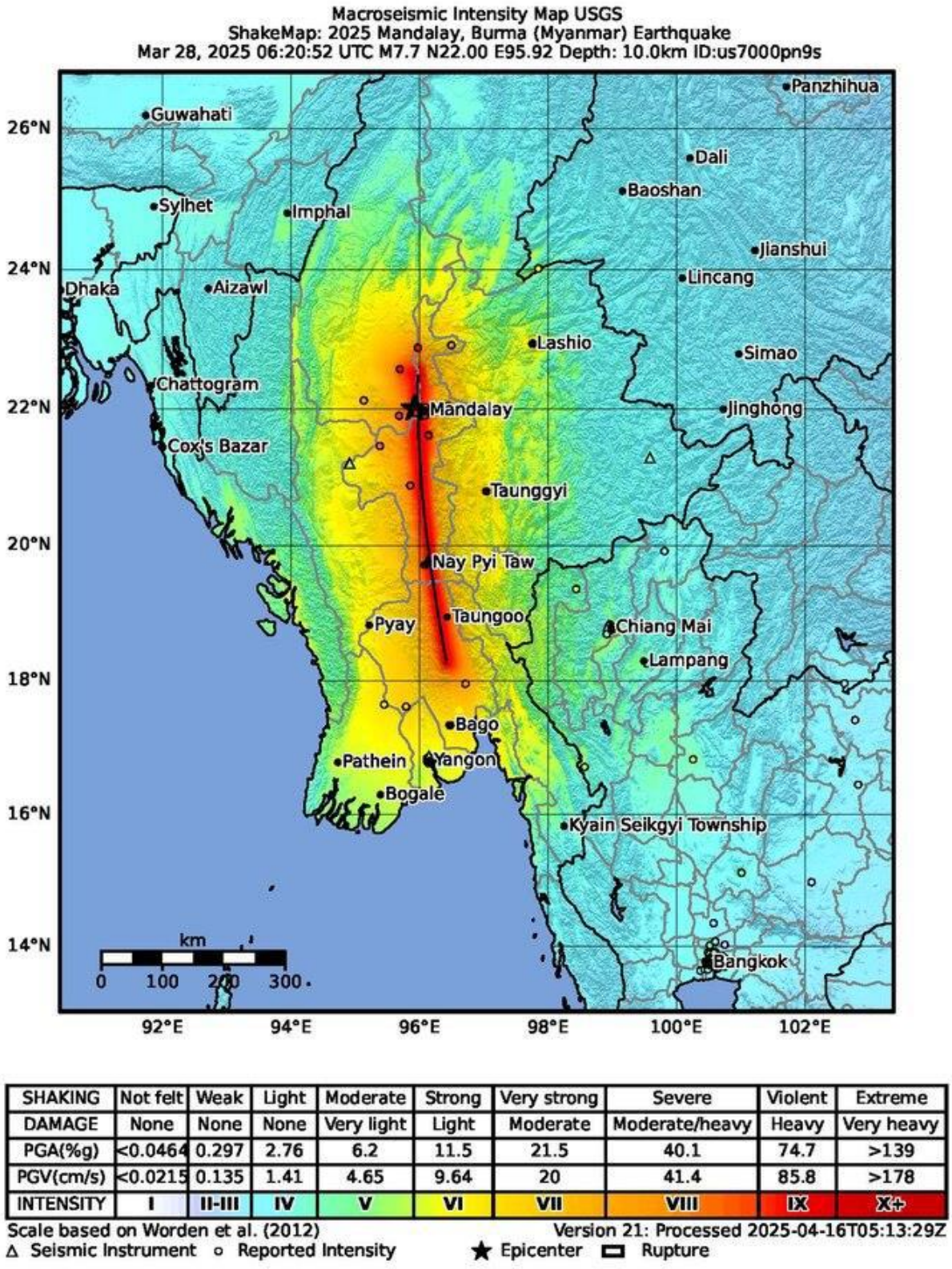
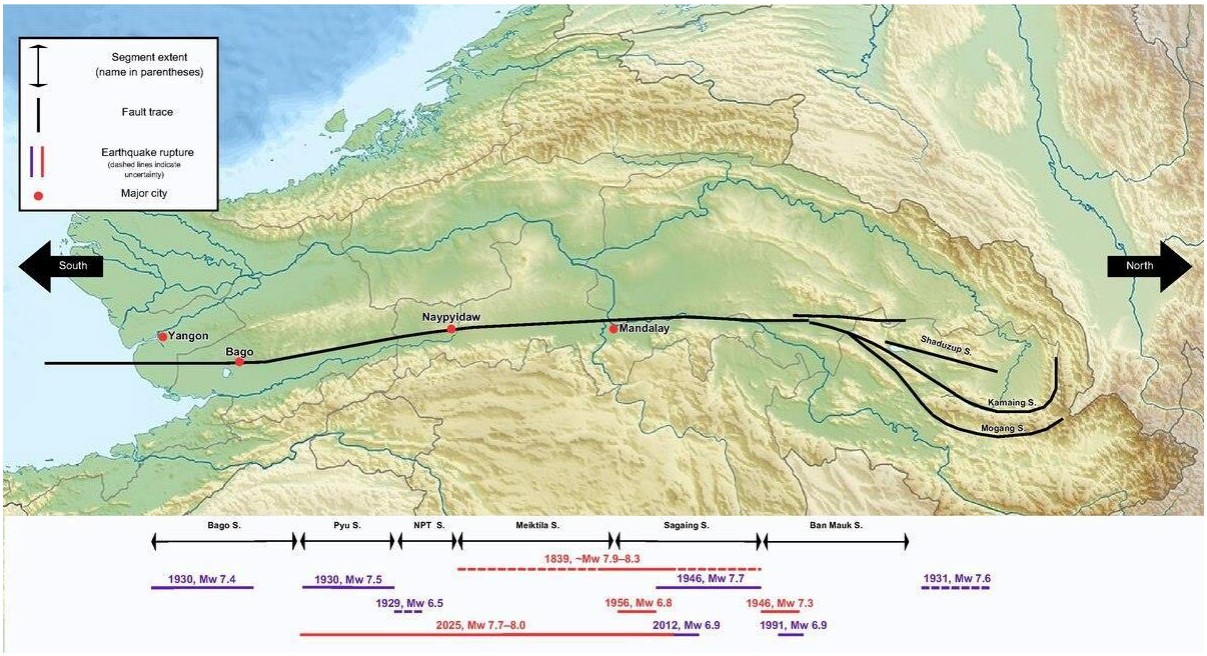


Figure: 5.3.3-3. Macroseismic intensity map of Mandalay earthquake on 28 March, 2025



Reference: https://en.wikipedia.org/wiki/File:2025_Myanmar_Earthquake_(M_7.7)_shakemap_v2.pdf

Figure: 5.3.3-4. Sagaing fault and segments in Myanmar



Reference: https://en.wikipedia.org/wiki/File:Sagaing_Fault_mapv2.pdf

Table: 5.3.3-1. Earthquake history in Myanmar

Date	Earthquake	Lat	Long	Mag:	Depth	Mechanism	Source
23 May 1912	Maymyo	21°N	97°E	8.0		Strike slip Thrusting	Inlay lake pull apart basin
8 Aug, 1929	Swa	19° 15'N	96° 15' E	7.0		'	Fault Scrap
5 May 1930	Bago	17°N	96° 30' E	7.0		'	Kabauk In (pull apart basin)
3 Dec 1930	Phyu	18°N	96° 30' E	7.3		'	Restraining Bend
27 Jan, 1931	Kamaing	25.6°N	96.8°E	7.3		'	Indawgyi Lake Pull Apart Basin
10 Aug, 1935	Pyinmana						Releasing Bond
12 Aug, 1946	Tagaung	23°30' N	96°E	7.5,7.75			Sag Pond
16 July,1956	Sagaing	22°N	96°E	7.0			Yega In (Pull apart basin)
8 July,1975	Bagan	21°30' N	94.7° E	6.8	10 km	Thrusting	Salin Basin
22 Sept 2003	Taungdwingyi	19.94° N	95.72° E	6.7	10 km		Flower Structure in Salin Basin
24 Aug 1858, 2007	Thayet	19°N	95.15° E	7.0, 5.5	10 km		Pyay Basin
22 Jun, 1923		22°75' N	98.75° E	7.3			
26 Dec, 1941		21°N	99°E	7.0			
2 Feb, 1950		22°N	100°E	7.0			

11 March, 2011	Tarlay	20.705°N	99.949° E	6.8	10 km		Pull Apart Basin
25 March 1992		20.7°N	97.1° E	5.7			
28 Oct 1992		20.7°N	97.1°E	5.9			
11 Nov 2012	Thabeikkyin	23.009°N	95.884°E	6.8	10 km	Strike Slip Faulting	Sagaing fault
30 Jan, 2013	Yangon	16.950°N	96.127°' E	3.4	10 km	Strike Slip Faulting	Ayeyarwady Basin, Rakhine Yoma Basin, Bonding
3 April, 2013 11 April, 2013	Thayet, Aung Lan	19.24°N	95.66° E		11 km 10.1 km	Thrust faulting	Central Myanmar Basin
27 Nov, 2015	Monywa-Kani	22.6144°N	95.040° E	5.4	23 km	Strike Slip Faulting	Shwebo Monywa Basin
13 April, 2016	Mawleik	23.133°N	94.9°E		134 km	'	Shwebo-Monywa Basin
24 August 2016	Chauk	20.92 N	94.58 E	6.8	84.1 km		Several pagodas were damaged in Bagan region.
13 March 2017	Yangon			5.1 mb	10.0 km		
11 Jan 2018	Bago			6.0	9.0 km		Felt strongly in many places
26 Nov 2021	Hakha			6.2	42.5 km		Minor damaged occurred in Bangladesh
21 July 2022	Keng Tung			5.9	5.0 km		Damage in Keng Tung also felt in China, Thailand and Laos
7 June 2023	Maubin			4.8	10.0 km		Several buildings and pagodas damaged in Mau-bin.
28 March, 2025	Mandalay	22.001°N,	95.925 ° E	7.7	10 km	Strike slip, super shear	Affected areas; Sagaing, Mandalay, Naypyitaw, Nyaungshwe, Inle,Taungoo, Pyu, Kyaukkyi, Kyauktaga,

							Oktwin, Yedashe and Htantabin Yangon, Bangkok, Thailand, Yunan, China, Hochimin city, Vietnam, 3700 casualties.

[Source: Myanmar Earthquake history]

Reference: https://en.wikipedia.org/wiki/2025_Myanmar_earthquake

5.4. Social Environment

5.4.1. Population

There are 247,904 people residing in Taungtha Township with 45,744 households.

Table: 5.4.1-1. Population of Taungtha Township

Town	Total (Male/Female)				Households
	Male	Female	Total	Sex Ratio	
Taungtha	115764	132140	247904	1:1.14	45744

[Source: Taungtha Township, GAD]

5.4.2. Ethnicity

A total of 5 races are living in Taungtha Township where Bamar is the most populated race, 247889 people, followed by Kayin, Chin and Kachin race.

Table: 5.4.2-1. Races in Taungtha Township

No.	Race	Number	%
1.	Kachin	1	0.0004
2.	Kayar	-	-
3.	Kayin	5	0.0020
4.	Chin	6	0.0024
5.	Mon	-	-
6.	Bamar	247889	99.9939
7.	Rakhine	-	-
8.	Shan	-	-
9.	Others	3	0.0012

[Source: Taungtha Township, GAD]

5.4.3. Religion

Myanmar is a multi-religious country. Religious freedom is the fundamental right in Myanmar where 88% of the populations are Theravada Buddhism. Buddhism is practiced by 99.99 % of the Township's population. It is followed by Muslim believer 0.005 % of the population. Christianity is ranked in third place, 0.003 %.

Table: 5.4.3-1. Religion in Taungtha Township

Township	Religion	Buddhist	Christian	Hindu	Muslim	Other	Total
Taungtha	Number	247883	8	0	13	-	247904
	(%)	99.99	0.003	0	0.005	-	100

[Source: Taungtha Township, GAD]

5.4.4. Occupational Patterns

In Taungtha Township, eight crops out of 10 important crops are cultivated, in which oil crops by far the most important agricultural product, covered about 58.89% of the total cultivated acres, 203689 acres. Major occupation in Taungtha Township, is agriculture sector which contributes about 37.25 % of total occupational pattern, followed by others sector.

Table: 5.4.4-1. Occupational patterns

Gov: Employee	Services	Agri:	Live:	Trade	Industry	Arbitrary	Others	Total
4775	1542	53950	13011	7700	1710	15410	46696	144824
3.297 %	1.06 %	37.25 %	8.98 %	5.31 %	1.18 %	10.64 %	32.24%	100 %

[Source: Taungtha Township, GAD]

Table: 5.4.4-2. Employment

Workforce	Employed	Unemployed	Unemployed Rate
149569	144824	4745	3.17 %

[Source: Taungtha Township, GAD]

5.4.5. Education

Due to the Township statistical data 2019, Taungtha Township has 225 schools in which 43213 students are learning. Among these students, 7476 students are studying at primary school which is 17.30 % of total students. Matriculation pass rate is 27.04 % for 2019.

Table: 5.4.5-1. Educational infrastructure

School	No. of School	No. of Teachers	No. of Students	Teacher/ Student Ratio
BEHS	16	564	14332	1:25
BEHS (Extend)	29	471	9867	1:21
BEMS	23	237	4632	1:20
BEMS (Extend)	13	129	2961	1:23
BEPS (Extend)	29	252	3860	1:15
BEPS	100	484	5943	1:12
Monastery school	13	87	1533	1:18
Preschool	2	4	85	1:21
Total	225	2453	43213	1:17
BEHS	16	564	14332	1:25

[Source: Taungtha Township, GAD]

Table: 5.4.5-2. School enrollment

No. of 5 yrs-old children			Enrollment			Enrollment Rate
Male	**Female**	**Total**	**Male**	**Female**	**Total**	
1965	1992	3957	1642	1738	3380	85.41 %

[Source: Taungtha Township, GAD]

Table: 5.4.5-3. Matriculation pass rate

2017-2018			2018-2019		
Sit	**Pass**	**Pass Rate**	**Sit**	**Pass**	**Pass Rate**
4878	1286	26.36	4963	1342	27.04 %

[Source: Taungtha Township, GAD]

Table: 5.4.5-4. Literacy rate

Population	Above 15 years of Age	Literate	Literacy Rate
247904	148794	148030	99.49 %

[Source: Taungtha Township, GAD]

5.4.6. Health Care Profile

Doctor and population ratio is 0.1307 per 1000, comparing to National level is 0.37 for per 1000.

Table: 5.4.6-1. Healthcare

Population	No. of Doctor	Ratio	No. of Nurses	Ratio	No. of Healthcare Assistant	Ratio
247904	9	1:27544 0.036 per (1000)	27	1:9181	11	1:22536

[Source: Taungtha Township, GAD]

Table: 5.4.6-2. Hospitals

Sr. No	Hospital	Govt./Private	Number	Bed
1.	Taungtha Hostipal	Govt.	1	50
2.	Kyawze	Govt.	1	16
3.	Welaung	Govt.	1	16
4.	Zachan	Govt.	1	16
5.	Yonesigyi	Govt.	1	16
	Total	**Govt.**	**5**	**114**

[Source: Taungtha Township, GAD]

Table: 5.4.6-3. HIV/AIDS

2017-2018		2018-2019	
Infected	Dead	Infected	Dead
17	-	18	-

[Source: Taungtha Township, GAD]

Table: 5.4.6-4. Health indices

Maternal	Infant	Per 1000			
		Birth	Paternal Mortality Rate	Infant Mortality Rate	Abortion Rate
4159	3981	13.6	0.8	6.0	1.9

[Source: Taungtha Township, GAD]

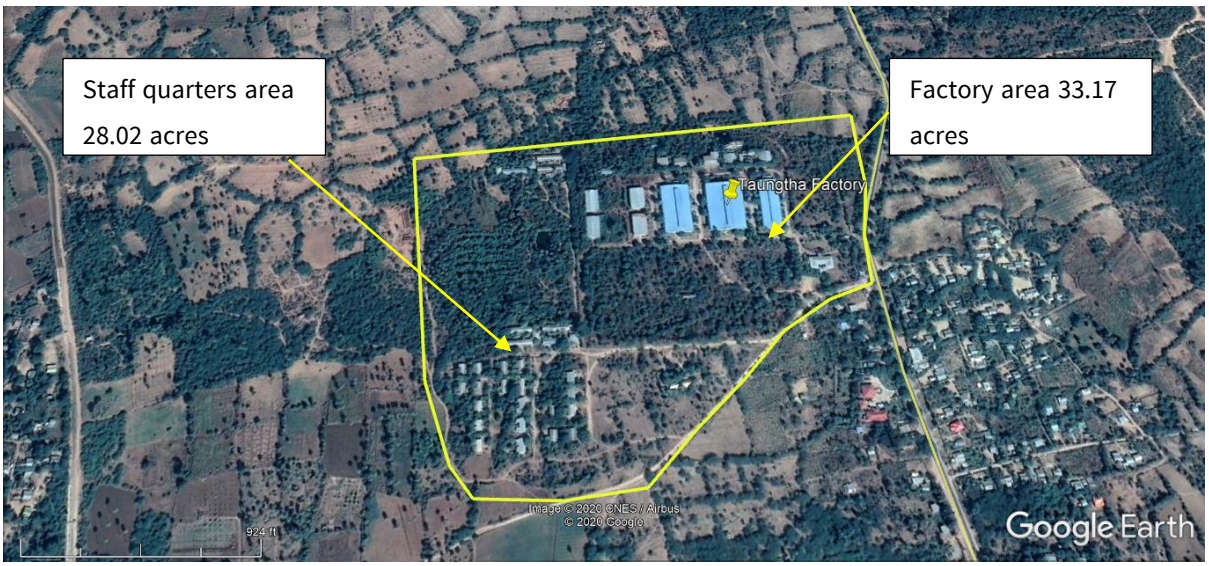
5.4.7. Nearby Villages

There are no nearby villages around 1 mile of the factory, except Taungtha town.

5.5. Land Use

Total factory compound area is 61.19 acres, main factory 33.17 areas, and staff quarters, 28.02 acres. Land use percentage of the factory is 100 %.

Figure: 5.5-1. Factory land use



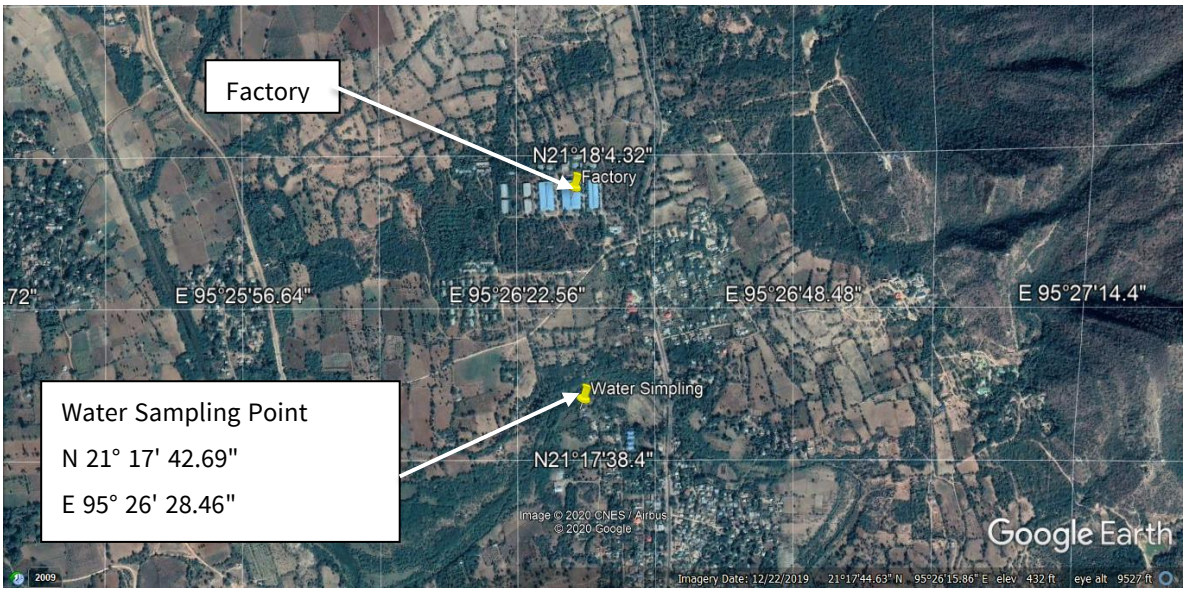
5.6. Water Quality

Well water near Taungtha creek was collected and analyzed with WHO drinking water standards such as pH, color, turbidity, conductivity, total hardness, calcium hardness, magnesium hardness, total alkalinity, bicarbonate (HCO_3), iron, chloride (CL), sodium chloride (NaCL), sulfate (SO_4), total solids (TS), total suspended solids (TSS) and total dissolved solids (TDS).

5.6.1. Sample Collecting Methodology

A water sample was taken from a shallow well near Taungtha creek. The time between sampling and analysis was kept to a minimum, less than 24 hours. The sampling procedures and preservation, storage, and analysis method comply with the WHO sampling method.

Figure: 5.6.1-1. Water sampling GPS point



5.6.2. Discussion on Water Quality

Well water quality is shown in the following table. Total 23 parameters were analyzed and it is observed that the values of pH, turbidity, conductivity, total hardness, calcium hardness, magnesium hardness, total alkalinity, bicarbonate (HCO3), chloride (as CL), sodium chloride NaCL, total solid (TS) and total dissolved solid were above the WHO drinking water standard. It is evident that shallow well water quality near Taungtha creek is not suitable to use. Water treatment system was installed in Taungtha factory and it needs to be functioned well to comply with WHO drinking water standards.

Table: 5.6.2-1. Raw water quality analysis results

Sr. No.	Quality Parameter	Result Qty:	Result Units	WHO Drinking Water Standard	Remark
1.	pH	8.7	_	6.5-8.5	Normal
2.	Color (True)	5	TCU	15 TCU	_
3.	Turbidity	14	NTU	5 NTU	Clear
4.	Conductivity	1940	µS/cm	400	
5.	Total Hardness	940	mg/l as $CaCO_3$	500	Normal
6.	Calcium Hardness	628	mg/l as $CaCO_3$	500	_

7.	Magnesium Hardness	312	mg/l as CaCO3	50	Normal
8.	Total Alkalinity	616	mg/l as CaCO3	400	Normal
9.	Phenolphthalein Alkalinity	10	mg/l as CaCO3	-	
10.	Carbonate (CaO_3)	20	mg/l as CaCO3	500	
11.	Bicarbonate (HCO_3)	596	mg/l as CaCO3	500	Soft
12.	Iron	0.72	mg/l	0.3	Normal
13.	Chloride (as CL)	210	mg/l	250	_
14.	Sodium chloride NaCL	347	mg/l	250	Normal
15.	Sulphate (as SO_4)	160	mg/l	500	
16.	Total Solid (TS)	993	mg/l	500	
17.	Total Suspended Solid (TSS)	23	mg/l	300	
18.	Total Dissolved Solid	970	mg/l	300	
19.	Manganese	Nil	mg/l	0.05	
20.	Phosphate	Nil	mg/l		
21.	Phenolphthalein Acidity	-	Mg/l		
22.	Methyl Orange Acidity	Nil	Mg/L		
23.	Salinity	-	ppt		

5.7. Air Quality

Total 2 evaporated ton/hr boilers (3-ton x 2) using furnace oil as a fuel with a 30 feet stack height are employed for dyeing purpose for finishing workshop. No cyclone dust collector was used due to the use of furnace oil burning because combustion of furnace oil produces few amounts of sulfur, mercury, and particulates. All the boilers are shut down due to the lack of work order to the factory. But regular boiler inspection works is performed with boiler inspector. Ambient air quality was monitored inside the factory compound with HAZ monitoring apparatus for 24 hours as shown in Figure 5.7-1. The parameters include particulate matter PM_{10}, particulate matter $PM_{2.5}$, and volatile organic compounds. The results are shown in Table: 5.7-1, indicating that the values are less than NEQEG 2.3.2.1 Textile Manufacturing Guideline values.

Figure: 5.7-1. Air quality monitoring with HAZ-Scanner



Figure: 5.7-2. Air quality test GPS point

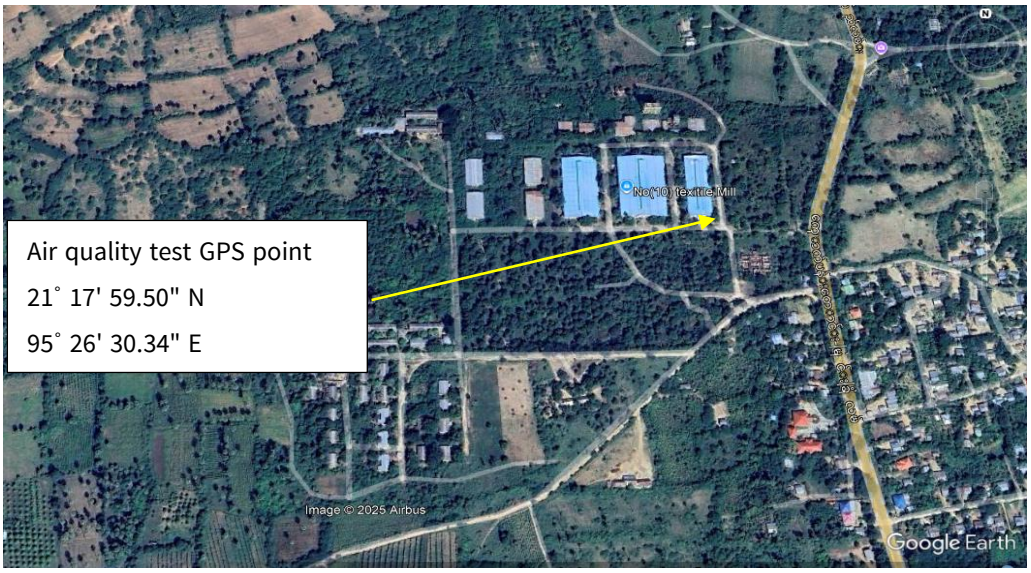


Table: 5.7-1. Air quality test results

Sr.	Parameter	Unit	NEQEG 2.3.2.1 Textile Manufacturing Guideline value	Results
1.	Ammonia	mg/Nm^{3a}	30	-
2.	Particulates	mg/Nm^3	50^b	PM_{10} 9.73

				$PM_{2.5}$ 7.16
3.	Carbon disulfide	mg/Nm^3	150	-
4.	Chlorine	mg/Nm^3	5	-
5.	Formaldehyde	mg/Nm^3	20	-
6.	Hydrogen sulfide	mg/Nm^3	5	-
7.	Volatile Organic Compound (VOC_s)	mg/Nm^3	2/20/50/75/100/150[c,d]	0.31

[a] Milligrams per normal cubic meter at specified temperature and pressure

[b] As the 30-minutes mean for stack emissions

[c] Calculated as Total carbon

[d] As the 30 minutes mean for stack emission: 2 mg/Nm^3 for volatile organic compounds classified as carcinogenic or mutagenic with mass flow greater than or equal to 10g/hour; 20 mg/Nm^3 for discharges of halogenated volatile organic compound with a mass flow equal or greater than 100 g/hour; 50 mg/Nm^3 for waste gases from drying of large installations (solvent consumption > 15 tons/years); 75 mg/Nm^3 for coating application process for large installation (solvent consumption > 15 tons/years); 100 mg/Nm^3 for coating application process for large installation (solvent consumption > 15 tons/years); if solvent is recovered from emissions and reused, the guideline value is 150 mg/Nm^3

5.7.1. Discussion on Air Quality

To assess the air quality within the factory compound, it is important to note that the air quality guidelines for NEQEQ 2.3.2.1 Textile Manufacturing are currently being met concerning particulates (PM_{10} and $PM_{2.5}$) and volatile organic compounds (VOCs), as indicated in Table 5.7-1. On the other hand, due to the instrumental issues, the other parameters were unable to be measured. If the emission values exceed the guideline limits set by NEQEG 2.3.2.1 for Textile Manufacturing, appropriate measures must be taken to address the issue.

5.8. Soil Quality

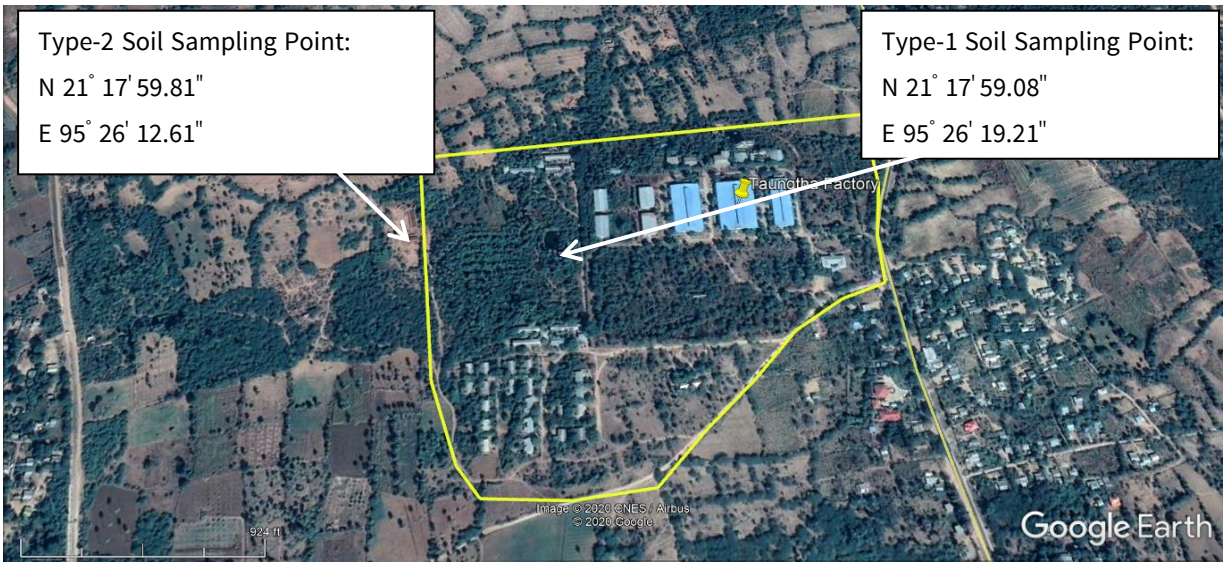
A soil quality test was carried out to determine pH, nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), soil particle size, texture, and organic matter (OM) content.

5.8.1. Sample Collecting Methodology

A total of 6 soil samples: 3 samples from Wastewater Treatment Pond (WTP) basin bed called Type (1) and 3 samples from cultivated land which is 500 feet

away from (WTP), defined Type (2) are collected in accordance with Forest Research Institute (FRI) laboratory's soil sample collection manual.

Figure: 5.8.1-1. Soil sampling GPS point



5.8.2. Testing

A total of six samples (3 samples as Type-1 and 3 as Type-2) were tested for pH value, N%, P%, K%, and texture at the Forest Research Institute (FRI) soil laboratory, Yezin, Forest Department. Test results are shown in Table 5.8.2-1.

Table: 5.8.2-1. Soil analysis results

Parameter		Wastewater Treatment Pond Soil Type (1)			Cultivated Land Soil Type (2)			Reference Soil Properties
Depth(cm)		0-10	40-50	80-90	0-10	40-50	80-90	
pH		9.04	9.80	9.85	9.14	9.03	8.86	5.0 – 8.0
Total N %		0.020	0.026	0.021	0.034	0.038	0.032	0.07-0.1
Ava. P %		0.00017	0.00021	0.00023	0.00010	0.00005	0.00005	0.002-0.005
Ext	K %	0.022	0.007	0.006	0.052	0.007	0.006	0.002-0.003
	Ca (%)	0.143	0.131	0.125	0.077	0.145	0.142	0.08-0.12
OM %		4.0	2.0	2.0	2.0	3.0	3.0	3-7
Particular Size Distribut-	Sand	53	56	65	59	56	54	
	Silt	21	19	16	14	18	18	
	Clay	26	22	17	21	24	25	

ion (%)								
Texture		Sandy-Clay-Loam	Sandy-Clay-Loam	Sandy-Loam	Sandy-Clay-Loam	Sandy-Clay-Loam	Sandy-Clay-Loam	Sandy-Loam Sandy- Clay- - Loam

Table: 5.8.2-2. Na analysis results

Depth (cm)	Type (1) Soil Exchangeable Na		Type (2) Soil Exchangeable Na	
	(cmol(+)/kg	Rating	(cmol(+)/kg	Rating
0-10 cm	9.76	Very High	0.78	Medium
40-50 cm	14.15	Very High	4.75	Very High
80-90 cm	0.68	Medium	0.79	Medium

Table: 5.8.2-3. Mg analysis results

Depth (cm)	Type (1) Soil Exchangeable Mg		Type (2) Soil Exchangeable Mg	
	(cmol(+)/kg	Rating	(cmol(+)/kg	Rating
0-10 cm	6.22	High	4.48	High
40-50 cm	4.82	High	5.66	High
80-90 cm	4.95	High	4.72	High

5.8.3. Discussion for Soil Quality

The above table shows that the Type-1 and Type-2 pH values were higher than the reference value. The maximum pH value for Type-1 was 9.85 which was very much higher than reference range 5.0-8.0. It can be defined that both Type-1 and Type-2 soils can be defined as very alkaline soil. The N%, P% and K% values were much lower than reference soil properties value. It is understandable that both soil Type-1 and Type-2 are not fertile. It is understandable that exchangeable Na and Mg values are very high. Taungtha factory uses large volume of water and different kinds of chemicals for dyeing purpose and discharges effluent to the

wastewater treatment pond. The function of wastewater treatment pond is to contain the effluent with the capacity of 200,000 gallons. There is a very low potential that effluent level goes beyond its limit if it receives heavy rain and as a consequence, untreated effluent would spill over nearby cultivated land.

However, since the establishment of Taungtha factory, it had never happened due to the few amounts of effluent generated. Neither chemical treatment nor biological water hyacinth treatment was conducted in this wastewater treatment pond.

5.9. Effluent Quality

In some instances, within Taungtha Township, the factory halted operations in certain sections responsible for producing effluents. As a result, no samples could be collected from the wastewater treatment pond, preventing any analysis of effluent quality.

5.10. Odor

The factory does not emit odor to the surrounding areas.

5.11. Noise, Vibration, and Light

A noise level is monitored at different locations which need assessment and improvement, as related to worker's health issues, namely cone winding, knitting and finishing machines are operating. There are 100 sewing machines at the garment workshop. When those machines operate at the same time, it generates a noise exposure with sound pressure level in order of exceeding 50 dB (A) because all these machines sit on the same floor under one roof. The noise exposure is not threatening the employees' health problem such as deafness.

Table: 5.11-1. Lights and noise data recorded with GPS points

Sr.no	Monitoring Location	GPS Coordinates		Noise dBA	Light LUX
		N	E		
1.	Garment Workshop (1)	21°18'00.32"	95°26'25.43"	67	58
2.	Garment Workshop (2)	21°18'00.90"	95°26'25.38"	9	70
3.	Garment Workshop (3)	21°18'01.59"	95°26'25.37"	67	9
4.	Garment Workshop (4)	21°18'00.26"	95°26'24.92"	63	80

5.	Knitting Workshop (1)	21°18'00.48"	95°26'29.79"	67	58
6.	Knitting Workshop (2)	21°18'00.86"	95°26'29.76"	70	65
7.	Knitting Workshop (3)	21°18'01.37"	95°26'29.77"	58	11
8.	Knitting Workshop (4)	21°18'00.85"	95°26'29.75"	60	70
9.	Finishing Workshop (1)	21°18'00.27"	95°26'28.11"	13	58
10.	Finishing Workshop (2)	21°18'00.33"	95°26'27.25"	15	65
11.	Finishing Workshop (3)	21°18'01.65"	95°26'27.17"	9	73
12.	Finishing Workshop (4)	21°18'01.88"	95°26'28.02"	12	65

Figure: 5.11-1. Integrating sound level meter



Figure: 5.11-2. Noise test GPS points

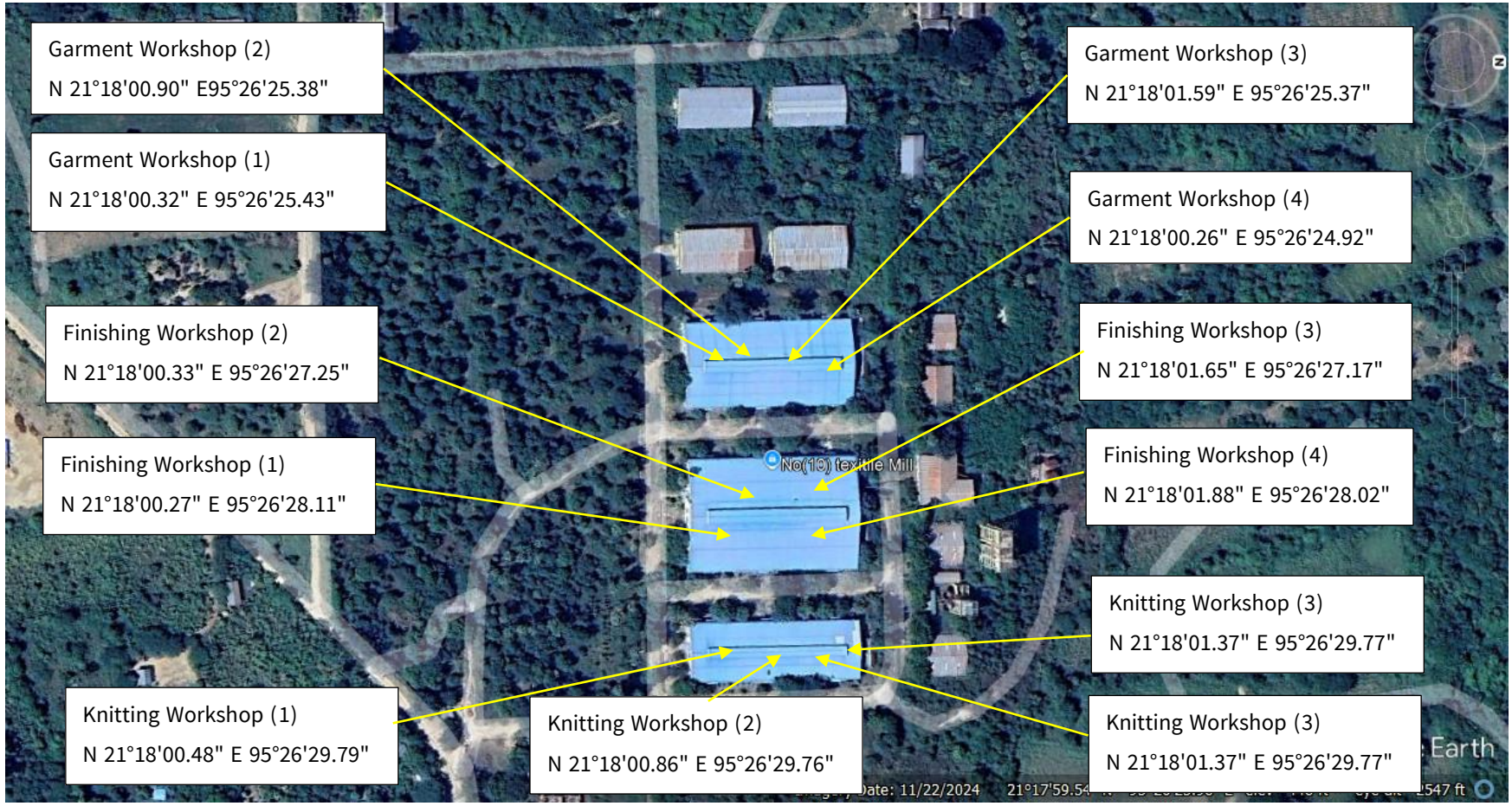
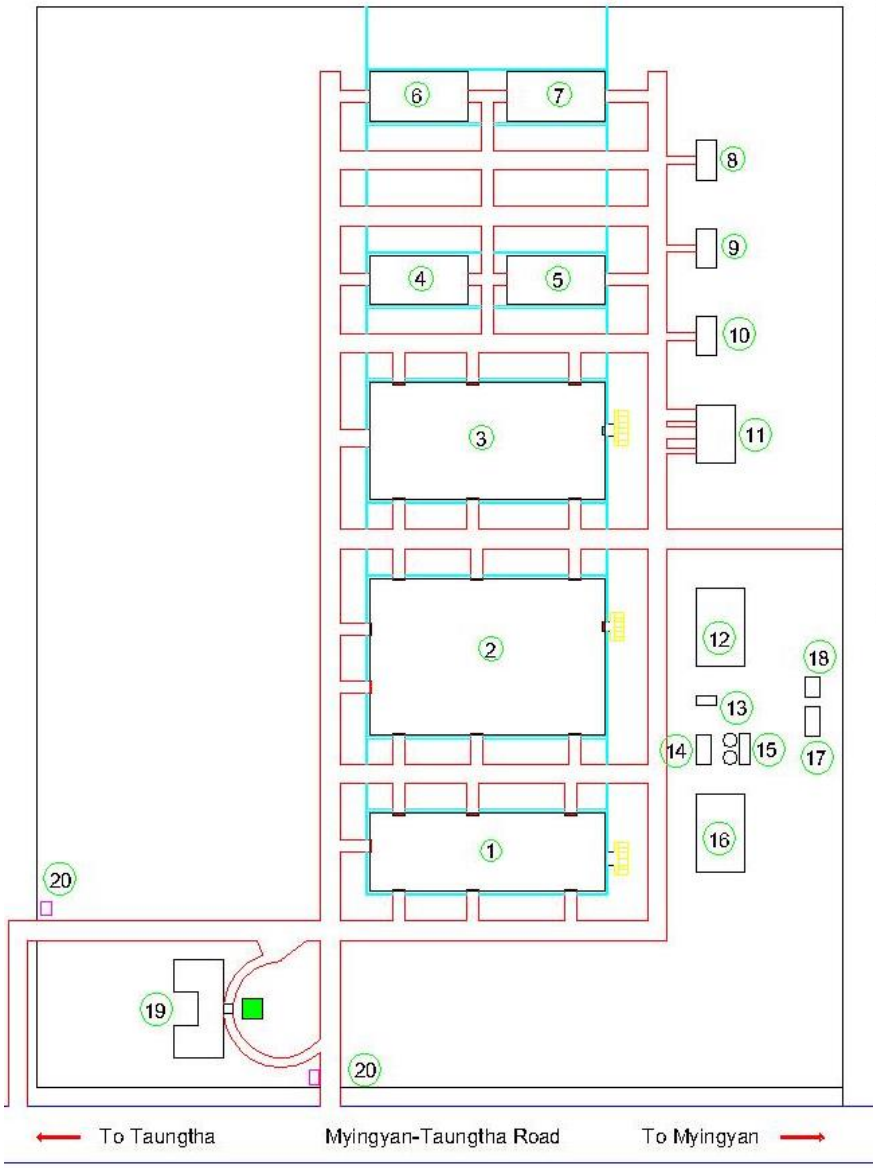


Figure: 5.11-3. Factory layout plan



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

5.12. Biodiversity

5.12.1. Introduction

The term biodiversity refers to all living organisms within an ecosystem, including the diversity and numbers of species present, and environmental factors such as temperature, oxygen, carbon dioxide, and climate. The degree of variation in biological, zoological, and ecological aspects is known as biodiversity. Understanding the coexistence of species, their reliance on each other, and their survival is important in studying the biodiversity present. Maintaining biodiversity is crucial for many reasons, including the benefits to humankind. For example, biodiversity has led to the discovery of drugs derived from plants or microbes, benefiting healthcare. However, pollution, deforestation, global warming, climate change, urbanization, and population growth pose significant threats to biodiversity leading to an alarming rate of species extinction. Conservation efforts are required to protect endangered species and their habitats. Myanmar's Environmental Law aims to conserve biodiversity and manage biological resources, issued by the Ministry of Natural Resources and Environmental Conservation (MONREC).

Table: 5.12.1-1. Environmental law related to biological matters

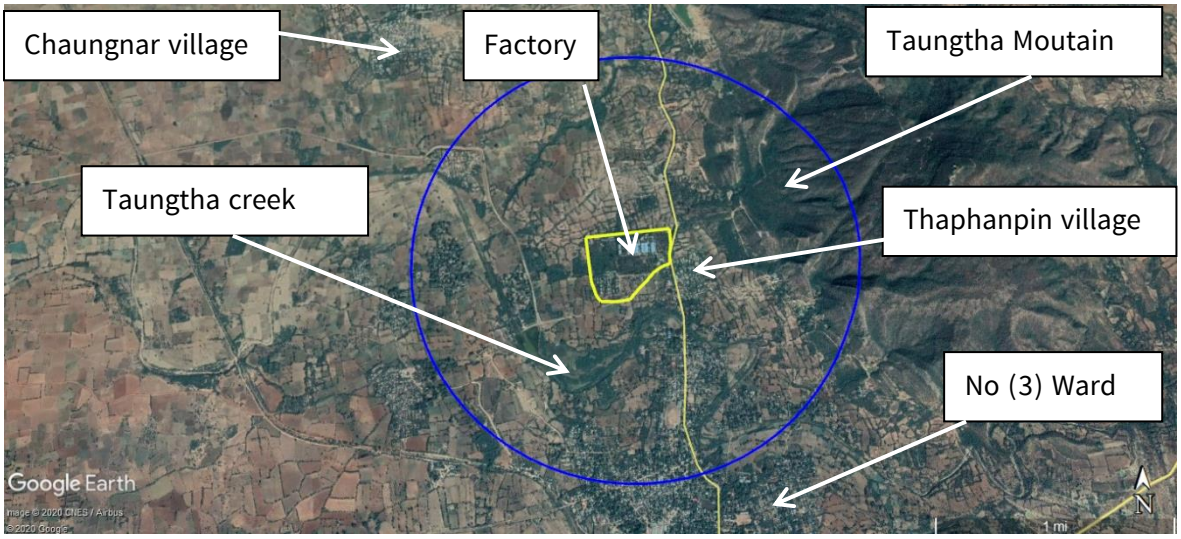
Sr. No.	Name of Law	Mention
1.	The Territorial Sea and Maritime Zones Law, 1977	Measures for the protection of marine and coastal zone environment and the conservation of marine biological diversity
2.	The amended forest law, 2018	Provisions to conserve water, soil, biological diversity, and environment: sustain forest produce yields, protect for cover; establish forest and village firewood plantation, sustainably extract and transport forest products
3.	Forest Rule, 1994	Provision of the sustainability of ecosystem and biodiversity
4.	Forest Policy, 1995	Provision of the sustainability of ecosystem, habitats, biodiversity
5.	Biodiversity and Protected Area Law, 2018	Provision of biodiversity and wildlife protection, natural and conservation, carrying out the protection

and conservation, biodiversity, ecosystem and protected areas as well protection of migratory birds in accordance with International Conventions acceded by the State, protecting the endanger species of wildlife and their natural habitats and contribution for the development research on natural science.

5.12.2. Biological Environment of the Factory

The factory is situated at the dry zone in Myanmar. As shown in the figure, the majority of the study area is covered by cultivated land, Myingyan-Taungtha-Meikhtilar Road, Taungtha mountain, No (3) ward, Taungtha creek, Thaphanpin village, and Chaungnar village.

Figure: 5.12.2-1. Biodiversity survey area, 2-miles diameter circle



5.12.3. Survey Methodology and Analysis of Plant Species

The observers employed the complete enumeration method to conduct direct observations. Although this method is costly, it is essential for certain types of data sets. To ensure accuracy, survey error estimation, time series analysis, and seasonal adjustment were taken into account. The observation period spanned from July 2020 to December 2024. Field survey points were recorded using Global Positioning System (GPS) technology and are listed in the accompanying tables

by section. The identification of plant species was conducted, and the scientific name, family name, and Myanmar name of each plant were recorded. The following table shows the GPS points of the plant survey.

Table: 5.12.3-1. Plant survey GPS points

No.	Latitude	Longitude
1.	21° 17' 59.73"	95° 26' 32.27"
2.	21° 18' 0.16"	95° 26' 33.87"
3.	21° 17' 56.43"	95° 26' 34.04"
4.	21° 17' 57.80"	95° 26' 30.54"
5.	21° 17' 52.27"	95° 26' 19.92"
6.	21° 17' 50.98"	95° 26' 20.11"
7.	21° 17' 48.20"	95° 26' 31.26"
8.	21° 17' 52.26"	95° 26' 18.92"

Figure: 5.12.3-1. Recorded plant species

















Table: 5.12.3-2. Recorded plant species

No.	Scientific Name	Family	Myanmar Name	Habitat	IUCN Status
1.	Pterocarpus macrocarpus Kurtz	Fabaceae	Padauk	Tree	LC
2.	Chukrasia tabularis A. Juss.	Meliaceae	Yinma	Tree	LC
3.	Salmalia malabarica	Bombacaceae	Let-pan	Tree	LC
4.	Carica papaya L.	Caricaceae=1	Thinbaw	Tree	LC
5.	Cassia siamea Lam.	Fabaceae	Mezali	Tree	LC
6.	Clerodendrum indicum (L.) Kuntze	Lamiaceae	Ngayan-padu	Tree	LC
7.	Emblica officinalis Gaertn	Phyllanthaceae	Zibyu	Tree	LC
8.	Lannea coromandelica (Houtt.) Merr	Anacardiaceae	Thayet	Tree	LC
9.	Leucaenna glauca (L.) Benth	Fabaceae	Baw-sa-gaing	Tree	LC
10.	Mimosa pudica L.	Mimosaceae=4	Tikayon	Herb	LC
11.	Eclipta alba (L.) Hassk.	Asteraceae	Kyeik-hman	Herb	LC
12.	Psidium guajava L.	Myrtaceae	Ma-la-ka	Tree	LC
13.	Moringa oleifera Lam.	Moringaceae=1	Dan-da-lun	Tree	LC
14.	Tadehagi triquetrum (L.) H. Ohashi	Fabaceae	Lauk-thay	Shrub	LC
15.	Tamarindus indica L.	Fabaceae	Magyi	Tree	LC
16.	Terminalia catatta L.	Combretaceae=5	Banda	Tree	LC
17.	Zizipus jujube (L.) Mill & Lam	Rhamnaceae	Zee Pin	Tree	LC
18.	Albizia lebbek (L.) Benth	Mimosaceae	Kok-ko , (Siris)	Tree	LC
19.	Delonix regia	Rosaceae	Sein-Pan Prunus	Tree	LC
20.	Eucalyptus L Her	Myrtaceae	Eu-ka-lit	Tree	LC
21.	Holoptelea integrifolia	Ulmaceae	Pyauk-sake	Tree	LC
22.	Casuarina equisetifolia	Casuarinaceae	Pin-le-ka-vee Rhu or Casuarina	Tree	LC
23.	Cocos Nucifera	Arecaceae	Ohn Pin	Tree	LC
24.	Ficus Benghalensis	Moraceae	Nyaung-pin	Tree	LC
25.	Azadirachta indica A.Juss	Meliaceae	Tamar	Tree	LC
26.	Hta Naung	Mimosaceae	Hta Naung	Tree	LC
27.		Verbenaceae	Taung Htan	Tree	LC
28.	Tectona Grandis	Lamiaceae	Kyun	Tree	LC
29.	Terminalia catatta L	Combretaceae	Htauk Kyant	Tree	LC

LC-Least concern

5.12.4. Discussion on Plant Species

The whole survey area is dominated by cultivated fields and Taungtha town. The identifications of plant species are recorded and analyzed. The list of plant species is shown in Table 5.12.3-2 with IUCN status. All the plant species are not listed for protection, nevertheless, from the environmental point of view, those plants should be kept to maintain green zone and create the diverse ecosystem.

A total of 29 plant species of 15 families were investigated. The Fabaceae family is the highest frequencies (6 species, 20.68 %), followed by Mimosaceae (3 species, 10.34%), and Conbretaceae (3 species, 7.69%) family among the collected species. The composition of tree is 89.65 %, followed by herb 6.89 %, shrub 3.44 %. None of those species are found on threatened categories of ICUN red list 2017. Among the plant species composition, Tamar (Meliaceae) is the highest number because the factory paid attention to environmental activities since 2005: such as growing Tamar tree which is suitable for climate, inside the factory compound area.

5.12.5. Data Collection & Analysis of Fauna Species

Data collection was carried out within a 2-mile diameter circle of the factory as the same plant species investigation was done. Direct observation was done by the complete enumeration method which is expensive, but essential for certain data sets. In this method, survey error estimation, time series analysis, and seasonal adjustment need to be considered. The observation period started in July 2020 and ended in August 2020.

Field survey points are recorded as Global Positioning System (GPS) points. The identification of fauna species was carried out and their scientific name, family name, and common name are recorded and listed regarding the literature published by the Forestry Department, MONERC, and Forest Research Institute (FRI) Yezin.

Table: 5.12.5-1. Survey points (GPS) for amphibians and reptiles

Sr. No.	Latitude	Longitude
	N	E
1.	21° 17' 57.01"	95° 26' 26.12"
2.	21° 17' 53.08"	95° 26' 25.59"
3.	21° 17' 42.20"	95° 25' 56.47"
4.	21° 18' 09.99"	95° 26' 51.85"
5.	21° 18' 46.92"	95° 26' 36.13"
6.	21° 18' 04.09"	95° 26' 17.72"
7.	21° 18' 05.32"	95° 26' 30.37"

Table: 5.12.5-2. Amphibians and reptiles

Sr. No	Family	Common Name	Scientific Name	IUCN Status 2017	Habitat
	Frog and Toad				
1.	Dicroglossidae	Painted chorus frog	Kaloula pulchra	LC	Pond
2.	Bufonidae	Asian common toad	Duttaphrynus melanostatus	LC	Open area
3.	Rhacophoridae	Tree frog	Polypedates leucomystax	LC	Tree
4.	Microhylidae	Paddy frog	Micryletta aishani	LC	Paddy field
5.	Rhacophoridae	Shrub frog	Rhacophorus rhodopus	LC	Paddy field, river bank
6.	Microhylidae	Banded Bull Frog	Kaloula pulachra	LC	Paddy field, tree, house
7.	Gecarcinucoidea	Paddy field crab	Parathelphusa convexa	NL	Tree
8.	Helicidae Lizard	Land snail	Terrestrial Mollusc	NL	Land
9.	Agamidae	Indo-chinese forest lizard lizard	Calotes mystaceus	LC	Tree

10.	Gekkonidae	Common house gecko	Hemidactylus frenatus	LC	House
11	Gekkonidae	Burmese flying gecko	Gekko lionotum	LC	Tree
12.	Elapidae	Monocellate cobra	Naja kaouthia	LC	Paddy field
13.	Elapidae	Russel's viper	Daboia russelli	LC	Paddy field
14.	Leporidae	Pentalagus	Rabbit	LC	Forest
15.	Phasianidae	G. gallus	Red jungle fowl	LC	Forest
16.	Varnidae	Varanus	Monitor Lizards	LC	Forest
17.	Cervidae	Artiodactyla	Deer	LC	Forest

LC – Least Concern, NL-Not Listed

5.12.5.1. Discussion on Amphibians and Reptiles

A total of 17 species of amphibian and reptiles belonging to 13 families were observed shown in Table 5.27. The population level is lower than 50. Survey period started on July, the beginning of raining season, whilst farmers plough in their paddy field in which different kind of frog, crab and snail enjoy muddy field under the rain, and ended in August, 2020. Banded bull frog which belongs to the Microhylidae family has been counted as the highest frequency among the amphibians because they live in paddy field and forest floor where they can live eating earthworms, flies, month and grasshopper. Even in dry season, they can survive dry conditions by burying themselves in ground and waiting for rain.

5.12.6. Data Collection of Avifauna, Birds

Data collection was carried out within a 2-mile diameter circle of the factory as the same amphibian and reptile investigation was done. Direct observation was done by the complete enumeration method which is expensive, but essential for certain data sets. In this method, survey error estimation, time series analysis, and seasonal adjustment need to be considered. The observation period started in July 2020 and ended in August 2020.

Table: 5.12.6-1. Survey points (GPS) for birds

No.	Latitude	Longitude
	N	E
1.	21° 17' 57.01"	95° 26' 26.12"
2.	21° 17' 53.08"	95° 26' 25.59"
3.	21° 17' 42.20"	95° 25' 56.47"
4.	21° 18' 09.99"	95° 26' 51.85"
5.	21° 18' 46.92"	95° 26' 36.13"
6.	21° 18' 04.09"	95° 26' 17.72"
7.	21° 18' 05.32"	95° 26' 30.37"

Table: 5.12.6-2. Recorded bird species

Sr. No.	Family	Common name	Scientific name	IUCN 2016 Status	Habitats	Abundance status
1.	Ardeidae	Cattle egret	Bubulcus ibis	LC	Paddy field	S
2.	Passeridae	Euro Asian tree sparrow/ House sparrow	Passer domesticus	LC	Tree	S
3.	Ralliade	Water cock	Gallicrex cinerea	LC	Water edge	S
4.	Corvidae	House crow	Corvus splendens	LC	Tree	S
5.	Dicruridae	Black Drongo	Dicrurus macrocercus	LC	Tree	S
6.	Hirundinidae	Red-rumped swallow	Cypsiurus balasiensis Gray, JE,	LC	Tree	S
7.	Columbidae	Ashy wood pigeon	Columba pulchricollis	LC	Tree	S

LC – Least Concern

5.12.6.1. Discussion on Bird Species

Field survey of bird species found at sis locations including forest, muddy beach, housing, lawn, and paddy fields, as shown in Table: 5.11.6-1. A total of 7 species of birds belonging to 7 families were recorded in the survey area. The

population is less than 50. The recorded species are very common across the country. None of the bird species are listed on the threatened species of the IUCN 2017 list.

The cattle egret is the highest frequency in the record list. House sparrow species is the second highest frequency, while house crow is the third, and Ashy wood pigeon is the lowest one.

5.12.7. Specimen Collection of Fish Species

Observation of fish species was not conducted because the factory is surrounded by cultivated land and there is only Taungtha creek about 1600 feet from the factory.

IUCN Red List 2016

In this investigation, none of the species are found on the IUCN Red List 2016.

5.12.8. Discussion on Biodiversity

Taungtha Township doesn't lie in the protected area. The National Biodiversity Strategy and Action Plan (NBSAP, 2015-2020) proposed seven additional Protected Areas by 2021. AICHI biodiversity target is stated in the following Box.

Box 1- AICHI BIODIVERSITY TARGET 11 ON PROTECTED AREAS
At the tenth meeting of the CBD Conference of the parties in 2010, in Nagoya, Aichi prefecture, Japan, 20 Biodiversity Targets were agreed for the 2011-2020 period. Target 11 relates to Protected Areas and states that "By 2020, at least 17% of terrestrials and inland water areas and 10 % of coastal and marine areas should be protected." The areas conserved should be: • Of particular importance for biodiversity and ecosystem services • Ecologically representative- including at least 10% of each ecoregion within the country • Effectively and equitably managed- with measures in place to ensure ecological integrity and the protection of species, habitats, and ecosystem processes, with the full participation of indigenous and local communities, and such that costs and benefits of the areas are fairly shared. • Well-connected- to the wider landscape or seascape using corridors and ecological networks to allow connectivity, adaption to climate change, and the application of the ecosystem approach.

The survey area covers 3.142 square miles, encompassing paddy fields, wards, villages, Taungtha creek and Taungtha mountain. This survey identified 29 plant species, 17 amphibian and reptile species, and 7 bird species.

It was investigated that cattle egrets and cows rely on each other. Cattle egrets live on insets. Two species form a relationship that is mutually beneficial to both parties which is called symbiosis. In this biodiversity: shrub frog enjoys the paddy field; banded frog eats earthworms in the paddy field; different kinds of shrubs become home for tree frogs; The small forest encompassing, the Tamar tree, and Baw-sa-gaing tree, and Kokko tree helps reduce carbon dioxide by direct removing and indirectly by reducing air temperature.

Therefore, it can be concluded that animal species and trees depend on each other for what each offers ensuring the natural sustainability of this biodiversity.

5.13. Corporate Social Responsibility (CSR)

The factory's Corporate Social Responsibility (CSR) program is enhancing society and the environment. Factory's CSR program could be cooperated with the environment, society, and biodiversity.

In Myanmar, people celebrate the Kathina festival during Tazaungmon, the eighth month of the Myanmar lunar calendar. The essence of the Kathina festival revolves around offering new sets of robes to the monks. Factory workers have the opportunity to participate in the celebration activities in their own way. Each year, the total donations amount to about 3 million Myanmar kyats, which are distributed to various monasteries in Taungtha Township.

The Waso robe offering ceremony marks the start of the three-month Buddhist lent period, during which travel is prohibited. Each year, factory workers present robes to the monks for them to wear throughout the lent.

There is a residential area within the factory compound that can accommodate many workers. However, some factory workers reside in nearby villages. The creation of jobs in the factory not only stimulates economic growth in the region but also enhances the socio-economic well-being of the surrounding area.

Natural disasters, such as floods, cyclones, fire outbreaks, and earthquakes, can have a significant impact on communities. To address these risks, a disaster management program is conducted at the factory, as the first responders to any disaster are often the employees and residents of the area. As part of this program, the Township Fire Brigade provides rescue and fire extinguishing training at the factory every six months. Additionally, the Township Red Cross Society offers special disaster response training to the factory's communities, aimed at enhancing their ability to withstand disasters.

No. (10) Textile Mill (Taungtha) commits to spending 2% of income revenue for CSR programs in compliance with environmental conservation regulations. As per government financial regulation, the factory needs to apply budget allocation to the Ministry of Industry one year ahead.

Social Welfares Activities

Inter-factory sports competitions are held in December to uplift physical fitness and morale which would benefit the social development among the workers. The factory also provides ferry services to Taungtha Town and nearby villages with free of charge.

Environmental Conservation Activities

The factory has a long history of environmental conservation activities. Since 2010, the factory has grown Tamar, Kokko, and Mango trees around the factory compound areas in collaboration with the forest department as a part of the factory greening project. About 10 acres of factory land were put under plantation. It is a very remarkable effort made by the factory to harmonize the environment and production business.

In order to fulfill the partial requirement of EMP, Taungtha factory plans to implement an agroforestry system, which involves planting a mix of trees and vegetables in the tropical zone. This method allows for the cultivation of vegetables alongside or under the canopy of forests or tree-based systems. Such practices are prevalent in tropical regions and are designed to enhance biodiversity, improve soil fertility, and optimize land use.

Taungtha factory is committed to launching this program in collaboration with local farmers and the Dry Zone Greening Department, implementing it in phases. Initially, the factory will start by planting one acre of mango trees interspersed with beans. The following year, the plan is to expand to two acres, and over the next three years, an additional three acres will be established.

The agroforestry system is expected to benefit both the Taungtha factory and the surrounding local communities. By establishing this system, both parties can enhance biodiversity, improve soil health, diversify income streams for farmers, and contribute to climate change mitigation through carbon sequestration in trees. The program is set to begin in 2027-2028 fiscal year, contingent upon securing financial support from the Ministry and Government.

Implementing such an agroforestry system in Taungtha can lead to sustainable agricultural practices, improved livelihoods, and enhanced environmental resilience.

The factory has a strong commitment to implementing area-wide three R's program which includes reduce, reuse, and recycle for waste minimization and conservation of natural resources. This program covers the factory's residential area, as well as nearby villages and wards.

To sum up, No. (10) Textile Mill (Taungtha) is committed to the socio-economic development of the surrounding areas, and their efforts towards environmental conservation are commendable.

5.14. Commitment by the factory

The factory promises to follow its commitments.

Table: 5.14-1. Commitment by the factory

No.	Name of Commitment	Description About Commitment	Refer to
1.	Water quality	The factory guarantees that its operations will not affect the quality of surface water. Any waste discharged from the premises is only goes into the wastewater treatment pond. There will be no discharged of any effluent from the treatment pond.	Chapter 5 Article 5.6

2.	Air quality	All boilers are currently shut down due to a lack of work orders for the factory. Regular boiler inspections will be conducted with the boiler inspector once the factory resumes operations.	Chapter 5 Article 5.7
3.	Soil quality	The factory doesn't dispose of any hazardous material into the soil.	Chapter 5 Article 5.8
4.	Effluent quality	The factory uses bleaching and dyeing process in its finishing process. The factory commits to discharge treated wastewater to nearby land. When the factory resumes operation in the future, a multimedia filtration system must be installed and treated wastewater will be treated again in this system to comply with the NEQEG effluent quality guidelines for textile manufacturing.	Chapter 5 Article 5.9
5.	Noise	There are 100 sewing machines at the garment workshop. The factory will prioritize the safety and well-being of its employees and take significant steps to reduce noise levels in compliance with NEQEG 1.3 noise level guideline values.	Chapter 5 Article 5.11
6.	Biodiversity	The factory's operations will not impact the nearby ecosystem. Myanmar's Environmental Law regarding biological conservation and management, issued by the Ministry of Natural Resources and Environmental Conservation (MONREC), will be adhered to in order to protect biodiversity and reduce negative effects.	Chapter 5 Article 5.12
7.	CSR fund	The factory has pledged to allocate 2% of its income revenue towards its CSR program.	Chapter 5 Article 5.13
8.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 5 Article 5.13

Chapter 6
Environmental Impacts and Mitigation

Chapter (6)

Environmental Impacts and Mitigations

6.1. Introduction

Environmental studies define "Environment" as the intricate interplay between bio-physical and socio-economic components. It is important to note that a project and its environment have a two-way interaction. While the project can impact its environment, the environment can also exert constraints and provide opportunities for the project. The emergence of a new environmental condition in the study area due to the project's impact is termed environmental impact. To identify and evaluate the potential effect of a project on the surrounding environment, prediction is a critical component of EMP studies. A wide range of impacts on the environment attributed to the proposed project has been identified, and their significance has been assessed based on the environmental quality in the area and the magnitude of the impact.

6.2. Identification and Characterization of Impacts

In this chapter, the focus is on discussing the potential environmental impacts of various activities carried out by the factory. The activities generate wastes and pollutants which can cause different types of environmental impacts. The main activities of the factory and their anticipated environmental impacts are categorized and discussed below.

Table: 6.2-1. Assessment criteria

Nature of impact	An explanation of how the environment will be affected by specific activities
Mitigation	What measures could be applied to reduce negative impacts or enhance positive impacts
Extent	The geographical extent of the impact
Duration	The length of the time that the impact persists: Very short 0-1 years Short term 2-5 years Medium-term 6-15 years Long-term- life span of the project Permanent-Post closure
Intensity	Very low (The impact on the environment is not detectable) Low (The impact affects the environment in such a way that natural functions and processes are not affected)

	Medium (Where the affected environment is altered but natural functions and processes continue, albeit in a modified way) High (Where natural functions or processes are altered to the extent that it will temporarily or permanently cease)
Probability	The probability of the impact occurring: Improbable (a low probability that the impact will occur) Probable (a distinct probability that the impact will occur) Highly probable (It is most likely that the impact will occur) Definite (where the impact will occur regardless of any mitigation measures)
Confidence	The level of confidence that can be placed on this assessment: Low (Would indicate that further investigation is required if the impact could potentially be significant) Medium (Further investigation may be required if the impact could be significant) High (The impact is well understood. However further investigation may be required to determine the effectiveness of possible mitigation measures)
Impact Significance	The significance of the impact is determined as a synthesis of the above assessment criteria where: Low significance means that the impact would not affect the decision to prove the project Medium significance- the assessed impact should affect the decision unless it is effectively mitigated High significance- the decision would be influenced regardless of any mitigation.
Further investigation or monitoring	A recommendation for further investigation (before the commencement of the activity) or monitoring (before commencement and/or during operations or even post closure.

Each source of impact has been identified by four parameters; magnitude, duration, extent, and probability. Each assessment has five scales as shown below.

Table: 6.2-2. Impact assessment parameters and its scale

Assessment Parameter	Scale				
	1	2	3	4	5
Magnitude (M)	Insignificant	Small and will have no effect on the working environment	Moderate and will result in minor changes on the working environment	High and will result in significant changes on the working environment	Very high and will result in permanent changes on the working environment
Duration (D)	0-1 year	2-5 years	6-15 years	Life of operation	Post Closure

Extent (E)	Limited to the site	Limited to the local area	Limited to the region	National	International
Probability (P)	Very improbable	Improbable	Probable	Highly probably	Definite

The following formula calculates the significant point (SP).

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

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

Table: 6.2-3. Impact of significance

Significant Point (SP)	Impact's Significance		Significance Description
< 15	Very low		No Significant Impact
15-29	Low		Insignificant impact
30-44	Moderate		Low impact, try to improve
45-59	High		Significant impact, real necessity to improve
>60	Very high		Highly significant impact, must be improved

6.3. Impact and Mitigation Measures at the Construction Stage

6.3.1. Impact on Soil at the Construction Stage

At the construction stages, soil is removed from building sites, and areas are to be paved. It is important to conserve this topsoil for later rehabilitation. The following instructions should be followed:

- Need to remove topsoil and grow vegetation on that soil, being enriched and maintained.
- Stockpile topsoil in conical shape not exceeding 2 meters in height to protect against erosion by surface water flow.
- Allow grass and shrubs to grow naturally.
- Remove topsoil and subsoil separately.
- Replace subsoil first and topsoil later.

Table: 6.3.1-1. Impact on soil at the construction stages

Impact on soil	
Nature on impact	Potential destruction of the soil profile by mixing topsoil with subsoil
Mitigation	• Separate removal and stockpiling of topsoil and subsoil • Leave plant in top soil • Prevent erosion of stockpiles

	• When rehabilitation, first replace subsoil and then top soil • Grow trees around the factory/project
Extent	Whole project construction areas
Duration	Short term
Intensity	High
Probability	Definite
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Investigate soil quality yearly.

6.3.2. Potential Impact of Surface Water Pollution at the Construction Stage

At the construction stage, construction materials were stockpiled and a drainage system was constructed to discharge runoff water which includes sediment, heavy metal, and litter from site clearing and earthwork excavation.

Table: 6.3.2-1. Potential impact on water pollution at the construction stage

Impact on water	
Nature on impact	Potential contamination of surface water (stream)
Mitigation	• Temporary trenches were dug to discharge the run-off water from the construction site in the rainy season
Extent	Whole project construction areas
Duration	Short term
Intensity	Low
Probability	Very improbable
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Investigate stream water quality monthly.

6.3.3. Potential Impact of Air Emission at the Construction Stage

At the construction stage, site cleaning, earthwork, backfilling, landfill, and transportation of construction materials were done by using heavy-duty vehicles. Dust caused by the activities of these vehicles affects the air quality in the construction area. Emissions from the vehicles and emergency diesel generators also downgraded the air quality in this area because the use of diesel engines may result in lower CO_2.

Table: 6.3.3-1. Potential impact on air quality at the construction stage

Potential Impact on Air Quality	
Nature on impact	Low level of dust emissions
Mitigation	• Proper maintenance for diesel truck vehicles • Spraying on the road • A green belt zone around the factory is created.

	• Emission Control Technologies should be applied in heavy duty diesel vehicle. • Masks should be provided to workers.
Extent	Construction area
Duration	Short term
Intensity	Low
Probability	Very low
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Construction areas' air quality needs to be checked in every six months.

6.3.4. Potential Impact of Noise Environment at the Construction Stage

The source of noise at the construction site was mainly vehicles, heavy-duty trucks, noise-generating equipment, emergency diesel generators, air compressors, different types of mobile cranes, concrete mixers, wheel loaders, bulldozers, and excavators. The large vehicles move to and from the construction site anytime during daylight hours. The noise was generated by large vehicles in loading yards.

Table: 6.3.4-1. Potential impact of noise environment at the construction stage

Potential Impact on Noise Environment.	
Nature on impact	High level of noise.
Mitigation	• Lubrication to rotating material to reduce noise transmission • Noise-generating equipment will be encased to control noise. • All operators need to wear ear plugs as PPE. • Slow movement of large vehicles.
Extent	Construction areas
Duration	Short term
Intensity	Low
Probability	Very low
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Check noise level weekly.

6.3.5. Potential Impact on 33 KV High Voltage Transmission Line at Construction Stage

A 33 KV power line was constructed from Myingyan sub-station to the factory. The electricity system produces an extremely low frequency electromagnetic field which comes under non-ionizing radiations which can cause health effects. Apart from the human effect, the electrostatic coupling and electromagnetic interference of high voltage transmission lines have an impact on plants and telecommunication

equipment mainly operating in the frequency range below UHF. Necessary measures and protection were done in the construction of 33 KV high voltage line to safeguard the Electric and Magnetic Field effects. Before the 33 KV line construction, a temporary 11 KV line was connected to the construction site for street lighting, internal lighting, temporary site camp lighting, handling equipment usage, and other utilities.

Table: 6.3.5-1. Potential impact of the 33 KV electric power line at the construction stage

Potential Impact of 33 KV Power Line (Construction stage)	
Nature on impact	High Level Electric and Magnetic Field Effect.
Mitigation	• Necessary measures to be conducted to reduce the electromagnetic field effect. • Cables embedment was done properly following the safety standard.
Extent	Cable straight line distance from Myingyan sub-station to Factory.
Duration	Very short term
Intensity	High
Probability	Low
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Monitor the well-being of humans and biodiversity near power lines yearly.

6.3.6. Socio-economic Environment Impact at the Construction Stage

The Taungtha factory project created temporary job opportunities for construction activities and related services like transportation of construction materials, food supply, water supply, locally available construction materials supply such as; brick, aggregate, sand, and hardwood, ferry service to construction workers and vehicle maintenance workshop for locals during construction period.

6.3.7. Impact on Biodiversity at the Construction Stage

Impacts on Biodiversity are accountable for various construction activities such as earth excavation, soil erosion, water contamination, dust emission, etc. In order to leverage these impacts, mitigation measures will be implemented by project developers, communities, and stakeholders as shown in Table: 6.3.7-1.

Table: 6.3.7-1. Impacts on biodiversity at the construction stage

Impact on Biodiversity	
Nature on impact	▪ Soil contamination, erosion, water contamination, and improper waste disposal, affect the species' life span to be shortened or to be executed or generation decreased.
Mitigation	Selection of debris disposal area carefully. Landfill areas should be designated not affecting the lives of animals. Greenbelt plantation was started at the beginning of the project.
Extent	Factory construction site
Duration	Short term
Intensity	Low
Probability	Highly probable
Confidence	High
Significance	Low means that the impact would not affect the decision to prove the project.
Further investigation	Maintain greenbelt.

6.3.8. Positive Impacts at Construction Stage

At the construction stage, the project creates temporary jobs for locals followed by secondary effects in the adjacent region. These positive impacts are as follows:

Table 6.3.8-1. Positive impacts at the construction stage

Positive Impact on Construction Activities	
Nature on impact	Temporary and positive impact in short terms
Positive Nature	▪ Temporary employment was generated due to the huge construction activities and related services like transportation, hardware retailers, food and water supply, ferry service, and vehicle maintenance, and secondary effects were demonstrated in locally available construction materials supply such as; brick, aggregate, sand and hardwood.
Extent	Project construction site
Duration	Short term
Intensity	High
Probability	Definite
Confidence	High
Significance	High-the decision would be influenced regardless of any mitigation.
Further investigation	Not required

6.3.9. Impact on Occupational Health and Safety at the Construction Stage

At the construction stage, the activities caused by construction activities are as follows:

- Physical hazards such as dust, noise, vibrations,

- Unplanned collision caused by vehicular movement,
- Electric shock caused by unskilled workers and negligence of work safety.
- Other accidents caused by unprecedent factors: such as poor quality of construction material, and heavy construction vehicle unfitness.

The mitigation measures are explained in Table 6.3.9-1.

Table: 6.3.9-1. Impacts on occupational health and safety

Positive Impact on Construction Activities	
Nature on impact	Temporary impacts in the short-term
Positive Nature	▪ Designate the work site area. ▪ Temporary fencing to protect outsiders coming in. ▪ Cautionary sign board to be hung. ▪ First aid box be ready. ▪ Safety gear such as helmets, goggles, gloves, and booth to be provided. ▪ Develop and maintain an effective safety and health program. ▪ Provide safety training for construction workers.
Extent	Project construction site
Duration	Short term
Intensity	High
Probability	Definite
Confidence	High
Significance	High-the decision would be influenced regardless of any mitigation.
Further investigation	Not required

6.3.10. Impact of Solid Waste Disposal at Construction Stage

Due to the construction activities, different kinds of debris were collected. It became a big issue for environmental conservation. Mitigation measures are as follows:

Table 6.3.10-1 Impacts on solid waste disposal at the construction stage

Positive Impact on Construction Activities	
Nature on impact	Debris collected in the construction site
Mitigation measures	▪ Flammable items to be burned. ▪ Inflammable item to be buried. ▪ Landfill area to be designated
Extent	Project construction site
Duration	Short term
Intensity	High
Probability	Definite

Confidence	High
Significance	High-the decision would be influenced regardless of any mitigation.
Further investigation	Not required

6.4. Impacts and Mitigation Measures on Production Stage

6.4.1. Impacts of Surface Water Contamination

The factory uses 30,000 gallons of raw water from the shallow wells at Taungtha Creek which is 0.5 mile far every day. The treated water is used for various purposes, including boiler usage, sanitation, gardening, and household. The factory's runoff water, stormwater, and sewage are discharged to the wastewater treatment pond. The factory has implemented mitigation measures to minimize its environmental impacts.

Table: 6.4.1-1. Impact of surface water contamination at the production stage

Potential for Surface water Contamination	
Nature on impact	Surface water contamination is due to industrial activities such as sanitation, and households.
Mitigation	• Well-designed stormwater network will be provided to collect rainwater from the entire factory area. • Contaminated stormwater, if any, will be diverted to drain. .
Extent	Within 2 miles diameter areas
Duration	Long term
Intensity	Very low
Probability	Very low
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Check Taungtha creek water quality every six months.

6.4.2 Potential Impact of Groundwater Contamination and Mitigation Measures at the Production Stage

The factory, which employs 325 workers, discharges some amount of sewage, and the residential area's domestic sewage is channeled to the drain. However, these contaminations are preventable. To mitigate these issues, the following measures can be taken:

Table: 6.4.2-1. Impact of groundwater contamination at the production stage

Potential for Groundwater Contamination	
Nature on impact	Potential contamination of groundwater by effluent from fuels, oils, hydraulic fluids, or domestic waste.
Mitigation	• A deep well approximately 500 feet will be bored • Pave vehicle parks and collect runoff.

	• Maintain all vehicles to prevent spills of oils, hydraulic fluids, etc. • Make sure to collect waste and dispose at an approved disposal facility. • All the diesel oil and lubricant will be stored in a dedicated storage area with impervious flooring to restrict/control leakages and prevent groundwater contamination.
Extent	Within 2 miles diameter areas
Duration	Short term
Intensity	Very low
Probability	Very low
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Water quality tests should be taken periodically.

6.4.3. Potential Impact of Air Emission and Mitigation Measures at the Production Stages

Taungtha factory is about 100 yards away from the Meikhtilar-Taungtha-Myingyan Road, which sees low traffic from diesel trucks, passenger buses, trucks, and bikes around the clock. The air quality inside the factory compound might be affected by the movement of vehicles on the road and boiler emission. Tree plantation around the factory plays an important role in reducing dust pollution. It will lower the wind speed and also trap a lot of dust. Mitigation measures must be implemented to ensure compliance with these air quality standards.

Table: 6.4.3-1. Emission from diesel engine

Carbon Monoxide (CO)	Hydrocarbon (HC)	Diesel Particulate Matter (DPM)	Nitrogen Oxide (NOx)	Sulfur dioxide (SO_2)
vppm	vppm	g/m^3	vppm	vppm
5-1,500	20-400	0.1-0.25	50-2500	10-150

Table: 6.4.3-2. Potential impact on air quality at the production stage

Potential Impact on Air Quality	
Nature on impact	Production activities, vehicles movement
Mitigation	• Emergency diesel generator stack should have adequate height. • Diesel will be used for DEG sets and the factory will provide adequate height for proper dispersion of gaseous emission into the atmosphere. • Trees surrounding the factory are to be grown. • Proper maintenance for diesel truck vehicles

	• Sprinkling on the road twice a day. • All employees need to wear masks as PPE.
Extent	Surrounding areas
Duration	Long term
Intensity	Low
Probability	Improbable
Confidence	High
Significance	Low-provided mitigation is effectively implemented
Further investigation	Air quality needs to be checked every six months.

6.4.4. Potential Impact on Noise Environment and Mitigation Measures at the Production Stage

There are 100 sewing machines in the garment section generating a noise exposure of over 50 dB (A) while operating at the same time. Mitigation measures are as follows.

Table: 6.4.4-1. Potential impact on noise environment at the production stage

Potential Impact on Noise Environment. (Production Stage)	
Nature on impact	High level of noise due to the production activities especially sewing machines
Mitigation	• Improve the machine design for noise reduction • Install the latest technology based on low-noise DEG sets with acoustic enclosures. Install the noise barriers/absorbers around stationary noise sources, viz. pumps, compressors blowers, etc. • Proper and timely oiling, lubrication, and preventive maintenance are done regularly. • All the vibrating parts are checked periodically and serviced to reduce noise generation. • Noisy equipment is enclosed in (soundproofing) enclosures to give residual sound pressure lower than 90 dB (A). • Green belt acts as a barrier to the propagation of noise from the factory premises. It reduces the noise levels appreciably. Hence, there isn't any adverse impact on the nearby present human settlement. • Vehicular movements during the operation phase for loading/unloading of raw and finished materials and other transportation activities may increase noise levels. • The transport contractors are instructed to keep vehicles periodically serviced and maintained as per the requirement
Extent	Production Area
Duration	Long term

Intensity	High
Probability	Highly probable
Confidence	High
Significance	Medium-the assessment impact should affect the decision unless it is effectively mitigated.
Further investigation	Check noise level weekly. Examine employees' health yearly.

6.4.5. Potential Impact of Soil Contamination and Mitigation Measures at the Production Stage

When it comes to agricultural growth, soil plays a fundamental role and impacts almost all aspects of the life cycle. However, agricultural lands that are irrigated by industrial effluents may result in the soil's physical and chemical properties being affected, as well as its fertility, by increasing the activity and diversity of microorganisms. There is a very low potential for soil contamination during the production stage as treated sewage is typically dry out in the treatment pond. Here are some mitigation measures that can be taken:

Table: 6.4.5-1. Potential impact of soil contamination at the production stage

Potential Impact on Soil Contamination	
Nature on impact	The soil was contaminated due to the factory activities: oil storage, untreated effluent discharge, spillage, and handling.
Mitigation	• It is understandable that regular maintenance is carried out for the plants and machinery to avoid soil contamination. • The flooring of the entire plant area is made up of concrete except for the open ground cover for greenbelt development to prevent seepage and leakage into the subsoil surface.
Extent	Factory Areas
Duration	Short term
Intensity	High
Probability	improbable
Confidence	High
Significance	Very low-provided mitigation is effectively implemented
Further investigation	Check soil quality every six months.

6.4.6. Potential Impact of Light Intensity and Mitigation Measures at the Production Stage

The knitting, finishing and garment plants are one story factories. Light intensity is crucial to create a good working environment and mitigation measures are as

follows:

Table: 6.4.6-1. Potential impact on light intensity at the production stage

Potential Impact on Light Intensity	
Nature on impact	Low light intensity causes employees' health problems.
Mitigation	• Provide adequate light to the factory.
Extent	knitting factory, finishing factory, garment factory
Duration	Very short term
Intensity	High
Probability	Low
Confidence	High
Significance	Low provided mitigation is effectively implemented
Further investigation	Examine light intensity inside the factory daily.

6.4.7. Impact on Odor (Production Stage)

Since there will be no discharge of untreated waste (gaseous and liquid) on land or in the air or any water body, there are no visual adverse impacts on land and water.

6.4.8. Potential Impact on Occupational Health and Safety at the Production Stage

Occupational health and safety aim to improve workplace health and safety standards. Taungtha factory consists of several production processes and there are several occupational health and safety issues associated with these production processes. The major occupational health and safety issues in the factory are stated as follows:

1) Exposure to cotton dust,
2) Exposer to chemicals
3) Exposure to noise,
4) Ergonomic issues.

Noise is the main hazard in sewing and knitting factory. Another hazard in the factory is cotton dust which may cause health problems for the workers. The hazards involved in the factory are expressed in the following Table 6.4.8-1. To achieve zero accidents in the factory, the causes of hazards, their consequences, and the actions to be taken are revealed in the following tables. Material Safety Data Sheets (MSDS) for chemicals used in Taungtha factory are attached in Appendix.

Table: 6.4.8-1. Hazards involved in the factory

Sr. No.	Hazard	Consequences	Action to be taken/mitigation measures
1.	Exposure to noise Physical hazards a) Noise	Noise-induced hearing loss, Tinnitus	1) Machine design should be improved. 2) Inverter drive control to be used to control noise in the spinning frame. 3) Proper maintenance lubricating control noise.
2.	Exposure to cotton dust Physical hazards b) Dust	Causes respiratory problems and causes Byssinosis (a disease caused by cotton dust)	1)Regular dust collector maintenance 2)Proper cleaning 3)Workers need to wear PPE
3.	Ergonomic issues Physical hazards c) Light	Eye strain and glaring	Proper lighting condition
4.	Ergonomic issues Physical hazards d) Lifting heavy weight	Muscular-Skeletal Disorders	1) keep your backbone straight while lifting the load. 2) pull the load as close to the body. 3)Lift and carry loads with straight arms
5.	Fire hazards	Loss of life. Damages to the equipment	Fire hydrant system and sprinkler system
	a) Welding operation	Spark ignition is very dangerous.	Restrict unauthorized person to do welding
	b) Electrical short circuit happens	If no trip occurs it gets sparks and gets fire.	Air Circuit Breaker, MCB
	c) Smoking	Easily get fire	Safety signs and workers must be aware of not using any ignition products.
6.	Chemical hazard		
	Handling of chemicals	Causes acute health effect: Skin burns and rashes Eye irritation or damage Respiratory issues (e.g., coughing, shortness of breath from inhaling fumes) Chemical poisoning (through inhalation, skin absorption, or accidental ingestion)	**Proper Chemical Selection** Safety Data Sheets (SDS) Safe Storage **Engineering Controls** Ventilation Automation Fire and spill control **Administrative Control** SOP and protocol Training program Monitoring and inspection **Personal Protective Equipment (PPE)** **Waste and Effluent Management** **Emergency Preparedness** Response Equipment Drill
	Handling of chemicals	Causes chronic health effect: Occupational asthma or lung disease Chronic dermatitis Reproductive disorders Cancer (e.g., from long-term exposure to formaldehyde or certain azo dyes)	
7.	Electrical hazard a) Improper earthing	Trip occurs	avoid improper earthing and loose connection
	b) Improper isolation	Electric shocks	all circuits are to be closed in a proper circuit.
	c) Moisture	Proper wiring	moisture to keep in control

	d) Motor high-speed rotation Due to high voltage	Causes problems for the machine	A circuit breaker must be an individual
	e) Usage of old wire	Not proper current flow	Use of wires as per Electrical standard.
	f) The output power load exceeds more than input power	Cable melting & switch becomes heat	The input wire must be more power than the output load.
	g) Looping in the running line.	Electronics PCB	Avoid looping
	h) Electrical Maintenance	ECB board Check the connection Grease the motor frequently,	Needs preventive maintenance

6.4.8.1. Hazards

Hazards could be categorized as follows: (a) mechanical hazard, (b) chemical hazard (c) fire hazard.

a. Mechanical Hazards

Working machine parts and equipment need to be checked regularly to ensure that they work properly and that protective casing, guards, and covers are in good condition and operate correctly. Make sure emergency stops are fixed on the working equipment and machines.

b. Chemical Hazards

Chemical hazards in a Taungtha factory involves a comprehensive approach that includes engineering controls, administrative measures, proper chemical handling, training, and use of personal protective equipment (PPE). The consequences of chemical hazards in a factory can be severe and affect workers, the environment, machinery, and business operations. Mitigating chemical hazards involves preventive, protective, and corrective strategies across every level of operation.

C. Fire Hazards

In the factory, the major hazard is the fire hazard which produces a lot of fatal accidents and property damage in a wide range. It is important to take preventive measures which are very useful for the workers and management team to understand the fire hazards and the importance of giving awareness to the workers and concerned person. The root causes of the fire hazard are:

- electricity,
- welding operation,
- smoking,
- mechanical fault.

Electricity cause

Mishandling or improper handling of electricity is the main cause of electricity-related fires. Causes are as follows: loose connection, temporary connection, overloading of electrical apparatus, short circuit, and lack of maintenance.

Welding operation cause

Welding and other hot operations like grinding produce sparks in the normal operations so it will create fire hazards in the factory. In order to avoid these, skilled workers are allowed to conduct.

Smoking in the workplace

Smoking is strictly prohibited in the industry. A smoke detection system needs to be installed in the factory and awareness training for the workers should be given.

Mechanical fault

When machines are operating, mechanical fault creates friction between two revolving parts that ignite a fire in that machine. In the past, these fires were controlled by alert factory workers who were able to bring manually and automatically operated fire extinguishers and fire hoses to the machine and fight the fire. Even if the fire was relatively large, it normally only damaged one or two machines.

Systematic storage facility

Material storage is the most important practice in the Textile industry because a lot of fire accident occurs in the storage area. Preventive measures are necessary to keep away combustible materials and other flammable materials such as cotton, lubricants and motor oils from ignition sources like electrical panels, and moving or rotating machine parts. Mitigation measures are explained in the following tables.

Table: 6.4.8.1-1. Potential impact on occupational health (mechanical hazard)

Potential Impact on Occupational Hazards (Production Stage)	
Nature on impact	Mechanical hazard
Mitigation	▪ Preventive measures to be carried out to achieve zero accident. ▪ Regular preventive machine maintenance to be conducted. ▪ Protective equipment to be in place. ▪ Work safety awareness training to be provided.
Extent	Factory
Duration	Long term
Intensity	Low
Probability	Probable
Confidence	High
Significance	Low- the impact would not have an effect on the decision to prove the project.
Further investigation	Monitor the preventive machine maintenance schedule. Check the readiness of medical response team daily.

Table: 6.4.8.1-2. Potential impact on occupational health (Chemical hazard)

Potential Impact on Occupational Hazards (Production Stage)	
Nature on impact	Chemical hazard
Mitigation	• **Proper Chemical Selection** Safety Data Sheets (SDS): To make sure every chemical has a corresponding SDS that is easily accessible. Risk Assessment: Analyze potential hazards (toxicity, flammability, reactivity, etc.) and exposure pathways (inhalation, skin contact, etc.). • **Engineering Controls** Ventilation: Use local exhaust ventilation systems (fume hoods, scrubbers) to remove airborne contaminants. Closed Systems: Automate chemical dosing and use closed-loop systems to minimize direct handling. Spill Containment: Use bunds, trays, and spill kits around chemical storage and processing areas. Separate Storage Areas: Segregate incompatible chemicals (e.g., acids and bases, oxidizers and organics). • **Administrative Control** Standard Operating Procedures (SOPs): Document and enforce SOPs for handling, storage, mixing, and disposal. Labeling: Clearly label all containers with hazard information according to GHS (Globally Harmonized System). Access Control: Limit access to chemical storage and handling areas to trained personnel only.

	Shift Rotation: Limit exposure time to reduce chronic effects on workers SOP and protocol. Training program Monitoring and inspection • **Personal Protective Equipment (PPE)** Basic PPE: Gloves (chemical-resistant), goggles, face shields, aprons, and safety boots. Respiratory Protection: Use masks or respirators when handling volatile solvents or powders. PPE Maintenance: Regularly inspect, clean, and replace PPE to ensure effectiveness. • **Emergency Preparedness** Worker Training: Educate employees on chemical risks, safe handling, PPE use, and emergency response. First Aid: Equip stations and train staff in chemical burn and inhalation response. Fire Safety: Install extinguishers suitable for chemical fires (Class B/C) and conduct fire drills. Spill Response Plan: Establish a plan for containing and neutralizing spills quickly and safely. • **Waste and Effluent Management** Chemical Substitution: Replace hazardous chemicals with less toxic or biodegradable alternatives whenever possible. Waste Segregation: Separate and label chemical wastes correctly for proper disposal or recycling. Effluent Treatment: Install wastewater treatment systems to neutralize or remove hazardous substances before discharge. • **Monitoring** Air and Surface Monitoring: Regularly test for chemical residues and airborne concentrations. Health Surveillance: Monitor workers' health, especially those exposed to hazardous substances. Audits and Reviews: Conduct internal safety audits and update risk controls based on new findings or incidents.
Extent	Factory
Duration	Long term
Intensity	Low
Probability	Probable
Confidence	High
Significance	Low- the impact would not have an effect on the decision to prove the project.
Further investigation	Monitor the preventive machine maintenance schedule. Check the readiness of medical response team daily.

Table: 6.4.8.1-3. Potential impact on occupational hazards (fire hazard)

Potential Impact on Occupational Hazards (Production Stage)	
Nature on impact	High level of fire hazard
Mitigation	▪ Flammable materials such as chemicals, lubricants, and petrol need to be stored separately. ▪ Protective gear needs to be accessible and workable; such as fire hydrant, fire extinguisher, fire engine, emergency kit, ladder, fire helmet, gloves, and smoke detector. ▪ Fire drill to be held every month. ▪ Fire exit to be reachable.
Extent	Cover the whole factory
Duration	Long term
Intensity	Low
Probability	Probable
Confidence	High
Significance	Medium-the assessed impact should have an effect on the decision unless it is effectively mitigated.
Further investigation	Fire safety training to be held monthly.

There are 325 employees at the Taungtha factory. According to the Social Security Law 2012, all employees need to register for the Social Security System and can benefit from the Health and Social Care Insurance System. The advantages are:

- medical treatment and cash benefits for sickness,
- medical treatment and cash benefits for maternity and confinement,
- medical treatment for the insured after retirement,
- funeral benefit for the deceased due to any cause.

The social security program was introduced at the factory in 2007. The emergency medical rescue team was organized for first aid assistance to the accident.

6.4.9. Potential Impacts on Biodiversity at the Production Stage

Biodiversity is such a complex and multidimensional landscape, an ecosystem that is so wide-ranging from affecting water sources, rivers, freshwater, soil, forests, and livelihood of fauna, amphibians, birds, fish, organisms, and microorganisms. Multiple metrics and indicators are needed to measure these impacts and progress. Setting targets and accountability for such a complex range is much more challenging than managing the ecosystem which leads to a better understanding of how each part of the factory affects the biodiversity.

All the bird species occurring there are endemic to Myanmar, but the impact of the factory is considered to be very low due to the small area of habitat affected and the wide distribution of these species. In this factory, the potential impact on fauna would be mainly due to loss of habitat. However, none of the populations of species would be significantly affected by the factory because the area affected is very small. As shown in Table 6.4.9-1 and 6.4.9-2, most of the negative impact comes from the two stages in the factory: the material production process and the end of the product. Mitigation measures are stated in Table 6.4.9-3.

Table: 6.4.9-1. Potential impact on biodiversity at the production stage

	Land use	Water use	Waste production	Energy consumption
Processing				
Transport and distribution				
End-use				

Highest negative impact

High negative impact

Higher negative impact

Low negative impact

Table: 6.4.9-2. Impact areas and assessment of impact level

	Land and water	Pollution	Climate change	Over exploitation
Processing		**Low Impact** production process	**Low Impact** Energy use (Air Conditioning and Dust Controlling System)	
Transport and distribution			**Low Impact** Transport mode Emissions from air, sea, road or rail freight	**Low Impact** Spread of invasive species Existing species endangered by imported invasive species

Table: 6.4.9-3. Impact on biodiversity at the production stage

Potential Impact on Biodiversity	
Nature on impact	
Mitigation	A negative biological environment is inevitable if the factory doesn't act to the following measures: - plan for the conservation of the biological environment, - comply with law, rules, and regulations; the Protection of Wild Life and Protected Area Law, 1994, Conservation of Environment Law, 2012 and Regulation 2014, - control the stack emission and dust caused by emergency diesel generators, and truck movement activities have a direct effect on the soil quality which leads to degraded biodiversity, - plan the minimum disturbance to the flora when conducting factory activities, - grow more trees around the factory to create a green belt maintaining good practices of biodiversity, - litter is strictly prohibited because it is a common cause of fatalities to wildlife and domestic stock.
Extent	Factory and surrounding areas
Duration	Long term
Intensity	Low
Probability	Probable
Confidence	High
Significance	Low-the impact would not affect the decision to prove the project
Further investigation	Examine the fauna every six months.

6.4.10. Impact on Road Traffic at the Production Stage

Taungtha factory is situated near the Meikhtila-Myingyan Road where express buses, heavy-duty trucks, light trucks, motorbikes, bicycles, and pedestrians are used to and from transporting goods and passengers. Mitigation measures are as follows:

Table: 6.4.10-1. Potential impact on road traffic at the production stage

Potential Impact on Road Traffic at the Production Stage	
Nature on impact	Unplanned Vehicle Collision
Mitigation	▪ Rumble strips are used primarily to reduce road collisions. ▪ Speed limit sign to be fixed before the factory. ▪ Enough illumination should be done in front of the factory. ▪ Road safety awareness training to be held. ▪ Prepared and maintained readiness for implementing an emergency rescue plan for road accidents.
Extent	In front of the factory
Duration	Long term
Intensity	Low
Probability	Probable

Confidence	Low
Significance	Low- the impact would not affect the decision to prove the project.
Further investigation	Road safety training to be held every six months.

6.4.11. Impact of Solid Waste Disposal at the Production Stage

Solid waste management system may be defined as the discipline associated with the control of generation, storage, collection, transfer, processing, and disposal of solid waste.

The main purposes of a solid waste management system are:

(i) to minimize public health and environmental impacts;

(ii) to create effective, reliable, and socially acceptable Solid Waste Management (SWM) systems;

(iii) to maximize the 3 R' reduction, reuse, and recycling of waste.

The source of solid waste can be categorized as hazardous waste and non-hazardous waste. The ancillary sources of hazardous waste are chemical waste, solvents, waste oils and lubricants, contaminated rags and PPE, empty chemical containers, batteries and sludge. The Non-Hazardous materials are classified as follows: fabric and yarn waste, packaging waste, general office waste, biodegradable waste, dust and lint and sewing waste. These do not pose significant risks and are often recyclable or reusable.

Hazardous and non-hazardous waste should be separated at the source. Hazardous waste must be labeled and stored in a secure area. It is essential to provide staff training on proper waste handling techniques. The sludge disposal area has been thoughtfully designated near the WHWWTP, ensuring a responsible approach to landfilling that prioritizes both environmental stewardship and community well-being. Compliance with environmental regulations is mandatory. The factory collaborates with recyclers or the township development committee for effective waste management.

Table: 6.4.11-1. Impact of solid waste disposal at the production stage

Potential Impact on Solid Waste Disposal (Production Stage)	
Nature on impact	Disposal of hazardous waste and non-hazardous waste
Mitigation	**For hazardous waste disposal** ▪ The factory has provided a dedicated area for hazardous waste storage within premises having impervious flooring, roof cover, and leachate collection facility, ▪ discarded containers/bags are sold to local scrap vendors. **For non-hazardous wastes disposal** • such as plastic, metal, glass, paper, cupboard, wood, rubber, and kitchen waste are disposed to the designated garbage collecting area approved by the township development committee. ▪ spent/used oil and lubricant generation from plant and machinery will be sold to the registered reprocessors. **Record keeping** Factory maintains records-keeping procedures with provisions for: ❖ Tracking collections of waste materials at the factory and delivering to the recycling, reuse and salvage. ❖ Records on logs for each department that include the type of material, weight, recycling and reuse and date accepted by recycling service and reuse from the production department, and disposal.
Extent	Factory area
Duration	Long term
Intensity	Low
Probability	Probable
Confidence	Low
Significance	Medium-the assessed impact should affect the decision unless it is effectively mitigated.
Further investigation	Check the Solid Waste Management System every six months.

6.4.12. Potential Impact of 33 KV High Voltage Power Transmission Line at Production Stage

A 33 KV line was connected to the factory from the Myingyan sub-station to the factory. The electricity system produces an extremely low frequency electromagnetic field which comes under non-ionizing radiations that can cause health effects. Apart from human effect, the electrostatic coupling and electromagnetic interference of high

voltage transmission lines have an impact on plants and telecommunication equipment mainly operating in the frequency range below UHF. Necessary measures and protection were taken in the construction of a 33 KV high voltage line to safeguard the electric and magnetic field effects.

Table: 6.4.12-1. Potential impact of 33 KV power line at the production stage

Potential Impact on 33 KV Power Line	
Nature on impact	High Level Electric and Magnetic Field Effect.
Mitigation	▪ Necessary measures to be conducted to reduce the electromagnetic field effect. ▪ Cabling was done properly following the safety standard level. ▪ Areas under 33 KV line to be kept clean.
Extent	Cable straight line distance from Power source to factory.
Duration	Long term
Intensity	Low
Probability	Improbable
Confidence	Low
Significance	Low-the impact would not affect the decision to prove the project.
Further investigation	Monitor the well-being of humans and biodiversity near power lines yearly.

6.4.13. Positive Impacts at the Production Stage

No. (10) Textile Mill (Taungtha) provides employment for 325 people and creates job opportunities in the nearby areas. More job creations were done due to the secondary or multiple effects of large weaving industrial zones in the upper Myanmar region. The raw materials and finished goods are transported by truck which provides indirect employment to people engaged in this sector. So, the factory's contribution to the growth of the service sector is increased.

The factory has been working closely with nearby villages to generate maximum indirect employment by allowing local contractors for sanitation works, gardening, and building maintenance works. Opportunities are given to learn the high technology and technical know-how in the textile industry, ranging from higher level textile engineers, mechanical engineers, electrical engineers, technicians, and technologists. Good accommodations were provided for employees as a part of the implementation of the urbanization project in Taungtha Township. The factory significantly contributes to the local economy through employment, human resource development, and technological transfer.

With proper implementation of the mitigation measures, it is predicted that the potential environmental and social impacts caused by the work over activities of the factory would be low significance.

6.4.13.1. Socio-economic Environment

No. (10) Textile Mill (Taungtha) is aware of the obligations towards society and fulfills the social obligations as far as possible.

In the healthcare sector, a social welfare clinic was opened in the factory to provide medical assistance to the workers. During the COVID-19 outbreak, the vaccination program was carried out in compliance with MOH's guidelines incorporation with the help of clinical staff and local communities. Tuberculosis (TB) as a priority transmissible disease in the National Health Plan along with malaria and HIV/AIDS, was a very common disease in the textile industry many years ago and declined due to the empowerment of health workers and volunteers in TB prevention and care activities for reduction of TB disease and better occupational health program.

The relationship between the factory and its local communities is cemented and nothing is deniable that Taungtha factory brings prosperities to all mankind and surrounding communities.

No. (10) Textile Mill (Taungtha) highlights significant social, economic, and environmental issues associated with the design, construction and operational aspects of the project. The factory is meant to stimulate the socio-economic development and sustainable infrastructure development of Taungtha Township specifically and in Mandalay Region at large. The identified impacts are categorized as negative and positive. The identification of the impacts on the environment showed that during the production phase, there will be a number of negative impacts on the environment however the positive impacts associated with the implementation prime on the negative impact.

6.5. Impact of Factory Closure at the Decommissioning Stage

The factory has been prepared to address the activities related to the demolition of the factory that may have had a significant impact on the environment. This work would involve:

- the demolition and removal of buildings related to the operation of the production process and other associated processes;
- demolition would be undertaken using heavy machinery such as bulldozers, dump trucks and hydraulic excavators;
- intermediate storage of the demolished material at the factory site to be disposed or recycled;
- removal of foundations and septic tanks associated with the building;
- removal of underground cabling and sewage pipe line beneath the factory;
- disconnection of intake water pipe line;
- removal of insulation, corrosion protection material from the steam pipe line and chemical transport pipe line from production process.

These demolition works may have excavation work which may extend down to approximately three meters below the ground level. Demolition works as defined under the laws and regulations will be undertaken by licensed demolition works experts.

6.5.1. Air Pollution at Decommissioning Stage

At the decommissioning stage, air pollution will occur due to the gaseous and dust emissions from the activities of decommissioning the factory.

Table: 6.5.1-1. Impact of air pollution at the decommissioning stage

Potential Impact on air pollution	
Nature on impact	Gaseous and dust emissions from the demolition activities
Mitigation	▪ Use of plastic cover sheet while transporting debris from demolition works. ▪ Use of water sprinkling system at site for dust suppression. ▪ Provision of barricade sheet or steel sheet of minimum 5 meters height to protect the surrounding area from dust. ▪ Adequate PPE will be provided to construction workers. ▪ Proper maintenance for diesel truck vehicles. ▪ A green belt zone around the site is created.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	Improbable
Confidence	Low

Significance	Low-the impact would not have an effect on the decision to prove the project.
Further investigation	Air quality to be checked during demolition stage.

6.5.2. Surface Water Pollution at Decommissioning Stage

Decommissioning activities will affect the quality of surface water. The suggested management plan for water quality is stated in the following table.

Table: 6.5.2-1. Impact of surface water pollution at the decommissioning stage

Potential Impact on surface water pollution	
Nature on impact	Demolition activities
Mitigation	▪ Prompt cleaning up of the accidental spillages will be ensured. ▪ Measures will be taken to prevent contamination of hydrological features by leakage and spillage of diesel, grease, oil etc. derived from the demolition area. ▪ The machinery equipment will be maintained in good operating condition. ▪ Specially designated areas will be created for vehicle maintenance. ▪ Provision will be made to ensure the transportation vehicles follow the access track to prevent mud and dirt being deposited on roads. ▪ All mud and dirt deposited on the roads from the demolition activities will be cleaned regularly. ▪ Make sure drainage system for temporary works and sewage system for workers.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	Improbable
Confidence	Low
Significance	Low-the impact would not have an effect on the decision to prove the project.
Further investigation	Water quality to be checked during demolition stage.

6.5.3. Soil Pollution at Decommissioning Stage

The demolition phase of the factory will involve demolition of the existing buildings, backfilling, and the possibility of silt run-off in case of rain. These activities can affect the soil quality and change its properties.

Table 6.5.3-1 Impact of soil pollution at the decommissioning stage

Potential Impact on soil pollution	
Nature on impact	Demolition activities
Mitigation	▪ Maintain demolition machinery properly. ▪ Grow trees at work sites.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	Improbable
Confidence	Low
Significance	Low-the impact would not have an effect on the decision to prove the project.
Further investigation	Soil quality to be checked during demolition stage.

6.5.4. Noise Pollution at Decommissioning Stage

The debris and solid waste transporting vehicles, compactors, excavators, bulldozers etc. will generate noise and affect the local residents/commuters and surrounding habitants during decommissioning stage of the factory. In order to control the noise pollution, necessary measures should be taken in this phase.

Table 6.5.4-1 Impact of noise pollution at the decommissioning stage

Potential Impact on noise pollution	
Nature on impact	Demolition activities could cause acoustic impacts at identified sensitive receptors.
Mitigation	▪ The noise generated from demolition machinery such as hydraulic excavator with drilling vibrator and transport vehicle will be kept low by keeping the moving parts serviced and properly lubricated. ▪ The vehicle will be properly maintained. ▪ Adequate PPE will be provided to the workers. ▪ Greenbelt will be developed which will have significant impact in reduction of the noise. ▪ High noise generating demolition works would be confined to fewer sensitive times of the days not exceeding the hours of 7 am to 6 pm Monday to Saturday.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	Improbable
Confidence	Low
Significance	Low-the impact would not have an effect on the decision to prove the project.

Further investigation	Noise exposure to be checked during demolition stage.

6.5.5. Flora and Fauna at Decommissioning Stage

The factory is near the Kyaukpadaung-Myingyan Road. The vicinity of the site represents paddy fields, vegetation, and villages. No endangered species of flora and fauna is present in and around the factory. But to prevent the damage to domestic flora and fauna, some steps shall be taken while demolition of the existing buildings.

Table: 6.5.5-1. Impact on flora and fauna at the decommissioning stage

Potential Impact on flora and fauna	
Nature on impact	Demolition of the buildings causes huge impact on soil, water, and air.
Mitigation	▪ Keep forest green. ▪ Plan the minimum disturbance to the flora when conducting demolishing activities.
Extent	Factory and surrounding area
Duration	Short term
Intensity	Low
Probability	Improbable
Confidence	Low
Significance	Low-the impact would not have an effect on the decision to prove the project.
Further investigation	to be checked during demolition stage.

6.5.6. Local Socio-Economic Environment at Decommissioning Stage

As a great contributor to the local economy, the factory appointed 325 employees. At the decommissioning stage, all the workers will be laid off but their social benefits, pension, and compensation will be provided in compliance with pension law and social security law. In this stage, local contractors will create a small number of temporary jobs for a very short period of time.

6.5.7. Occupational Health and Safety at Decommissioning Stage

A number of social factors have been considered during the demolition phase of the factory to prevent the degradation of the social environment such as occupational health and safety issues which need to be addressed in compliance with laws.

Table: 6.5.7-1. Impact on occupational health and safety at the decommissioning stage

Potential Impact on occupational health and safety	
Nature on impact	Demolition works generate heat, noise, and dust due for the use of hydraulic excavators and transport vehicles.
Mitigation	▪ Prepare demolition plan prioritizing safety measures.

	▪ Sprinkling the building during the time of using hydraulic vibrator. ▪ Need to wear PPE. ▪ Necessary preventive measures will be conducted to achieve zero accidents. ▪ Emergency medical response team and first aid should be ready. ▪ No admission sign should be in place in the working areas. ▪ Be aware of communicable disease during demolition stage. ▪ Fire engine should be in place.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	low
Confidence	Low
Significance	Low-the impact would not have an effect on the decision to prove the project.
Further investigation	Occupational health and safety to be checked during demolition stage.

6.5.8. Solid Waste Management at Decommissioning Stage

The significant impacts on solid waste management will be identified and their mitigation measures will be given. In consultation with the township development committee, a non-recycled debris disposal area will be determined.

Table: 6.5.8-1. Impact on solid waste management at the decommissioning stage

Potential Impact on solid waste management	
Nature on impact	Demolition activities generate solid wastes such as bricks, concrete materials, glass, iron, and wood.
Mitigation	▪ Debris to be sold out for recycling purposes (for example: beams to be recycled to the foundry shop). ▪ Non-recycle debris to be disposed to the designated areas. ▪ Some to be used for landfill.
Extent	Factory area
Duration	Short term
Intensity	Low
Probability	low
Confidence	Low
Significance	Low: the impact would not affect the decision to prove the project.
Further investigation	Solid waste disposal is to be checked during the demolition stage.

6.5.9. Liquid Waste Management at Decommissioning Stage

Liquid waste including sewage from workers and effluent from the demolishing site will be collected in the temporary septic tank and discharged by the demolishing contractor.

6.5.10. Hazardous Waste Management at Decommissioning Stage

At this stage, heavy machinery and compressors will be used to demolish the buildings in association with heavy vehicles. Oil spillage and vehicle engine oil leakage will occur. Action needs to be taken.

6.6. Summary of Impacts, Significance, and Proposed Mitigation Measures

No. (10) Textile Mill (Taungtha) factory has made tireless commitments to ensure appropriate environmental and social performance. A summary of project impacts and the commitment measures tailored to manage and mitigate those impacts is presented in the following Table. For each potential environmental impact or issue, the significance is stated in the following the assessment. Potential mitigation and further investigations that have been recommended are summarized in keyword form as shown in Table 6.6-1. These may need to be applied at one or more stages of the project life cycle:

- Planning
- Construction
- Production or Operations
- Closure and Post closure

Table: 6.6-1. Summary of mitigation measures

Environmental Impact	Significance Rating	Possible Mitigation	Further Investigation or Monitoring Recommended
Construction Stage			
Potential destruction of the soil profile by mixing topsoil with subsoil	Low	▪ Topsoil to be generated during construction activity will be preserved and used for the greenbelt development. ▪ Other excavated earth from the construction activity will be used for the backfilling and leveling in low-lying areas.	Investigate soil quality yearly.

		▪ Greenbelt development will have a significant impact on reduction of the soil erosion.	
Potential contamination of surface water	Low	▪ Measure will be implemented to prevent seepage of liquid materials into the ground which may contaminate groundwater and soil. ▪ Prompt cleaning up of the accidental spillages will be ensured. ▪ Measures will be taken to prevent contamination of hydrological features by leakage and spillage of diesel, grease, oil, etc. derived from the working area. ▪ The machinery equipment will be maintained in good operating condition. ▪ Specially designated areas will be created for vehicle maintenance. ▪ Provision will be made to ensure the construction vehicles follow the access track to prevent mud and dirt from being deposited on roads. ▪ All mud and dirt deposited on the roads from the construction activities will be cleaned regularly.	Check water quality yearly.
Low level of dust emissions	Low	▪ Use of plastic cover sheet while transporting construction material at the site. ▪ Storage of sand and other dispersible material by covering with tarpaulin sheet. ▪ Keeping minimum inventory stock of sand and other such dispersible material at the site. ▪ The height, from which materials to be dropped, will be the minimum particle height to limit fugitive dust generation. ▪ Use of water sprinkling system at site for dust suppression. ▪ Provision of barricade sheet or steel sheet of minimum 5 meters	Construction areas air quality needs to be checked in every year.

		height to protect the surrounding area from dust. ▪ Adequate PPE will be provided to construction workers. ▪ Proper maintenance for diesel truck vehicles ▪ A green belt zone around the factory is created.	
Low level of noise	Low	▪ The noise generated from construction machinery will be kept low by keeping the moving parts serviced and properly lubricated. ▪ The vehicle will be properly maintained. ▪ Adequate PPE will be provided to the workers. ▪ Greenbelt will be developed which will have a significant impact on the reduction of the noise.	Check noise level every six months.
High-level electric and magnetic field effect.	Low	▪ Necessary measures to be conducted to reduce the electromagnetic field effect. ▪ Cabling was done properly in accordance with the safety standard level. ▪ Areas under 33 KV line to be kept clean.	Monitor the well-being of humans and biodiversity near the power line yearly.
Positive impacts in the short term for socio-economics.	High and Positive	▪ Temporary employment will be generated due to the construction activities and related services like transportation, hardware retailers, food and water supply, ferry service, and vehicle maintenance. ▪ Secondary effects were demonstrated by the supply of locally available construction materials: brick, sand hardwood, etc.	
Impacts on biodiversity: Species life span shortened or be executed or generation decreased	Low	▪ Greenbelt plantation will be started at the beginning of the project.	Maintain greenbelt zone.

Production Stage			
Groundwater contamination	Low	▪ Deep well water (approximately 500 feet) will be bored. ▪ All the raw materials as well as products will be stored in a dedicated storage area with impervious flooring to restrict/control leakages and prevent groundwater contamination.	Check groundwater quality every six months.
Surface water contamination	Very low	▪ Well-designed stormwater network will be provided to collect rainwater from the entire factory area.	-
Soil contamination	Low	▪ Regular maintenance of plants and machinery is carried out and proper care is taken while loading, unloading, and transfer of materials to avoid any soil contamination. ▪ The entire plant area flooring is made up of concrete except for open ground cover for greenbelt development to prevent any seepage and leakage into subsoil surface. No spillage is allowed in open ground.	Soil quality needs to be checked every six months.
Impact of air pollution	Low	▪ Emergency diesel generator stack should have adequate height. ▪ Diesel will be used for DEG sets and the unit will provide adequate height for proper dispersion of gaseous emission into the atmosphere. ▪ Proper maintenance for diesel trucks. ▪ Sprinkling on the road twice a week. ▪ All employees need to wear masks as PPE.	Surrounding areas' air quality needs to be checked every six months. Air quality inside the main factory building needs to be checked every six months.
Impact of noise environment	Low	▪ To minimize the adverse effect on health, Earmuffs/ earplugs are provided to the workers working under high noise areas such as spinning sections. ▪ Install the latest technology based on low-noise DEG sets with	Check noise level once per month.

		acoustic enclosures. Install the noise barriers/absorbers around stationary noise sources, viz. pumps, compressors blowers, etc. ▪ Proper and timely oiling, lubrication and preventive maintenance are done regularly. ▪ All the vibrating parts are checked periodically and serviced to reduce noise generation. ▪ Noisy equipment is enclosed in soundproofing enclosures to give residual sound pressure lower than 70 dB (A). ▪ Earmuffs/ earplugs are provided to the workers working in high-noise areas. ▪ Green belt acts as a barrier to the propagation of noise from the factory premises. It reduces the noise levels appreciably. Hence, there isn't any adverse impact on the nearby present human settlement. ▪ Vehicular movements during the operation phase for loading/unloading of raw and finished materials and other transportation activities may increase noise levels. ▪ The transport contractors are instructed to keep vehicles periodically serviced and maintained as per the requirement of the latest trends in the automobile industry.	
Impact on Occupational Health and Safety (Production Stage)			
Mechanical hazard, (Preventive measures)	Low	▪ Preventive measures to be carried out to achieve zero accidents. ▪ Regular preventive machine maintenance to be conducted. ▪ Protective equipment to be in place. ▪ Work safety awareness training to be provided.	Monitor the machine maintenance schedule monthly. Regularly check on the readiness of the medical rescue team daily.
Chemical hazard,	Low	• **Proper Chemical Selection** Safety Data Sheets (SDS): To make sure every chemical has a	Monitor the machine maintenance to make

		corresponding SDS that is easily accessible. Risk Assessment: Analyze potential hazards (toxicity, flammability, reactivity, etc.) and exposure pathways (inhalation, skin contact, etc.). • **Engineering Controls** Ventilation: Use local exhaust ventilation systems (fume hoods, scrubbers) to remove airborne contaminants. Closed Systems: Automate chemical dosing and use closed-loop systems to minimize direct handling. Spill Containment: Use bunds, trays, and spill kits around chemical storage and processing areas. Separate Storage Areas: Segregate incompatible chemicals (e.g., acids and bases, oxidizers and organics). • **Administrative Control** Standard Operating Procedures (SOPs): Document and enforce SOPs for handling, storage, mixing, and disposal. Labeling: Clearly label all containers with hazard information according to GHS (Globally Harmonized System). Access Control: Limit access to chemical storage and handling areas to trained personnel only. Shift Rotation: Limit exposure time to reduce chronic effects on workers SOP and protocol. Training program Monitoring and inspection • **Personal Protective Equipment (PPE)** Basic PPE: Gloves (chemical-resistant), goggles, face shields, aprons, and safety boots. Respiratory Protection: Use masks or respirators when handling volatile solvents or powders.	sure **Engineering controls** work properly. Check the **Emergency Preparedness.** To reduce chemical hazards, it is essential to select the **Right Chemicals.**

		PPE Maintenance: Regularly inspect, clean, and replace PPE to ensure effectiveness. • **Emergency Preparedness** Worker Training: Educate employees on chemical risks, safe handling, PPE use, and emergency response. First Aid: Equip stations and train staff in chemical burn and inhalation response. Fire Safety: Install extinguishers suitable for chemical fires (Class B/C) and conduct fire drills. Spill Response Plan: Establish a plan for containing and neutralizing spills quickly and safely. • **Waste and Effluent Management** Chemical Substitution: Replace hazardous chemicals with less toxic or biodegradable alternatives whenever possible. Waste Segregation: Separate and label chemical wastes correctly for proper disposal or recycling. Effluent Treatment: Install wastewater treatment systems to neutralize or remove hazardous substances before discharge. • **Monitoring** Air and Surface Monitoring: Regularly test for chemical residues and airborne concentrations. Health Surveillance: Monitor workers' health, especially those exposed to hazardous substances. Audits and Reviews: Conduct internal safety audits and update risk controls based on new findings or incidents.	
Fire hazard (Preventive measures)	Low	▪ Flammable materials such as lubricants, and petrol need to be stored separately. ▪ Protective gear needs to be accessible and workable; such as fire hydrant, fire extinguisher, fire	Fire safety exercise is to be held monthly.

		engine, emergency kit, ladder, fire helmet, gloves, and smoke detector. ▪ Fire drill to be held every month. ▪ Fire exit to be reachable.	
Impact on biodiversity	Low	▪ Plan for the conservation of the biological environment, ▪ Comply with law, rules, and regulation; the Protection of Wild Life and Protected Area Law, 1994, Conservation of Environment Law, 2012 and Regulation 2014, ▪ Control the stack emission and dust caused by emergency diesel generators, and truck movement activities have a direct effect on the soil quality which leads to degraded biodiversity, ▪ Plan the minimum disturbance to the flora when conducting factory activity, ▪ Grow more trees around the factory to create a green belt maintaining good practices of biodiversity, ▪ Litter is strictly prohibited because it is a common cause of fatalities to wildlife and domestic stock.	Monitor the existence of trees, birds, fish, amphibian and reptiles yearly.
Impact on Road Traffic	Low	▪ Rumble strips are used primarily to reduce road collisions. ▪ Speed limit sign to be fixed before the factory. ▪ In front of the factory should be illuminated at night. ▪ Road safety awareness training to be held.	Road safety training is to be held every six months.
Impact of Solid Waste Management	Low	**For hazardous waste disposal** ▪ The factory has provided a dedicated area for hazardous waste storage within premises having impervious flooring, roof cover, and leachate collection facility, ▪ discarded containers/bags are sold to local scrap vendors. **For non-hazardous wastes disposal**	Check the Solid Waste Management System every six month.

		• such as plastic, metal, glass, paper, cupboard, wood, rubber, and kitchen waste are disposed to the designated garbage collecting area approved by the township development committee. ▪ spent/used oil and lubricant generation from plant and machinery will be sold to the registered resellers. **Record keeping** Factory maintains records-keeping procedures with provisions for: ❖ Tracking collections of waste materials at the factory and delivering to the recycling, reuse and salvage. ❖ Records on logs for each department that include the type of material, weight, recycling and reuse and date accepted by recycling service and reuse from the production department, and disposal.	
Potential Impact of 33 KV High Voltage Transmission Line	Low	▪ Necessary measures to be conducted to reduce the electromagnetic field effect. ▪ Cabling was done properly in accordance with the safety standard level. ▪ Areas under 33 KV line to be kept clean.	Check the 33 KV power line yearly.
Positive Impact on Socio-economic	High	▪ Provides employment of 325 people, creating job opportunities for adjacent areas. ▪ More job creation was done due to the secondary effects or multiple effects of a large industry in the middle of Myanmar: a) increasing the demand for essential daily utilities in the local market and ancillary	Socio-economic development needs to be checked every six months.

		business development to some extent for the population, b) creating jobs for local contractors for sanitation works, gardening works, and building maintenance works. ▪ Opportunities are given to learn the high technology and technical know-how in the textile industry, ranging from higher level textile engineers, mechanical engineers, and electrical engineers to technicians. ▪ Good accommodations were provided for employees as a part of the implementation of the urbanization project in the Taungtha area.	
Closure or Post Closure Stage			
Air Pollution	Low	▪ Use of plastic cover sheet while transporting debris from demolition works. ▪ Use of water sprinkling system at site for dust suppression. ▪ Provision of barricade sheet or steel sheet of minimum 5 meters height to protect the surrounding area from dust. ▪ Adequate PPE will be provided to construction workers. ▪ Proper maintenance for diesel truck vehicles. ▪ A green belt zone around the site is created.	Check air quality every six months.
Water Pollution	Low	▪ Prompt cleaning up of the accidental spillages will be ensured. ▪ Measures will be taken to prevent contamination of hydrological features by leakage and spillage of diesel, grease, oil, etc. derived from the demolition area. ▪ The machinery equipment will be maintained in good operating condition. ▪ Specially designated areas will be created for vehicle maintenance.	Check water quality every six months.

		▪ Provision will be made to ensure the transportation vehicles follow the access track to prevent mud and dirt from being deposited on roads. ▪ All mud and dirt deposited on the roads from the demolition activities will be cleaned regularly. ▪ Make sure drainage system for temporary works and sewage system for workers.	
Soil Contamination	Low	▪ Maintain demolition machinery properly. ▪ Grow trees at work sites.	Check soil quality every six months.
Noise Level and Vibration	Low	▪ The noise generated from demolition machinery such as hydraulic excavators with drilling vibrators and transport vehicles will be kept low by keeping the moving parts serviced and properly lubricated. ▪ The vehicle will be properly maintained. ▪ Adequate PPE will be provided to the workers. ▪ Greenbelt will be developed which will have significant impact in reduction of the noise. ▪ High noise generating demolition works would be confined to fewer sensitive times of the days not exceeding the hours of 7 am to 6 pm Monday to Saturday.	Check noise level every month.
Flora and Fauna and Aquatic Ecology	Low	▪ Keep forest green. ▪ Plan the minimum disturbance to the flora when conducting demolishing activities.	Check fauna and flora every six months.
Local socio-economic conditions	Low	▪ Temporary employment for demolition works. ▪ The unemployment rate will increase due to the closure of a factory with more than 965 employees.	
Occupational Health and Safety	Low	▪ Prepare demolition plan prioritizing safety measures. ▪ Sprinkling the building during the time of using hydraulic vibrator. ▪ Need to wear PPE.	Check demolition plan every six months.

		▪ Necessary preventive measures will be conducted to achieve zero accident. ▪ Emergency medical response team and first aid should be ready. ▪ No admission sign should be in place in the working areas. ▪ Be aware of communicable disease during demolition stage. ▪ Fire engine should be in place.	
Solid waste management	Low	▪ Debris to be sold out for recycle purpose (for example: beams to be recycled to foundry shop). ▪ Non-recycle debris to be disposed to the designated areas. ▪ Some to be used for landfill.	Check solid waste management plan every six months.
Liquid waste	Low	▪ Sewage from workers and effluent from site area collected in temporary septic tank.	
Hazardous waste	Low	▪ Engine oil leaks, spills of vehicles and machines used in decommission.	

6.7. Commitments

The factory promises to fulfil each commitment below.

Table: 6.7-1. Commitment by the factory

No.	Name of Commitment	Description about Commitment	Refer to
1.	Impacts and mitigation	The factory and consultancy company are determined to preserve the natural environment by significantly reducing their environmental impact and proactively mitigating any unavoidable impacts resulting from their operations.	Chapter 6
2.	Surface and ground water contamination	The factory and consultancy company take active measures to preserve the natural environment and significantly reduce environmental impact and take proactive steps to mitigate any unavoidable impacts resulting from factory's activities. The effluent would be closely monitored and treated in strict compliance with NEQEG 2.3.2.1 textile manufacturing effluent guideline values. This is not only a responsible approach to environmental preservation, but also a legal obligation that must be upheld.	Chapter 6. Article 6.4.1 Article 6.4.2

3.	Air emission	The factory will perform mitigation measures to reduce or minimize the impact on air quality, if any.	Chapter 6 Article 6.4.3
4.	Noise	The factory will consider to improve the machine design to make the noise reduction if high noise occurs due to the result of all the machines running at the same time.	Chapter 6 Article 6.4.4
5.	Soil	Although the factory uses bleach and dyes in the production process, effluent is discharge only into the treatment pond and treated. Treated effluent are not drained into nearby areas. Therefore, soil quality will not be affected by the activities of the factory.	Chapter 6 Article 6.4.5
6.	Odor	There will be no discharge of untreated waste (gaseous and liquid) on land or in air or to any water body, there are no visual adverse impacts made by the factory.	Chapter 6 Article 6.4.7
7.	Occupational Health and Safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 6 Article 6.4.8
8.	Biodiversity	Small numbers of the population of species might be affected by the activities of the factory. The factory will fulfill all of the mitigation measures to conserve the nature of the environment.	Chapter 6 Article 6.4.9
9.	Road traffic	The factory prepares and maintains readiness for implementing an emergency rescue plan to road accidents.	Chapter 6 Article 6.4.10
10.	Solid waste disposal	The factory will fulfill all of the mitigation measures in disposal of solid wastes.	Chapter 6 Article 6.4.11

Chapter 7

Risk Assessments

Chapter (7)

Risk Assessment

7.1. Introduction

No. (10) Textile Mill (Taungtha) has been producing knitted wear with knitting machinery for 20 years and employs 325 people. The manufacturing process uses these machineries and requires a lot of energy, electricity, and water. The safety of workers is very important, as they work in tough conditions. Accidents that can injure workers or damage the factory and the public have become a major concern in the Environmental Management Plan (EMP). The factory must pay close attention to safety issues and manage operations and hazardous conditions effectively. It is mandatory for the factory handling these hazards to maintain specified safety standards generate an on-site emergency plan and keep it linked with off-site emergency plan.

Risk Assessment is defined as a continuous and integrated process of identification, evaluation and measurement of risks, along with their potential impact on the organization. Risk assessment study for the Taungtha factory has been carried out. Based on findings and recommendations of Risk Assessment (RA) report, management plan for the factory has also been prepared and included.

Identification analysis and assessment of hazards and risks are very useful in providing information to risk management. It provides the basis for what should be the type and capacity of its on-site and off-site emergency plan and also what types of safety measures are required. Risk and consequence analysis are carried out by considering the storage and handling of raw materials, intermediates and products as well as the manufacturing process.

The objectives considered for the risk assessment study are as follows;

- To assess the risk involved in manufacturing, storing and transporting raw materials up to the final product,
- To evaluate the risk and to get a complete view of the available facilities,
- To take appropriate action to control the incidents,

- To safeguard employees and people in the vicinity,
- To minimize damage to property and neighboring environment,
- To inform the employees, general public, and Government authority about various types of hazards assessed risk, safeguards provided, residual risk if any,
- To inform the police, fire brigade, local authority, and statutory authority to provide help during emergencies,
- To work out a plan with all provisions to handle emergencies and to provide training to employees through mock rehearsals,
- To rescue and give treatment to the casualties and to count the number of injured persons.

The benefits of risk assessment include the following:

- Prevention or reduction in occurrence of accidents,
- Mitigation of the severity and/or consequences by way of improved process techniques, fire protection systems, arrangements of storage, inventory monitoring to fit production requirements,
- Confidences develop among employees by improving competency,
- Preparedness and prompt response to deal with any accident.

Risk assessment can be done in three ways:

1. Qualitative
2. Quantitative
3. Semi-quantitative

However, semi-quantitative risk assessments are currently widely used to overcome some of the shortcomings associated with qualitative approaches.

Semi-quantitative Method

Semi-quantitative risk assessment takes the qualitative approach a step further by attributing values or multipliers to the likelihood and consequence groupings. It may also involve the multiplication of frequency levels.

All risks cannot be eliminated. Urgent action is required for risks assessed as critical or high which may include instructions for an immediate cessation of the work and/or isolation of the hazard until permanent measures can be implemented. Documented control plans with responsibilities and completion dates need to be developed for moderate risks.

Acceptable Risk

The risk that is acceptable to regulatory agencies and to the public is called acceptable risk. There are no formally recognized regulatory criteria for risk to personnel in the textile industry. Because of the uncertainties linked with probabilistic risk analysis used for quantification of the risk levels the general guiding principle is that the risk be reduced to a level considered.

Preventive Measures

The implementation of prevention measures aims to reduce the likelihood of work accidents or occupational disease occurrence. The measures used are as follows:

a. Engineering Control of Risks

- Remove – during the workspace designing phase, any equipment not meeting the occupational health standards should not be used.
- Reduce – levels of hazardous substances can be reduced by proper ventilation through dust-controlling system.
- Replace – high-risk equipment or substances should be replaced by low-risk ones.

b. Administrative Control of Risk

- Training of employees – Workers must know the risks they are exposed to, the harm they might cause, and precautions that could prevent these harmful effects
- Work instructions for every activity.

Protection Measures

a. Envelope the hazard.

b. Enclose or isolate the risk through the use of guards, protection of machinery parts, etc.,

c. Eliminate human interface. Use of physical barriers such as acoustic, thermal, electrical, etc.,

d. Envelope the individual use of Personal Protective Equipment (PPE) to protect the worker from the residual risk. Workers must be trained regarding the selection and use of PPE.

Mitigation Measures

When prevention and protective measures fail, a work accident or an occupational illness could happen. The factory needs to be prepared (emergency preparedness) and to have mitigation measures implemented. The aim of mitigation measures is to reduce the severity of any damage to facilities and harm to employees and the public.

Environmental Monitoring and Measures

There are three main objectives of the assessment of exposure:

- To determine the level of exposure of workers to harmful agents,
- To assess the need for control measures, and
- To ensure the efficiency of control measures in use.

7.2. Methodology of Risk Assessment

7.2.1. Areas of Study

The following aspects and areas have been covered in this study;

A. Identification of major risk areas.

B. Hazard identification

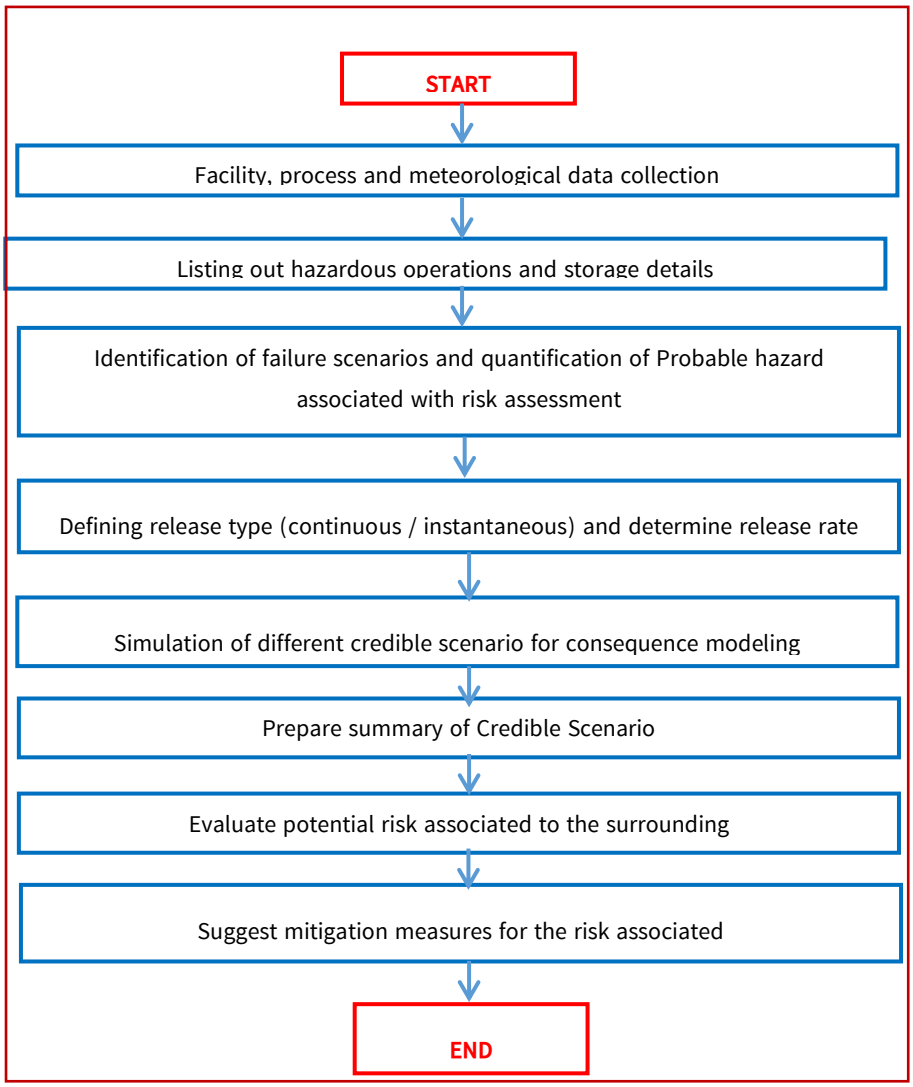
7.2.2. Identification of Major Risk Areas.

- Determination of the probable risk by operation of production machinery due to the high machine revolution and friction which tends to cause fire breakout,
- Risk assessment based on the above evaluation and risk acceptability,
- Minimum preventive and protective measures to be taken to minimize risks to the maximum possible extent,
- Giving pointers for effective disaster management,
- Suggesting measures to lower the risk probability.

7.2.2.1. Methodology

The design data and built-in safety systems of No. (10) Textile Mill (Taungtha) are studied. Discussions were held with factory officials from various departments. Safety related individual system was discussed. Hazard identification was conducted taking into consideration of materials, material handling methods, standard operating procedures (SOP), operating parameters and safety measures to be taken in the factory. In this study, manufacturing areas, non-manufacturing areas, utilities areas and storage areas were studied to evaluate safety systems in the event of any abnormalities occurring.

Figure: 7.2.2.1-1. Risk assessment methodology



Reference: https://www.ncbi.nlm.nih.gov/pmc/articles/pmc5844132

7.2.3. Hazard Identification

All the factory activities pertaining to various manufacturing departments and non-manufacturing departments such as warehouse, office, security, and utilities were minutely examined to identify all the possible hazards inherent to the nature of work or work environment as shown in Table 7.2.3-1. The following methods were used to identify the hazards in the workplace:

- Walking around the workplace to inspect what is in the general area.
- Employee participation by interacting with them regarding their work place, working hours, and the possible hazards they noticed.

- Reviewing of Department Procedure Manual (DPM), Work Instruction, and Standard Operating Procedure (SOP) and comparing it with the regular practice.
- Reviewing previous incident reports.

Department-wise work activities of the factory are shown in following Table 7.2.3-1.

Table: 7.2.3-1. Department-wise activities of Taungtha factory

Section No.	Department	Activities
1.	Knitting	Soft Cone Winding
		Circular Knitting
		Turning
2.	Finishing Process	Scouring, Bleaching and Dyeing
		Hydro extracting
		Heat Setting Stenter
		Pre-shrinking Machine
		Inspection
3.	Garment Manufacturing	Sample Section
		Spreading and Cutting Section
		Sewing Section
		Quality Control Section
		Finishing and Packaging
4.	Laboratory	Sampling for raw materials
		Testing for physical properties
5.	Mechanical and Electrical Maintenance (Workshop)	Maintenance of LT feeder
		Maintenance of HT feeder
		Maintenance of Transformers
		Maintenance of PT, CT, Feeders, LA
		Maintenance of LT Panel
		Maintenance of Batteries
		Maintenance of VFD
		Maintenance of air conditioning units
		Metal foundry shop
		Machine Workshop
		Maintenance of compressors

		Maintenance of generators
		Maintenance of firefighting system
6.	Warehouse	Loading and unloading of materials
		Material storage
		Forklifting of materials
		Manual carrying and lifting of large, bulky and/or heavy object
		Storage of gas cylinder
		Storage of used batteries
		Storage of used lubricants
7.	Transportation	Carrying goods inside factory compound, transporting raw materials and finished goods to distribution depots
8.	Security	Outdoor duties
9.	Office	Working at an office for long hours

After all the possible hazards were identified, the occupational health risk that could be associated with the hazard was identified by studying previous incident reports, first aid/injury records and health records of the employees. Identification of hazards in factory activities is of primary significance. The consequence severity was identified as follow:

Table: 7.2.3.-2. Consequence severity table

	Health and Safety	Environment and Community
Major	Severe impact on human health (e.g. Breathing problems such as shortness of breath, cough etc.) Prolong exposure may cause epidemic/death	Destruction of Wildlife or plants or their habitat Long-term environmental damage. The devastation to a large area of land/water/air body. Severely affecting the health of a local community. Community complaints received with impact at the national level.
Significant	Prolong exposure causes mental/ physical instability or disease Long term health damage	Severely affect wildlife or plants. Emission/discharge exceeding legal standard and is reportable to a government authority legally actionable activity.

Moderate	Damage work environment prolonged exposure cause nuisance/minor illness	Minor level pollution can be alleviated by simple mitigation measures Non-compliance with internal environmental target. Concern by the local community, environmental matter.
Minor	No impact on human health and safety	No direct pollution to any environmental component. No community complaints. No breach of regulation or consent.

Table: 7.2.3-3. Likelihood classifications

Certain	Likely	Moderate	Unlikely	Rare
The event is expected to occur on most occasions	The event is expected to occur on many occasions.	The event is expected to occur on Some occasions	The event is expected to occur infrequently	The event may occur in exceptional circumstances
Frequency: At Least once per week	Frequency: At least once per month	Frequency: At least once in 6 months	Frequency: At least once a year	Frequency: Less than Once a Year

Table: 7.2.3-4. Risk matrix

Certain		Likelihood				
		Rare	Unlikely	Moderate	Likely	Certain
		U	V	X	Y	**Z**
Minor	A	AU	AV	AX	AY	AZ
Moderate	B	BU	BV	BX	BY	BZ
Significant	C	CU	CV	CX	CY	CZ
Major	D	DU	DV	DX	DY	DZ
Low Risk			Moderate Risk		High Risk	

Table: 7.2.3-5. Aspects, impacts, and risk scoring of risk factors

Section	Aspect	Department	Impact	Risk Score	Risk Status
S.1	Generation of noise	Knitting, Finishing, Garment production	Noise Pollution	BX	Moderate risk
	Dust and particulate matter generation	Knitting, Finishing, Garment production	Air Pollution	AV	Moderate risk
	Solid waste generation	Knitting, Finishing, Garment production	Degradation of land and water body	AV	Moderate risk
	Effluent generation	Finishing	Degradation of land and water body	AV	Moderate risk
S.2	Use of electricity	Mechanical and Electrical Maintenance	Resource depletion	BV	Moderate risk
	Use of diesel to operate the generator	Mechanical and Electrical Maintenance	Depletion of natural resources	BV	Moderate risk
	Generation of noise	Mechanical and Electrical Maintenance	Noise Pollution	BZ	High risk
S.3	Solid waste disposal (domestic waste, waste yarn, waste fabric, carton box)	Store	Degradation of land and water body	BX	Moderate risk
	Generation of waste oil (machine oil, compressor oil)	Store	Degradation of land and water body	BV	Moderate risk
	Generation of solid waste	Store	Degradation of land and water body	BX	Moderate risk
S.4	Dust and particulate matter generation	Transportation	Air Pollution	BX	Moderate risk
	Noise generation	Transportation	Noise Pollution	BX	Moderate risk
S.5	Potential for dehydration, heat disorder	Security	Health	BV	Moderate risk

S.6	Potential for illness due to long working hours	Office	Health	AV	Moderate risk
S.7	Solid waste disposal (domestic waste, waste fabric, carton box)	Waste Management System	Degradation of land and water body	AV	Moderate risk

7.2.3.1. Hazard Identification Areas

The hazard identification areas are defined as follows:

- Production machinery areas associated with operations in the factory utility areas (such as Knitting machines, sewing machines, machine shop and foundry shop).
- The factory warehouse has an organized hazard control and prevention system in place and complies with all the applicable provisions of the following statutes;
    1. Factories Act, 1951
    2. Law Amending the Factories Act 1951, 2016
    3. Environmental Conservation Law, 2012
    4. Environmental Conservation Rules, 2014
    5. Myanmar Insurance Law, 1993
    6. Occupational Health and Safety Law, 2019
    7. National Disaster Management Law, 2013
    8. Myanmar Oil Products Law,2017
    9. Myanmar Fire Brigades Law, 2015

7.3. Hazards

7.3.1. Documentation

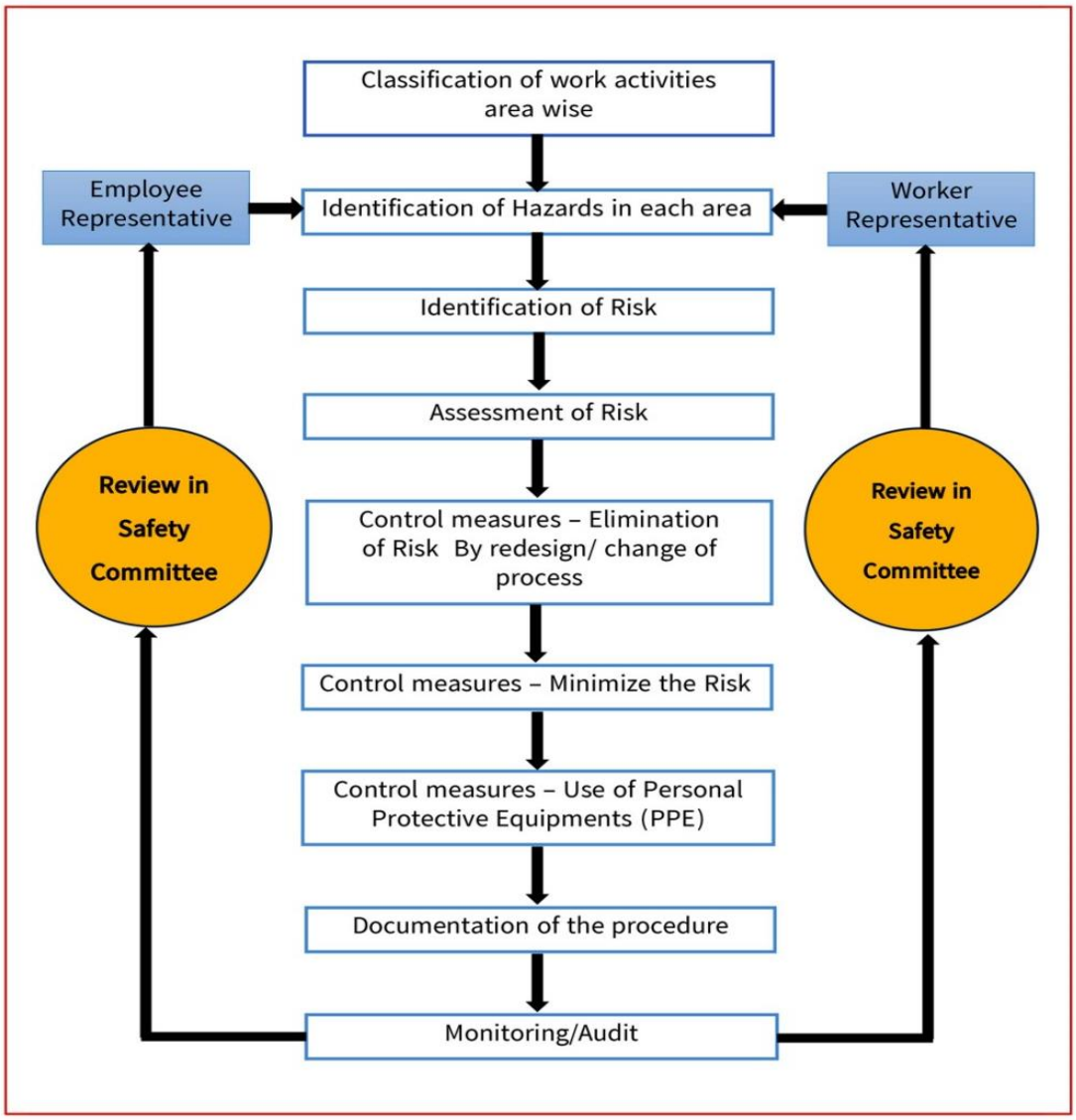
Documenting the process helps to ensure that the identified risk control measures are implemented in the way they were intended. It will also assist in managing other hazards and risks that may be in some way similar to ones already

identified. Adequate record keeping of the risk management process should show that the process has been conducted properly. This information should include:

- Assessment of the risks associated with those hazards,
- Decision on control measures to manage exposure to the risks,
- How and when the control measures are implemented,
- Evidence of monitoring and reviewing of the effectiveness of the controls.

In this factory, various hazards were identified and their analysis was performed. They have been classified into five major categories.

Figure: 7.3.1-1. Hazard identification methodology



- Physical
  - Mechanical
  - Electrical
  - Chemical
  - Heat
  - Dust
  - Noise
  - Vibration
- Fire and explosion
- Biological
- Ergonomical
- Psychosocial

The major hazards, risk assessment, and control measures are tabulated below.

Table: 7.3.1-1 Hazard identification and potential harm and control measures

Activity	Hazard	Potential Harm	Control measures
Mechanical Hazard			
Knitting section **Knitting of yarns**	Running machine parts may severely damage	Injury	Follow up SOP. Before the maintenance of machines, make sure to stop the machine. Wear PPE. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Finishing section	Rotating squeezing rollers draw fingers.	Hand injury	Need to place a warning sign. And, most importantly, ensure that all mechanics receive comprehensive training on safety protocols.
Garment section	Rotating rollers draw the fingers.	Hand injury, Fingers broken.	Follow up SOP. Need to place warning sign. “Don’t remove the cover while the machine is running”. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.

Warehouse **Loading and unloading materials at warehouse and factory**	Fall from height	Head injury, Broken bones,	Follow up SOP. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Material storage	Material improperly stored falls from a height.	Head injury, Broken bones	Follow up SOP. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Forklift movement in the store	Materials fall from forklift.	Head injury, broken bones.	Fencing to be done. Prohibited to unauthorized access. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Used lubricants and grease storage.	Spillage causes the potential to slip.	Head injury, broken bone.	Place barriers and warning signs around spillage area. The spillage area must be cleaned as soon as possible.
Chemical Hazard			
Finishing Section			
Chemical handling	Dyes stuff mixing, Chemical container spillage,	Causes acute health effect, Causes chronic effect	Act administrative control. Wear PPE. Engineering control to be conducted immediately.
Electrical Hazard			
Maintenance of electrostatic precipitator	Fall from height due to high voltage.	Head injury, Bones broken, Death	Follow up SOP strictly. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Maintenance of CT, PT, SF, LA, WT, and high-tension line.	Fall from height due to high voltage.	Head injury, Broken bones, Death	Follow up SOP strictly. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Maintenance of ceiling lamp /street lamp	Fall from height.	Head injury, Broken bones.	Follow up SOP. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
Control transformer	Short-circuiting due to overheating.	Product failure.	Switch off the power supply. Isolate the equipment. Restrict the work in that area. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
ARC welding	Electric shock	Burn injury, Scald, ventricular fibrillation	Switch off the power supply. Isolate the equipment. Restrict the work in that area.

Grinding and cutting	Electric shock	ventricular fibrillation	Switch off the power supply. Isolate the equipment. Restrict the work in that area.
Drilling	Electric shock	ventricular fibrillation	Switch off the power supply. Isolate the equipment. Restrict the work in that area.
Fire Hazard			
Cotton raw material storage	Heat generated due to poor ventilation and ignition in the warehouse.	Burn injury	Stack the cotton bales in an organized manner to ensure proper ventilation. Additionally, it's crucial to prominently display a warning sign within the warehouse, cautioning against ignition. And, most importantly, ensure that all workers receive comprehensive training on safety protocols.
ARC welding	Fire	Burn injury	Wear PPE. First aid box. Training to the workers.
Gas cutting	Fire	Burn injury	Wear PPE. First aid box. Training to the workers.
Grinding	Fire	Burn injury	Wear PPE. First aid box. Training to the workers.
Storage of gas cylinder	Explosion, Fire	Burn severely	Wear PPE. First aid box. Training to the workers.
Heat Disorder			
Security persons	Outdoor activities in summer with exposure to excessive heat	Heat stroke	Workers are advised to drink a cup of water every hour. Workers acclimatized by exposing them gradually in hot weather. Cool area for rest. Workers are advised to wear light-color loose-fitting cotton cloths.
Induction furnace operators at the foundry shop	Heat exposure	Heat stroke	Workers are advised to drink a cup of water every hour during operating hours. Cool area for rest. Workers are advised to wear light-color loose-fitting cotton cloths.
Noise Environment			
Knitting machine operators	The knitting machine generates noise.	Hearing loss	Wear PPE. Training to the workers. Measuring noise level compared with permissible limit.

7.3.2. Occupational Health and Safety Program

The main ill effects anticipated for the health of workers are due to exposure to chemicals, noise and dusts. No other source of adverse effects on occupational health and safety is likely to occur. However, the standard operating procedure will be prepared and made available to the management as well as concerned

personnel working with materials or areas likely to be affected by materials and machines.

Followings are the key safety measures to be followed and implemented.

- Provision of all necessary equipment like portable detectors, online detectors, and other laboratory equipment as proposed for regular monitoring of workplace air and other conditions.
- Implementation of safety policy.
- Provision of proximity suits and self-breathing apparatus.
- Provision and compulsory use of necessary PPEs like helmets, safety goggles, face masks, hand gloves, and safety shoes for all workers.
- Provision of first-aid boxes (containing Povidone iodine, eye drops, Burnol, Soframycin (ointment), sterilized cotton bandage, antiseptic solution, etc.) at various places in the premises.
- Organize training program for information on accident prevention, proper control and maintenance of equipment, first aid training, and safe material handling practices.

The following measures are rigorously followed and implemented to ensure the occupational health of the workers

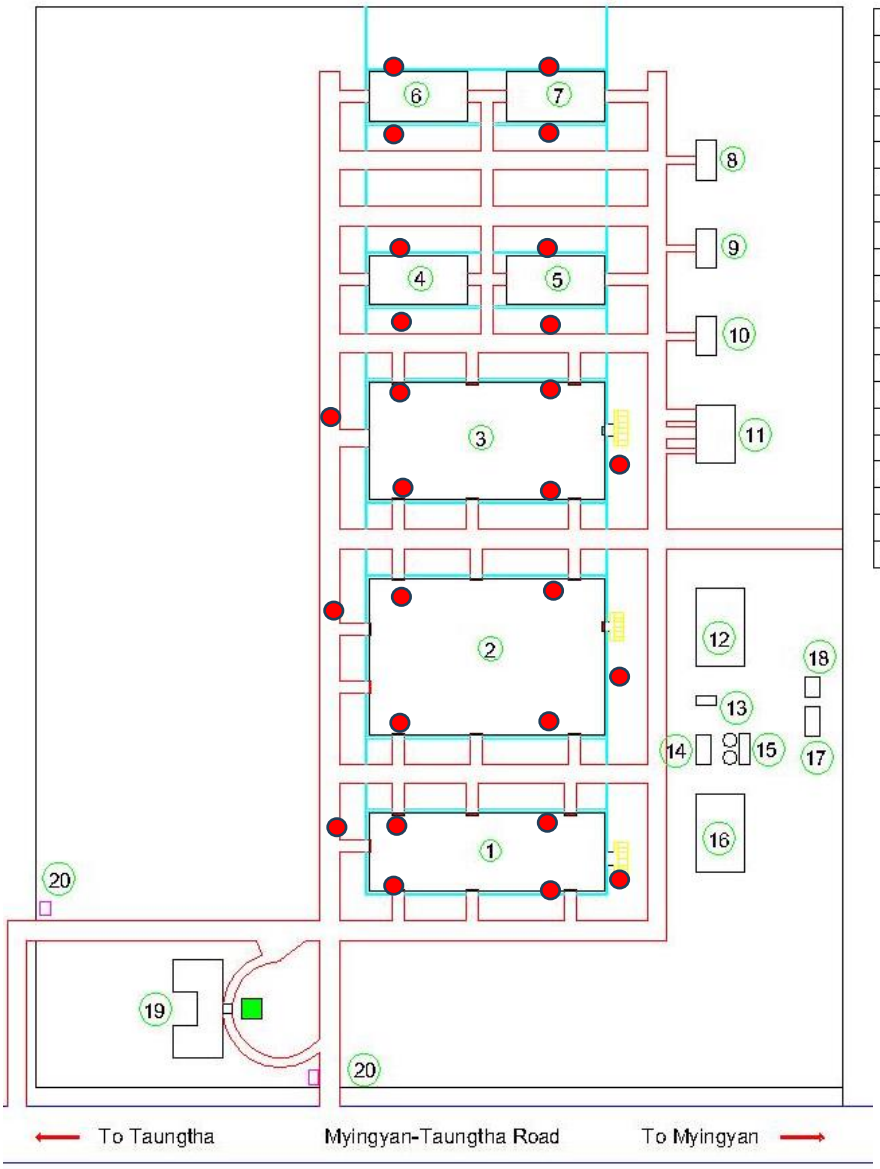
- Pre-medical checkups at the time of employment and regular medical checkups of employees. Maintain all the records certifying fitness for employment in hazardous processes and operations as per Factories Act (1951) guidelines. Maintain health register of all the employees.
- Monitoring of occupational hazards like noise and dust exposure at frequent intervals as per details given in Chapter 6 and maintaining all records as per the Factories Act.
- Provision of occupational health center (OHC) or social welfare clinic and medical doctor, nurse, and staff as per Factories Act guidelines.
- Provision of drinking water supply for the employees as per standard of drinking water as per WHO guidelines.

- Availability of proper sanitary facilities for the employees so that they do not suffer from any health ailments.

7.3.3. Firefighting System

An adequate firefighting system has been provided in the factory. Sufficient numbers of firefighting equipment such as fire extinguishers, fire engines, fire pumps, smoke detectors, flame detectors, hydrant and automatic sprinklers are installed in the factory and warehouses. Mock drills and training are scheduled and conducted every six months. Respiratory PPEs like self – contained breathing apparatus, bubble hood point with air compressor, online respirator, and non-respiratory PPEs like PVC apron, gum boot, goggles, and rubber hand gloves are provided in case of fire. The fire hydrant and emergency exit positions are expressed in Figure 7.3.3-1. The factory has its own fire station and Taungtha Township Fire Station is located at a distance of 2.2 miles from the factory. Also, another nearest fire station, Myingyan fire station which is located 12.4 miles distance will provide mutual aid for firefighting.

Figure: 7.3.3-1. Fire hydrant location points

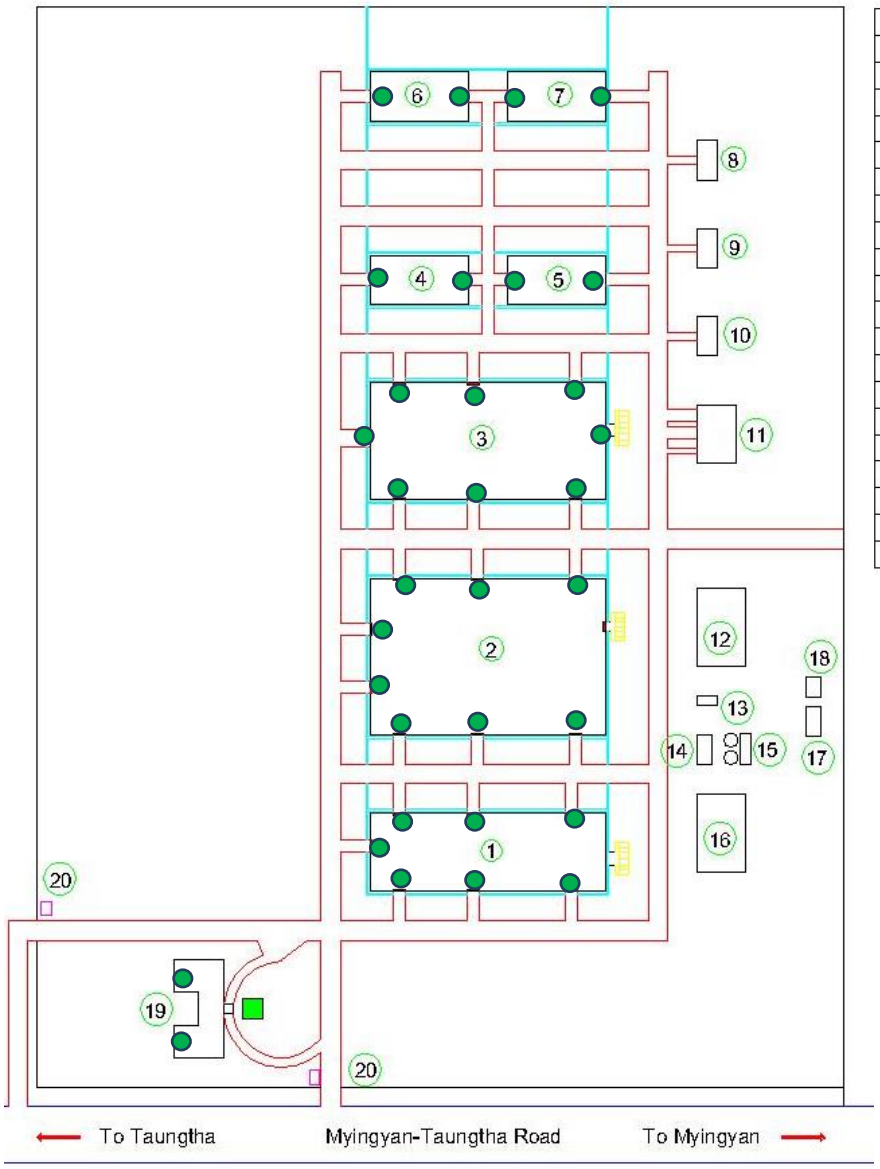


No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

Legend

Fire hydrant

Figure: 7.3.3-2. Emergency exit plan



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

Legend

Emergency Exit

7.4. Risk Mitigating Measures

Risk is rated based on the likelihood of various consequences. The level of an emergency can be defined and in the event of an accident, management can take necessary steps as per the Standard Operating Procedure (SOP). Following precautionary mitigation measures associated with probable risk are to be followed and implemented.

A. General Mitigation Measures

- Installation of all the equipment as per guidelines of provision of The Factories Act, 1951.
- Proper control of the operating parameters, mainly temperature, vacuums, cooling media circulation, during plant operation, and solvent recovery.
- For any case of fire emergency, availability of standard type of firefighting equipment and fire extinguishers in the storage area as well as required places in the plant.
- Strictly prohibit smoking inside the factory.
- Provision of adequate and suitable personnel protective equipment to operators and workers.
- Availability of First-Aid facility and First-Aid trained person at the time of handling operation.

Table: 7.4-1. Risk rating for Taungtha factory

Risk Rating	Risk Criteria	Emergency	Type of Emergency	Management
1-4	Low	I	Any incident which is Minor in nature. No potential risk of threatening lives or facilities in the plant. i.e, Minor fires that can be extinguished easily. Minor gas or toxic releases can be isolated within a short period of time, Minor spillage of hazardous materials (eg. lubricants) which can be contained by absorbent materials	On-site impact. Within the capability of Unit at Plant Level and can be managed with routine procedure.
5-12	Medium	II	Any incident which is Major / Serious in nature. Potential risk of threatening lives,	On-site impact. Acceptable risk within the capability of the factory

			facilities, or buildings on-site or off-site. i.e. Fire involving flammable storage tanks or plant equipment, Gas or toxic releases of large quantities which can be isolated safely, Spillage of flammable or hazardous substances which requires substantial resources for cleaning up or recovery.	with Management's review. SOP to be followed for mitigation of associated risk.
13-25	High	III	Any incident that is severe/catastrophic in nature that requires assistance from external emergency agencies i.e., major or prolonged fire involving spread over entire plant or storage area; Major or prolonged release of dust or toxic releases due to catastrophic failure of process equipment or storage tanks which requires on-site evacuation.	Off-site impact. Off-site emergency plan to be followed.

7.5. Onsite Emergency Plan and Disaster Management

An emergency is said to have risen when operators in the factory are not able to cope with a potential hazardous situation i.e. loss of an incident causes the plant to go beyond its normal operating conditions, thus creating danger. When such an emergency evolves, a chain of events that affect the normal working within the factory area and/or which may cause injuries, loss of life, and substantial damage to property and environment both inside and around the factory takes place and a disaster is said to have occurred. Various steps involved in a Disaster Management Plan can be summarized as follows:

(a) Minimize risk occurrence (Prevention)

(b) Rapid Control (Emergency Response)

(c) Effectively rehabilitate damaged areas (Restoration).

Disaster Management Plan is evolved by careful scrutiny and interlinking of types and causes of disaster, technical know-how, and resource availability.

Types of Disaster:

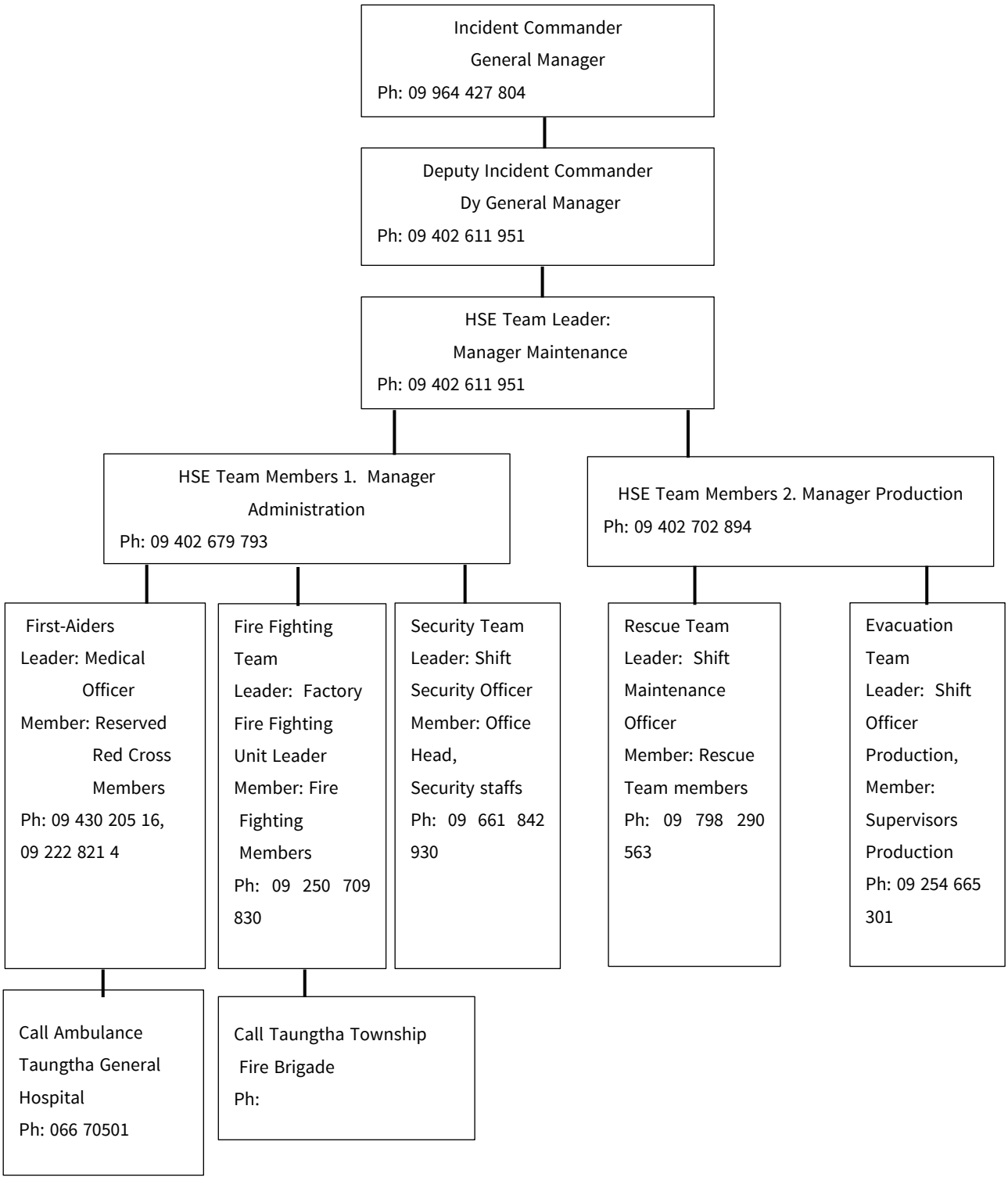
a. Due to Fire and Explosion,
b. Storms, Flood, Cyclones, Earthquakes and other Natural Calamities.

This plan is developed to make the best possible use of resources to:

- Reduce possibilities of accident.
- Contain the incident and control it with minimum damage.
- Safeguard others
- Rescue the victims and treat them suitable.
- Identify the persons affected/ dead.
- Inform relatives of the causalities.
- Provide information to the news media.
- Preserve relevant records and equipment needed as evidence in case of any inquiry.
- Rehabilitate the affected areas.

The primary purpose of the on-site emergency plan is to control and contain the incident and to prevent it from spreading to nearby plants. It is not possible to cover every eventuality in the plant and successful handling of the emergency will depend on appropriate action and decisions being taken on the spot. The following three staged activities are suggested as they are co-related and provide better points for emergency preparedness, emergency action, and subsequent follow-up. The hierarchy of the emergency response team is given below in Figure 7.5-1, which is implemented for the Taungtha factory.

Figure: 7.5-1. Organization chart for emergency response team (ERT) **(Production Phase)**



7.5.1. (a) Incident Commander

The responsibilities of the Incident Commander are:

1. Forming the site ERT,
2. Overall person in charge in the event of an emergency situation,
3. Provision of adequate resources for the ERT (i.e. manpower, equipment, etc.),
4. In charge of liaising with the related agencies and other stakeholders,
5. Assess the situation of the incident, accident and activate the ERT members for counter measures,
6. Classifying / determining the emergency level,
7. Direct all counter measures and emergency procedures to control and suppress the situation, and decide on the evacuation of the factory.

In production phase, general manager usually holds the position of Incident Commander.

7.5.1 (b) Deputy Incident Commander

The responsibilities of the Deputy Incident Commander are:

1. Assist the Incident Commander on the coordination and execution of the site emergency response procedures,
2. To cover the duties of the Incident Commander when he is not at site,
3. Person in charge of coordination and directing of the ERT,
4. Collating and reporting the headcounts of the emergency evacuation to the Incident Commander,
5. Directing the search and rescue of missing personnel.

In operation phase, deputy general manager usually holds the position of deputy incident commander.

7.5.1 (c) Health, Safety, and Environmental Team Leader (HSE Officer / HSE Team Leader)

The responsibilities of the HSE team are:

1. To assist the Incident and Deputy Incident Commander on execution and directing of the factory emergency response procedures,
2. Assist in assembling and coordination with the ERT,

3. Assist in coordinating work at the emergency evacuation assembly area.

In operation phase, the factory maintenance manager usually holds the position of HSE team leader.

7.5.1. (d) HSE Team Members

The responsibilities of the HSE team members are:

1. Inform all personnel of the emergency situation,
2. Lock all office documents and shut down all electrical equipment, if possible,
3. Evacuate from their respective work areas calmly upon activation of emergency evacuation,
4. Remove all sensitive documents with them during evacuation, if possible,
5. Assist any personnel who require any help,
6. Conduct headcount and report to the site HSE team leader / Deputy Incident Commander.

In operation phase, factory administration manager/factory production manager usually holds the position of HSE team member.

7.5.1. (e) Qualified First-Aiders

The responsibilities of the Qualified First-Aiders are:

1. Setting up of the first-aid treatment area at the site emergency evacuation work area,
2. Rendering first-aid to the injured,
3. Coordination, directing and reporting to the external professional medical Personnel,
4. Reporting the status of injured personnel to the Incident Commander / Deputy Incident Commander.

7.5.1. (f) Fire-Fighting Team

The responsibilities of the Fire-Fighting Team are:

1. Conducting fire-fighting in the event of a fire emergency.
2. Directing personnel to evacuate from the scene of fire.
3. Coordinating the rescue of personnel with the Rescue Team members from the scene of fire.

4. Remove any flammable materials.

7.5.1. (g) Evacuation Team

The responsibilities of the Evacuation Team are:

1. Set up the site emergency evacuation assembly area upon activation,
2. Liaise with the respective persons in charge from the different companies and work groups and collate the headcounts,
3. Reporting the headcounts to the Deputy to check the number of people present and missing and report the status to the Incident Commander.

7.5.1. (h) Rescue Team

The responsibilities of the Rescue Team are:

1. Coordinating the evacuation and rescue of personnel.
2. Cooperating with the fire-fighting team on the rescue of personnel.
3. Cooperating with the respective persons in charge of the personnel on the rescue of missing personnel from their working areas.
4. Reporting to the Deputy Incident Commander on the status of their rescue.

7.5.1. (i) Security Team

The responsibilities of the Security Team are:

1. Inform the site HSE personnel on the workers and contractors manpower on site.
2. Control the site personnel and vehicle traffic movement.
3. Stop all personnel / vehicles from entering the worksite in the event of an emergency.

7.5.1. (j) Contractors / Persons in Charge

The responsibilities of the Contractors / Persons in charge are:

1. Inform all their personnel of the emergency situation and carry out evacuation when instructed.
2. Ensure all personnel are evacuated from their work areas.
3. Ensure all machineries, equipment, etc. are shut down before leaving the work area.
4. Conduct headcount of their work personnel and report the headcount to

the site HSE personnel / Deputy Incident Commander.

5.In the event of missing personnel, inform the rescue teams on the last working area of the missing personnel.

6. Ensure their personnel assemble neatly at their respective positions and wait for further instructions from the factory HSE personnel / Incident or Deputy Incident Commander.

7.5.2. Emergency Level Determination

The executing institute operates within the hierarchical response framework. The emergency level is determined by the complexity of the incident, the risk to personnel and the public, and the impact on the environment, and is further determined by the need for mobilization of resources. After a no-failure or emergency condition is detected or and/or reported to Incident Commander, he / she is responsible for classifying the event into one of the following three emergency levels.

- Level 1 (Green)

Incident that is short term and can be effectively managed locally utilizing factory facility resources.

- Level 2 (Yellow)

Incident that is middle term, has the potential for off-site impacts and requires assistance from headquarter office / regional /township resources.

- Level 3 (Red)

Incident that is long term, may have wide spread impacts and requires assistance from government office / global resources.

7.5.3. Communication and Reporting

All personnel first observing or verifying any emergency situation at the factory are responsible for notifying the managing supervisor. Quick notification allows time to provide early warning to ERT and agencies.

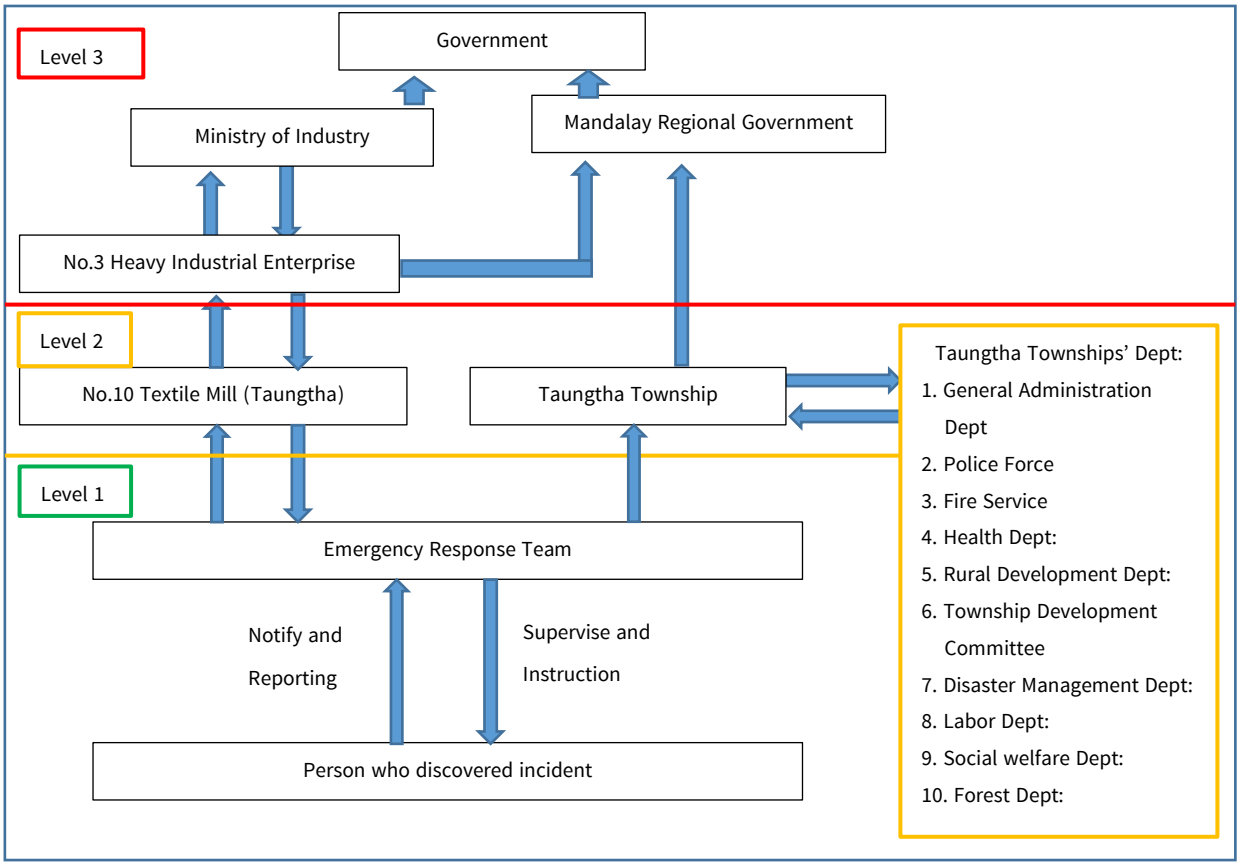
(1) Fire Alarms

Fire alarms are activated manually and immediately after personnel discover fire incident. Vocal alarms as per emergency response are given immediately after discovery of an incident to alert personnel.

(2) Accident and Major Incident Reporting Procedure

When an incident occurs, the person who discovers the incident will notify ERT, and then he/she will notify Incident Commander in accordance with organization chart. The Incident Commander will then determine according to emergency level if the headquarter office needs to be notified / activated. If it needs, the Incident Commander will communicate to notify / report the headquarter office and then need to be supported by the headquarter office. The accident and major incident reporting flow is described below. This is a typical procedure and therefore, this procedure should be updated before the operational phase.

Figure: 7.5.3-1. Typical incident reporting flow



(3) Injury and Near-Misses

All incidents resulting in injuries or near-misses to personnel, contractor or any visitor must be reported immediately to the Managing Supervisors.

The relevant engineer with the support of the factory HSE Manager/Officer shall investigate all injuries and near-misses immediately, and the details recorded on the Accident/Incident Report. When causative factors have been established, remedial actions shall be implemented without delay.

The analysis of Accident Reports will assist in the identification of trend processes and activities occasioning physical injuries and enable the preventive procedures to be made or revised, if necessary. An investigation process and analysis of the accident process should be developed before the operational phase.

(4) Related Agencies Notifications

Incident Commander is responsible for assuring that all required notifications/reports are completed in a timely manner for all incidents. All contacts with regulatory agencies should be properly documented. Typical information to report would be the incident location, type and size of a spill, date and time of the incident, and other relevant information. The reporting protocol, items and detailed contents should be fixed after discussion with regulatory agencies before the operational phase.

7.5.4. Emergency Actions

After the Incident Commander determines the emergency condition and emergency level, the emergency response procedures may be taken. The emergency response procedures are organized according to incident scenarios.

The Incident Commander instructs managing supervisors to record the available information, observations, and actions taken on the record for previous section (communication and reporting). The time of changing conditions should be noted on the form and the situation documented with photographs and video, if possible. These actions may be performed directly by personnel or contractor by managing supervisors.

7.5.5. Scenario Emergency Response Procedures

The purpose of scenario emergency response procedures is to quickly identify the sensitivities that could potentially be affected during an incident and quickly emergency responses to them.

In general, scenario emergency response procedure is made by the following steps.

- Step 1. Identifying hazards and those at risk looking for those things during plant operation that have the potential to cause harm and identifying things and people who may be exposed to the hazards.
- Step 2. Evaluating and prioritizing risks estimating the existing risks (the severity and probability of possible harm) and prioritizing them in order of importance.
- Step 3. Deciding on emergency responses Identifying the appropriate emergency response to eliminate or control the risks.
- Step 4. Making the emergency response plan Making emergency response scenario including classifying the emergency level based on identifying the appropriate emergency response and through a prioritization of risk.

Scenario emergency response procedures will be made before the operational phase according to the detailed design. This document introduces a scenario emergency response procedure in the following section.

7.5.6. Scenario Emergency Response Procedure (Example)

Water/Effluent pipe leak response procedure

1. The person(s) discovering the water/effluent pipe leak shall raise the alarm by informing the parties responsible/involved in the source of the leak.
2. If the water/effluent pipe leak is controllable, the responsible party shall shut off the source of water/effluent pipe leak immediately (e.g. turn off the valves / mains of the water supply, etc.).
3. If the water/effluent pipe leak is uncontrollable, such as due to the damaged/failure of its containment, damage or rupture of piping/valves,

etc. the party responsible shall inform the key personnel, any members of the ERT.

4. The ERT shall response within half hour (2 hours after office hour) and assess the situation while work together with the facilities management representative for the external help. And at the meantime, the plumber on standby at the site shall be activated.
5. If it is safe to do so, the responsible party shall assist in cordoning off the affected area to prevent further unauthorized entry until the ERT arrives and take over control of the emergency area.
6. If there is an outbreak of fire, the fire-fighting team shall commence to put out the fire.
7. The rescue team shall check for any casualty in the location and conduct rescue.
8. The first-aid team shall administer first-aid treatment if there is any injured.
9. The ERT shall contact the Incident / Deputy Incident Commander and report the status of the emergency.
10. Based on the information given, the Incident / Deputy Incident Commander shall assess the seriousness of the emergency incident and, decide on emergency level and then the next course of action.
11. In the event of the activation of emergency evacuation, the respective person(s) in charge shall commence headcount of their personnel and ensure all their personnel are accounted for. The person(s) in charge shall report their headcount and any missing personnel and their last known location to the site HSE personnel / Deputy Incident Commander immediately.
12. The Incident / Deputy Incident Commander shall liaise with all relevant external parties (i.e. authorities, emergency services, etc.) involved.
13. The Incident / Deputy Incident Commander shall inform the headquarter office and related agencies of the incident / situation and keep him/her informed of the status of the emergency, and an emergency incident

report and submit the report to the headquarter office and related departments according to the reporting protocol.

14. The Incident / Deputy Incident Commander shall ensure that all other official documentation required are submitted to the related departments.

7.6. Pre-emergency Activity

For the systematic management of on-site emergencies and to make emergency control measures more effective, certain pre-emergency activities and planning play essential roles. The following aspects are followed and implemented as a part of the pre-emergency plan;

A. Training of workers

Training is most important for the effectiveness of an emergency plan. Before implementing an emergency action plan, a sufficient number of workers are trained to manage emergencies. Details of various training to be given to workers are given below:

Induction and safety training for all workers before engaging for work,

Safety and fire-fighting training for all employees as well as for contractors' employees periodically,

Training on using personnel protective equipment for all workers,

Training by calling external experts to impart training on critical subjects,

Assist selective employees of the Health Safety and Environment (HSE) team with specialized training being organized by different professional institutions.

B. Internal Safety Survey

To identify various hazards in factory areas.

To check protective equipment for workability.

To check various Safety installations.

To check firefighting equipment, water shower, etc.

To suggest extra modification required.

Checklist is prepared to conduct an internal safety survey effectively and smoothly. The checklist covers all the project activities and entire factory area. It

is ensured that the check-list is used by HSE team as a part of SOP to conduct internal safety survey and will be updated from time to time for the effective implementation.

C. Third Party Survey

To identify various hazards inside the factory.

To conduct a survey on available safety equipment.

To check built-in safety system for its efficiency.

To suggest modifications/new additions in the system.

D. Non-Destructive Testing (NDT)

To prepare a list of equipment/pipe lines for Non-Destructive testing.

To prepare a plan for replacements/repairs as per testing reports.

To maintain Plant wise record to compare with the last period.

E. Safety Valve Testing

To prepare a list in the plant.

To prepare a periodic schedule for their testing and maintaining record.

F. Fire Fighting System Testing

To prepare a list of fire hydrants, Fire Fighting appliances, Fire water pumps and other available appliances and maintain the record.

To plan for testing schedule.

To replace defective equipment/accessories.

To check fire water pumps capacity.

To check all firefighting equipment/appliances under fire services for operability.

G. Mock drills

The internal mock drill is conducted to train the workers.

Periodic drills, once in six months, are conducted to check the performance of workers and equipment.

To know the drawbacks/defects of the system and its corrective actions.

H. Personal Protective Equipment (PPE)

To arrange for sufficient quantity of personal protective equipment.

To train workers to use each PPE. To maintain them in good condition.

I. Communication

To maintain internal/external communication system in good working condition.

To modify the siren sound for an emergency.

Install wind socks to indicate wind direction.

J. Emergency Lights

To check and maintain the emergency lights in the control room and selected areas.

To keep sufficient number of torches in supervisor's office and in each department.

DEGs set are maintained in working conditions as a standby in case of failure of normal power supply.

K. Emergency Control Room

To identify the place of the emergency control room.

To identify the alternative emergency control room.

To keep a sufficient quantity of PPE in control rooms.

To provide a proper telephone system in the emergency control room.

To prepare a plan for replacements/repairs.

To provide the plan of the factory showing hazardous points and emergency control points in the emergency control room.

L. Assembly Points

To identify the location for assembling the plant emergency staff and co-ordinate in case of emergency

To utilize the services of others to fix assembly points for non-essential workers and to assemble in case of emergency.

Appropriate sign boards showing the fire exit and the assembly points will be provided in the entire plant.

Assembly point is located near the factory. It can accommodate at least 100 persons.

M. Liaison with State Authorities

To keep liaison with police, fire brigade, Factory Inspector, Collector, local hospital and keep them informed.

To inform them about the requirements in advance.

To keep them informed about mock drills.

N. Safety Measures for General Public

The following measures will be taken to ensure the safety of nearby villagers:

Factory will prepare and distribute the booklet in Myanmar language giving detailed actions to be taken in case of any incident. Emergency sirens are installed at the security cabin near the main gate of the plant to inform the public about any type of emergency. All the sirens are tested periodically. Periodical seminars and workshops in collaboration with industrial associations or with coordination with nearby industries are arranged at the nearest village to aware villagers for safety measures and emergency preparedness for accidents.

7.7. Commitment

The factory promises to fulfil the following commitment.

No.	Name of Commitment	Description about Commitment	Refer to
1.	Risk Assessment	The factory and the consultancy company are fully dedicated to achieving all the objectives outlined in the risk assessments study.	Chapter 7 Article 7.1

Chapter 8

Public Consultation

Chapter (8)

Public Consultation

8.1. The Importance of Public Consultation and Information Disclosure

Public consultation is a process that involves the public in providing their views and feedback on a proposal to consider in the decision-making. Public consultation and stakeholder engagement are emerging as inclusive and continuous dialogue between a factory and the public (or) stakeholders that encompasses a range of activities and approaches and spans the entire life of the factory. The public, often referred to as stakeholders, are individuals and organizations that are affected directly or indirectly by a factory or a decision, as well as those who can influence the decision, both positively and negatively. They can also be people who simply have an interest in the factory. The public consultation has two approaches: the short-term approach is to seek ways to meet regulatory requirements, and secondly, the long-term approach emphasizes relationship building and proactive risk management. Successful public consultation can be defined as different things for different individuals and organizations.

Policymakers and factory proponents will often need to strike a balance between consulting those who are significantly affected by a factory and consulting a wider group of people who will not be directly affected, but who will have a reasonable fear that they might be, or will have strong feelings about an issue. The matter of defining the 'public concerned' for a consultation is highly fractious as it is often a factor in the available resources.

The benefits of public consultation are as follows: Public consultation provides an opportunity for the affected people and interesting parties to have a say in decisions that affect their lives. It gives the decision-makers a better understanding of the stakeholder's values, interests, issues, and concerns about the factory's activities to incorporate into decisions and ultimately empowers them to make better decisions. By facilitating a better understanding of the proposal for the public and problems and opportunities for the consultant, it generates new ideas to be considered and appraised throughout the development.

Amid the COVID-19 outbreak, a public consultation meeting was held cautiously following the precautionary measures issued by the Ministry of Health, at the factory meeting hall on September 1, 2020. The persons responsible for IIC Company, the factory GM and staff, stakeholders from surrounding areas, administrative personnel, and interested people attended the public consultation meeting. All the outcomes were compiled and considered to be addressed in the EMP.

8.2. Data Collection

IIC Company collected primary data, including socio-economic, biodiversity, and governing parameters, during the survey. Secondary data, which comprises factory data and related facts, is compiled from regional administrative offices.

8.3. Public Consultation and Participation Process

Undertaking public consultation needs to consider the following salient points.

a) Project information should be meaningful and disclosed in an understandable format to the local culture and customs.
b) A two-way meeting is an opportunity for both parties to exchange information, listen to each other, ask questions, and address issues.
c) Gender inclusion is necessary.
d) All the issues discussed and consulted are documented because these are a tangible record of the public consultation for its participants and a source of information for individuals unable to attend.
e) Report back to the stakeholders promptly on consultation outcomes and next steps.
f) Engagement between both parties remains ongoing throughout the project life. The list of participants is shown in the Table below.

Table 8.3-1 List of participants

No.	Category	Number of Participant		
		Male	Female	Total
1.	Local People	14	-	14
2.	Factory	3	3	6
3.	Village Administrative Personnel	6	-	6
4.	IIC Company	4		4
	Total			30

8.4. Comments of the Public and Project Proponent's Response

The public consultation meeting was held at the meeting hall of the factory with 30 attendees, those who were directly or indirectly affected by the factory. The meeting agenda was as follows:

a) Introductory speech delivered by No. (10) Textile Mill (Taungtha) Factory GM,
b) Cause and effect of global warming in this century by IIC Company,
c) Brief explanation about the objectives of the Environmental Management Plan (EMP) and governing parameters and disclosure of the results by IIC Company,
d) Socio-economic related matters problems and solutions by IIC Company,
e) Interaction between factories and villages by village administrative heads,
f) Open discussion for participants,
g) Question and answer section,
h) Conclusion remark by GM.

8.5. Project Disclosure

A brief explanation of the factory was presented by IIC Company for a better understanding of stakeholders during the public consultation. Secondly, the governing parameters and disclosure of test results were presented using charts. The interrelationship among organisms, micro-organisms, amphibians, reptiles, fish, birds, and plants is accounted for the nature of biodiversity, and how to safeguard the biodiversity in connection with the factory was presented in the meeting. The outcomes are documented and compiled concerning their benefits, needs, and concerns.

Table: 8.5-1. Outcomes of public consultation

Village/Quarter	Discussion	Benefits from the Factory	Most Public Needs	Most Public Concerns
U Win Swe Myint Administrative Head, No. (1) Ward	-Great thanks to factory -Many jobs were created -Always be proud of this factory	-Job creation	-To create more jobs	
U Myitn Lwin, Administrative Head, No. (2) Ward	-Factory should be upgraded -No impact on effluent discharged -Grow more trees	-Green belt zone		

U Thein Swe Administrative Head, No. (3) Ward	-Many job opportunities created -Factory should produce high quality product	-Job creation	-Grow more trees	-Sustainable growth of the factory
U Kyaw Swe Administrative Head, No. (4) Ward	-No environmental impacts suffered -Factory needs to upgrade the product quality -Thanks for giving job opportunities for our graduated youth.			-Product quality to be upgraded

8.6. Outcomes from Public Consultation Meeting

Outcomes from public consultation meetings are compiled as follows:

Table: 8.6-1. Actions to be taken

No.	Public concerns raised by consultation	Action plan	Target date to be completed
1.	Job stability	As state-owned enterprises, government factories are seeking ways to cooperate with the private sector.	2027-2031
2.	Create more jobs	When factory receive more work orders more labor will be recruited	2027 to 2031 (5 years)
3.	Green belt zone	Grow more trees	2027 to 2031 (5 years)

8.7. Public Disclosure Process

Hard copies of public consultation meeting minutes will be distributed to all participants. Executive summary of the Environmental Management Plan, written in Myanmar language, will be delivered to key stakeholders.

8.8. Future Program for Public Participation and Consultation

An all-inclusive public consultation meeting will be held every six months at the factory. In this meeting, gender, key stakeholders, administrative personnel, NGOs, and volunteer groups will participate and overview the implementation of the EMP report. Future works will also be discussed.

8.9. Commitments

The factory promises to implement the following commitments.

Table: 8.9-1. Commitment by the factory

No.	Name of Commitment	Description about Commitment	Refer to
1.	Public consultation	The factory and consultancy company have made a firm commitment to collect data without any bias, which includes information on socio-economic, biodiversity, and governing parameters during the survey. It's also confirmed that they have taken a rigorous approach to sourcing all secondary data from local administrative offices to ensure reliability. Moreover, the HSE team's full responsibility towards monitoring the outcome of the public consultation is praiseworthy.	Chapter 8 Article 8.3.

Chapter 9
Environmental Management Plan

Chapter (9)

Environmental Management Plan

9.1. Institutional Requirements

The factory will organize a team to undertake the Health, Safety, and Environmental (HSE) affairs throughout the lifespan of the project. The team leader is responsible for coordination with local authorities, key stakeholders, and the factory. The team formation is shown below.

Table: 9.1-1. HSE team formation for Taungtha factory

No.	Title	Respective Organization	Title in HSE Team
1.	Manager, Maintenance Department	No. (10) Textile Mill, Taungtha	Team Leader
2.	Manager, Production Department	No. (10) Textile Mill, Taungtha	member
3.	Manager, Administration Department	No. (10) Textile Mill, Taungtha	member
4.	Shift Officer Production	No. (10) Textile Mill, Taungtha	member
5.	Shift Officer Maintenance	No. (10) Textile Mill, Taungtha	member
6	Shift Officer Security	No. (10) Textile Mill, Taungtha	member
7.	Medical Officer	No. (10) Textile Mill, Taungtha	member
8.	Administrative Head,	Thaphanpin Village	member
9.	Environmental Consultant	Environmental Company	member

It is an employer's duty to protect the health and safety of their employees and other people who might be affected by the factory. Awareness of biodiversity needs to be educated to the local communities. Employers must do whatever is reasonably practicable to achieve this.

The responsibilities of the HSE team are as follows:

a) Preparing HSE (Health, Safety, and Environmental) plan for the project as per requirements,
b) Ensure compliance with statutory provisions and required documents,
c) Continuously raise awareness about safety amongst employees of the factory,
d) The team has a duty under health and safety law to assess risks in the workplace. Risk assessments should be carried out that address all risks that might cause harm in the workplace.
e) Inform the risks in the workplace and how protection is done, and also instruct and train employees on how to deal with the risks.

f) Consult employees on health and safety issues. Consultation must be either direct or through a safety representative who is either elected by the workforce.

g) In addition, the following plans need to be implemented.

- Emergency Response Plan
- Monitoring Plan
- Fire Fighting Plan
- Corporate Social Responsibility Plan
- Community Grievance Redress Mechanism

9.1.1. Emergency Response Plan (ERP)

The basic function of the emergency response plan (ERP) is to prepare for potential incidents or accidents. It is required to secure a life of workers and safety of the Taungtha factory. The detailed emergency response plan will be fixed during the operational phase according to the current condition of the factory.

Objectives of the emergency response plan are to take the prompt action if emergency cases occur during operation of the factory, and to be able to minimize panic and confusion for operator and factory's workers when an emergency occurs. The emergency response plan is to be applied in all phases of the project and the target area is all around the factory. Related organizations and/or agencies are Township Fire Brigade, Reserved Fire Brigade, Township Red Cross, Township Police Force, Township Health Department, Township Disaster Management Department, Township Development Department, Township Labor Department, Township Social welfare Department, Township General Administration Department, Township Forest Department and Township Rural Development Department. Contents of the plan are as follows:

9.1.1.A. Emergency Response Framework

9.1.1.A.1. Organization of the Emergency Response Team (ERT)

The Emergency Response Team (ERT) will implement to respond to any major incident in a safe, rapid, effective, and efficient manner. This organization will be prepared in the factory. The typical organization charts are shown below and will be used in three operational phases.

Figure: 9.1.1-1. Organization chart for emergency response team (ERT)

Construction Phase

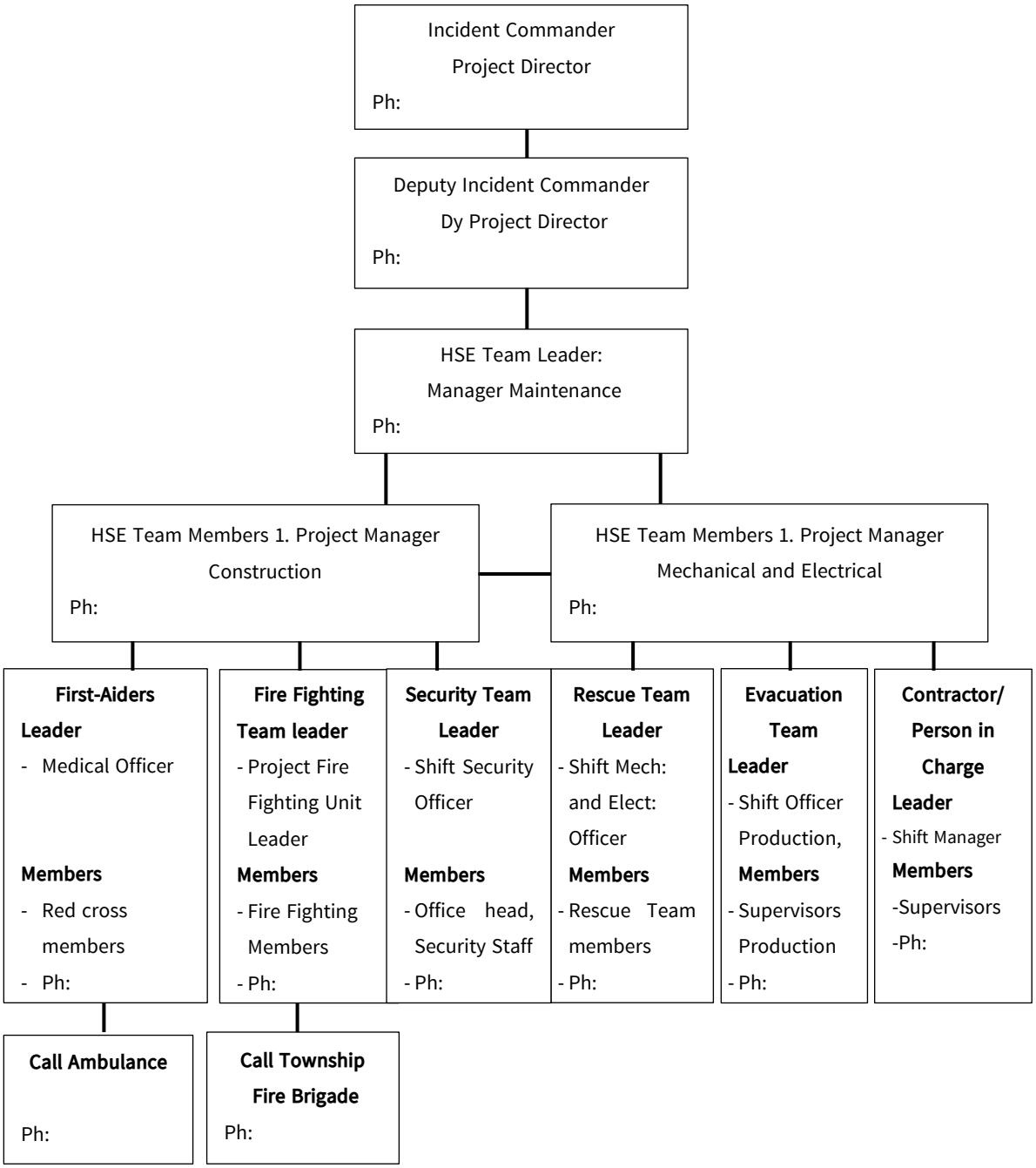


Figure: 9.1.1-2. Organization chart for emergency response team (ERT)

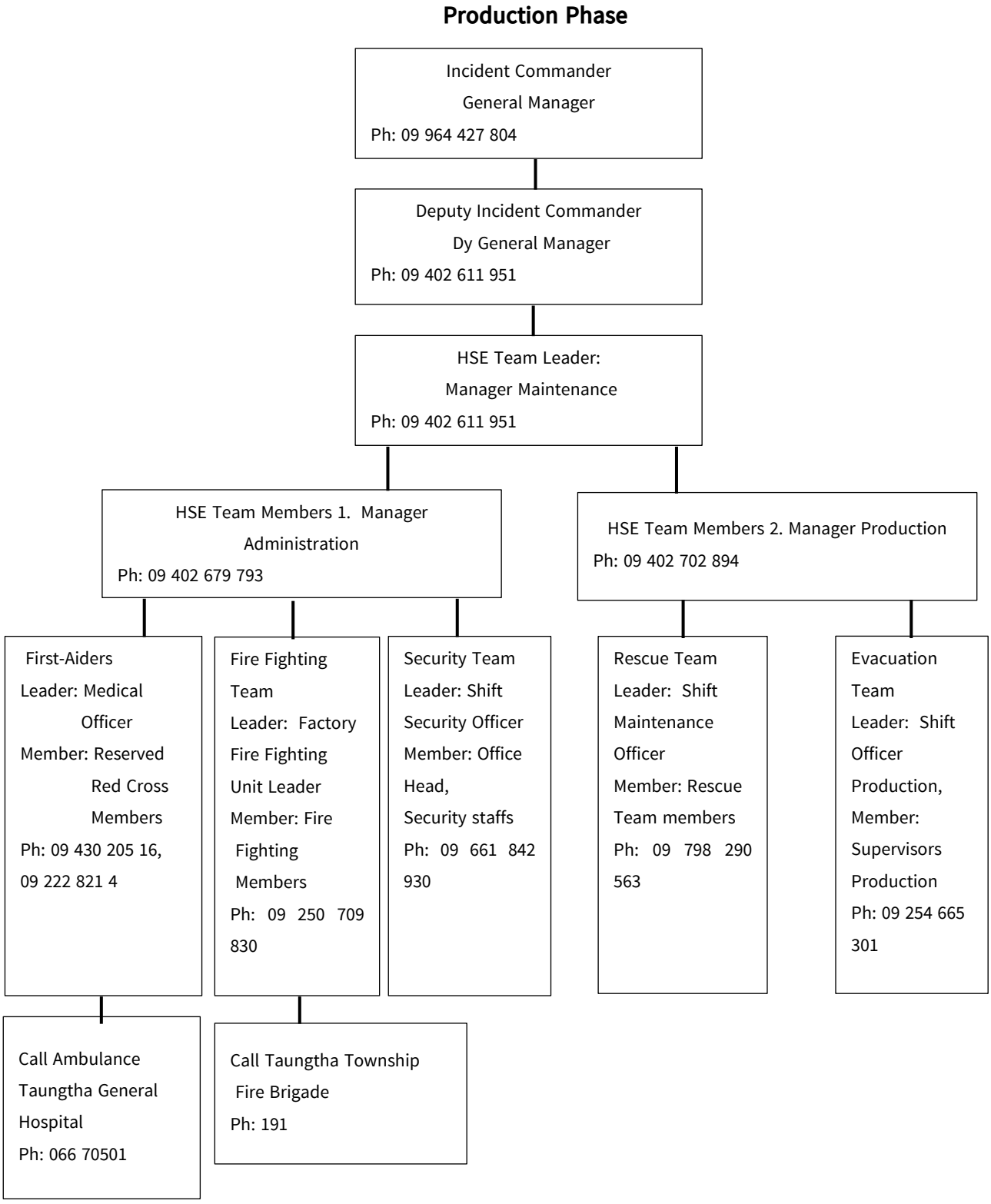
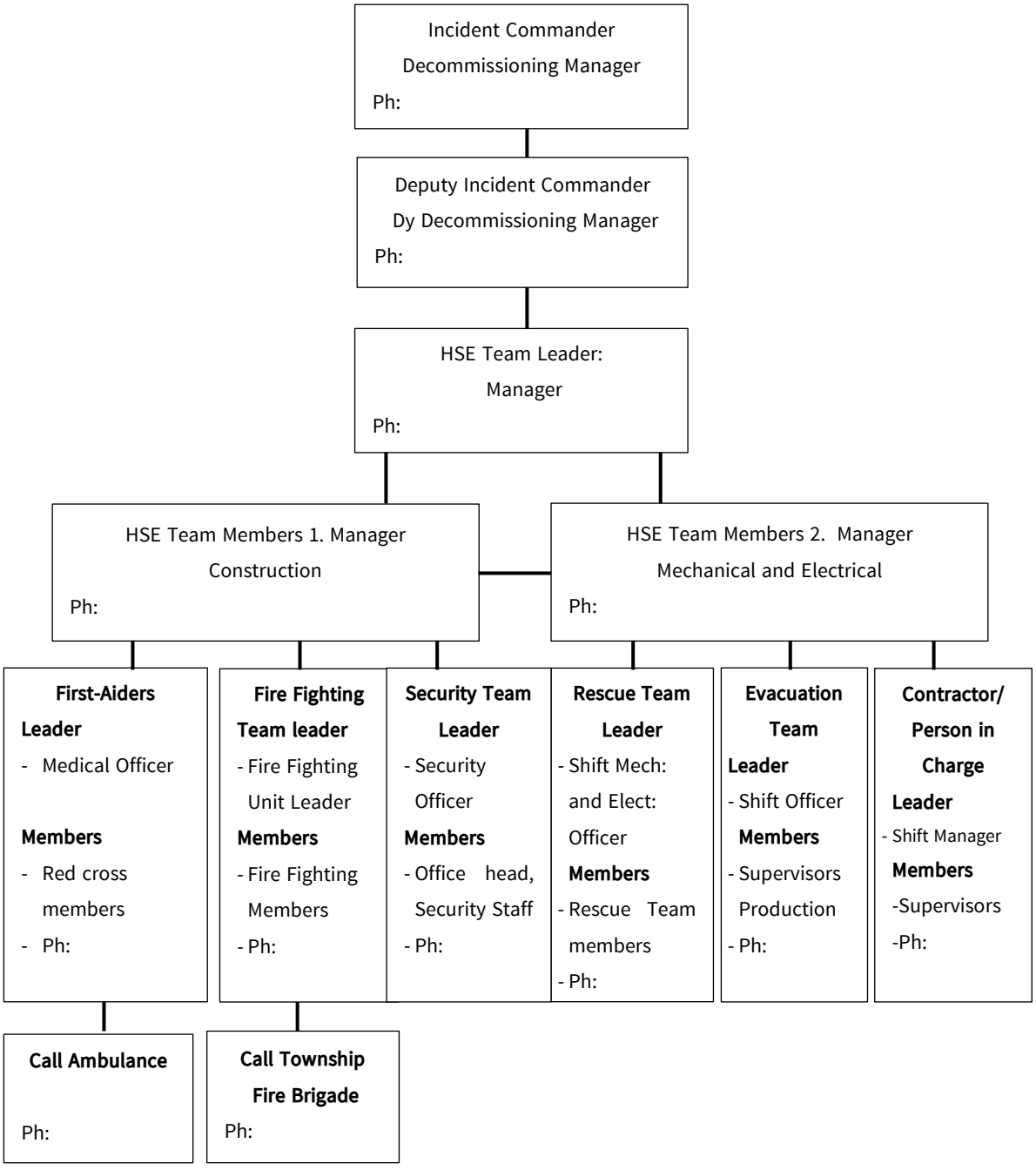


Figure: 9.1.1-3. Organization chart for emergency response team (ERT)

Decommissioning Phase



9.1.1.A.1. (a) Incident Commander

The responsibilities of the Incident Commander are:

1. Forming the site ERT,
2. Overall person in charge in the event of an emergency situation,
3. Provision of adequate resources for the ERT (i.e. manpower, equipment, etc.),
4. In charge of liaising with the related agencies and other stakeholders,
5. Assess the situation of the incident, accident and activate the ERT members for counter measures,
6. Classifying / determining the emergency level,
7. Direct all counter measures and emergency procedures to control and suppress the situation, and decide on the evacuation of the factory.

In construction phase, the project director usually holds a position of the Incident Commander and in production phase and decommissioning phase, general manager and Decommissioning Manager respectively holds the position of Incident Commander.

9.1.1.A.1. (b) Deputy Incident Commander

The responsibilities of the Deputy Incident Commander are:

1. Assist the Incident Commander on the coordination and execution of the site emergency response procedures,
2. To cover the duties of the Incident Commander when he is not at site,
3. Person in charge of coordination and directing of the ERT,
4. Collating and reporting the headcounts of the emergency evacuation to the Incident Commander,
5. Directing the search and rescue of missing personnel.

In construction phase, the deputy project director usually holds a position of the deputy incident commander and in operation phase and decommissioning phase, deputy general manager and deputy decommissioning manager respectively holds the position of deputy incident commander.

9.1.1.A.1. (c) **Health, Safety, and Environmental Team Leader (HSE Officer / HSE Team Leader)**

The responsibilities of the HSE team are:

1. To assist the Incident and Deputy Incident Commander on execution and directing of the factory emergency response procedures,
2. Assist in assembling and coordination with the ERT,
3. Assist in coordinating work at the emergency evacuation assembly area.

In construction phase, the maintenance manager usually holds a position of the HSE team leader, and in operation phase and decommissioning phase, the factory maintenance manager and main contractor respectively hold the position of HSE team leader.

9.1.1. A.1. (d) HSE Team Members

The responsibilities of the HSE team members are:

1. Inform all personnel of the emergency situation,
2. Lock all office documents and shut down all electrical equipment, if possible,
3. Evacuate from their respective work areas calmly upon activation of emergency evacuation,
4. Remove all sensitive documents with them during evacuation, if possible,
5. Assist any personnel who require any help,
6. Conduct headcount and report to the site HSE team leader / Deputy Incident Commander.

In construction phase, the project managers (Construction, and Mechanical and Electrical) usually hold a position of the HSE team members and in operation phase and decommissioning phase, factory administration manager/factory production manager and sub-contractor respectively holds the position of HSE team member.

9.1.1.A.1. (e) Qualified First-Aiders

The responsibilities of the Qualified First-Aiders are:

1. Setting up of the first-aid treatment area at the site emergency evacuation work area,
2. Rendering first-aid to the injured,

3. Coordination, directing and reporting to the external professional medical Personnel,

4.Reporting the status of injured personnel to the Incident Commander / Deputy Incident Commander.

9.1.1. A.1. (f) Fire-Fighting Team

The responsibilities of the Fire-Fighting Team are:

1. Conducting fire-fighting in the event of a fire emergency.
2. Directing personnel to evacuate from the scene of fire.
3. Coordinating the rescue of personnel with the Rescue Team members from the scene of fire.
4. Remove any flammable materials.

9.1.1. A.1. (g) Evacuation Team

The responsibilities of the Evacuation Team are:

1. Set up the site emergency evacuation assembly area upon activation,
2. Liaise with the respective persons in charge from the different companies and work groups and collate the headcounts,
3. Reporting the headcounts to the Deputy to check the number of people present and missing and report the status to the Incident Commander.

9.1.1. A.1. (h) Rescue Team

The responsibilities of the Rescue Team are:

1. Coordinating the evacuation and rescue of personnel.
2. Cooperating with the fire-fighting team on the rescue of personnel.
3. Cooperating with the respective persons in charge of the personnel on the rescue of missing personnel from their working areas.
4. Reporting to the Deputy Incident Commander on the status of their rescue.

9.1.1. A.1. (i) Security Team

The responsibilities of the Security Team are:

1. Inform the site HSE personnel on the workers and contractors manpower on site.
2. Control the site personnel and vehicle traffic movement.
3. Stop all personnel / vehicles from entering the worksite in the event of an emergency.

9.1.1. A.1. (j) Contractors / Persons in Charge

The responsibilities of the Contractors / Persons in charge are:

1. Inform all their personnel of the emergency situation and carry out evacuation when instructed.
2. Ensure all personnel are evacuated from their work areas.
3. Ensure all machineries, equipment, etc. are shut down before leaving the work area.
4. Conduct headcount of their work personnel and report the headcount to the site HSE personnel / Deputy Incident Commander.
5. In the event of missing personnel, inform the rescue teams on the last working area of the missing personnel.
6. Ensure their personnel assemble neatly at their respective positions and wait for further instructions from the factory HSE personnel / Incident or Deputy Incident Commander.

9.1.1.A.2. Emergency Level Determination

The executing institute operates within the hierarchical response framework. The emergency level is determined by the complexity of the incident, the risk to personnel and the public, and the impact on the environment, and is further determined by the need for mobilization of resources. After a no-failure or emergency condition is detected or and/or reported to Incident Commander, he / she is responsible for classifying the event into one of the following three emergency levels.

- Level 1 (Green)

Incident that is short term and can be effectively managed locally utilizing factory facility resources.

- Level 2 (Yellow)

Incident that is middle term, has the potential for off-site impacts and requires assistance from headquarter office / regional /township resources.

- Level 3 (Red)

Incident that is long term, may have wide spread impacts and requires assistance from government office / global resources.

9.1.1.A.3. Communication and Reporting

All personnel first observing or verifying any emergency situation at the factory are responsible for notifying the managing supervisor. Quick notification allows time to provide early warning to ERT and agencies.

(1) Fire Alarms

Fire alarms are activated manually and immediately after personnel discover fire incident. Vocal alarms as per emergency response are given immediately after discovery of an incident to alert personnel.

(2) Accident and Major Incident Reporting Procedure

When an incident occurs, the person who discovers the incident will notify ERT, and then he/she will notify Incident Commander in accordance with organization chart. The Incident Commander will then determine according to emergency level if the headquarter office needs to be notified / activated. If it needs, the Incident Commander will communicate to notify / report the headquarter office and then need to be supported by the headquarter office. The accident and major incident reporting flow is described below.

(3) Injury and Near-Misses

All incidents resulting in injuries or near-misses to personnel, contractor or any visitor must be reported immediately to the Managing Supervisors.

The relevant engineer with the support of the factory HSE Manager/Officer shall investigate all injuries and near-misses immediately, and the details recorded on the Accident/Incident Report. When causative factors have been established, remedial actions shall be implemented without delay.

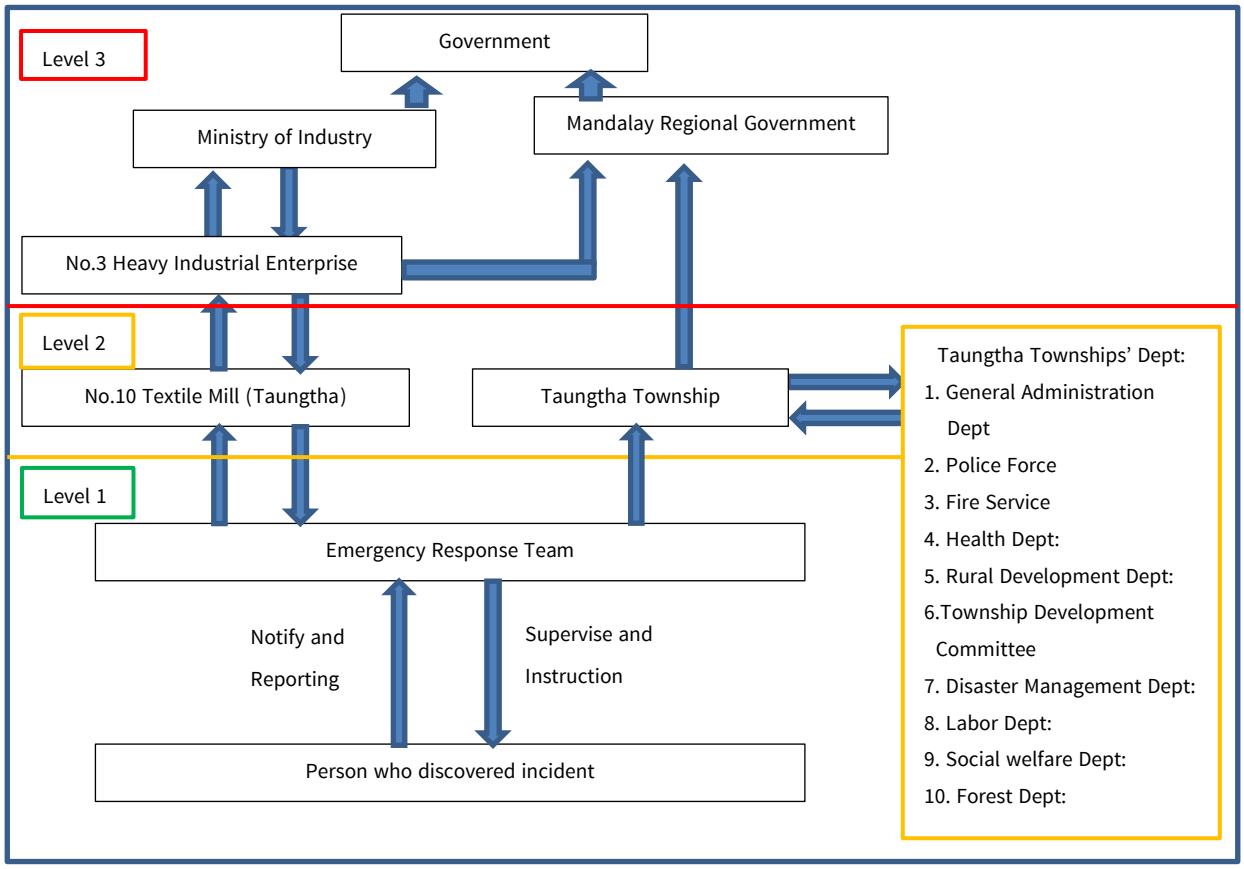
The analysis of Accident Reports will assist in the identification of trend processes and activities occasioning physical injuries and enable the preventive procedures to be made or revised, if necessary. An investigation process and analysis of the accident process should be developed before the operational phase.

(4) Related Agencies Notifications

Incident Commander is responsible for assuring that all required notifications/reports are completed in a timely manner for all incidents. All contacts with regulatory agencies should be properly documented. Typical information to report would be the incident location, type and size of a spill, date and time of the

incident, and other relevant information. The reporting protocol, items and detailed contents should be fixed after discussion with regulatory agencies before the operational phase.

Figure: 9.1.1-4. Typical incident reporting flow



9.1.1.A.4. Emergency Actions

After the Incident Commander determines the emergency condition and emergency level, the emergency response procedures may be taken. The emergency response procedures are organized according to incident scenarios.

The Incident Commander instructs managing supervisors to record the available information, observations, and actions taken on the record for previous section (communication and reporting). The time of changing conditions should be noted on the form and the situation documented with photographs and video, if possible. These actions may be performed directly by personnel or contractor by managing supervisors.

9.1.1.A.5. Scenario Emergency Response Procedures

The purpose of scenario emergency response procedures is to quickly identify the sensitivities that could potentially be affected during an incident and quickly emergency responses to them.

In general, scenario emergency response procedure is made by the following steps.

- Step 1. Identifying hazards and those at risk Looking for those things during plant operation that have the potential to cause harm and identifying things and people who may be exposed to the hazards.
- Step 2. Evaluating and prioritizing risks estimating the existing risks (the severity and probability of possible harm) and prioritizing them in order of importance.
- Step 3. Deciding on emergency responses Identifying the appropriate emergency response to eliminate or control the risks.
- Step 4. Making the emergency response plan Making emergency response scenario including classifying the emergency level based on identifying the appropriate emergency response and through a prioritization of risk.

Scenario emergency response procedures will be made before the operational phase according to the detailed design. This document introduces a scenario emergency response procedure in the following section.

9.1.1.A.6. Scenario Emergency Response Procedure (Example)

Water / wastewater pipe leak response procedure

1. The person(s) discovering the water/ wastewater pipe leak shall raise the alarm by informing the parties responsible / involved in the source of the leak.
2. If the water /wastewater pipe leak is controllable, the responsible party shall shut off the source of water / wastewater pipe leak immediately (e.g. turn off the valves / mains of the water / wastewater pipe, etc.).
3. If the water / wastewater leak is uncontrollable, such as due to the damaged / failure of its containment, damage or rupture of piping / valves, etc. the party responsible shall inform the key personnel, any members of the ERT.

4. The ERT shall response within half an hour (2 hours after office hour) and assess the situation while work together with the facilities management representative for the external help. And at the meantime, the plumber on standby at the site shall be activated.
5. If it is safe to do so, the responsible party shall assist in cordoning off the affected area to prevent further unauthorized entry until the ERT arrives and take over control of the emergency area.
6. If there is an outbreak of fire, the fire-fighting team shall commence to put out the fire.
7. The rescue team shall check for any casualty in the location and conduct rescue.
8. The first-aid team shall administer first-aid treatment if there is any injured.
9. The ERT shall contact the Incident / Deputy Incident Commander and report the status of the emergency.
10. Based on the information given, the Incident / Deputy Incident Commander shall assess the seriousness of the emergency incident and, decide on emergency level and then the next course of action.
11. In the event of the activation of emergency evacuation, the respective person(s) in charge shall commence headcount of their personnel and ensure all their personnel are accounted for. The person(s) in charge shall report their headcount and any missing personnel and their last known location to the site HSE personnel / Deputy Incident Commander immediately.
12. The Incident / Deputy Incident Commander shall liaise with all relevant external parties (i.e. authorities, emergency services, etc.) involved.
13. The Incident / Deputy Incident Commander shall inform the headquarter office and related agencies of the incident / situation and keep him/her informed of the status of the emergency, and an emergency incident report and submit the report to the headquarter office and related departments according to the reporting protocol.
14. The Incident / Deputy Incident Commander shall ensure that all other official documentation required are submitted to the related departments.

9.1.1.B. Training and Drill

On an annual basis, personnel will exercise this ERP by responding to an unscheduled, simulated emergency at the factory. The purpose of this exercise is to check the readiness of personnel and the effectiveness of the ERP, including to find any corrections that need to be made to the ERP. The headquarter office and/or factory administration section will conduct the simulated emergency drill of the ERP. At the end of the drill should be given feedback any deficiencies identified during the simulation.

An annual ERP drill report will be prepared and kept on file that includes the executed scenario, actions and field observations taken during the drill, evaluator recommendations, training and follow-up items.

9.1.1.C. Monitoring Plan for Emergency Response Plan (ERP)

The monitoring plan on the emergency response plan is necessary to reduce and prevent the person injured and environmental impact to the project site and around the project site. The following table shows the responsible organization and method of monitoring.

Table: 9.1.1.C-1. Monitoring plan on emergency response plan (ERP)

Project phase	Monitoring method	Place	Frequency	Project /Factory components	Responsible organization
Construction	Checking record of training and drill	Project site	Monthly	Construction site	Construction contractor, No. (3) Heavy Industrial Enterprise, Ministry of Industry,
Production	Checking record of training and drill	Factory and nearby areas	Monthly	-Production Department,	ERT, HSE, No. (3) Heavy Industrial Enterprise, Ministry of Industry.
Decommissioning	Checking record of training and drill	Factory demolishing area	Monthly	-Demolishing site	Decommissioning Contractor, ERT, HSE, No. (3) Heavy Industrial Enterprise,

					Ministry of Industry.

9.2. Fire Protection and Fire Fighting Plan

The objectives of the fire protection plan are to minimize the likelihood of a fire breakout, to be extinguished within a very short time, and to minimize the spread of fire within the factory and to neighboring areas. All staffs working in the factory need to understand the contents of the fire prevention plan so that they know what they must do. Regular exercises need to be conducted to test how well firefighting plan works and make sure that staff understands what to do. The drill should be conducted in regular basic. The firefighting plan should include the following points:

1) Activities at the factory

One of the main causes of fire breakouts is a process operation activity.

Fire prevention plan must provide details of the different types of activities such as blowing section which open the cotton bale and clean the cotton with high-speed beaters and transporting with pressurized pipe, carding section which carries out cleaning the cotton and shaping to sliver, machine shop with welding activities, and any other activities that could be a fire risk.

2) Site plans and maps

a) Layout of buildings

Any areas where hazardous materials are stored on site (location of gas cylinders, process areas, piles of combustible wastes, oil and fuel tanks).

b) Main access routes for fire engines and any alternative access points around the site perimeter to assist fire hydrants, water supply, and building emergency exit.

c) Pollution control features such as drain closure valves and fire water containment systems.

d) storage areas with pile dimensions and fire walls (where applicable) - includes wastes stored in a building, bunker, or containers the quarantine area

3) Manage common cause of fire

4) Build-up of loose combustible waste, dust and fluff
5) Reactions between wastes

   Need to be followed up procedure for waste acceptance checks to prevent reactions between incompatible or unstable wastes.

6) Prevent self-combustion

   Many wastes can self-combust under certain conditions. Self-combustion happens when a material which can self-heat generates heat at a faster rate than it can be lost to the environment. Eventually the material reaches auto-ignition and the material then self-combust.

7) Water supplies
8) Managing fire water
9) Schedule for fire drill

9.3. Emergency Preparedness

The emergency preparedness and response plan are prepared for accidental fire breakout, earthquake and flood. The factory is committed to the safety and well-being of its staffs. Upholding this commitment requires planning and practice.

9.3.1. Emergency Preparedness for Fire Breakout

Table: 9.3.1-1. Fire emergency evacuation plan

When fire breakouts	✓ Pull fire alarm
	✓ Call 191
	✓ Contain the fire
	✓ Evacuate
	✓ Extinguish
Fire extinguisher only if	✓ When you are trained
	✓ Make sure you have unobstructed exit
	✓ Little smoke or flames
	✓ Check everyone else left
Never fight fire if	✓ Lack a safe way to escape
	✓ Unsure the type of extinguisher
Upon being notified about the fire: occupants must	✓ Leave the building using designated escape route
	✓ Assembled in the designated area
	✓ Remain outside until the official announcement that is safe to reenter
Designated official must do	✓ Coordinate an elderly evacuation

	✓ Provide necessary information about the building to firefighting officials
	✓ Determine emergency rescue method to seek missing persons
Area/floor monitors must do	✓ Ensure that all employees have evacuated
	✓ Report to Evacuation team leader
Assistant to physically disable	✓ Assist to all physically disable persons

Emergency fire evacuation plan chart is to be posted in every corner of the buildings.

9.3.2. Emergency Preparedness for Earthquake

Earthquakes are more common in the Myanmar. Different intensities earthquake hit Myanmar 100 years ago. Necessary measures need to be prepared for emergency evacuation plan if earthquake hit Taungtha region. On March 28, 2025, an earthquake measuring 7.7 in magnitude struck the Sagaing, Mandalay areas. No casualties were reported from the factory. Due to its location along the Sagaing Fault, Taungtha Township is highly vulnerable to seismic events and the potential for significant damage from future earthquakes. It is crucial to prepare earthquake evacuation plan.

In the event of an earthquake the procedures are as follows:

- Stay away from large windows, shelving systems, or tall room partitions.
- Get under a desk, table, door arch, or stairwell, if none of these are available: move against an interior wall and cover your head with your arms.
- Remain under cover until the movement subsides. After the shaking stops, survey your immediate area for trapped or injured persons and ruptured utilities (water, gas, etc.) If damage has occurred in your area, inform Township Fire Service Department (FSD) immediately.
- If it is safe to do so, remain at your location and await further instructions from rescue team from Myanmar Fire Service Department.
- Do not evacuate until instructed by emergency personnel.

After an earthquake:

- Put on enclosed shoes to protect against broken glass.
- If the power is out, use a flashlight. Never use light a match or candle.
- Be alert for safety hazards such as fire, electrical wires, pipe leaks, etc.

- Check on others. If there are injuries or other urgent problems, report them to Safety and Security Officer.
- Give or seek first aid. Assist any disabled persons in finding a safe place for them.
- Evacuate if the building seems unsafe or if instructed to do so:
- Use stairs, not elevators.
- Unplug small electrical appliances.
- Be prepared for aftershocks.
- Cooperate with emergency personnel, keep informed, and remain calm

9.3.3. Emergency Preparedness for Flood

Flooding is one of the major hazards and the most devastating natural disasters in Myanmar. Emergency preparedness for imminent or actual flood is as follows:

- Secure vital equipment, records, and other important papers.
- If present in your area, report all hazardous materials (physical, biological) to fire fighting and rescue team.
- Move to higher, safer ground.
- Shut off all electrical equipment.
- Do not attempt to drive or walk through flooded areas.
- Wait for further instructions on immediate action from Safety and Security.
- If the building must be evacuated, follow the instructions on MFSD.
- Do not return to your building if you have been evacuated by flooding until you have been instructed to do so by authority.

9.4. Environmental Management Plan

The objectives of the Environmental Management Plan are as follows:

- To identify the potential environmental impacts
- To minimize and mitigate these impacts
- To continuously monitor the implementation of EMP
- To allocate the budget for each phase.

The identification of potential environmental impacts was carried out in three different stages: construction stage, production stage and decommissioning stage, followed up by mitigation measures to minimize these impacts. The life span of EMP is as same as the factory does; the monitoring process is conducted by the Health, Safety and Environment (HSE) team which is broadly formed with the responsible persons from the factory, stakeholders, villagers, administrative personnel from nearby villages/ward, environmental experts, township labor officer, township public health officer, township development committee officer, *parahita* organizations, and volunteers. The purpose of mitigation measures is to minimize the impacts caused by the factory and in order to implement these measures, the allocation of budget is very crucial. As State Owned Enterprise (SOE), the No. (3) Heavy Industrial Enterprise needs to ask for budget allocation from the government. The Environmental Management Plan for Taungtha factory is presented in the following Table 9.4.-1.

Table: 9.4.-1. Environmental Management Plan for Taungtha factory

Environmental impact		**Project/ factory activities**	**Impact's significance before measures**	**Mitigation measures**	**Responsible party**	**Residual impact's significance after measures**
Construction Phase						
Impact on environmental resources	Soil pollution	-Top soil removal -Site cleaning and earthwork excavation	Low	▪ Top soil to be generated during construction activity will be preserved and used for the greenbelt development. ▪ Other excavated earth from the construction activity will be used for the backfilling and leveling in low-lying areas. ▪ Greenbelt development will have a significant impact on reduction of the soil erosion.	Will be carried out by Public Works and Taungtha project.	Very low
	Surface water	Construction materials	Low	▪ Measure will be implemented to prevent	Will be carried out by Public	Very low

	contamination	were stockpiled and a drainage system was constructed to discharge runoff water which includes sediment, heavy metals, and litter from site clearing and earth work excavation.		leakage of liquid waste into ground which may contaminate ground water and soil. ▪ Prompt cleaning up of the accidental spillages will be ensured. ▪ Measures will be taken to prevent contamination of hydrological features by leakage and spillage of diesel, grease, oil etc. derived from the working area. ▪ The machinery equipment will be maintained in good operating condition. ▪ Specially designated areas will be created for vehicle maintenance. ▪ Provision will be made to ensure the construction vehicles follow the access track to prevent mud and dirt being deposited on roads. ▪ All mud and dirt deposited on the roads from the construction activities will be cleaned regularly.	Works and Taungtha project.	
	Air pollution	-Site cleaning, earthwork, backfilling, landfill, and transportation of construction materials were done by using heavy duty vehicles. -Dust caused by the activities of	Low	▪ Use of plastic cover sheet while transporting construction material at site. ▪ Storage of sand and other dispersible material by covering with tarpaulin sheet. ▪ Keeping minimum inventory stock of sand and other such dispersible material at site. ▪ The heights, from which materials to be dropped, will be the minimum particle height to limit	Will be carried out by Public Works and Taungtha project.	Very low

		these vehicles affect the air quality in the construction area. Emission from the vehicles and emergency diesel generator.		fugitive dust generation. ▪ Use of water sprinkling system at site for dust suppression. ▪ Provision of barricade sheet or steel sheet of minimum 5-meter heights to protect the surrounding area from dust. ▪ Adequate PPE will be provided to construction workers. ▪ Proper maintenance for diesel truck vehicles. ▪ Green belt zone around the factory is created.		
	High noise exposure	-Source of noise at the construction site will be mainly vehicles, heavy duty trucks, noise generating equipment, emergency diesel generators, air compressors, different type of mobile cranes, concrete mixers, wheel loaders, bull dozer and excavator. -The activities of large vehicles move to and from the construction	Low	▪ The noise generated from construction machinery will be kept low by keeping the moving parts serviced and properly lubricated. ▪ The vehicles will be properly maintained. ▪ Adequate PPE will be provided to the workers. ▪ Greenbelt will be developed which will have significant impact in reduction of the noise.	Will be carried out by Public Works and Taungtha project.	Very Low

		site anytime during daylight hours. -Noise was generated by large vehicles in loading yards.				
	High-level electric and magnetic field effect	Temporarily, 33 KV power line was constructed from Myingyan station to the factory. The power line cables were embedded and one pair overhead line was built for emergency purpose. The electricity system produces extremely low-frequency electromagnetic field which comes under Non ionizing radiations which can cause health effects.	Low	▪ Necessary measures to be conducted to reduce the electromagnetic field effect. ▪ Cables embedment was done properly in accordance with the safety standard level. ▪ Areas under 33 KV line to be kept clean.	Will be carried out by Public Works and Taungtha project.	Very low
Positive impact on socio-economic development	Job creations	Temporary job creation at construction site (masonry,	Positive	▪ Mitigation matters were not required. ▪ Contribution to the socio-economic development of the region as well as regional development.	Ministry of Industry No. (1)	

		carpenter, electrician, painter, welder) Development of infrastructure and other utilities such as (school, road, electricity, treated water, and child day care center)				
Impact on ecological resources	Flora and fauna and aquatic ecology	Construction of factory buildings. -Vibration and noise caused by use of heavy vehicles. -Surface water contamination caused by construction material	Low	▪ Selection of debris disposal area carefully. ▪ Landfill area should be designated not affecting the lives of animals. ▪ Greenbelt plantation was started at the beginning of the project.	Will be carried out by Public Works and Taungtha project.	Low
	Occupational health and safety	-Physical hazards such as dust, noise, vibrations -unplanned collision caused by vehicular movement. -electric shock caused by unskilled workers and negligence of work safety	Low	▪ Designated work site area. ▪ Temporary fencing to protect outsiders coming in. ▪ Cautionary sign board to be hang. ▪ First aids box be ready. ▪ Safety gears such as helmet, googles, gloves and booth to be provided. ▪ Develop and maintain an effective safety and health program. ▪ Provide safety training for construction workers.	Factory project	Very low

		-other accidents caused by unprecedent factors: such as poor quality of construction material, heavy construction vehicle unfitness.				
	Solid waste disposal	-Debris collected from construction site	Low	▪ Flammable items to be burned. ▪ Inflammable items to be buried. ▪ Landfill area to be designated.	Will be carried out by Factory project.	Very low
Production phase						
Impact on environmental resources	Surface-water contamination	Surface water contaminati-on due to factory's activities	Very low	▪ Well-designed stormwater network will be provided to collect rainwater from the entire factory area.	Will be carried out by HSE team, Taungtha factory.	Very low
	Ground water contamination	Groundwater contaminatio n due to the factory's activities	Low	▪ Deep well water (approximately 500 feet) will be bored. ▪ All raw materials as well as the oils and lubricants will be stored in a dedicated storage area with impervious flooring to restrict/control leakages and prevent groundwater contamination.	Will be carried out by HSE team, Taungtha factory.	Very low
	Air pollution	-Emissions from DEG sets, factory vehicles and vehicles passing through on Meikhtilar-Myingyan road, factory	Low	▪ DEG should have an adequate height. ▪ Proper maintenance for diesel truck vehicles. ▪ Sprinkling on the road. ▪ Wear mask as PPE. To ensure optimal air quality inside the main factory building in compliance with OSHA standard	Will be carried out by HSE team, Taungtha factory.	Very low

		activities inside the main factory building				
	Noise level and vibration	Manufacturi-ng activities; operation of 100 sewing machines which generate noise exposure and other production machineries and other activities (transportat-ion of raw materials and finished products).	High	▪ To minimize the adverse effect on the health, Earmuffs/ earplugs are provided to the workers working under high noise areas such as spinning section. ▪ Install latest technology based on low noise DEG sets with acoustic enclosures. Install the noise barriers/absorbers around stationery noise sources, viz. pumps, compressors and blowers etc. ▪ Adequate noise control measures such as anti-vibration pad for equipment with high vibration are provided. ▪ Proper and timely oiling, lubrication and preventive maintenance are done regularly. ▪ All the vibrating parts are checked periodically and serviced to reduce the noise generation. ▪ Noisy equipment are enclosed in sound proofing enclosures to give residual sound pressure lower than 70 dB (A). ▪ Green belt acts as a barrier to the propagation of noise from the factory premises. It reduces the noise levels appreciably. Hence, there isn't any adverse impact to the nearby present human settlement. ▪ Vehicular movements during	Will be carried out by HSE team, Taungtha factory.	Low

				operation phase for loading/unloading of raw and finished materials and other transportation activity may increase noise level. Speed limit sign should be posted inside the factory. ▪ The transport contractors are instructed to keep vehicle periodically serviced and maintained as per the requirement of the latest trend in automobile industry.		
	Soil contamination	Soil was contaminated due to the factory activities: hazardous waste storage and handling	Very Low	▪ Regular maintenance of plants and machinery is carried out and proper care is taken while loading, unloading, and transfer of materials to avoid any soil contamination. ▪ The entire plant area flooring is made up of concrete except open ground cover for greenbelt development to prevent any seepage and leakage into the soil surface. No spillage is allowed in open ground.	Will be carried out by HSE team, Taungtha factory.	Very low
	Impact of Light Intensity	Low light intensity causes employees' health problems.	Low	▪ Provide adequate light to the factory.	Will be carried out by HSE team, Taungtha factory.	Very low
	Impact on occupational health and safety	Major occupational health and safety issues are caused by exposure to cotton dust, chemicals, exposure, high noise and	Low	▪ Machine designs should be improved. ▪ Inverter drive control to be used to control noise in ring frame. ▪ Proper maintenance lubricating control noise. ▪ Proper cleaning. ▪ Workers need to wear PPE ▪ Proper lighting condition ▪ Keep your backbone straight while lifting load.	Will be carried out by HSE team, Taungtha factory.	Very low

		ergonomic issues and hazards.		▪ Pull the load as close to the body. ▪ Lift and carry loads with straight arms. ▪ Check fire hydrant and sprinkler system. ▪ Restrict unauthorized person to do welding. ▪ Safety sign and workers must be aware of not using any ignition products.		
		Electrical hazard		▪ Avoid improper earthing and loose connection. ▪ All circuits to be closed in a proper circuit. ▪ Moisture to keep in control. ▪ Circuit breaker must be individual. ▪ Use of wires as per Electrical standard. ▪ Input wire must be more power than output wire. ▪ Avoid looping.		
		Mechanical Hazard		▪ Needs preventive maintenance. ▪ Awareness training for workers. ▪ Preventive measures to be carried out to achieve zero accident. ▪ Regular preventive machine maintenance to be conducted. ▪ Protective equipment to be in place. ▪ Work safety awareness training to be provided.		
		Chemical hazard		▪ Proper chemical selection ▪ Engineering control ▪ Administrative control ▪ Personal protective equipment (PPE) ▪ Emergency preparedness ▪ Waste and effluent management		

		Fire hazard		▪ Monitoring ▪ Flammable material such as cotton yarn, lubricants, chemicals and petrol need to be stored in separately. ▪ It's important to store the products with enough space in a systematic way to allow for natural ventilation. This helps to prevent the buildup of heat that can be generated by the garment. ▪ Protective gears need to be accessible and workable such as fire hydrant, fire extinguisher, fire engine, emergency kit, ladder, fire helmet, gloves, and smoke detector. ▪ Fire drill to be held monthly. ▪ Fire exit to be reachable. ▪ Emergency respond team to be ready 24/7.		
	Potential Impact on Biodivers-ity	Most of the negative impact comes from factory activities	Low	A negative biological environment is inevitable if the factory doesn't act, to the following measures: ▪ plan for the conservation of the biological environment, ▪ comply with law, rules, and regulations; the Protection of Wild Life and Protected Area Law, 1994, Conservation of Environment Law, 2012 and Regulation 2014, ▪ control the dust caused by emergency diesel generators, and truck movement activities have a direct effect on the soil quality which leads to degraded biodiversity, ▪ plan the minimum disturbance to the flora	Will be carried out by HSE team, Taungtha factory.	Low

				when conducting factory activities, ▪ grow more trees around the factory to create a green belt maintaining good practice of biodiversity, ▪ litter is strictly prohibited because it is a common cause of fatalities to wildlife and domestic stock.		
	Impact on Road Traffic	Unplanned vehicle collision at the factory area	Low	▪ Rumble strips are used primarily to reduce road collisions. ▪ Speed limit sign to be fixed before the factory. ▪ Enough illumination should be done in front of the factory. ▪ Road safety awareness training to be held. ▪ Prepared and maintained readiness for implementing an emergency rescue plan for road accidents.	Will be carried out by HSE team, Taungtha factory.	Very low
	Impact on solid waste disposal	The factory delivers a variety of solid waste	Low	**For hazardous waste disposal** ▪ The factory has provided a dedicated area for hazardous waste storage within premises having impervious flooring, roof cover, and leachate collection facility, ▪ discarded containers/bags are sold to local scrap vendors. **For non-hazardous wastes disposal** • such as plastic, metal, glass, paper, cupboard, wood, rubber, and kitchen waste are disposed to the designated garbage collecting area approved by the township development committee. ▪ spent/used oil and	Will be carried out by HSE team, Taungtha factory.	Very low

				lubricant generation from plant and machinery will be sold to the registered reprocessors. **Record keeping** Factory maintains records-keeping procedures with provisions for: ❖ Tracking collections of waste materials at the factory and delivering to the recycling, reuse and salvage. ❖ Records on logs for each department that include the type of material, weight, recycling and reuse and date accepted by recycling service and reuse from the production department, and disposal. ❖ Proper documentation ensures that waste materials are effectively managed and disposed of in a safe and environmentally friendly manner.		
	Impact on 33 KV line	High Level Electric and Magnetic Field Effect.	Low	▪ Necessary measures to be conducted to reduce the electromagnetic field effect. ▪ Cabling was done properly in accordance with the safety standard level. ▪ Areas under 33 KV line to be kept clean.	Will be carried out by HSE team, Taungtha factory.	Very low
Decommissioning Phase						
Impact on environmental Resources	Air pollution	Gaseous and dust emission from the activities of decommissioning of the factory.	Low	▪ Use of plastic cover sheet while transporting debris from demolition works. ▪ Use of water sprinkling at the site for dust suppression. ▪ Provision of barricade sheet or steel sheet of minimum	Demolition contractor, Environmental Consultancy Company will carry out.	Very low

				5-meters heights to protect the surrounding area from dust. ▪ Adequate PPE will be provided to the workers. ▪ Proper maintenance for diesel truck vehicles. ▪ Green belt zone around the site is created.		
	Water pollution	Activities related with decommissioning works and waste disposed by decommissioning workers. Oil spillage from demolition machinery equipment.	Low	▪ Prompt cleaning up of the accidental spillages will be ensured. ▪ Measures will be taken to prevent contamination of hydrological features by leakage and spillage of diesel, grease, oil etc. derived from the demolition area. ▪ The machinery equipment will be maintained in good operating condition. ▪ Specially designated areas will be created for vehicle maintenance. ▪ Provision will be made to ensure the transportation vehicles follow the access track to prevent mud and dirt being deposited on roads. ▪ All mud and dirt deposited on the roads from the demolition activities will be cleaned regularly. ▪ Make sure drainage system for temporary works and sewage system for workers.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low
	Noise and Vibration	Operation of heavy vehicles and equipment from decommissioning activities.	Low	▪ The noise generated from demolition machinery such as excavators with drilling vibrators and transport vehicles will be kept low by keeping the moving parts serviced and properly lubricated.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low

		Vehicular movement for transport of debris from the site.		▪ The vehicles will be properly maintained. ▪ Adequate PPE will be provided to the workers. ▪ Greenbelt will be developed which will have a significant impact in the reduction of the noise. ▪ High noise generating demolition works would be confined to less sensitive times of the days not outside the hours of 7 am to 6 pm Monday to Saturday.		
	Soil contamination	Accidental spills or releases and leakage of grease and oils from machinery and equipment of demolition.	Low	▪ Maintain demolition machinery properly. ▪ Grow trees at work sites.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low
Impact on biodiversity	Endanger the biodiversity	Demolition of the building causes huge impact on soil, water, and air.	Moderate	▪ Keep forest green.	Land Owner	Low
Impact on human	Occupational health and safety	Exposure to dust and noise risks of accidents caused by fire, mechanical, and electrical hazards. Cause communicable disease transmitted by outsiders.	Low	▪ Prepare demolition plan prioritizing safety measures. ▪ Sprinkling the building during the time of using hydraulic vibrator. ▪ Need to wear PPE. ▪ Necessary preventive measures will be conducted to achieve zero accidents. ▪ Emergency medical response team and first aid be ready. ▪ No admission sign should be in place in the working areas.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low

				▪ Be aware of communicable disease during demolition stage. ▪ Fire engine should be in place.		
	Local socio economic conditio-ns	Temporary recruitment to demolish the factory.	Low	▪ The unemployment rate will increase. ▪ Only temporary jobs were assigned for short periods.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low
Waste disposal	Solid waste	Debris from demolition site and domestic waste from temporary workers.	Low	▪ Debris to be sold out for recycling purposes (for example: beams to be recycled to the foundry shop). ▪ Non-recycle debris to be disposed to the designated areas. ▪ Some to be used for landfill.	Demolition contractor, Environmental Consultancy Company will carry out.	Very Low
	Liquid waste	Sewage from temporary site camp	Low	▪ Appropriate hygienic sewage management system to be conducted.	Demolition contractor, Environmental Consultancy Company will carry out.	Very low

9.5. Sub-Environmental Management Plan (Sub-EMPs)

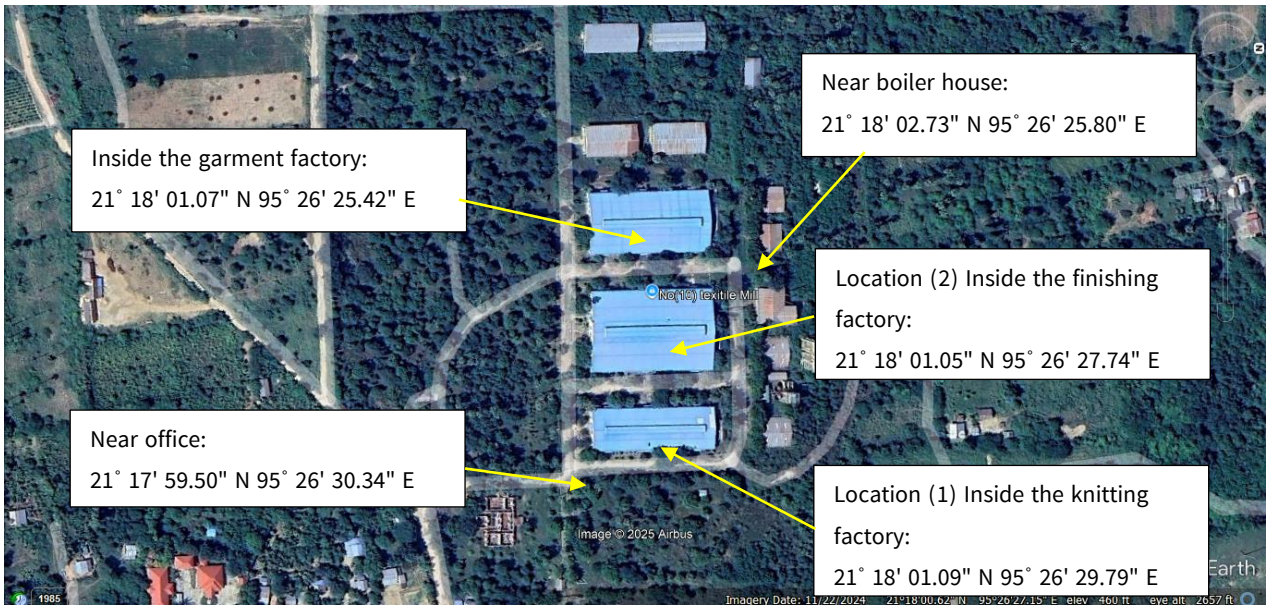
9.5.1. Air Quality Management Plan

Table: 9.5.1-1. Air quality management plan

<table>
<tr><th>Element</th><th>Content</th></tr>
<tr><td>Objectives</td><td>• Ambient air quality in the factory meets the prescribed standards through the production phase.
• Community concerns and complaints about air quality are to be addressed quickly.
• The OSHA standard aims to protect workers from the respiratory hazards associated with cotton dust exposure, such as byssinosis (brown lung disease).</td></tr>
<tr><td>Performance indicators</td><td>• Information collected from the complaint center concerning air quality below the standard.</td></tr>
<tr><td>Sources</td><td>The main sources are the emissions from buses, trucks, boiler and diesel generator that could adversely affect the local air quality in and near the factory.</td></tr>
<tr><td>Applicable standard</td><td>Applicable ambient air quality standard is as follows:
NEQEG 2.3.2.1 Textile Manufacturing. Air Emission Levels
<table>
<tr><td>Pollutant</td><td>Not to be Exceeded</td></tr>
<tr><td>Particulates</td><td>50 mg/Nm^3 for stack emission 30 minutes</td></tr>
<tr><td>Volatile organic compounds</td><td>2/20/50/75/100/1 150 total carbon</td></tr>
<tr><td>Ammonia</td><td>30 mg/Nm^3</td></tr>
<tr><td>Carbon disulfide</td><td>150 mg/Nm^3</td></tr>
</table>
</td></tr>
</table>

	<table><tr><td>Chlorine</td><td>5 mg/Nm^3</td></tr><tr><td>Formaldehyde</td><td>20 mg/Nm^3</td></tr><tr><td>Hydrogen sulfide</td><td>5 mg/Nm^3</td></tr></table> The factory produces knitted T-shirt, sports shirt and vest by mechanically and chemically manufacturing methods. The factory will take full responsibility to measure and mitigate all the above parameters if it emits polluted chemicals to air. **OSHA standard**: For cotton industry air quality, OSHA's standard (29 CFR 1910.1043) sets a permissible exposure limit (PEL) of 200 µg/m³ of lint-free respirable cotton dust, averaged over an eight-hour period.
Mitigation measures	▪ Emergency diesel generator stack should have adequate height. ▪ Diesel will be used for DEG sets and the factory will provide adequate height for proper dispersion of gaseous emission into the atmosphere. ▪ Proper maintenance for diesel truck vehicles. ▪ Sprinkling on the road. ▪ All employees need to wear masks as PPE. ▪ To ensure optimal air quality inside the main factory building in compliance with OSHA standard, the air conditioning and ventilation system, dust collector, chillers must be operated to maintain a relative humidity of 65%.
Monitoring	**Air quality** Location (1) Inside the knitting factory: 21˚ 18' 01.09" N 95˚ 26' 29.79" E Location (2) Inside the finishing factory: 21˚ 18' 01.05" N 95˚ 26' 27.74" E Location (3) Inside the garment factory: 21˚ 18' 01.07" N 95˚ 26' 25.42" E Location (4) Near boiler house: 21˚ 18' 02.73" N 95˚ 26' 25.80" E Location (5) Near office: 21˚ 17' 59.50" N 95˚ 26' 30.34" E
Reporting	If more than one complaint is raised in the preceding more frequently. Report to MONREC and the Ministry of Industry once every six months.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry
Estimated cost	4 million MMK/year

Figure: 9.5.1-1. Air quality monitoring GPS points



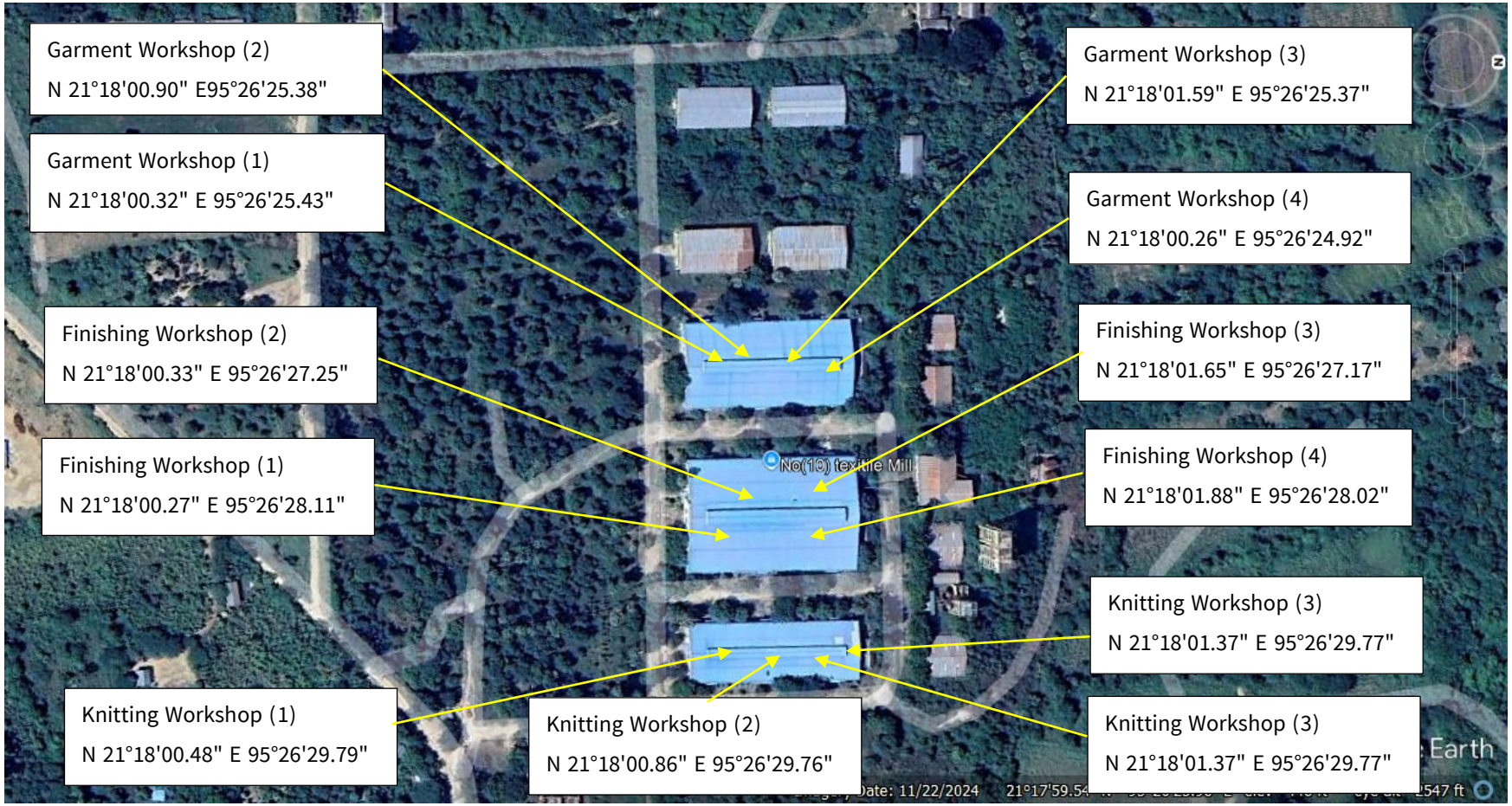
9.5.2. Noise Level Management Plan

Table: 9.5.2-1. Noise level management plan

<table>
<tr><th>Element</th><th>Content</th></tr>
<tr><td>Objectives</td><td>• To minimize the adverse effect on the health to the workers working under high noise areas such as knitting and sewing sections.
• To ensure that the noise level at the identified sensitive receptors will not exceed the maximum limits prescribed by NEQEG 1.3 General Guideline values.</td></tr>
<tr><td>Performance indicators</td><td>• Ambient noise level compared to standard value.
• Data collected from the medical center concerning hearing problems among workers.</td></tr>
<tr><td>Sources</td><td>The main source, garment section where 100 sewing machines sit at the same floor under one roof which generates noise and some other production areas.</td></tr>
<tr><td>Applicable standard</td><td>Applicable noise maximum limit is as follows:
NEQEG 1.3 Noise level
<table>
<tr><td>Pollutant</td><td>Not to be Exceeded</td></tr>
<tr><td>Industrial sound level</td><td>70 dBA daytime 07:00-22:00</td></tr>
<tr><td>Industrial sound level</td><td>70 dBA nighttime 22:00-07:00</td></tr>
</table>
OSHA Standard 90 dBA for 8 working hours</td></tr>
<tr><td>Mitigation measures</td><td>▪ Install the noise barriers/absorbers around stationery noise sources, viz. pumps, compressors and blowers etc.
▪ Proper and timely oiling, lubrication and preventive maintenance are done regularly.
▪ All the vibrating parts are checked periodically and serviced to reduce noise generation.
▪ Noisy equipment is enclosed in soundproofing enclosures to give residual sound pressure lower than 90 dB (A).
▪ Green belt acts as a barrier to the propagation of noise from the factory premises. It reduces the noise levels appreciably. Hence, there isn’t any adverse impact on the nearby present human settlement.
▪ Vehicular movements during the operation phase for loading/unloading of raw and finished materials and other transportation activities may increase noise levels.
▪ Speed limit sign should be posted inside the factory.
▪ The transport contractors are instructed to keep vehicles periodically serviced and maintained as per the requirement of the latest trends in the automobile industry.</td></tr>
<tr><td>Monitoring</td><td>Monitor the noise level in the production department of the Taungtha factory once per month.
Location (1) Garment Workshop-1: 21°18'00.32" N 95°26'25.43" E
Location (2) Garment Workshop-2: 21°18'00.90" N 95°26'25.38" E
Location (3) Garment Workshop-3: 21°18'01.59" N 95°26'25.37" E
Location (4) Garment Workshop-4: 21°18'00.26" N 95°26'24.92" E
Location (5) Knitting Workshop-1: 21°18'00.48" N 95°26'29.79" E
Location (6) Knitting Workshop-2: 21°18'00.86" N 95°26'29.76" E
Location (7) Knitting Workshop-3: 21°18'01.37" N 95°26'29.77" E
Location (8) Knitting Workshop-4: 21°18'00.85" N 95°26'29.75" E
Location (9) Finishing Workshop-1: 21°18'00.27" N 95°26'28.11" E
Location (10) Finishing Workshop-2: 21°18'00.33" N 95°26'27.25" E
Location (11) Finishing Workshop-3: 21°18'01.65" N 95°26'27.17" E
Location (12) Finishing Workshop-4: 21°18'01.88" N 95°26'28.02" E</td></tr>
<tr><td>Reporting</td><td>Report to MONREC and Ministry of Industry once every six months.</td></tr>
</table>

Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	0.2 million MMK/year

Figure: 9.5.2-1. Noise level monitoring points

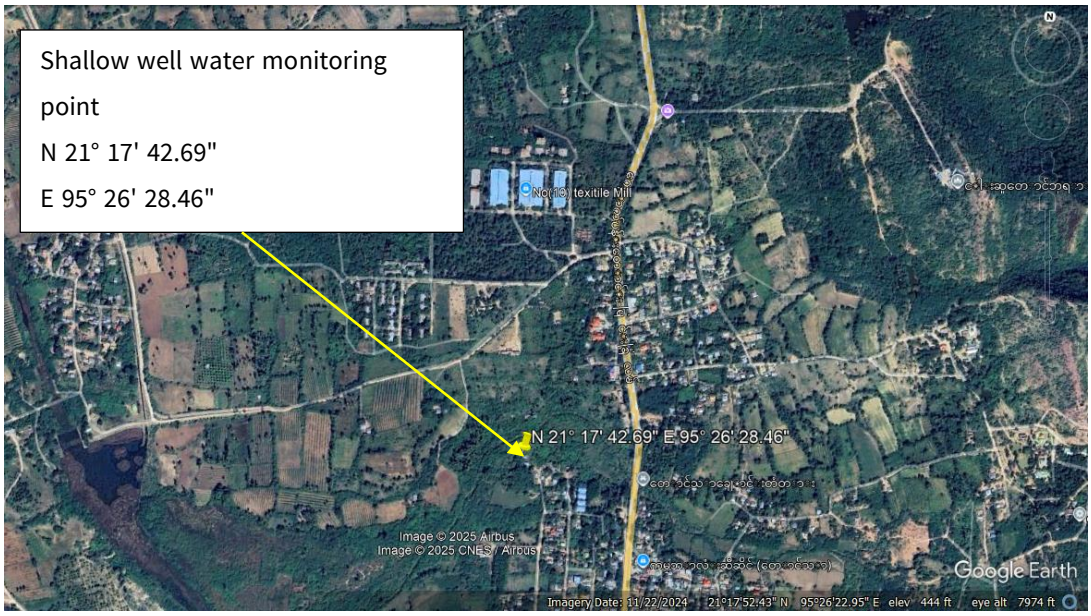


9.5.3. Surface water/Shallow well water Management Plan

Table: 9.5.3-1. Well water management plan

<table>
<tr><td>Element</td><td>Content</td></tr>
<tr><td>Objectives</td><td>• To make sure that groundwater quality is suitable to be used and contamination-free.</td></tr>
<tr><td>Performance indicators</td><td>• Number of complaints from nearby communities.
• Data collected from nearby village's water quality.</td></tr>
<tr><td>Sources</td><td>Wastewater discharged from the factory</td></tr>
<tr><td>Applicable standard</td><td>WHO drinking water standard.
<table>
<tr><th>No.</th><th>Quality Parameter</th><th>Units</th><th>WHO Drinking Water Standard</th></tr>
<tr><td>1.</td><td>pH</td><td>_</td><td>6.5-8.5</td></tr>
<tr><td>2.</td><td>Turbidity</td><td>FNU</td><td>5 FNU</td></tr>
<tr><td>3.</td><td>Conductivity</td><td>mS/m</td><td>400</td></tr>
<tr><td>4.</td><td>Color</td><td>mg Pt/l</td><td>15</td></tr>
<tr><td>5.</td><td>Chloride (Cl)</td><td>mg/l</td><td>250</td></tr>
<tr><td>6.</td><td>Sulphate (SO_4)</td><td>mg/l</td><td>500</td></tr>
<tr><td>7.</td><td>Potassium (K)</td><td>mg/l</td><td>12</td></tr>
<tr><td>8.</td><td>Magnesium (Mg)</td><td>mg/l</td><td>50</td></tr>
<tr><td>9.</td><td>Calcium (Ca)</td><td>mg/l</td><td>250</td></tr>
<tr><td>10.</td><td>Total hardness</td><td>mg/l</td><td>500</td></tr>
<tr><td>11.</td><td>Total solid</td><td>mg/l</td><td>500</td></tr>
<tr><td>12.</td><td>Total dissolved solid</td><td>mg/l</td><td>500</td></tr>
<tr><td>13.</td><td>Iron (Fe)</td><td>mg/l</td><td>0.3</td></tr>
<tr><td>14.</td><td>Manganese (Mn)</td><td>mg/l</td><td>0.4</td></tr>
<tr><td>15.</td><td>Arsenic (As)</td><td>µg/l</td><td>10</td></tr>
<tr><td>16.</td><td>Lead (Pb)</td><td>µg/l</td><td>10</td></tr>
<tr><td>17.</td><td>Zinc (Zn)</td><td>µg/l</td><td>500</td></tr>
</table></td></tr>
<tr><td>Mitigation measures</td><td>▪ it is imperative to install the multimedia filtration system.</td></tr>
<tr><td>Monitoring</td><td>Monitoring of the well water quality will be carried out every six months.
Location: Shallow well water near Taungtha creek: N 21° 17' 42.69" E 95° 26' 28.46"</td></tr>
<tr><td>Reporting</td><td>Report to MONREC and Ministry of Industry once in every six months.</td></tr>
<tr><td>Responsible Agency</td><td>No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry</td></tr>
<tr><td>Estimated cost</td><td>0.5 million MMK/year</td></tr>
</table>

Figure: 9.5.3-1: Shallow well water monitoring GPS points



9.5.4. Effluent Management Plan

Currently, the factory has stopped manufacturing process and no effluent is discharged. If the factory reestablished and run again in the future, a proper multimedia filtration system would be installed. The effluent will be treated in WHWWTP to comply with NEQEG 2.3.2.1 guidelines. After that, the treated effluent from WHWWTP will be filtered again in multimedia filtration system before discarding to nearby area. The following management plan should be implemented.

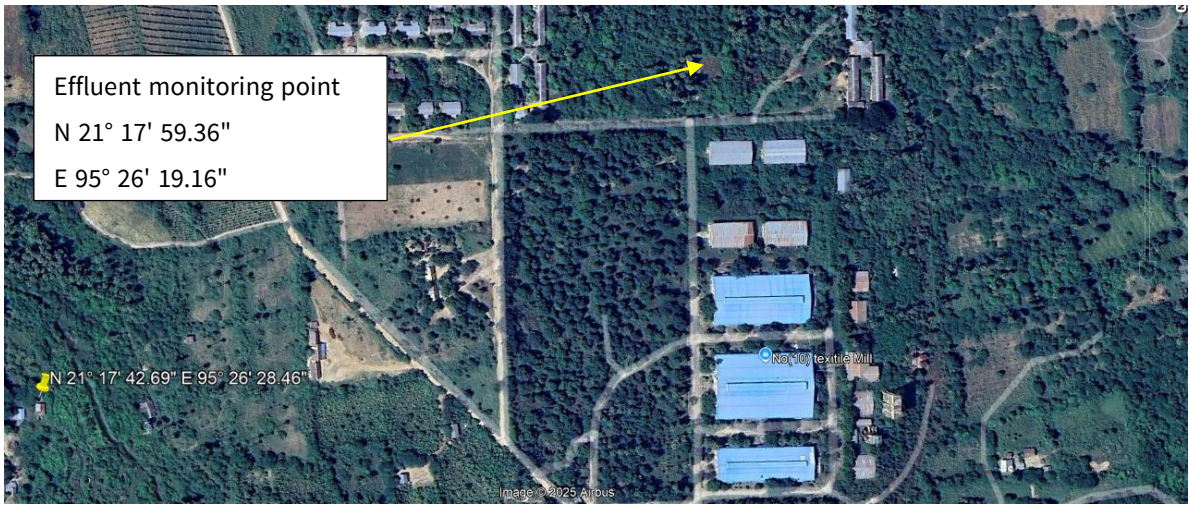
Table: 9.5.4-1. Effluent management plan

<table>
<tr><th>Element</th><th>Content</th></tr>
<tr><td>Objectives</td><td>• To ensure that the effluent generated from the production department and sewage from the factory will be adequately treated before discharging to the drain.</td></tr>
<tr><td>Performance indicators</td><td>• Number of complaints related to effluent disposal.
• Data collected from effluent quality after treatment at WHWWTP.</td></tr>
<tr><td>Sources</td><td>Currently, no effluent is discharged from the factory.
Sewage collected from the whole factory.</td></tr>
<tr><td>Applicable standard</td><td>The applicable effluent limit is as follows:
NEQEG 2.3.2.1 Textile Manufacturing (Effluent level)
<table>
<tr><td>Pollutant</td><td>Not to be Exceeded</td></tr>
<tr><td>5 days Biochemical oxygen demand</td><td>30 mg/l</td></tr>
<tr><td>Adsorbable organic halogens</td><td>1 mg/l</td></tr>
<tr><td>Ammonia</td><td>10 mg/l</td></tr>
<tr><td>Cadmium</td><td>0.02 mg/l</td></tr>
<tr><td>Chemical oxygen demand</td><td>160 mg/l</td></tr>
<tr><td>Chromium (hexavalent)</td><td>0.1 mg/l</td></tr>
</table></td></tr>
</table>

	Chromium (total)	0.5 mg/l
	Cobalt	0.5 mg/l
	Color	7/5/3 nm
	Copper	0.5 mg/l
	Nickle	0.5 mg/l
	Oil and grease	10 mg/l
	Pesticides	0.05-0.10 mg/l
	pH	6-9 (Standard Unit)
	Phenol	0.5 mg/l
	Sulfide	1 mg/l
	Temperature increase	<3
	Total coliform bacteria	400 for 100 ml
	Total nitrogen	10 mg/l
	Total phosphorous	2 mg/l
	Total suspended solids	50 mg/l
	Zinc	2 mg/l

Mitigation measures	▪ Proper collection and handling of industrial effluent will be done to prevent any seepages and leakages. ▪ Well-designed stormwater network will be provided to collect rainwater from the entire plot area. ▪ All raw materials and the products will be stored in a dedicated storage area with impervious flooring to restrict/control leakages. ▪ Install adequate administrative and infrastructural setup for the continuous and efficient operation of waste water treatment plant and take necessary care during the treatment and handling of effluent. ▪ Any spillage will be washed and directed to the WHWWTP via a network of drains and sub-surface pipelines. ▪ Contaminated stormwater, if any, will be diverted to WHWWTP for further treatment. ▪ Maintain the performance of the Water Hyacinth Wastewater Treatment Plant (WHWWTP) in a regular basic.
Monitoring	Monitoring of the effluent quality after treatment at WHWWTP will be carried out every six months. Location: Wastewater treatment pond (WHWWTP): N 21° 17' 59.36" E 95° 26' 19.16"
Reporting	Report to MONREC and Ministry of Industry once in every six months.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	1.5 million MMK/year

Figure: 9.5.4-1. Effluent monitoring GPS points



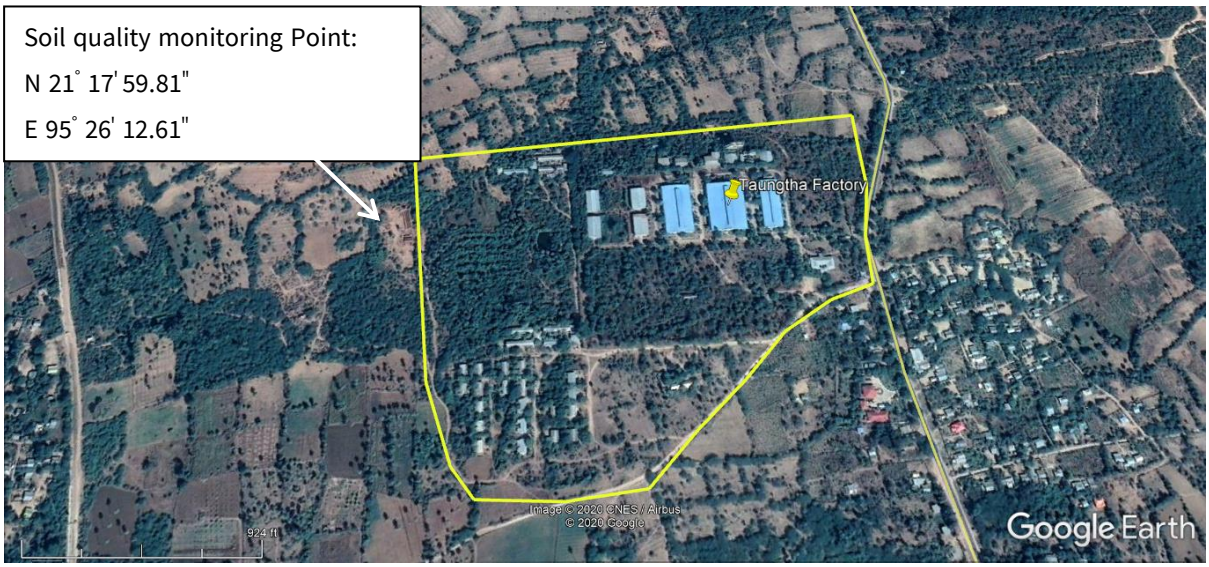
9.5.5. Soil Contamination Management Plan

Table: 9.5.5-1. Soil contamination management plan

<table>
<tr><th>Element</th><th>Content</th></tr>
<tr><td>Objectives</td><td>• To make sure that soil quality should be suitable to grow and contamination free.</td></tr>
<tr><td>Performance indicators</td><td>• Number of complaints from farmers.</td></tr>
<tr><td>Sources</td><td>Effluent discharged from production department, lubricants and petrol spillage and sewage collected from the factory.</td></tr>
<tr><td>Applicable standard</td><td>The applicable soil quality is as follows:
Soil quality (WHO) standard
<table>
<tr><th>Soil Properties</th><th>Suitable Soil Quality (WHO Standards)</th></tr>
<tr><td>pH</td><td>5.5-8.0</td></tr>
<tr><td>Texture</td><td>Sandy-loan</td></tr>
<tr><td>Organic matter %</td><td>3-6</td></tr>
<tr><td>Phosphorous (ppm)</td><td>(25-50)</td></tr>
<tr><td>Nitrogen (N ppm)</td><td>(10-50)</td></tr>
<tr><td>Potassium (K ppm)</td><td>40-80</td></tr>
<tr><td>Calcium (Ca ppm)</td><td>430-540</td></tr>
<tr><td>Sodium (Na ppm)</td><td><40</td></tr>
<tr><td>Magnesium (Mg ppm)</td><td>40-50</td></tr>
</table></td></tr>
<tr><td>Mitigation measures</td><td>▪ Regular maintenance of plants and machinery is carried out and proper care is taken while loading, unloading, and transfer of materials to avoid any soil contamination.
▪ The entire plant area flooring is made up of concrete except open ground cover for greenbelt development to prevent any seepage and leakage into the soil surface. No spillage is allowed in open ground.</td></tr>
<tr><td>Monitoring</td><td>Monitoring of the soil quality will be carried out every six months.
Location: Cultivated land N 21° 17' 59.81" E 95° 26' 12.61"</td></tr>
<tr><td>Reporting</td><td>Report to MONREC and Ministry of Industry once in every six months.</td></tr>
</table>

Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	0.6 million MMK/year

Figure: 9.5.5-1. Soil quality monitoring GPS point



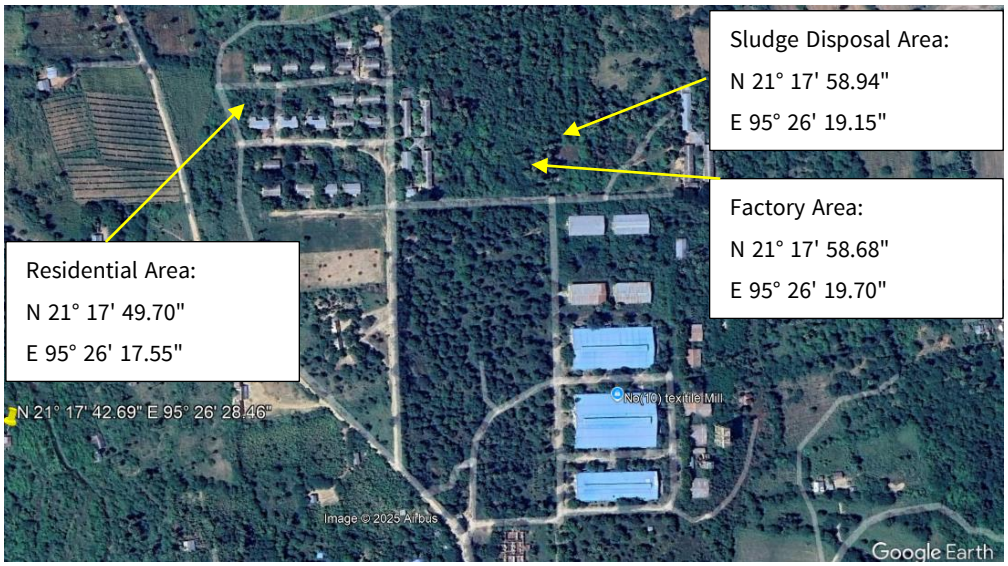
9.5.6. Solid Waste Management Plan

Table: 9.5.6-1. Solid waste management plan

Element	Content
Objectives	• To minimize public health and environmental impacts. • To maximize the 3 R' reduction, reuse, and recycling of waste.
Performance indicators	Complaints by villagers concerning solid waste disposal.
Sources	Factory discharges hazardous and non-hazardous waste.
Applicable standard	Solid waste disposal complies with rules and regulations issued by MONREC and the local township development committee.
Mitigation measures	**For hazardous waste disposal** ▪ The factory has provided a dedicated area for hazardous waste storage within premises having impervious flooring, roof cover, and leachate collection facility, ▪ discarded containers/bags are sold to local scrap vendors. **For non-hazardous waste disposal** ▪ Domestic wastes; such as plastic, metal, glass, paper, cupboard, wood, rubber, and kitchen waste are disposed to the designated garbage collecting area approved by the township development committee. ▪ Spent /used oil and lubricant generation from plant and machinery will be sold to the registered reprocessors. **Record keeping** Factory maintains record-keeping procedures with provisions for: ❖ Tracking collections of waste materials at the factory and delivering them to recycling,

	reuse, and salvage. ❖ Records on logs for each department that include the type of material, weight, recycling, and reuse date accepted by recycling service and reuse from the production department, and disposal. ▪ Implement 3R waste collecting and recycle system and introduce to nearby communities.
Monitoring	Monitor the implementation of mitigation measures on a monthly basis. Location: Residential Area N 21° 17' 49.70" E 95° 26' 17.55" Factory Area: N 21° 17' 58.68" E 95° 26' 19.70"
Reporting	Report to MONREC and the Ministry of Industry every six months.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	Including the cost of the monitoring system.

Figure: 9.5.6-1. Solid waste disposal areas GPS points



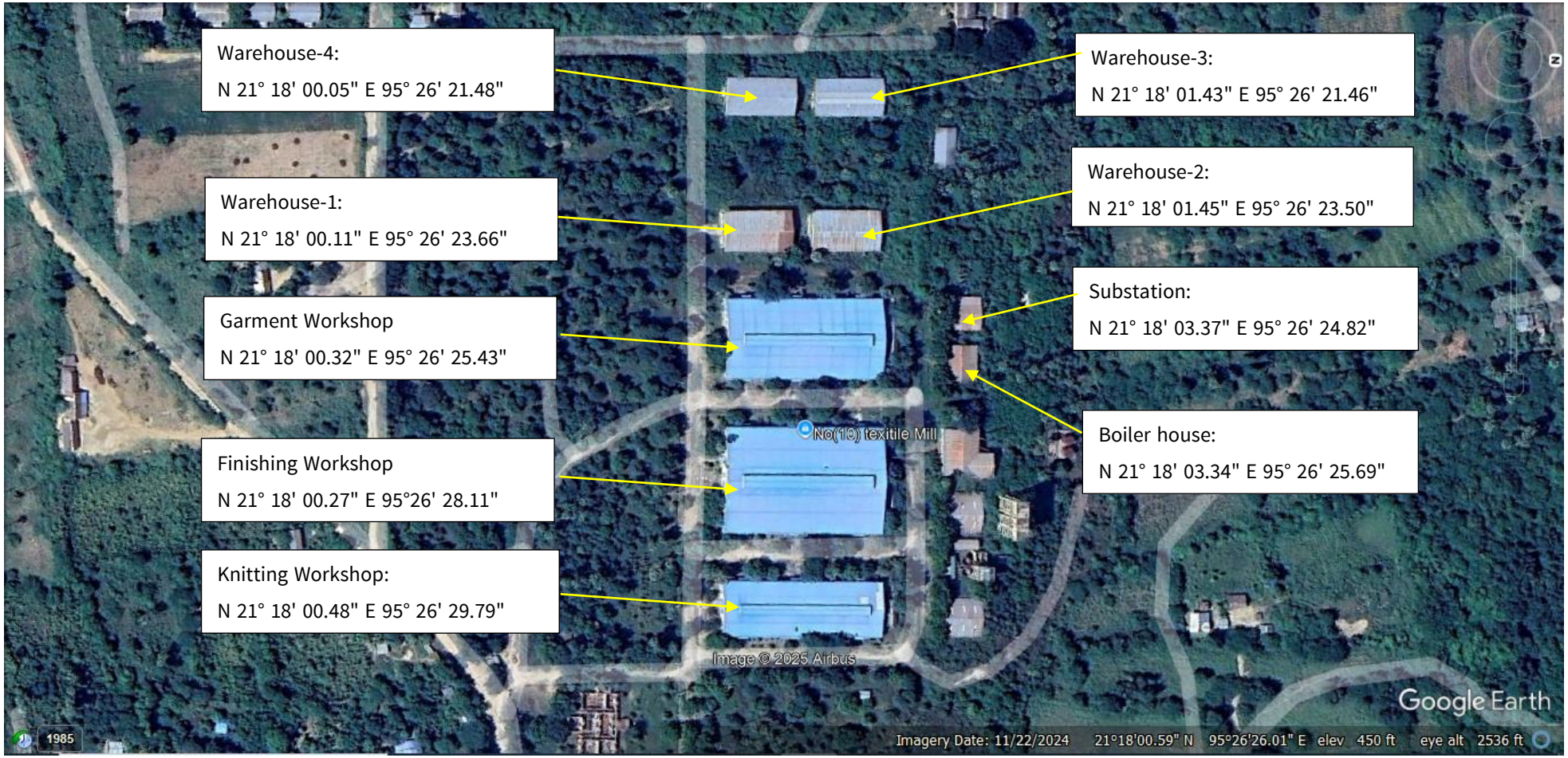
9.5.7. Occupational Health and Safety Management Plan

Table: 9.5.7-1. Occupational health and safety management plan

Element	Content
Objectives	▪ To make sure the best occupational health and safety practice
Performance indicators	▪ Injury treatment frequency record ▪ Working hours record ▪ Accident record ▪ Complaints from workers.
Sources	Public safety will be managed in the traffic management plan and workers' safety will be secured by this occupational health and safety (OHS) management plan under good working conditions.
Applicable standard	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.
Mitigation measures	Creating an effective **Occupational Health and Safety (OHS) Plan** for the factory is essential to prevent accidents, protect worker health, and ensure compliance with legal and industry standards. **For mechanical hazard** • Install machine guards and safety interlocks. • Provide regular maintenance and inspections.

	• Train operators on safe machine handling. • Implement lockout/tagout (LOTO) procedures. • Use anti-fatigue mats to reduce strain during long hours at machines. **For electrical hazard** • Ground all electrical equipment properly. • Regularly inspect and maintain wiring and circuits. • Train staff on electrical safety protocols. • Clearly mark high-voltage areas. • Use Residual Current Devices (RCDs) where necessary. **For chemical hazard** • Install proper ventilation and exhaust systems. • Use PPE like masks or respirators where necessary. • Conduct air quality monitoring. • Store chemicals in labeled, ventilated areas. • Use eco-friendly, low-toxicity dyes and finishes when possible. **For fire hazard** • Install fire alarms, extinguishers, and sprinkler systems. • Conduct regular fire drills and training. • Ensure clear access to emergency exits. • Store flammable materials in compliance with fire safety codes. • Use flame-retardant materials in construction and furnishings. **Health Monitoring & Emergency Response** • Conduct regular health check-ups. • Set up an on-site first-aid station with trained personnel. • Maintain emergency contact lists. • Create an emergency response plan for injuries, fires, or chemical spills.
Monitoring	OHS performance will be checked through: ▪ Daily informal inspections ▪ Weekly formal inspections of the workplace. ▪ Monitoring results will be discussed in the HSE monthly review meetings. Monitoring points: 1. Knitting Workshop: N 21°18'00.48" E 95°26'29.79" 2. Finishing Workshop: N 21°18'00.27" E 95°26'28.11" 3. Garment Workshop: N 21°18'00.32" E 95°26'25.43" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48"
Reporting	Report to MONREC and the Ministry of Industry twice a year.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry.
Estimated cost	Including the cost of monitoring system.

Figure: 9.5.7-1. Occupational health and safety monitoring points

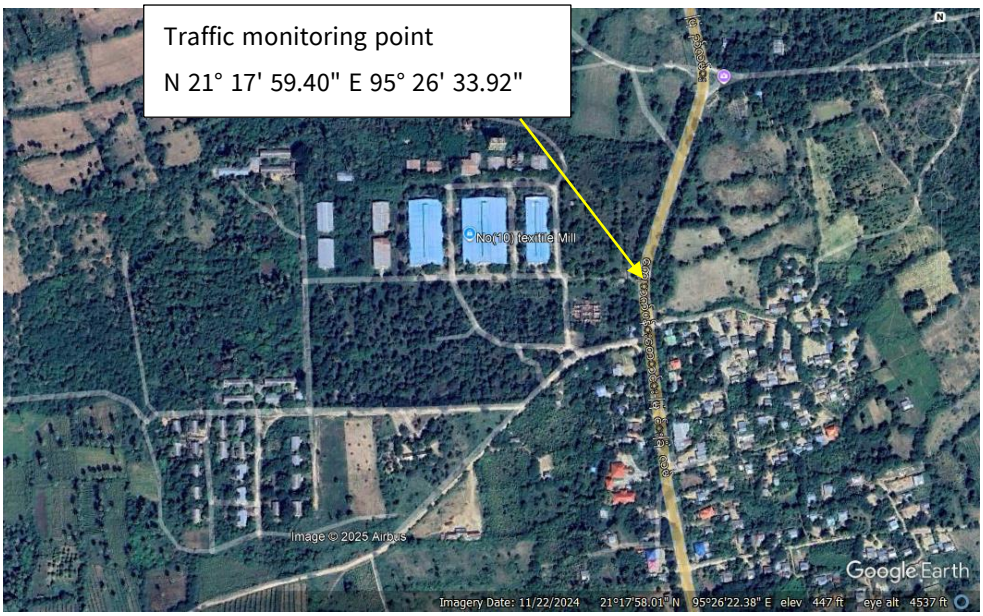


9.5.8. Traffic Management Plan

Table: 9.5.8-1. Traffic Management Plan

Element	Content
Objectives	To reduce road accidents in front of and inside the factory.
Performance indicators	Records for road accidents. Hospital records for injuries and casualties by road accidents
Sources	Township police force and Taungtha township Hospital.
Applicable std:	Myanmar Police Act
Mitigation measures	▪ Rumble strips are used primarily to reduce road collisions. ▪ Speed limit sign to be fixed before the factory. ▪ Enough illumination should be done in front of the factory. ▪ Road safety awareness training to be held. Prepared and maintained readiness for implementing an emergency rescue plan for road accidents.
Monitoring	Monitor the implementation of mitigation measures twice a year. Check the frequently road accident occurring places. Location: Infront of the factory, Meikhtilar-Myingyan Road: N 21° 17' 59.40" E 95° 26' 33.92"
Reporting	Report to MONREC and the Ministry of Industry twice a year.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	Including the cost of the monitoring system.

Figure 9.5.8-1. Traffic management monitoring GPS points



9.5.9. Emergency Response Sub Plan

Table 9.5.9-1. Emergency response sub plan

Element	Content
Objectives	The objective of the emergency response plan (ERP) is to prepare for potential incidents or accidents.
Performance indicators	Fire warning records at the factory. Natural disaster warning records from meteorological department. Earthquakes records from meteorological department. Safety records for occupational hazards at the factory.
Sources	Factory, metrological department, natural disaster management department.
Applicable std:	Natural disaster management law (2013)
Mitigation measures	▪ Checking record of training and drill. ▪ Prepare and maintain readiness for implementing an emergency response plan for incidents, accidents, fire breakout and natural disasters.
Monitoring	Monitor the implementation of mitigation measures twice a year. Check the frequently accidents and natural disaster occurring places. 1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"
Reporting	Report to MONREC and the Ministry of Industry twice a year.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	Including the cost of the monitoring system.

Figure: 9.5.9-1. Emergency response sub plan GPS points

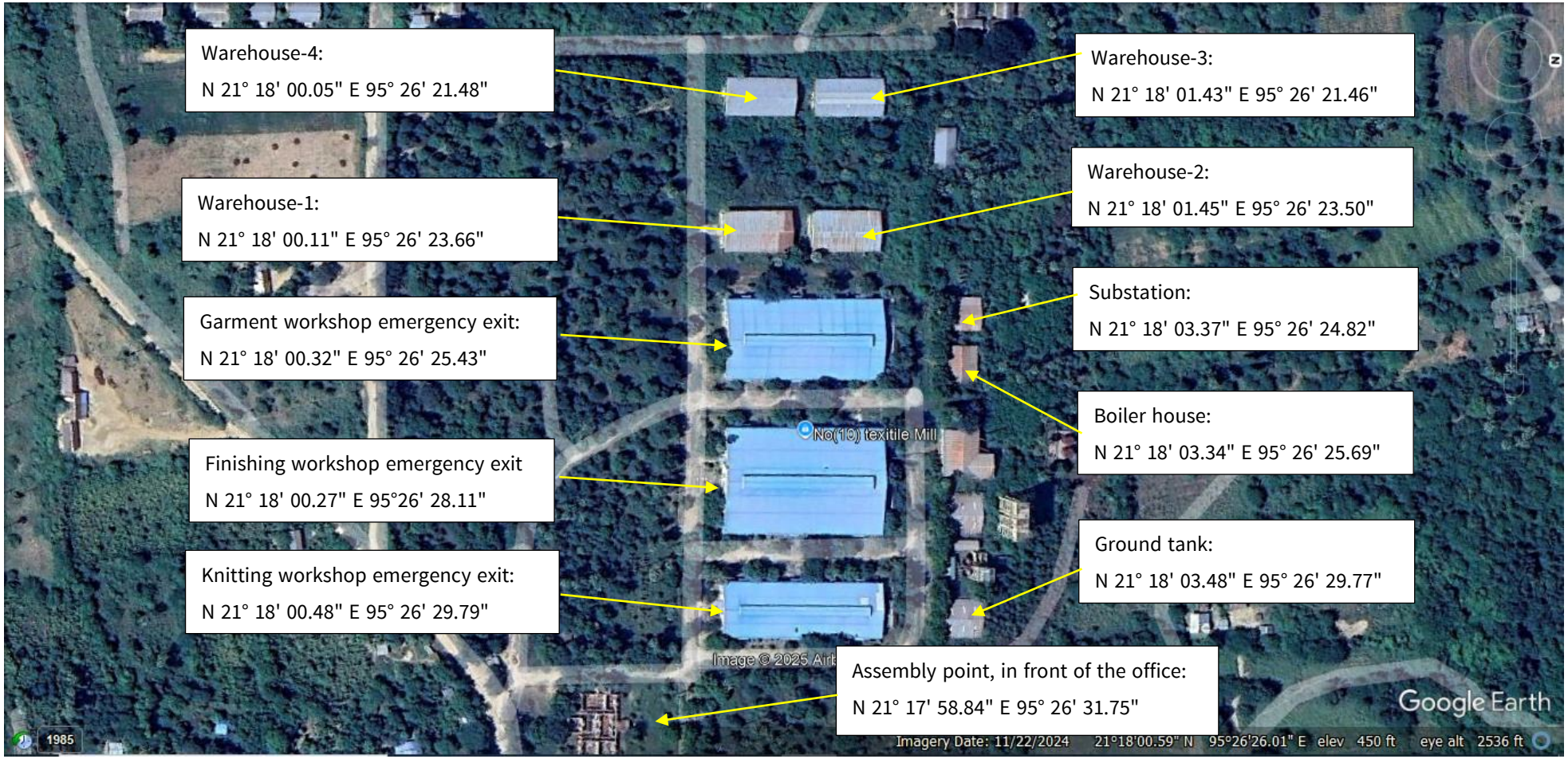
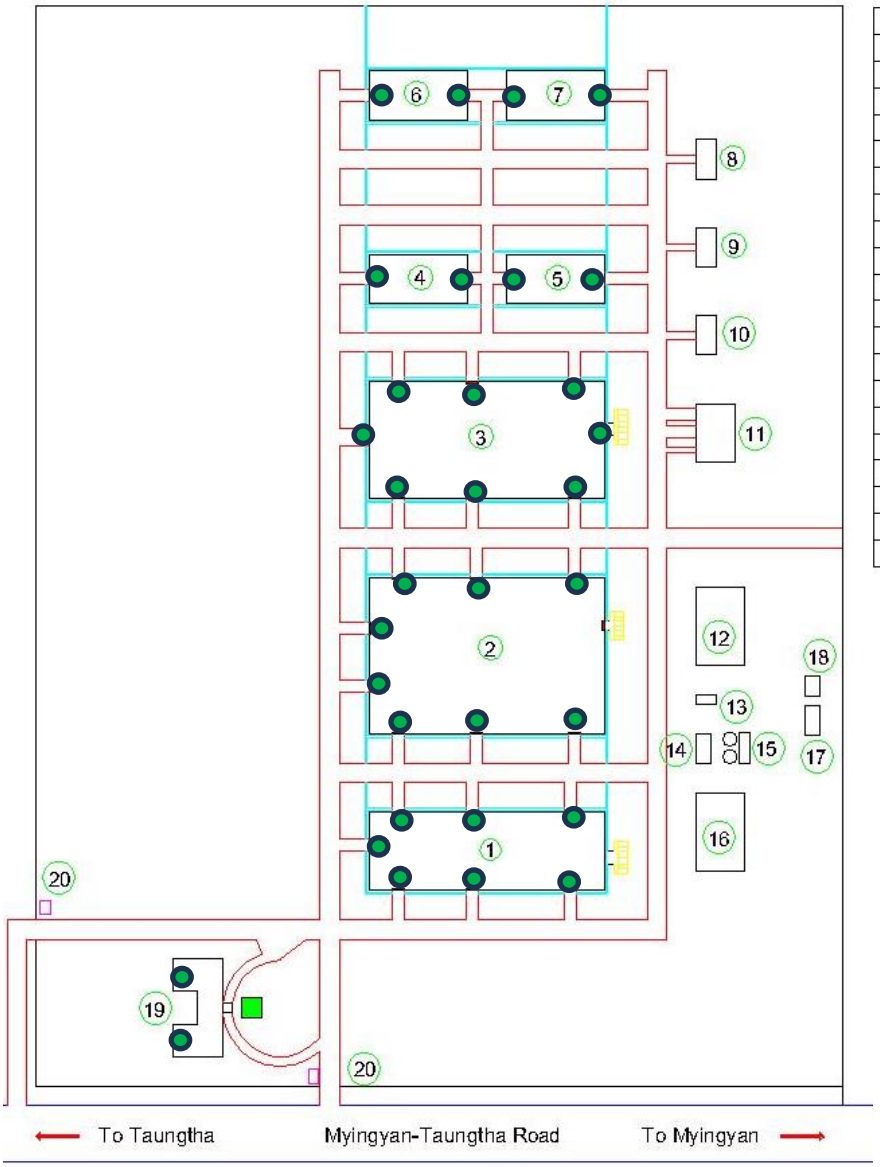


Figure: 9.5.9-2. Emergency exit layout plan



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

Legend

Emergency Exit

9.5.10. Fire Management Sub Plan

Table 9.5.10-1. Fire Management sub plan

Element	Content
Objectives	The objectives of the fire management plan are to prepare for fire prevention and fire control.
Performance indicators	Fire warning records at the factory. Safety records for occupational hazards at the factory.
Sources	Factory, township fire brigade.
Applicable std:	Natural disaster management law (2013),

Mitigation measures	▪ Checking record of training and drill. ▪ Prepare and maintain readiness for implementing a fire management plan.
Monitoring	Monitor the implementation of mitigation measures twice a year. Check the frequently accidents and natural disaster occurring places. 1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"
Reporting	Report to MONREC and the Ministry of Industry twice a year.
Responsible Agency	No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprise, Ministry of Industry
Estimated cost	Including the cost of the monitoring system.

Figure: 9.5.10-1. Fire management plan monitoring GPS points

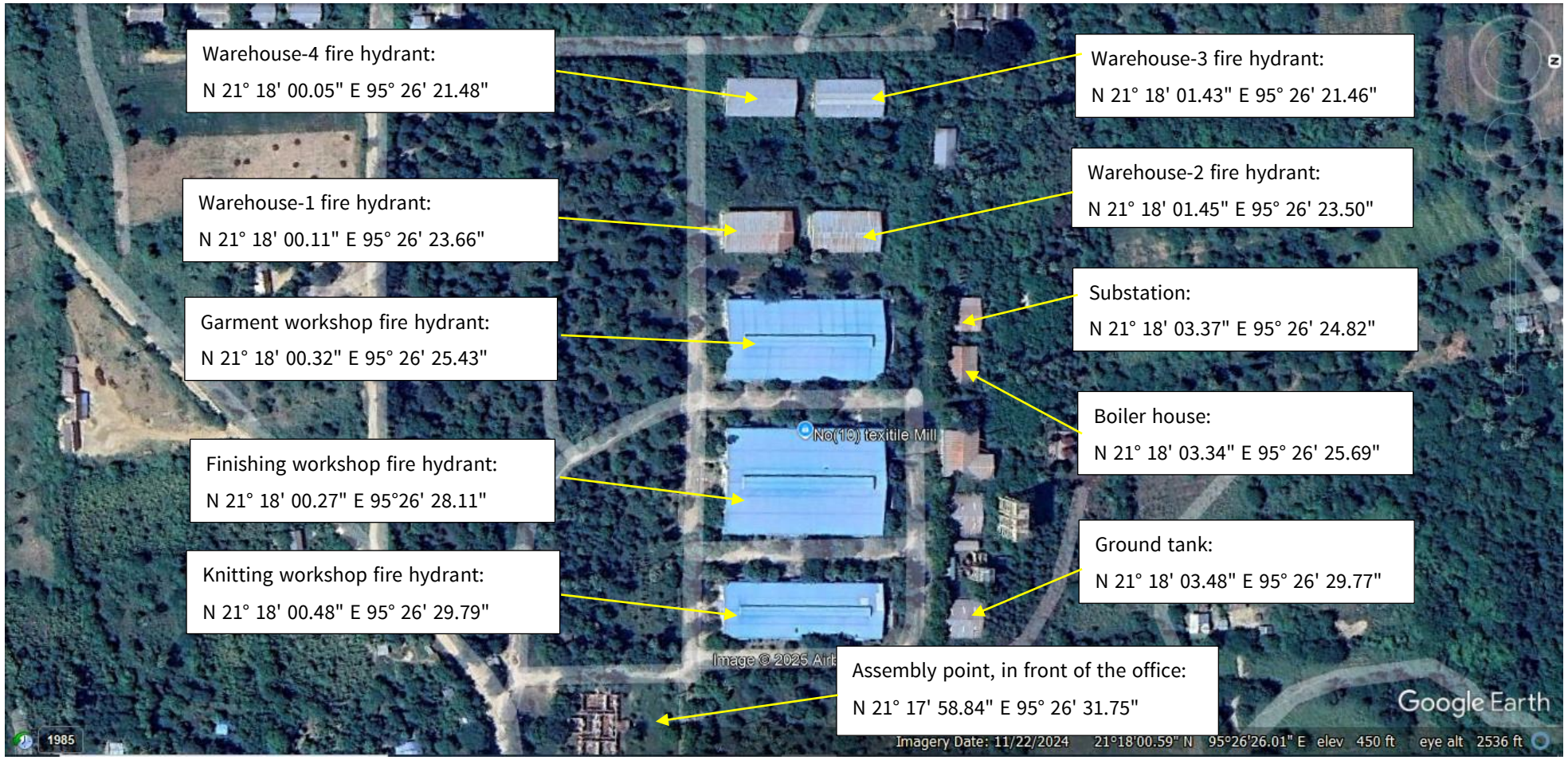
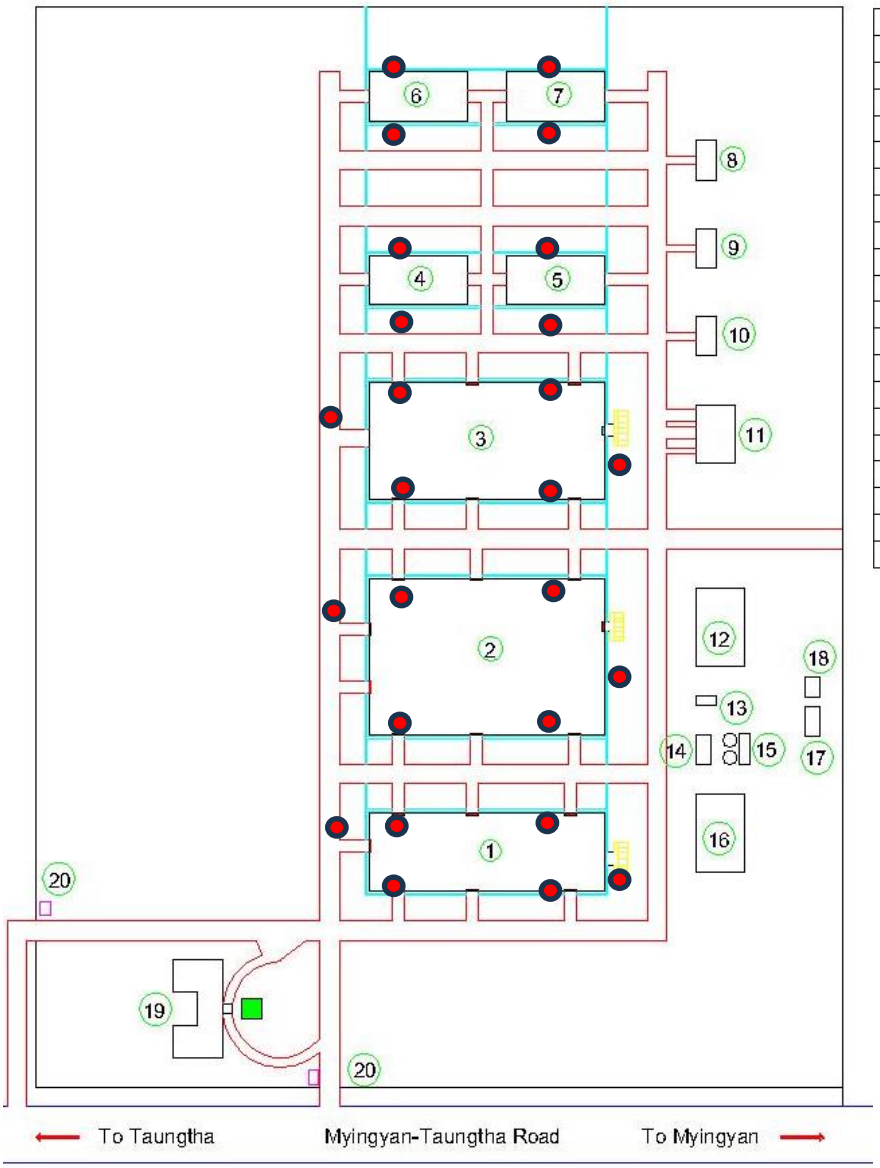


Figure: 9.5.10-2. Fire hydrant location points



No.	Name	Nos
1	Knitting Factory	1
2	Finishing Factory	1
3	Garment Factory	1
4	Ware House (1)	1
5	Ware House (2)	1
6	Ware House (3)	1
7	Ware House (4)	1
8	Fire Station	1
9	Workshop	1
10	Sub Station	1
11	Biolar House	1
12	Ground Tank (150000) gal	1
13	Pump House	1
14	Water Treament	1
15	Clarifier	1
16	Ground Tank (100000) gal	1
17	Overhead Tank (30000) gal	1
18	Overhead Tank (20000) gal	1
19	Office	1
20	Gate	1

Legend

Fire hydrant

9.6. Estimated Cost for Mitigation Measures

The estimated cost for mitigation measures will cost 14 million kyats per year, 70 million kyats for 5 years span as shown in Table 9.6-1. The factory will keep provision for adequate funds aside to meet regular expenses for the environmental control measures. As a state-owned enterprise, the estimated cost was calculated for only 5 year-period in this report and for another coming years, budget needs to be requested again from the government.

Table: 9.6-1. Estimated cost for mitigation measures (Kyats in million)

Sr. No.	Mitigation measures	Related environmental impacts areas	Year-wise budget allocation for five years (Kyats in million)				
			1st yr	2nd yr	3rd yr	4th yr	5th yr
1.	Green belt area extension/Establish agroforestry system	air/soil/sound/ biodiversity	10	20	10	10	10
2.	Provision of PPE	Occupational health and safety	4	4	4	4	4
3.	Awareness trainings 1. Fire Protection 2. Disaster Management 3. Electric Safety 4. Environmental awareness	Occupational health and safety/social/	6	6	6	6	6
	Total		20	30	20	20	20
	Grand Total for 5 years	110 million kyats					

9.7. Reporting Schedules

Voluntary reporting of environmental performance with reference to EMP will be undertaken. The team leader of HSE will coordinate all monitoring programs at the site and data generated is submitted regularly to the statutory agencies. Frequency of reporting is once every six months for 5 years period.

9.8. Green Belt Development Plan

Development of a greenbelt mitigates to a certain extent the potential negative impact on the environment due to dust, air emissions, fugitive emission and noise. A green cover itself acts as containment for dust. Presence of a green belt, lead to micro-climate and soil quality balancing, by retaining of soil moisture, recharge of ground water as well as self-control of micro-climate of that area. It also improves the aesthetic value of the area, later on it becomes the natural habitat of various bird species. The factory will also participate in the greenbelt development programs outside the premises. The scenario of planting arrangement and size is based on the optimum use of available land. Plants suitable to abate the pollution are identified to be local plants. The general considerations involved in developing the green belt are:

- Local/native fast-growing trees are planted.
- Tree plantation is undertaken in appropriate encircling rows.

- Species are tolerant to air pollutants present in the area mainly dust pollution. It possesses extensive foliar area to provide a maximum impinging surface for continued efficient adsorption and absorption of pollutants.
- It is tall in peripheral curtain plantation, with a large, spreading canopy in the primary and secondary attenuation zones.
- It is able to grow and thrive on the soil and be evergreen in a habitat having a minimum of leaf fall.
- It maintains the ecological, land, and hydrological balance of the region.

It is tall in the peripheral curtain plantation, with a large, spreading canopy in the green belt zone. It is able to grow and thrive on the soil of the area, be evergreen in habitat having a minimum of leaf fall. It maintains the ecological, land, and hydrological balance of the region. The scenario of planting arrangement and size is based on the optimum use of available land. Plants suitable to abate the pollution are identified to be local plants.

9.9. Corporate Environmental Responsibility

It's learned that the Taungtha factory not only focuses on its business, but also takes its environmental responsibilities seriously. The factory's commitment to sustainable development and pollution control is highly commendable. The factory has established a dedicated Health Safety and Environmental (HSE) team to manage all the environmental activities. The Environment, Occupational Health and Safety (EOHS) Policy, which has been approved by No. (3) Heavy Industrial Enterprise, is a great step towards effective and efficient working with a view to environmental protection. It's also encouraging to learn that there will be different Standard Operating Procedures (SOPs) related to the EOHS of the factory, which will be periodically implemented and reviewed. The EOHS Policy, which is designed to comply with the statutory norms related to the Environment, Occupational Health, and safety, aims for continuous improvement to prevent pollution, reduce wastage, conserve energy, and minimize risk and health hazards. The all employees at each level of the factory are aware of the EOHS Policy of the factory, and the policy has been posted at various prominent places in the factory. It's reassuring to know that the Taungtha factory has a hierarchical system and administrative order in place to deal with environmental issues and ensure total environmental compliance.

9.10. Corporate Social Responsibility (CSR) Plan

Corporate Social Responsibility has been receiving greater attention than ever before as enterprises attempt to bolster their public image and highlight their commitment to all stakeholders. Taungtha factory has been implementing different forms of social welfares activities comprising of social security, education, environmental activities, religious activities such as Warso robe offering and Kathina robe offering and celebrating Myanmar New Year (Thingyan festival) which is recently called traditional way of CSR since 2005. Under the Environmental Management Program, new CSR approach should be prepared with the form of all-inclusive organizations such as factory, administrative personal, volunteers, media, stakeholders and departmental officials.

No. (10) Textile Mill (Taungtha) commits to spend 2% of income revenue for CSR program in compliance with environmental conservation regulation. As per government financial regulation, factory needs to apply budget allocation to the Ministry of Industry one year ahead.

The CSR plan could be divided into four categories.

(a) Social-Economic Contribution

The factory has employed total 325 persons for the various jobs profile in different section. Some of those are semi-skilled workers and unskilled workers from nearby villages. The factory also generates maximum indirect employment in nearby villages by appointing local contractors for gardening, sanitation, maintenance, transportation and etc. These secondary jobs and indirect employment are also bound to be generated to day-to-day requirements and services to the workforce and industrial activity. It's always important to consider both the present and the future, especially in business. It sounds like Taungtha factory is taking a responsible approach to their operations.

Environmental Activities Contribution

Taungtha factory is surrounded by villages, staff quarters and paddy fields. It has pledged to do more to conserve factory's greenbelt zone on promoting public awareness to forest green on the sideline of community-

based forest. In support to biodiversity, tree planation becomes crucial to improve air quality by intercepting and trapping dust and other pollutants from the air.

Agroforestry System

In order to fulfill the partial requirement of EMP, Taungtha factory plans to implement an agroforestry system, which involves planting a mix of trees and vegetables in the tropical zone. This method allows for the cultivation of vegetables alongside or under the canopy of forests or tree-based systems. Such practices are prevalent in tropical regions and are designed to enhance biodiversity, improve soil fertility, and optimize land use.

Taungtha factory is committed to launching this program in collaboration with local farmers and the Dry Zone Greening Department, implementing it in phases. Initially, the factory will start by planting one acre of mango trees interspersed with beans. The following year, the plan is to expand to two acres, and over the next three years, an additional three acres will be established.

The agroforestry system is expected to benefit both the Taungtha factory and the surrounding local communities. By establishing this system, both parties can enhance biodiversity, improve soil health, diversify income streams for farmers, and contribute to climate change mitigation through carbon sequestration in trees. The program is set to begin in 2027-2028 fiscal year, contingent upon securing financial support from the Ministry and Government. Budget requirement for five consecutive years is shown in Table: 9.6-1.

Implementing such an agroforestry system in Taungtha can lead to sustainable agricultural practices, improved livelihoods, and enhanced environmental resilience.

3 R's Program

In addition, HSE team plans to implement area-wide (factory residential area and factory area) three R's program for waste minimization and conserving natural resources. 3 R's can be defined as follows:

Reduce: The best way to manage waste is to not produce it.

Reuse: It makes economic and environmental sense to reuse products.

Recycle: Recycling is a series of steps that takes a used material and processes, remanufactures, and sells it as a new product. Begin recycling at home and at work.

Necessary arrangements are underway to extend this program in local communities in association with public awareness in nature conservation training.

(b) Disaster Risk Management Training

The factory contributes to hold awareness training for disaster risk management for all communities, factory employees, and volunteers in conjunction with fire service department and disaster management department.

(c) On Job Training Programs

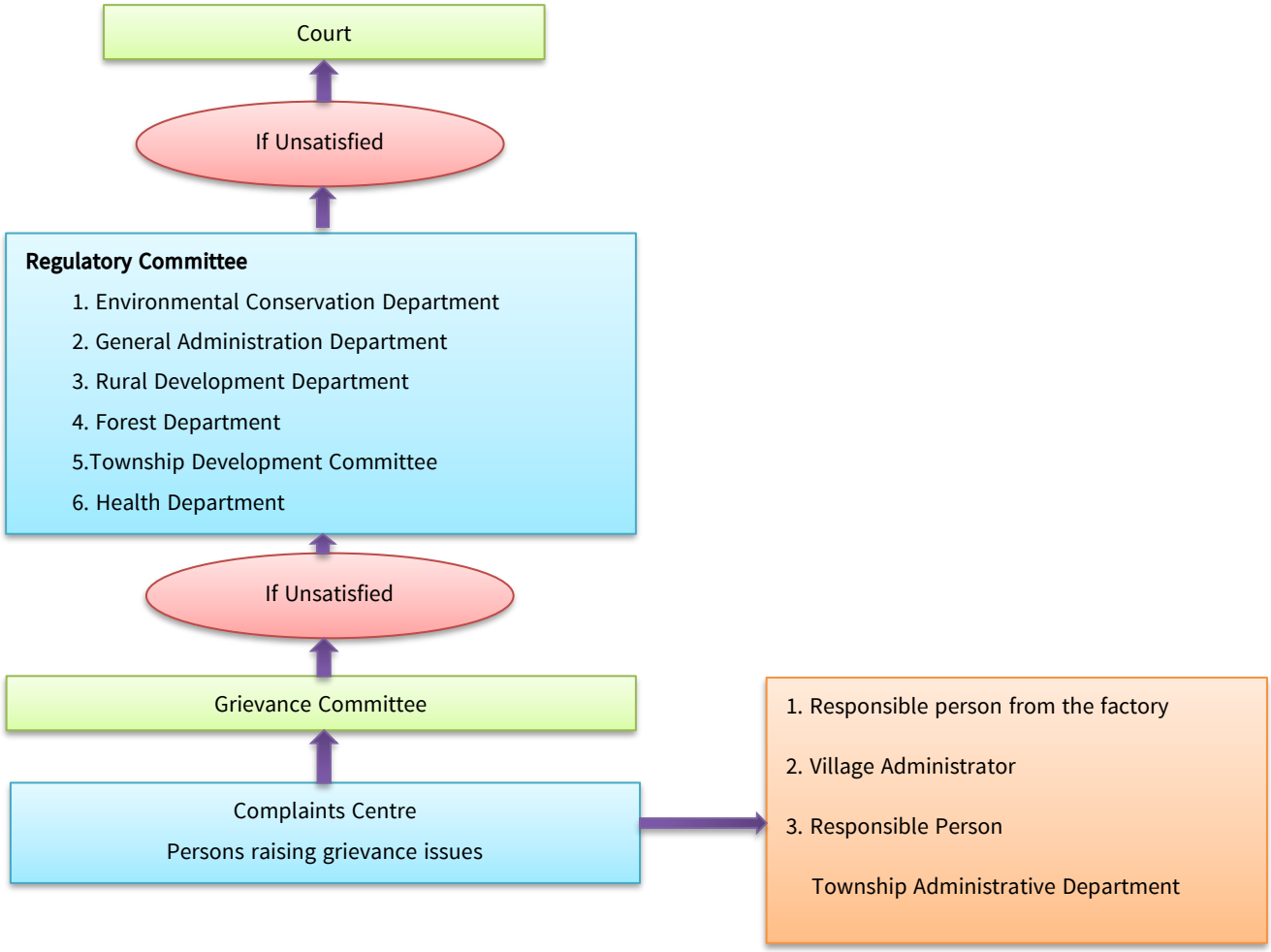
On-job training programs are vital to educate new comers to be skillful for employment and meet the factory skill demands. Apart from this, arrangements are underway to open computer training for better understanding of hardware and software for new workers to meet workforce demands. Budget allocation is crucial to implement these CSR plan.

9.11. Community Grievance Redress Mechanism

Grievance redress mechanism is involved in the EMP implementation process because it spans through the life of factory and balancing mechanism should be put in place to solve the EMP related matters with which some disagreement or complaints could occur. The complaint center is opened at the Health Safety and Environmental office inside the factory compound, and easily accessible to local

communities. The complaint form is attached in Appendix. The grievance mechanism for facilitating settlement of environmental disputes is shown below.

Figure: 9.11-1. Grievance redress mechanism for environmental disputes



9.12. Commitments

No. (10) Textile Mill (Taungtha) fulfils the following commitments.

Table: 9.12-1. Commitment by the factory

No.	Name of Commitment	Description about Commitment	Refer to
1.	EMP	The factory and the consultancy company will fulfill all of the institutional requirements to organize the HSE team.	Chapter 9 Article 9.1
2.	HSE team's duty and responsibility	HSE team will perform all of the responsibilities of the HSE team, will fulfill the objectives of the emergency response team, and will perform the entire sub environmental management plans, i.e., air quality, high noise level, effluent, soil contamination, solid waste, occupational health and safety and traffic management plans, emergency response	Chapter 9 Article 9.1.1

		sub plan, fire management sub plan.	
3.	Effluent management plan	Currently the factory has ceased the operation due to some situations. When the factory resumes production, a proper multimedia filtration system must be installed. The effluent will be treated in WWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WWTP will be filtered again in multimedia filtration system before discarding to the nearby area. Monitoring and mitigation measures would be implemented.	Chapter 9 Article 9.5.4
4.	Estimated cost	As a state own factory, it has a policy that says 2% of income revenue will be kept as fund CSR expenses for the environmental mitigation measures. The factory needs to ask for budget allocation from the government if the fund doesn't cover the cost for mitigation measures.	Chapter 9 Article 9.6
5.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 9 Article 9.10

Chapter 10

Monitoring Program

Chapter (10)

Monitoring Program

10.1. Introduction

Monitoring is vital for continuous commitment to an Environmental Management Plan with which the progress could be measured using various tools or parameters. The project proponent could decide the pros and cons of EMP by reviewing the comparison statements of governing parameters prior to the EMP and after. It will be undertaken primarily to determine the environmental effects of human activities, and secondarily to increase understanding of cause-effect relationships between human activity and environmental change. Thus, environmental monitoring is the effective observation of site conditions and work activities; identification of potential non-compliance situations, and initiation of corrective or remedial actions. Monitoring is as important as controlling pollution since the efficiency of control measures can only be determined by monitoring. The objectives of the monitoring program are:

- Assessment of the changes in environmental conditions, if any, during the project operation/activities.
- Monitoring and tracking the effectiveness of the Environment Management Plan and implementation of mitigation measures.
- Identification of any significant adverse transformation in environmental conditions to plan additional mitigation measures.
- To comply with the statutory requirements of monitoring for compliance with conditions of Environmental Conservation Law.
- To comply with the provisions of the Factory Act.
- To verify the result of the impact assessment study in particular regarding new development.
- To check or assess the efficiency of the controlling measures.

10.2. Monitoring Program

From the monitoring point of view, the important components are air, water, soil and noise. Environmental Consultancy Company will conduct the monitoring program. Currently the factory has stopped manufacturing and no effluent is discharged. If the factory operates again in the future, a proper multimedia filtration system will be constructed. The effluent will be treated in WHWWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WHWWTP will be filtered again in the multimedia filtration system before discarding to nearby area. Mandatory mitigation measures would be implemented. A detailed environmental monitoring program is given in the following table.

Table: 10.2-1. Monitoring program for Taungtha factory

Item	Environmental concern	Parameters	Frequency	Location/ GPS	Responsible party
Production Phase					
1.	Air Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing) (factory premises)	Ammonia, Particulate, Chlorine, Formaldehyde, VOCs, Carbon disulfide, Hydrogen sulfide	once/every six months, 5 points	Location (1) Inside the knitting factory: 21˚ 18' 01.09" N 95˚ 26' 29.79" E Location (2) Inside the finishing factory: 21˚ 18' 01.05" N 95˚ 26' 27.74" E Location (3) Inside the garment factory: 21˚ 18' 01.07" N 95˚ 26' 25.42" E Location (4) Near boiler house: 21˚ 18' 02.73" N 95˚ 26' 25.80" E Location (5) Near office: 21˚ 17' 59.50" N 95˚ 26' 30.34" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
2.	Noise Level (Referred to NEQEG 1.3 General Guidelines)	dB(A)	once/month, 12 points	Location (1) Garment Workshop-1: 21°18'00.32" N 95°26'25.43" E Location (2) Garment Workshop-2:	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				21°18'00.90" N 95°26'25.38" E Location (3) Garment Workshop-3: 21°18'01.59" N 95°26'25.37" E Location (4) Garment Workshop-4: 21°18'00.26" N 95°26'24.92" E Location (5) Knitting Workshop-1: 21°18'00.48" N 95°26'29.79" E Location (6) Knitting Workshop-2: 21°18'00.86" N 95°26'29.76" E Location (7) Knitting Workshop-3: 21°18'01.37" N 95°26'29.77" E Location (8) Knitting Workshop-4: 21°18'00.85" N 95°26'29.75" E Location (9) Finishing Workshop-1: 21°18'00.27" N 95°26'28.11" E Location (10) Finishing Workshop-2: 21°18'00.33" N 95°26'27.25" E Location (11) Finishing Workshop-3: 21°18'01.65" N 95°26'27.17" E Location (12) Finishing Workshop-4: 21°18'01.88" N 95°26'28.02" E	
3.	Effluent Quality (Referred to NEQEG	5 days Biological oxygen demand,			HSE team, No. (10) Textile Mill (Taungtha),

	2.3.2.1 Textile Manufacturing Guideline)	Adsorbable organic halogens, Ammonia, Cadmium, Chemical oxygen demand, Chromium (hexavalent), Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide, Temperature increase, Total coliform bacteria, Total nitrogen, Total phosphorous, Total suspended solids, Zinc	once/every six months, one point	Water Hyacinth Wastewater treatment pond (WHWWTP): 21° 17' 59.36" N 95° 26' 19.16" E	No. (3) Heavy Industrial Enterprises, Ministry of Industry,
4.	Soil Quality (Referred to WHO suitable soil quality standard)	pH, Texture, Organic matter %, Phosphorous (P ppm), Nitrogen (N ppm), Potassium (K ppm), Calcium (Ca ppm), Sodium (Na ppm), Magnesium (Mg ppm)	once/six months, one point	Cultivated land: 21° 17' 59.81" E 95° 26' 12.61" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
5.	Solid waste	Rules and regulations issued by MONREC and the local township development committee.	once/six months, two points	Residential Area: 21° 17' 49.70" N 95° 26' 17.55" E Factory Area: 21° 17' 58.68" N 95° 26' 19.70" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

6.	Shallow well/surface water quality (Referred to WHO drinking water Standard)	Total alkalinity, Turbidity, pH, Electrical Conductivity, Biochemical Oxygen Demand, Dissolved Oxygen, Chemical Oxygen Demand, Ortho-Phosphorus, Water Temperature, Total Dissolved Solid, Calcium, Magnesium (Mg), Potassium (K), Sodium (Na), Ammonium Nitrogen (NH_3-N), Sulphate (SO_4), Nitrate (NO_3), Hardness, Chloride (Cl), Fluoride (F), Copper (Cu), Lead (Pb), Mercury (Hg), Color	once/every six months, one point	Shallow well water in Taungtha creek: 21° 17' 42.69" N 95° 26' 28.46" E	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry.
7.	Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health	Once/every six months, 9 points	1. Knitting Workshop: N 21°18'00.48" E 95°26'29.79" 2. Finishing Workshop: N 21°18'00.27" E 95°26'28.11" 3. Garment Workshop: N 21°18'00.32" E 95°26'25.43" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48"	
8.	Traffic Management	Myanmar Police Act	Once/every six months, one point	Infront of the factory, Meikhtilar-Myingyan Road: N 21° 17' 59.40" E 95° 26' 33.92"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,
9.	Emergency Response Plan	Natural disaster management law (2013)	once/every six months, 11 points	1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

				E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	
10.	Fire Management	Natural disaster management law (2013),	Once/every six months, 11 points,	1. Knitting Workshop emergency exit: N 21° 17' 59.73" E 95° 26' 29.81" 2. Finishing Workshop emergency exit: N 21° 17' 59.62" E 95° 26' 27.72" 3. Garment Workshop emergency exit: N 21° 17' 59.58" E 95° 26' 25.40" 4. Substation: N 21° 18' 03.37" E 95° 26' 24.82" 5. Boiler house: N 21° 18' 03.34" E 95° 26' 25.69" 6. Warehouse-1: N 21° 18' 00.11" E 95° 26' 23.66" 7. Warehouse-2: N 21° 18' 01.45" E 95° 26' 23.50" 8. Warehouse-3: N 21° 18' 01.43" E 95° 26' 21.46" 9. Warehouse-4: N 21° 18' 00.05" E 95° 26' 21.48" 10. Ground tank: N 21° 18' 03.48" E 95° 26' 29.77" 11. Assembly point, in front of the office: N 21° 17' 58.84" E 95° 26' 31.75"	HSE team, No. (10) Textile Mill (Taungtha), No. (3) Heavy Industrial Enterprises, Ministry of Industry,

Decommission Phase					
1.	Air Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	Ammonia, Particulate, Chlorine, Formaldehyde, VOCs, Carbon disulfide, Hydrogen sulfide	Once/every six months, two points	Between finishing and garment departments: 21° 17' 59.28" N 95° 26' 26.53" E Between office and knitting department: 21° 17' 59.41" N 95° 26' 30.86" E	Demolishing contractor/ Environmental Consultant Company
2.	Noise (Referred to NEQEG 1.3 Noise Level General Guidelines)	dB(A)	Once/month, four points	1. Between finishing and garment departments: 21° 17' 59.28" N 95° 26' 26.53" E 2. Between office and knitting department: 21° 17' 59.41" N 95° 26' 30.86" E 3. Between boiler house and ground tank: 21° 18' 02.66" N 95° 26' 26.29" E 4. Between knitting department and ground tank: 21° 18' 02.66" N 95° 26' 30.42" E	Demolishing contractor/ Environmental Consultant Company
3.	Effluent Quality (Referred to NEQEG 2.3.2.1 Textile Manufacturing Guideline)	Biochemical Oxygen Demand (BOD), Absorbable organic halogen, Ammonia, Cadmium, Chemical Oxygen Demand (COD), Chromium (hexavalent), Chromium (total), Cobalt, Color, Copper, Nickle, Oil and grease, Pesticides, pH, Phenol, Sulfide, Temperature	Once/every six months, one point	Water Hyacinth Wastewater treatment pond (WHWWTP): 21° 17' 59.36" N 95° 26' 19.16" E	Demolishing contractor/ Environmental Consultant Company

		increase, Total coliform bacteria, Total Nitrogen, Total phosphorous, Total Suspended Solid (TS), Zinc			
4.	Soil Quality (Referred to WHO suitable soil quality)	pH, Total N%, Ava P%, K%, Ca%, OM%, Exchangeable Na, Exchangeable Mg.	Once/every six months, one point	Cultivated land: 21° 17' 59.81" E 95° 26' 12.61" E	Demolishing contractor/ Environmental Consultant Company

10.3. Infrastructure Requirement and Reporting

The HSE team will conduct all monitoring programs in collaboration with an environmental consultancy company to report to MONREC for every six months.

Currently, the factory has stopped operating and if it runs again in the future, a multimedia filtration system needs to be installed in order to improve the biological, physical and chemical qualities of the treated effluent from the wastewater treatment pond. The air quality will be monitored every six months in strict compliance with NEQEG 2.3.2.1 Textile Manufacturing guideline. Well water quality will be tested periodically, and their values compared with WHO Drinking Water values. The soil quality will be examined every six months as an absolute requirement of the monitoring program. The HSE team will carry out periodic monitoring for noise, and any deviations will be dealt with promptly. In order to provide quick medical assistance, the Taungtha has established necessary tie-ups with nearby hospitals such as Taungtha Township Hospital. The implementation of the action plan for solid waste management, emergency response plan, traffic control management, occupational health and safety management, and fire management plan will be closely monitored by the HSE team associated with an environmental consultancy company. The HSE team will prepare and submit monitoring reports to the Environmental Conservation

Department, Ministry of Natural Resources and Environmental Conservation (MONREC) every six months without fail.

10.4. Monitoring Expenditure

The monitoring and evaluation processes require extensive surveys and primary data collection, either to establish the baseline or to measure changes. In order to respond to management needs for carrying out environmental monitoring for the production phase of the factory, a contingency budget is required. The annual cost of environmental monitoring will be about 15 million kyats per year. A monitoring report will be submitted to the Environmental Conservation Department (ECD) every six months. The estimated monitoring cost for the Taungtha factory is stated as follows:

Table: 10.4-1. Estimated monitoring cost for Taungtha factory (Kyats in million)

Sr.	Particular	1st year Million MMK	2nd year Million MMK	3rd year Million MMK	4th year Million MMK	5th year Million MMK
1.	Air Quality	4	4	4	4	4
2.	Noise	0.2	0.2	0.2	0.2	0.2
3.	Surface water / tube well water / effluent	2.5	2.5	2.5	2.5	2.5
4.	Soil	0.3	0.3	0.3	0.3	0.3
5.	Reporting includes the cost for implementation of solid waste management plan, occupational health and safety management plan, traffic management plan, emergency response sub plan, fire management sub plan	8	8	8	8	8
	Total cost	15	15	15	15	15

10.5. Total Estimated Cost for Environmental Management Plan

The total estimated cost for the environmental management plan is revealed in the following table.

Table: 10.5-1. Estimated cost for EMP Taungtha factory (Kyats in million)

Sr.	Particular	1st year Million MMK	2nd year Million MMK	3rd year Million MMK	4th year Million MMK	5th year Million MMK
1.	Mitigation measures cost	20	30	20	20	20
2.	Monitoring cost	15	15	15	15	15
	Grand total	35	45	35	35	35

10.6. Commitments

The HSE team promises to follow each commitment below.

Table: 10.6-1. List of commitments

No.	Name of Commitment	Description about Commitment	Refer to
1.	Monitoring	The factory and the consultant company commit to accomplish the monitoring program.	Chapter 10 Table: 10.2-1
2.	Air quality	Air quality will be monitored and if any, the factory will engage the source of impact to mitigate the pollution and prevent further environmental damage.	Chapter 10 Table: 10.2-1
3.	Noise level	Mitigation plans for high noise level will be fulfilled by the factory.	Chapter 10 Table: 10.2-1
4.	Well water quality	The quality of Well water will not be affected by the activities of the factory because there is no direct disposal of wastewater into the environment.	Chapter 10 Table: 10.2-1
5.	Effluent and treated wastewater	Currently, the factory has stopped operating and if it runs again in the future, a multimedia filtration system needs to be installed. The effluent from the factory will firstly be treated in WWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WWTP will be filtered again in multimedia filtration system in order to improve the biological, physical and chemical qualities of the treated effluent before discarding to nearby area. Mandatory mitigation measures would be implemented.	Chapter 10 Table: 10.2-1
6.	Soil quality	The factory will monitor soil quality in nearby cultivated land and make sure the soil quality won't be affected by the activities of the factory.	Chapter 10 Table: 10.2-1
7.	Solid waste management	Disposal of solid waste will follow the rules and regulations issued by MONREC and the local township development committee.	Chapter 10 Table: 10.2-1

8.	Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 10 Table: 10.2-1
9.	Traffic management plan	Traffic management plan will be performed with HSE team due to accident records.	Chapter 10 Table: 10.2-1
10.	Emergency response sub plan	Emergency response sub plan will be carried out HSE team under the guidance of Incidents commander/ factory general manager.	Chapter 10 Table: 10.2-1
11.	Fire management sub plan	Fire management sub plan will be implemented by HSE team members.	Chapter 10 Table: 10.2-1

Chapter 11
Conclusion and Recommendation

Chapter (11)

Conclusion and Recommendations

11. Conclusion and Recommendation

11.1. Conclusion

The present study focuses on No. (10) Textile Mill (Taungtha) located in Taungtha Township, Myingyan District, Mandalay Region. The factory has an annual output capacity of 1.2 million pieces of knitted fabrics per year and has been operating for over 20 years. The total investment is 2280.878 million kyats.

The study was undertaken by IIC Company to compile, collect, validate, and describe primary and secondary environmental data to produce environment verification from July 2020 to April 2025. The study was conducted to meet the Environmental Conservation Department's requirements and reviews and was generated based on the National Environmental Quality Emission Guideline (NEQEG) 2.3.2.1 values for Textile Manufacturing. In addition, NEQEG 1.3 Guideline values (Noise) were applied.

Air Quality: Primarily, it is learned that the concentration of PM_{10}, $PM_{2.5}$ and Volatile Organic Compounds (VOCs) are within the NEQEG 2.3.2.1 Textile Manufacturing guideline values.

Water Quality: Water quality analysis results indicate that shallow well water requires treatment before use.

Soil Quality: According to the lab results, the soil may still need extra nourishment for agricultural use.

Odor: The factory doesn't emit any odor in the surrounding areas.

Effluent Quality: The effluent quality test was not conducted due to the production section closure. Once the factory resumes operations, the effluent quality will be analyzed in compliance with NEQEG 2.3.2.1.

Noise environment: The noise levels of every section inside the factory were under the NEQEG 1.3 (Noise) general application limit according to the observation results by sound level meter.

Reducing Green House Gas Emission: The informative greenhouse gas emissions for the Taungtha factory were recorded as 2512.54 tons per year for 2010-2011. To reduce GHG emissions, the Taungtha factory needs a combination of energy efficiency measures, renewable energy adoption, and operational improvements.

Impact on Biodiversity: No protected areas lie in the study area, and neither endangered nor rare threatened plant nor animal species were observed within a 2-mile diameter area of the factory. The factory needs to emphasize on green belt zone project in favor of biodiversity.

Socioeconomic Environment: The socio-economic benefits of the factory are prominent, creating jobs for local people, followed by secondary effects, which create opportunities for local people, small and medium businessmen, grocery sellers, retail shops, and more.

Risk Assessment: The study conducted a risk assessment to determine the risk factors and hazard identifications. An effective Disaster Management Plan (DMP) to mitigate the risks involved has been prepared. All the test results were disclosed in public consultation meetings, and the stakeholders who joined the factory benefited from jobs and suffered no odor impact.

Environmental Management Plan (EMP): EMP for effective management of environmental impacts and ensuring overall protection of the environment through appropriate management procedures has been recommended in the report. The amount shall be marked procurement of air and water pollution control devices, noise pollution control, strengthening health safety and environment (HSE) team, green belt zone development, disaster management training, monitoring, multimedia filtration system installation, etc. The budget for mitigation measures in the Environmental Management Plan (EMP) is allocated at 20 million MMK for the first year. This funding will primarily be used to establish an agroforestry system, provide personal protective equipment (PPE), and conduct awareness training. In the second year, the budget

increases to 30 million MMK, followed by an allocation of 20 million MMK for each of the remaining three years. The factory is aligned with EMP mitigation measures, maintaining greenbelt growth to conserve nature. As a state-owned enterprise, the estimated cost was calculated for only 5 year-period in this report and for another coming years, budget needs to be requested again from the government.

Public Consultation: All the test results are disclosed in public consultation meeting. The outcomes from the public consultation meeting revealed that most of the stakeholders who joined the factory benefited from jobs and suffered no impact. The request arising from public consultation is to create more jobs and to create more green belt zones.

Disaster Management Plan: An effective Disaster Management Plan (DMP) to mitigate the risks involved has been prepared. Training exercises will be held to ensure that all persons are familiar with their responsibilities and that the communication links are functioning effectively.

Monitoring Program: The HSE team associated with Environmental Consultancy Company will be responsible for an environmental monitoring program in an all-inclusive manner. The sampling and analysis of the environmental attributes will be as per the guidelines of ECD. Annually, the monitoring program will cost 15 million MMK per year with 6 months reporting system for five consecutive years.

Corporate Social Responsibility (CSR): Taungtha factory has been participating in traditional activities such as Warso and Kathina robe offerings to the monasteries in nearby villages, Myanmar New Year (Thingyan festival) celebration, providing stationery and uniform to the local communities, and strong involvement in Hepatitis B vaccination program and Covid-19 vaccination program voluntarily. It is impressive to see how these activities have a national character embodied in them. It's heartening to note that the Taungtha factory is taking a proactive approach to implement EMP mitigation measures, waste minimization, and conservation of natural resources.

No. (10) Textile Mill (Taungtha) commits to spend 2% of income revenue for CSR program in compliance with environmental conservation regulation. As per

government financial regulation, factory needs to apply budget allocation to the Ministry of Industry in advance.

(a) Socio-Economic Contribution

The factory has employed a total of 325 persons for the various job profiles in different sections. Some of those are semi-skilled workers and unskilled workers from nearby townships. In addition to that, the factory also generates huge indirect employment as a secondary effect in nearby villages by appointing local contractors for gardening, sanitation, building maintenance and transportation.

(b) Environmental Activities Contribution

The factory is committed to implementing EMP mitigation measures such as maintaining greenbelt growth to conserve nature. In order to fulfill the partial requirement of EMP, Taungtha factory plans to implement an agroforestry system, which involves planting a mix of trees and vegetables in the tropical zone. This method allows for the cultivation of vegetables alongside or under the canopy of forests or tree-based systems. Such practices are prevalent in tropical regions and are designed to enhance biodiversity, improve soil fertility, and optimize land use. Taungtha factory is committed to launching this program in collaboration with local farmers and the Dry Zone Greening Department, implementing it in phases. Initially, the factory will start by planting one acre of mango trees interspersed with beans. The following year, the plan is to expand to two acres, and over the next three years, an additional three acres will be established. The agroforestry system is expected to benefit both the Taungtha factory and the surrounding local communities. By establishing this system, both parties can enhance biodiversity, improve soil health, diversify income streams for farmers, and contribute to climate change mitigation through carbon sequestration in trees. The program is set to begin in 2027-2028 fiscal year, contingent upon securing financial support from the Ministry and Government.

The factory's strong commitment to implementing the three R's program for waste minimization and conservation of natural resources is also noteworthy.

It's important to continue such efforts towards sustainability and environmental protection.

Positive Impacts: It's noteworthy that most of the stakeholders who are associated with the factory benefit from jobs, social security insurance systems, and housing. Additionally, the factory's indirect employment generation through services for the plant is praiseworthy and can further benefit the stakeholders and the broader community.

Conclusion: No. (10) Textile Mill (Taungtha) has been a key player in meeting the national textile demand for the past 20 years. While the factory has had some small impacts, it has made significant efforts to ensure that its operations are sustainable and beneficial to the local community. To continue this positive trend, it's essential to monitor the factory's activities over its long-life span and implement an effective environmental management plan. The factory's commitment to an all-inclusive CSR program is a commendable effort that should be continued and expanded. By taking suggested mitigation measures and implementing an environmental management plan, the factory can significantly reduce its impact on the environment while continuing to benefit the surrounding communities. Therefore, it can be concluded that the No. (10) Textile Mill (Taungtha) will have manageable impacts on the environment, ensuring a sustainable future for all.

11.2. Recommendations

In order to meet the requirements of Myanmar Environmental Conservation Law (2012), it is necessary for No. (10) Textile Mill (Taungtha) to implement EMP objectives to support No. (3) Heavy Industrial Enterprise, Ministry of Industry as a State Own Enterprise. It is important to monitor progress, build capacity, and allocate budgets properly in order to achieve these objectives.

11.3. Commitments

The factory promises to implement the following commitments.

Chapter 2

No.	Name of Commitment	Description	Refer to
1.	EMP Criteria	The factory and the consultancy company promise to fulfill all the criteria of the EMP report.	Chapter 2 Article 2.2

Chapter 3

No.	Name of Commitment	Description	Refer to
1.	Commitments of Project Developer, No. (10) Textile Mill (Taungtha)	Comply with the commitments of the environmental and socio-economic development revealed in the Environmental Management Plan report.	Chapter 3 Article 3.4.1
		Acknowledgement and compliance with the laws, regulations, and guidelines associated with the factory, included in the report.	Chapter 3 Article 3.4.1
		Comply and proceed with the alternative methods, mitigation measures, and monitoring plans included in the report for the reduction of the negative environmental impacts; and take responsibility for the environmental impacts due to non-compliance of the commitment.	Chapter 3 Article 3.4.1
		Give priorities for the occupational health and safety of the workers.	Chapter 3 Article 3.4.1
		Utilize the exact amount of funds as stated in the proposed expenditure for corporate social responsibility (CSR) funds.	Chapter 3 Article 3.4.1
		Take responsibility for all of the work and absence of the contractors, sub-contractors, officers, and representatives of the company in operating processes.	Chapter 3 Article 3.4.1
		Take responsibility to support after discussion with the affected people to ensure their stable livelihoods are not lower than before the project; and resettlement and rehabilitate the impacted local people, government organizations, and other related people and organizations.	Chapter 3 Article 3.4.1
		Follow the environmental commitments, mitigation measures, and management plans illustrated in the EMP report. We also commit to follow the Environmental Conservation Laws 2012, Environmental Conservation Rules	Chapter 3 Article 3.4.1

		2014 as stated in EIA, and International Laws related to environmental conservation.	
		We, No. (10) Textile Mill (Taungtha) commit to comply with occasionally issued laws, procedures, regulation, instructions and orders set forth by MONREC and State. The proponent has signed a pledge to abide by these rules, and failure to do so may result in legal consequences.	Chapter 3 Article 3.4.1
2.	Commitments of the Environmental Assessment Practitioner	The EMP has been designed in compliance with the National Constitution, Environmental Conservation Law, EIA Procedures, the National Environmental Quality Emission Guidelines (NEQEG), and International Convention, Law, and Guidelines.	Chapter 3 Article 3.4.2.
		Beside the above guidelines, this EMP report also adheres to existing labor laws and amendment, occupational health and safety laws, rules, and procedures.	Chapter 3 Article 3.4.2.
		The environmental impact protection procedures in this report aim to assist the project proponent in avoiding incidents, mitigating their effects, and replacing any damage caused. The proponent is committed to following these procedures. This Environmental Management Plan has been systematically designed to address not only environmental impact protection procedures and occupational safety and health but also emergency management planning and social welfare programs.	Chapter 3 Article 3.4.2.
		All the facts and data presented in this report have been systematically surveyed in the project area without bias and are authentic. As a third party, we take full responsibility for all facts mentioned in this report	Chapter 3 Article 3.4.2.

Chapter 4

No.	Name of Commitment	Description of Commitment	Refer to
1.	Production process	Currently, the factory has stopped operating and if it runs in the future, the factory promises to follow rules and regulations regarding with the conservation of natural environment.	Chapter 4. Article 4.13

2.	Wastewater Treatment Plant	A multimedia filtration system would be installed and treated effluent from the wastewater treatment plant would be treated to improve the biological, chemical and physical properties of the effluent and to prevent any negative impact on the environment. Wastewater discharge would be monitored and treated in accordance with the NEQEG 2.3.2.1 Textile Manufacturing guideline values.	Chapter 4 Article 4.18
3.	Reducing Green House Gas (GHG) Emission	The factory is committed to reducing its greenhouse gas (GHG) emissions by implementing energy efficiency initiatives, increasing renewable energy use, and improving operations.	Chapter 4 Article 4.19

Chapter 5

No.	Name of Commitment	Description About Commitment	Refer to
1.	Water quality	The factory guarantees that its operations will not affect the quality of surface water. Any waste discharged from the premises is only goes into the wastewater treatment pond. There will be no discharged of any effluent from the treatment pond.	Chapter 5 Article 5.6
2.	Air quality	All the boilers are shut down due to the lack of work order to the factory. Regular boiler inspection works will be performed with boiler inspector when the factory operates again in the future.	Chapter 5 Article 5.7
3.	Soil quality	The factory doesn't dispose of any hazardous material into the soil.	Chapter 5 Article 5.8
4.	Effluent quality	The factory uses bleach and dyes in its finishing process, and there is no discharge of treated effluent from the wastewater treatment pond to nearby areas. When the factory operates again in the future, a multimedia filtration system must be installed and treated wastewater will be treated again in this system to comply with the NEQEG effluent quality guidelines for textile manufacturing.	Chapter 5 Article 5.9
5.	Noise	There are 100 sewing machines at the garment workshop. The factory will prioritize the safety and well-being of its employees and take significant steps to reduce noise levels in compliance with NEQEG 1.3 noise level guideline values.	Chapter 5 Article 5.11

6.	Biodiversity	The factory's operations will not impact the nearby ecosystem. Myanmar's Environmental Law regarding biological conservation and management, issued by the Ministry of Natural Resources and Environmental Conservation (MONREC), will be adhered to in order to protect biodiversity and reduce negative effects.	Chapter 5 Article 5.12
7.	CSR fund	The factory has pledged to allocate 2% of its income revenue towards its CSR program.	Chapter 5 Article 5.13
8.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 5 Article 5.13

Chapter 6

No.	Name of Commitment	Description about Commitment	Refer to
1.	Impacts and mitigation	The factory and consultancy company are determined to preserve the natural environment by significantly reducing their environmental impact and proactively mitigating any unavoidable impacts resulting from their operations.	Chapter 6
2.	Surface and ground water contamination	The factory and consultancy company take active measures to preserve the natural environment and significantly reduce environmental impact and take proactive steps to mitigate any unavoidable impacts resulting from factory's activities. The effluent would be closely monitored and treated in strict compliance with NEQEG 2.3.2.1 textile manufacturing effluent guideline values. This is not only a responsible approach to environmental preservation, but also a legal obligation that must be upheld.	Chapter 6. Article 6.4.1 Article 6.4.2
3.	Air emission	The factory will perform mitigation measures to reduce or minimize the impact on air quality, if any.	Chapter 6 Article 6.4.3
4.	Noise	The factory will consider to improve the machine design to make the noise reduction if high noise occurs due to the result of all the machines running at the same time.	Chapter 6 Article 6.4.4
5.	Soil	Although the factory uses bleach and dyes in the production process, effluent is discharge only into the treatment pond and treated. Treated effluent are not	Chapter 6 Article 6.4.5

		drained into nearby areas. Therefore, soil quality will not be affected by the activities of the factory.	
6.	Odor	There will be no discharge of untreated waste (gaseous and liquid) on land or in air or to any water body, there are no visual adverse impacts made by the factory.	Chapter 6 Article 6.4.7
7.	Occupational Health and Safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 6 Article 6.4.8
8.	Biodiversity	Small numbers of the population of species might be affected by the activities of the factory. The factory will fulfill all of the mitigation measures to conserve the nature of the environment.	Chapter 6 Article 6.4.9
9.	Road traffic	The factory prepares and maintains readiness for implementing an emergency rescue plan to road accidents.	Chapter 6 Article 6.4.10
10.	Solid waste disposal	The factory will fulfill all of the mitigation measures in disposal of solid wastes.	Chapter 6 Article 6.4.11

Chapter 7

No.	Name of Commitment	Description	Refer to
1.	Risk Assessment	The factory and the consultancy company are fully dedicated to achieving all the objectives outlined in the risk assessments study.	Chapter 7 Article 7.1

Chapter 8

No.	Name of Commitment	Description	Refer to
1.	Public consultation	The factory and consultancy company have made a firm commitment to collect data without any bias, which includes information on socio-economic, biodiversity, and governing parameters during the survey. It's also confirmed that they have taken a rigorous approach to sourcing all secondary data from local administrative offices to ensure reliability. Moreover, the HSE team's full responsibility towards monitoring the outcome of the public consultation is praiseworthy.	Chapter 8 Article 8.3.

Chapter 9

No.	Name of Commitment	Description about Commitment	Refer to
1.	EMP	The factory and the consultancy company will fulfill all of the institutional requirements to organize the HSE team.	Chapter 9 Article 9.1
2.	HSE team's duty and responsibility	HSE team will perform all of the responsibilities of the HSE team, will fulfill the objectives of the emergency response team, and will perform the entire sub environmental management plans, i.e., air quality, high noise level, effluent, soil contamination, solid waste, occupational health and safety and traffic management plans, emergency response sub plan, fire management sub plan.	Chapter 9 Article 9.1.1
3.	Effluent management plan	Currently the factory has ceased the operation due to some situations. If the factory operates again in the future, a proper multimedia filtration system must be installed. The effluent will be treated in WHWWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WHWWTP will be filtered again in multimedia filtration system before discarding to the nearby area. Monitoring and mitigation measures would be implemented.	Chapter 9 Article 9.5.4
4.	Estimated cost	As a state own factory, it has a policy that says 2% of income revenue will be kept as fund CSR expenses for the environmental mitigation measures. The factory needs to ask for budget allocation from the government if the fund doesn't cover the cost for mitigation measures.	Chapter 9 Article 9.6
5.	Agroforestry system	Taungtha factory commits to establish agroforestry system in 2027 after receiving financial support from the government.	Chapter 9 Article 9.10

Chapter (10)

No.	Name of Commitment	Description about Commitment	Refer to
1.	Monitoring	The factory and the consultant company commit to accomplish the monitoring program.	Chapter 10 Table: 10.2-1
2.	Air quality	Air quality will be monitored and if any, the factory will engage the source of impact to mitigate the pollution and prevent further environmental damage.	Chapter 10 Table: 10.2-1
3.	Noise level	Mitigation plans for high noise level will be fulfilled by the factory.	Chapter 10 Table: 10.2-1

4.	Shallow well water quality	The quality of Well water will not be affected by the activities of the factory because there is no direct disposal of wastewater into the environment.	Chapter 10 Table: 10.2-1
5.	Effluent and treated wastewater	Currently, the factory has stopped operating and if it runs again in the future, a multimedia filtration system needs to be installed. The effluent from the factory will firstly be treated in WHWWTP to comply with NEQEG 2.3.2.1 guidelines. The treated effluent from WHWWTP will be filtered again in multimedia filtration system in order to improve the biological, physical and chemical qualities of the treated effluent before discarding to nearby area. Mandatory mitigation measures would be implemented.	Chapter 10 Table: 10.2-1
6.	Soil quality	The factory will monitor soil quality in nearby cultivated land and make sure the soil quality won't be affected by the activities of the factory.	Chapter 10 Table: 10.2-1
7.	Solid waste management	Disposal of solid waste will follow the rules and regulations issued by MONREC and the local township development committee.	Chapter 10 Table: 10.2-1
8.	Occupational health and safety	Workers' safety will be conducted in compliance with Factory Act, social security law, and standards enforced by the Ministry of Health.	Chapter 10 Table: 10.2-1
9.	Traffic management plan	Traffic management plan will be performed with HSE team due to accident records.	Chapter 10 Table: 10.2-1
10.	Emergency response sub plan	Emergency response sub plan will be carried out HSE team under the guidance of Incidents commander/ factory general manager.	Chapter 10 Table: 10.2-1
11.	Fire management sub plan	Fire management sub plan will be implemented by HSE team members.	Chapter 10 Table: 10.2-1

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APPENDIX

No. (10) Textile Mill (Taungtha)

Some recorded photos during the public meeting

5.6.2020 **Meeting room**









အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)

သဘာဝပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာတွေ့ဆုံပွဲ

တက်ရောက်သူများ မှတ်တမ်း

ရက်စွဲ - ၅.၆.၂၀၂၀

စဉ်	အမည်	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လိပ်စာ	လက်မှတ်
၁	ဦး ကျော်ဦး	ရပ်ကွက်အုပ်			
၂	″ ထက်ထက်အောင်	ဒေါ်/တာရပ်ကွက်အုပ်			
၃	″ ကိုကြီး	နာယကရပ်ကွက်အုပ်			
၄	ဒေါ်ခင်မောကို	″	၀၉-ဂ၆၆၆၆၆၆	၁၁ ပေါက်ပင်ကွက်	
၅	ဒေါ်ဝေးသင်းထွေး	အလုပ်ရုံခွဲမှူး	၀၉-၇၇၇၇၆၆၆၆၆	သဖန်းပင်ကွက်	
၆	ဒေါ်ဖြူဖြူအေးဦး	″	၀၉-၂၅၆၂၅၀၀၃၄	၁၁ ပေါက်ပင်ကွက်	
၇	ဒေါ်ဝါဝါညွှန့်	အလုပ်ရုံမှူးကြီး	၀၉-၄၀၀၀၀၀၀၀၀၀	သဖန်းပင်ကွက်	
၈	″ နွယ်နွယ်ပက်	စုစုကို	၀၉.၄၀၂၆၈၆ ၃၆၄.	၁၁ ပေါက်ပင်ကွက်	
၉	″ ယဉ်ယဉ်မြင့်ယဉ်	အလုပ်ကိုင်ကော်ဖျော်		အမှတ်(၄)	
၁၀	ဒေါ်သိန်းမွှေး	″ ″		အမှတ်(၁၆)	
၁၁	ဒေါ်ခိုင်ဖြူဖြူ	စာရင်းကိုင် (၄)	၀၉-၆၀၂၆၆၁၄ ၈၆	အမှတ်(၄)	
၁၂	″ စန်းစန်းဖြူ	ထုတ်လုပ်မှု (၄)	-	အမှတ်(၅)	
၁၃	″ ဘုန်းသန်းထိုက်	″	၀၉-၂၅၀၂၄၅၆၆	″	
၁၄	″ ခိုင်ခိုင်မွန်	″	၀၉၇၄၅၀၉၇၁၇၃	အမှတ်(၃)	

အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)

သဘာဝပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာတွေ့ဆုံပွဲ

တက်ရောက်သူများ မှတ်တမ်း

ရက်စွဲ - ၅.၆.၂၀၂၀

စဉ်	အမည်	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လိပ်စာ	လက်မှတ်
၁	ဒေါ်(ကျော်ဝေဘဦး	ထုတ်ကုန်(၄)		အောင်သာ	ကျော်
၂	ဒေါ်နီလာထွန်း	ထုတ်ကုန်(၄)		အမှတ်(၅)	ထွန်း
၃	အိုးအေးအေးမော်	ထုတ်ကုန်(၅)		စက်ရုံ	မော်
၄	ဒေါ်အိအိမွန်	ထုတ်ကုန်(၄)		ကိုရုံ(အဆောက်)	
၅	ယိုသီပွယ်ဦး	ထုတ်ကုန်(၄)		အောင်သာ	
၆	မိုးခင်ယုဇော်	အထွေထွေ		အမှတ်(၃)	
၇	ဒေါ်စန်းကြွယ်	ထုတ်ကုန်(၄)		ကုမ္ပဏီအိမ်ယာ	
၈	ဒေါ်ချောထူးမိုး	ထုတ်ကုန်(၄)		အောင်သာ	
၉	ဒေါ်တင်တင်မော	စာ-ရေ-၄		ဝန်ထမ်းဌာန	
၁၀	ဒေါ်ဆဲဆဲထွန်း	ထရက်-၄		အမှတ်(၂)	
၁၁	ဒေါ်ခင်မြသန်း	စာ-ရေ-၃		ကြောင်းသံ(အမှတ်-၂)	
၁၂	ဒေါ်ခင်ဆွေမိုး	စာ-ရေ-၃		အမှတ်(၂)ဝင်းပြင်	
၁၃	ဒေါ်အေးမြမွန်	အလှူငွေစုဝတ်မှု		ကုမ္ပဏီအိမ်ရာ	
၁၄	ဒေါ်ဟိဟိလွင်	ထုတ်ကုန်-၄		အမှတ်(၅)အရှေ့	
၁၅	ဒေါ်စုစုပြုံ	ထုတ်ကုန်-၄		အောက်ကွင်း	

အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)

သဘာဝပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာတွေ့ဆုံပွဲ

တက်ရောက်သူများ မှတ်တမ်း

ရက်စွဲ - ၅.၆.၂၀၂၀

စဉ်	အမည်	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လိပ်စာ	လက်မှတ်
၁	ဒေါ်စိုးစိုးဝေး	တာဂစ်ကိုင်ငန်	၀၉.၇၆၁၄၄၄၀၆	No ၅	စိုး
၂	။ မြမြမြင့်မိုင်	ရပ်ဝန်း	၀၉.၃၆၄၃၇၁၆		မြင့်
၃	။ ခေါ်ကေခိုင်	ဝ.ဝ.ဂ		No 6	Chaw
၄	။ မူးမူး ဝက္ကု	ဟယ်ကွင်ပုဇွန်	၀၉.၇၆၈၇၃၄၄၅၇	No.2	မူး

အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)

သဘာဝပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာတွေ့ဆုံပွဲ

တက်ရောက်သူများ မှတ်တမ်း

ရက်စွဲ - ၅.၆.၂၀၂၀

စဉ်	အမည်	အလုပ်အကိုင်	ဖုန်းနံပါတ်	လိပ်စာ	လက်မှတ်
၁	ဦး ဝေး ဆွေ မင့်	အာဖဖ ဘုပ်ဖြစ်	၀၉၄၄၆၀၀၃၆၄	အမှတ် ၁	
၂	ဦး ဖေစိုးဦး	ဒု ပ	၀၉၂၆၂၈၆၉၀	အမှတ်-၂	
၃	ဦး သိန်း ဆွေ	ဒု ဂ ပ			
၄	ဦး ကျော်ဆွေ	ဒု ၄ ပ	၀၉.၂၅၆၂၇၀၁၈၀		
၅	ဦး တင်ထွန်း အောင်	ဒု ဂ ပ	၀၉၉၇၇၆၆၆၄၂၁၁၁		
၆	ဦး သန်းလွင်	အကြီးအကဲ ပ	၀၉ ၂၅၇၄၄၀၅၈၇		

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
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စိမ်းလန်းအဓိပ္ပြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R /322

Date / နေ့စွဲ: 25 Jun, 2020

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	အမှတ်(၃) အကြီးစားစက်မှုလုပ်ငန်း အမှတ်(၁၀) အထည်စက်ရုံ (တောင်သာ)	လေနမူနာအမှတ်စဉ်Sample I.D.	327	
နေရာ (မြို့နယ်) Location (Township)	တောင်သာမြို့နယ်	လက်တီတွဒ် Latitude	N 21° 17′ 58.64″	
		လောင်ဂျီတွဒ် Longitude	E 095° 26′ 31.80″	
နေရာ (တိုင်းပြည်နယ်) Location (Region/state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Ambient Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	Industry & Infrastructure Consultancy IIC Co.ltd	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	16.6.2020	7:15 AM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	16.6.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	17.6.2020	7:15 AM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	101.04	µg/m³ µg/m³	1	year hour	*40 µg/m³ * 200 µg/m³	1-year 1-hour
၂	Particulate matter PM 10	9.73	µg/m³ µg/m³	24	year hours	*20 µg/m³ * 50 µg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	7.16	µg/m³ µg/m³	24	year hours	* 10 µg/m³ * 25 µg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	31.75	µg/m³ µg/m³	10	hours mins	* 20 µg/m³ * 500 µg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	28.91	µg/m³ µg/m³	8	year hours	* 100 µg/m³	8 Hour Daily Maximum
၆	ကာဗွန်ဒိုင်အောက်ဆိုဒ် Carbon dioxide	141.70	ppm ppm	24	year hours	NG	-
၇	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	99.54	ppb ppb	24	year hours	NG	-

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(ဓါတ်ခွဲခန်း၏ စာဖြင့်ရေးသားခေသာသဘောတူညီချက်မရရှိပဲယခုအစီရင်ခံစာကိုအပြည့်အစုံမှလွဲ၍ တစ်စိတ်တစ်ပိုင်း ဖြတ်ယူအသုံးပြုခြင်း၊ ဓိတ္တုပွားခြင်းမပြုလုပ်ရ)

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Website: http//www.ecolabmyanmar.org Email: info@ecolabmyanmar.org

ဂေဟဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
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စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၈	ဟိုက်ဒရိုကာဗွန် Hydrocarbon		ppm		hour		
		12.78	ppm	24	hours	NG	-
၉	မီသိန်း Methane		ppm		hour		
		36.88	ppm	24	hours	NG	-
၁၀	ရေဒီယိုသတ္တိကြွ Atomic Radiation	17.19	CPM		hour		
			CPM	24	hours	NG	-
၁၁	အပူချိန် Temperature	33.15	°C		hour		
			°C	24	hours	NG	-
၁၂	Volatile Organic Compound (VOC)	0.102	ppb		hour		
			ppb	24	hours	NG	-
၁၃	လေတိုက်နှုန်း Wind Speed	1.44	Kph		hour		
			Kph	24	hours	NG	-
၁၄	လေတိုက်ရာအရပ် Wind Direction	211.97	Deg		hour		
			Deg	24	hours	NG	-
၁၅	စိုထိုင်းဆ Relative Humidity	68.52	RH%		hour		
			RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

မှတ်ချက်။ ။တိုင်းတာသည့်ကြာချိန်သည် သတ်မှတ်စံနှုန်းအချိန်ထက်နည်းပါက အများဆုံးတိုင်းတာခဲ့သည့်အချိန်၏ ပျမ်းမျှရလဒ်ကိုသာဖော်ပြထားပါသည်။

သတ်မှတ်စံနှုန်းအချိန်ထက် ပိုမိုတိုင်းတာထားသောအရည်အသွေးများအတွက် သတ်မှတ်အချိန် ပျမ်းမျှရလဒ်များ၏ အများဆုံးရလဒ်တစ်ခုသာဖော်ပြထားပါသည်။

တိုင်းတာတွက်ချက်သူ
Analyzed by
Sa Aung Thet Oo
Mobile Lab Technician
Ecological Laboratory
ALARM

စစ်ဆေးသူ
Checked by
Dr. Aye Aye Win
Laboratory In-Charge
Ecological Laboratory
(ALARM)

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(ဓါတ်ခွဲခန်း၏ စာဖြင့်ခွင့်ပြုချက်မရရှိပဲယခုအစီရင်ခံစာကိုအပြည့်အစုံမှလွဲ၍ တစ်စိတ်တစ်ပိုင်း ဖြတ်ယူအသုံးပြုခြင်း၊ ဓါတ္တုပွားခြင်းမပြုလုပ်ရ)

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လက်ထောက်ညွှန်ကြားရေးမှူး
ရေမြေသားငှက်နှင့်သစ်တောသယံဇာတဌာနစု
သစ်တောသုတေသနဌာန - ရေဆင်း
စာအမှတ်။ ၂၂၈ / ဒ(က) ၁/ Soil
ရက် စွဲ။ ၁၆ - ၆ -၂၀၂၀

သို့

ဒေါက်တာအောင်ကျော်စိုး
Senior Consultant / Director
IIC Co., Ltd
စက်မှုဝန်ထမ်းဟောင်းများအသင်း

အကြောင်းအရာ။ **မြေနမူနာအဖြေပြန်ကြားခြင်း**

အထက်အကြောင်းအရာပါကိစ္စနှင့် ပတ်သက်၍ IIC Co.,Ltd ၊ စက်မှုဝန်ထမ်းဟောင်းများအသင်းမှ ပေးပို့လာသော မြေနမူနာများ၏ အခြေအနေကို (Soil Test) ပြုလုပ်ရန် သစ်တောဖွံ့ဖြိုးရေးဌာနခွဲ၊ ရေမြေသားငှက်နှင့် သစ်တောသယံဇာတဌာနစုသို့ ပေးပို့ရောက်ရှိလာသော မြေနမူနာများအား ခါတ်ခွဲစမ်းသပ်ပြီးဖြစ်ပါ၍ မြေနမူနာအဖြေများအား ပူးတွဲ ပေးပို့အပ်ပါသည်။

(လှမျိုးအောင်)
လက်ထောက်ညွှန်ကြားရေးမှူး
ရေမြေသားငှက်နှင့်သစ်တောသယံဇာတဌာနစု
သစ်တောသုတေသနဌာန၊ ရေဆင်း

မိတ္တူ-
- ရုံးလက်ခံ။

စက်မှုဝန်ထမ်းဟောင်းများအသင်း (IIC Co.,Ltd) ပေးပို့လာသော မြေနမူနာများ၏ မြေနမူနာများ၏ ဓါတ်ခွဲစမ်းသပ်တွေ့ရှိချက်အစီရင်ခံစာ

၁။ မြေနမူနာများအားဓါတ်ခွဲစမ်းသပ်တွေ့ရှိချက်

မြေဆီလွှာ၏ ဂုဏ်သတ္တိများ	ဓါတ်ခွဲစမ်းသပ်တွေ့ရှိမှုအရ အနိမ့်ဆုံးနှင့် အမြင့်ဆုံးပါဝင်မှု	အပင်စိုက်ပျိုးရန်သင့်တော်သော မြေ၏ဂုဏ်သတ္တိအခြေအနေ
မြေချဉ်ဓါတ် (pH)	၈.၂၁-၉.၉၁	၅.၀ - ၈.၀
မြေအနုအကြမ်း (Texture)	သဲဆန်နုန်းမြေ၊ သဲစနယ်မြေ၊ နုန်းမြေစေး၊မြေစေး	သဲဆန်နုန်းမြေ၊ သဲစနယ်မြေ
မြေဆွေးဓါတ် % (Organic Matter)	၂.၀၀-၁၄.၀၀	၃ - ၇
ဖော့စဖောရပ်စ်ဓါတ် % (Phosphorous)	၀.၀၀၀၃-၀.၀၀၀၃၇	၀.၀၀၂ - ၀.၀၀၅
နိုက်ထရိုဂျင်ဓါတ် % (Nitrogen)	၀.၀၁၄-၀.၁၄၃	၀.၀၇-၀.၁
ပိုတက်ဆီယမ်ဓါတ် % (Potassium)	၀.၀၀၃-၀.၀၅၂	၀.၀၀၂-၀.၀၀၃
ကယ်လဆီယမ်ဓါတ် % (Calcium)	၀.၀၅၆-၀.၃၉၆	၀.၀၈-၀.၁၂

စက်ရုံများမှကောက်ယူစုဆောင်လာသည့်မြေနမူနာအဖြေများ

Sr. no.	Particular	Depth (cm)	pH	Total N %	Ava. P %	Ext. K %	Ext. Ca %	OM %	Particle size distribution (%) sand	Silt	Clay	Texture
1	အမှတ်(၇)ဝမ်းတွင်း	0–10	9.28	0.057	0.00037	0.016	0.175	3.0	70	14	15	Sandy-Loam
2	ဆေးဆိုးရုံအနီး	40–50	9.43	0.057	0.00026	0.014	0.122	2.0	72	15	13	Sandy-Loam
3		80–90	9.44	0.023	0.00010	0.019	0.232	2.0	65	16	18	Sandy-Loam
4	ခြံစည်းရိုးအနီး	0–10	9.27	0.143	0.00010	0.025	0.182	14.0	58	18	25	Sandy-Clay-Loam
5		40–50	9.87	0.029	0.00023	0.025	0.225	2.0	64	15	20	Sandy-Loam
6		80–90	9.91	0.019	0.00006	0.034	0.148	2.0	53	24	24	Sandy-Clay-Loam
7	အမှတ်(၄)ဖွင့်ဖြူ	0–10	8.53	0.106	0.00004	0.008	0.220	7.0	19	45	36	Clay-Loam
8	ဗေဒါကန်	40–50	8.55	0.057	0.00005	0.005	0.244	12.0	17	47	36	Clay-Loam
9		80–90	8.21	0.066	0.00004	0.003	0.396	6.0	20	40	38	Clay-Loam
10	လယ်မြေ	0–10	8.70	0.093	0.00007	0.008	0.317	7.0	26	40	34	Clay-Loam
11		40–50	8.89	0.049	0.00004	0.004	0.292	5.0	23	40	32	Clay-Loam
12		80–90	8.98	0.029	0.00003	0.005	0.247	5.0	21	44	35	Clay-Loam

Sr. no.	Particular	Depth (cm)	pH	Total N %	Ava. P %	Ext.		OM %	Particle size distribution (%)			Texture
						K %	Ca %		sand	Silt	Clay	
13	အမှတ်(၈)ရေမည်းသင်း	0–10	9.21	0.021	0.00003	0.006	0.074	3.0	38	29	31	Clay-Loam
14	စက်ရုံတွင်း	40–50	9.21	0.035	0.00003	0.008	0.062	3.0	45	22	31	Sandy-Clay-Loam
15		80–90	8.99	0.040	0.00003	0.008	0.062	4.0	41	24	30	Sandy-Clay-Loam
16	စက်ရုံပြင်	0–10	9.27	0.055	0.00009	0.015	0.080	3.0	40	25	34	Clay-Loam
17		40–50	9.37	0.067	0.00004	0.014	0.086	3.0	44	21	33	Sandy-Clay-Loam
18		80–90	9.30	0.034	0.00007	0.013	0.078	4.0	43	24	33	Clay-Loam
19	အမှတ်(၁)ရွှေတောင်	0–10	8.86	0.103	0.00009	0.015	0.121	6.0	44	28	28	Clay-Loam
20	ဗေဒါကန်	40–50	9.25	0.049	0.00018	0.012	0.100	3.0	37	33	30	Clay-Loam
21		80–90	9.62	0.030	0.00005	0.008	0.074	4.0	22	39	38	Clay-Loam
22	ကြက်ဖြူတောင်လယ်မြေ	0–10	8.25	0.025	0.00007	0.007	0.056	6.0	9	40	51	Clay
23		40–50	8.38	0.006	0.00020	0.014	0.111	5.0	10	38	46	Clay
24		80–90	8.67	0.014	0.00027	0.014	0.084	5.0	10	39	46	Clay

Sr. no.	Particular	Depth (cm)	pH	Total N %	Ava. P %	Ext.		OM %	Particle size distribution (%)			Texture
						K %	Ca %		sand	Silt	Clay	
25.	အမှတ်(၁၀) ၊တောင်သာ	0–10	9.04	0.020	0.00017	0.022	0.143	4.0	53	21	26	Sandy-Clay-Loam
26.	ဗေဒါကန် (တွင်း)	40–50	9.80	0.026	0.00021	0.007	0.131	2.0	56	19	22	Sandy-Clay-Loam
27.		80–90	9.85	0.021	0.00023	0.006	0.125	2.0	65	16	17	Sandy-Loam
28.	(အပြင်)	0–10	9.14	0.034	0.00010	0.052	0.077	2.0	59	14	21	Sandy-Clay-Loam
29.		40–50	9.03	0.038	0.00005	0.007	0.145	3.0	56	18	24	Sandy-Clay-Loam
30		80–90	8.86	0.032	0.00005	0.006	0.142	3.0	54	18	25	Sandy-Clay-Loam

စိုက်ပျိုးရေးမွေးမြူရေးနှင့်ဆည်မြောင်းဝန်ကြီးဌာန
စိုက်ပျိုးရေးသုတေသနဦးစီးဌာန
မြေဆီလွှာ၊ ရေအသုံးချရေးနှင့် စိုက်ပျိုးရေးအင်ဂျင်နီယာဌာနခွဲ
ရေအသုံးချရေးသုတေသနဌာနစု
ရေဆင်း၊ နေပြည်တော်။

ညွှန်ကြားရေးမှူးဖုန်း - ၉၅-၆၇-၄၁၆၅၃၂ စာအမှတ်-ခခ/၂၀၁၉-၂၀၂၀/ ၂၇၃
ရေအသုံးချရေးဌာနစုဖုန်း-၀၆၇-၄၁၆၅၃၁-Ext.၃၇၉ နေ့စွဲ-၂၀၂၀ ပြည့်နှစ်၊ ဇွန်လ(၂၅) ရက်

အကြောင်းအရာ ။ **မြေနမူနာ ဓာတ်ခွဲအဖြေများ ပေးပို့ခြင်း။**

ဒေါက်တာအောင်ကျော်စိုး၊ (စက်မှုဝန်ထမ်းဟောင်းများအသင်း) မှ (၃.၆.၂၀၂၀) နေ့တွင် ပေးပို့ထားသော မြေနမူနာ (၃၀) မျိုး၏ ဓာတ်ခွဲ တွေ့ရှိချက်များကို ဤစာနှင့် အတူ ပေးပို့ပါသည်။

ဒေါက်တာအောင်ကျော်စိုး
စက်မှုဝန်ထမ်းဟောင်းများအသင်း

ဒေါက်တာခင်မာဌေး
ဌာနစုတာဝန်ခံ
ရေအသုံးချရေးသုတေသနဌာနစု
စိုက်ပျိုးရေးသုတေသနဦးစီးဌာန
နေပြည်တော်၊ရေဆင်း။

မိတ္တူကို -
ရုံးလက်ခံ။

IRRIGATION WATER QUALITY ANALYSIS LABORATORY Phone: 95-67-416531, Fax: 95-67-416532 E. mail: waterlab2020@gmail.com

ISO TECH LABORATORY

ISO 9001:2015 Cert. No. 688600

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

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

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WATER QUALITY TEST RESULTS FORM

Client	IIC Co.,Ltd.
Nature of Water	ချောင်းရေ
Location	အမှတ် (၁၀) အထည်စက်ရုံ၊ တောင်သာ။
Date and Time of collection	21.5.2020
Date and Time of arrival at Laboratory	23.5.2020
Date and Time of commencing examination	24.5.2020
Date and Time of completing	26.5.2020

Results of Water Analysis			WHO Drinking Water Guideline (Geneva - 1993)
pH	8.7		6.5 - 8.5
Colour (True)	5	TCU	15 TCU
Turbidity	14	NTU	5 NTU
Conductivity	1940	micro S/cm	
Total Hardness	940	mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness	628	mg/l as $CaCO_3$	
Magnesium Hardness	312	mg/l as $CaCO_3$	
Total Alkalinity	616	mg/l as $CaCO_3$	
Phenolphthalein Alkalinity	10	mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)	20	mg/l as $CaCO_3$	
Bicarbonate (HCO_3)	596	mg/l as $CaCO_3$	
Iron	0.72	mg/l	0.3 mg/l
Chloride (as CL)	210	mg/l	250 mg/l
Sodium chloride (as NaCL)	347	mg/l	
Sulphate (as SO_4)	160	mg/l	500 mg/l
Total Solids	993	mg/l	1500 mg/l
Total Suspended Solids	23	mg/l	
Total Dissolved Solids	970	mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

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

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

Approved by
Signature:
Name: Thinzar Theint Theint
B.E (Civil)
Assistant Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

IIC Company Registration



ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်

Certificate of Incorporation

အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

I I C COMPANY LIMITED

Company Registration No. 102588584

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ

အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

အား ၂၀၁၈ ခုနှစ် မေ ၈ ရက်နေ့တွင်

အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ

အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that

I I C COMPANY LIMITED

was incorporated under the Myanmar Companies Act 1914 on 8 May 2018

as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ

Registrar of Companies

ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

Directorate of Investment and Company Administration

Former Registration No. 668/2018-2019(YGN)

IIC Company Extract

DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Company Information

Registration Number	Registration Date	Status
102588584	08/05/2018	Registered
Company Type	**Foreign Company**	**Small Company**
Private Company Limited by Shares	No	Yes
Principal Activity	**Date of Last Annual Return**	**Previous Registration Number**
62 - Computer programming, consultancy and related activities	21/03/2023	668/2018-2019(YGN)

Addresses

Registered Office In Union	AREZANI BEIKMAN STREET,, SHWE NATHA LANE, EAST SHWE DAGON GATEWAY, BAHAN TOWNSHIP,, YANGON REGION, MYANMAR Email Address: kyawzaw1954@gmail.com Telephone Number: 095087001

Officers

Name:	AHMAR YI	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	10/11/1958
Nationality:	MYANMAR	N.R.C./Passport:	12/KAMAYA(N)029210
Gender:	FEMALE	Business Occupation:	-
Name:	AYE LWIN	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	04/04/1954
Nationality:	MYANMAR	N.R.C./Passport:	12/BAHANA(N)032233
Gender:	MALE	Business Occupation:	-
Name:	CHO WIN MAW	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	10/10/1954
Nationality:	MYANMAR	N.R.C./Passport:	12/MAYAKA(N)108669
Gender:	MALE	Business Occupation:	-
Name:	DR.AUNG KYAW SOE	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	06/06/1965
Nationality:	MYANMAR	N.R.C./Passport:	12/KAMATA(N)018391
Gender:	MALE	Business Occupation:	-
Name:	HLA HTAY	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	18/01/1959

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Nationality:	MYANMAR	N.R.C./Passport:	8/MALANA(N)004745
Gender:	MALE	Business Occupation:	-
Name:	KHIN MAUNG TINT	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	12/02/1956
Nationality:	MYANMAR	N.R.C./Passport:	12/DAGANA(N)004277
Gender:	MALE	Business Occupation:	-
Name:	KHIN MAUNG TUN	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	08/04/1959
Nationality:	MYANMAR	N.R.C./Passport:	9/MANAMA(N)097211
Gender:	MALE	Business Occupation:	-
Name:	KYAW ZAW	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	29/03/1954
Nationality:	MYANMAR	N.R.C./Passport:	12/OUKAMA(N)074580
Gender:	MALE	Business Occupation:	-
Name:	MAUNG MAUNG MYINT	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	14/04/1952
Nationality:	MYANMAR	N.R.C./Passport:	12/TAMANA(N)050037
Gender:	MALE	Business Occupation:	-
Name:	MAUNG MAUNG TOE	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	20/03/1952
Nationality:	MYANMAR	N.R.C./Passport:	12/TAMANA(N)004696
Gender:	MALE	Business Occupation:	-
Name:	MAW HEIN	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	19/03/1953
Nationality:	MYANMAR	N.R.C./Passport:	7/YATAYA(N)005313
Gender:	MALE	Business Occupation:	-
Name:	MIN SEIN	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	05/05/1953
Nationality:	MYANMAR	N.R.C./Passport:	12/TAMANA(N)070182
Gender:	MALE	Business Occupation:	-
Name:	MYO THAW	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	23/09/1955
Nationality:	MYANMAR	N.R.C./Passport:	12/KATATA(N)003122
Gender:	MALE	Business Occupation:	-
Name:	NYUNT AUNG	Type:	DIRECTOR

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
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Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Date of Appointment:	N/A	Date of Birth:	05/08/1949
Nationality:	MYANMAR	N.R.C./Passport:	7/TANGANA(N)004971
Gender:	MALE	Business Occupation:	-
Name:	SEIN WIN	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	13/10/1953
Nationality:	MYANMAR	N.R.C./Passport:	8/PAKHAKA(N)114027
Gender:	MALE	Business Occupation:	-
Name:	SOE TINT @ TOE LWIN	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	13/02/1959
Nationality:	MYANMAR	N.R.C./Passport:	12/AHSANA(N)124228
Gender:	MALE	Business Occupation:	-
Name:	THAN WIN	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	06/03/1953
Nationality:	MYANMAR	N.R.C./Passport:	12/TAMANA(N)046534
Gender:	MALE	Business Occupation:	-
Name:	THAUNG MYINT	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	01/07/1955
Nationality:	MYANMAR	N.R.C./Passport:	9/MAMANA(N)005130
Gender:	MALE	Business Occupation:	-
Name:	THEIN LWIN	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	10/06/1956
Nationality:	MYANMAR	N.R.C./Passport:	12/DAGANA(N)018315
Gender:	MALE	Business Occupation:	-
Name:	TIN AUNG	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	08/12/1951
Nationality:	MYANMAR	N.R.C./Passport:	8/MAKANA(N)009932
Gender:	MALE	Business Occupation:	-
Name:	TUN MYINT	Type:	DIRECTOR
Date of Appointment:	28/08/2020	Date of Birth:	15/11/1950
Nationality:	MYANMAR	N.R.C./Passport:	12/MABANA(N)003740
Gender:	MALE	Business Occupation:	-
Name:	WYNN KO KO	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	30/09/1959
Nationality:	MYANMAR	N.R.C./Passport:	12/MAYAKA(N)054462
Gender:	MALE	Business Occupation:	-

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Name:	ZAW HEIN @ SOE SOE	Type:	DIRECTOR
Date of Appointment:	N/A	Date of Birth:	25/12/1956
Nationality:	MYANMAR	N.R.C./Passport:	10/KAHTANA(N)008170
Gender:	MALE	Business Occupation:	-

Ultimate Holding Company

Name of Ultimate Holding Company	Jurisdiction of Incorporation	Registration Number
-	-	-

Share Capital Structure

Total Shares Issued by Company
1,830

Currency of Share Capital
MMK

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	1,830	18,300,000.00	0.00

Members

Name:	AHMAR YI		
Gender:	Female	Date of Birth:	10/11/1958
Nationality:	Myanmar	N.R.C./Passport:	12/KAMAYA(N)029210

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	100	1,000,000.00	0.00

Name:	AYE LWIN		
Gender:	Male	Date of Birth:	04/04/1954
Nationality:	Myanmar	N.R.C./Passport:	12/BAHANA(N)032233

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name:	CHO WIN MAW		
Gender:	Male	Date of Birth:	10/10/1954
Nationality:	Myanmar	N.R.C./Passport:	12/MAYAKA(N)108669

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: DR.AUNG KYAW SOE

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Gender: Male | Date of Birth: 06/06/1965
Nationality: Myanmar | N.R.C./Passport: 12/KAMATA(N)018391

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: HIA HTAY
Gender: Male | Date of Birth: 30/09/1959
Nationality: Myanmar | N.R.C./Passport: 8/MALANA(N)004745

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: KHIN MAUNG TINT
Gender: Male | Date of Birth: 12/02/1956
Nationality: Myanmar | N.R.C./Passport: 12/DAGANA(N)004277

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	130	1,300,000.00	0.00

Name: KHIN MAUNG TUN
Gender: Male | Date of Birth: 08/04/1959
Nationality: Myanmar | N.R.C./Passport: 9/MANAMA(N)097211

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: KYAW ZAW
Gender: Male | Date of Birth: 29/03/1954
Nationality: Myanmar | N.R.C./Passport: 12/OUKAMA(N)074580

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: MAUNG MAUNG MYINT
Gender: Male | Date of Birth: 14/04/1952
Nationality: Myanmar | N.R.C./Passport: 12/TAMANA(N)050037

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: MAUNG MAUNG TOE
Gender: Male
Date of Birth: 20/03/1952
Nationality: Myanmar
N.R.C./Passport: 12/TAMANA(N)004696

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: MAW HEIN
Gender: Male
Date of Birth: 19/03/1953
Nationality: Myanmar
N.R.C./Passport: 7/YATAYA(N)005313

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: MIN SEIN
Gender: Male
Date of Birth: 05/05/1953
Nationality: Myanmar
N.R.C./Passport: 12/TAMANA(N)070182

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: MYO THAW
Gender: Male
Date of Birth: 23/09/1955
Nationality: Myanmar
N.R.C./Passport: 12/KATATA(N)003122

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: NYUNT AUNG
Gender: Male
Date of Birth: 05/08/1949
Nationality: Myanmar
N.R.C./Passport: 7/TANGANA(N)004971

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	120	1,200,000.00	0.00

Name: SEIN WIN

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
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Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Gender:	Male	Date of Birth:	13/10/1953
Nationality:	Myanmar	N.R.C./Passport:	8/PAKHAKA(N)114027

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name:	SOE TINT @ TOE LWIN		
Gender:	Male	Date of Birth:	13/02/1959
Nationality:	Myanmar	N.R.C./Passport:	12/AHSANA(N)124228

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name:	THAN WIN		
Gender:	Male	Date of Birth:	06/03/1953
Nationality:	Myanmar	N.R.C./Passport:	12/TAMANA(N)046534

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name:	THAUNG MYINT		
Gender:	Male	Date of Birth:	10/06/1956
Nationality:	Myanmar	N.R.C./Passport:	9/MAMANA(N)005130

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name:	THEIN LWIN		
Gender:	Male	Date of Birth:	10/06/1956
Nationality:	Myanmar	N.R.C./Passport:	12/DAGANA(N)018315

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name:	TIN AUNG		
Gender:	Male	Date of Birth:	08/12/1951
Nationality:	Myanmar	N.R.C./Passport:	8/MAKANA(N)009932

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)
I I C COMPANY LIMITED

Company Name (Myanmar)
အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: TUN MYINT
Gender: Male
Date of Birth: 15/11/1950
Nationality: Myanmar
N.R.C./Passport: 12/MABANA(N)003740

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	50	500,000.00	0.00

Name: WYNN KO KO
Gender: Male
Date of Birth: 30/09/1959
Nationality: Myanmar
N.R.C./Passport: 12/MAYAKA(N)054462

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Name: ZAW HEIN @ SOE SOE
Gender: Male
Date of Birth: 25/12/1956
Nationality: Myanmar
N.R.C./Passport: 10/KAHTANA(N)008170

Class	Description	Total Number	Total Amount Paid	Total Amount Unpaid
ORD	Ordinary	90	900,000.00	0.00

Mortgages and Charges

Form / Filing Type	Effective Date

No records available

Details about all mortgages and charges can be accessed from the Company Profile Filing History at no charge.

Filing History

Form / Filing Type	Effective Date
AR | Annual Return	21/03/2023
AR | Annual Return	18/05/2022
AR | Annual Return	30/05/2021
D-1 | Particulars of directors and secretary	28/08/2020
C-3 | Change to share capital or register of members	28/08/2020
I-9D | Application to revoke suspension of company registration	25/08/2020
AR | Annual Return	25/08/2020

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DIRECTORATE OF INVESTMENT AND COMPANY ADMINISTRATION

Myanmar Companies Online Registry - Company Extract

Company Name (English)	Company Name (Myanmar)
I I C COMPANY LIMITED	အိုင် အိုင် စီ ကုမ္ပဏီ လီမိတက်

I-9A | Notice of intent to suspend for failure to file annual return	09/06/2020
B-1 | Application for re-registration of a private company limited by shares	31/08/2018

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ECD Licenses

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
The Government of the Republic of the Union of Myanmar
သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
Ministry of Natural Resources and Environmental Conservation
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (ပုဂ္ဂိုလ်)

Environmental Impact Assessment License (Individual)

ဒေါက်တာအောင်ကျော်စိုး၊ ၁၂/ကမတ(နိုင်)၀၁၈၃၉၁ အား တွဲဖက်အကြံပေးပုဂ္ဂိုလ် အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာလုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is hereby issued that **Dr.Aung Kyaw Soe, 12/KaMaTa(N)018391** has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an **Associate Consultant** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

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

1. ရေထုညစ်ညမ်းမှု ကြိုတင်ကာကွယ်ခြင်း၊ ထိန်းချုပ်ခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်းနှင့် ထိခိုက်မှုကြိုတင်ခန့်မှန်းခြင်း (Water Pollution Prevention, Control, Monitoring and Prediction of Impacts)
2. စွန့်ပစ်အစိုင်အခဲနှင့် ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲခြင်း (Solid Waste and Hazardous Waste Management)
3.
4.
5.

လိုင်စင်နံပါတ် License Number	: EIA-AC 056/2023
ထုတ်ပေးသည့် ရက်စွဲ Date of Issue	: 1-12-2023
ကုန်ဆုံးသည့် ရက်စွဲ Date of Expiry	: 30-11-2026



(သိန်းတိုး)
ညွှန်ကြားရေးမှူးချုပ်

စည်းကမ်းချက်များ

၁။ ဤလုပ်ငန်းလိုင်စင်ကိုင်ဆောင်ထားသူသည်-

(က) လုပ်ငန်းလိုင်စင်မိတ္တူကို လုပ်ငန်းခွင်တွင် အများမြင်သာအောင်ချိတ်ဆွဲ၍ မူရင်းကို လုံခြုံစွာထိန်းသိမ်းထားရှိရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်ကို ပြင်ဆင်ခြင်းနှင့် ဖျက်ဆီးခြင်း၊ လုပ်ငန်းလိုင်စင်မူရင်း သို့မဟုတ် မိတ္တူကို မသက်ဆိုင်သူ တစ်ဦးဦးအား အခကြေးငွေဖြင့်ငှားရမ်းခြင်း၊ အမည်ခံအသုံးပြုစေခြင်းနှင့်တစ်ဆင့်လွှဲပြောင်းကိုင်ဆောင်စေခြင်း မပြုရ၊

(ဂ) လုပ်ငန်းလိုင်စင်ပါအချက်များကို ပြုပြင်ပြောင်းလဲရန် လိုအပ်ပါက ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ ကြိုတင်တင်ပြလျှောက်ထားရမည်၊

(ဃ) လုပ်ငန်းလိုင်စင် ပျက်စီးခြင်း၊ ပျောက်ဆုံးခြင်း ဖြစ်ပွားပါက ၇ ရက်အတွင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အကျိုးအကြောင်းခိုင်လုံစွာ ဖော်ပြ၍ တင်ပြလျှောက်ထားရမည်၊

(င) လုပ်ငန်းလိုင်စင်ကို သတ်မှတ်သည့် စည်းကမ်းဘောင်အတွင်း လုပ်ငန်းလုပ်ကိုင်ခွင့် အငြင်းပွားမှုများနှင့်စပ်လျဉ်း၍ တာဝန်ယူဖြေရှင်းရမည်။ ယင်းသို့ဖြေရှင်းနိုင်ခြင်းမရှိပါက လုပ်ငန်းလုပ်ကိုင်ခွင့်ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက်ခြင်း ခံရမည်၊

(စ) လုပ်ငန်းလိုင်စင်တွင် ခွင့်ပြုထားသည့် ကျွမ်းကျင်မှုနယ်ပယ်များအတွက်သာ တာဝန်ယူ လေ့လာ ဆန်းစစ်ရေးဆွဲရမည်၊

(ဆ) အဖွဲ့အစည်းဖြစ်လျှင် အဖွဲ့အစည်းတွင် ဒါရိုက်တာဘုတ်အဖွဲ့ (Board of Director) ၊ အကြံပေးပုဂ္ဂိုလ်၊ အထောက်အကူပြုအဖွဲ့ဝင်များ ပြောင်းလဲမှုတစ်စုံတစ်ရာ ရှိပါက ပြောင်းလဲသည့် နေ့ရက်မှစ၍ ရက်ပေါင်း ၉၀ အတွင်း တည်ဆဲဥပဒေများနှင့်အညီ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အချိန်မီ အကြောင်းကြားရမည်၊

(ဇ) အကြံပေးအဖွဲ့အမျိုးအစား (က) သို့မဟုတ် (ခ) တွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဆောင်ရွက်နေသော အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေးပုဂ္ဂိုလ်ဖြစ်ပါက အခြားအကြံပေးအဖွဲ့အစည်းတွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ၊ အဓိကမဟုတ်သော အကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ ပါဝင်ဆောင်ရွက်ခြင်း မပြုရ၊

(ဈ) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ၊ နည်းဥပဒေများ၊ အမိန့်၊ ညွှန်ကြားချက်နှင့် လုပ်ထုံးလုပ်နည်းများကိုလည်းကောင်း၊ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းများလုပ်ငန်းလိုင်စင်ဆိုင်ရာလုပ်ထုံးလုပ်နည်း အပိုဒ် ၃၃ ပါ စည်းကမ်းချက်များကိုလည်းကောင်း၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက အခါအားလျော်စွာ သတ်မှတ်သည့် စည်းကမ်းချက်များကိုလည်းကောင်း လိုက်နာရမည်၊

၂။ လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးခြင်းနှင့် စပ်လျဉ်း၍-

(က) လုပ်ငန်းလိုင်စင်လုပ်ထုံးလုပ်နည်းတွင် သတ်မှတ်ထားသည့်အတိုင်း လုပ်ငန်းလိုင်စင် သက်တမ်းမကုန်ဆုံးမီ သုံးလကြိုတင်၍ မပျက်မကွက် လိုင်စင် သက်တမ်းတိုးရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးရန် လျှောက်ထားခြင်း၊ လိုင်စင်ထုတ်ယူခြင်းကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ လူကိုယ်တိုင် သို့မဟုတ် အဖွဲ့အစည်းတာဝန်ခံကိုယ်တိုင် လာရောက် ဆောင်ရွက်ရမည်၊

(ဂ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးပြီး လိုင်စင်အသစ်ထုတ်ယူရာတွင် လက်ဝယ်ရှိမူရင်းလိုင်စင်ကို ပြန်လည်အပ်နှံရမည်။

၃။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက ခွင့်ပြုထားသော ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အမျိုးအစားမှအပ အခြားဆန်းစစ်ခြင်းအမျိုးအစားကို လေ့လာဆန်းစစ်ရေးဆွဲဆောင်ရွက်ခြင်း မပြုရ။

၄။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် မြန်မာနိုင်ငံ၏ တည်ဆဲဥပဒေတစ်ရပ်ရပ်ကို ဖောက်ဖျက်ကြောင်း သို့မဟုတ် ဆန်းစစ်ခြင်း လုပ်ငန်းများဆောင်ရွက်ရာတွင် သိသာထင်ရှားသော မှားယွင်းမှုများ ပါရှိနေပြီး သတ်မှတ်စံချိန်စံညွှန်း သို့မဟုတ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေများ၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းတို့အရ စိစစ်သုံးသပ်ပြီး ကနဦးသဘောထားမှတ်ချက်နှင့်အညီ ပြန်လည်ပြင်ဆင်ခြင်း မရှိကြောင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သတ်မှတ်ဆုံးဖြတ်ခြင်းခံရလျှင် လုပ်ငန်းလိုင်စင် ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက်ခြင်း ခံရမည်။

၅။ လုပ်ငန်းလိုင်စင်ရရှိသော အဖွဲ့အစည်းသည် သက်ဆိုင်ရာစီမံကိန်းအတွက် လေ့လာဆန်းစစ်ရေးဆွဲ ဆောင်ရွက်ရန် တတိယအဖွဲ့အစည်းအတည်ပြုချက်ရယူရာ၌ မိမိအဖွဲ့အစည်းတွင် ပါဝင်သည့် အကြံပေးပုဂ္ဂိုလ်၊ တွဲဖက်အကြံပေးပုဂ္ဂိုလ်များ၏ အမည်စာရင်းမှအပ အခြားပုဂ္ဂိုလ်များ၏ အမည်စာရင်းများကို တင်ပြခွင့်မရှိရ။

၆။ လုပ်ငန်းလိုင်စင်ရရှိသောအဖွဲ့အစည်းသည် မိမိအဖွဲ့အစည်းက လက်လှမ်းမမီသော ကျွမ်းကျင်မှုနယ်ပယ်များအတွက် လေ့လာဆန်းစစ်ရေးဆွဲ ဆောင်ရွက်နိုင်ရန် လုပ်ငန်းလိုင်စင်ရရှိပြီးဖြစ်သည့် တစ်သီးပုဂ္ဂလိက လုပ်ကိုင်သူ (Freelancer) အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေးပုဂ္ဂိုလ်ကို သက်ဆိုင်ရာစီမံကိန်းအတွက်သာ ငှားရမ်းဆောင်ရွက်ရမည်။ သက်ဆိုင်ရာစီမံကိန်းအတွက် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ တတိယအဖွဲ့အစည်း အတည်ပြုချက်ရယူရာတွင် ယင်းသို့ ငှားရမ်းဆောင်ရွက်ကြောင်း နှစ်ဦးသဘောတူစာချုပ် အထောက်အထားကို တစ်ပါတည်း ထည့်သွင်းဖော်ပြရမည်။

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

Environmental Impact Assessment License (Individual)

ဦးထွန်းမြင့်၊ ၁၂/မဘန(နိုင်)၀၀၃၇၄၀ အား တွဲဖက်ကြေးပုဂ္ဂိုလ်အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်း လုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့် အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is hereby issued that U Tun Myint, 12/MaBaNa(N)003740 has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as an Associate Consultant under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လေ့လာဆန်းစစ်ခွင့်ရှိသည့် ကျွမ်းကျင်မှုနယ်ပယ်များမှာ အောက်ပါအတိုင်းဖြစ်သည်-

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

1. ဂေဟစနစ်နှင့် ဇီဝမျိုးစုံမျိုးကွဲ (Ecology and Biodiversity)
2.
3.
4.
5.

လိုင်စင်နံပါတ် License Number	: EIA-AC 058/2023
ထုတ်ပေးသည့် ရက်စွဲ Date of Issue	: 1-12-2023
ကုန်ဆုံးသည့် ရက်စွဲ Date of Expiry	: 30-11-2026



(သိန်းတိုး)
ညွှန်ကြားရေးမှူးချုပ်

စည်းကမ်းချက်များ

၁။ ဤလုပ်ငန်းလိုင်စင်ကိုင်ဆောင်ထားသူသည်-

(က) လုပ်ငန်းလိုင်စင်မိတ္တူကို လုပ်ငန်းခွင်တွင် အများမြင်သာအောင်ချိတ်ဆွဲ၍ မူရင်းကို လုံခြုံစွာထိန်းသိမ်းထားရှိရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်ကို ပြင်ဆင်ခြင်းနှင့် ဖျက်ဆီးခြင်း၊ လုပ်ငန်းလိုင်စင်မူရင်း သို့မဟုတ် မိတ္တူကို မသက်ဆိုင်သူ တစ်ဦးဦးအား အခကြေးငွေဖြင့်ငှားရမ်းခြင်း၊ အမည်ခံအသုံးပြုစေခြင်းနှင့်တစ်ဆင့်လွှဲပြောင်းကိုင်ဆောင်စေခြင်း မပြုရ၊

(ဂ) လုပ်ငန်းလိုင်စင်ပါအချက်များကို ပြုပြင်ပြောင်းလဲရန် လိုအပ်ပါက ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ ကြိုတင် တင်ပြလျှောက်ထားရမည်၊

(ဃ) လုပ်ငန်းလိုင်စင် ပျက်စီးခြင်း၊ ပျောက်ဆုံးခြင်း ဖြစ်ပွားပါက ၇ ရက်အတွင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အကျိုးအကြောင်းခိုင်လုံစွာ ဖော်ပြ၍ တင်ပြလျှောက်ထားရမည်၊

(င) လုပ်ငန်းလိုင်စင်ကို သတ်မှတ်သည့် စည်းကမ်းဘောင်အတွင်း လုပ်ငန်းလုပ်ကိုင်ခွင့် အငြင်းပွားမှုများနှင့်စပ်လျဉ်း၍ တာဝန်ယူဖြေရှင်းရမည်။ ယင်းသို့ဖြေရှင်းနိုင်ခြင်းမရှိပါက လုပ်ငန်းလုပ်ကိုင်ခွင့်ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက်ခြင်း ခံရမည်၊

(စ) လုပ်ငန်းလိုင်စင်တွင် ခွင့်ပြုထားသည့် ကျွမ်းကျင်မှုနယ်ပယ်များအတွက်သာ တာဝန်ယူ လေ့လာ ဆန်းစစ်ရေးဆွဲရမည်၊

(ဆ) အဖွဲ့အစည်းဖြစ်လျှင် အဖွဲ့အစည်းတွင် ဒါရိုက်တာဘုတ်အဖွဲ့ (Board of Director) ၊ အကြံပေးပုဂ္ဂိုလ်၊ အထောက်အကူပြုအဖွဲ့ဝင်များ ပြောင်းလဲမှုတစ်စုံတစ်ရာ ရှိပါက ပြောင်းလဲသည့် နေ့ရက်မှစ၍ ရက်ပေါင်း ၉၀ အတွင်း တည်ဆဲဥပဒေများနှင့်အညီ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အချိန်မီ အကြောင်းကြားရမည်၊

(ဇ) အကြံပေးအဖွဲ့အမျိုးအစား (က) သို့မဟုတ် (ခ) တွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဆောင်ရွက်နေသော အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေးပုဂ္ဂိုလ်ဖြစ်ပါက အခြားအကြံပေးအဖွဲ့အစည်းတွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ၊ အဓိကမဟုတ်သော အကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ ပါဝင်ဆောင်ရွက်ခြင်း မပြုရ၊

(ဈ) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ၊ နည်းဥပဒေများ၊ အမိန့်၊ ညွှန်ကြားချက်နှင့် လုပ်ထုံးလုပ်နည်းများကိုလည်းကောင်း၊ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းများလုပ်ငန်းလိုင်စင်ဆိုင်ရာလုပ်ထုံးလုပ်နည်း အပိုဒ် ၃၃ ပါ စည်းကမ်းချက်များကိုလည်းကောင်း၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက အခါအားလျော်စွာ သတ်မှတ်သည့် စည်းကမ်းချက်များကိုလည်းကောင်း လိုက်နာရမည်၊

၂။ လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးခြင်းနှင့် စပ်လျဉ်း၍-

(က) လုပ်ငန်းလိုင်စင်လုပ်ထုံးလုပ်နည်းတွင် သတ်မှတ်ထားသည့်အတိုင်း လုပ်ငန်းလိုင်စင် သက်တမ်းမကုန်ဆုံးမီ သုံးလ ကြိုတင်၍ မပျက်မကွက် လိုင်စင် သက်တမ်းတိုးရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးရန် လျှောက်ထားခြင်း၊ လိုင်စင်ထုတ်ယူခြင်းကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ လူကိုယ်တိုင် သို့မဟုတ် အဖွဲ့အစည်းတာဝန်ခံကိုယ်တိုင် လာရောက် ဆောင်ရွက်ရမည်၊

(ဂ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးပြီး လိုင်စင်အသစ်ထုတ်ယူရာတွင် လက်ဝယ်ရှိမူရင်းလိုင်စင်ကို ပြန်လည်အပ်နှံရမည်။

၃။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက ခွင့်ပြုထားသော ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အမျိုးအစားမှအပ အခြားဆန်းစစ်ခြင်းအမျိုးအစားကို လေ့လာဆန်းစစ်ရေးဆွဲဆောင်ရွက်ခြင်း မပြုရ။

၄။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် မြန်မာနိုင်ငံ၏ တည်ဆဲဥပဒေတစ်ရပ်ရပ်ကို ဖောက်ဖျက်ကြောင်း သို့မဟုတ် ဆန်းစစ်ခြင်း လုပ်ငန်းများဆောင်ရွက်ရာတွင် သိသာထင်ရှားသော မှားယွင်းမှုများ ပါရှိနေပြီး သတ်မှတ်စံချိန်စံညွှန်း သို့မဟုတ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေများ၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းတို့အရ စိစစ်သုံးသပ်ပြီး ကနဦးသဘောထားမှတ်ချက်နှင့်အညီ ပြန်လည်ပြင်ဆင်ခြင်း မရှိကြောင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သတ်မှတ်ဆုံးဖြတ်ခြင်းခံရလျှင် လုပ်ငန်းလိုင်စင် ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက်ခြင်း ခံရမည်။

၅။ လုပ်ငန်းလိုင်စင်ရရှိသော အဖွဲ့အစည်းသည် သက်ဆိုင်ရာစီမံကိန်းအတွက် လေ့လာဆန်းစစ်ရေးဆွဲ ဆောင်ရွက်ရန် တတိယအဖွဲ့အစည်းအတည်ပြုချက်ရယူရာ၌ မိမိအဖွဲ့အစည်းတွင် ပါဝင်သည့် အကြံပေးပုဂ္ဂိုလ်၊ တွဲဖက်အကြံပေးပုဂ္ဂိုလ်များ၏ အမည်စာရင်းမှအပ အခြားပုဂ္ဂိုလ်များ၏ အမည်စာရင်းများကို တင်ပြခွင့်မရှိရ။

၆။ လုပ်ငန်းလိုင်စင်ရရှိသောအဖွဲ့အစည်းသည် မိမိအဖွဲ့အစည်းက လက်လှမ်းမမီသော ကျွမ်းကျင်မှုနယ်ပယ်များအတွက် လေ့လာဆန်းစစ်ရေးဆွဲ ဆောင်ရွက်နိုင်ရန် လုပ်ငန်းလိုင်စင်ရရှိပြီးဖြစ်သည့် တစ်သီးပုဂ္ဂလိက လုပ်ကိုင်သူ (Freelancer) အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေးပုဂ္ဂိုလ်ကို သက်ဆိုင်ရာစီမံကိန်းအတွက်သာ ငှားရမ်းဆောင်ရွက်ရမည်။ သက်ဆိုင်ရာစီမံကိန်းအတွက် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ တတိယအဖွဲ့အစည်း အတည်ပြုချက်ရယူရာတွင် ယင်းသို့ ငှားရမ်းဆောင်ရွက်ကြောင်း နှစ်ဦးသဘောတူစာချုပ် အထောက်အထားကို တစ်ပါတည်း ထည့်သွင်းဖော်ပြရမည်။

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

The Government of the Republic of the Union of Myanmar

သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန

Ministry of Natural Resources and Environmental Conservation

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

Environmental Conservation Department

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ငန်းလိုင်စင် (အဖွဲ့အစည်း)

Environmental Impact Assessment License (Organization)

Industry and Infrastructure Consultancy ၊ ကုမ္ပဏီမှတ်ပုံတင်အမှတ်-၁၀၂၅၈၈၅၈၄ အား **အကြံပေးအဖွဲ့အမျိုးအစား(ခ)** အဖြစ် လုပ်ကိုင်ဆောင်ရွက်ရန် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ငန်းလိုင်စင်ကို ကနဦး ပတ်ဝန်းကျင် ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းလုပ်ငန်း လိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့်အညီ ဤဝန်ကြီးဌာန၏ အတည်ပြုချက်ဖြင့် ထုတ်ပေးလိုက်သည်။

It is here by issued that **Industry and Infrastructure Consultancy Company** ၊ Registration No. 102588584 has fulfilled the requirements for obtaining an Environmental Impact Assessment License to conduct as a **Consulting Organization Type(B)** under the Licensing Procedure for the Third Persons or Organizations Undertaking Initial Environmental Examination and Environmental Impact Assessment, approved by the Ministry of Natural Resources and Environmental Conservation.

လိုင်စင်နံပါတ် License Number	: EIA-CO(B)007/2024
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(သိန်းတိုး)

ညွှန်ကြားရေးမှူးချုပ်

စည်းကမ်းချက်များ

၁။ ဤလုပ်ငန်းလိုင်စင်ကိုင်ဆောင်ထားသူသည်-

(က) လုပ်ငန်းလိုင်စင်မိတ္တူကို လုပ်ငန်းခွင်တွင် အများမြင်သာအောင် ချိတ်ဆွဲ၍ မူရင်းကို လုံခြုံစွာထိန်းသိမ်းထားရှိရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်ကို ပြင်ဆင်ခြင်းနှင့် ဖျက်ဆီးခြင်း၊ လုပ်ငန်းလိုင်စင်မူရင်း သို့မဟုတ် မိတ္တူကို မသက်ဆိုင်သူ တစ်ဦးဦးအား အခကြေးငွေဖြင့်ငှားရမ်းခြင်း၊ အမည်ခံအသုံးပြုစေခြင်းနှင့်တစ်ဆင့်လွှဲပြောင်းကိုင်ဆောင်စေခြင်း မပြုရ၊

(ဂ) လုပ်ငန်းလိုင်စင်ပါအချက်များကို ပြုပြင်ပြောင်းလဲရန် လိုအပ်ပါက ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ ကြိုတင် တင်ပြလျှောက်ထားရမည်၊

(ဃ) လုပ်ငန်းလိုင်စင် ပျက်စီးခြင်း၊ ပျောက်ဆုံးခြင်း ဖြစ်ပွားပါက ၇ ရက်အတွင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အကျိုးအကြောင်းခိုင်လုံစွာ ဖော်ပြ၍ တင်ပြလျှောက်ထားရမည်၊

(င) လုပ်ငန်းလိုင်စင်ကို သတ်မှတ်သည့် စည်းကမ်းဘောင်အတွင်း လုပ်ငန်းလုပ်ကိုင်ခွင့် အငြင်းပွားမှုများနှင့်စပ်လျဉ်း၍ တာဝန်ယူဖြေရှင်းရမည်။ ယင်းသို့ဖြေရှင်းနိုင်ခြင်းမရှိပါက လုပ်ငန်းလုပ်ကိုင်ခွင့်ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက် ခြင်း ခံရမည်၊

(စ) လုပ်ငန်းလိုင်စင်တွင် ခွင့်ပြုထားသည့် ကျွမ်းကျင်မှုနယ်ပယ်များအတွက်သာ တာဝန်ယူ လေ့လာဆန်းစစ်ရေးဆွဲရမည်၊

(ဆ) အဖွဲ့အစည်းဖြစ်လျှင် အဖွဲ့အစည်းတွင် ဒါရိုက်တာဘုတ်အဖွဲ့ (Board of Director) ၊ အကြံပေးပုဂ္ဂိုလ်၊ အထောက် အကူပြုအဖွဲ့ဝင်များ ပြောင်းလဲမှုတစ်စုံတစ်ရာ ရှိပါက ပြောင်းလဲသည့် နေ့ရက်မှစ၍ ရက်ပေါင်း ၉၀ အတွင်း တည်ဆဲ ဥပဒေများနှင့်အညီ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနသို့ အချိန်မီ အကြောင်းကြားရမည်၊

(ဇ) အကြံပေးအဖွဲ့အမျိုးအစား (က) သို့မဟုတ် (ခ) တွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဆောင်ရွက်နေသော အကြံပေးပုဂ္ဂိုလ် သို့မဟုတ် တွဲဖက်အကြံပေးပုဂ္ဂိုလ်ဖြစ်ပါက အခြားအကြံပေးအဖွဲ့အစည်းတွင် အဓိကအကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ၊ အဓိကမဟုတ်သော အကြံပေးပုဂ္ဂိုလ်အဖြစ် ဖြစ်စေ ပါဝင်ဆောင်ရွက်ခြင်း မပြုရ၊

(ဈ) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ၊ နည်းဥပဒေများ၊ အမိန့်၊ ညွှန်ကြားချက်နှင့် လုပ်ထုံးလုပ်နည်းများကိုလည်းကောင်း၊ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းများလုပ်ငန်းလိုင်စင်ဆိုင်ရာလုပ်ထုံးလုပ်နည်း အပိုဒ် ၃၃ ပါ စည်းကမ်းချက်များကိုလည်းကောင်း၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက အခါအားလျော်စွာ သတ်မှတ်သည့် စည်းကမ်းချက်များကိုလည်းကောင်း လိုက်နာရမည်၊

၂။ လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးခြင်းနှင့် စပ်လျဉ်း၍-

(က) လုပ်ငန်းလိုင်စင်လုပ်ထုံးလုပ်နည်းတွင် သတ်မှတ်ထားသည့်အတိုင်း လုပ်ငန်းလိုင်စင် သက်တမ်းမကုန်ဆုံးမီ သုံးလ ကြိုတင်၍ မပျက်မကွက် လိုင်စင် သက်တမ်းတိုးရမည်၊

(ခ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးရန် လျှောက်ထားခြင်း၊ လိုင်စင်ထုတ်ယူခြင်းကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီး ဌာနသို့ လူကိုယ်တိုင် သို့မဟုတ် အဖွဲ့အစည်းတာဝန်ခံကိုယ်တိုင် လာရောက် ဆောင်ရွက်ရမည်၊

(ဂ) လုပ်ငန်းလိုင်စင်သက်တမ်းတိုးပြီး လိုင်စင်အသစ်ထုတ်ယူရာတွင် လက်ဝယ်ရှိမူရင်းလိုင်စင်ကို ပြန်လည်အပ်နှံရမည်။

၃။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနက ခွင့်ပြုထားသော ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အမျိုးအစားမှအပ အခြားဆန်းစစ်ခြင်းအမျိုးအစားကို လေ့လာဆန်းစစ်ရေးဆွဲဆောင်ရွက်ခြင်း မပြုရ။

၄။ လုပ်ငန်းလိုင်စင်ရရှိသူသည် မြန်မာနိုင်ငံ၏ တည်ဆဲဥပဒေတစ်ရပ်ရပ်ကို ဖောက်ဖျက်ကြောင်း သို့မဟုတ် ဆန်းစစ်ခြင်း လုပ်ငန်းများဆောင်ရွက်ရာတွင် သိသာထင်ရှားသော မှားယွင်းမှုများ ပါရှိနေပြီး သတ်မှတ်စံချိန်စံညွှန်း သို့မဟုတ် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေများ၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းတို့အရ စိစစ်သုံးသပ်ပြီး ကနဦးသဘောထားမှတ်ချက်နှင့်အညီ ပြန်လည်ပြင်ဆင်ခြင်း မရှိကြောင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သတ်မှတ် ဆုံးဖြတ်ခြင်းခံရလျှင် လုပ်ငန်းလိုင်စင် ရပ်ဆိုင်းခြင်း သို့မဟုတ် ပယ်ဖျက်ခြင်း ခံရမည်။

၅။ လုပ်ငန်းလိုင်စင်ရရှိသော အဖွဲ့အစည်းသည် သက်ဆိုင်ရာစီမံကိန်းအတွက် လေ့လာဆန်းစစ်ရေးဆွဲဆောင်ရွက်ရန် တတိယအဖွဲ့အစည်းအတည်ပြုချက်ရယူရာ၌ မိမိအဖွဲ့အစည်းတွင် ပါဝင်သည့် အကြံပေးပုဂ္ဂိုလ်၊ တွဲဖက်အကြံပေးပုဂ္ဂိုလ် များ၏ အမည်စာရင်းမှအပ အခြားပုဂ္ဂိုလ်များ၏ အမည်စာရင်းများကို တင်ပြခွင့်မရှိရ။

၆။ လုပ်ငန်းလိုင်စင်ရရှိသောအဖွဲ့အစည်းသည် မိမိအဖွဲ့အစည်းက လက်လှမ်းမမီသော ကျွမ်းကျင်မှုနယ်ပယ်များအတွက်လေ့လာ

Industry and Infrastructure Consultancy Company

လိုင်စင်နံပါတ် License Number : EIA-CO(B)007/2024

(က) အဓိကအကြံပေးပုဂ္ဂိုလ်များ

စဉ်	အမည်	လုပ်ငန်းလိုင်စင်အမှတ်	မှတ်ချက်
၁	၂	၃	၄
(က) အကြံပေးပုဂ္ဂိုလ်			
၁	မရှိပါ	-	
(ခ) တွဲဖက်အကြံပေးပုဂ္ဂိုလ်			
၁	ဒေါက်တာအောင်ကျော်စိုး	EIA-AC 056/2023	
၂	ဦးထွန်းမြင့်	EIA-AC 058/2023	

Industry and Infrastructure Consultancy Company

လိုင်စင်နံပါတ် License Number : EIA-CO(B)007/2024

အဖွဲ့အစည်းက လေ့လာဆန်းစစ်ခွင့်ရှိသော စီမံကိန်းလုပ်ငန်းအုပ်စုများ

စဉ်	လုပ်ငန်းလိုင်စင်ဆိုင်ရာလုပ်ထုံးလုပ်နည်း ပုံစံ (ခ) ပါ စီမံကိန်းလုပ်ငန်းအုပ်စုများ	မှတ်ချက်
၁။	အကြံပေးအဖွဲ့အမျိုးအစား(ခ)အတွက် လုပ်ငန်းလိုင်စင်သာခွင့်ပြုသော်လည်း ကျွမ်းကျင်မှု နယ်ပယ်များလိုအပ်သည့်အတွက် လေ့လာဆန်းစစ်ခွင့်ရှိသည့် စီမံကိန်းလုပ်ငန်းအုပ်စုများမရှိသေးပါ။	

Industry and Infrastructure Consultancy Company

လိုင်စင်နံပါတ် License Number : EIA-CO(B)007/2024

Eligible Categories of Projects to be conducted by the Organization

Sr. No.	Categories of Projects as per Form B of Licensing Procedure	Note
1.	Although the license for the Consulting Organization Type(B) is allowed, there are no project groups that have the right to conduct for the requirement of expertise areas.	

Air Quality Analysis (10 minutes)

Main | Preferences | Header | Data | Report

Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
EPAS 915088	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Daily Jun 16, 2020	0	16.5793	98.9692	117.188	12.6187	42.3581	70.6388	11.1904	8.08730	50.2628	13.7748	33.1220	.279761	158.125	3.86339	13.6364
	0	27	231	283	22.4	127	397	66	74	70	117	40	5	248	9.2	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10 7:12:01 16/6/20	0	18	220	50	6.66	36	244.4	3	1.1	58	1	29.1	.2	152.4	3.89	13.51
	0	18	220	50	8.2	45	397	6	2	58	1	30	2	172	6.3	13.7
	0	18	220	50	5.9	35	105	2	1	58	1	29	0	144	1.4	13.4
Ave Period 10 7:22:01 16/6/20	0	20	220	50	7.53	35	227.8	2	1	58	1	30	.7	161.4	3.17	13.48
	0	22	220	50	8.6	35	257	2	1	58	1	30	1	198	4.5	13.5
	0	18	220	50	6.7	35	160	2	1	58	1	30	0	132	1.2	13.4
Ave Period 10 7:32:01 16/6/20	0	22	220	50	7.57	35	182.3	2.2	1	52.6	1	29.9	.6	153.7	3.31	13.56
	0	22	220	50	8.8	35	257	3	1	58	1	30	1	184	5.6	13.7
	0	22	220	50	6.7	35	71	2	1	49	1	29	0	126	1.4	13.4
Ave Period 10 7:42:01 16/6/20	0	12	220	50	9.79	35	146.7	2	1.1	49.5	1	30	.2	143.5	3.73	13.52
	0	12	220	50	14.1	35	202	2	2	50	1	30	1	168	7.2	13.7
	0	12	220	50	5.8	35	117	2	1	49	1	30	0	123	1.2	13.5
Ave Period 10 7:52:01 16/6/20	0	16.8	220	50	14.23	36.2	181.5	2	1	50	1	30	0	157.7	4.67	13.6
	0	20	220	50	14.9	37	239	2	1	50	1	30	0	177	6.3	13.7
	0	12	220	50	13.4	35	122	2	1	50	1	30	0	141	2.5	13.5
Ave Period 10 8:02:01 16/6/20	0	20	220	50	14.93	44	187.3	3.1	1.2	50	1	30	.1	157.3	4.88	13.51
	0	20	220	50	15.2	44	226	9	3	50	1	30	1	182	7.8	13.7
	0	20	220	50	14.9	44	22	2	1	50	1	30	0	138	2.3	13.4

Main | Preferences | Header | Data | Report

Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10 8:12:01 16/6/20	0	20	196	50	14.37	44	6.9	2.8	1	50	1	31	.2	162.2	4.1	13.58
	0	20	220	50	15.6	44	33	6	1	50	1	32	1	186	7	13.7
	0	20	180	50	13.3	44	2	2	1	50	1	30	0	139	1.3	13.5
Ave Period 10 8:22:01 16/6/20	0	20	180	50	14.21	44	4.9	2	1	50	1	31.8	.2	150.7	3.82	13.56
	0	20	180	50	15.4	44	18	2	1	50	1	32	1	163	5.9	13.7
	0	20	180	50	13.2	44	2	2	1	50	1	31	0	123	1.6	13.4
Ave Period 10 8:32:01 16/6/20	0	16.4	180	50	14.14	44	2	2	1	49	1	32	.5	154.5	5.22	13.55
	0	20	180	50	15	44	2	2	1	50	1	32	2	173	8.2	13.7
	0	11	180	50	13.2	44	2	2	1	40	1	32	0	134	2	13.4
Ave Period 10 8:42:01 16/6/20	0	11	56.9	58.8	14.45	44	2	2	1	40	17.8	32.1	1.3	154.5	6.1	13.66
	0	11	180	70	15.3	44	2	2	1	40	62	33	2	174	9.2	13.8
	0	11	27	50	13.2	44	2	2	1	40	1	32	0	140	4.2	13.4
Ave Period 10 8:52:01 16/6/20	0	11	53.1	66	15.04	31.2	7.5	2.2	1	40	26.6	32.2	.8	154.3	5.17	13.6
	0	11	56	70	15.3	44	44	3	1	40	33	33	1	176	8.7	13.8
	0	11	41	50	13.7	28	2	2	1	40	1	32	0	131	3.6	13.4
Ave Period 10 9:02:01 16/6/20	0	11	59.1	58	13.91	28	20.6	2	1	40	2.3	33.2	0	158.2	5.46	13.69
	0	11	82	82	15.1	28	65	2	1	40	8	34	0	188	8.3	13.8
	0	11	41	50	13	28	2	2	1	40	1	33	0	129	3.5	13.5
Ave Period 10 9:12:01 16/6/20	0	11	74.6	87.4	14.14	39.1	19.2	2	1	40	32.3	33	0	160.9	5.51	13.69
	0	11	84	99	15.2	44	103	2	1	40	46	33	0	193	7.3	13.8
	0	11	55	72	13.1	37	2	2	1	40	15	33	0	138	4.1	13.5
Ave Period 10 9:22:01 16/6/20	0	11	83	114.4	13.96	37	17.6	2	1	40	40.5	33	0	170	4.69	13.57
	0	11	83	117	14	37	22	2	1	40	43	33	0	201	9.1	13.8
	0	11	83	102	13.7	37	2	2	1	40	30	33	0	114	2.8	13.5

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	11	84	64.6	13.83	37	12	2.5	1	40	9.4	34.2	0	166.9	3.52	13.76
9:32:01 16/6/20	0	11	96	117	14.6	37	39	4	1	40	43	35	0	191	6.7	13.8
	0	11	82	50	13.3	37	2	2	1	40	1	33	0	136	1.3	13.7
Ave Period 10	0	11	79.6	110.5	13.62	37	2.1	2	1	39	2.3	35.7	.5	157.2	5.11	13.65
9:42:01 16/6/20	0	11	83	125	14.6	37	3	2	1	39	14	37	2	176	6.5	13.8
	0	11	68	78	12.7	37	2	2	1	39	1	35	0	142	3.6	13.5
Ave Period 10	0	11	79.4	87.7	13.48	37	19.4	3.3	1	39	1.5	35.9	.6	158	4.51	13.67
9:52:01 16/6/20	0	11	82	125	14.3	37	61	6	1	39	6	36	2	193	7.5	13.8
	0	11	69	50	12.6	37	2	2	1	39	1	35	0	141	2.8	13.4
Ave Period 10	0	11	66.4	126.2	14.12	37	30	2.6	1	39	35.3	34.9	2.1	169.6	4.77	13.73
10:02:01 16/6/20	0	11	82	162	15.6	37	70	4	1	39	51	35	4	187	6.8	13.8
	0	11	55	61	13.2	37	2	2	1	39	2	34	1	140	3.6	13.7
Ave Period 10	0	9.6	50.5	172.2	16.08	37	49.8	3	1	39	59.7	34.2	3.1	162.9	3.92	13.68
10:12:01 16/6/20	0	11	70	183	21.4	37	116	5	1	39	86	35	4	187	6.6	13.8
	0	8	28	159	14	37	6	2	1	39	51	34	2	147	2.8	13.5
Ave Period 10	0	10.1	59.1	142	15.1	37	46	2.1	1.3	47.8	64.5	34.8	3.1	168.9	4.28	13.74
10:22:01 16/6/20	0	12	70	161	15.3	37	88	3	3	50	79	35	4	200	6.8	13.8
	0	9	56	129	15	37	9	2	1	39	42	34	2	152	2.6	13.7
Ave Period 10	0	12.5	63.4	94	17.42	37	62.5	2	1	50	77.5	34.2	2.9	158.3	5.14	13.74
10:32:01 16/6/20	0	21	71	122	22.4	37	132	2	1	50	93	35	5	178	7.6	13.8
	0	11	29	69	15	37	16	2	1	50	55	34	1	141	1.8	13.7
Ave Period 10	0	19.1	80.3	76.8	14.24	37	54.4	2	1	50	56.7	35.3	1.9	162.3	5.25	13.76
10:42:01 16/6/20	0	24	84	89	15.7	37	127	2	1	50	100	36	4	186	7.6	13.8
	0	12	68	56	12.7	37	7	2	1	50	22	34	0	147	1.7	13.7

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	18.9	69.4	78.1	13.38	37	47	2	1	50	27.3	35.1	1.9	182.2	4.17	13.61
10:52:01 16/6/20	0	26	82	79	13.4	37	50	2	1	50	30	36	2	219	5.7	13.8
	0	10	68	78	13.2	37	20	2	1	50	27	35	1	151	2	13.5
Ave Period 10	0	22	137.8	83.1	13.93	37	33.2	2.5	1	50	10	35.9	.6	177.4	4.17	13.74
11:02:01 16/6/20	0	22	152	143	15	37	76	5	1	50	49	36	2	248	5.5	13.8
	0	22	68	50	12.9	37	2	2	1	50	1	35	0	137	3.2	13.7
Ave Period 10	0	22	120.5	198.6	14.5	37	16.7	2	1	50	44.8	36.7	.7	159.9	5.48	13.65
11:12:01 16/6/20	0	22	137	214	15.7	37	48	2	1	50	74	37	1	206	7.1	13.8
	0	22	97	165	12.8	37	2	2	1	50	18	36	0	142	3.2	12.8
Ave Period 10	0	22	77.2	254.1	14.54	37	14.7	2	1	50	96.7	36.6	.5	155.6	4.24	13.71
11:22:01 16/6/20	0	22	98	274	20	37	80	2	1	50	117	37	1	189	6.3	13.8
	0	22	42	222	12.8	37	2	2	1	50	82	36	0	138	1.8	13.5
Ave Period 10	0	18	118.6	185.8	14.35	37	2.5	2.3	1	48	59.8	37	.6	151.7	2.87	13.71
11:32:01 16/6/20	0	22	207	274	14.5	37	7	4	1	48	99	38	1	188	5	13.8
	0	10	69	50	13.7	37	2	2	1	48	1	36	0	57	1.2	13.4
Ave Period 10	0	17.9	165.6	178.5	14.66	37	17.4	6.7	1.3	48	47.3	36.1	.1	164.6	4.5	13.69
11:42:01 16/6/20	0	26	208	218	20.9	37	40	10	3	48	99	37	1	205	6.1	13.8
	0	11	151	88	12.8	37	2	3	1	48	9	36	0	142	2	13.5
Ave Period 10	0	18.3	124	243.4	13.92	37	45.4	10.5	2.3	48	81.3	36	0	168.5	4.39	13.74
11:52:01 16/6/20	0	23	152	256	14.1	37	97	14	5	48	97	37	0	191	6.5	13.8
	0	12	96	224	13.8	37	10	6	1	48	67	35	0	144	2.5	13.7
Ave Period 10	0	16.7	85.3	241.4	14.4	37	59.7	13.9	1.5	48	78.3	35.9	0	178.3	4	13.73
12:02:01 16/6/20	0	24	96	251	20.4	37	104	20	5	48	103	37	0	237	5.9	13.8
	0	10	82	232	13.6	37	14	9	1	48	61	35	0	151	2	13.5

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	19	82	214.1	15.24	37	73.5	23.4	6.9	48	77.2	35.9	0	171.4	4.47	13.73
12:12:01 16/6/20	0	27	82	228	20	37	155	29	10	48	109	37	0	200	8.1	13.8
	0	13	82	198	12.9	37	23	18	1	48	52	35	0	151	1.9	13.7
Ave Period 10	0	16.5	77.7	193.9	14.34	127	81.4	18.9	4.7	48	33	37.3	0	167.8	2.92	13.74
12:22:01 16/6/20	0	26	82	205	19.8	127	141	24	12	48	49	38	0	197	4.8	13.8
	0	10	68	185	12.5	127	40	12	1	48	10	36	0	133	.8	13.5
Ave Period 10	0	15	70.2	174.8	13.4	127	60	12.9	1	48	32.5	37	0	147.6	4.48	13.63
12:32:01 16/6/20	0	15	82	179	13.4	127	70	13	1	48	34	37	0	163	7.5	13.8
	0	15	68	174	13.4	127	26	12	1	48	24	37	0	138	2.8	13.5
Ave Period 10	0	15	148.4	101.7	13.91	127	34.8	14	3.6	48	12.5	36.7	0	156.2	3.78	13.75
12:42:01 16/6/20	0	15	192	174	20.2	127	76	16	6	48	34	38	0	199	6.1	13.8
	0	15	69	50	12.7	127	2	12	1	48	1	36	0	136	2	13.7
Ave Period 10	0	15.1	98.5	206.4	13.35	127	49.4	10.3	1	48	20.2	37.3	0	161.4	4.98	13.78
12:52:01 16/6/20	0	16	137	243	13.7	127	107	12	1	48	32	38	0	191	7.3	13.8
	0	15	82	154	12.9	127	2	8	1	48	3	37	0	128	3.2	13.7
Ave Period 10	0	17.7	63.2	233.6	14.36	127	73.3	3.9	1	48	14.1	38.5	.3	176.4	4.17	13.75
13:02:01 16/6/20	0	25	82	239	21	127	118	11	1	48	31	39	1	245	5.7	13.8
	0	11	41	228	13.2	127	40	2	1	48	1	38	0	138	2	13.7
Ave Period 10	0	16.9	52	242.9	14.75	127	27.8	2	1	48	29.6	38.5	.2	165.4	4.83	13.76
13:12:01 16/6/20	0	21	57	251	15.7	127	75	2	1	48	54	39	1	210	6.3	13.8
	0	13	42	233	12.5	127	2	2	1	48	4	38	0	140	3	13.7
Ave Period 10	0	19.1	47.8	262.4	15.35	38	4.8	2	1	48	65.7	37.8	0	150.7	2.86	13.73
13:22:01 16/6/20	0	24	55	279	20.5	38	20	2	1	48	90	40	0	172	5.2	13.8
	0	12	41	243	12.8	38	2	2	1	48	43	37	0	134	1.3	13.5

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	17.2	47.9	270.6	13.33	38	30.1	2	1	48	70.3	38.5	0	160.2	2.71	13.73
13:32:01 16/6/20	0	26	55	283	13.7	38	70	2	1	48	101	39	0	206	4	13.8
	0	10	41	262	13.1	38	2	2	1	48	50	38	0	134	.4	13.5
Ave Period 10	0	18.4	85.4	224.4	13.37	38	34.5	3.4	3.2	48	51.4	38.8	0	160.4	4.43	13.63
13:42:01 16/6/20	0	26	221	268	14.1	38	36	9	13	48	64	39	0	188	6.9	13.8
	0	9	55	50	13.2	38	22	2	1	48	1	38	0	140	2.6	13.5
Ave Period 10	0	16	154.6	148.3	18.37	38	82.9	20.1	24.9	48	8.5	37.1	.3	162.9	3.36	13.76
13:52:01 16/6/20	0	19	193	227	21.8	38	158	27	32	48	34	38	1	225	6.1	13.8
	0	11	109	50	12.4	38	20	13	17	48	1	37	0	133	1.6	13.7
Ave Period 10	0	16.8	83.8	229.9	14.34	38	158.4	34.8	37.3	48	8.9	37.3	0	172.8	3.71	13.71
14:02:01 16/6/20	0	21	109	237	19.9	38	218	40	42	48	25	39	0	203	4.4	13.8
	0	12	67	222	11.5	38	117	28	30	48	1	36	0	155	2.1	13.5
Ave Period 10	0	17.4	54.7	205.8	12.5	38	203.5	51.1	53.1	48	8.6	36.4	0	168.6	4.85	13.73
14:12:01 16/6/20	0	22	68	227	18.6	38	253	60	60	48	22	37	0	206	7.3	13.8
	0	10	39	191	11	38	135	40	45	48	1	36	0	139	3.2	13.5
Ave Period 10	0	17.9	30.8	184	12.7	38	234.8	62.1	65.3	48	1	36.1	0	172.5	4.15	13.66
14:22:01 16/6/20	0	26	41	201	13.5	38	261	66	74	48	1	37	0	196	6.6	13.8
	0	11	26	173	11.1	38	197	57	59	48	1	36	0	151	2.9	13.5
Ave Period 10	0	18.3	61.3	136.1	13.01	38	196.3	50	52.7	48	1	36	0	169.1	2.75	13.65
14:32:01 16/6/20	0	23	150	173	13.2	38	244	66	74	48	1	36	0	211	5.6	13.8
	0	12	27	50	11.7	38	71	10	2	48	1	36	0	125	1	13.5
Ave Period 10	0	16.1	96.6	108.7	13.36	38	168.1	20.9	8.2	48	1	35.9	.1	177.9	4.06	13.77
14:42:01 16/6/20	0	20	136	155	19.5	38	205	24	12	48	1	36	1	199	5.8	13.8
	0	12	68	50	11.9	38	122	18	3	48	1	35	0	155	2.1	13.7

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10 14:52:01 16/6/20	0	14.6	57.6	167.6	12.14	38	176.8	25.8	7.8	39	1	36.2	0	184.9	3.92	13.74
	0	20	82	178	13.1	38	222	30	11	48	1	37	0	207	5.7	13.8
	0	14	26	151	11.4	38	131	22	4	38	1	36	0	171	1.8	13.5
Ave Period 10 15:02:01 16/6/20	0	18.3	27.4	182.4	12.3	38	219.6	21.5	4.2	38	1	37.5	.2	163.2	4.01	13.74
	0	26	40	187	12.9	38	281	25	12	38	1	39	1	181	6.5	13.8
	0	10	12	176	11.7	38	174	14	1	38	1	37	0	137	1.7	13.5
Ave Period 10 15:12:01 16/6/20	0	17.2	13.8	198.6	12.41	38	171.9	7	1	38	1	37.6	0	163.4	5.65	13.74
	0	24	27	212	13.1	38	211	12	1	38	1	39	0	179	7.8	13.8
	0	11	12	182	11.9	38	112	2	1	38	1	36	0	125	4	13.5
Ave Period 10 15:22:01 16/6/20	0	18	17.8	236.2	13.66	38	158.4	12.9	1.2	38	1	35.7	.1	175.2	4.13	13.74
	0	23	28	254	13.9	38	212	22	3	38	1	37	1	215	6	13.8
	0	10	13	206	13.4	38	110	7	1	38	1	35	0	160	1.4	13.5
Ave Period 10 15:32:01 16/6/20	0	19.1	13	248.2	13.03	38	218.9	26.5	6.1	38	1	35	0	165.4	5.83	13.61
	0	26	13	249	13.5	38	235	29	7	38	1	35	0	189	7.6	13.8
	0	10	13	244	12.9	38	139	20	6	38	1	35	0	142	3.7	13.5
Ave Period 10 15:42:01 16/6/20	0	20.9	66.2	109.7	12.53	38	145.9	13.2	2.5	38	1	36	0	158.2	5.27	13.75
	0	25	95	249	13	38	235	27	6	38	1	37	0	189	7.3	13.8
	0	15	13	50	11.5	38	59	4	1	38	1	35	0	137	3.3	13.7
Ave Period 10 15:52:01 16/6/20	0	22	73.8	111.1	13.26	38	121.7	6.7	1	38	4.3	36.5	.1	155.5	5.4	13.75
	0	22	83	141	13.6	38	150	8	1	38	27	37	1	183	6.7	13.8
	0	22	55	62	12.7	38	83	4	1	38	1	36	0	142	3	13.7
Ave Period 10 16:02:01 16/6/20	0	22	47.4	162.2	12.88	38	135.8	4	1	38	2.1	36.2	0	167.5	4.23	13.7
	0	22	68	177	13.5	38	184	6	1	38	12	37	0	190	7.1	13.8
	0	22	27	149	12.5	38	90	2	1	38	1	35	0	149	1.5	13.5

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10 17:32:01 16/6/20	0	16.5	12.8	89	12.22	38	64.3	15.7	22.7	40	1	32.2	.1	165.8	2.22	13.66
	0	26	26	115	13.6	38	97	18	30	40	1	33	1	180	5.2	13.8
	0	10	0	50	11.7	38	2	10	9	40	1	32	0	148	.2	13.5
Ave Period 10 17:42:01 16/6/20	0	21.1	89.7	60.4	12.41	38	69.6	19.2	20.8	40	1	32	0	162.1	3.49	13.76
	0	23	121	83	13.4	38	106	25	27	40	1	32	0	199	5	13.8
	0	16	12	50	11.8	38	43	13	15	40	1	32	0	135	2.3	13.7
Ave Period 10 17:52:01 16/6/20	0	20.2	121	95.6	12.51	38	105.6	28.9	29.9	40	1	32	0	146.6	3.23	13.73
	0	26	121	111	13.3	38	144	32	33	40	1	32	0	158	6	13.8
	0	10	121	85	11.8	38	45	25	27	40	1	32	0	109	.4	13.5
Ave Period 10 18:02:01 16/6/20	0	17.9	121	94	12.5	38	90	34	33	40	1	31	0	154.2	2.78	13.52
	0	25	121	94	12.5	38	90	34	33	40	1	31	0	176	6.7	13.7
	0	15	121	94	12.5	38	90	34	33	40	1	31	0	134	.5	13.4
Ave Period 10 18:12:01 16/6/20	0	15.8	121	50	11.37	38	5.8	18.1	8.7	40	1	31	0	153.4	2.72	13.6
	0	19	121	50	13.3	38	36	22	11	40	1	31	0	173	3.7	13.7
	0	11	121	50	5.6	38	2	13	7	40	1	31	0	140	1.3	13.5
Ave Period 10 18:22:01 16/6/20	0	17.5	121	65.4	11.24	38	12.6	27.2	14	40	1	31	0	151.1	4.32	13.63
	0	21	121	86	13.2	38	84	31	17	40	1	31	0	171	5.7	13.8
	0	12	121	50	5.2	38	2	23	12	40	1	31	0	141	2	13.5
Ave Period 10 18:32:01 16/6/20	0	17.9	121	95.1	12.62	38	11.5	35.3	16.2	40	1	31	0	152.7	3.8	13.55
	0	26	121	99	12.9	38	83	38	17	40	1	31	0	168	5.5	13.8
	0	10	121	90	11.7	38	2	34	13	40	1	31	0	141	1.5	13.4
Ave Period 10 18:42:01 16/6/20	0	20.1	121	68.4	11.96	38	6.7	18.2	10.5	40	1	30.9	0	148.9	3.23	13.6
	0	23	121	96	13.1	38	22	35	17	40	1	31	0	165	7.3	13.8
	0	11	121	50	5.6	38	2	5	3	40	1	30	0	131	1.6	13.5

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	16.5	12.8	89	12.22	38	64.3	15.7	22.7	40	1	32.2	.1	165.8	2.22	13.66
17:32:01 16/6/20	0	26	26	115	13.6	38	97	18	30	40	1	33	1	180	5.2	13.8
	0	10	0	50	11.7	38	2	10	9	40	1	32	0	148	.2	13.5
Ave Period 10	0	21.1	89.7	60.4	12.41	38	69.6	19.2	20.8	40	1	32	0	162.1	3.49	13.76
17:42:01 16/6/20	0	23	121	83	13.4	38	106	25	27	40	1	32	0	199	5	13.8
	0	16	12	50	11.8	38	43	13	15	40	1	32	0	135	2.3	13.7
Ave Period 10	0	20.2	121	95.6	12.51	38	105.6	28.9	29.9	40	1	32	0	146.6	3.23	13.73
17:52:01 16/6/20	0	26	121	111	13.3	38	144	32	33	40	1	32	0	158	6	13.8
	0	10	121	85	11.8	38	45	25	27	40	1	32	0	109	.4	13.5
Ave Period 10	0	17.9	121	94	12.5	38	90	34	33	40	1	31	0	154.2	2.78	13.52
18:02:01 16/6/20	0	25	121	94	12.5	38	90	34	33	40	1	31	0	176	6.7	13.7
	0	15	121	94	12.5	38	90	34	33	40	1	31	0	134	.5	13.4
Ave Period 10	0	15.8	121	50	11.37	38	5.8	18.1	8.7	40	1	31	0	153.4	2.72	13.6
18:12:01 16/6/20	0	19	121	50	13.3	38	36	22	11	40	1	31	0	173	3.7	13.7
	0	11	121	50	5.6	38	2	13	7	40	1	31	0	140	1.3	13.5
Ave Period 10	0	17.5	121	65.4	11.24	38	12.6	27.2	14	40	1	31	0	151.1	4.32	13.63
18:22:01 16/6/20	0	21	121	86	13.2	38	84	31	17	40	1	31	0	171	5.7	13.8
	0	12	121	50	5.2	38	2	23	12	40	1	31	0	141	2	13.5
Ave Period 10	0	17.9	121	95.1	12.62	38	11.5	35.3	16.2	40	1	31	0	152.7	3.8	13.55
18:32:01 16/6/20	0	26	121	99	12.9	38	83	38	17	40	1	31	0	168	5.5	13.8
	0	10	121	90	11.7	38	2	34	13	40	1	31	0	141	1.5	13.4
Ave Period 10	0	20.1	121	68.4	11.96	38	6.7	18.2	10.5	40	1	30.9	0	148.9	3.23	13.6
18:42:01 16/6/20	0	23	121	96	13.1	38	22	35	17	40	1	31	0	165	7.3	13.8
	0	11	121	50	5.6	38	2	5	3	40	1	30	0	131	1.6	13.5

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	19.5	121	52.7	10.68	38	15.2	7.3	5.1	40	1	31	.1	152.6	3.29	13.61
18:52:01 16/6/20	0	22	121	67	13	38	47	9	7	40	1	31	1	187	4.5	13.8
	0	10	121	50	4.7	38	2	5	2	40	1	31	0	131	1.4	13.5
Ave Period 10	0	19.2	121	87.6	10.75	38	13.4	8.8	7	40	1	30.7	0	160.8	2.75	13.59
19:02:01 16/6/20	0	26	121	109	12.7	38	46	12	10	40	1	31	0	178	5.3	13.8
	0	15	121	71	5.7	38	2	5	4	40	1	30	0	119	1.1	13.5
Ave Period 10	0	14	117.7	106.2	10.91	38	11.5	10	6.4	40	1	30.1	.1	161.4	3.73	13.55
19:12:01 16/6/20	0	18	121	116	13	38	36	14	9	40	1	31	1	183	7.3	13.7
	0	11	110	94	5.4	38	2	6	4	40	1	30	0	141	1.4	13.4
Ave Period 10	0	13	110	114	12.72	38	23.7	12.2	5.4	42.4	1	30.8	0	150	4.07	13.56
19:22:01 16/6/20	0	13	110	120	13.4	38	52	17	8	48	1	31	0	169	7.7	13.7
	0	13	110	99	12.3	38	2	11	4	40	1	30	0	109	2.2	13.4
Ave Period 10	0	13	110	92	12.49	38	30.2	9.9	4	54.3	1	31	0	151.2	3.83	13.53
19:32:01 16/6/20	0	13	110	120	12.9	38	54	11	6	69	1	31	0	171	6	13.8
	0	13	110	50	12.3	38	2	6	2	48	1	31	0	136	2.1	13.4
Ave Period 10	0	13	110	50.2	12.39	38	18.6	6.2	3.7	69	1.4	31	0	149.7	3.54	13.61
19:42:01 16/6/20	0	13	110	52	12.6	38	39	9	7	69	5	31	0	169	4.7	13.8
	0	13	110	50	12.1	38	2	3	1	69	1	31	0	130	2	13.5
Ave Period 10	0	13	110	70.2	12.8	38	29.6	3.9	2.5	69	1	30.4	0	149.4	2.47	13.62
19:52:01 16/6/20	0	13	110	80	13.4	38	59	7	5	69	1	31	0	166	4.5	13.7
	0	13	110	58	11.7	38	2	2	1	69	1	30	0	132	.9	13.5
Ave Period 10	0	13	110	85	11.54	38	50.2	3.1	2.4	69.5	1	31	0	154.4	2.22	13.56
20:02:01 16/6/20	0	13	110	92	12.7	38	81	6	4	70	1	31	0	173	4.6	13.7
	0	13	110	73	5.8	38	25	2	1	69	1	31	0	130	.8	13.5

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	13	110	100.3	12.98	38	28.1	2.2	2.2	70	1	30.2	0	145.9	1.74	13.56
20:12:01 16/6/20	0	13	110	108	13.7	38	61	4	3	70	1	31	0	163	3.7	13.7
	0	13	110	88	11.6	38	2	2	1	70	1	30	0	95	1	13.5
Ave Period 10	0	13	110	104.2	12.81	35	46.2	2.8	2.5	70	1	30.6	0	145.8	3.14	13.54
20:22:01 16/6/20	0	13	110	111	13.1	38	113	6	5	70	1	33	0	168	4.2	13.7
	0	13	110	97	12.3	33	4	2	1	70	1	30	0	128	.8	13.5
Ave Period 10	0	13	110	108.7	12.57	33	77.7	8	4	70	1	30	0	155.5	2.96	13.44
20:32:01 16/6/20	0	13	110	109	12.6	33	81	8	4	70	1	30	0	193	4.6	13.7
	0	13	110	106	12.3	33	48	8	4	70	1	30	0	137	1.6	13.2
Ave Period 10	0	13	110	55.9	12.39	33	49.5	8.3	6.5	70	1	30	0	149.7	2.96	13.58
20:42:01 16/6/20	0	13	110	109	13.3	33	81	11	9	70	1	30	0	165	6	13.7
	0	13	110	50	6.1	33	10	6	4	70	1	30	0	132	.8	13.5
Ave Period 10	0	13	110	52.2	11.35	33	39.7	7.7	10.5	70	1	29.8	0	153.2	2.54	13.6
20:52:01 16/6/20	0	13	110	62	13	33	88	12	14	70	1	30	0	175	4.2	13.8
	0	13	110	50	6	33	11	3	7	70	1	29	0	138	1.8	13.4
Ave Period 10	0	13	110	77.7	12.1	33	33.3	5.7	10.3	70	1	29.2	0	152.4	2.48	13.6
21:02:01 16/6/20	0	13	110	88	13.4	33	92	12	13	70	1	30	0	213	4.4	13.7
	0	13	110	65	6	33	2	2	7	70	1	29	0	126	.8	13.5
Ave Period 10	0	13	110	82.2	10.01	33	46.1	11.2	10.6	70	1	29.8	0	148.5	3.93	13.56
21:12:01 16/6/20	0	13	110	91	13	33	87	15	16	70	1	30	0	164	6	13.7
	0	13	110	73	4.7	33	2	9	8	70	1	29	0	136	1.7	13.5
Ave Period 10	0	13	110	80.9	9.5	33	45.7	16.2	11.3	70	1	30	0	148.3	4.08	13.57
21:22:01 16/6/20	0	13	110	90	12.6	33	85	21	15	70	1	30	0	158	5.4	13.8
	0	13	110	71	4.6	33	14	13	8	70	1	30	0	141	2.7	13.5

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	13	110	93.1	9.07	33	61.4	20.4	13.5	70	1	29.9	0	147.1	3.48	13.48
21:32:01 16/6/20	0	13	110	104	12.9	33	111	24	15	70	1	30	0	161	4.8	13.7
	0	13	110	81	4.1	33	30	18	11	70	1	29	0	135	2.5	13.2
Ave Period 10	0	13	110	85	12.09	33	66.3	17.3	11.2	70	1	30	0	147.9	3.52	13.5
21:42:01 16/6/20	0	13	110	100	12.9	33	89	19	14	70	1	30	0	166	5.8	13.5
	0	13	110	50	5.6	33	60	13	3	70	1	30	0	124	1.2	13.5
Ave Period 10	0	13	110	50	7.09	33	56.5	7.3	2.4	70	1	30	.3	145.5	3.53	13.52
21:52:01 16/6/20	0	13	110	50	13	33	104	10	6	70	1	30	1	155	6.7	13.8
	0	13	110	50	5.5	33	2	4	1	70	1	30	0	134	1.9	13.4
Ave Period 10	0	16.1	110	53.5	11.65	33	55.6	6.5	2.6	70	1	30	.3	143.5	3.11	13.57
22:02:01 16/6/20	0	24	110	64	12.5	33	93	10	5	70	1	30	1	161	4.1	13.7
	0	12	110	50	5.7	33	22	2	1	70	1	30	0	125	2.1	13.4
Ave Period 10	0	19.1	110	64.6	10.45	33	47.5	5.3	2.6	70	1	30	0	150.4	3.36	13.58
22:12:01 16/6/20	0	23	110	73	12.1	33	100	9	5	70	1	30	0	158	6.7	13.7
	0	12	110	59	4.5	33	2	2	1	70	1	30	0	137	1	13.5
Ave Period 10	0	19.1	110	70.4	8.87	35.4	55.2	8.5	5.2	70	1	29.1	.4	135.7	3.34	13.55
22:22:01 16/6/20	0	24	110	80	13.5	36	89	11	8	70	1	30	2	152	6.2	13.7
	0	12	110	64	6	33	26	6	3	70	1	29	0	66	.6	13.4
Ave Period 10	0	17.2	110	75.5	10.25	36	51	12.4	6.4	70	1.9	29.6	0	145.5	3.45	13.6
22:32:01 16/6/20	0	26	110	88	12.8	36	114	15	8	70	10	30	0	179	6.9	13.7
	0	10	110	69	4.9	36	6	8	5	70	1	29	0	105	2.2	13.5
Ave Period 10	0	19.2	110	83.3	12.7	36	28.6	12.3	7.1	70	1	29.1	.7	143.7	2.43	13.43
22:42:01 16/6/20	0	26	110	91	13.1	36	71	13	8	70	1	30	1	166	4.9	13.5
	0	15	110	82	11.6	36	16	10	7	70	1	29	0	93	.4	13.2

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	**0**	**16.3277**	**141.705**	**99.5442**	**12.1916**	**39.6347**	**53.7171**	**9.73324**	**7.16353**	**57.7928**	**12.1380**	**31.9638**	**.311662**	**155.598**	**3.85542**	**13.6065**
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	**0**	**13**	**110**	**93.1**	**9.07**	**33**	**61.4**	**20.4**	**13.5**	**70**	**1**	**29.9**	**0**	**147.1**	**3.48**	**13.48**
21:32:01 16/6/20	0	13	110	104	12.9	33	111	24	15	70	1	30	0	161	4.8	13.7
	0	13	110	81	4.1	33	30	18	11	70	1	29	0	135	2.5	13.2
Ave Period 10	**0**	**13**	**110**	**85**	**12.09**	**33**	**66.3**	**17.3**	**11.2**	**70**	**1**	**30**	**0**	**147.9**	**3.52**	**13.5**
21:42:01 16/6/20	0	13	110	100	12.9	33	89	19	14	70	1	30	0	166	5.8	13.5
	0	13	110	50	5.6	33	60	13	3	70	1	30	0	124	1.2	13.5
Ave Period 10	**0**	**13**	**110**	**50**	**7.09**	**33**	**56.5**	**7.3**	**2.4**	**70**	**1**	**30**	**.3**	**145.5**	**3.53**	**13.52**
21:52:01 16/6/20	0	13	110	50	13	33	104	10	6	70	1	30	1	155	6.7	13.8
	0	13	110	50	5.5	33	2	4	1	70	1	30	0	134	1.9	13.4
Ave Period 10	**0**	**16.1**	**110**	**53.5**	**11.65**	**33**	**55.6**	**6.5**	**2.6**	**70**	**1**	**30**	**.3**	**143.5**	**3.11**	**13.57**
22:02:01 16/6/20	0	24	110	64	12.5	33	93	10	5	70	1	30	1	161	4.1	13.7
	0	12	110	50	5.7	33	22	2	1	70	1	30	0	125	2.1	13.4
Ave Period 10	**0**	**19.1**	**110**	**64.6**	**10.45**	**33**	**47.5**	**5.3**	**2.6**	**70**	**1**	**30**	**0**	**150.4**	**3.36**	**13.58**
22:12:01 16/6/20	0	23	110	73	12.1	33	100	9	5	70	1	30	0	158	6.7	13.7
	0	12	110	59	4.5	33	2	2	1	70	1	30	0	137	1	13.5
Ave Period 10	**0**	**19.1**	**110**	**70.4**	**8.87**	**35.4**	**55.2**	**8.5**	**5.2**	**70**	**1**	**29.1**	**.4**	**135.7**	**3.34**	**13.55**
22:22:01 16/6/20	0	24	110	80	13.5	36	89	11	8	70	1	30	2	152	6.2	13.7
	0	12	110	64	6	33	26	6	3	70	1	29	0	66	.6	13.4
Ave Period 10	**0**	**17.2**	**110**	**75.5**	**10.25**	**36**	**51**	**12.4**	**6.4**	**70**	**1.9**	**29.6**	**0**	**145.5**	**3.45**	**13.6**
22:32:01 16/6/20	0	26	110	88	12.8	36	114	15	8	70	10	30	0	179	6.9	13.7
	0	10	110	69	4.9	36	6	8	5	70	1	29	0	105	2.2	13.5
Ave Period 10	**0**	**19.2**	**110**	**83.3**	**12.7**	**36**	**28.6**	**12.3**	**7.1**	**70**	**1**	**29.1**	**.7**	**143.7**	**2.43**	**13.43**
22:42:01 16/6/20	0	26	110	91	13.1	36	71	13	8	70	1	30	1	166	4.9	13.5
	0	15	110	82	11.6	36	16	10	7	70	1	29	0	93	.4	13.2

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	**0**	**16.3277**	**141.705**	**99.5442**	**12.1916**	**39.6347**	**53.7171**	**9.73324**	**7.16353**	**57.7928**	**12.1380**	**31.9638**	**.311662**	**155.598**	**3.85542**	**13.6065**
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	**0**	**16**	**110**	**59.6**	**12.22**	**36**	**16.7**	**8.5**	**5.4**	**70**	**1**	**29**	**.3**	**145.4**	**4.04**	**13.56**
22:52:01 16/6/20	0	19	110	82	13.1	36	62	13	8	70	1	29	1	156	6.2	13.7
	0	11	110	50	6	36	2	2	2	70	1	29	0	129	.4	13.5
Ave Period 10	**0**	**16.8**	**110**	**50**	**8.06**	**36**	**13.5**	**6.3**	**3.4**	**63**	**1.6**	**29**	**0**	**143**	**3.82**	**13.53**
23:02:01 16/6/20	0	21	110	50	13	36	37	9	7	70	7	29	0	157	5.2	13.7
	0	12	110	50	5.9	36	2	5	1	60	1	29	0	128	2.2	13.4
Ave Period 10	**0**	**17.4**	**110**	**54.6**	**9.6**	**36**	**17.4**	**6.6**	**5.9**	**60**	**1.3**	**29**	**0**	**145.7**	**3.22**	**13.57**
23:12:01 16/6/20	0	22	110	60	12.7	36	47	10	12	60	4	29	0	160	4.7	13.7
	0	10	110	50	5.2	36	2	5	2	60	1	29	0	128	1.9	13.4
Ave Period 10	**0**	**17.9**	**110**	**63.3**	**11.11**	**36**	**42**	**5.7**	**4.6**	**60**	**2.3**	**29**	**0**	**153.3**	**2.89**	**13.54**
23:22:01 16/6/20	0	26	110	75	12	36	86	9	8	60	10	29	0	171	4.5	13.7
	0	11	110	54	5.1	36	15	2	2	60	1	29	0	136	1.8	13.5
Ave Period 10	**0**	**18.3**	**110**	**73.4**	**7.28**	**36**	**34.2**	**7.2**	**7.6**	**60**	**2.3**	**29**	**0**	**152.3**	**3.3**	**13.54**
23:32:01 16/6/20	0	23	110	82	13.3	36	80	10	9	60	8	29	0	172	5.6	13.7
	0	12	110	61	4.6	36	2	5	5	60	1	29	0	128	1.5	13.5
Ave Period 10	**0**	**16.7**	**218.9**	**84.3**	**6.23**	**36**	**22.8**	**6.8**	**7.7**	**60**	**1**	**29**	**0**	**154.4**	**3.28**	**13.52**
23:42:01 16/6/20	0	24	231	94	12.2	36	64	10	10	60	1	29	0	184	4.9	13.7
	0	10	110	77	5.4	36	2	2	7	60	1	29	0	136	1.8	13.5
Ave Period 10	**0**	**17.625**	**231**	**79**	**12.2**	**36**	**2**	**6**	**7**	**60**	**1**	**29**	**0**	**152.875**	**2.4375**	**13.4375**
23:52:01 16/6/20	0	24	231	79	12.2	36	2	6	7	60	1	29	0	163	3.9	13.5
	0	12	231	79	12.2	36	2	6	7	60	1	29	0	144	1.2	13.2
Daily	**0**	**15.8037**	**230.708**	**62.7975**	**11.3022**	**33.9628**	**18.4752**	**6.69834**	**5.23966**	**73.4752**	**8.72933**	**29.5516**	**.378099**	**150.336**	**3.83884**	**13.5444**
Jun 17, 2020	0	27	231	105	15.9	37	376	22	17	82	74	33	3	210	9.5	13.8
	0	10	111	50	4.1	29	2	2	1	60	1	29	0	92	.8	13.4

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	17.5	231	50	6.78	37	21.4	8.6	7.4	82	2	29	0	156.3	2.82	13.52
1:12:01 17/6/20	0	21	231	50	13.1	37	65	15	9	82	11	29	0	189	3.7	13.7
	0	12	231	50	6	37	2	6	6	82	1	29	0	141	2.2	13.5
Ave Period 10	0	18.1	231	51.4	10.08	37	17.8	6.3	5.5	82	4.7	29	0	148.3	2.18	13.52
1:22:01 17/6/20	0	27	231	55	13.1	37	58	8	8	82	21	29	0	159	3.6	13.7
	0	10	231	50	5.6	37	2	4	2	82	1	29	0	141	.8	13.5
Ave Period 10	0	17.5	231	56.5	7.71	37	8.3	7.1	7.4	82	5.3	29	0	145.8	4.11	13.5
1:32:01 17/6/20	0	26	231	65	13.5	37	36	11	9	82	17	29	0	158	5.6	13.5
	0	10	231	51	5.7	37	2	3	5	82	1	29	0	130	2.6	13.5
Ave Period 10	0	15	231	63.2	12.92	37	30.2	8.8	8.3	82	8.4	29	0	147.3	3.68	13.56
1:42:01 17/6/20	0	15	231	72	13.2	37	62	11	10	82	18	29	0	160	5.9	13.7
	0	15	231	55	12.6	37	2	6	5	82	1	29	0	124	2.2	13.5
Ave Period 10	0	15	231	67.4	10.84	37	32.7	9.6	9.5	82	1.5	29	0	151.4	3.41	13.53
1:52:01 17/6/20	0	15	231	76	12.5	37	66	14	12	82	6	29	0	165	5.7	13.7
	0	15	231	53	5.4	37	2	6	8	82	1	29	0	141	1.4	13.4
Ave Period 10	0	15	231	71.7	11.63	37	47	13.7	9	82	6.3	29	0	148.4	3.65	13.49
2:02:01 17/6/20	0	15	231	73	11.9	37	52	14	9	82	9	29	0	163	4.7	13.7
	0	15	231	60	11.6	37	2	11	9	82	6	29	0	133	1.3	13.4
Ave Period 10	0	17.6	231	52.3	9.39	37	45.6	9.6	3.8	82	1.5	29	.5	145.1	3.3	13.51
2:12:01 17/6/20	0	25	231	73	12.3	37	97	14	9	82	6	29	2	165	4.3	13.7
	0	15	231	50	5.2	37	8	2	1	82	1	29	0	130	1.6	13.4
Ave Period 10	0	16	231	50	7.94	37	23.7	7.2	3.3	78.4	1	29	.2	149.3	3.07	13.55
2:22:01 17/6/20	0	19	231	50	12.3	37	70	13	5	82	1	29	1	169	4.1	13.7
	0	11	231	50	5	37	2	5	1	73	1	29	0	135	1.8	13.4

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	17.6	231	62.9	9.68	37	29.2	6.2	3.7	73	2.6	29	.4	143.9	2.49	13.52
2:32:01 17/6/20	0	24	231	76	12	37	70	9	5	73	17	29	2	172	4.5	13.7
	0	12	231	51	4.5	37	2	4	2	73	1	29	0	92	.8	13.5
Ave Period 10	0	18.3	231	74.7	10.08	37	17	5.7	3.6	73	1	29	.2	151.6	2.72	13.54
2:42:01 17/6/20	0	23	231	87	13.6	37	64	9	7	73	1	29	1	167	4.6	13.7
	0	10	231	65	4.1	37	2	4	1	73	1	29	0	131	1.1	13.5
Ave Period 10	0	18.4	231	85.4	12.62	37	7	3.6	3.3	73	1.4	29	.2	137.7	2.61	13.56
2:52:01 17/6/20	0	26	231	93	13.8	37	32	7	6	73	5	29	1	159	4.5	13.7
	0	10	231	74	6.3	37	2	2	2	73	1	29	0	122	1.3	13.5
Ave Period 10	0	17.3	231	91.5	11.14	37	12.9	4	2.4	73	2.2	29	.4	149.3	3.07	13.49
3:02:01 17/6/20	0	25	231	94	13.4	37	28	7	4	73	13	29	1	174	4.5	13.7
	0	11	231	88	6.1	37	2	2	1	73	1	29	0	138	1.5	13.4
Ave Period 10	0	17	231	78.7	11.32	37	9.6	5.5	2.5	73.6	1	29	.7	146.2	2.89	13.51
3:12:01 17/6/20	0	21	231	91	13.4	37	13	10	5	75	1	29	1	171	4	13.7
	0	12	231	50	6.4	37	2	4	2	73	1	29	0	131	.8	13.4
Ave Period 10	0	18.1	231	50	11.38	37	11.7	8.5	4.2	74.5	1	29	0	155.5	3.13	13.52
3:22:01 17/6/20	0	22	231	50	14	37	64	12	6	75	1	29	0	170	5.2	13.7
	0	12	231	50	6.5	37	2	5	1	70	1	29	0	131	1.4	13.5
Ave Period 10	0	16.7	231	50	9.2	37	4.1	8.3	4.4	70	1	29	0	151	3.2	13.56
3:32:01 17/6/20	0	26	231	50	13.5	37	23	10	7	70	1	29	0	165	4.9	13.7
	0	10	231	50	6.1	37	2	6	3	70	1	29	0	134	1.8	13.5
Ave Period 10	0	18.7	231	55	13.46	37	46.5	8.8	4.7	71.5	1	29	0	147.9	2.92	13.54
3:42:01 17/6/20	0	24	231	64	13.7	37	376	13	7	73	1	29	0	166	4.7	13.7
	0	12	231	50	13.3	37	2	5	1	70	1	29	0	123	1.1	13.5

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	17.5	231	63.4	9.03	37	2	8	3.5	73	1	29	0	148.4	3.03	13.5
3:52:01 17/6/20	0	21	231	78	13.4	37	2	11	5	73	1	29	0	157	4.9	13.5
	0	12	231	54	6.1	37	2	5	2	73	1	29	0	136	1.3	13.5
Ave Period 10	0	13.9	231	68.4	12.2	37	2.2	5.7	4.7	73	1	29	0	156.1	3.04	13.53
4:02:01 17/6/20	0	14	231	74	13.2	37	4	8	9	73	1	29	0	170	5	13.7
	0	13	231	61	5.7	37	2	3	1	73	1	29	0	145	1.4	13.4
Ave Period 10	0	16.8	231	69.2	12.62	37	2	7.5	5	73	1	29	0	142.1	3.3	13.47
4:12:01 17/6/20	0	26	231	76	12.7	37	2	10	7	73	1	29	0	152	5.8	13.7
	0	10	231	57	12.6	37	2	4	4	73	1	29	0	123	1.8	13.4
Ave Period 10	0	18	231	56	11.01	37	35.2	7.1	6.1	73	1	29	.8	153.2	2.96	13.53
4:22:01 17/6/20	0	25	231	70	13.4	37	82	8	11	73	1	29	2	174	4.7	13.7
	0	11	231	50	6.2	37	2	3	3	73	1	29	0	143	1	13.4
Ave Period 10	0	19.1	231	50	8.29	37	24.9	5.6	6.4	73	1	29	1.2	152.7	3.29	13.54
4:32:01 17/6/20	0	24	231	50	13.1	37	72	8	8	73	1	29	3	170	6.5	13.7
	0	12	231	50	6.1	37	2	2	4	73	1	29	0	139	1.5	13.5
Ave Period 10	0	11.1	231	51.1	11.07	37	31.7	5.4	6.8	73	1	29	.7	143.3	3.27	13.6
4:42:01 17/6/20	0	12	231	56	13.3	37	64	8	9	73	1	29	2	158	4.9	13.7
	0	11	231	50	6.2	37	2	3	5	73	1	29	0	111	1.9	13.5
Ave Period 10	0	11	231	54.2	13.02	30.6	15.5	4.8	7.8	73	1	29	1.3	146.2	4.39	13.56
4:52:01 17/6/20	0	11	231	65	13.3	37	44	7	11	73	1	29	3	170	7.2	13.7
	0	11	231	50	12.8	29	2	3	6	73	1	29	0	133	1.4	13.5
Ave Period 10	0	11	231	60.3	7.45	29	33.1	4.7	8.3	73	1	29	.9	150.5	4.16	13.6
5:02:01 17/6/20	0	11	231	71	13	29	78	8	11	73	1	29	3	165	6.3	13.7
	0	11	231	50	5.7	29	2	2	7	73	1	29	0	133	2.2	13.5

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	11	231	75.7	12.22	29	15.1	2	6.6	73	1.3	29	1	153.5	3.56	13.5
5:12:01 17/6/20	0	11	231	92	13.2	29	33	2	10	73	4	29	2	167	5.8	13.5
	0	11	231	57	5.8	29	2	2	4	73	1	29	0	141	1.4	13.5
Ave Period 10	0	10	231	87.8	12.54	29	12.5	2.6	7.4	73	1	29	0	152.7	5.19	13.47
5:22:01 17/6/20	0	10	231	92	13.2	29	53	8	11	73	1	29	0	167	7.9	13.5
	0	10	231	50	6.6	29	8	2	7	73	1	29	0	141	2.2	13.4
Ave Period 10	0	10	231	50	9.96	29	46.2	6.3	5.8	73	1	29	0	149.7	4.73	13.56
5:32:01 17/6/20	0	10	231	50	14.9	29	76	11	8	73	1	29	0	167	7.9	13.7
	0	10	231	50	6.4	29	2	4	3	73	1	29	0	130	2.2	13.5
Ave Period 10	0	10	231	50.3	9.52	29	22.1	4.6	5.2	73	1.4	29.4	.2	154.8	3.82	13.52
5:42:01 17/6/20	0	10	231	53	15.1	29	64	7	7	73	5	30	1	172	4.5	13.7
	0	10	231	50	6.2	29	2	2	4	73	1	29	0	142	2.4	13.5
Ave Period 10	0	10	231	62	14.18	29	12.7	3.6	5.9	73	6.1	30	0	159.5	3.75	13.56
5:52:01 17/6/20	0	10	231	73	14.8	29	37	5	8	73	17	30	0	191	6.4	13.7
	0	10	231	50	13.6	29	2	2	3	73	1	30	0	136	1.5	13.5
Ave Period 10	0	10	231	74.1	13.68	29	4.1	2.4	4	73	14.8	30	0	146.5	6.23	13.55
6:02:01 17/6/20	0	10	231	81	14.3	29	21	3	6	73	39	30	0	155	8.2	13.8
	0	10	231	64	13.2	29	2	2	2	73	1	30	0	138	4.1	13.5
Ave Period 10	0	10	231	76.7	14.72	29	4.9	2.8	4.3	73	25.2	30	.3	149.2	5.18	13.55
6:12:01 17/6/20	0	10	231	93	15.2	29	23	6	7	73	43	30	2	168	6.5	13.7
	0	10	231	67	14.4	29	2	2	1	73	12	30	0	126	3.9	13.4
Ave Period 10	0	10	231	96.2	11.96	29	2.8	2	2.3	73	25.3	30	.1	145.3	4.87	13.54
6:22:01 17/6/20	0	10	231	105	15.2	29	10	2	3	73	37	30	1	161	6.3	13.7
	0	10	231	80	6.1	29	2	2	1	73	19	30	0	132	3.3	13.4

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	15.7	231	73.5	13.62	29	26.2	2.4	4.6	73	12	30.3	.1	156.1	4.23	13.58
6:32:01 17/6/20	0	21	231	97	15.2	29	98	4	9	73	23	31	1	190	7	13.8
	0	10	231	50	13.2	29	2	2	3	73	1	30	0	138	1.7	13.4
Ave Period 10	0	17.4	231	50	13.87	29	8.5	2.1	4.9	73	10.8	30.9	.2	146.1	4.68	13.54
6:42:01 17/6/20	0	22	231	50	15.9	29	43	3	8	73	21	31	1	163	8.1	13.7
	0	10	231	50	8.4	29	2	2	3	73	1	30	0	125	2.6	13.5
Ave Period 10	0	19.8	231	60.2	13.73	29	2	2	3.5	73	46	31	1	149.9	6.18	13.56
6:52:01 17/6/20	0	26	231	67	14.2	29	2	2	5	73	56	31	2	171	9.5	13.7
	0	11	231	50	13	29	2	2	1	73	29	31	0	135	4.6	13.5
Ave Period 10	0	17.8	231	58.5	14.37	29.1	27.7	4.7	4.5	73	28.6	31	1.6	152.3	5.52	13.57
7:02:01 17/6/20	0	23	231	67	15.6	30	80	9	6	73	56	31	2	177	9.2	13.7
	0	11	231	50	13.3	29	2	2	1	73	1	31	1	136	2.2	13.4
Ave Period 10	0	18	231	50	12.91	30	27.8	4.7	2.7	73	11	31.2	1.3	152.4	5.55	13.6
7:12:01 17/6/20	0	18	231	50	15.4	30	59	7	5	73	26	32	3	174	8	13.7
	0	18	231	50	6.5	30	2	3	1	73	1	31	0	140	4.4	13.5
Ave Period 10	0	20	231	54.1	14.28	30	14.5	2.1	2.3	73	48.4	31.9	1.6	158.8	6.15	13.6
7:22:01 17/6/20	0	22	231	63	15.1	30	55	3	5	73	69	32	3	174	9.4	13.8
	0	18	231	50	13.5	30	2	2	1	73	28	31	0	144	4	13.5
Ave Period 10	0	22	231	70.9	15.12	30	7.2	2	2	73	58.5	32	1.9	154.2	4.61	13.45
7:32:01 17/6/20	0	22	231	72	15.2	30	54	2	10	73	65	32	2	167	6.5	13.5
	0	22	231	66	14.7	30	2	2	1	73	38	32	1	136	2	13.4
Ave Period 10	0	12	231	56.6	14.2	30	51.8	2.8	8.4	73	25	32.1	.8	152.1	5.95	13.64
7:42:01 17/6/20	0	12	231	72	15.2	30	111	8	17	73	65	33	2	182	7.9	13.8
	0	12	231	50	12.8	30	2	2	1	73	1	32	0	135	3.4	13.5

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 10	0	16.8	231	60.5	14.04	30	39	2.2	8.3	73	38.8	32.1	.5	161.3	6.4	13.67
7:52:01 17/6/20	0	20	231	77	15.2	30	95	4	10	73	74	33	2	191	8.5	13.8
	0	12	231	50	13	30	2	2	5	73	6	32	0	144	4.6	13.5
Ave Period 10	0	20	160.5	90	13.6	30	61	2	8.5	73	39.5	33	0	158	5.75	13.75
8:02:01 17/6/20	0	20	210	99	13.8	30	72	2	10	73	44	33	0	161	6	13.8
	0	20	111	81	13.4	30	50	2	7	73	35	33	0	155	5.5	13.7

Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

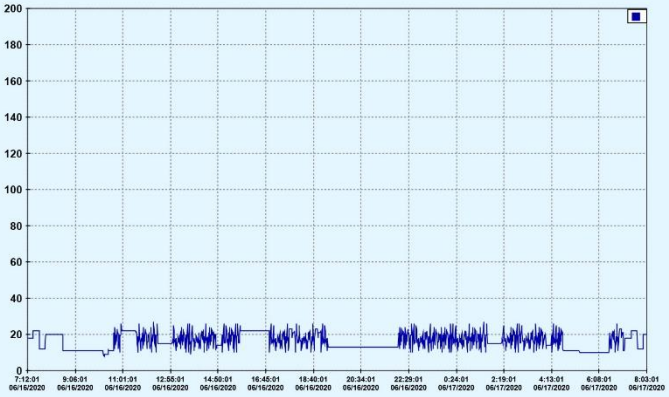
Collected by:

Logger ID 915088 Record Count 1492

Sensor ID

Range: to

Min	Ave	Max	Std. Dev	Hi Limit	% Above Hi	Lo Limit	% Below Lo
8	16.00	27	4.41		0.00%		0.00%

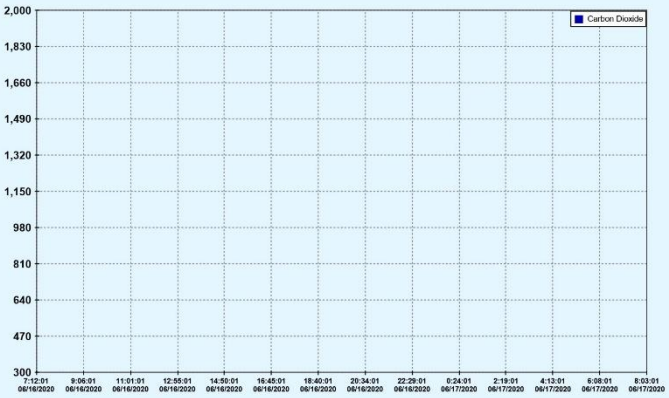


Sensor ID

Carbon Dioxide

Range: 0 to 5000 ppm

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
0	142.00	231	76.05	ppm		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

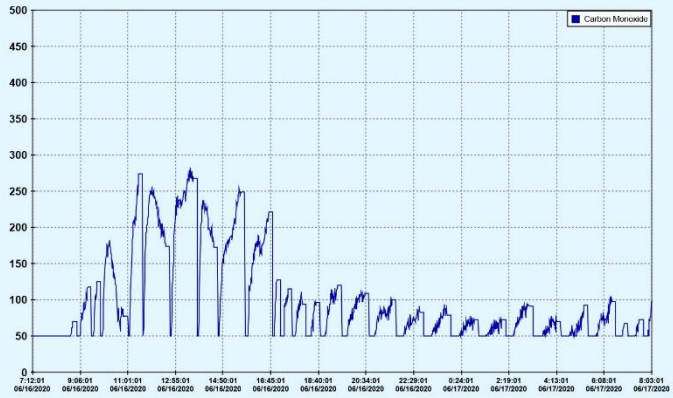
Logger ID 915088 Record Count 1492

Sensor ID

Carbon Monoxide

Range: 0 to 10000 ppb

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
50	100.00	283	62.53	ppb		0.00%		0.00%

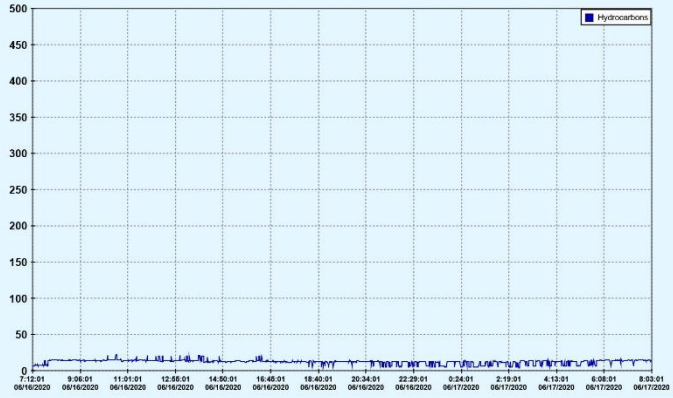


Sensor ID

Hydrocarbons

Range: 0 to 11000 ppm

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
4.1	12.20	22.4	3.10	ppm		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

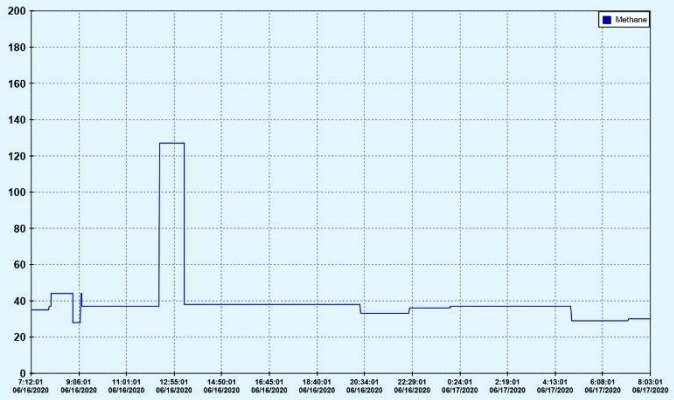
Logger ID 915088 Record Count 1492

Sensor ID

Methane

Range: 0 to 10000 ppm

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
28	39.60	127	18.20	ppm		0.00%		0.00%

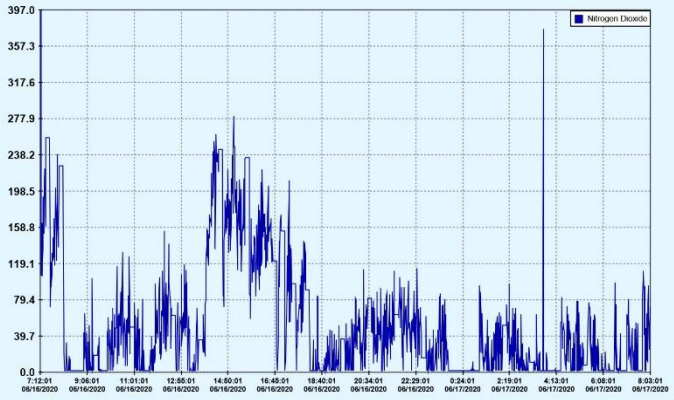


Sensor ID

Nitrogen Dioxide

Range: 0 to 5000 ppb

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
2	54.00	397	66.24	ppb		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

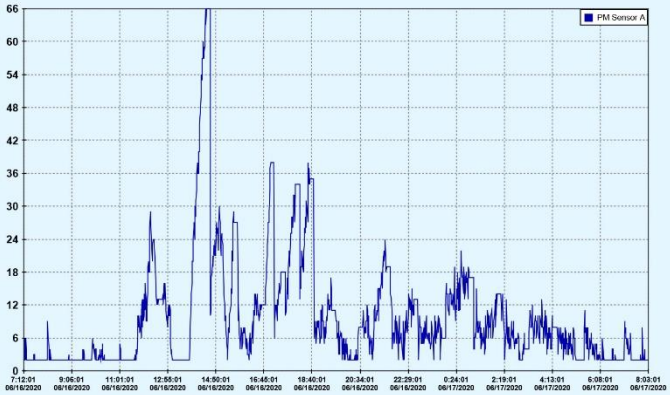
Logger ID 915088 Record Count 1492

Sensor ID

PM Sensor A

Range: 0 to 5000 uG/m3

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
2	10.00	66	10.47	uG/m3		0.00%		0.00%

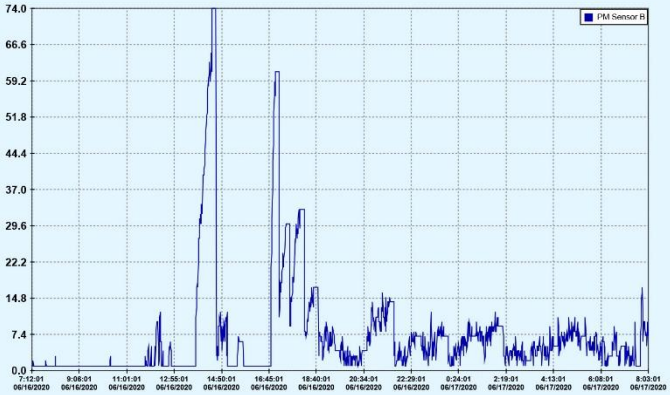


Sensor ID

PM Sensor B

Range: 0 to 5000 uG/m3

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
1	7.00	74	11.34	uG/m3		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

Logger ID 915088 Record Count 1492

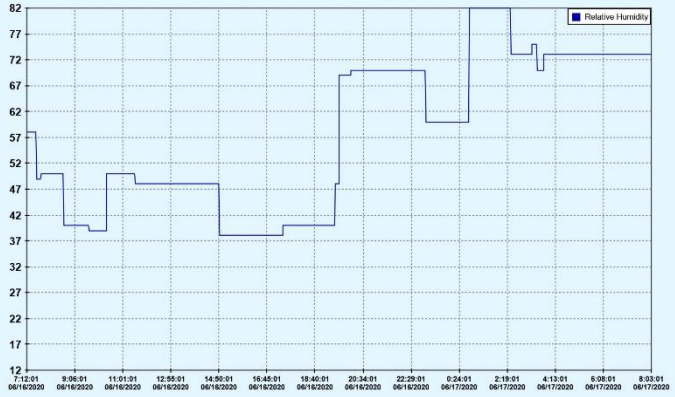
Sensor ID

R.H.

Relative Humidity

Range: 0 to 100 %

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
38	58.00	82	14.81	%		0.00%		0.00%



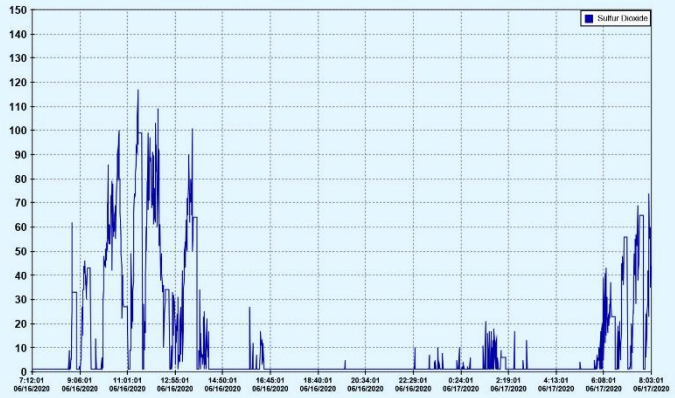
Sensor ID

SO2

Sulfur Dioxide

Range: 0 to 5000 ppb

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
1	12.00	117	22.84	ppb		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

Logger ID 915088 Record Count 1492

TEMP **Temperature** TEMP Sensor ID

Range: -20 to 60 Deg. C

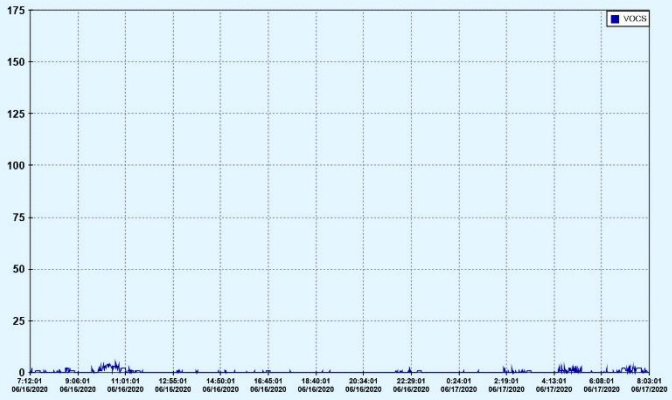
Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
29	32.00	40	3.09	Deg. C		0.00%		0.00%



VOCS **VOCS** VOCS Sensor ID

Range: 0 to 50000 ppb

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
0	0.00	5	0.72	ppb		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

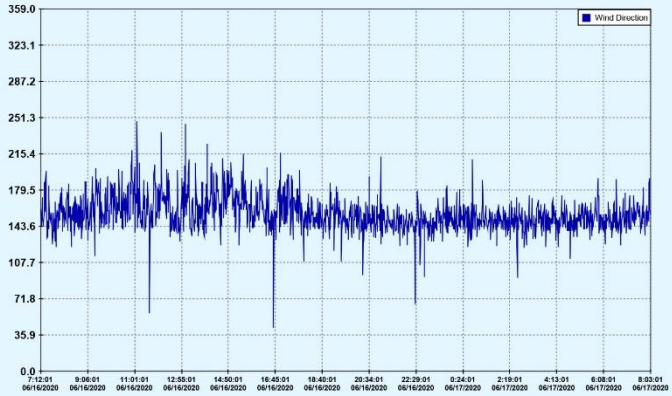
Collected by:

Logger ID 915088 Record Count 1492

W. DIR. **Wind Direction** W. DIR. Sensor ID

Range: 0 to 359 Deg.

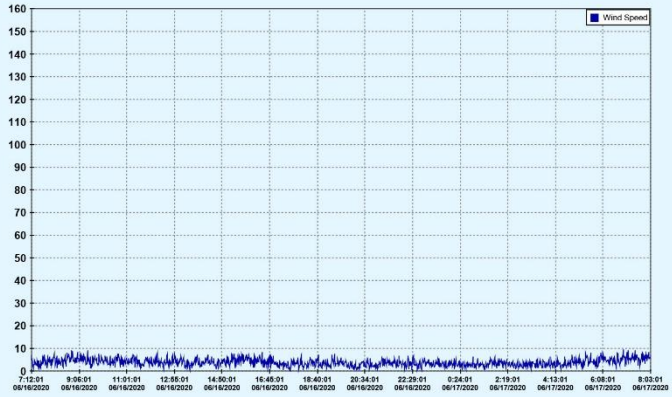
Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
43	156.00	248	17.48	Deg.		0.00%		0.00%



W. SPD. **Wind Speed** W. SPD. Sensor ID

Range: 0 to 160 kph

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
.2	3.90	9.5	1.61	kph		0.00%		0.00%



Environmental Report

Start: 16-06-2020 7:12:01 AM End: 17-06-2020 8:03:01 AM

Collected by:

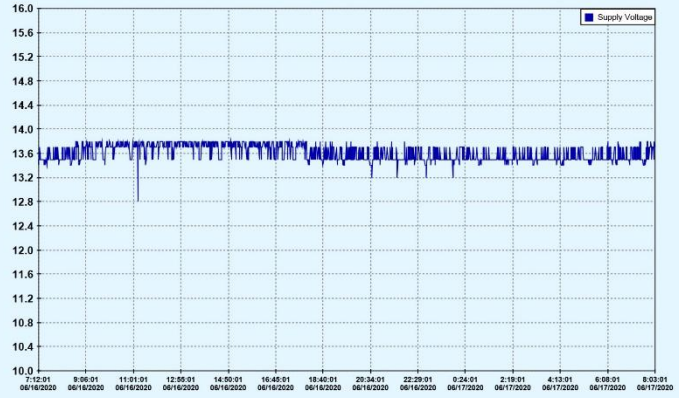
Logger ID 915088 Record Count 1492

Sensor ID

Batt. Supply Voltage Batt.

Range: 10 to 16 V

Min	Ave	Max	Std. Dev		Hi Limit	% Above Hi	Lo Limit	% Below Lo
12.8	13.60	13.8	0.13	V		0.00%		0.00%



Air Quality Analysis (1hr)

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
EPAS 915088	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Daily Jun 16, 2020	0	16.5793	98.9692	117.188	12.6187	42.3581	70.6388	11.1904	8.08730	50.2628	13.7748	33.1220	.279761	158.125	3.86339	13.6364
	0	27	231	283	22.4	127	397	66	74	70	117	40	5	248	9.2	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 1 7:12:01 16/6/20	0	18.1333	220	50	10.1183	36.8666	195	2.38333	1.06666	53.0166	1	29.8333	.3	154.333	3.94166	13.53
	0	22	220	50	15.2	45	397	9	3	58	1	30	2	198	7.8	13.7
	0	12	220	50	5.8	35	22	2	1	49	1	29	0	123	1.2	13.4
Ave Period 1 8:12:01 16/6/20	0	14.9	120.85	55.4666	14.3533	39.2	7.31666	2.16666	1	44.8333	8.28333	32.05	.5	155.733	4.97833	13.6066
	0	20	220	82	15.6	44	65	6	1	50	62	34	2	188	9.2	13.8
	0	11	27	50	13	28	2	2	1	40	1	30	0	123	1.3	13.4
Ave Period 1 9:12:01 16/6/20	0	11	77.8333	98.4666	13.8583	37.35	16.7166	2.4	1	39.5	20.2166	34.45	.533333	163.766	4.685	13.6783
	0	11	96	162	15.6	44	103	6	1	40	51	37	4	201	9.1	13.8
	0	11	55	50	12.6	37	2	2	1	39	1	33	0	114	1.3	13.4
Ave Period 1 10:12:01 16/6/20	0	15.3666	76.75	107.7	15.025	37	48.8166	2.26666	1.05	47.8	49.2833	34.9166	2.25	168.666	4.48833	13.7116
	0	26	152	183	22.4	37	132	5	3	50	100	36	5	248	7.6	13.8
	0	8	28	50	12.7	37	2	2	1	39	1	34	0	137	1.7	13.5
Ave Period 1 11:12:01 16/6/20	0	19.15	115.2	216.966	14.395	37	26.0666	6.23333	1.35	48.6666	68.0333	36.3833	.316666	163.1	4.24666	13.705
	0	26	208	274	20.9	37	104	20	5	50	117	38	1	237	7.1	13.8
	0	10	42	50	12.8	37	2	2	1	48	1	35	0	57	1.2	12.8
Ave Period 1 12:12:01 16/6/20	0	16.3833	90	187.416	14.1	112	62.0666	13.9	3.03333	48	31.5833	37.1166	.05	163.466	4.13333	13.73
	0	27	192	243	21	127	155	29	12	48	109	39	1	245	8.1	13.8
	0	10	41	50	12.5	37	2	2	1	48	1	35	0	128	.8	13.5

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 1 13:12:01 16/6/20	0	17.4	78.5833	229.75	14.9183	52.8333	56.4166	10.7166	11.4	48	39.0666	38	.083333	162.066	3.65	13.72
	0	26	221	283	21.8	127	218	40	42	48	101	40	1	225	6.9	13.8
	0	9	41	50	11.5	38	2	2	1	48	1	36	0	133	.4	13.5
Ave Period 1 14:12:01 16/6/20	0	17.1	54.7333	164.1	12.6683	38	199.85	38.5666	31.8833	44.8333	2.26666	36.35	.05	172.7	3.95666	13.715
	0	26	150	227	19.5	38	281	66	74	48	22	39	1	211	7.3	13.8
	0	10	12	50	11	38	71	10	1	38	1	35	0	125	1	13.5
Ave Period 1 15:12:01 16/6/20	0	19.8666	38.6666	177.666	12.9616	38	158.766	11.7166	2.13333	38	1.73333	36.1666	.033333	164.2	5.085	13.715
	0	26	95	254	13.9	38	235	29	7	38	27	39	1	215	7.8	13.8
	0	10	12	50	11.5	38	59	2	1	38	1	35	0	125	1.4	13.5
Ave Period 1 16:12:01 16/6/20	0	20.85	37.0166	159.9	13.6516	38	135.183	17	17.3833	38	2.35	34.9833	.2	158.883	4.12333	13.6916
	0	26	82	221	20.6	38	222	38	61	38	17	37	1	216	8.3	13.8
	0	10	13	50	11.3	38	2	3	1	38	1	33	0	43	1.3	13.5
Ave Period 1 17:12:01 16/6/20	0	18.4	68.4833	84.2166	12.3433	38	86.2666	20.95	25.4	39.5666	1	32.1333	.016666	161.15	2.86333	13.6716
	0	26	121	115	13.6	38	210	34	33	40	1	33	1	199	6.7	13.8
	0	10	0	50	11.5	38	2	9	9	38	1	31	0	109	.2	13.4
Ave Period 1 18:12:01 16/6/20	0	18.3333	121	69.8666	11.4366	38	10.8666	19.15	10.25	40	1	30.9333	.016666	153.25	3.35166	13.5966
	0	26	121	109	13.3	38	84	38	17	40	1	31	1	187	7.3	13.8
	0	10	121	50	4.7	38	2	5	2	40	1	30	0	119	1.1	13.4
Ave Period 1 19:12:01 16/6/20	0	13.1666	111.283	86.2666	12.1416	38	27.3	7.55	4.06666	57.3666	1.06666	30.7166	.016666	152.683	3.31	13.5716
	0	18	121	120	13.4	38	81	17	9	70	5	31	1	183	7.7	13.8
	0	11	110	50	5.4	38	2	2	1	40	1	30	0	109	.8	13.4
Ave Period 1 20:12:01 16/6/20	0	13	110	83.1666	12.3666	34.1666	45.75	5.78333	6	70	1	29.9666	0	150.416	2.63666	13.5533
	0	13	110	111	13.7	38	113	12	14	70	1	33	0	213	6	13.8
	0	13	110	50	6	33	2	2	1	70	1	29	0	95	.8	13.2

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Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 1 21:12:01 16/6/20	0	13.5166	110	74.1166	9.90166	33	55.2666	13.15	8.6	70	1	29.95	.1	146.8	3.60833	13.5333
	0	24	110	104	13	33	111	24	16	70	1	30	1	166	6.7	13.8
	0	12	110	50	4.1	33	2	2	1	70	1	29	0	124	1.2	13.2
Ave Period 1 22:12:01 16/6/20	0	17.9	110	67.2333	10.425	35.4	35.4166	8.88333	5.01666	68.8333	1.25	29.3	.233333	143.95	3.40666	13.5416
	0	26	110	91	13.5	36	114	15	8	70	10	30	2	179	6.9	13.7
	0	10	110	50	4.5	33	2	2	1	60	1	29	0	66	.4	13.2
Ave Period 1 23:12:01 16/6/20	0	17.5833	152.854	70.5833	9.1625	36	24.5833	6.47916	6.54166	60	1.60416	29	0	151.666	3.05	13.525
	0	26	231	94	13.3	36	86	10	12	60	10	29	0	184	5.6	13.7
	0	10	110	50	4.6	36	2	2	2	60	1	29	0	128	1.2	13.2
Daily Jun 17, 2020	0	15.8037	230.708	62.7975	11.3022	33.9628	18.4752	6.69834	5.23966	73.4752	8.72933	29.5516	.378099	150.336	3.83884	13.5444
	0	27	231	105	15.9	37	376	22	17	82	74	33	3	210	9.5	13.8
	0	10	111	50	4.1	29	2	2	1	60	1	29	0	92	.8	13.4
Ave Period 1 0:00:01 17/6/20	0	18.25	231	52.4166	11.8083	36.75	2	12.5	2.16666	60	1	29	0	148.416	3.48333	13.5416
	0	23	231	79	12.6	37	2	16	7	60	1	29	0	178	5.7	13.7
	0	10	231	50	5.5	36	2	6	1	60	1	29	0	133	2	13.4
Ave Period 1 0:12:01 17/6/20	0	17.7166	231	61.35	9.06	37	7.2	14.5333	5.83333	68.4333	1.38333	29	.033333	150.783	2.86333	13.5566
	0	26	231	77	13.6	37	95	22	10	82	10	29	1	210	6.5	13.7
	0	10	231	50	4.4	37	2	4	1	60	1	29	0	123	1	13.4
Ave Period 1 1:12:01 17/6/20	0	16.35	231	60.0333	9.99333	37	26.2333	9.01666	7.85	82	4.7	29	0	149.583	3.30833	13.52
	0	27	231	76	13.5	37	66	15	12	82	21	29	0	189	5.9	13.7
	0	10	231	50	5.4	37	2	3	2	82	1	29	0	124	.8	13.4
Ave Period 1 2:12:01 17/6/20	0	17.5333	231	69.4666	10.1416	37	22.5666	6.05	3.35	75.4	1.61666	29	.316666	146.15	2.87666	13.5283
	0	26	231	94	13.8	37	97	14	9	82	17	29	2	174	4.6	13.7
	0	10	231	50	4.1	37	2	2	1	73	1	29	0	92	.8	13.4

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Environmental Report

Record Cnt 1492

Start Date 16-06-2020 7:12:01 AM

End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 1 3:12:01 17/6/20	0	16.9833	231	60.9166	11.0983	37	12.6833	7.46666	4	72.6	1	29	.116666	150.85	3.035	13.5266
	0	26	231	91	14	37	376	13	9	75	1	29	1	171	5.2	13.7
	0	10	231	50	5.7	37	2	3	1	70	1	29	0	123	.8	13.4
Ave Period 1 4:12:01 17/6/20	0	14.5	231	56.8	10.5766	34.6	23.7333	5.85	6.73333	73	1	29	.816666	148	3.56166	13.55
	0	26	231	76	13.4	37	82	10	11	73	1	29	3	174	7.2	13.7
	0	10	231	50	5.7	29	2	2	3	73	1	29	0	111	1	13.4
Ave Period 1 5:12:01 17/6/20	0	10.1666	231	66.65	12.0166	29	18.7833	3.58333	5.81666	73	4.26666	29.4	.2	152.783	4.54666	13.5266
	0	11	231	92	15.1	29	76	11	11	73	39	30	2	191	8.2	13.8
	0	10	231	50	5.8	29	2	2	2	73	1	29	0	130	1.4	13.4
Ave Period 1 6:12:01 17/6/20	0	15.1166	231	69.1833	13.7116	29.0166	12.0166	2.66666	4.01666	73	24.65	30.5333	.55	149.816	5.11	13.5566
	0	26	231	105	15.9	30	98	9	9	73	56	31	2	190	9.5	13.8
	0	10	231	50	6.1	29	2	2	1	73	1	30	0	125	1.7	13.4
Ave Period 1 7:12:01 17/6/20	0	17.8461	228.288	59.6346	14.0903	30	29.3269	2.73076	4.88461	73	36.4615	31.9038	1.17307	155.846	5.73269	13.5980
	0	22	231	99	15.4	30	111	8	17	73	74	33	3	191	9.4	13.8
	0	12	111	50	6.5	30	2	2	1	73	1	31	0	135	2	13.4

Air Quality Analysis

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Environmental Report

Record Cnt 1492
Start Date 16-06-2020 7:12:01 AM
End Date 17-06-2020 8:03:01 AM

	NH3 ppm	ARadC PM	CO2 ppm	CO ppb	HC ppm	CH4 ppm	NO2 ppb	PMA uG/m3	PMB uG/m3	RH %	SO2 ppb	TmpC Deg. C	VOCS ppb	WDir Deg.	WSpM kph	Pwr V
Ave	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
Max	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
Min	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
EPAS 915088	0	16.3277	141.705	99.5442	12.1916	39.6347	53.7171	9.73324	7.16353	57.7928	12.1380	31.9638	.311662	155.598	3.85542	13.6065
	0	27	231	283	22.4	127	397	66	74	82	117	40	5	248	9.5	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Daily Jun 16, 2020	0	16.5793	98.9692	117.188	12.6187	42.3581	70.6388	11.1904	8.08730	50.2628	13.7748	33.1220	.279761	158.125	3.86339	13.6364
	0	27	231	283	22.4	127	397	66	74	70	117	40	5	248	9.2	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Ave Period 24 7:12:01 16/6/20	0	16.5793	98.9692	117.188	12.6187	42.3581	70.6388	11.1904	8.08730	50.2628	13.7748	33.1220	.279761	158.125	3.86339	13.6364
	0	27	231	283	22.4	127	397	66	74	70	117	40	5	248	9.2	13.8
	0	8	0	50	4.1	28	2	2	1	38	1	29	0	43	.2	12.8
Daily Jun 17, 2020	0	15.8037	230.708	62.7975	11.3022	33.9628	18.4752	6.69834	5.23966	73.4752	8.72933	29.5516	.378099	150.336	3.83884	13.5444
	0	27	231	105	15.9	37	376	22	17	82	74	33	3	210	9.5	13.8
	0	10	111	50	4.1	29	2	2	1	60	1	29	0	92	.8	13.4
Ave Period 24 0:00:01 17/6/20	0	15.5578	231	63.1782	10.9666	34.4398	17.1689	7.17592	5.28240	73.5324	5.39120	29.2685	.282407	149.673	3.61087	13.5379
	0	27	231	105	15.9	37	376	22	12	82	56	31	3	210	9.5	13.8
	0	10	231	50	4.1	29	2	2	1	60	1	29	0	92	.8	13.4
Ave Period 24 7:12:01 17/6/20	0	17.8461	228.288	59.6346	14.0903	30	29.3269	2.73076	4.88461	73	36.4615	31.9038	1.17307	155.846	5.73269	13.5980
	0	22	231	99	15.4	30	111	8	17	73	74	33	3	191	9.4	13.8
	0	12	111	50	6.5	30	2	2	1	73	1	31	0	135	2	13.4

Flyers for Natural Disasters




၂။ အန္တရာယ်ရှိနိုင်သော တောင်ကြီးများအောက်တိုင်း သစ်ပင်
သစ်ကိုင်းများ သတ်ပြုရှောင်ရှားပါ။ သက်ဆိုင်ရာသို့
အကြောင်းကြားပြီး ကူညီရှင်းလင်းပါ။
၃။ အိပ်ဆေးခိုင်ပုံများနေအထားနှင့် အဝတ်ပို့ဝေသာ
တိရစ္ဆာန်များ အိပ်ပြဲအတွင်း ရှိမရှိ စစ်ဆေးပါ။
၄။ သန့်ရှင်းသောသောက်သုံးရေ(သို့) ကျိုချက်
ထားသောရေ (သို့) ရောနှစ်ဆေးတော်ထားသော
ရေကိုသာ အမြဲသောက်သုံးပါ။
၅။ သက်ဆိုင်ရာဆရာဝန်ထံမှ ညွှန်ကြားချက်ရရှိပါက
ရွှေ့ပြောင်းထားသော ဘေးလွတ်ရာနေရာသို့ပြောင်း
ရွှေ့ပို့ပါ။
မုန်တိုင်းခြစ်ပေါ် နေစဉ်တွင်
လုံခြုံရာသို့ အရောက်များ
၆။ သက်ဆိုင်ရာဆရာဝန်ထံမှ ထုတ်ပြန်ကြေညာသော
မိုးလေဝသ သတင်းများကို ရဲဆင်နှင့်ကြားနာတော်ခြင်း
အကြိမ်ရေများကို လိုက်နာပါ။ အခြားသူများကိုလွှဲပေး
တောလားမလာ သတင်းများကို မယုံမှိန့်
၇။ မုန်တိုင်းဟိုးခြောက်သန့်ရှင်း
ဝေွာဝေပြိမ်သော်လည်း
မကြာမီ အချိန်အတွင်း
ဆန့်ကျင်ဘက်အရပ်မှ ပိုမို
ပြင်းထန် သည့် လေများ
တိုက်ခတ်လာနိုင်သည်ကို
သတိပြုပါ။
၈။ မုန်တိုင်းအန္တရာယ်ကင်းရှင်းကြောင်း သက်ဆိုင်ရာ
အရိုးရာဆရာမှ သတင်းထုတ်ပြန်သည်အထိ ဘေးကင်း
လုံခြုံသောနေရာတွင် နေထိုင်ပါ။
၁
၂


ရေလွှမ်းမိုးမှုဖြစ်လာလျှင်
ဘာလုပ်ရမလဲ
ရေလွှမ်းမိုးမှုမဖြစ်မီ
ရေတက်နေစဉ်အချိန်
ရေပြန်ကျသွားသည့်အချိန်

မီးဘေး

ကယ်ဆယ်ရေးနှင့် ပြန်လည်နေရာချထားရေးဦးစီးဌာန

ဖြစ်ပေါ်ခဲ့တဲ့အချက်များ



ပူမီသဲ ဖယောင်းတိုင်၊ မီးခွက်ထွန်းထားရန်၊
ကိုမင်းမဲ့မိသားများနှင့် ကလေးသူငယ်များကို မီးမွေ့ခြင်း၊
ဝမင်းမှက်ခြင်းများ မပြုလုပ်စေရန်၊
လောင်လွယ်သောပစ္စည်းများ၊ လောင်စာဆီများကို မီးပို့အနီး
ထားရန်၊

ဖော်ဆောင်ခဲ့တဲ့အချက်များ



- မီးပို့နံဘေးတွင် လုံလောက်သော အကာအရံများထားရှိပါ။
- အိမ်တိုင်းတွင် မီးသတ်ဆေးတူး၊ မီးခိုတ်၊ မီးတပ်၊ ရေပုံး၊ သဲပုံ
များအသင့်ထားရှိပါ။
- လျှပ်စစ်မီးကြိုး အပေါက်အပြဲများကို ကျွမ်းကျင်သူများနှင့် ပြ
ဆင်ရန်၊
- မီးကင်းစောင့်ခြင်း၊ လှည့်လည်သတိပေးခြင်းများ စီစဉ်ဆောင်
ရွက်ထားရန်၊
- Gas မီးဖိုအသုံးပြုရာတွင် လေဝင်လေထွက်ကောင်းစေရန်
အတွက် ပြတင်းပေါက်များဖွင့်ထားရန်၊

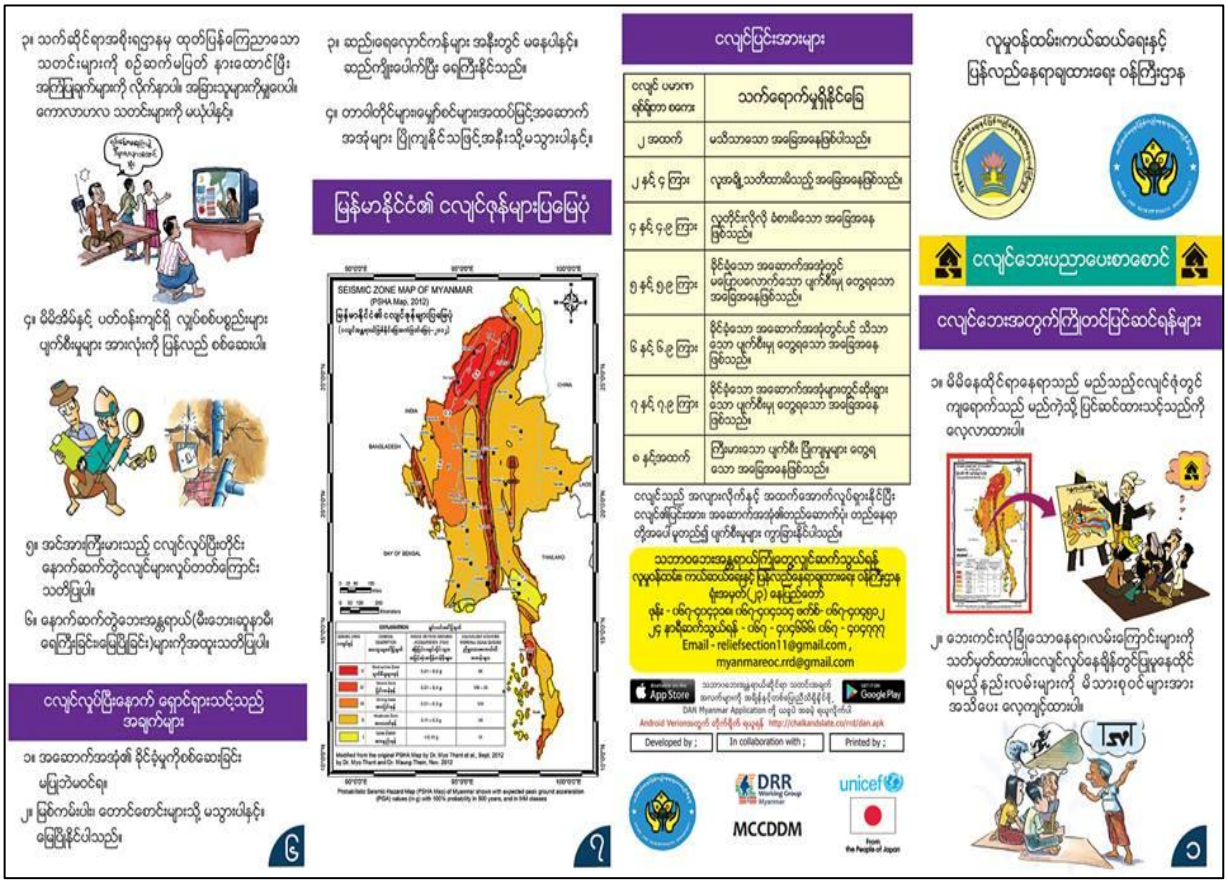
မီးဘေးဖြစ်ခဲ့ ဖော်ဆောင်ခဲ့ရသည့်အချက်များ



ခွက်ပေးသဲဖောင်းခေါက်ပါ။
ုက်မပြေပါနှင့် ကြိုတ်မပြိမ်းပါနှင့် ပတ်ဝန်းကျင်သို့
ကူအညီတောင်းပါ။
သတ်စခန်းသို့ အကြောင်းကြားပါ။
သတ်ကားများ ဝင်လမ်း၊ ထွက်လမ်း ပိတ်ဆို့မှုမရှိစေရေး
ုညီပါ။
ျှပ်စစ်ဝါယာရှော့ပြတ်လျှင် ပင်မလုပ်ကို ပိတ်ပြီးခြောက်သွေ့
သာအတက်ပြင့် ဖိုက်ပုတ်ငြိမ်းသတ်ပါ။


ကြောင်းကြီးနောက် ပြုလုပ်ရန်အချက်များ
၁။ မီးသားစုဝင်များ
ပျောက်ဆုံး ကွဲကွာပါက
သက်ဆိုင်ရာသို့
အကြောင်းကြားပါ။
၂။ သက်ဆိုင်ရာအစိုးရ
ဌာနမှ ထုတ်ပြန်
ကြေညာသော မိုးရေလေဝသ
သတင်းများကို စဉ်ဆက်မြဲတံ့နားထောင်ပြီး
အကြံပြုချက်များကို လိုက်နာပါ။
၃။ အရိုက်များအား ရန်စတက္ခု
ရှင်းလင်းခြင်း
တိရစ္ဆာန်အသေကောင်
များအား ရန်စတက္ခုပြန်ရှိ
ခြင်း(သို့) မြှုပ်နှံခြင်း
များပြုလုပ်ပါ။
၄။ အန္တရာယ်ရှိနိုင်သော
ဓာတ်ကြိုးများ၊ ဓာတ်တိုင်
သစ်ပင်သစ်ကိုင်းများကို
သတိပြုရှောင်ရှားပါ။
သက်ဆိုင်ရာသို့အကြောင်း
ကြားခြင်း ကူညီ
ရှင်းလင်းပါ။
၅။ ကြောင်းခြင်းဖြစ်နောက်ဆက်တွဲအနေဖြင့်ဖြစ်ပေါ်နိုင်
သော ဘေးအန္တရာယ်များနှင့် ကူးစက်ရောဂါများကို
ကင်းဝေးပါ။
၆။ ကယ်ဆယ်ရေးနှင့် အစဉ်အဆက်ပြန်လည်ထူထောင်ရေး
လုပ်ငန်းများတွင် မူဝေါင်းလုပ်ထောင်ပါ။
ကြောင်းကြီးပြင်းထန်မှုကြောင့်
ဆောင်ရွက်ရန်များ
၁။ သက်ဆိုင်ရာအစိုးရဌာနမှ ထုတ်ပြန်ကြေညာသော
မိုးရေလေဝသ သတင်းများကို စဉ်ဆက်မြဲတံ့နားထောင်ပြီး
အကြံပြုချက်များကို လိုက်နာပါ။ အခြားသူများ
ကိုလည်း မှာကြားပါ။
၂။ တောင်ပေါ်ဒေသများရောင်းများ
မြစ်ချောင်းများတွင် မိုးကြီး
ပါက ပြတ်ပြတ်ထစ်လျှောက်
တွင် လှုပ်ရှားမြဲတံ့ကြောင်း
ခြင်းများမြဲနိုင်ကြောင်း
သတိပြုကြပါ။
၃။ အရေးပေါ် သုံးစွဲရမည်များ
စားနပ်ရိက္ခာနှင့် အရေးကြီး စာရွက်စာတမ်း
များကို မိမိနှင့်အတူထားရှိပါ။
၄။ မီးသားစုဝင်များ
ကွဲကွာသွားပါက
ပြန်လည်ဆက်
သွယ်ရန် ဖုန်းနံပါတ်
အပြည်း ရင်ကွက်
ကျောရွာရှိ ဆက်သွယ်
ရမည့်သူဟောည်တို့အား
ရောဘရှိ မီးသားစုဝင်ပိုင်း ယူဆောင်ထားပါ။
၅။ သက်ဆိုင်ရာအစိုးရဌာနမှ ညွှန်ကြားချက်ရရှိ
ပါက ချေးဆုံးထားသော ဘေးလွတ်ရာနေရာသို့
ပြောင်းရွှေ့နိုင်ပါ။


ရေကြီးခြင်း ဖြစ်ပေါ်နေချိန်တွင်
ရှောင်ရှားသင့်သည့်အချက်များ
၁။ တိရစ္ဆာန်များကို
မလိုအပ်ဘဲ
ရည်နှောင်ထားခြင်း
မပြုလုပ်ပါနှင့်။
၂။ ရေကြီးသော ဒေသများတွင်
မြစ်ဖျောင်း ကမ်းပါး
တိုက်စားပြိုး ပြုကျ
တတ်သောကြောင့်
မြစ်ဖျောင်းကမ်းပါးများ
အနီးသို့ မသွားပါနှင့်။
၃။ ရေထဲတွင် ရေကူးခြင်း
လမ်းလျှောက်ခြင်းများ
မပြုလုပ်ပါနှင့်။
၄။ ရေစိုနေသော
လျှပ်စစ်ပစ္စည်းများကို
အသုံးမပြုပါနှင့်။
ရေကြီးခြင်းဖြစ်ပေါ်နေချိန်တွင်လိုက်နာရန်
အချက်များ
၁။ သက်ဆိုင်ရာအစိုးရဌာနမှ ထုတ်ပြန်ကြေညာသော
ဖိုးခေတသ သတင်းများကို ရဉ်ထက်မြဲတ်နားထောင်ပြီး
အကြံပြုချက်များကိုလိုက်နာပါ။
၂။ အိမ်သုံးလျှပ်စစ်ပစ္စည်းများ၊ ပိန်းခလုတ်များကို
ပိတ်ထားပါ။
၃။ သောက်သုံးရေသန့်(သို့) ကျိုမွှေက်ထားသောရေ
(သို့) ရေသန့်ဆေးတတ်ထားသော ရေကိုသာ အမြဲ
သောက်သုံးပါ။
၄။ အဆိပ်ရှိသော


၃။ သက်ဆိုင်ရာအစိုးရဌာနမှ ထုတ်ပြန်ကြေညာသော သတင်းများကို စဉ်ဆက်မပြတ် နားဆင်ပြီး အကြံပြုချက်များကို လိုက်နာပါ။ အခြားသူများကိုမှပေးပါ။ ကောလာဟလ သတင်းများကို ယုံပါနှင့်။
၄။ မိမိအိမ်နှင့် ပတ်ဝန်းကျင်ရှိ လျှပ်စစ်ပစ္စည်းများ ပျက်စီးမှုများ အားလုံးကို ပြန်လည် စစ်ဆေးပါ။
၅။ အင်အားကြီးများသည့် လျင်လှုပ်ပြီးတိုင်း နောက်ဆက်တွဲလျင်များလှုပ်တတ်ကြောင်း သတိပြုပါ။
၆။ နောက်ဆက်တွဲဘေးအန္တရာယ်(မီးဘေး၊ဆုနာမီ၊ ရေကြီးခြင်း၊မြေပြိုခြင်း)များကိုအထူးသတိပြုပါ။
လျင်လှုပ်ပြီးနောက် ရှောင်ရှားသင့်သည့် အချက်များ
၁။ အဆောက်အအုံ၏ ခိုင်ခံ့မှုကိုစစ်ဆေးခြင်း မပြုဘဲမဝင်ရ။
၂။ မြစ်ကမ်းပါး၊ တောင်စောင်းများသို့ မသွားပါနှင့်၊ မြေပြိုနိုင်ပါသည်။
၆
၁။ ဆည်၊ရေလှောင်ကန်များ အနီးတွင် မနေပါနှင့်၊ ဆည်ကျိုးပေါက်ပြီး ရေကြီးနိုင်သည်။
၂။ တာပါတိုင်များ၊မျှော်စင်များအထပ်မြင့်အဆောက် အအုံများ ပြိုကျနိုင်သဖြင့်အနီးသို့မသွားပါနှင့်၊
မြန်မာနိုင်ငံ၏ လျင်ငုန်များပြမြေပုံ
SEISMIC ZONE MAP OF MYANMAR
(PSHA Map, 2012)
၇
လျင်ပြင်းအားများ
လျင် ပမာဏ ရင်းမြစ် စကေး	သက်ရောက်မှုရှိနိုင်ခြေ
၂ အထက်	မသိသာသော အခြေအနေဖြစ်ပါသည်။
၂ နှင့် ၄ ကြား	လူအချို့သတိထားမိသည့် အခြေအနေဖြစ်သည်။
၄ နှင့် ၄.၉ ကြား	လူတိုင်းလိုလို ခံစားမိသော အခြေအနေ ဖြစ်သည်။
၅ နှင့် ၅.၉ ကြား	ခိုင်ခံ့သော အဆောက်အအုံတွင် မပြောလောက်သော ပျက်စီးမှု တွေ့ရသော အခြေအနေဖြစ်သည်။
၆ နှင့် ၆.၉ ကြား	ခိုင်ခံ့သော အဆောက်အအုံတွင်ပင် သိသာ သော ပျက်စီးမှု တွေ့ရသော အခြေအနေ ဖြစ်သည်။
၇ နှင့် ၇.၉ ကြား	ခိုင်ခံ့သော အဆောက်အအုံများတွင်ထိုးဖောက် သော ပျက်စီးမှု တွေ့ရသော အခြေအနေ ဖြစ်သည်။
၈ နှင့်အထက်	ကြီးမားသော ပျက်စီး ပြိုကျမှုများ တွေ့ရ သော အခြေအနေဖြစ်သည်။

လျင်သည် အလျားလိုက်နှင့် အထက်အောက်လှုပ်ရှားနိုင်ပြီး လျင်အရြင်းအစား အဆောက်အအုံ၏တည်ဆောက်ပုံ၊ တည်နေရာ တို့အပေါ်မူတည်၍ ပျက်စီးမှုများ ကွာခြားနိုင်ပါသည်။
သဘာဝဘေးအန္တရာယ်ကြိုတွေ့လျှင်ဆက်သွယ်ရန် လူမှုဝန်ထမ်း ကယ်ဆယ်ရေးနှင့် ပြန်လည်နေရာချထားရေး ဝန်ကြီးဌာန ပဋိသန္ဓေ(၂၉) ဧရပ်ညီတော် ရုံး - ၀၆၇-၄၇၀၃၀၊ ၀၆၇-၄၇၀၃၅ ဖက်စ် - ၀၆၇-၄၇၀၃၂ Email - reliefsection11@gmail.com , myanmareoc.rrd@gmail.com
App Store GooglePlay DAR Myanmar Application ကို ယခုပဲ အခမဲ့ ရယူလိုက်ပါ Android Version အတွက် လိုက်ရှိရင် ရယူရန် http://clickandclate.com/mdrdan.apk
Developed by ; In collaboration with ; Printed by ;
DRR Working Group Myanmar MCCDDM unicef From the People of Japan
လူမှုဝန်ထမ်းကယ်ဆယ်ရေးနှင့် ပြန်လည်နေရာချထားရေး ဝန်ကြီးဌာန
ဘေးဥပဒေ
လျင်ဘေးအတွက်ကြိုတင်ပြင်ဆင်ရန်များ
၁။ မိမိနေထိုင်ရာနေရာသည် မည်သည့်လျင်ငုံတွင် ကျရောက်သည် မည်ကဲ့သို့ ပြင်ဆင်ထားသင့်သည်ကို လေ့လာထားပါ။
၂။ ဘေးကင်းလုံခြုံသောနေရာ၊လမ်းကြောင်းများကို သတ်မှတ်ထားပါ။လျင်လှုပ်နေချိန်တွင်ပြုမူနေထိုင်ရမည့် နည်းလမ်းများကို မိသားစုဝင်များအား အသိပေး လေ့ကျင့်ထားပါ။
၅
၁။ ပြိုကျ၊ ပြုတ်ကျ၊ ကွဲရှနိုင်သော ပစ္စည်းများ၊ တွဲလောင်းကျနေသော အရာများကို အန္တရာယ်မဖြစ်စေရန် မြေမြှောင် ပြုလုပ်ထားပါ။
၃။ မိသားစုသုံး အရေးပေါ်ပစ္စည်းများအရေးကြီး စာရွက်စာတမ်းများကို ကြိုတင်ပြင်ဆင်ထားပါ။
၅။ မိမိအိမ်၏ ခိုင်ခံ့ မှုကို ပုံမှန်စစ်ဆေးပြီးတောင့်တင်းခိုင်မာအောင်ပြုလုပ်ထားပါ။
လျင်လှုပ်နေစဉ်တွင်လိုက်နာရန်အချက်များ
၁။ ကြောက်လွန်းတိတ်လန့်မှုမရှိပါနှင့်၊ သတိရှိပါ၊ တည်ငြိမ်မှုရှိပါ။
၂။ (၅) စက္ကန့် အတွင်း အဆောက်အအုံအပြင်သို့ ရောက်နိုင်ပါကပြေးထွက်ပါ။ မရောက်နိုင်ပါက ဘေးကင်းသောနေရာတွင် (ဝပ် ကာ ကိုင်)ပုံစံဖြင့်နေပါ။
ဝပ် = ဘေးအန္တရာယ်ကင်းသော နေရာတွင် ဝပ်နေပါ။
ကာ = ခိုင်ခံ့သော စားပွဲစုံခုတင်အောက်တွင် မိမိကိုယ်ကို အကာအကွယ်ယူပါ။
ကိုင် = ခိုင်ခံ့သော စားပွဲ၊ ပုံး၊ ခုတင်များကို မြဲမြံစွာကိုင်ထားပါ။
၄
၁။ လယ်ကွင်းကွင်းပြင်(သို့) ဘေးကင်းရာ (မြင့်မားသော အဆောက်အအုံ၊ လျှပ်စစ်မီးတိုင်များသစ်ပင်များ ပြိုကျနိုင်သောအရာများနှင့် ဝေးရာ) သို့ပြေးပါ။
၄။ လျင်ကြောင့် ဆုနာမီလိုင်းများ ဖြစ်ပေါ်လာနိုင်သည့်အတွက် ကမ်းခြေ (သို့) မြစ်ကမ်းစပ် အနီးတွင် ရောက်ရှိနေပါက ကုန်းမြေပြင်သို့ ခွေ့ပြောင်းပါ။
၅။ မီးအသုံးပြုနေစဉ် လျင်လှုပ်ပါက မီးတောက်ပြိမ်းပါ။ မီးဓလုတ်များကို ပိတ်ပါ။
အတွင်း
ဆပ်ထိ
၇
၆။ ဆိုင်ကယ်၊ ကားစသည်တို့မောင်းနှင်နေချိန်ဖြစ်ပါက အရှိန်လျော့ပြီး ဘေးကင်းရာနေရာတွင် ရပ်ထားပါ။
လျင်လှုပ်နေစဉ်တွင် ရှောင်ရှားသင့်သည့် အချက်များ
၁။ အဆောက်အအုံထဲသို့ မပြေးမဝင်ပါနှင့်။
၂။ တတ်လေ့ကကားများ အသုံးမပြုပါနှင့်။
၈
၁။ အထပ်မြင့်တိုက်များမှ ခုန်ထွက်ခြင်းမပြုပါနှင့်၊
လျင်လှုပ်ပြီးနောက် ပြုလုပ်ရန်အချက်များ
၁။ မိမိ၏ မိသားစုဝင်များကို စစ်ဆေးပါ။မိသားစုဝင် များပျောက်ဆုံးသွားပါက သက်ဆိုင်ရာသို့အကြောင်း ကြားပါ။
၂။ ထိခိုက်ဒဏ်ရာရရှိသူများကို စစ်ဆေးပြီး လိုအပ်သော အကူအညီများပေးပါ။
၉

Grievance Redress Form

1. Personal Information:

- Full Name: _____
- Contact Number: _____
- Email Address: _____
- Address: _____

2. Grievance Details:

- Date of Issue: _____
- Description of Grievance: _____

_____

_____

_____

3. Supporting Documents (if any):

- Attach relevant documents (e.g., receipts, photos, emails).

4. Desired Resolution:

- What resolution are you seeking? _____

_____

_____

5. Declaration:

- I declare that the information provided is true and accurate to the best of my knowledge.
- Signature: _____
- Date: _____

တိုင်ကြားချက်နှင့် ပြဿနာဖြေရှင်းရေးပုံစံ

၁။ ကိုယ်ရေးအချက်အလက်များ

- အမည်အပြည့်အစုံ _____
- ဆက်သွယ်ရန်ဖုန်းနံပါတ် _____
- အီးမေးလ်လိပ်စာ _____
- နေရပ်လိပ်စာ _____

၂။ တိုင်ကြားချက်အကြောင်းအရာ

- ဖြစ်ပွားသည့်ရက်စွဲ _____
- တိုင်ကြားချက်ဖော်ပြချက် _____

၃။ သက်သေအထောက်အထားများ (ရှိပါက)

- သက်ဆိုင်ရာစာရွက်စာတမ်းများ (ဥပမာ- ဘေလ်များ၊ ဓာတ်ပုံများ၊ အီးမေးလ်များ) ချိတ်ဆက်ထည့်သွင်းပါ။

၄။ ဖြေရှင်းလိုသည့်နည်းလမ်း

- သင်မည်သည့်ဖြေရှင်းမှုကို မျှော်လင့်ပါသနည်း _____

၅။ ကတိပြုချက်

- ဤပုံစံတွင်ဖော်ပြထားသော အချက်အလက်များသည် မှန်ကန်ပြီး ကျွန်ုပ်၏ အကောင်းဆုံးသိရှိထားသည်အတိုင်း ဖြစ်ကြောင်း ကတိပြုပါသည်။
- လက်မှတ် _____
- ရက်စွဲ _____

List of Chemicals requirements per year

Sr. No.	Name	Count	Nos:
	CHEMICALS	Kg	
	Scouring and Bleaching Process	Kg	
1.	Caustic Soda	Kg	2000
2.	Wetting agents	Kg	130
3.	Sequestering Agents	Kg	180
4.	Soaping Agents	Kg	150
5.	Sodium Silicate	Kg	350
6.	Hydrogen Peroxide (H_2O_2)	Kg	2000
7.	Urea	Kg	3000
	Dyeing Process for Cotton		
1.	Reactive Dyes		
	(a) Megawhite Cost PDR	Kg	180
	(b) Megawhite MP	Kg	300
	(c) Manutex M 330	Kg	1000
	(d) Mevatol SR	Kg	145
	(e) Kaoritex RK	Kg	180
	(f) Manutex		125
2.	Salt (NaCl)	Kg	2000
3.	Sodium Carbonate	Kg	550
4.	Wetting Agent	Kg	348
5.	Sequestering Agents	Kg	300
6.	Anti-foaming Agents	Kg	100

Material Safety Data Sheets (MSDS)

Caustic Soda / Sodium Hydroxide

Nature Physiochemical property	**International Number (REACH)**	01-2119457892-27		
	CAS Number	1310-73-2		
	Product Name / Chemical Name	Solid Caustic Soda / Sodium Hydroxide	Appearance and property	Solid, crystalline, highly hygroscopic, flakes, blocks, microgranules, white color,
	Molecular Formula	NaOH	Vapor pressure	1 hpa at 739 ˚C
	Molecular weight	318.4˚C	Solubility	420 g/l, water, at 0˚C in water 1, 100 g/l, water, at 20˚C, 3, 470 g/l, Water, at 100˚C, Soluble, alcohol (Glycerol)
	Melting point	Relative density (water=1) 2.13	Stability	Stable under recommended storage conditions
	Density		Major Utilities	Reagent, acidity regulator, iron exchange resin generator, catalyst, etching agent, cleaning agent, chemical intermediate product
	Hazard class	C		
Hazardous characteristics	Cause severe skin burns and eye damage, May be corrosive to metals			
Toxicity	Fish, various species, LC 50, 96 h, 35-189 mg/l, Crustaceans, Ceriodaphnia sp., EC 50, 48 h, 40.4 mg/l			
Harm to health	**Invasion ways**: inhalation, ingestion, percutaneous absorption. Harm to health: The power is irritative to respiratory tract, eye and skin. Acute toxic if swallowed, with the methemoglobinemia, gastroenteritis, lever and kidney damage or even suffocate.			
Accidental release measures	**For emergency personnel**: prevent further leakage or spillages if it is safe to do so. Keep away from the incompatible materials. Advice for emergency personnel: Evacuate personnel to a safe environment. Keep bystanders away from and upwind of split material/leak. Ventilate the area. Wear suitable protective clothing.			
Prevention measure	Don’t breathe dust/fume/gas/mist/vapors/spray, wear protective gloves/protective cloth/eye protection/face protection			
Emergency response	**If on skin**: remove/take off immediately all contaminated clothing, rinse skin with water/shower **If in eye**: Rinse cautiously with water for several minutes, remove contact lenses, If present and easy to do, continues rinsing. Immediately call doctor.			

First aid measure (description) & (symptom)	**Description** **Eye contact**: Consult with doctor, promptly wash eyes with plenty of water while lifting the eyelids for at least 15 minutes, **Skin contact:** Immediately take off contaminated clothing and shoes, immediately rinse with plenty of water, keep patient warm and take them to a calm environment, consult with doctor, wash any contaminated cloth before. **Inhalation:** Immediately leave the field and go to the area with fresh air, perform oxygen therapy in case of breath difficulty. Place the exposed person in the recovery position, cover them and keep warm, consult with a doctor immediately, Ingestion: Consult a doctor or poisonous information center immediately, take a patient to a hospital immediately, if ingested, rinse mouth with water (only if the patient is conscious), don't induce vomiting, artificial respiration and/or oxygen may be necessary. **Symptoms** **Inhalation**: corrosive to respiratory tracts, symptoms: difficulties in breathing, coughing, chemical pneumonia, pulmonary oedema, Prolonged or repeated exposure: risk of sore throat, nose bleed, chronic bronchitis, **Skin contact**: corrosive, Symptoms; Redness, swelling, burns. **Eye contact**: causes severe burn, small drops in the eye may cause irreversible tissue damage and blindness, may cause permanent irritation, Symptom: Redness, Lacrimation, swelling, burns
Fire-fighting method	**Use extinguishing media** appropriate for local conditions and environment. Water may be ineffective. The product is not flammable. Not flammable. React violently with water. Reaction with metals releases hydrogen. **Advice for firefighter**: Wear a positive pressure mask in case of fire, Use personal protection equipment, Wear a chemical –resistant overall, Cool off containers/tanks with water mist, Prevent firefighting runoff from contaminating surface water and groundwater systems.
Package, storage and transportation	**Precautions for safe handling of the substance or mix**ture: used in a closed system, when diluting, always add the product to the water, use equipment made from compatible materials. Keep away from incompatible materials. To prevent thermal decomposition, do not over heat. Ideally, the product should be transferred using a pump or with the help of gravity. **Condition for safe storage**: store in a original container. Store in a ventilated place. Store in a dry place. Store in a correctly labeled container. Keep container sealed. Avoid dust formation. Keep away from incompatible materials. Packing materials: Stainless steel, polyethylene, Paper and PE.
Environmental standard	**Toxicity**: Fish various species, LC 50, 96 h, 35~189 mg/l, crustaceans, ceriodaphnia sp., EC50, 48 h, 40.4 mg/l. Persistence and degradability: Air, result: neutralization via natural basicity, Water: result: ionization/neutralization, pH, Soil: ionization/neutralization
Disposal Instruction	**Waste treatment methods**: Dilute with plenty of water, Solution with high pH values must be neutralized before discharged. Neutralized with Acid, Comply with local and national regulations.

Hydrogen Peroxide (H_2O_2)

Nature Physiochemical property	**International Number**			
	CAS Number	7722-84-1		
	English Name	Hydrogen peroxide	**Appearance and property**	Clear, colorless liquid
	Molecular Formula	H_2O_2	**Vapor pressure**	23 mm Hg @ 30 °C
	Molecular weight	34	**Solubility Flammability**	Water solubility: completely soluble Solid, Gas, (Not Flammable)
	Specific gravity	1.13		
	Melting point	-33°C	**Stability**	Stable under recommended storage conditions
	Boiling point	108°C		
	Density	1.13 g/cm^3@ 20° C	**Major Utilities**	Reagent, acidity regulator, iron exchange resin generator, catalyst, etching agent, cleaning agent, chemical intermediate product
Hazardous characteristics	Cause serious eye damage, harmful if swallowed, harmful if inhaled, May cause respiratory irritation, Causes skin irritation, May cause or intensify fire; oxidizer.			
Toxicity	Rat: 50% solution, LC 50> 225, mg/kg bw, 35% solution: LD 50 1193 mg/kg bw, 70% solution: LD 50 1026 mg/kg Rabbit: 35% solution, LD 50> 2000 mg/kg bw, 70% solution: LD 50 9200 mg/kg bw,			
Toxicology Symptoms	Vapors, mists, or aerosols of hydrogen peroxide can cause upper airway irritation, inflammation of the nose, hoarseness, shortness of breath, and a sensation of burning or tightness in the chest. Prolonged exposure to concentrated vapor or to dilute solutions can cause irritation and temporary bleaching of skin and hair. Exposure to vapor, mist, or aerosol can cause stinging pain and tearing of eyes.			
Prevention measure	Use only outdoors or in a well-ventilated area, avoid breathing mist/vapors/spray, wear protective gloves/protective clothing/eye protection/face protection, keep away from heat/sparks/open flames/hot surfaces. No smoking, Take any precaution to avoid mixing with combustibles/flammables, Keep store away from clothing/flammable materials/combustibles.			
Emergency response	**If in EYES**: Rinse cautiously with water for several minutes, remove contact lens, if present and easy to do. Continue rinsing. Immediately call poison center or doctor. **If on SKIN**: wash with plenty of water and soap, if skin irritation occurs: get medical advice or attention, Take off all contaminated clothing and wash it before reuse. **If INHALED**: Remove person to fresh air and keep comfortable for breathing, call a poison centre or doctor if you feel unwell. **If SWALLOWED**: Call a poison center or doctor if you feel unwell, rinse mouth, in case of fire, use water for extinction.			
First aid measure	**Description**			

(description) & (symptom)	**Eye contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes, remove contact lenses, if present, after the 5 minutes, then continue rinsing. Seek immediate medical attention/advice. **Skin contact:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for further treatment advice. **Inhalation:** Move to fresh air, If a person is not breathing, contact emergency medical services, then give artificial respiration, preferably mouth-to mouth if possible. Call a poison control center or doctor for further treatment. **Ingestion:** Rinse mouth. Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Never give anything by mouth to an unconscious person. **Most important symptoms and effects**, both acute and delayed: In case of accidental ingestion, necrosis may result from the mucous membrane burns. Oxygen rapid release may cause stomach swelling and hemorrhaging, which may product major, or even fatal, injury to organs if a large amount has been ingested. In case of skin contact, may cause burns, erythema, blisters or even necrosis. Hydrogen peroxide irritates respiratory system and if inhaled, may cause inflammation and pulmonary edema. The effects may not be immediate **Indication of immediate medical attention and special treatment needed if necessary:** Hydrogen peroxide at these concentrations is a strong oxidant. Direct contact with the eye is likely to cause corneal damage especially if not wash immediately. Careful opthalmolgic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion, and the unlikelihood of systematic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is remote possibility, however that a nasogastric or orogastric tube may be required for reduction of severe distension due to gas formation.
Fire-fighting method	**Suitable extinguishing media**: Water. Do not use any other media. **Specific hazards arising from the chemical**: In closed unventilated containers, risk of rupture due to the increased pressure from decomposition. Contact with combustible material may cause fire. **Hazardous combustion products**: On decomposition product releases oxygen which may intensify fire. **Protective equipment and precautions for firefighters:** Use water spray to cool fire exposed surfaces and protect personnel. Move containers from fire area if you can do it without risk. As in any fire, wear self-contained breathing apparatus and full protective gear.
Package, storage and transportation	**Handling:** Store away from clothing /combustible materials, wear personnel protective equipment, Never return unused hydrogen peroxide to the original container. Contamination may cause decomposition and generation of oxygen gas which could result in high pressure and possible container rupture. Empty drum should be triple rinsed with water before discarding. Utensils used for handling hydrogen peroxide should only be made of glass, stainless steel, aluminum or plastic. Pipe and equipment should be passivized before first use. Use only in well ventilated areas. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner. **Storage**: Keep containers in cool areas out of direct sunlight and away from combustibles. Provide mechanical general and /or local exhaust ventilation to prevent release of vapor or mist into work environment. Containers must be vented. Keep store only in original container. Store room or

	container must be made of non-combustible material with impermeable floors. In case of release, spillage should floor to the safe area. Container should be visually inspected on a regular basic to detect any abnormalities (swollen drums, increase in temperature, etc). **Incompatible products**: Copper alloys, galvanized iron, strong reducing agents, heavy metals. Iron. Copper alloys, galvanized iron. Strong reducing agents. Heavy metals. Iron. Copper alloys. Contact with metals, metallic ions, alkalis, reducing agents and organic matter (such as alcohols or terpenes) may produce self-accelerated thermal decomposition.
Environmental Standard	Eco toxicity effects: Hydrogen peroxide is naturally produced by sunlight (between 0.1 and 4 ppb in air and 0.001 to 0.1 mg/L in water). Not expected to have significant environmental effects. Hydrogen peroxide: 96 h LC50, Fish Pimephales promelas, 16.4 mg/L, : 72 h LC50, Fish Leuciscus idus, 35 mg/L, : 48 h EC50, Daphnia pulex, 2.4, mg/L, : 24 h EC50, Daphnia magna, 7.7 mg/L : 72 h EC50, Algae Skeletonema, 1.38 mg/L : 21 d NOEC, Daphnia magna, 0.63 mg/L Persistence and degradability: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in fresh water ranged from 8 hours to 20 days, in air from 10-20 hours, and in soils from minutes to hours depending upon microbiological activity and metal contamination. Bioaccumulation: Material may have some potential to bio accumulated but will likely degrade in most environments before accumulation can occur. Mobility: Will likely be mobile in the environment due to its water solubility but will likely degrade over time. Other adverse effects: Decomposes into oxygen and water. No adverse effects.
Disposal Instruction	Waste disposal methods: Dispose of in accordance with local regulations. Can be disposed as waste water, when in compliance with local regulations. Contaminated Packing: Dispose of in accordance with local regulations. Drums-Empty as thoroughly as possible. Triple rinse drums before disposal. Avoid contamination: impurities accelerate decomposition. Never return product to original container.

Reactive Dye

Nature	International Number			
	CAS No.	17095-24-8		
Physiochemical Property	English Name	Reactive Dye		
	Boiling Point	ND	Appearance and Property	Black Powder, mixes with water
	Molecular weight	991.82	Vapor Pressure (mm Hg) /vapor density	ND / >1
	Melting range	>300°C	Flash Point (PMCC)	>93.3° C
	Density	1.00	Water Solubility	Miscible
	Hazard label		Major Utilities	
Hazardous Characteristic	May be harmful if swallowed, May be harmful in contact with skin, Serious eye damage/eye irritation, May cause allergy or asthma symptoms or breathing difficulties if inhaled.			
Toxicological Information	Acute dermal toxicity: LD50> 2000 mg/kg (rat), Oral Rat: 8377 mg/kg, Irritant effect on skin, non-irritant (rabbit), Irritant effect on eyes: non-irritant effect on eyes. **Skin:** Limited evidence suggests that skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population. **Eye**: No known significant effects or critical hazard. **Respiratory**: Inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Occupational exposure to reactive dyes may result in irritation of the respiratory tract, when inhaled in the dust form.			
Emergency Response to Leakage	**IF ON SKIN**: Wash with plenty of soap and water, Specific treatment, If skin irritation occurs: Get medical advice/attention, Take off contaminated clothing and wash before reuse, Rinse cautiously with water for several minutes remove contacts lenses, if present and easy to do. Continue rinsing. **IF EYE IRRITATION PERSISTS**: Get medical advice/attention, **IF SWALLOWED**: Call a POISON CENTER or doctor/physician if you feel unwell, Rinse mouth. **IF INHALED**: Remove to fresh air and keep at rest in a position comfortable			
Prevention Measure	Wash affected areas thoroughly, wear protective gloves/protective clothing/eye protection/face protection, Do not eat, drink or smoke when using this product,			
First Aid Measure	**EYES:** Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn). Slight abrasive damage, may also result. **SKINS**: The material is not thought to product adverse health, effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting, open cuts, abraded or irritated skin should not be exposed to this material, Entry into the bloodstream, though, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.			

	Examine the skin prior to the use of the material and ensure that any external damage is suitably blocked. **INHALATION:** The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practices require that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. **INGESTION:** This product has not been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. Effect of Exposure: May produce cumulative health effects involving organs or biochemical systems. **IF ON EYES**: 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. **IF ON SKIN:** Wash with plenty of soap and water. If irritation occurs, get medical advice/attention. Take off contaminated clothing and wash before reuse. **IF INHALAED**: Not expected to pose a respiratory hazard under normal conditions of use. If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, immediately administer artificial respiration and seek medical attention. Call a POISON CENTER or doctor/ physician if you feel unwell. **IF INGESTED**: Dilute with water. Do not induce vomiting A PHYSICIAN SHOULD BE SEEN IMMEDIATELY IF THE PRODUCT IS INGESTED. Ingestion may cause gastrointestinal irritation, diarrhea, nausea, and vomiting. MAY BE HARMFUL IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. Keep victim warm and quiet. If victim is conscious give two glasses of water to dilute. Never give anything by mouth to an unconscious person. If victim is unconscious, lay on side and keep breathing passages.
Fire Fighting Measures	**Extinguishing Media:** Water spray or fog, Foam, **Suitable Extinguishing Media**: Water spray or fog, Foam **Specific Hazards Arising from Chemical :** Combustible solid that burns, but propagates flame with difficulty **Hazardous Thermal Decomposition Products:** Carbon monoxide, carbon dioxide, nitrogen oxides, sulfur oxides, and other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes. **Special Protective Actions for Fire Fighter:** Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Water on hot liquid may cause violent frothing and spread the fire. **Special Protective Equipment for Fire-Fighters:** Wear self-contained breathing apparatus operated in a positive-pressure mode when fighting any chemical fire.
Handling and Storage and	**Protective Measures:** Put on appropriate personal equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing dust. Keep in the original container or an approved alternative made from a compatible material, kept tightly

	closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. **Advice on General Occupational Hygiene:** Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. **Recommended Storage Methods:** Polyethylene or polypropylene container. Check all containers are clearly labeled and free from leaks. Store in original containers. **Conditions for Safe Storage Including Any Incompatibilities:** Store in accordance with local regulations. Store in original container protected from direct sunlight in a cool, dry and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Keep away from heat, sparks, excessive moisture and open flames. Empty drums should not be cut with torches, grinders, or other heat-producing devices without first thoroughly cleaning with water and ensuring that no dangerous vapors are present in the empty drum. Avoid strong oxidizers.
Transportation	**Hazard Code:** Xn **Risk Statement**: May cause sensitization by inhalation and skin contact. **Safety Statement:** Do not breathe dust, Avoid contact with skin and eyes, Wear suitable gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately. Show label where possible.
Environmental Standard	Biodegradability: 25~50%, Fish Toxicity: Method: Batch Method, LC50>100 mg/L (48 h, Leuciscus idus), Bacteria Toxicity: EC 50> 1000mg/L, Chemical Oxygen Demand (COD): Approximately 660 mg/g. **Conclusion:** Persistent in the environment.
Disposal Consideration	The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, water ways, drains and sewers.

Wetting Agent

Material Safety Data Sheet

according to Regulation (EC) No. 1907/2006

Kick® Wetting Agent Konzentrat

Version: 4.4
Date of last issue: 23.12.2022
Date of first issue: 24.03.2016

Revision Date:
06.04.2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name	:	Kick® Wetting Agent Konzentrat
UFI	:	S9UE-U0W9-800Q-8407

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture	:	Wetting Agent

1.3 Details of the supplier of the safety data sheet

Company	:	COMPO EXPERT GmbH Krögerweg 10 D-48155 Münster
Telephone	:	+49 (0) 251 29 79 81 – 000
Telefax	:	+49 (0) 251 29 79 81 - 111
E-mail address of person responsible for the SDS	:	info@compo-expert.com

1.4 Emergency telephone number

GBK GmbH - Global Regulatory Compliance - 24h
Telephone: +49 (0) 6132 - 84463

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

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Hazard pictograms	:		
Signal word	:	Danger	
Hazard statements	:	H315	Causes skin irritation.
		H318	Causes serious eye damage.
Precautionary statements	:	P102	Keep out of reach of children.
		Prevention:	
		P270	Do not eat, drink or smoke when using this product.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		P264	Wash skin thoroughly after handling.
		Response:	
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER or doctor/ physician.
		P302 + P352	IF ON SKIN: Wash with plenty of water.

2.3 Other hazards

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Surfactant

Hazardous components

Chemical Name	CAS-No. EC-No. Registration number	Classification	Concentration (% w/w)
docusate sodium	577-11-7 209-406-4 01-2119491296-29	Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1;	>= 50 - <= 58

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Tridecanol, branched, ethoxylated	69011-36-5 500-241-6	Eye Dam. 1; H318 Aquatic Chronic 3; H412	>= 15 - <= 18,5

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Take off immediately all contaminated clothing.

If inhaled : Fresh air.
If unconscious place in recovery position and seek medical advice.
Warmth.
If symptoms persist, seek medical advice.

In case of skin contact : Wash thoroughly with soap and water.
If symptoms persist, seek medical advice.

In case of eye contact : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed : Clean mouth with water and drink afterwards plenty of water.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Carbon dioxide (CO2)
Dry powder
water spray

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : No information available.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective clothing.

6.2 Environmental precautions

Environmental precautions	:	Do not flush into surface water or sanitary sewer system.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Sweep up and shovel into suitable containers for disposal. Dispose contaminated material waste according to chapter 13.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Provide sufficient air exchange and/or exhaust in work rooms.
Advice on protection against fire and explosion	:	No special precautions required.
Hygiene measures	:	General industrial hygiene practice.

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage conditions	:	Keep container tightly closed.
Advice on common storage	:	Not relevant
Storage class (TRGS 510)	:	12, Non Combustible Liquids

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7.3 Specific end use(s)

Specific use(s) : Not relevant

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

The product does not contain any relevant quantities of materials with workingplace related values that require supervising.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
Kick® Wetting Agent Konzentrat				
Remarks:	This information is not available.			

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Kick® Wetting Agent Konzentrat		
Remarks:	This information is not available.	

8.2 Exposure controls

Personal protective equipment

Eye protection : Tightly fitting safety goggles (splash goggles) (EN 166)

Hand protection

Remarks : PVC or other plastic material gloves

Skin and body protection : Wearing of closed work clothing is recommended.

Respiratory protection : Breathing apparatus needed only when aerosol or mist is formed.

Particle filter EN 143 Type P2, medium efficiency, (solid and

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liquid particles of harmful substances).

Protective measures : Avoid contact with skin, eyes and clothing.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	yellowish
Odour	:	product specific
pH	:	ca. 4,5 - 7,5, Concentration: 100 g/l (20 °C)
Solidification / Setting point	:	ca. > -20 °C
boiling point	:	> 85 °C
Flash point	:	> 100 °C
Evaporation rate	:	No data available
Flammability (solid, gas)	:	not highly flammable
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	> 50 hPa (50 °C)
Relative vapour density	:	No data available
Density	:	1,1100 g/cm³
Solubility(ies)		
Water solubility	:	completely miscible

Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	> 200,00 °C
Decomposition temperature	:	No decomposition if stored and applied as directed.
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	Not considered an oxidizing substance

9.2 Other information

Surface tension	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

Conditions to avoid	:	Protect from frost, heat and sunlight.

10.5 Incompatible materials

Materials to avoid	:	None known.

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

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11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat): > 2.000 mg/kg
Acute dermal toxicity	:	LD50 (Rabbit): > 10.000 mg/kg

Skin corrosion/irritation

Product:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritant

Serious eye damage/eye irritation

Product:

Species: Rabbit
Method: OECD Test Guideline 405
Result: irritating

Respiratory or skin sensitisation

Product:

Remarks: This information is not available.

germ cell mutagenicity

Product:

Genotoxicity in vitro	:	Remarks: Contains no hazardous ingredients according to GHS

Carcinogenicity

Product:

Remarks: Contains no ingredient listed as a carcinogen

Reproductive toxicity

Product:

Effects on fertility	:	Remarks: Contains no ingredient listed as toxic to reproduction
Effects on foetal	:	Remarks: Contains no ingredient listed as toxic to

development reproduction

STOT - single exposure

Product:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Product:

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Endocrine disrupting properties

No data available

Further information

Product:

Remarks: The toxicological data has been taken from products of similar composition.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	LC50 (golden orfe): ca. 10 - 100 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna): 10 - 100 mg/l Exposure time: 48 h
Toxicity to bacteria	:	EC10 (Bacteria): 10.000 mg/l Exposure time: 0,5 h Remarks: Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations.

12.2 Persistence and degradability

Product:

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Biodegradability	:	Result: Product is not persistent.
Biochemical Oxygen Demand (BOD)	:	140 mg/g Incubation time: 5 d
Chemical Oxygen Demand (COD)	:	1.500 mg/g
Physico-chemical removability	:	see user defined free text > 80 % Remarks: Readily eliminated from water

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: No data available

12.4 Mobility in soil

Product:

Mobility	:	Remarks: No data available
Distribution among environmental compartments	:	Remarks: No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT)..

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Product:

Adsorbed organic bound halogens (AOX)	:	Remarks: Product does not contain any organic halogens.
Additional ecological information	:	The product has not been tested. The information is derived from the properties of the individual components.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Must not be disposed together with household garbage. Do

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not allow product to reach sewage system.
It must undergo special treatment, e.g. at suitable disposal site, to comply with local regulations.

Contaminated packaging : Offer rinsed packaging material to local recycling facilities.
Observe all local regulations.

SECTION 14: Transport information

14.1 UN number or ID number
Not regulated as a dangerous good

14.2 UN proper shipping name
Not regulated as a dangerous good

14.3 Transport hazard class(es)
Not regulated as a dangerous good

14.4 Packing group
Not regulated as a dangerous good

14.5 Environmental hazards
Not regulated as a dangerous good

14.6 Special precautions for user
Not applicable

14.7 Maritime transport in bulk according to IMO instruments
Remarks : Not relevant

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Water contaminating class (Germany) : WGK 2 water endangering

15.2 Chemical Safety Assessment
A Chemical Safety Assessment is not required for this substance.

SECTION 16: Other information

Full text of H-Statements

H318 : Causes serious eye damage.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

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Acute Tox.	:	Acute toxicity
Aquatic Chronic	:	Chronic aquatic toxicity
Eye Dam.	:	Serious eye damage
Skin Irrit.	:	Skin irritation

(Q)SAR - (Quantitative) Structure Activity Relationship; ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; DIN - Standard of the German Institute for Standardisation; ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISO - International Organisation for Standardization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TRGS - Technical Rule for Hazardous Substances; UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative; DSL - Domestic Substances List (Canada); KECI - Korea Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); AICS - Australian Inventory of Chemical Substances; IECSC - Inventory of Existing Chemical Substances in China; ENCS - Existing and New Chemical Substances (Japan); ISHL - Industrial Safety and Health Law (Japan); PICCS - Philippines Inventory of Chemicals and Chemical Substances; NZIoC - New Zealand Inventory of Chemicals; TCSI - Taiwan Chemical Substance Inventory; CMR - Carcinogen, Mutagen or Reproductive Toxicant; GLP - Good Laboratory Practice

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

DE / EN

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Sodium Bicarbonate

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

Sodium carbonate ≥99,5 %, Ph.Eur., USP, BP, anhydrous

article number: **P028**
Version: **6.1 en**
Replaces version of: 2024-03-02
Version: (6)

date of compilation: 2015-06-03
Revision: 2024-09-18

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance	**Sodium carbonate** ≥99,5 %, Ph.Eur., USP, BP, anhydrous
Article number	P028
Index No (GB CLP)	011-005-00-2
EC number	207-838-8
CAS number	497-19-8
Alternative name(s)	Soda

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for private purposes (household). Food, drink and animal feedingstuffs.

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:	Department Health, Safety and Environment
e-mail (competent person):	**sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
National Poisons Information Service City Hospital	Dudley Rd	B187QH Birming-ham	844 892 0111	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.3	Serious eye damage/eye irritation	2	Eye Irrit. 2	H319

For full text of abbreviations: see SECTION 16

Safety data sheet Safety data sheet
acc. to Regulation (EC) No. 1907/2006 (REACH)

Sodium carbonate ≥99,5 %, Ph.Eur., USP, BP, anhydrous
article number: **P028**

2.2 Label elements

Labelling

Signal word **Warning**

Pictograms

GHS07



Hazard statements

H319 Causes serious eye irritation

Precautionary statements

Precautionary statements - response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 If eye irritation persists: Get medical advice/attention

2.3 Other hazards

Results of PBT and vPvB assessment
According to the results of its assessment, this substance is not a PBT or a vPvB.

Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Sodium carbonate
Molecular formula	Na_2CO_3
Molar mass	106 $^{g}/_{mol}$
CAS No	497-19-8
EC No	207-838-8
Index No (GB CLP)	011-005-00-2

SECTION 4: First aid measures

4.1 Description of first aid measures



General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower.

Following eye contact
Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. In case of eye irritation consult an ophthalmologist.

Following ingestion
Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed
Irritation

4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media
co-ordinate firefighting measures to the fire surroundings!
water, foam, alcohol resistant foam, dry extinguishing powder, ABC-powder

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture
Non-combustible.

Hazardous combustion products
In case of fire may be liberated: Carbon monoxide (CO), Carbon dioxide (CO_2)

5.3 Advice for firefighters
In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel
Avoid contact with skin, eyes and clothes. Do not breathe dust.

6.2 Environmental precautions
Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill
Covering of drains. Take up mechanically.

Advice on how to clean up a spill
Take up mechanically. Control of dust.

Other information relating to spills and releases
Place in appropriate containers for disposal.

6.4 Reference to other sections
Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid dust formation.

Measures to prevent fire as well as aerosol and dust generation
Removal of dust deposits.

Advice on general occupational hygiene
Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities
Store in a dry place.

Incompatible substances or mixtures
Observe hints for combined storage. Incompatible materials: see section 10.

Protect against external exposure, such as
humidity

Consideration of other advice:

Ventilation requirements
Use local and general ventilation.

Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [mg/m³]	STEL [mg/m³]	Ceiling-C [mg/m³]	Notation	Source
GB	dust		WEL	10			i	EH40/2005
GB	dust		WEL	4			r	EH40/2005

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
i	Inhalable fraction
r	Respirable fraction
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection.

Skin protection



- **hand protection**

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

- **type of material**

NBR (Nitrile rubber)

- **material thickness**

>0,11 mm

- **breakthrough times of the glove material**

>480 minutes (permeation: level 6)

- **other protection measures**

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P1 (filters at least 80 % of airborne particles, colour code: White).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid
Form	powder
Colour	white
Odour	odourless

Melting point/freezing point	851 °C (ECHA)
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	not relevant (solid)
Flash point	not applicable
Auto-ignition temperature	not determined
Decomposition temperature	>400 °C (ECHA)
pH (value)	11 – 11,5 (in aqueous solution: 4 $^{g}/_{l}$, 25 °C)
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	212,5 $^{g}/_{l}$ at 20 °C (ECHA)
Partition coefficient	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
Density and/or relative density	
Density	2,532 $^{g}/_{cm^3}$ at 20 °C (ECHA)
Relative vapour density	not relevant (solid)
Bulk density	~1.100 $^{kg}/_{m^3}$
Particle characteristics	No data available.
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics:	There is no additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity
This material is not reactive under normal ambient conditions.

10.2 Chemical stability
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: Alkali metals, Alkaline earth metal, Nitro compound, Sulphuric acid, Strong acid

10.4 Conditions to avoid
Humidity. Keep away from heat. Decompostion takes place from temperatures above: >400 °C.

10.5 Incompatible materials
aluminium, zinc, Light metals

10.6 Hazardous decomposition products
Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS

Acute toxicity
Shall not be classified as acutely toxic.
GHS of the United Nations, annex 4. May be harmful if swallowed or in contact with skin.

Acute toxicity					
Exposure route	**Endpoint**	**Value**	**Species**	**Method**	**Source**
oral	LD50	2.800 $^{mg}/_{kg}$	rat		ECHA
dermal	LD50	>2.000 $^{mg}/_{kg}$	rabbit		ECHA

Skin corrosion/irritation
Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation
Causes serious eye irritation.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity
Shall not be classified as germ cell mutagenic.

Carcinogenicity
Shall not be classified as carcinogenic.

Reproductive toxicity
Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure
Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**
  Data are not available.

- **If in eyes**
  Causes serious eye irritation
- **If inhaled**
  Inhalation of dust may cause irritation of the respiratory system
- **If on skin**
  Frequently or prolonged contact with skin may cause dermal irritation
- **Other information**
  none

11.2 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

11.3 Information on other hazards
There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity
Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)				
Endpoint	**Value**	**Species**	**Source**	**Exposure time**
LC50	300 $^{mg}/_{l}$	fish	ECHA	96 h
EC50	227 $^{mg}/_{l}$	aquatic invertebrates	ECHA	48 h

12.2 Persistence and degradability
Theoretical Oxygen Demand (without nitrification): -0,1132 $^{mg}/_{mg}$
Theoretical Oxygen Demand (with nitrification): -0,1132 $^{mg}/_{mg}$
Theoretical Carbon Dioxide: 0,4152 $^{mg}/_{mg}$

12.3 Bioaccumulative potential
Data are not available.

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Endocrine disrupting properties
Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

12.7 Other adverse effects
Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information
Do not empty into drains.

Waste treatment of containers/packagings
Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

13.2 Relevant provisions relating to waste
The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

Properties of waste which render it hazardous
HP 4 irritant - skin irritation and eye damage

13.3 Remarks
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1	**UN number or ID number**	not subject to transport regulations
14.2	**UN proper shipping name**	not assigned
14.3	**Transport hazard class(es)**	none
14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user
There is no additional information.

14.7 Maritime transport in bulk according to IMO instruments
The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

International Maritime Dangerous Goods Code (IMDG) - Additional information
Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information
Not subject to ICAO-IATA.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant provisions of the European Union (EU)

Seveso Directive

2012/18/EU (Seveso III)			
No	**Dangerous substance/hazard categories**	**Qualifying quantity (tonnes) for the application of lower and upper-tier requirements**	**Notes**
	not assigned		

Deco-Paint Directive

VOC content	0 %
VOC content	0 g/l

Industrial Emissions Directive (IED)

VOC content	0 %
VOC content	0 g/l

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)
not listed

Water Framework Directive (WFD)

List of pollutants (WFD)

Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
Sodium carbonate	Metals and their compounds		a)	

Legend
a) Indicative list of the main pollutants

Regulation on the marketing and use of explosives precursors
not listed

Regulation on drug precursors
not listed

Regulation on substances that deplete the ozone layer (ODS)
not listed

Regulation concerning the export and import of hazardous chemicals (PIC)
not listed

Regulation on persistent organic pollutants (POP)
not listed

National regulations(GB)

List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list
not listed

Restrictions according to GB REACH, Annex 17
not listed

Other information
Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
JP	ISHA-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relev-ant
2.2	Labelling of packages where the contents do not exceed 125 ml: Signal word: Warning		yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.3		Endocrine disrupting properties:	yes

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

Sodium carbonate ≥99,5 %, Ph.Eur., USP, BP, anhydrous

article number: **P028**

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relev-ant
		Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.	
14.8	Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information: Not subject to ADR, RID and ADN.		yes
15.1	Restrictions according to REACH, Annex XVII		yes
15.1		Dangerous substances with restrictions (REACH, Annex XVII): change in the listing (table)	yes
15.1	List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list: Not listed.		yes
15.1	VOC content: 0 % 0 g/l	VOC content: 0 %	yes
15.1		VOC content: 0 g/l	yes
15.1		National regulations(GB)	yes
15.1		List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list: not listed	yes
15.1		Restrictions according to GB REACH, Annex 17: not listed	yes
15.1		National inventories: change in the listing (table)	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
ED	Endocrine disruptor
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GB CLP	The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/720 (as amended)
GB REACH	The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

Sodium carbonate ≥99,5 %, Ph.Eur., USP, BP, anhydrous

article number: **P028**

Abbr.	Descriptions of used abbreviations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H319	Causes serious eye irritation.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

စက်မှုဝန်ထမ်းတောင်းများအသင်း
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သို့

ဦးဆောင်ညွှန်ကြားရေးမှူး
အမှတ်(၃)အကြီးစားစက်မှုလုပ်ငန်း
စက်မှုဝန်ကြီးဌာန။

စာအမှတ်၊အိုင်အိုင်စီ/EMP/တောင်သာ/၂၀၂၅(၀၀၆)
ရက်စွဲ၊၂၀၂၅ ခုနှစ် ဇွန် လ ၅ ရက်

အကြောင်းအရာ။ ။ အမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)၏ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)ပထမအကြိမ်ပြင်ဆင်တင်ပြခြင်းကိစ္စ။

ရည်ညွှန်းချက် ။ ။ (၁) အမှတ်(၃)အကြီးစားစက်မှုလုပ်ငန်း၏ ၄-၂-၂၀၂၅ ရက်စွဲပါ စာအမှတ် ၁၅၀၆ (နပဖ)၂၀၂၅/၅၆၉ (၁၉၂)
(၂) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၃၀-၁-၂၀၂၅ ရက်စွဲပါ စာအမှတ် EIA -1/5/(3rd IRT) (၅၄၄/၂၀၂၅)

ရည်ညွှန်း(၁)(၂)ပါစာအရအမှတ်(၁၀)အထည်စက်ရုံ(တောင်သာ)၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP)ပထမအကြိမ် (First Revised) အား Hard copy (၃)စုံ၊ CD (၃) ချပ် တို့နှင့်အတူ ပြင်ဆင်တင်ပြအပ်ပါသည်။

လေးစားစွာဖြင့်

ဒေါက်တာအောင်ကျော်စိုး
အကြံပေး/ဒါရိုက်တာ
IIC Company Limited

မိတ္တူကို
ရုံးလက်ခံ

အမှတ် (၃) အကြီးစားစက်မှုလုပ်ငန်း၊ အမှတ် (၁၀)အထည်စက်ရုံ (တောင်သာ)မှ စွပ်ကျယ်ထုတ်လုပ်ခြင်း လုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) တွင် ပြင်ဆင်ဖြည့်စွက်ထားရှိသည့်အချက်များ

၅.၆.၂၀၂၅

စဉ်	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာနမှ စိစစ်တွေ့ရှိမှုအပေါ် ပြင်ဆင်ဖြည့်စွက်ရမည့်အချက်များ	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာန၏ စိစစ်တွေ့ရှိမှုအပေါ် ပတ်ဝန်းကျင်ဆိုင်ရာ အတိုင်ပင်ခံကုမ္ပဏီမှ ပြင်ဆင်ဖြည့်စွက်ချက်များ
(က)	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်အခန်းတွင်အောက်ပါအချက်များ ကို ပြည့်စုံရှင်းလင်းစွာဖော်ပြရန်	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်အခန်းတွင် အောက်ပါ အချက်များကို ပြင်ဆင်ဖြည့်စွက်ဖော်ပြထားပါသည်။
၁။	စာမျက်နှာ ၁၀၃ တွင် ကုန်ကြမ်းအနေဖြင့် Grey Yarn အသုံးပြုကြောင်း ဖော်ပြချက်အရ ကုန်ကြမ်းရယူသည့် နေရာဒေသ၊ အသုံးပြုမည့် ပမာဏ (ရက်/လ/နှစ် အလိုက်) နှင့် သိုလျောင်ထားရှိမှုအစီအစဉ်တို့ကို ဖော်ပြရန်၊	ကုန်ကြမ်းအသုံးပြုမှုနှင့်ရယူသည့်နေရာဒေသနှင့်ပတ်သက်၍ အစီရင်ခံစာပါအခန်း (၄)၊ ခေါင်းစဉ် (၄.၁၁)၊ စာမျက်နှာ (၄.၁၅) တွင်ဖော်ပြထားပါသည်။
၂။	အဆိုပြုလုပ်ငန်းစဉ်တွင် Scouring, Bleachng and Dyeing Process တို့ ပါဝင်သဖြင့် ၎င်းတို့၌အသုံးပြုသည့် ဓါတုပစ္စည်း အမျိုးအမည်၊ အသုံးပြုသည့် ပမာဏ (ရက်/လ/နှစ် အလိုက်) နှင့် သိုလှောင်ထားရှိသည့် အစီအစဉ်တို့ကို ဖော်ပြရန်၊	အသုံးပြုသည့် ဓါတုပစ္စည်း အမျိုးအမည်၊ တစ်နှစ်လိုအပ်ချက် ပမာဏ နှင့် သိုလှောင်ထားရှိသည့်အစီအစဉ်တို့ကိုအခန်း(၄)၊ခေါင်းစဉ်(၄.၁၁)၊ စာမျက်နှာ (၄.၁၅) နှင့် နောက်ဆက်တွဲ စာမျက်နှာ (၆၅) တွင်ဖော်ပြထားပါသည်။
၃။	စက်ရုံအတွက် လိုအပ်သောရေကို တောင်သာချောင်းမှ ရယူသုံးစွဲကြောင်းဖော်ပြချက်အရ အဆိုပါချောင်းသည် စက်ရုံမှ မည်မျှအကွာအဝေးတွင် ရှိကြောင်းခန့်မှန်း ဖော်ပြရန်၊	တောင်သာချောင်းသည် စက်ရုံမှ ၀.၅ မိုင်ကွာဝေးကြောင်း အခန်း (၆)၊ အခန်းခွဲ (၆.၄.၁)၊ စာမျက်နှာ (၆.၁၁) တွင် ဖော်ပြထားပါသည်။

၄။	စာမျက်နှာ ၁၁၀၊ အပိုဒ် ၄.၁၉ တွင် စက်ရုံပြင်ပ၌ ဂါလန် ၂၅၀,၀၀၀ ဆံ့ ကွန်ကရစ်မြေထိန်းနံရံပါ ရေဆိုး စုဆောင်းကန် ရှိသော်လည်း သီးသန့် စွန့်ပစ်ရေ သန့်စင်သည့် စနစ်မရှိကြောင်း ဖော်ပြချက်အရ ထုတ်လုပ်မှုလုပ်ငန်းစဉ်မှ ထွက်ရှိသည့် စွန့်ထုတ်အရည် များကို အဆိုပါကန်သို့သာ စွန့်ထုတ်ကြောင်း ယူဆရသဖြင့် မည်သို့သော နည်းလမ်းဖြင့် စွန့်ထုတ်ကြောင်းကို ရှင်းလင်းစွာ ဖော်ပြရန်၊	စက်ရုံမှထွက်ရှိသောရေဆိုးစွန့်ထုတ်ခြင်းနည်းလမ်းအားအခန်း(၄)၊ ခေါင်းစဉ်ခွဲ (၄.၁၈.၁)၊ (၄.၁၈.၂) ပုံ (၄.၁၈-၁)နှင့် ပုံ (၄.၁၈-၂)၊စာမျက်နှာ (၄-၃၂)၊ (၄-၃၃) (၄-၃၄) တွင် ရှင်းလင်းဖော်ပြထားပါသည်။
၅။	စာမျက်နှာ ၁၁၀၊ အပိုဒ် ၄.၁၉ တွင် စက်ရုံမှ ၁ ရက်လျှင် ဂါလန် ၁၀,၀၀၀ ထွက်ရှိသည့် စွန့်ပစ်ရေများကို ရေဆိုးစုဆောင်းကန်သို့ စွန့်ပစ်ကြောင်း ဖော်ပြထားချက်အရ အဆိုပါကန်ရှိ ရေဆိုးများ ပြည့်လျှံလာပါကအနီးနားရှိစိုက်ပျိုးမြေများကို သက်ရောက်နိုင်သဖြင့် မည်သို့ ဆောင်ရွက်ထားကြောင်းကို ဖော်ပြရန်၊	စက်ရုံမှထွက်ရှိသော ရေဆိုးစွန့်ထုတ်ခြင်းနည်းလမ်းအား အခန်း (၄)၊ ခေါင်းစဉ်ခွဲ (၄.၁၈.၁)၊ (၄.၁၈.၂) ပုံ (၄.၁၈-၁)နှင့် ပုံ (၄.၁၈-၂) စာမျက်နှာ (၄-၃၂)၊ (၄-၃၃) (၄-၃၄)၊ တွင် ရှင်းလင်းဖော်ပြထားပါသည်။
၆။	စာမျက်နှာ ၁၁၁၊ ပုံ ၄-၂၀ အရ စက်ရုံ၌ Sludge Dry Pond တည်ဆောက်ထားချက်အရ Sludge ပမာဏ (ခန့်မှန်း) မည်မျှတွင် မည်သို့စီမံစွန့်ပစ်ကြောင်း(သို့)ပြန်လည်အသုံးပြုသည့် အစီအစဉ် ရှိပါက ဖော်ပြရန်၊	အခန်း(၆)၊ခေါင်းစဉ်ခွဲ(၆.၄.၁၁)၊စာမျက်နှာ(၆-၂၄)၊တွင်ရှင်းလင်းဖော်ပြ ထားပါသည်။ Sludge စွန့်ပစ်မည့်နေရာအားအခန်း(၉)၊ ခေါင်းစဉ်ခွဲ (၉.၅.၆)၊ ဧယား(၉.၅.၆.-၁)ပုံ(၉.၅.၆-၁)စာမျက်နှာ(၉-၄၄)၊(၉-၄၅)တွင် ရှင်းလင်းဖော်ပြထားပါသည်။
၇။	စွန့်ပစ်အမှိုက်များကို မြို့နယ်စည်ပင်နှင့် ချိတ်ဆက်စွန့်ပစ်သည့် အကြိမ်ရေကို (တစ်ပတ်/တစ်လ) ဖော်ပြရန်၊	စွန့်ပစ်အမှိုက်များကို မြို့နယ်စည်ပင်မှ သတ်မှတ်စွန့်ပစ်ခွင့်ပေးထားသော နေရာသို့ တစ်ပတ်လျှင် ၂ ကြိမ်စွန့်ပစ်မည်ဖြစ်ကြောင်း အစီရင်ခံစာ၏ အခန်း (၄)၊ ခေါင်းစဉ်ခွဲ (၄.၂၁)၊ စာမျက်နှာ(၄-၄၀) တွင် ဖော်ပြထားပါသည်။
၈။	စာမျက်နှာ ၁၁၂၊ အပြစ်အနာဆာရှိ အထည်များကို ၁၀၀ ကီလိုဘေထုတ်ကဲ့သို့ ထုတ်ပိုး၍ SME လုပ်ငန်းများသို့ ပြန်လည်ရောင်းချကြောင်း ဖော်ပြထားချက်အရ လုပ်ငန်းမှ တစ်နေ့	လစဉ်အပြစ်အနာဆာရှိအထည် (၄၅၀) ကေဂျီထွက်ရှိပါသည်။ အခန်း (၄)၊ ခေါင်းစဉ်ခွဲ(၄.၂၁)၊ဧယား(၄.၂၁-၁) စာမျက်နှာ(၄-၃၇)(၄-၃၈)(၄-၃၉)(၄.၄၀) တွင် ဖော်ပြထားပါသည်။

	(သို့) တစ်လ ထွက်ရှိသည့် အပြစ်အနာဆာရှိ အထည်ပမာဏကို ခန့်မှန်းဖော်ပြရန်၊	
၉။	ဆေးဆိုးလုပ်ငန်းစဉ်အတွက်ဘွိုင်လာအသုံးပြုကြောင်း ဖော်ပြထားချက်အရ ဘွိုင်လာ Blowdown မှ ထွက်ရှိသည့် စွန့်ပစ်ရေပူများကို စွန့်ပစ်ရန် ဆောင်ရွက်ထားရှိသည့် အစီအစဉ်ကို ဖော်ပြရန်၊	ဘွိုင်လာBlowdownမှ ထွက်ရှိသည့် စွန့်ပစ်ရေပူများကို စက်ရုံမြောင်းမှတဆင့် ရေဆိုးသန့်စင်ကန်သို့စွန့်ပစ်ပါသည်။စက်ရုံမှထွက်ရှိသောရေဆိုးစွန့်ထုတ်ခြင်းနှင့်သန့်စင်ခြင်းနည်းလမ်း များနှင့် ပတ်သက်၍ အခန်း (၄)၊ ခေါင်းစဉ်ခွဲ (၄.၁၈)၊ပုံ(၄.၁၈-၁)နှင့်ပုံ(၄.၁၈-၂)၊စာမျက်နှာ(၄-၃၂)တွင်ရှင်းလင်းဖော်ပြထားပါသည်။
၁၀။	စာမျက်နှာ ၈၈၊ အပိုဒ် ၄.၁၀၊ စက်ရုံ၌ အဓိကဌာနကြီး ၆ ခုရှိကြောင်းနှင့် အဆိုပါဌာနများအနက် Quality Control Department ၏ လုပ်ငန်းတာဝန်များကို ဖော်ပြရန်၊	Quality Control Section ၏ လုပ်ငန်းတာဝန်များကို အခန်း (၄)၊ ခေါင်းစဉ်ခွဲ (၄.၁၃.၃)၊ စာမျက်နှာ(၄-၂၁)၊ တွင်လည်းကောင်း၊ ပုံ (၄.၁၃.၃-၂) Garment Manufacturing Process၊ စာမျက်နှာ (၄-၂၃) တွင်အဝါရောင်ခြယ်ပြထားသောအမှတ်များသည် အရည်အသွေးစစ်မှတ်များကို ဖော်ပြ ခြင်းဖြစ်ပါသည်။
(ခ)	ဥပဒေအခန်းတွင် စီမံကိန်းမှ လိုက်နာအသုံးပြုမည့် Guideline ၌ NEQEG ဟုဖော်ပြထားရာ NEQEG ၏ မည်သည့် Guideline အမျိုးအစားကို (General or Specific Guideline) ကိုးကားထားကြောင်းနှင့် WHO Guideline ဟု ဖော်ပြထားခြင်းသည် WHO ၏ လေ (သို့) သောက်သုံးရေ (သို့) စွန့်ပစ်ရေ စသည့် မည်သည့်အရည်အသွေးအပေါ် မူတည်၍ ကိုးကားထားကြောင်းကို တိကျစွာ ဖော်ပြပေးရန်၊	အစီရင်ခံစာ၏ အခန်း (၃)တွင် ကိုးကား လိုက်နာရမည့် သက်ဆိုင်ရာ လမ်းညွှန်ချက်များကို ရှင်းလင်းစွာ ပြင်ဆင်ဖော်ပြထားရှိပါသည်။

(ဂ)	လက်ရှိပတ်ဝန်းကျင်အခြေအနေအခန်းတွင် Dyeing Process တို့မှ ထွက်ရှိသည့်စွန့်ထုတ်ရည်အရည်အသွေးများကို တိုင်းတာဖော်ပြရမည်ဖြစ်သော်လည်း ဖော်ပြထားခြင်းမရှိသဖြင့် ဘာကြောင့် တိုင်းတာဖော်ပြလာခြင်းမရှိသည်ကိုခိုင်လုံသော အကြောင်းပြချက်နှင့် ရှင်းလင်းဖော်ပြရန်၊	စွန့်ထုတ်ရည်အရည်အသွေးအား ဖော်ပြထားရှိခြင်း မရှိသည့် အကြောင်းအရင်းအား အစီရင်ခံစာ၏ အခန်း (၅)၊ ခေါင်းစဉ်ခွဲ (၅.၉)၊ စာမျက်နှာ (၅-၂၅)တွင် ရှင်းလင်းဖော်ပြထားပါသည်။
(ဃ)	အဆိုပြုလုပ်ငန်းစဉ်သည် ခါတုပစ္စည်းများဖြင့် ပြုလုပ်ထားသည့် Yarn ကိုအသုံးပြု၍ အထည်ထုတ်လုပ်ခြင်းဖြစ်ရာ အဆိုပါလုပ်ငန်းစဉ်အတွက် NEQEG ၏ အခန်းခွဲ ၂.၃.၂.၁၊ ထုတ်လွှတ်အခိုးအငွေ့အဆင့်သတ်မှတ်ချက်များနှင့် နှိုင်းယှဉ်ရမည်ဖြစ်သော်လည်း စာမျက်နှာ ၁၄၃၊ အပိုဒ် ၅.၇၊ လေအရည်အသွေးနှင့် ပတ်သက်၍ General NEQEG ဖြင့် ဘာကြောင့် နှိုင်းယှဉ်ဖော်ပြထားခြင်းကို ခိုင်လုံသော အကြောင်းပြချက်နှင့် ရှင်းလင်းဖော်ပြပေးပါ။ ထို့ပြင် ဇယား ၅.၂၀၊ General NEQEG တွင် မပါသော ပါရာမီတာများ ဖော်ပြထားသဖြင့် အဆိုပါ ပါရာမီတာများအတွက် လုပ်ငန်းမှ အမှတ်တကယ် လိုက်နာနိုင်သည့် နိုင်ငံတကာ လမ်းညွှန်ချက်တစ်ခုခုဖြင့် နှိုင်းယှဉ်ဖော်ပြရန်၊	အဆိုပြုလုပ်ငန်းစဉ်သည်ဝါချည်များဖြင့်စက်ထိုးအထည်ထုတ်လုပ်ခြင်းဖြစ်ရာ စက်ရုံမှ ထုတ်လွှတ်အခိုးအငွေ့အရည်အသွေးအား အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု)လမ်းညွှန်ချက်များ(၂.၃.၂.၁)ပါရာမီတာများအတိုင်း အခန်း (၅)၊ ခေါင်းစဉ် (၅.၇.၁)၊ စာမျက်နှာ (၅-၂၂) တွင် နှိုင်းယှဉ်ဖော်ပြထားပါသည်။
(င)	စာမျက်နှာ ၁၅၁၊ ဇယား ၅.၂၃၊ ဆူညံသံရလဒ်တို့နှင့် နှိုင်းယှဉ်မည့် လမ်းညွှန်ချက်နှင့် လမ်းညွှန်တန်ဖိုးတို့ကို ဖော်ပြရန်နှင့် General NEQEG အခန်း ၁.၃၊ ဆူညံသံ လမ်းညွှန်ချက်ဖြင့် နှိုင်းယှဉ်ပါက	ဆူညံသံရလဒ်တို့နှင့် နှိုင်းယှဉ်မည့် လမ်းညွှန်ချက်နှင့် လမ်းညွှန်တန်ဖိုးတို့ကို NEQEG အခန်း ၁.၃၊ ဆူညံသံ လမ်းညွှန်ချက် အရ Receptor မှာ Industrial, Commercial ဖြစ်ပါသည်။ အခန်း (၃)၊ ခေါင်းစဉ်ခွဲ (၃.၉.၄)၊ ဇယား (၃.၉.၄-၁)စာမျက်နှာ(၃-၅၉) တွင် ဖော်ပြထားပါသည်။

	မည်သည့် Recepter ဖြင့် နှိုင်းယှဉ်ထားကြောင်း ရှင်းလင်းစွာ ဖော်ပြရန်၊	
(စ)	စာမျက်နှာ ၁၈၄၊ ဇယား ၆.၁၂၊ လုပ်ငန်းလည်ပတ်စဉ်ကာလ လေအရည်အသွေး သက်ရောက်မှုအပေါ် လျှော့ချမည့် နည်းလမ်း၌ လမ်းများတွင် ရေဖြန်းကြောင်း ဖော်ပြထားရာ တစ်နေ့ (သို့) တစ်ပတ် ရေဖြန်းသည့်အကြိမ်ရေကို ဖော်ပြရန်၊	အခန်း (၆)၊ ခေါင်းစဉ်ခွဲ (၆.၄.၃)၊ ဇယား (၆.၄.၃-၂)စာမျက်နှာ (၆-၁၂) တွင် ဖော်ပြထားပါသည်။
(ဆ)	စာမျက်နှာ ၁၉၈၊ အပိုဒ် ၆.၁၅၊ Waste Disposal တွင် Sludge များကို မြေဖို့ရာ၌ အသုံးပြုကြောင်း ဖော်ပြထားချက်အရ တစ်ပတ် (သို့) တစ်လ မြေဖို့သည့် အကြိမ်ရေနှင့် စက်ရုံမှ အဆိုပါ Sludge များကို မည်သည့်နေရာတို့တွင် ဆောင်ရွက်ကြောင်း ဖော်ပြရန်၊	Sludge များကို မြေဖို့ရာ၌ အသုံးပြုမည်ဖြစ်ကြောင်း စွန့်ပစ်မည့်နေရာအား အခန်း(၉)၊ခေါင်းစဉ်ခွဲ(၉.၆.၅)၊ပုံ(၉.၅.၆-၁)စာမျက်နှာ(၉-၄၅)တွင် ဖော်ပြထားပါ သည်။ စက်ရုံစတင်လည်ပတ်သည်မှယနေ့ထိရေဆိုးထွက်ရှိမှုနည်းပါးသောကြောင့် Sludge ထွက်ရှိမှုမရှိခဲ့ပါ။
(ဇ)	စာမျက်နှာ-၂၄၂၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ဇယားပုံစံ (ဇယား-၉.၂) အစား EIA Procedure အပိုဒ် ၆၃ အပိုဒ်ခွဲငယ် (၆)ပါအတိုင်း Box Type (သို့) Paragraph Type ပုံစံဖြင့်ဖြစ်စေ ပြင်ဆင်ဖော်ပြရန်၊ (နမူနာပုံစံအား နောက်ဆက်တွဲဖြင့်)	အခန်း (၉) တွင်ဖော်ပြထားရှိပါသည်။
(ဈ)	စာမျက်နှာ-၂၄၇၊ လုပ်ငန်းလည်ပတ်စဉ်ကာလ ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုဇယားတွင်ရေအရည်အသွေးစီမံခန့်ခွဲမှု(တောင်သာချောင်းရေ၊သောက်သုံးရေ၊စွန့်ထုတ်အရည်)နှင့် ပတ်သက်၍ဖော်ပြထားခြင်း မရှိသဖြင့် ဖော်ပြရန်၊	လုပ်ငန်းလည်ပတ်စဉ်ကာလ ပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှု ဇယားတွင် ရေအရည်အသွေးစီမံခန့်ခွဲမှုအကြောင်းအားအခန်း(၆)၊ခေါင်းစဉ်ခွဲ(၆.၄.၁)၊(၆.၄.၂) စာမျက်နှာ(၆-၁၁)(၆-၂)တွင်ဖော်ပြထားပါသည်။စွန့်ထုတ်အရည်နှင့်ပတ်သက်၍စမ်းသပ်စစ်ဆေးမှုမပြုလုပ်နိုင်ခဲ့သဖြင့်ဖော်ပြနိုင်ခြင်းမရှိပါ။ စွန့်ထုတ်ရည်အရည်အသွေးအားဖော်ပြထားရှိခြင်းမရှိသည့်အကြောင်းအရင်းအားအစီရင်ခံစာ၏အခန်း(၅)၊ခေါင်းစဉ်ခွဲ(၅.၉)၊စာမျက်နှာ(၅-၂၅)တွင် ရှင်းလင်းဖော်ပြထားပါသည်။

(ည)	စာမျက်နှာ ၂၆ (မြန်မာဘာသာအကျဉ်းချုပ်အစီရင်ခံစာ)နှင့် ၂၅၇ (Production Phase) စောင့်ကြပ်ကြည့်ရှုမည့်ဇယားတွင် တိုင်းတာမည့် ကြိမ်နှုန်းတို့သည် ကိုက်ညီမှုမရှိသဖြင့် ပြန်လည်ဆန်းစစ်ပြီး စက်ရုံပိုင်ရှင်နှင့် ညှိနှိုင်း၍ စောင့်ကြည့်မည့် ကြိမ်နှုန်းကို ဖော်ပြရာတွင် ၁ နှစ်ကိုအခြခံ၍ ၂ ကြိမ် (သို့) ၃ ကြိမ် စသည်ဖြင့် ပြင်ဆင်ဖော်ပြရန်၊	စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ် ဇယားတွင် အကြိမ်အရေအတွက်၊ နေရာ၊ တာဝန်ရှိအဖွဲ့အစည်းစသည်တို့အား အခန်း(၁၀)၊ခေါင်းစဉ်ခွဲ(၁၀.၂)၊ ဇယား (၁၀.၂-၁)၊စာမျက်နှာ(၁၀-၄)မှ(၁၀-၁၁)တွင်ပြန်လည်စိစစ်ပြင်ဆင်၍ ဖော်ပြ ထားပါသည်။
(ဋ)	စာမျက်နှာ ၂၅၇ (Production Phase)၊ စောင့်ကြည့်မည့်တည်နေရာများကို One/Two Point ဟု ဖော်ပြမည့်အစား လုပ်ငန်းအကြောင်းအရာကို (ဥပမာ-ဆေးဆိုးသည့်လုပ်ငန်းနေရာ၊ ဘွိုင်လာအနီး) တိကျစွာ ဖော်ပြရန်၊	စောင့်ကြည့်မည့်တည်နေရာများကို အခန်း(၁၀)၊ခေါင်းစဉ်ခွဲ(၁၀.၂)၊ ဇယား (၁၀.၂-၁)၊စာမျက်နှာ(၁၀-၄)မှ(၁၀-၁၁)တွင်ပြန်လည်စိစစ်ပြင်ဆင်၍ ဖော်ပြ ထားပါသည်။
(ဌ)	စာမျက်နှာ ၂၅၇ (Production Phase)၊ စောင့်ကြည့်ရမည့် ရေအရည်အသွေးသည် တောင်သာချောင်းရေ (သို့) လုပ်ငန်းစဉ်မှ စွန့်ထုတ်ရည် (သို့) သောက်သုံးရေအရည်အသွေး စသည့် မည်သည့်အရည်အသွေးကို စောင့်ကြည့်မည်ဖြစ်ကြောင်း တိကျစွာ ဖော်ပြရန်၊	တောင်သာချောင်းအနီးရေတိမ်တွင်းရေနှင့် စက်ရုံမှထွက်ရှိသော ရေဆိုးများ အား စောင့်ကြည့်မည် ဖြစ်ကြောင်း အခန်း(၁၀)၊ ခေါင်းစဉ်ခွဲ (၁၀.၂)၊ ဇယား (၁၀.၂-၁)စာမျက်နှာ(၁၀-၅)(၁၀-၇) တွင် စိစစ်၍ တိကျစွာဖော်ပြထားပါသည်။
(ဍ)	စာမျက်နှာ ၂၅၇ (Production Phase)၊ စောင့်ကြပ်ကြည့်ရှုခြင်း အစီအစဉ်တွင်လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ် ကင်းရှင်းရေး၊ စွန့်ပစ်အစိုင်အခဲ၊ မြေအရည်အသွေး၊ ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းတို့နှင့် ပတ်သက်၍ စောင့်ကြပ်ကြည့်ရှုမည့် နေရာ၊ အကြိမ်ရေ၊ လျာထားရန်ပုံငွေနှင့် တာဝန်ယူဆောင်ရွက်သည့် အဖွဲ့အစည်းတို့ ပါဝင်သည့် အစီအစဉ်ကို ဖော်ပြရန်၊	အခန်း(၁၀)၊ ခေါင်းစဉ်ခွဲ (၁၀.၂)၊ ဇယား (၁၀.၂-၁)၊စာမျက်နှာ(၁၀-၆)၊(၁၀-၇) တွင်ပြန်လည်စိစစ်ပြင်ဆင်၍ ဖော်ပြထားပါသည်။

<table>
<tr><td>(ဃ)</td><td>စီမံကိန်းလုပ်ငန်းဆောင်ရွက်မှုကြောင့် မကျေနပ်ချက်များရှိပါက တိုင်ကြားနိုင်သည့် နေရာများ စီစဉ်ဆောင်ရွက်ထားမှုကို ဖော်ပြရန်၊</td><td>စီမံကိန်းလုပ်ငန်းဆောင်ရွက်မှုကြောင့်မကျေနပ်ချက်များရှိပါက တိုင်ကြားနိုင်သည့် နေရာအား စီစဉ်ဆောင်ရွက်ထားရှိကြောင်း အခန်း(၉)၊ ခေါင်းစဉ်ခွဲ (၉.၁၁)၊ စာမျက်နှာ (၉-၅၉) (၉-၆၀)တွင် ဖော်ပြထားရှိပါသည်။</td></tr>
<tr><td>(ဏ)</td><td>EIA Procedure အပိုဒ် ၁၀၈ အရ စီမံကိန်းအဆိုပြုသူသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်၏ဖေယားပါအတိုင်း စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာကို ဝန်ကြီးဌာနသို့ ၆ လ ၁ ကြိမ် သို့မဟုတ် ဝန်ကြီးဌာနက သတ်မှတ်သည့် အတိုင်း တင်ပြမည် ဖြစ်ကြောင်း ထည့်သွင်း ဖော်ပြရန်၊</td><td>EIA Procedure အပိုဒ် ၁၀၈ အရ စီမံကိန်းအဆိုပြုသူသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်၏ ဖေယားပါအတိုင်း စောင့်ကြပ်ကြည့်ရှုမှု အစီရင်ခံစာကို ဝန်ကြီးဌာနသို့ ၆ လ ၁ ကြိမ် သို့မဟုတ် ဝန်ကြီးဌာနက သတ်မှတ်သည့် အတိုင်း တင်ပြမည် ဖြစ်ကြောင်း အခန်း (၁၀) ၊ ခေါင်းစဉ် (၁၀.၃) ၊ စာမျက်နှာ (၁၀-၁၁) တွင် ဖော်ပြထားပါသည်။</td></tr>
<tr><td>(တ)</td><td>အစီရင်ခံစာပါအခန်းအလိုက်ပတ်ဝန်းကျင်ထိခိုက်မှုများ လျော့ပါးစေရေးဆောင်ရွက်မည့်လုပ်ငန်းစဉ်များကိုအကျဉ်းချုပ်၍ အောက်ပါကတိကဝတ်ဖေယားပုံစံဖြင့် ဖော်ပြရန်၊
<table>
<tr><th>အမှတ်စဉ်</th><th>ကတိကဝတ် အတိုချုပ်အမည်</th><th>ကတိကဝတ်အား ရှင်းလင်းဖော်ပြချက်</th><th>အစီရင်ခံစာပါ ရည်ညွှန်းချက် (အခန်း)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table></td><td>ကတိကဝတ်များအားသက်ဆိုင်ရာအခန်းအလိုက်ဖေယားများဖြင့် ဖော်ပြထားရှိပါသည်။</td></tr>
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