INITIAL ENVIRONMENTAL EXAMINATION (IEE) REPORT ON

YOKE PYO
TRADITIONAL MEDICINE PRODUCTION

Conducted by

SEIN SHWE HEIN CO.LTD. MONYWA

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Project Manager:	Hla Myo Aung Khant Myat Kaung
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REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENTALCONSERVATION

ENVIRONMENTAL CONSERVATION DEPARTMENT

SUBMISSION FORM OF
INITIAL ENVIRONMENTAL EXAMINATION REPORT AND
ENVIRONMENTAL MANAGEMENT PLAN

This is the official submission form of an Initial Environmental Examination (IEE) Report together with an Environmental Management Plan (EMP) under *Environmental Impact Assessment Procedure Notification No.616/2015*. This form shall be completed in its entirety and submitted to the Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation, along with all required IEE and EMP Report.

Project Proponent Information

Proponent Name:	**Yoke Pyo Co., Ltd**	Company Registration Number by DICA (if any):	
Contact name of Proponent:	Kyaw Thet Naing		
Proponent's address for correspondence:	No. (3/108), Yan Gyi Aung Street, No (3) Quarter, Shwebo, Sagaing Region, Myanmar		
Telephone (fixed/mobile):	9575-21252, 9575-21646	Email address: yokepyo.enterprise@gmail.com	

Project Information

Project Title	Yoke Pyo Traditional Medicine Production
Project Location (Address)	

Report type

☐ New report	☐ Revised report	Date of submission (dd/06/2022)

Check list of necessary contents for IEE report

The EIA Report shall contain the following information (see also Article 63 of EIA Procedure)

- ☐ a) Executive Summary
- ☐ b) Introduction
- ☐ c) Policy, Legal and Institutional Framework
- ☐ d) Description of the Project and Alternatives Selection
- ☐ e) Description of the Surrounding Environment
- ☐ f) Impact and Risk Assessment and Mitigation Measures
- ☐ g) Cumulative Impact Assessment (If applicable)
- ☐ h) Environmental Management Plan
- ☐ i) Public Consultation and Disclosure
- ☐ j) Conclusion and recommendations

Check list of necessary contents for EMP

The EMP, prepared as an all-inclusive or a standalone document, shall contain the following information (see also Article 2s) to t), and Article 63 – 8.0 of EIA Procedure No.616/2015)

- ☐ a) Executive Summary (if separate volume)
- ☐ b) Project Description (if separate volume)
- ☐ c) Health Policies and Commitments, legal requirements and institutional arrangements (if separate volume)
- ☐ d) Summary of impacts and mitigation measures (if separate volume)
- ☐ e) Overall budget for implementation on the EMP
- ☐ f) Management and Monitoring Sub-Plans for each identified impact
- ☐ g) Contents of each sub-plan

Proposed measure for information disclosure of the report

The EIA report shall be disclosed to civil society not later than 15 days after submission (in accordance with Article 65 of EIA Procedure Notification No.616/2015)			
Duration/date of disclosure	Methodology (Public meeting, WEB, newspaper and so on)	Accessible place (Address, URL of web site, and so on)	Type of documents to be disclosed
17.2.2020	Public Survey (Focus Group Discussion, Interview, Questionnaires)	**Yoke Pyo Co., Ltd**	Project information, Screening and Scoping Results
18.2.2020	Public meeting Township and village level Public Consultation	**Yoke Pyo Co., Ltd**	Impact Identification and Mitigation Measures EMP Draft
	Yoke Pyo Website	www.yokepyo.com	IEE Report EMP Report

Signature (Representative of the project proponent)

I, the undersigned Proponent (or representative, there of), hereby state that the information provided in/with the application and the report ensure:
a) the accuracy and completeness of the IEE and the EMP report;
b) that the IEE and the EMP report have been prepared in strict compliance with applicable laws including EIA Procedure Notification No. 616/2015 and with the TOR for the EIA; and
c) that the Project will at all times comply fully with the commitments, mitigation measures, and plans in the IEE and EMP Report.

Signature:		Date of submission:	(dd/mm/yyyy)
Name:			

FOR OFFICE USE ONLY

Date received: Project Identification Number:

The proponent submitted the reports with the forms of:

☐ Paper copy ☐ Digital copy

Recorded by:

Additional comments, notes or recommendations (attached if necessary):

LETTER OF ENDORSEMENT BY THE PROJECT PROPONENT

This Initial Environmental Examination (IEE) Report for Yoke Pyo Traditional Medicine Production Factory was prepared by Sein Shwe Hein Company Limited and Smart Environs Company Limited on behalf of Yoke Pyo Company Limited. I hereby issue my letter of endorsement to confirm:

(a) the accuracy and completeness of the IEE;

(b) that the EIA has been prepared in strict compliance with applicable laws including the EIA Procedure and with the ToR for the IEE; and

(c) that the Project will at all times comply fully with the commitments, mitigation measures, and plans in the IEE Report.

Signed

Name : …….

Position : …….

Organization : …….

LETTER OF ENDORSEMENT BY THE THIRD PARTY

This Initial Environmental Examination Report has been done with resonable skills, care and diligence in accordance with the stipulations of Environmental Conservation Law 2012, Environmental Conservation Rules (2014) and EIA Procedures (2015). I hearby signed this report to certify that all the information in it are true and convincing to the best of our knowledge.

Signed

Name : U Khant Myat Kaung

Position : Managing Director

Organization : Smart Environs Company Limited

စီမံကိန်းကတိကဝတ်များ (List of Commitments)

ရုပ်ပျိုတိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးကုမ္ပဏီလီမိတက်သည် လုပ်ငန်း ဆောင်ရွက်ချိန်၌ (List of Commitement) ဇယားပါ ကတိကဝတ်များ၊ ပတ်ဝန်း ကျင် စီမံခန့်ခွဲမှုအစီအစဉ်ပါ ထိခိုက်မှုလျော့ချရေး အစီအစဉ်များ၊ ပတ်ဝန်းကျင် ထိန်းသိမ်း ရေးဥပဒေ၊ နည်းဥပဒေများ၊ နိုင်ငံတကာ သဘောတူညီချက်များကိုလိုက်နာ၍ အ ကောင် အထည်ဖော် ဆောင်ရွက်သွားမည်ဖြစ် ကြောင်း၊ ဝန်ခံကတိ ပြုပါသည်။

စဉ်	ကတိကဝတ်၏ အတိုချုပ်အမည်	ကတိကဝတ်အား ရှင်းလင်းဖော်ပြချက်	အစီရင်ခံစာပါ ရည်ညွှန်းချက် (အခန်း)
၁။	မူဝါဒ၊ ဥပေဒနှင့် မူဘောင်များ	လုပ်ငန်းများ ဆောင်ရွက်ချိန် တွင် ဥပဒေ၊ နည်းဥပဒေ များ၊ လုပ် ထုံး လုပ်နည်းများ၊ စံချိန်စံညွှန်းများ နှင့် နိုင်ငံတကာစည်းကမ်းချက် များကို လိုက်နာဆောင်ရွက် သွားပါမည်။	အခန်း (၂)၊
၂။	ထိခိုက်နိုင်မှုနှင့် လျော့ပါးစေရေး ဆောင်ရွက်မည့် အစီအစဉ်များ	တိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေး လုပ်ငန်းများ ဆောင်ရွက်ချိန် တွင် ပတ်ဝန်းကျင် ထိခိုက်မှုများ လျော့ ပါးစေရေး အစီအစဉ်(Mitigation Measures) များ၊ ပတ်ဝန်း ကျင် စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ပါ လျော့ ပါးစေ ရေးနည်းလမ်းများအတိုင်း လိုက် နာအကောင် အထည်ဖော် ဆောင် ရွက်သွားမည်ဖြစ်ပါသည်။	အခန်း (၅)၊ Impact Assessment Ranking Table တစ်ခုစီအောက် တွင် ဖော်ပြထား သော Mitigation Measures များ၊ (၅-၃၊ ၅-၄၊ ၅-၅၊ ၅-၆၊ ၅-၇) အခန်း (၆)
၃။	ဘေးအန္တရာယ် ကာကွယ်ရေး အစီအစဉ်များ	လုပ်ငန်းခွင်ကျွမ်းကျင်မှုရှိစေရန် လေ့ကျင့် သင်တန်းပေးမည့် အစီ အစဉ်များ၊ အရေးပေါ်အန္တရာယ် ကျရောက်ပါက ဆောင် ရွက် မည့် အစီအစဉ်များကို အကောင် အထည် ဖော် ဆောင်ရွက်သွားပါမည်။	အခန်း (၆) ၆-၉၊ ၆-၁၂။

စဉ်	ကတိကဝတ်၏ အတိုချုပ်အမည်	ကတိကဝတ်အား ရှင်းလင်းဖော်ပြချက်	အစီရင်ခံစာပါ ရည်ညွှန်းချက် (အခန်း)
၄။	စောင့်ကြပ်ကြည့်ရှု ခြင်းနှင့် ရန်ပုံငွေ လျာထားချက်	လုပ်ငန်းဆောင်ရွက်ခြင်းမှ ပတ်ဝန်း ကျင် အပေါ် ထိ ခိုက်မှု များ နှင့် ထွက် ရှိလာမည့် စွန့်ပစ်ပစ္စည်း များအပေါ် စောင့်ကြပ်ကြည့်ရှု ရန် အဖွဲ့ ဖွဲ့စည်း ၍ ရန်ပုံငွေ ကျပ် (၅,၀၀၀,၀၀၀) ထားရှိ၍ စောင့် ကြပ်ကြည့်ရှု သွား မည်ဖြစ်ပါသည်။	အခန်း (၆) (၆.၆)
၅။	အဖွဲ့အစည်းနှင့် ရန်ပုံငွေ လျာထား ချက်	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို အကောင်အထည်ဖော်မည့် အဖွဲ့ အစည်း ဖွဲ့စည်း၍ အကောင်အ ထည် ဖော် ဆောင် ရွက် နိုင်ရန် ရန်ပုံငွေ ကျပ် (၅,၀၀၀,၀၀၀) ထား ရှိ ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။	အခန်း (၆) (၆.၇)
၆။	ဒေသဖွံ့ဖြိုးရေး အစီအစဉ် (CSR)	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပါ ဒေသခံပြည်သူများ ၏ လူမှုစီးပွား ဆိုင်ရာ ဖွံ့ဖြိုးရေးလုပ်ငန်းများ အ တွက် ရန်ပုံငွေ (၁၀,၀၀၀,၀၀၀) ထား ရှိဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။	အခန်း (၆) (၆.၈)
၇။	လုပ်ငန်းပိတ်သိမ်း မည့် အစီအစဉ်	လုပ်ငန်းပိတ်သိမ်းချိန်တွင် ကြွင်း/ မြောင်း များကို မြေဖို့၍ ဒေသနှင့် ကိုက်ညီသည့် အပင် များစိုက် ပျိုး ခြင်း၊ အ ဆောက်အဦးများ အား စနစ်တကျ ဖယ်ရှား ခြင်း၊ ရေအရည် အသွေး၊ မြေအရည်အသွေး များ ကို စစ်ဆေးစမ်းသပ်၍ ပြန်လည်ပြုပြင် ရန်အတွက် ရန်ပုံငွေ ကျပ် (၅,၀၀၀,၀၀၀) ထားရှိဆောင်ရွက် သွားပါမည်။	အခန်း (၆) (၆.၆)

မန်နေဂျင်းဒါရိုက်တာ
ရုပ်ပျိုတိုင်းရင်းဆေး ကုမ္ပဏီလီမိတက်

အနှစ်ချုပ်အစီအရင်ခံစာ

၁-၁။ နိဒါန်း

ရုပ်ပျိုတိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးလုပ်ငန်းကို ၁၉၇၃ခုနှစ်တွင် တိုင်ရင်းဆေးသမားတော်ကြီး ဦးချိန်မှ စတင် တည်ထောင်ခဲ့ ပါသည်။ ယခုအချိန်တွင် GMP စနစ်နှင့်အညီ ရွှေဘို စက်မှုဇုန်ဧရိယာကွင်းအမှတ် (C-5,6,7,8) ၊ ရွှေဘိုမြို့နယ်၊ စစ်ကိုင်းတိုင်းဒေသကြီး ရှိ ၄.၉၆၇ ဧက ကျယ်ဝန်းသောမြေဧရိယာပေါ်တွင် တိုင်းရင်းဆေး ကဏ္ဍ ဖွံ့ဖြိုး တိုးတက် စေရေး၊ တိုင်းရင်းဆေးအပေါ်သုံးစွဲသူများ ယုံကြည်စိတ်ချစေရေးနှင့် အစွမ်း ထက်မြက်၍ အရည်အသွေး စိတ်ချရ သော ဆေးဝါးများကို ထုတ်လုပ်နိုင်ရေးအတွက် ခေတ်မှီကိရိယာများ၊ ဓါတ်ခွဲခန်းများဖြင့် အများပြည်သူ ကျန်းမာရေး စောင့်ရှောက်မှုအတွက် GMP စနစ်နှင့်အညီ အစဉ်ဆက်မပြတ် ကြိုးစားဆောင်ရွက် လိုသော ရည်ရွယ် ချက်ဖြင့် တိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးစက်ရုံ အသစ် တည်ဆောက်လိုခြင်းဖြစ်ပါသည်။

၁-၂။ စီမံကိန်းအဆိုပြုသူ

ရုပ်ပျိုတိုင်းရင်းဆေးဝါး ထုတ်လုပ်ရေးစီမံကိန်းကို ရုပ်ပျိုတိုင်းရင်းဆေး ကုမ္ပဏီက အဆိုပြုခြင်းဖြစ်ပြီး ၎င်း၏ အချက်အလက်အကျဉ်းချုပ်မှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။

စဉ်	အကြောင်းအရာ	အသေးစိတ်
၁	ကုမ္ပဏီ အမည်	ရုပ်ပျိုကုမ္ပဏီ လီမိတက်
၂	စီမံကိန်းတည်နေရာ	C-5,6,7,8, ရုပ်ပျိုလမ်း၊ ရွှေဘို စက်မှုဇုန်၊ ရွှေဘိုမြို့နယ်၊ စစ်ကိုင်းတိုင်းဒေသကြီး
၃	ကုမ္ပဏီ လိပ်စာ	C-5,6,7,8 ရုပ်ပျိုလမ်း၊ ရွှေဘို စက်မှုဇုန်၊ ရွှေဘိုမြို့နယ်၊ စစ်ကိုင်းတိုင်းဒေသကြီး
၄	စီမံကိန်းပိုင်ရှင်	ဦးကျော်သက်နိုင်
၅	ကုမ္ပဏီ မှတ်ပုံတင်အမှတ်	102159519(001)
၆	စီမံကိန်းစတင်သည့် ရက်စွဲ	၂၀၁၂
၇	တည်ဆောက်ရေးကာလ	၅ နှစ်
၈	လုပ်ငန်းအမျိုးအစား	P.P.P
၉	စီမံကိန်း ဧရိယာ	၄.၉၆၇ ဧက

၁-၃။ ဥပဒေ မူဝါဒနှင့် ဖွဲ့စည်းပုံမူဘောင်

ကနဦး ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း လုပ်ငန်းများ ဆောင်ရွက်ရာတွင် အောက်ဖော်ပြပါ ပြဋ္ဌာန်းချက်များ၊ လမ်းညွှန်ချက်များနှင့် အပြည်ပြည်ဆိုင်ရာ လမ်းညွှန်ချက်များအား ကိုးကားလုပ်ဆောင်ခဲ့ပြီး ရုပ်ပျိုကုမ္ပဏီ လီမိတတ် မှ ထိုဥပဒေပြဋ္ဌာန်းချက်များကို လိုက်နာဆောင်ရွက်ရမည် ဖြစ်ပါသည်။

(၁) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဥပဒေ (၂၀၁၂)၊ ပုဒ်မ ၇ (ဏ)၊ ၁၄၊၁၅၊ ၂၄၊ ၂၉)

(၂) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ (၂၀၁၄) (နည်း ၆၉)

(၃) ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ် ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းများ၊ ၂၀၁၅ (အပိုဒ် ၁၀၂ မှ ၁၁၀၊ ၁၁၃၊ ၁၁၅၊ ၁၁၇)

(၄) အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅)

(၅) တိုင်းရင်းသားလူမျိုးများ အခွင့်ရေးကာကွယ် စောင့်ရှောက်ရေးဥပဒေ၊(၂၀၁၅) (ပုဒ်မ ၅)

(၆) မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ဥပဒေ၊ ၂၀၁၆ (ပုဒ်မ ၅၀(ဃ)၊ ၅၁၊ ၆၅(စ) မှ (ထ)၊ ၇၃)

(၇) မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေများ၊ ၂၀၁၇(နည်း ၂၀၂၊ ၂၀၃၊ ၂၀၆၊ ၂၁၂)

(၈) ပုပွလိကစက်မှုလုပ်ငန်းဥပဒေ၊ ၁၉၉၀(ပုဒ်မ ၄၊ ၁၃(ခ)(စ)(ဆ)၊ ၁၅(က)(ခ))

(၉) ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ခြင်းဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၁၅၊ ၁၆၊ ၁၇၊ ၂၂၊ ၂၇)

(၁၀) မြန်မာ့မီးသတ်တပ်ဖွဲ့ ဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၂၅)

(၁၁) ရေနံနှင့်ရေနံထွက်ပစ္စည်းဆိုင်ရာဥပဒေ၊ ၂၀၁၇ (ပုဒ်မ ၉ (က) (c)၊ ၁၀(ခ)၊ (လောင်စာဆီ/ သယ်) ပုဒ်မ ၁၁၊ (ကန် ဖြင့်လှောင်လျှင်) ပုဒ်မ ၁၀(က)(ဂ)(ဃ))

(၁၂) မော်တော်ယာဉ်ဥပဒေ၊ ၂၀၁၅

(၁၃) စံချိန်စံညွှန်းသန်မှတ်ခြင်းဆိုင်ရာဥပဒေ ၊ ၂၀၁၄ (ပုဒ်မ ၁၇၊ ၁၉၊ ၂၆)

(၁၄) ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၃၇၊၃၄)

(၁၅) မြန်မာအင်ဂျင်နီယာကောင်စီဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၃၇၊၃၄)

(၁၆) ရှေးဟောင်းဝတ္ထုပစ္စည်းကာကွယ်ထိန်းသိမ်းရေးဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၁၂)

(၁၇) ရှေးဟောင်းအဆောက်အအုံကာကွယ်ထိန်းသိမ်းရေးဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၁၂၊ ၁၅၊ ၂၀(ခ))

(၁၈) ပို့ကုန်သွင်းကုန်ဥပဒေ၊ ၂၀၁၂ (ပုဒ်မ ၇) (ရှိလျှင်)

(၁၉) အလုပ်သမားအဖွဲ့အစည်းဥပဒေ၊ ၂၀၁၁

(၂၀) အလုပ်သမား အငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ၊ ၂၀၁၂

(၂၁) အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှုဖွံ့ဖြိုး တိုးတက်ရေးဥပဒေ၊ ၂၀၁၃

(၂၂) အနည်းဆုံးအခကြေးငွေဥပဒေ၊ ၂၀၁၃

(၂၃) အခကြေးငွေပေးချေရေးဥပဒေ၊ ၂၀၁၆

(၂၄) Workmen Compensation Act, 1983

(၂၁) ခွင့်နှင့်အလုပ်ပိတ်ရက်များဥပဒေ၊ ၁၉၅၁

(၂၅) လူမှုဖူလုံရေးဥပဒေ၊ ၂၀၁၂

(၂၆) မြန်မာနိုင်ငံ ပြည်သူ့ကျန်းမာရေးဥပဒေ၊ ၁၉၇၂(ပုဒ်မ ၃၊ ၅)

(၂၇) ကူးစက်ရောဂါများကာကွယ်နှိမ်နှင်းရေးဥပဒေ၊ ၁၉၉၅ (ပုဒ်မ ၃(က)(c)၊ ၄ ၊ ၁၁)

(၂၈) ဆေးလိပ်နှင့်ဆေးရွက်ကြီးထွက်ပစ္စည်း သောက်သုံးမှုထိန်းချုပ် ရေးဥပဒေ၊ (ပုဒ်မ ၉)

(၂၉) ရန်ကုန်တိုင်းဒေသကြီးစည်ပင်သာယာရေးအဖွဲ့ဥပဒေ၊ ၂၀၁၈

(၃၀) ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးဥပဒေ၊ ၂၀၀၆ (ပုဒ်မ ၈(က)၊ ၁၁၊ ၁၉၊ ၂၁(ခ)၊ ၂၂၊ ၂၄(ခ))

(၃၁) ရေချိုငါးလုပ်ငန်းဥပဒေ (၁၉၉၁)

(၃၂) စားသုံးသူအကာအကွယ်ပေးရေးဥပဒေ (၂၀၁၄)

(၃၃) လုပ်ငန်းခွင်အန္တရာယ်ကင်းရှင်းရေးနှင့်ကန်းမာရေးဆိုင်ရာဥပဒေ (၂၀၁၉)

(၃၄) လျှပ်စစ်ဥပဒေ (၂၀၁၄)

၁-၄။ စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

ရုပ်ပျိုတိုင်းရင်းဆေးဝါး ထုတ်လုပ်ရေးလုပ်ငန်းအနေဖြင့် ရုပ်ပျိုတိုင်းရင်းဆေးဝါး ထုတ်လုပ်ရေး စက်ရုံအသစ်တွင် ချောင်းဆိုးဆေးရည်ဘူး၊ မန်းဆေး၊ ဆီးချိုကျဆေး၊ လေငန်းစကြာဆေး၊ ဆီးဆေးညို နှင့် အနုမြူမန်းဆေးများကိုထုတ်လုပ်မည်ဖြစ်ပါသည်။ ရုပ်ပျိုတိုင်းရင်းဆေးဝါး ထုတ်လုပ်ရေး စက်ရုံ၏ တိုင်းရင်းဆေး ထုတ်လုပ်ပုံအကျဉ်းမှာ အောက်ပါအတိုင်းဖြစ်သည်။

- ကုန်ကြမ်းပစ္စည်းများပြုပြင်ခြင်းနှင့်သိုလှောင်ခြင်း
- ဆေးများကိုအချိုးကျဖော်စပ်ခြင်း
- တိုင်းရင်းဆေးများကိုထုတ်လုပ်ခြင်း
- ထုတ်ပိုးခြင်း နှင့်
- အရည်အသွေးစစ်ဆေးခြင်း

၁-၅။ ပတ်ဝန်းကျင်အခြေအနေ

(၁) အကျိုးသက်ဆိုင်သူများ

ဒေသခံများ၊ အစိုးရအဖွဲ့အစည်းများ၊ စီမံကိန်းအဆိုပြုသူ နှင့် စီမံကိန်းနှင့် သက်ဆိုင်သည့် အခြား အဖွဲ့အစည်းများ (ဥပမာ - အစိုးရမဟုတ်သည့် အဖွဲ့အစည်းများ) ကို စီမံကိန်း၏ အကျိုးသက်ဆိုင်သူများ (Stakeholders) ဟူ၍ သတ်မှတ်ထားပါသည်။

ဇယား (၁-၁) စီမံကိန်းအတွက်အကျိုးသက်ဆိုင်သူများ

စဉ်	အကျိုးသက်ဆိုင်သူ အုပ်စု	အကျိုးသက်ဆိုင်သူ	စိတ်ဝင်စားမှု		စိတ်ဝင်စားမှု
			ပမာဏ	အကြောင်းရင်း	
၁	ဒေသခံများ	မင်းကျောင်းကျေးရွာ	မြင့်	နီးကပ်ခြင်း	- ညစ်ညမ်းမှု - အဝင်၊အထွက် လမ်းများ - ရေအရင်းအမြစ် - အနှံ့ထွက်ရှိမှု
		မြောင်းကြီးကျေးရွာ	မြင့်	အလွန်နီးကပ်ခြင်း	
		ပဂိုးကုန်းကျေးရွာ	မြင့်	အလွန်နီးကပ်ခြင်း	
၂	အစိုးရဌာနများ	အထွေထွေ အုပ်ချုပ်ရေးဦးစီးဌာန	အလယ်အလတ်	အုပ်ချုပ်ရေး	- အုပ်ချုပ်ရေး - ပူးပေါင်းဆောင်ရွက် ရေး - CSR - ပတ်ဝန်းကျင်ညစ်ညမ်းမှု - ဒေသခံပြည်သူ များအလုပ်အကိုင်အခွင့်အလမ်း ရရှိနိုင်မှု
		မြို့နယ်ပညာရေးမှူးရုံး	နိမ့်	CSR	
		မြေစာရင်းဦးစီးဌာန	နိမ့်	မြေအရှုပ်အရှင်းမရှိ	
		ကျန်းမာရေးဦးစီးဌာန	နိမ့်	CSR	
		မြို့နယ်ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန	နိမ့်	ပတ်ဝန်းကျင်ညစ်ညမ်းမှု	
		မြို့နယ်မီးသတ်တပ်ဖွဲ့	နိမ့်	မီးဘေးအန္တရာယ်ကာကွယ်ထားရှိမှု	
		မြို့နယ်စည်ပင်သာယာရေးကော်မတီ	နိမ့်	-	
၃	လုပ်ငန်းအဆိုပြုသူ	စီမံကိန်းအဖွဲ့ တည်ဆောက်ရေးအဖွဲ့	မြင့်	စီမံကိန်းပိုင်ရှင်	- လုပ်ငန်းလည်ပတ်ရေး နှင့် စီမံခန့်ခွဲ ရေး - တည်ဆောက်ရေး - EMP
၄	အခြား	မရှိ	-	-	-

(၂) စီမံကိန်း၏သက်ရောက်ဧရိယာများ

စီမံကိန်း၏ သက်ရောက် ဧရိယာများကို စီမံကိန်း၏ အကျိုးသက်ဆိုင်သူများ (Stakeholders) လေ့လာ ဆန်းစစ်မှု ရလဒ်များပေါ်တွင် အခြေခံ၍ နယ်ပယ်ပိုင်းခြား သတ်မှတ်ပါသည်။ နယ်ပယ်ပိုင်းခြား သတ်မှတ်ထားမှုများကို အောက်ပါဇယား တွင်ဖော်ပြထားပါသည်။

ဇယား ၁-၂။ နယ်ပယ်ပိုင်းခြားသတ်မှတ်ထားမှုများ

စဉ်	ကဏ္ဍ	သက်ရောက်ဧရိယာ	ဆက်နွယ်နေသည့် အကြောင်း အချက်များ
၁	လူနေရပ်ကွက်/ ကျေးရွာများ	မင်းကျောင်းကျေးရွာ မြောင်းကြီးကျေးရွာ ပဂိုးကုန်းကျေးရွာ	- လမ်းအသုံးပြုမှု - ပတ်ဝန်းကျင်ညစ်ညမ်းမှု
၂	မြေထုပတ်ဝန်းကျင်	အနီးနားရှိစိုက်ပျိုးမြေများ၊ စီမံကိန်းပတ်ဝန်းကျင်	- စွန့်ပစ်ပစ္စည်းများ - ရေသွယ်မြောင်းများ - လမ်းအသုံးပြုမှု - မြေထုမညီညာမှုများ
၃	ဇီဝပတ်ဝန်းကျင်	စီမံကိန်းဧရိယာ၊ ပတ်ဝန်းကျင်ရှိ လယ်ယာမြေများ၊	ညစ်ညမ်းမှုများ
၄	လေထုနှင့်အသံဆူညံမှု	စီမံကိန်းဧရိယာနှင့် စီမံကိန်း အနီးရှိ ကျေးရွာများ	- ဆူညံသံနှင့်တုန်ခါမှုများ - လေထုအရည်အသွေး
၅	ရေထုပတ်ဝန်းကျင်	စီမံကိန်းဧရိယာနှင့် စီမံကိန်းဧရိယာအနီးရှိ ကျေးရွာများ	- ရေအသုံးပြုမှု - ရေအရည်အသွေး - စွန့်ပစ်ရေ
၆	လူမှုစီးပွားပတ်ဝန်းကျင်	စီမံကိန်းဧရိယာအနီးရှိ ကျေးရွာများ	- အလုပ်အကိုင်ရရှိမှုများ - ပတ်ဝန်းကျင်အကျိုးပြုလုပ်ငန်းများ

(၃) လေအရည်အသွေး

လက်ရှိစီမံကိန်းပတ်ဝန်းကျင်၏ လေထုအရည်အသွေးသိရှိနိုင်စေရန်အတွက် လေထုဖိအား၊ ကာဗွန်ဒိုင် အောက်ဆိုဒ်၊ ဟိုက်ဒရိုဂျင် ဆာလဖိုက်ဒ်၊ မီသိန်း၊ နိုက်ဒရိုဂျင်ဒိုင်အောက်ဆိုဒ်၊ အိုဇုန်း၊ PM_{10}၊ $PM_{2.5}$၊ စိုထိုင်းဆ၊ ဆာလဖာဒိုင် အောက်ဆိုဒ်၊ ဆိုလာဓါတ်ရောင်ခြည်၊ အပူချိန်၊ လေတိုက်နှုန်း နှင့် လေတိုက်ရာအရပ်တို့ကို တိုင်းတာမည် ဖြစ်ပါသည်။

လေထုအရည်အသွေးအား အမှတ် (၁) မှတ်လျှင် (၁၂) နာရီတိုင်းတာမည်ခဲ့ပြီး စီမံကိန်းဧရိယာအတွင်းတွင် တိုင်းတာခဲ့ခြင်း ဖြစ်ပါသည်။ တိုင်းတာမှုများကို စိမ်းလန်းအမိမြေ လေထု အရည်သွေးတိုင်းတာ ဆန်းစစ်သည့်အဖွဲ့မှ တိုင်းတာခဲ့ပြီး တိုင်းတာမှုရလဒ်များကို Table 25 တွင်အသေးစိတ် ဖော်ပြထားပါသည်။

(၂) ရေအရည်အသွေး

ရုပ်ပျိုတိုင်ရင်းဆေးဝါးထုတ်လုပ်ရေး စက်ရုံ တည်ဆောက်ခြင်း နှင့် လုပ်ငန်းလည်ပတ်ခြင်းတို့တွင် အသုံးပြုရန်အတွက် ရေကို စီမံကိန်းဧရိယာအတွင်းရှိ တွင်းရေမှ ရယူသုံးစွဲပါသည်။ လက်ရှိရေအရည်အသွေး ကိုသိရှိနိုင်စေရန် အတွက် စီမံကိန်းဧရိယာအတွင်းရှိ တွင်းရေ မှ ရေနမူနာ ကောက်ယူခဲ့ပြီး ရေအရည်အသွေး တိုင်းတာမှုများ ပြုလုပ်ခဲ့ပါသည်။ ရေအရည်အသွေးတိုင်းတာရာတွင် တွင်းရေ၏ ချဉ်ဖန်ကိန်း၊ အရောင်၊ နောက်ကျိမှု၊ ပျော်ဝင်အနည်များ၊ ဆိုင်းကြွအနည်၊ ကလိုရိုဒ်၊ အစေးအသွက်၊ အောက်ဆီဂျင်ပျော်ဝင်မှု၊ သံသတ္တုဓါတ် နှင့် ဖလိုရိုဒ် များကို တိုင်းတာခဲ့ပြီး တိုင်းတာမှုရလဒ်များကို Table (22) တွင် ဖော်ပြထား ပါသည်။

(၃) မြေအရည်အသွေး

Table (19) နှင့် (20) တို့တွင် ဖော်ပြထားသော ရုပ်ပျိုတိုင်းရင်းဆေးဝါးစက်ရုံဝင်းအတွင်းမှ ကောက်ယူထားသည့် မြေကို တိုင်းတာထားသော မြေတိုင်းတာမှုရလဒ်များအရ လက်ရှိမြေအရည်အသွေးမှာ အယ်ကာလီဓာတ်အသင့် အတင့် ရှိကြောင်း တွေ့ရှိရပါသည်။

(၄) ဇီဝဝန်းကျင်

ရွှေဘိုမြို့နယ်အတွင်းတွင်ပေါက်ရောက်သည့်သဘာဝပေါက်ပင်များမှာ သစ်ရာ၊ အင်ကြင်း၊ ပျဉ်ကတိုး၊ ကွန်ဘို၊ နဘဲ၊ ထောက်ကြံ့၊ တောခံပင်၊ သဇင်ရိုင်း၊ ထနောင်း၊ ရှားစောင်း၊ တမာ၊ မန်ကျည်း၊ ကုက္ကိုလ်၊ ဇီး၊ ကျားလျှာ၊ ကန္တာရပေါက်ပင်တို့ဖြစ်ပါသည်။ ရွှေဘိုမြို့နယ်အတွင်းတွေ့ရသော တောရိုင်း တရိစ္ဆာန်များမှာ ဂျီ၊ ယုန်၊ ငုံး၊ ခါ၊ ဘုတ်ငှက်၊ တောကြောင် နှင့် အခြားငှက်မျိုးစုံတို့ဖြစ်ပါသည်။ အသေးစိတ်ကို Table (28 to 34) တွင်ဖော်ပြထားပါသည်။

(၆) ရာသီဥတု

ရွှေဘိုမြို့နယ်သည်ပူအိုက်သောရာသီဥတုရှိပြီး နှစ်စဉ်ပျမ်းမျှအပူချိန် (၆၀မှ၁၀၄) ဒီဂရီဖာရင်ဟိုက် ရှိပါသည်။ ဧပြီလသည် ရွှေဘိုမြို့နယ်၏ အပူဆုံးလဖြစ်ပြီး အပူချိန် ၁၀၄ ဒီဂရီဖာရင်ဟိုက် ရှိ၍ ဇန်နဝါရီလမှာမူ မရွှေဘိုမြို့နယ်၏ အအေးဆုံးလဖြစ်ပြီး အပူချိန် ၆၀ ဒီဂရီဖာရင်ဟိုက် ရှိပါသည်။ နှစ်စဉ်ပျမ်းမျှမိုးရေချိန်မှာ ၀.၀၄ လက်မ ဖြစ်ပါသည်။ ဖေဖော်ဝါရီလသည် မိုးရွာသွန်းမှုအနည်းဆုံးလဖြစ်ပြီး ပျမ်းမျှမိုးရေချိန်မှာ ၀.၀ လက်မ ရှိပါသည်။ ရွှေဘိုမြို့နယ်၏ မိုးလေဝသနှင့် ဇလဗေဒဆိုင်ရာ အချက်အလက်များကို အခန်း (၄.၅) တွင် အသေးစိတ်ဖော်ပြထားပါသည်။

(၇) လူမှုစီးပွားပတ်ဝန်းကျင်

ရွှေဘိုမြို့နယ်သည် ရပ်ကွက် (၁၀) ခု၊ ကျေးရွာ (၆၂) ရွာ တို့ဖြင့် ဖွဲ့စည်းထားသော မြို့နယ် တစ်ခု ဖြစ်ပါသည်။ ရွှေဘိုမြို့နယ်အတွင်းတွင် အိမ်ထောင်စု ၅၀၂၄၇ စုရှိပြီး လူဦးရေ ၂၃၅၅၄၂ ဦး ရှိပါသည်။ ဗမာလူမျိုး

အများစုနေထိုင်ကြပြီး ဗုဒ္ဓဘာသာ ကိုးကွယ်သူများဖြစ်ကြပါသည်။ ခရစ်ယာန်ဘာသာကိုးကွယ်သူအနည်းငယ် ရှိပြီး အစ္စလာမ်နှင့် ဟိန္ဒူ ဘာသာ ကိုးကွယ်သူအနည်းစုရှိပါသည်။

မြို့နယ်အတွင်းရှိဒေသခံ ပြည်သူလူထုအများစုမှာ လယ်ယာ၊ သစ်တောနှင့် ငါးလုပ်ငန်း ကျွမ်းကျင် သူများ ဖြစ်ကြပြီး ဒုတိယအများဆုံးမှာ လက်မှုပညာနှင့် ဆက်စပ်လုပ်ငန်းလုပ်ကိုင်သူများ ဖြစ်ကြပါသည်။ မြို့နယ်အတွင်း ရှိဒေသခံပြည်သူလူထုသည် စိုက်ပျိုးရေးလုပ်ငန်းကိုအဓိကလုပ်ကိုင် ဆောင်ရွက် ကြပါသည်။ ရွှေဘိုမြို့နယ်သည် စစ်ကိုင်းတိုင်းဒေသကြီး အတွင်းတွင် တည်ရှိပြီး စီးပွားရေးအရ ဖွံ့ဖြိုးတိုးတက်မှု ရှိသော မြို့နယ်တစ်ခုဖြစ်ပါသည်။ ရွှေဘိုမြို့နယ်မှ စစ်ကိုင်းတိုင်းဒေသကြီး၊ မုံရွာမြို့နယ်သို့ ကုန်းလမ်း ဖြင့် သွားလာနိုင်ပြီး လမ်းပန်းဆက်သွယ်ရေး ကောင်းမွန်သော မြို့နယ်ဖြစ်ပါသည်။ မြို့နယ်၏အဓိက ထွက်ကုန်မှာ ဆန်စပါးဖြစ်ပြီး မြန်မာတစ်နိုင်ငံလုံးသို့ တင်ပို့ရောင်းချပါသည်။ ရွှေဘို မြို့နယ်တွင် အစိုးရဝန်ထမ်း ၅၅၆၂ ဦး၊ ဝန်ဆောင်မှုလုပ်ငန်းတွင်လုပ်ကိုင်သူ ၁၃၀၇ ဦး၊ စိုက်ပျိုးရေးလုပ်ငန်းတွင်လုပ်ကိုင်သူ ၁၇၁၀၀ ဦး၊ မွေးမြူရေး လုပ်ငန်းတွင် လုပ်ကိုင်သူ ၈၄၆၀ ဦး၊ အရောင်းအဝယ်လုပ်ငန်းတွင်လုပ်ကိုင်သူ ၉၃၇၇ ဦး၊ စက်မှုလက်မှု လုပ်ငန်းတွင် လုပ်ကိုင်သူ ၈၃၇၂ ဦး၊ ရေလုပ်ငန်းတွင်လုပ်ကိုင်သူ ၆၂၄ ဦး၊ ကျပန်းလုပ်ကိုင်သူ ၈၂၃၈ ဦး နှင့် အခြား လုပ်ငန်းလုပ်ကိုင်သူ ၆၄၃၄၅ ဦး ခန့် ရှိပါသည်။

ရွှေဘိုမြို့နယ်တွင် အဆင့်မြင့်တက္ကသိုလ်နှင့်ကောလိပ် (၃) ကျောင်း၊ အထက်တန်းကျောင်း (၁၇) ကျောင်း၊ အလယ်တန်းကျောင်း (၃၃) ကျောင်းနှင့် မူလတန်းကျောင်း (၁၃၂) ကျောင်း၊ ဘုန်းတော်ကြီးသင်ပညာရေးကျောင်း (၁၁) ကျောင်း နှင့် မူလတန်းကြိုကျောင်း(၉) ကျောင်းတို့ တည်ရှိပါသည်။ ရွှေဘိုမြို့နယ်၏ ကျောင်းနေအရွယ် ကလေးများကျောင်းအပ်နှံမှုရာခိုင်နှုန်းမှာ (၉၉) ရာခိုင်နှုန်းဖြစ်ပြီး ၂၀၁၈ ခုနှစ် စစ်တမ်းများအရ တက္ကသိုလ် ဝင်တန်းအောင်မြင်မှုမှာ (၃၉.၈၀) ရာခိုင်နှုန်းဖြစ်ပါသည်။ မြို့နယ်အတွင်း အသက် (၁၅) နှစ် နှင့်အထက်လူဦးရေ ၁၃၉၇၀၃ ဦး ရှိပြီး စာတတ်မြောက်သူဦးရေ ၁၃၅၁၀၀ ဦး ဖြစ်ပါသဖြင့် စာတတ်မြောက်မှု ရာခိုင်နှုန်းမှာ (၉၆) ရာခိုင်နှုန်းဖြစ်ပါသည်။

ရွှေဘိုမြို့နယ်တွင် အဝိစိတွင်းရေ၊ ရေပိုက်လိုင်း နှင့် ရေတွင်း(အုတ်စီ) ကန်များမှရေကို အဓိကထား အသုံးပြုကြသည်။ ထို့အပြင် အိမ်ထောင်စုများ၏ (၈၃.၈) ရာခိုင်နှုန်းသည် သောက်ရေအတွက် ရေကောင်းရေသန့် (ရေပိုက်လိုင်း၊ အဝိစိတွင်း၊ ရေတွင်း (အုတ်စီ)၊ ရေသန့်စက်/ရေသန့်ဘူး) ကို အသုံးကြပါသည်။ လျှပ်စစ်မီးကို အဓိက အသုံးပြုကြပြီး လျှပ်စစ်မီးမရရှိသည့် ကျေးရွာများတွင် ဖယောင်းတိုင်မီး၊ ရေနံဆီမီး နှင့် ဆိုလာမီးတို့ကို အသုံးပြုကြပါသည်။ ထမင်းဟင်း ချက်ပြုတ်ရန် လောင်စာအဖြစ် ထင်းနှင့်ဆက်စပ်ပစ္စည်းများကို အဓိကထား အသုံးပြုကြပြီး ကျောက်မီးသွေးကို အသုံးပြုကြပါသည်။ ရွှေဘိုမြို့နယ် အတွင်းတွင် ဆေးရုံ (၈) ရုံ၊ ကျေးလက် ဆေးပေးခန်း (၃၆) ခု နှင့် ကျေးလက်ကျန်းမာရေးဌာန/ဌာနခွဲ (၄၀)ခု ရှိပါသည်။

၁-၆။ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုများ

ရုပ်ပျိုတိုင်းရင်းဆေး ထုတ်လုပ်ခြင်းလုပ်ငန်းများကြောင့် ပတ်ဝန်းကျင်၊ လူမှုရေး၊ ကျန်းမာရေးနှင့် မျှော်လင့်မထားသော ကဏ္ဍများတွင် သက်ရောက်မှုများကို အောက်ပါဇယားများတွင် ဖော်ပြထားသည်။

ဇယား ၁-၃၊ တပ်ဆင်ခြင်းအဆင့် သက်ရောက်မှုများ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင်သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှုကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
	၁-၂ လောင်စာဆီ သို လျောင်ထိန်းသိမ်းခြင်း	၁-၂-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှုကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
	၁-၃ စွမ်းအင် အသုံးပြုမှု	၁-၃-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှုကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
၂။ ရေအရည်အသွေး	၂-၁ လောင်စာဆီ သို လျောင် ထိန်းသိမ်းခြင်း	၂-၁-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၂ ဘေးဖြစ်စေတတ် သော ပစ္စည်းများ သိုလျောင်ကိုင်တွယ်ခြင်း	၂-၂-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၃ ရေဆိုးစွန့်ပစ်မှု	၂-၃-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၄ ဘေးဥပါဒ် မဖြစ်စေတတ် သော ပစ္စည်းများ သိုလျောင် ကိုင်တွယ်ခြင်း	၂-၄-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၅ စက်ပစ္စည်းများ နေရာယူ ထားရှိမှု	၂-၅-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း			
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုးစိတ်များ/ ထိခိုက်လွယ်သော/ ကာကွယ် ထားသော	၃-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၃-၁-၁ ရေဆိုးစွန့်ပစ်မှု၊ မြောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
ဧရိယာများ	၃-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၃-၂-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
	၃-၃ ရေဆိုးစွန့်ပစ်မှု	၃-၃-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
	၃-၄ ဘေးဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၃-၄-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
	၃-၅ စက်ပစ္စည်း အထောက်အကူ ပြု ကိရိယာများ နေရာယူ ထားရှိမှု	၃-၅-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
	၃-၆ စက်ပစ္စည်းများ နေရာယူ ထားရှိမှု	၃-၆-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၄။ သယ်ယူပို့ဆောင်ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြောအတွင်း ယာဉ်ပိုများ လာခြင်း ၄-၁-၂ တော်တဆမှုများ ကြောင့် ယာဉ်ကြော ပြတ်တောက်နိုင်ခြင်း	ထိခိုက်မှုအဆင့် နိမ့်
၅။ စွန့်ပစ္စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ် ဖြစ်စေ နိုင်သောပစ္စည်းနှင့် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင်သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ္စည်းများ ရောနှောရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရသဖြင့်၊ ကောင်းမွန်သော လူနေမှုဘဝ အရည်အသွေးလျော့ကျနိုင်ခြင်း ၅-၁-၂ လက်ရှိစွန့်ပစ္စည်း စီမံမှု စနစ်နှင့် ပစ္စည်းများအပေါ် ဝန်ပိစေခြင်း	လျစ်လျူရှုနိုင်
	၅-၂ ရေဆိုးစွန့်ပစ်မှု	၅-၂-၁ ပတ်ဝန်းကျင်သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ္စည်းများ ရောနှောရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရသဖြင့်၊ ကောင်းမွန်သော လူနေမှုဘဝ အရည်အသွေးလျော့ကျနိုင်ခြင်း	လျစ်လျူရှုနိုင်
၆။ လူမှုစီးပွားရေး	၆-၁ ထောက်ပံ့ရေးနှင့် အထောက်အကူပြုခြင်း	၆-၁-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ဝင်ငွေ၊ ရောင်းဝယ်မှု၊ စီးပွားရေးဝန်ဆောင်မှု၊ အခွင့်အလမ်းများ တိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု
	၆-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၆-၂-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ဝင်ငွေ၊ ရောင်းဝယ်မှု၊ စီးပွားရေးဝန်ဆောင်မှု၊ အခွင့်အလမ်းများ တိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု
	၆-၃ ဘေးဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၆-၃-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ဝင်ငွေ၊ ရောင်းဝယ်မှု၊ စီးပွားရေးဝန်ဆောင်မှု၊ အခွင့်အလမ်းများ တိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု
	၆-၄ ဘေးဥပါဒ် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၆-၄-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ဝင်ငွေ၊ ရောင်းဝယ်မှု၊ စီးပွားရေးဝန်ဆောင်မှု၊ အခွင့်အလမ်းများ တိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
	၆-၅ စက်ပစ္စည်းများ နေရာယူ ထားရှိမှု	၆-၅-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ဝင်ငွေ၊ ရောင်းဝယ်မှု၊ စီးပွားရေးဝန်ဆောင်မှု၊ အခွင့်အလမ်းများ တိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု
	၆-၆ အလုပ်သမား၊ စက်ကိရိယာ၊ ဝန်ဆောင်မှု ထောက်ပံ့ပေးခြင်း	၆-၆-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ရောင်းဝယ်မှု၊ အခွင့်အလမ်းများတိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု
ယဉ်ကျေးမှုဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၇။ သမိုင်းဝင်၊ ရှေးဟောင်း ယဉ်ကျေးမှု ဆိုင်ရာ အမွေအနှစ်များ	၇-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၇-၁-၁ ရပ်ဝေးအလုပ်သမားများနှင့် ဒေသခံ ယဉ်ကျေးမှု ကြား ပဋိပက္ခ ဖြစ်နိုင်ခြင်း	လျစ်လျူရှုနိုင်
	၇-၂ စက်ရုံ တည်ဆောက် ရန်တူးဖော်ခြင်း၊ စက် ပစ္စည်းထားရှိခြင်း	၇-၂-၁ ရှေးဟောင်းပစ္စည်း၊ ရှေးဟောင်း အမွေအနှစ် တူးဖော်တွေ့ရှိခြင်း၊ ထိခိုက် မိခြင်း	လျစ်လျူရှုနိုင်

ဇယား ၁-၄ လုပ်ငန်းလည်ပတ်သည့်အဆင့် သက်ရောက်မှုများ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင်သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
	၁-၂ လောင်စာဆီ သို လှောင် ထိန်းသိမ်းခြင်း	၁-၂-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
	၁-၃-၁ စွမ်းအင် အသုံးပြုမှု	၁-၃-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
၂။ ရေအရည်အသွေး	၂-၁ လောင်စာဆီ သို လှောင် ထိန်းသိမ်းခြင်း	၂-၁-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၂ ရေဆိုးစွန့်ပစ်မှု	၂-၃-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း			
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုးစိတ်များ/ ထိခိုက်လွယ်သော/ ကာကွယ် ထားသော ဧရိယာများ	၃-၁ ရေဆိုးစွန့်ပစ်မှု	၃-၁-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း			

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
၄။ သယ်ယူပို့ဆောင်ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြောအတွင်း ယာဉ်ပိုများလာခြင်း ၄-၁-၂ တော်တဆမှုများ ကြောင့် ယာဉ်ကြော ပြတ်တောက်နိုင်ခြင်း	လျစ်လျူရှုနိုင်
၅။ စွန့်ပစ္စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ် ဖြစ်စေနိုင်သောပစ္စည်းနှင့် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင်သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ္စည်းများ ရောနှောရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရသဖြင့်၊ ကောင်းမွန်သော လူနေမှုဘဝ အရည်အသွေးလျော့ကျနိုင်ခြင်း ၅-၁-၂ လက်ရှိစွန့်ပစ္စည်း စီမံမှု စနစ်နှင့် ပစ္စည်းများအပေါ် ဝန်ပိစေခြင်း	လျစ်လျူရှုနိုင်
၆. လူမှု စီးပွားရေး	၆-၁ အလုပ်သမား၊ စက်ကိရိယာ၊ ဝန်ဆောင်မှု ထောက်ပံ့ပေးခြင်း	၆-၁-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ရောင်းဝယ်မှု၊ အခွင့်အလမ်းများတိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု

ဇယား ၁-၅ လုပ်ငန်း ပိတ်သိမ်း သည့်အဆင့် သက်ရောက်မှုများ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင်သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေးကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှုကိုဖြစ်ပေါ်စေခြင်း	လျစ်လျူရှုနိုင်
၂။ ရေအရည်အသွေး	၂-၁ ဘေးဖြစ်စေတတ်သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၁-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
	၂-၂ ဘေးဥပါဒ် မဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၂-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	လျစ်လျူရှုနိုင်
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း			
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုးစိတ်များ/ ထိခိုက်လွယ်သော/ ကာကွယ်ထားသော ဇရိယာများ	၃-၁ ဘေးဖြစ်စေတတ်သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၃-၁-၁ ရေဆိုးစွန့်ပစ်မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း			
၄။ သယ်ယူပို့ဆောင်ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြောအတွင်း ယာဉ်ပိုများလာခြင်း ၄-၁-၂ တော်တဆမှုများ ကြောင့် ယာဉ်ကြော ပြတ်တောက်နိုင်ခြင်း	လျစ်လျူရှုနိုင်

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
၅။ စွန့်ပစ္စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ် ဖြစ်စေနိုင်သောပစ္စည်းနှင့် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင်ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင်သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ္စည်းများ ရောနှောရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရသဖြင့်၊ ကောင်းမွန်သော လူနေမှုဘဝ အရည်အသွေးလျော့ကျနိုင်ခြင်း ၅-၁-၂ လက်ရှိစွန့်ပစ္စည်း စီမံမှု စနစ်နှင့် ပစ္စည်းများအပေါ် ဝန်ပိစေခြင်း	ထိခိုက်မှုအဆင့် နိမ့်
၆. လူမှု စီးပွားရေး	၆-၁ အလုပ်သမား၊ စက်ကိရိယာ၊ ဝန်ဆောင်မှု ထောက်ပံ့ပေးခြင်း	၆-၁-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ်အကိုင်၊ ရောင်းဝယ်မှု၊ အခွင့်အလမ်းများတိုးတက်ခြင်း	ကောင်းကျိုး သက်ရောက်မှု

ဇယား ၁-၆ ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု အကဲဖြတ်ချက်

ပြည်သူ့ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု အကဲဖြတ်ချက်			
၁။ အများပြည်သူ ကျန်းမာရေး	၁-၁ သယ်ယူပို့ဆောင်ရေး	၁-၁-၁ မတော်တဆမှု၊ လေညစ်ညမ်းမှု၊ ဆူညံသံ၊ စွန့်ပစ်/ ဖိတ်စင် လောင်စာ တို့နှင့်ထိတွေ့မှုကြောင့် အများပြည်သူကျန်းမာရေးထိခိုက်မှု ရှိနိုင်သည်။	လျစ်လျူရှုနိုင်
	၁-၂ အနှံ့ထွက်ရှိမှု	၁-၂-၁ လောင်စာဆီ ယိုဖိတ်ခြင်း၊ စွန့်ပစ်ရေ၊ ပရဆေးပင်များ ဖြတ်တောက် ကြိတ်ချေခြင်း၊ အမှုန့်ကြိတ်ခြင်းတို့မှ အနှံ့ထွက်နိုင်သည်။	လျစ်လျူရှုနိုင်
လုပ်ငန်းခွင် ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု အကဲဖြတ်ချက်			
၂။ လုပ်ငန်းခွင် ကျန်းမာရေး	၂-၁ လေအရည်အသွေး	၂-၁-၁ မတော်တဆမှု၊ လေညစ်ညမ်းမှု၊ ဆူညံသံ၊ အခြားကျန်းမာရေးဆိုင်ရာကိစ္စများအပေါ် စိုးရိမ်မှု တို့ကြောင့် လုပ်ငန်းခွင် ကျန်းမာရေးထိခိုက်မှု ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၂ (အမှုန့်ကြိတ်) စက်ဆူညံသံ	၂-၂-၁ ဆူညံသံကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၃ အနှံ့ ထွက်ရှိမှု	၂-၃-၁ ပရဆေးပင်များ သိမ်းဆည်း၊ဖြတ်တောက်၊ ကြိတ်ချေ ခြင်းကြောင့် အလုပ်သမားများ အနှံ့ များနှင့် ထိတွေ့နေနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၄ စွန့်ပစ်ရေဆိုး	၂-၄-၁ မတော်တဆမှု၊ စွန့်ပစ်ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စတို့နှင့်ပတ်သက်၍ စိုးရိမ်မှုတို့ကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၅ ဘေး ဥပါဒ် မဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၅-၁ မတော်တဆမှု၊ စွန့်ပစ်ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စတို့နှင့်ပတ်သက်၍ စိုးရိမ်မှု တို့ကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၆ ဘေးဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၆-၁ မတော်တဆမှု၊ စွန့်ပစ်ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စတို့နှင့်ပတ်သက်၍ စိုးရိမ်မှုတို့ကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်
	၂-၇ အလုပ်ခွင် မတော်တဆ ဖြစ်မှုများ	၂-၇-၁ မတော်တဆမှု၊ စွန့်ပစ်ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် တိုက်ရိုက် ထိတွေ့မှု၊ ၄င်းကိစ္စတို့နှင့်ပတ်သက်၍ စိုးရိမ်မှုတို့ကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်

အနှစ်ချုပ်အစီရင်ခံစာ

ဇယား ၁-၇ စီစဉ်မထားသော အဖြစ်အပျက်များကြောင့် သက်ရောက်မှုများ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ကြွင်းကျန်သက်ရောက်မှု
၁။ လောင်စာဆီ၊ ဓာတု ပစ္စည်း၊ ဘေးဥပါဒ်ဖြစ်စေနိုင်သော ပစ္စည်းများ၊ စွန့်ပစ်ပစ္စည်းများဖိတ်စင်မှု	၁-၁ လောင်စာဆီ၊ ဓာတု ပစ္စည်း၊ ဘေးဥပါဒ်ဖြစ်စေနိုင်သော ပစ္စည်းများ၊ အခြားစွန့်ပစ်ပစ္စည်းများသိုလှောင်မှု	၁-၁-၁ ဖော်ပြပါပစ္စည်းများ ပတ်ဝန်းကျင်သို့ ဖိတ်စင်ခြင်းဖြင့် ရေအရည်အသွေးနှင့် ရေနေသက်ရှိသတ္တဝါများကို ထိခိုက်နိုင်သည်။	လျစ်လျူရှုနိုင်
၂။ မီးလောင်မှု	၂-၁ လောင်စာဆီ၊ ဓာတု ပစ္စည်းများသိုလှောင်မှု	၂-၁-၁ မီးလောင်မှု၊ ပေါက်ကွဲမှုတို့ကြောင့် ခန္ဓာကိုယ်ထိခိုက်မှု၊ ပျက်စီးမှု၊ အသက်သေဆုံးမှု၊ ညစ်ညမ်းမှု များဖြစ်နိုင်သည်။	ထိခိုက်မှုအဆင့် နိမ့်

၁-၇။ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (EMP)

ဇယား ၁-၈ ရုပ်ပျိုး တိုင်းရင်းဆေးဝါး ထုတ်လုပ်ရေးစက်ရုံကြောင့် ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများနှင့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (EMP) ကတိကဝတ် ဇယား

စက်ရုံ စက်ပစ္စည်း တပ်ဆင်ခြင်းအဆင့်

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ								
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၁-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန် စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ်အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။ ၁-၁-၁-၂ စက်တပ်ဆင်ချိန်ကာလ အတိုဆုံး ဖြစ်စေရန် စက်များသယ်ယူ ရွှေ့ပြောင်းရ မည့် သင့်လျော်သည့် အချိန်ဇယားတစ်ခု ထားရှိဆောင်ရွက်ရန်။	လျှစ်လျူရှုနိုင်	စက်တပ်ဆင်မည့် Contractor က သင့်လျော်သည့် စက်ရွှေ့ ပြောင်းသယ်ယူ မည့် အချိန်ဇယားနှင့် စက်ထိန်းသိမ်းရေးအချိန် ဇယား အဆိုပြုထားရှိ ပေးရန်။	Yoke Pyo/ Contractor	စက်တပ် ဆင်ခြင်း	၁။ စက်ကိရိယာ/ ယန္တရားများ ထိန်းသိမ်းရေး အချိန်ဇယား မိတ္တူ ၂။ ထိန်းသိမ်းမှု မှတ်တမ်း
	၁-၂ လောင်စာဆီသို့ လျောင် ထိန်းသိမ်းခြင်း	၁-၂-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၂-၁-၁ စက်ယန္တရားများ အသုံးပြုရာ၊ ဆီဖြည့်ရာ၊ သိုလျှောင်ရာတွင် ဖိတ်စင်မှု၊ အငွေ့ပျံမှု၊ လေလွင့်မှု နည်းစေရေး ဆောင်ရွက်ရန်။ ၁-၂-၁-၂ ထိန်းသိမ်းမှုကို ပုံမှန် စစ်ဆေးမှု ပြုလုပ်ရန်။	လျှစ်လျူရှုနိုင်	စက်ဆီဖြည့်တင်းခြင်း၊ ဆီသိုလှောင်ရာ နေရာ စစ်ဆေးခြင်း အချိန် ဇယား ထားရှိရန်။	Yoke Pyo/ Contractor	စက်တပ် ဆင်ခြင်း	၁။ စက်ဆီဖြည့် တင်းသည့် အချိန် ဇယား ထားရှိရန်။ ၂။ စစ်ဆေးချက် မှတ်တမ်း။
	၁-၃ စွမ်းအင် အသုံးပြုမှု	၁-၃-၁ အခိုးအငွေ့ အမှုန်အမွှား	၁-၃-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန်	လျှစ်လျူရှုနိုင်	စက်တပ်ဆင်မည့် Contractor က	Yoke Pyo/ Contractor	စက်တပ် ဆင်ခြင်း	၁။ စက်ဆီဖြည့် တင်းသည့် အချိန်

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		ထုတ်လွှတ် ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။ ၁-၃-၁-၂ စက်တပ်ဆင်ချိန်ကာလ အတိုဆုံး ဖြစ်စေရန် စက်များသယ်ယူ ရွှေ့ပြောင်းရ မည့် သင့်လျော်သည့် အချိန်ဇယားတစ်ခု ထားရှိဆောင်ရွက်ရန်။		သင့်လျော်သည့် စက်ရွှေ့ ပြောင်းသယ်ယူမည့် အချိန်ဇယားနှင့် စက်ထိန်း သိမ်း ရေးအချိန်ဇယား အဆိုပြုထားရှိ ပေးရန်။			ဇယားထားရှိရန်။ ၂။ စစ်ဆေးချက် မှတ်တမ်း။
၂။ ရေ အရည်အသွေး	၂-၁ လောင်စာဆီ သို့ လျောင် ထိန်းသိမ်းခြင်း	၂-၁-၁ ရေညစ် ညမ်းမှု ဖြစ်နိုင်ချေ ရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ် အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်း နိုင်ခြင်း။	၂-၁-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၂-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။ ၂-၁-၁-၃ အပို/ မှားယွင်း တပ်ဆင်မိခြင်း များမှ ရှောင်ကျဉ် နိုင်ရန် တပ်ဆင်မည့် နေရာအစီအစဉ် နှင့် ဒီဇိုင်းကို သေချာ စွာစစ်ဆေး ဆောင်ရွက်ရန်။	လျစ်လျူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြုကြောင်းသေချာစေ ရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ် စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
	၂-၂ ဘေးဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင်ကိုင်တွယ်ခြင်း	၂-၂-၁ ရေညစ် ညမ်းမှု ဖြစ်နိုင်ချေ ရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ် အတောက် ပါဝင် နိုင်ခြင်း၊	၂-၁-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၂-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့်	လျစ်လျူရှုနိုင်	၁။ ဖိတ်စင်ကျသော ဓာတုပစ္စည်း၊ လောင်စာဆီ၊ စွန့်ပစ္စည်း များ ထည့်ရန် ရုပ်ပျိုမှ spill kits ထားရှိပေးရန်။ ၂။ ရုပ်ပျိုမှWaste Management Plan ထားရှိပေးရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	၁။ ဖိတ်စင်ကျမှု မှတ်ထမ်း ၂။ Waste Management Plan

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်း နိုင်ခြင်း။	ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။ ၂-၁-၁-၃ အပို/ မှားယွင်း တပ်ဆင်မိခြင်း များမှ ရှောင်ကျဉ် နိုင်ရန် တပ်ဆင်မည့် နေရာအစီအစဉ် နှင့် ဒီဇိုင်းကို သေချာ စွာစစ်ဆေး ဆောင်ရွက်ရန်။					
	၂-၃ ရေဆိုးစွန့် ပစ်မှု	၂-၃-၁ ရေညစ်ညမ်း မှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန် အမွှား၊ အညစ် အကြေး အဆိပ် အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	၂-၃-၁-၁ ရေဆိုးစွန့်ပစ်မှု နှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၂-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာစေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်	လျစ်လျူရှုနိုင်	ရုပ်ပျိုး၏ Waste Management Plan နှင့်အညီ ရေဆိုးများကို သိုလှောင်၊ ခွဲခြား၊ သယ်ပို့ စွန့်ပစ်ရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	Waste Management Plan
	၂-၄ ဘေးဥပဒ်ဖြစ် မဖြစ် စေ တတ်သော ပစ္စည်း များ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၄-၁ ရေညစ်ညမ်း မှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန် အမွှား၊ အညစ် အကြေး အဆိပ် အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်း နိုင်ခြင်း။	၂-၄-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၂-၄-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျစ်လျူရှုနိုင်	တာဝန်ရှိသူများက ရေကို အနည်းဆုံးသာ အသုံးပြု ကြောင်းသေချာစေရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့် ရေကို သတ်မှတ် စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
	၂-၅ စက်ပစ္စည်း များ နေရာယူ ထားရှိမှု	၂-၅-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင် ချေရှိခြင်း၊ ရေထဲတွင်	၂-၅-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို	လျစ်လျူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြုကြောင်းသေချာစေ ရန် သေချာစွာ ညွှန်ကြား၍	Yoke Pyo/ Contractor	စက်တပ် ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ် စံချိန်စံညွှန်းနှင့် ကိုက်

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ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ် အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်း နိုင်ခြင်း။	ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၂-၅-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။ ၂-၅-၁-၃ အပို/ မှားယွင်းတပ်ဆင်မိခြင်း များမှ ရှောင်ကျဉ်နိုင်ရန် တပ်ဆင်မည့် နေရာအစီအစဉ် နှင့် ဒီဇိုင်းကို သေချာ စွာစစ်ဆေးဆောင်ရွက်ရန်။		စစ်ဆေးမှု ပြုလုပ်ရန်။			မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း								
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုးစိတ်များ/ ထိခိုက် လွယ်သော/ ကာကွယ် ထားသော ဇရိယာများ	၃-၁ ဘေးဖြစ် စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၃-၁-၁ ဘေးဖြစ် စေတတ် သော ပစ္စည်းများ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင် သည်။	၃-၁-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျှော်လျှူနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြုကြောင်းသေချာစေရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo	စက်တပ်ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
	၃-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၃-၂-၁ လောင်စာဆီ နှင့် ပတ်သက်သော ပစ္စည်းများ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေ သက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင် သည်။	၃-၂-၁-၁ စက်များမတပ်ဆင်မီ၊ တပ်ဆင် နေစဉ်၊ တပ်ဆင်ပြီး ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၂-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး	လျှော်လျှူနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြုကြောင်းသေချာစေရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo	စက်တပ်ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း

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ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
			ကိုက်ညီမှုသာ စွန့်ပစ်ရန်။					
	၃-၃ ရေဆိုးစွန့် ပစ်မှု	၃-၃-၁ ရေဆိုးစွန့်ပစ် မှု၊ မှောက်ကျ လျှံကျမှု ကြောင့် ရေနေ သက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင် သည်။	၃-၃-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၃-၁-၂ ၂-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။	လျှော့လျှူရှုနိုင်	Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် Yoke Pyo က ရေသန့်စင်မှုစနစ် ထားရှိရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	ရေဆိုးစွန့်ပစ် မှု မှတ်တမ်း
	၃-၄ ဘေးဖြစ်စေ တတ် သော ပစ္စည်းများ သို လှောင်ကိုင်တွယ် ခြင်း	၃-၄-၁ ဘေးဖြစ်စေ တတ် သော ပစ္စည်း များ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင် သည်။	၃-၄-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၄-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။	လျှော့လျှူရှုနိုင်	Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် Yoke Pyo က ရေသန့်စင်မှုစနစ် ထားရှိရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	ရေဆိုးစွန့်ပစ် မှု မှတ်တမ်း
	၃-၅ စက်ကိရိယာ များ နှင့် အကူ ပစ္စည်းများ တည်ရှိမှု	၃-၅-၁ စက်ပစ္စည်း/ စက်ဆီ/ ချောဆီ ဖိတ်စင်ကျမှုကြောင့် ရေညစ်ညမ်းမှု ဖြစ်ပြီး ရေနေ သက်ရှိများနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	၃-၅-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၅-၁-၂ ၂-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။	လျှော့လျှူရှုနိုင်	Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် Yoke Pyo က ရေသန့်စင်မှုစနစ် ထားရှိရန်။	Yoke Pyo (သို့မဟုတ်) Contractor	စက်တပ် ဆင်ခြင်း	ရေဆိုးစွန့်ပစ် မှု မှတ်တမ်း
	၃-၆ စက်ပစ္စည်း များ နေရာယူ ထားရှိမှု	၃-၆-၁ စက်ပစ္စည်း/ စက်ဆီ/ ချောဆီ ဖိတ်စင်ကျမှုကြောင့်	၃-၆-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ	လျှော့လျှူရှုနိုင်	Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ	Yoke Pyo (သို့မဟုတ်) Contractor	စက်တပ် ဆင်ခြင်း	ရေဆိုးစွန့်ပစ် မှု မှတ်တမ်း

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		ရေညစ်ညမ်းမှု ဖြစ်ပြီး ရေနေ သက်ရှိများနှင့် ဂေဟစနစ်ကို ထိခိုက်နိုင်သည်။	ကို လိုက်နာရန်။ ၃-၆-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။		စေ ရန် Yoke Pyo က ရေသန့်စင်မှုစနစ် ထားရှိရန်။			
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း								
၄။ သယ်ယူပို့ ဆောင် ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြော အတွင်း ယာဉ်ပိုများ လာခြင်း ၄-၁-၂ တော်တဆ မှုများ ကြောင့် ယာဉ်ကြော ပြတ်တောက်နိုင်ခြင်း	၄-၁-၁-၁ စက်တပ်ဆင်ခြင်းမစမီ အနည်းဆုံး (၅) ရက် ကြို၍ ရွှေဘိုတက္ကသိုလ်တာဝန်ရှိသူများနှင့် တွေ့ဆုံပြီး၊ အဆင်ပြေမည်ရက် သတ်မှတ်ရန်။ ၄-၁-၁-၂ ယာဉ်မတော်တဆမှုများ ကာကွယ် တားဆီးရန်၊ သယ်ယူပို့ ဆောင်ရေးယာဉ်အားလုံးတွင် သင့်လျော်သော အချက်ပြမီး တပ်ဆင်ရန်	ထိခိုက်မှု အဆင့်နိမ့်	ရွှေဘိုတက္ကသိုလ်တာဝန်ရှိသူများနှင့် တွေ့ဆုံ၍ အဆင်ပြေမည့်ရက် သတ်မှတ်ရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	ရွှေဘိုတက္ကသိုလ်တာဝန်ရှိသူ များနှင့် ဆက်သွယ်သည့် မှတ်တမ်း။
၅။ စွန့်ပစ်စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ် ဖြစ်စေ နိုင်သော ပစ္စည်းနှင့် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင် သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ်စည်းများ ရောနှော ရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ်စည်းများ တွေ့မြင်ရသဖြင့်၊ ကောင်းမွန် သော လူနေမှုဘဝ အရည် အသွေး လျော့ကျ နိုင်ခြင်း ၅-၁-၂ လက်ရှိစွန့်	၅-၁-၁-၁ စွန့်ပစ်စည်း ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက်သည့် ပြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၅-၁-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် စွန့်ပစ်စည်း ရှင်းလင်း/ သန့်စင်မှုစနစ် ထားရှိရန်။ ၅-၁-၂-၁ စက်သုံးဆီများဖြင့် ညစ်ညမ်းနေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲပြီးမှ စွန့်ပစ်ခြင်း။ ၅-၁-၂-၁ အန္တရာယ်ရှိပစ္စည်းနှင့် အန္တရာယ်မရှိ ပစ္စည်းခွဲ၍ သင့်လျော်	လျှစ်လျူရှုနိုင်	စွန့်ပစ်စည်း စီမံခန့်ခွဲမှု စနစ်ထားရှိရန်	Yoke Pyo/ ရွှေဘို မြို့နယ် စည်ပင်သာယာ ရေးကော်မတီ	စက်တပ် ဆင်ခြင်း	စွန့်ပစ်စည်း ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက် သည့် မှတ်တမ်း

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		ပစ္စည်း စီမံမှု စနစ်နှင့် ပစ္စည်း များအပေါ် ဝန်ပိစေခြင်း	သော အညွှန်းစာ ချိတ်ဆွဲခြင်း။					
	၅-၂ ရေဆိုးစွန့် ပစ်မှု	၅-၂-၁ ပတ်ဝန်းကျင် သို့ အန္တရာယ်ရှိ/ မရှိ စွန့်ပစ္စည်းများ ရောနှော ရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရ သဖြင့်၊ ကောင်းမွန် သော လူနေမှုဘဝ အရည် အသွေး လျော့ကျ နိုင်ခြင်း	၅-၂-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၅-၂-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။ ၅-၂-၁-၃ စက်သုံးဆီများဖြင့် ညစ်ညမ်းနေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲပြီးမှ စွန့်ပစ်ခြင်း။ ၅-၂-၁-၄ အန္တရာယ်ရှိပစ္စည်းနှင့် အန္တရာယ်မရှိ ပစ္စည်းခွဲ၍ သင့်လျော် သော အညွှန်းစာ ချိတ်ဆွဲခြင်း။	လျစ်လျူရှုနိုင်	စွန့်ပစ်ရေ စီမံခန့်ခွဲမှု/ သန့်စင်မှု စနစ်ထားရှိရန်	Yoke Pyo	စက်တပ် ဆင်ခြင်း	စွန့်ပစ်ရေ ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက် သည့် မှတ်တမ်း
၆။ လူမှုစီးပွားရေး	၆-၁ ထောက်ပံ့ရေး နှင့် အထောက်အ ကူပြုခြင်း	၆-၁-၁ အနီးပတ်ဝန်း ကျင်၌ အလုပ် အ ကိုင်၊ ဝင်ငွေ၊ ရောင်း ဝယ်မှု၊ စီးပွားရေး ဝန်ဆောင်မှု၊ အခွင့် အလမ်းများ တိုးတက်ခြင်း	၆-၁-၁-၁ ဒေသတဝိုက်မှ ဝန်ဆောင်မှုနှင့် ဆက်စပ်ပစ္စည်း များကို ဖြစ်နိုင်သမျှ ဝယ်ယူရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံ အကြီးအကဲများ၊ ထုတ်လုပ်သူများနှင့် ဆက်သွယ်ရန်။	ဒေသတွင်း အလုပ်သမား များ၊ လုပ်ငန်းရှင်များ	စက်တပ် ဆင်ခြင်း	ဝယ်ယူမှုမှတ်တမ်းများ
	၆-၂ အလုပ်သမား၊ စက်ကိရိယာ၊ ဝန်ဆောင်မှု	၆-၂-၁ အနီးပတ် ဝန်းကျင် ၌ အလုပ်အကိုင်၊	၆-၂-၁-၁ ဖြစ်နိုင်ပါက အရည် အချင်းရှိသော ဒေသခံ အလုပ်သမားများ ခန့်အပ်ရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံလူထု၏ အကြီး အကဲများနှင့် ဆက်သွယ်ရန်။	ဒေသတွင်း အလုပ် သမား များ၊ လုပ်ငန်းရှင်များ	စက်တပ် ဆင်ခြင်း	အလုပ်သမားခန့်အပ် မှု မှတ်တမ်းများ

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	ထောက်ပံ့ပေးခြင်း	ရောင်းဝယ်မှု၊ အခွင့်အလမ်းများ တိုးတက် ခြင်း						
ယဉ်ကျေးမှုဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း								
၇။ သမိုင်းဝင်၊ ရှေးဟောင်း ယဉ်ကျေးမှု ဆိုင်ရာ အမွေအနှစ်များ	၇-၁ စက်ရုံ တည်ဆောက် ရန်တူးဖော်ခြင်း၊	၇-၁-၁ ရှေးဟောင်း ပစ္စည်း၊ ရှေးဟောင်း အမွေအနှစ် တူးဖော် တွေ့ရှိခြင်း၊ ထိခိုက် မိခြင်း	မြေသားလုပ်ငန်းခွင်အတွင်း ကြီးကြပ်စောင့်ကြည့်ခြင်း။	လျစ်လျူရှုနိုင်	မြေသားလုပ်ငန်း ခွင်ကို စစ်ဆေး၍ လိုအပ်ပါက ရှေးဟောင်းယဉ်ကျေးမှု အမွေအနှစ်ထိန်းသိမ်းရေး ဌာနနှင့် ဆက်သွယ်ရန်။	Yoke Pyo	စက်တပ် ဆင်ခြင်း	မြေသားလုပ်ငန်း မှတ်တမ်း

အနှစ်ချုပ်အစီရင်ခံစာ

စက်ရုံ လည်ပတ်သည့် အဆင့်

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်းများ
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ								
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၁-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန် စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ်အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။	လျစ်လျူရှုနိုင်	စက်ထိန်းသိမ်းမှု လက်စွဲ ထားရှိပြီး ပုံမှန်ထိန်းသိမ်းမှု ပြုလုပ်ရန်	Yoke Pyo	စက်ရုံ လည်ပတ်ခြင်း	စက်/ယာဉ်ထိန်းသိမ်းမှု မှတ်တမ်းများ
	၁-၂ လောင်စာဆီ သို့လှောင်ထိန်းသိမ်းခြင်း	၁-၂-၁ အခိုးအငွေ့အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၂-၁-၁ လောင်စာဆီထိန်းသိမ်းမှု သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း သိုလှောင် ထိန်းသိမ်းရန်။	လျစ်လျူရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure) ထားရှိရန်	Yoke Pyo	စက်ရုံ လည်ပတ်ခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure)
	၁-၃ စွမ်းအင် အသုံးပြုမှု	၁-၃-၁ အခိုးအငွေ့အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၃-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန် စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ်အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။	လျစ်လျူရှုနိုင်	စက်ထိန်းသိမ်းမှု လက်စွဲ ထားရှိပြီး ပုံမှန်ထိန်းသိမ်းမှု ပြုလုပ်ရန်	Yoke Pyo	စက်ရုံ လည်ပတ်ခြင်း	စက်/ယာဉ်ထိန်းသိမ်းမှု မှတ်တမ်းများ
၂။ ရေအရည်အသွေး	၂-၁ လောင်စာဆီ သို့လှောင် ထိန်းသိမ်းခြင်း	၂-၁-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊	၁-၂-၁-၁ လောင်စာဆီထိန်းသိမ်းမှု သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း သိုလှောင်	လျစ်လျူရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက်	Yoke Pyo	စက်ရုံ လည်ပတ်ခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက်

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင် ပါဝင်မှု ကျဆင်း နိုင် ခြင်း။	ထိန်းသိမ်းရန်။ ၂-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။		(Standard Operating Procedure) ထားရှိရန်			(Standard Operating Procedure)
	၂-၂ အန္တရာယ်ရှိပစ္စည်းများ သုံး၍ ဓာတ်ခွဲစမ်းသပ်ခြင်း	၂-၂-၁ အန္တရာယ်ရှိပစ္စည်း လွတ်ထွက်ပြီးပတ်ဝန်းကျင် ထိခိုက်စေနိုင်ခြင်း	၂-၂-၁-၁ အန္တရာယ်ရှိပစ္စည်း ယိုထွက် စိမ့်ထွက်နိုင်မှုကို ပုံမှန်စောင့်ကြည့်ပြီး အကြောင်းရင်းရှာဖွေရန်	လျစ်လျူရှုနိုင်	သက်ဆိုင်ရာဝန်ထမ်းကို စနစ်တကျ လေ့ကျင့်၍ ယိုဖိတ်မှု အနည်းဆုံးဖြစ်အောင်ဆောင်ရွက်ရန်။	Yoke Pyo (Safety and Environment Section)	စက်ရုံလည်ပတ်ခြင်း	အန္တရာယ်ရှိပစ္စည်း အသုံးပြုမှု မှတ်တမ်း
	၂-၃ အန္တရာယ်မရှိသော စွန့်ထုတ်ပစ္စည်းများ စီမံခန့်ခွဲမှု	၂-၃-၁ စွန့်ပစ်ရေဆိုး၊ အနံ့များ ပတ်ဝန်းကျင်သို့ ထွက်ရှိမှု	၂-၃-၁-၁ မြို့တော်စည်ပင်သာယာရေးကော်မတီ၏ သတ်မှတ်ချက်၊ စံနှုန်းများနှင့် အညီလိုက်နာဆောင်ရွက်ရန်။	လျစ်လျူရှုနိုင်	အမျိုးအစားအလိုက်ခွဲခြား ပြီး အညွှန်းစာကပ်၍ သင့်လျော် စွာ စွန့်ပစ်ရန်။ အစားအစာစွန့်ပစ် စွည်းများကို သီးခြားခွဲပစ်ရန်။	Yoke Pyo and City Development Committee	စက်ရုံလည်ပတ်ခြင်း	စွန့်ပစ်စွည်း စီမံခန့်ခွဲမှု မှတ်တမ်း
	၂-၄ ရေဆိုးစွန့်ပစ်မှု	၂-၄-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီဂျင် ပါဝင်မှု ကျဆင်းနိုင် ခြင်း။	၂-၄-၁-၁ ညစ်ညမ်းရေများစုစည်း၍ စနစ်တကျသန့်စင်ပြီး၊ သတ်မှတ်ချက်နှင့် အညီစွန့်ပစ်ရန်။	လျစ်လျူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံး သာ အသုံးပြု ကြောင်းသေချာ ရေနှုန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo	စက်ရုံလည်ပတ်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ် စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း								
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုးစိတ်များ/ ထိခိုက်လွယ်သော/ ကာကွယ် ထားသော ဧရိယာများ	၃-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၃-၁-၁ ရေဆေးကြောမှု ကြောင့် ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ် အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊	၃-၁-၁-၁ စက်များ လည်ပတ်စဉ် ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျှော်လျှူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံး သာ အသုံးပြု ကြောင်း သေချာ စေရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo (Safety and Environment Section)	စက်ရုံ လည်ပတ်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြောပြီး သည့်ရေကို စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
	၃-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၃-၂-၁ ယိုဖိတ်မှုများကြောင့် ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ် အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊	၃-၂-၁-၁ လောင်စာဆီထိန်းသိမ်းမှု သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း သိုလှောင် ထိန်းသိမ်းရန်။ ၃-၂-၁-၂ လိုအပ်၍ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျှော်လျှူရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure) ထားရှိရန်	Yoke Pyo (Safety and Environment Section)	စက်ရုံ လည်ပတ်ခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure)
	၃-၃ ရေဆိုးစွန့်ပစ်မှု	၃-၃-၁ ရေဆိုးစွန့်ပစ် မှု၊ မှောက်ကျ လျံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင်သည်။	၃-၃-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။ ၃-၃-၁-၃ စက်သုံးဆီများဖြင့် ညစ်ညမ်းနေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲပြီးမှ စွန့်ပစ်ခြင်း။	လျှော်လျှူရှုနိုင်	ရုပ်ပျိုး၏ Waste Management Plan နှင့်အညီ ရေဆိုးများကို သိုလှောင်၊ ခွဲခြား၊ သယ်ပို့ စွန့်ပစ်ရန်။	Yoke Pyo (Safety and Environment Section)	စက်ရုံ လည်ပတ်ခြင်း	Waste Management Plan
	၃-၄ ဘေးဥပါဒ် ဖြစ်စေ နိုင်သော	၃-၄-၁ ဘေးဥပါဒ် ဖြစ်စေ နိုင်သော ပစ္စည်းများမှောက်ကျ လျံကျမှု၊ ကြောင့် ရေနေ	၃-၄-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။	လျှော်လျှူရှုနိုင်	ရုပ်ပျိုး၏ Waste Management Plan နှင့်အညီ	Yoke Pyo (Safety and	စက်ရုံ လည်ပတ်ခြင်း	Waste Management Plan

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	ပစ္စည်းများ သိုလှောင်ကိုင်တွယ်ခြင်း	သက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင် သည်။	၃-၄-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။		ရေဆိုးများကို သိုလှောင်၊ ခွဲခြား၊ သယ်ပို့၊ စွန့်ပစ်ရန်။	Environment Section)		
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း								
၄။ သယ်ယူပို့ဆောင်ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြော အတွင်း ယာဉ်ပိုများ လာခြင်း ၄-၁-၂ တော်တဆမှုများ ကြောင့် ယာဉ် ကြော ပြတ်တောက်နိုင်ခြင်း	၄-၁-၁-၁ စက်ရုံတဝိုက် မီတာ ၂၀ ဘေးကင်းရေးဇုန် သတ်မှတ်ရန်။ ၄-၁-၂-၁ ယာဉ်မတော်တဆမှုများ ကာကွယ် တားဆီးရန်၊ သယ်ယူပို့ဆောင်ရေးယာဉ်အားလုံးတွင် သင့်လျော်သော အချက်ပြမီး တပ်ဆင်ရန်	ထိခိုက်မှု အဆင့်နိမ့်		Yoke Pyo	စက်ရုံ လည်ပတ်ခြင်း	မီတာ ၂၀ ဘေးကင်းရေးဇုန်
၅။ စွန့်ပစ်စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ်ဖြစ်စေ နိုင်သော ပစ္စည်းနှင့် မဖြစ်စေတတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင် သို့ အန္တရာယ်ရှိ/ မရှိ သော စွန့်ပစ်စည်းများ ရောနှော ရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ်စည်းများ တွေ့မြင်ရ သဖြင့်၊ ကောင်းမွန် သော လူနေမှုဘဝ အရည် အသွေးလျော့ကျ နိုင်ခြင်း ၅-၁-၂ လက်ရှိ စွန့်ပစ်စည်း စီမံမှု စနစ်နှင့် ပစ္စည်းများ အပေါ် ဝန်ပိစေခြင်း	၅-၁-၁-၁ အန္တရာယ်ရှိသော/ မရှိ သော စွန့်ပစ်စည်းများကိုခွဲ ခြား၍အညွှန်းစာ တပ်ထားသော ထည့်စရာထဲထည့်သိမ်း ဆည်းရန်။ ၅-၁-၁-၂ မည်သည့်စွန့်ပစ်စည်းကိုမျှ သတ်မှတ်ချက်နှင့်မကိုက်ညီသည့်နေရာ တွင် မစွန့်ပစ်ပါနှင့်။ ၅-၁-၁-၃ အန္တရာယ်ရှိသော စွန့်ပစ်စည်း များကို မီးနှင့်ဝေးရာထားပါ။ သယ်ပို့ရာ တွင် ခိုင်ခံ့သောကင်းသော ထည့်စရာဖြင့် ရွှေ့ပြောင်းပါ။ ၅-၁-၁-၄ စွန့်ပစ်စည်း အမျိုးအစား ၊ ပမာဏကို မှတ်တမ်းထားပါ။ ခွဲခြား သိမ်းဆည်း၊ သယ်ပို့၍ သင့်လျော်သော နည်းလမ်းပစ္စည်းများသုံး၍ စွန့်ပစ်ပါ။	လျှစ်လျူရှုနိုင်	သင့်လျော်သော waste management system ထားရှိပါ။	Yoke Pyo/ ရွှေဘို မြို့နယ် စည်ပင်သာယာ ရေးကော်မတီ	စက်ရုံပိတ်သိမ်းခြင်း	စွန့်ပစ်စည်း စီမံခန့်ခွဲမှု မှတ်တမ်း။
၆. လူမှု စီးပွားရေး	၆-၁ အလုပ်သမား၊ စက်ကိရိယာ၊ ဝန်ဆောင်မှု	၆-၁-၁ အနီးပတ်ဝန်း ကျင်ဌာ အလုပ်အကိုင်၊ ရောင်းဝယ် မှု၊ အခွင့်အလမ်းများ	၆-၂-၁-၁ ဖြစ်နိုင်ပါက အရည် အချင်း ရှိသော ဒေသခံ အလုပ်သမားများ ခန့်အပ်ရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံလူထု၏ အကြိုး အကဲ များနှင့် ဆက်	ဒေသတွင်း အလုပ်သမား များ၊ လုပ်ငန်းရှင်များ	စက်ရုံ လည်ပတ်ခြင်း	အလုပ်သမားခန့် အပ်မှု မှတ်တမ်း များ

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	ထောက်ပံ့ပေးခြင်း	တိုးတက် ခြင်း			သွယ်ရန်။			
	၆-၂ ထောက်ပံ့ရေး နှင့် အထောက်အကူပြုခြင်း	၆-၂-၁ အနီးပတ်ဝန်း ကျင်၌ ရောင်း ဝယ်မှု၊ ဝန်ဆောင်မှု၊ အခွင့်အလမ်းတိုးတက်ခြင်း	၆-၁-၁-၁ ဒေသတဝိုက်မှ ဝန်ဆောင်မှုနှင့် ဆက်စပ်ပစ္စည်း များကို ဖြစ်နိုင်သမျှ ဝယ်ယူရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံများ၊ ထုတ်လုပ်သူများ နှင့် ဆက်သွယ်ရန်။	ဒေသတွင်း အလုပ်သမား များ၊ လုပ်ငန်းရှင်များ	စက်ရုံ လည်ပတ်ခြင်း	ဝယ်ယူမှုမှတ်တမ်းများ

အနှစ်ချုပ်အစီရင်ခံစာ

လုပ်ငန်း ပိတ်သိမ်း သည့်အဆင့်

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင် ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ								
၁။ လေ အရည်အသွေး	၁-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူပို့ဆောင်ခြင်း	၁-၁-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ်ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၁-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန် စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ်အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။ ၁-၁-၁-၂ ထိန်းသိမ်းမှုကို ပုံမှန် စစ်ဆေးမှု ပြုလုပ်ရန်။	လျှစ်လျူရှုနိုင်	စက်ထိန်းသိမ်းမှု လက်စွဲ ထားရှိပြီး ပုံမှန်ထိန်းသိမ်းမှု ပြုလုပ်ရန်	Yoke Pyo	စက်ရုံပိတ်သိမ်းခြင်း	စက်/ယာဉ် ထိန်း သိမ်းမှု မှတ်တမ်းများ
	၁-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၁-၂-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ် ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၂-၁-၁ စက်ယန္တရားများ အသုံးပြုရာ၊ ဆီဖြည့်ရာ၊ သိုလှောင်ရာတွင် ဖိတ်စင်မှု၊ အငွေ့ပျံမှု၊ လေလွင့်မှု နည်းစေရေး ဆောင်ရွက်ရန်။	လျှစ်လျူရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure) ထားရှိရန်	Yoke Pyo (Safety and Environment Section)	စက်ရုံပိတ်သိမ်းခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure)
	၁-၃ စွမ်းအင် အသုံးပြုမှု	၁-၃-၁ အခိုးအငွေ့ အမှုန်အမွှား ထုတ်လွှတ် ခြင်း နှင့် GHG ကြောင့် လေအရည်အသွေး ကို လျော့ကျစေပြီး ရာသီဥတုပြောင်းလဲမှု ကိုဖြစ်ပေါ်စေခြင်း	၁-၃-၁-၁ စက်စွမ်းရည် ကောင်းမွန်မှုကို သေချာစေရန် စက်ထုတ်လုပ်သည့် ကုမ္ပဏီများ၏ သတ်မှတ်ချက် များနှင့် သတ်မှတ်အချိန်ကာလ အတိုင်း စက်များကို ပြုပြင်ထိန်းသိမ်းရန်။	လျှစ်လျူရှုနိုင်	စက်ထိန်းသိမ်းမှု လက်စွဲ ထားရှိပြီး ပုံမှန်ထိန်းသိမ်းမှု ပြုလုပ်ရန်	Yoke Pyo	စက်ရုံပိတ်သိမ်းခြင်း	စက်ထိန်း သိမ်းမှု မှတ်တမ်းများ
၂။ ရေအရည်အသွေး	၂-၁ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၂-၁-၁ ရေညစ် ညမ်းမှု ဖြစ်နိုင်ချေ ရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ် အတောက် ပါဝင်နိုင်ခြင်း၊ အောက်စီ ဂျင် ပါဝင်မှု ကျဆင်း နိုင်ခြင်း။	၂-၁-၁-၁ ဆေးကြောသန့်ရှင်းသည့်ရေ အနည်းဆုံး အသုံးပြုမည့် စက်ရုံပိတ်သိမ်းမည့်နည်းကို အသုံးပြုရန် ၂-၁-၁-၂ စက်မှုဇုန်တွင်တည်ရှိ သဖြင့် ပစ္စည်းများကို အခြားနည်းဖြင့် အသုံးပြုရန်ဖြစ်နိုင်ပါက အသုံးပြုရန်	လျှစ်လျူရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure) ထားရှိရန်	Yoke Pyo (Safety and Environment Section)	စက်ရုံပိတ်သိမ်းခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure)

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	၂-၂ ဘေးဖြစ်စေ တတ် သော ပစ္စည်း များ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၂-၁ ဘေးဖြစ်စေ တတ် သော ပစ္စည်း များမှောက် ကျ၊ လျှံကျမှုကြောင့် ရေ ညစ်ညမ်းမှု ဖြစ်နိုင်ချေ ရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ် အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	၃-၂-၁-၁ လောင်စာဆီထိန်းသိမ်းမှု သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း သိုလှောင် ထိန်းသိမ်းရန်။ ၃-၂-၁-၂ လိုအပ်၍ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျစ်လျူ ရှုနိုင်	၁။ ဖိတ်စင်ကျသော ဓာတုပစ္စည်း၊ လောင် စာဆီ၊ စွန့်ပစ်ဆည်း များ ထည့်ရန် ရုပ်ပျိုမှ spill kits ထားရှိ ပေးရန်။ ၂။ ရုပ်ပျိုမှ Waste Management Plan ထားရှိပေးရန်။	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	၁။ ဖိတ်စင်ကျမှု မှတ်ထမ်း ၂။ Waste Manage-ment Plan
	၂-၃ ရေဆိုးစွန့်ပစ်မှု	၂-၃-၁ ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ် အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	၃-၃-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်း များ ကို လိုက်နာရန်။ ၃-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေ ရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။	လျစ်လျူ ရှုနိုင်	ရုပ်ပျိုး၏ Waste Management Plan နှင့်အညီ ရေဆိုးများကို သိုလှောင်၊ ခွဲခြား၊ သယ်ပို့ စွန့်ပစ်ရန်။	Yoke Pyo (Safety and Environment Section)	စက်ရုံပိတ် သိမ်းခြင်း	Waste Manage-ment Plan
	၂-၄ ဘေးဥပါဒ် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၂-၄-၁ ပစ္စည်းများ ဖိတ်စင်မှု ကြောင့် ရေညစ် ညမ်းမှု ဖြစ်နိုင်ချေရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ်အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊ အောက်စီ ဂျင်ပါဝင်မှု ကျဆင်းနိုင်ခြင်း။	၃-၄-၁-၁ စက်ရုံပိတ်သိမ်းစဉ်ကာလတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦးနံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၄-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျစ်လျူ ရှုနိုင်	တာဝန်ရှိသူများက ရေကို အနည်းဆုံးသာ အသုံးပြု ကြောင်း သေချာစေရန် သေချာစွာ ညွှန်ကြား ၍ စစ်ဆေးမှု ပြုလုပ် ရန်။	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြော ပြီး သည့် ရေကို သတ်မှတ် စံချိန် စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေး ခြင်း မှတ်တမ်း
ဂေဟဗေဒဆိုင်ရာ ပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ခြင်း								
၃။ ရေနေသက်ရှိများ/ ပျက်သုဉ်းနိုင်ချေရှိမျိုး စိတ်များ/	၃-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၃-၁-၁ စက်နှင့်ယာဉ်များ ရေဆေးကြောမှု ကြောင့် ရေညစ်ညမ်းမှု ဖြစ်နိုင်	၃-၁-၁-၁ စက် ပိတ်သိမ်းစဉ် ကာလများ တွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို	လျစ်လျူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြု ကြောင်း သေချာ စေရန်	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြော ပြီးသည့်ရေကို

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
ထိခိုက်လွယ်သော/ ကာကွယ် ထားသော ဧရိယာများ		ချေရှိခြင်း၊ ဂေဟ စနစ် ကိုထိခိုက် နိုင်ခြင်း၊	အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၁-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။		သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။			စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
	၃-၂ လောင်စာဆီ သိုလှောင် ထိန်းသိမ်းခြင်း	၃-၂-၁ ယိုဖိတ်မှုများကြောင့် ရေညစ်ညမ်းမှု ဖြစ်နိုင်ချေ ရှိခြင်း၊ ရေထဲတွင် အမှုန်အမွှား၊ အညစ် အကြေး အဆိပ်အတောက် ပါဝင် နိုင်ခြင်း၊	၃-၂-၁-၁ လောင်စာဆီထိန်းသိမ်းမှု သတ်မှတ်ချက် များနှင့် သတ်မှတ် အချိန်ကာလ အတိုင်း သိုလှောင် ထိန်းသိမ်းရန်။ ၃-၂-၁-၂ လိုအပ်၍ ဆေးကြောပြီး သည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျှစ်လျူ ရှုနိုင်	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure) ထားရှိရန်	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	လောင်စာဆီ ထိန်းသိမ်းမှု သတ်မှတ်ချက် (Standard Operating Procedure)
	၃-၃ ရေဆိုးစွန့် ပစ်မှု	၃-၃-၁ ရေဆိုးစွန့်ပစ် မှု၊ မှောက်ကျ လျှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင်သည်။	၃-၃-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၃-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။ ၃-၃-၁-၃ စက်သုံးဆီများဖြင့် ညစ်ညမ်းနေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲ၍ စွန့်ပစ်ခြင်း။	လျှစ်လျူရှုနိုင်	စွန့်ပစ်ရေ စီမံခန့်ခွဲမှု/ သန့်စင်မှု စနစ်ထား ရှိရန်	Yoke Pyo	စက်တပ် ဆင်ခြင်း	စွန့်ပစ်ရေ ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက် သည့် မှတ်တမ်း
	၃-၄ ဘေးဖြစ်စေ တတ် သော ပစ္စည်း များ သိုလှောင် ကိုင်တွယ်ခြင်း	၃-၄-၁ ပတ်ဝန်းကျင် သို့ အန္တရာယ်ရှိ စွန့်ပစ္စည်းများ ရောနှော ရောက်ရှိနိုင်ခြင်း၊ စွန့်ပစ္စည်းများ တွေ့မြင်ရ သဖြင့်၊ ကောင်းမွန် သော လူနေမှုဘဝ အရည် အသွေး လျော့ကျ နိုင်ခြင်း	၃-၄-၁-၁ စွန့်ပစ္စည်း ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၃-၄-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာစေရန် စွန့်ပစ္စည်း ရှင်းလင်း/ သန့်စင်မှုစနစ် ထားရှိရန်။	လျှစ်လျူရှုနိုင်	စွန့်ပစ္စည်း စီမံခန့်ခွဲမှု စနစ်ထားရှိရန်	Yoke Pyo/ ရွှေဘို မြို့နယ် စည်ပင်သာယာ ရေးကော်မတီ	စက်ရုံပိတ် သိမ်းခြင်း	စွန့်ပစ္စည်း ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက် သည့် မှတ်တမ်း

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		၃-၄-၂ လက်ရှိစွန့် ပစ္စည်း စီမံမှု စနစ်နှင့် ပစ္စည်း များအပေါ် ဝန်ပိစေခြင်း	၃-၄-၂-၁ စက်သုံးဆီများဖြင့် ညစ်ညမ်း နေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲပြီးမှ စွန့်ပစ်ခြင်း။ ၃-၄-၂-၂ အန္တရာယ်ရှိပစ္စည်းနှင့် အန္တရာယ်မရှိ ပစ္စည်းခွဲ၍ သင့်လျော် သော အညွှန်းစာ ချိတ်ဆွဲခြင်း။					
	၃-၅ စက်ပစ္စည်း များ နေရာယူ ထားရှိမှု	၃-၅-၁ စက်နှင့်ယာဉ်များ ရပ်ဆေးကြောမှု ကြောင့် ရေညစ်ညမ်းမှု ဖြစ်နိုင် ချေရှိခြင်း၊ ဂေဟ စနစ် ကိုထိခိုက် နိုင်ခြင်း၊	၃-၅-၁-၁ ပိတ်သိမ်းစဉ် ကာလများတွင် စက်အစိတ်အပိုင်း၊ အဆောက်အဦး နံရံ၊ ကြမ်းပြင်တို့ကို ဆေးကြောရပါက ရေကို အနည်းဆုံးသာ အသုံးပြုရန်။ ၃-၅-၁-၂ ဆေးကြောပြီးသည့်ရေကို သတ်မှတ်စံချိန်စံညွှန်းနှင့် ကိုက်မကိုက် စစ်ဆေးပြီး ကိုက်ညီမှသာ စွန့်ပစ်ရန်။	လျှော်လျှူရှုနိုင်	တာဝန်ရှိသူများက ရေကိုအနည်းဆုံးသာ အသုံးပြုကြောင်းသေ ချာစေရန် သေချာစွာ ညွှန်ကြား၍ စစ်ဆေးမှု ပြုလုပ်ရန်။	Yoke Pyo/ Contractor	စက်တပ် ဆင်ခြင်း	၁။ ရေသုံးစွဲမှု မှတ်တမ်း ၂။ ဆေးကြော ပြီး သည့်ရေကို စံချိန်စံညွှန်းနှင့် ကိုက် မကိုက် စစ်ဆေးခြင်း မှတ်တမ်း
လူမှုရေးဆိုင်ရာ သက်ရောက်မှု အကဲဖြတ်ခြင်း								
၄။ သယ်ယူပို့ ဆောင်ခြင်း	၄-၁ ဝန်ထမ်းများ၊ ပစ္စည်းများသယ်ယူ ပို့ဆောင်ခြင်း	၄-၁-၁ ယာဉ်ကြော အတွင်း ယာဉ်ပိုများ လာခြင်း ၄-၁-၂ တော်တဆမှုများ ကြောင့် ယာဉ်ကြော ပြတ်တောက်နိုင်ခြင်း	၄-၁-၁-၁ စက်တပ်ဆင်ခြင်းမစမီ အနည်းဆုံး (၅) ရက် ကြို၍ ရှေဘိုတက္ကသိုလ်တာဝန်ရှိသူ များနှင့်တွေ့ဆုံပြီး၊ အဆင်ပြေမည့်ရက် သတ်မှတ်ရန်။ ၄-၁-၂-၁ ယာဉ်မတော်တဆမှုများ ကာကွယ်တားဆီးရန်၊ သယ်ယူပို့ ဆောင်ရေးယာဉ် အားလုံးတွင် သင့်လျော်သော အချက်ပြမီး တပ်ဆင်ရန်	ထိခိုက်မှု အဆင့်နိမ့်	ရှေဘိုတက္ကသိုလ်တာဝန်ရှိသူ များနှင့် တွေ့ဆုံ၍ အဆင်ပြေ မည့်ရက် သတ်မှတ်ရန်။	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	ရှေဘိုတက္ကသိုလ် တာဝန်ရှိသူ များနှင့် ဆက်သွယ် သည့် မှတ်တမ်း။
၅။ စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု	၅-၁ ဘေးဥပါဒ် ဖြစ်စေ နိုင်သော ပစ္စည်းနှင့် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင် ကိုင်တွယ်ခြင်း	၅-၁-၁ ပတ်ဝန်းကျင် သို့ အန္တရာယ်ရှိ/ မရှိ သော စွန့်ပစ်ပစ္စည်းများ ရောနှော ရောက်ရှိနိုင်ခြင်း၊ စွန့် ပစ်ပစ္စည်းများ တွေ့မြင်ရ သဖြင့်၊ ကောင်းမွန် သော လူနေမှုဘဝ အရည် အသွေးလျော့ကျ နိုင်ခြင်း	၅-၁-၁-၁ အန္တရာယ်ရှိသော/ မရှိ သော စွန့်ပစ်ပစ္စည်းများကိုခွဲ ခြား၍အညွှန်းစာ တပ်ထားသော ထည့်စရာထဲထည့်သိမ်း ဆည်းရန်။ ၅-၁-၁-၂ မည်သည့်စွန့်ပစ်ပစ္စည်းကိုမျှ သတ်မှတ်ချက်နှင့်မကိုက်ညီသည့်နေရာ တွင် မစွန့်ပစ်ပါနှင့်။ ၅-၁-၁-၃ အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်း	လျှော်လျှူ ရှုနိုင်	သင့်လျော်သော waste management system ထားရှိပါ။	Yoke Pyo/ ရှေဘို မြို့နယ် စည်ပင်သာယာ ရေးကော်မတီ	စက်ရုံပိတ် သိမ်းခြင်း	စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု မှတ်တမ်း။

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
		၅-၁-၂ လက်ရှိ စွန့်ပစ်ဥည်း စီမံမှု စနစ်နှင့် ပစ္စည်းများ အပေါ် ဝန်ပိစေခြင်း	များကို မီးနှင့်ဝေးရာထားပါ။ သယ်ပို့ရာ တွင် ခိုင်ခံ့ဘေးကင်းသော ထည့်စရာဖြင့် ရွှေ့ပြောင်းပါ။ ၅-၁-၁-၄ စွန့်ပစ်ဥည်း အမျိုးအစား ၊ ပမာဏကို မှတ်တမ်းထားပါ။ ခွဲခြား သိမ်းဆည်း၊ သယ်ပို့၍ သင့်လျော်သော နည်းလမ်းပစ္စည်းများသုံး၍ စွန့်ပစ်ပါ။					
	၅-၂ ရေဆိုးစွန့် ပစ်မှု	၅-၂-၁ ရေဆိုးစွန့်ပစ် မှု၊ မှောက်ကျ လွှံကျမှု၊ ကြောင့် ရေနေသက်ရှိနှင့် ဂေဟ စနစ်ကို ထိခိုက်နိုင်သည်။	၅-၂-၁-၁ ရေဆိုးစွန့်ပစ်မှုနှင့် ပတ်သက်သည့် မြန်မာနိုင်ငံ၏ စံသတ်မှတ်ချက်များ၊ စည်းမျဉ်းများ ကို လိုက်နာရန်။ ၅-၂-၁-၂ စွန့်ပစ်ရေ အရည်အသွေး သည် Myanmar Emission Guideline (2015) နှင့် ကိုက်ညီမှုရှိကြောင်း သေချာ စေရန် ရေသန့်စင်မှုစနစ် ထားရှိရန်။ ၅-၂-၁-၃ စက်သုံးဆီများဖြင့် ညစ်ညမ်းနေသော ရေကိုစုဆောင်း၍ ဆီနှင့်ရေခွဲပြီးမှ စွန့်ပစ်ခြင်း။ ၅-၂-၁-၄ အန္တရာယ်ရှိပစ္စည်းနှင့် အန္တရာယ်မရှိ ပစ္စည်းခွဲ၍ သင့်လျော် သော အညွှန်းစာ ချိတ်ဆွဲခြင်း။	လျှစ်လျူရှုနိုင်	စွန့်ပစ်ရေ စီမံခန့်ခွဲမှု/ သန့်စင်မှု စနစ်ထားရှိရန်	Yoke Pyo	စက်ရုံပိတ် သိမ်းခြင်း	စွန့်ပစ်ရေ ရှင်းလင်း/ သန့်စင်မှုနှင့် ပတ်သက် သည့် မှတ်တမ်း
၆. လူမှု စီးပွားရေး	၆-၁ ပစ္စည်း၊ ဝန်ဆောင်မှု များထောက်ပံ့ ဖြည့်ဆည်းခြင်း	၆-၁-၁ အနီးပတ်ဝန်းကျင်၌ အလုပ် အ ကိုင်၊ ဝင်ငွေ၊ ရောင်း ဝယ်မှု၊ ဝန်ဆောင်မှု၊ အခွင့် အလမ်းများ တိုးတက်ခြင်း	၆-၁-၁-၁ ဒေသတဝိုက်မှ ဝန်ဆောင်မှုနှင့် ဆက်စပ်ပစ္စည်း များကို ဖြစ်နိုင်သမျှ ဝယ်ယူရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံ ထုတ် လုပ်သူများ နှင့် ဆက်သွယ်ရန်။	ဒေသတွင်း အလုပ်သမား များ၊ လုပ်ငန်းရှင်များ	စက်ရုံပိတ် သိမ်းခြင်း	ဝယ်ယူမှုမှတ် တမ်းများ
	၆-၂ အလုပ်သမား၊ စက်ကိရိယာ၊ ထောက်ပံ့ပေးခြင်း	၆-၂-၁ အနီးပတ် ဝန်းကျင်၌ အလုပ်အကိုင်၊ ရောင်း ဝယ်မှု၊ အခွင့် အလမ်းများ တိုးတက် ခြင်း	၆-၂-၁-၁ ဖြစ်နိုင်ပါက အရည် အချင်းရှိသော ဒေသခံ အလုပ်သမားများ ခန့်အပ်ရန်။	ကောင်းကျိုး သက်ရောက်မှု	ဒေသခံလူထု၏ အကြိုး အကဲများ နှင့် ဆက်သွယ်ရန်။	ဒေသတွင်း အလုပ် သမား များ၊ လုပ်ငန်းရှင်များ	စက်ရုံပိတ် သိမ်းခြင်း	အလုပ်သမား ခန့်အပ်မှု မှတ်တမ်းများ

ပြည်သူ့ကျန်းမာရေးနှင့် အလုပ်ခွင်ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
ပြည်သူ့ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု								
၁။ အမျှားပြည်သူ ကျန်းမာရေး	၁-၁ သယ်ယူ ပို့ဆောင်ရေး	၁-၁-၁ မတော်တဆ မှု၊ လေညှစ်ညှမ်းမှု၊ ဆူညံသံ၊ စွန့်ပစ်/ ဖိတ်စင် လောင်စာ တို့နှင့်ထိတွေ့မှု ကြောင့် အမျှား ပြည်သူ ကျန်းမာ ရေးထိခိုက်မှု ရှိနိုင်သည်။	၁-၁-၁-၁ စက်ရုံပတ်လည်တွင် မီတာ ၂၀ ဘေးကင်းရေးဇုန်သတ်မှတ်ရန်။ ၁-၁-၁-၂ ထိုဧရိယာကို အဆင့်အားလုံးတွင် စောင့်ကြပ်ကြည့်ရှုရန်။ ၁-၁-၁-၃ အဓိက သယ်ပို့မှု ကြိုးများ မတိုင်မီ အနည်းဆုံးတစ်ရက်ကြို၍ အနီးဝန်းကျင် လူထုသို့ လုပ်ငန်းဆိုင်ရာ အချက် အလက်များ ပေးပို့ရန်။	လျစ်လျူရှုနိုင်	ဘေးကင်းဇုန်ကို ပုံမှန် စောင့်ကြည့် ကြပ်မတ်ရန်	Yoke Pyo	အဆင့် အားလုံး	စောင့်ကြည့် ကြပ်မတ်ခြင်း မှတ်တမ်း
	၁-၂ အနှံ့ ထွက်ရှိခြင်း	၁-၂-၁ တိုင်းရင်းဆေး ပစ္စည်းများ ကြိတ် ခွဲခြင်း၊ စွန့်ပစ်ပစ္စည်း များ၊ ဖိတ်စင်လောင် စာဆီများမှ အနှံ့ ထွက် နိုင်ခြင်း။	၁-၂-၁-၁ အဆင့်အားလုံးတွင် စွန့်ပစ်ပစ္စည်း၊ လောင်စာဆီဖိတ်စင်ခြင်းကဲ့သို့ အနှံ့ထွက် နိုင်သည့် source များကို ထိန်းချုပ်ရန်။	လျစ်လျူရှုနိုင်	၁။ လောင်စာဆီ ယိုဖိတ်မှုများကို ပုံမှန်ရှင်းလင်းရန်။ ၂။ ပရဆေးပင် ဆေး ရွက်များကို သတ် မှတ်နေရာတွင်သာ ဖြတ်တောက်ကြိတ် ခွဲရန်။	Yoke Pyo	အဆင့် အားလုံး	လောင်စာဆီ ယိုဖိတ်မှုများကို ပုံမှန်ရှင်းလင်း ခြင်းမှတ်တမ်း
အလုပ်ခွင်ကျန်းမာရေးဆိုင်ရာထိခိုက်မှု								
၂။ လုပ်ငန်းခွင် ကျန်းမာရေး	၂-၁ လေအရည် အသွေး	၂-၁-၁ မတော်တဆ မှု၊ လေညှစ်ညှမ်းမှု၊ ဆူညံ သံ၊ အခြား ကျန်းမာရေး ဆိုင်ရာ ကိစ္စများအပေါ် စိုးရိမ်မှု တို့ကြောင့် လုပ် ငန်းခွင် ကျန်း မာ ရေးထိ ခိုက်မှု ရှိနိုင်သည်။	၂-၁-၁-၁ သက်ဆိုင်ရာလုပ်သားများ အ တွက် သင့်လျော်သော အသက်ရှူလမ်း ကြောင်း ကာကွယ်ရေးပစ္စည်း အသုံးပြုရန်။	လျစ်လျူရှုနိုင်	လေအရည်အသွေး စစ်ဆေး၍ အသက် ရှူလမ်း ကြောင်း ကာကွယ်ရေးပစ္စည်း ပံ့ပိုးရန်။	Yoke Pyo	အဆင့် အားလုံး	အသက် ရှူ လမ်း ကြောင်း ကာကွယ်ရေး ပစ္စည်းများ

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	၂-၂ (အမှုန့်ကြိတ်) စက်ဆူညံသံ	၂-၂-၁ ဆူညံသံကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	၂-၂-၁-၁ ဆိုင်ရာ လုပ်သားများကို earplug၊ earmuff စသော Personnel Protective Equipment (PPE) ပံ့ပိုးရန်။ ၂-၂-၁-၂ လုပ်သားများကို safety operation နှင့် regulation နှင့်အညီ အလုပ်လုပ်တတ်စေရန် သင်တန်းပေး ရမည်။ ၂-၂-၁-၃ စက်များကို ထိန်းသိမ်းမှု လမ်းညွှန်ချက်နှင့်အညီ ပြုပြင်ထိန်းသိမ်းရမည်။	လျစ်လျူရှုနိုင်	ဆူညံသံ အဆင့် ကို တိုင်း တာ၍ ဆိုင်ရာ အလုပ် သမားများကို သင့်လျော်သော နား အကာအကွယ် ပစ္စည်း ပံ့ပိုးရန်။	Yoke Pyo	အဆင့် အားလုံး	အလုပ်ခွင်ဘေးကင်းရေးဆိုင်ရာသင်တန်း မှတ်တမ်း။ ဆူညံမှု အဆင့် တိုင်းတာမှု မှတ်တမ်း။
	၂-၃ အနှံ့ ထွက်ရှိခြင်း	၂-၃-၁ တိုင်းရင်းဆေးပစ်စည်းများ ကြိတ်ချေခြင်း၊ စွန့်ပစ်စည်းများ၊ ဖိတ်စင်လောင်စာဆီများမှ အနှံ့ ထွက်နိုင်ခြင်း။	၂-၃-၁-၁ အဆင့်အားလုံးတွင် စွန့်ပစ်စည်း၊ လောင်စာဆီဖိတ်စင်ခြင်းကဲ့သို့ အနှံ့ထွက်နိုင်သည့် source များကို ထိန်းချုပ်ရန်။	လျစ်လျူရှုနိုင်	၁။ လောင်စာဆီယိုဖိတ်မှုများကို ပုံမှန်ရှင်းလင်းရန်။ ၂။ ပရဆေးပင် ဆေးရွက်များကို သတ်မှတ်နေရာတွင်သာ ဖြတ်တောက်ကြိတ်ချေရန်။	Yoke Pyo	အဆင့် အားလုံး	လောင်စာဆီယိုဖိတ်မှုများကို ပုံမှန်ရှင်းလင်းခြင်းမှတ်တမ်း
	၂-၄ စွန့်ပစ်ရေဆိုး	၂-၄-၁ မတော်တဆမှု၊ စွန့်ပစ်ပစ္စည်းဖိတ်စင်မှု တို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စတို့နှင့်ပတ်သက်၍ စိုးရိမ်မှုတို့ကြောင့် လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	၂-၄-၁-၁ ရေသန့်စင်မှု စနစ်နှင့် ရေနတ်မြောင်းကိုပုံမှန်စစ်ဆေးထိန်းသိမ်း ရန်။ ၂-၄-၁-၂ သောက်ရေ၊ လုပ်ငန်းသုံးရေ တို့ကို ညစ်ညမ်းမှုအမျိုးမျိုးမှ ကာကွယ်ရန် သန့်ရှင်းလုံခြုံစွာထားရမည်။ ၂-၄-၁-၃ အလုပ်ခွင်အတွင်းရောဂါ ပျံ့ပွားမှုများမဖြစ်စေရန် လုပ်ငန်းခွင်သန့်ရှင်းရေး ကိုတင်းကြပ်စွာ ထိန်းသိမ်းရမည်။ ၂-၄-၁-၄ အလုပ်ခွင် သန့်ရှင်းရေး အလေ့အကျင့် ကောင်းရရှိစေရန် လုပ်သားများကို ကျန်းမာရေး အသိပညာပေး သင်တန်း တက်ရောက်စေရမည်။	လျစ်လျူရှုနိုင်	ရေဆိုးသန့်စင်မှုစနစ် ကောင်းမွန်စေရန်။ လုပ်သားများ မှန်ကန်သော လေ့ ကျင့်မှု သင်တန်းရရှိစေရန်။	Yoke Pyo	အဆင့် အားလုံး	ရေနုတ်မြောင်းထိန်းသိမ်းမှု မှတ်တမ်း၊ လုပ်သားသင်တန်းပေးမှုမှတ်တမ်း
	၂-၅ ဘေး ဥပါဒ် မဖြစ်စေ တတ် သော ပစ္စည်းများ သိုလှောင်	၂-၅-၁ ဘေး ဥပါဒ် မဖြစ်စေ တတ် သော စွန့်ပစ်စည်း	၂-၅-၁-၁ အစားအသောက် စွန့်ပစ်စည်းများကို အခြားစွန့်ပစ်စည်းများနှင့် ခွဲခြားရမည်။	လျစ်လျူရှုနိုင်	စွန့်ပစ်စည်းများ သိမ်းဆည်းစွန့်ပစ်မည့် Standard	Yoke Pyo	အဆင့် အားလုံး	SOP နှင့်အညီ စွန့်ပစ်သည့် မှတ်တမ်း

အနှစ်ချုပ်အစီရင်ခံစာ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြွင်းကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
	ကိုင်တွယ်ခြင်း	ဖိတ်စင်မှု၊ ၄င်းတို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စ တို့နှင့်ပတ်သက်၍ စိုးရိမ်မှု အန္တရာယ် ရှိနိုင်သည်။	၂-၅-၁-၂ ကျန်သော အန္တရာယ်မရှိ ပစ္စည်းများကို စွန့်ပစ်၊ သန့်စင်၊ ပြန်မသုံးမီ အမျိုးအစားခွဲ ရမည်။ ၂-၅-၁-၃ စွန့်ပစ္စည်းများကို ရွှေဘို စည်ပင်သာယာရေးကော်မတီကသိမ်းဆည်း စွန့်ပစ်မည်။		Operating Procedure, SOP ထားရှိရန်။			
	၂-၆ ဘေးဖြစ် စေတတ်သော ပစ္စည်းများ သိုလှောင်ကိုင်တွယ်ခြင်း	၂-၆-၁ ဘေးဖြစ် စေတတ် သော ပစ္စည်းများ၊ စွန့်ပစ် ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် ထိတွေ့မှု၊ ၄င်းကိစ္စ တို့နှင့် ပတ်သက်၍ စိုးရိမ်မှု အန္တရာယ် ရှိနိုင်သည်။	၂-၆-၁-၁ ဘေးဖြစ် စေတတ် သော စွန့်ပစ္စည်းများကို လုံခြုံသည့်ထည့်စရာ တွင်ထည့်ပိတ် ၍ သယ်ပို့၊ စွန့်ပစ်ရမည်။ ၂-၆-၁-၂ ဘေးဖြစ် စေတတ် သော စွန့်ပစ္စည်းများကို ကိုင်တွယ်ရသည့် ဝန်ထမ်း များကို ဆိုင်ရာသင်တန်းပေးခြင်း၊ သင့်လျော်သည့် Personnel Protective Equipment (PPE) များပံ့ပိုးထားရမည်။ ၂-၆-၁-၃ ဆီနှင့်လောင်စာဆီ ဖိတ်စင်မှု ဆိုင်ရာ ထိန်းသိမ်းရေးအစီအအစဉ်များ၊ ပစ္စည်းများ ထားရှိရမည်	လျစ်လျူရှုနိုင်	စွန့်ပစ္စည်းများ သိမ်းဆည်းစွန့်ပစ်မည့် Standard Operating Procedure, SOP ထားရှိရန်။	Yoke Pyo	အဆင့် အားလုံး	သင့်လျော်သည့် PPE ၊ စွန့်ပစ္စည်းများ သိမ်း ဆည်းစွန့်ပစ်မည့် Standard Operating Procedure, SOP
	၂-၇ အလုပ်ခွင် မတော်တဆ ဖြစ်မှုများ	၂-၇-၁ မတော်တဆ ထိခိုက်မှု၊ စွန့်ပစ် ပစ္စည်း ဖိတ်စင်မှု တို့နှင့် တိုက်ရိုက် ထိတွေ့မှု၊ လုပ်ငန်းခွင် အန္တရာယ် ရှိနိုင်သည်။	၂-၇-၁-၁ ဝန်ထမ်းများ လုပ်ငန်းခွင် အန္တရာယ်ကိုသိရှိပြီး ဘေးကင်းစွာ အလုပ်လုပ်တတ်စေမည့် ဘေးကင်းရှင်း ရေးသင်တန်းများ တက်ရောက်စေရန်။ ၂-၇-၁-၂ လုပ်သားများကို လုပ်ငန်းသဘာဝ အလိုက် သင့်လျော်သော PPE ပံ့ပိုးရန်။ ၂-၇-၁-၃ သယ်ယူနိုင်သော သင့်လျော်သည့် မီးသတ်ဆေးဘူး ကိုလုံလောက်သောအရေ အတွက်ထားရှိရန်။ ၂-၇-၁-၄ မီးလောင်မှု၊ ဆီနှင့် ဓာတုပစ္စည်း ဖိတ်စင်မှု တို့ကိုထိရောက်စွာ ဖြေရှင်းနိုင်ရန် အရေးပေါ် စီမံခန့်ခွဲမှု အစီအစဉ် ထားရှိ ရမည်။ ၂-၇-၁-၅ လိုအပ်သော ရှေးဦးသူနာပြု ပစ္စည်းများနှင့် ပြုစု တတ်သူအဆင်သင့်ထားရှိရန်။	လျစ်လျူရှုနိုင်	လုပ်ငန်းခွင်၌ မတော်တဆဖြစ်မှုများကာကွယ်ရန် တိကျသည့် မတော်တဆဖြစ်မှု ဆိုင်ရာ SOP ထားရှိရမည်။	Yoke Pyo	အဆင့် အားလုံး	ဘေးကင်းရှင်း ရေးသင်တန်း မှတ်တမ်း။ အရေးပေါ် စီမံခန့်ခွဲမှု အစီအစဉ် ။

အနှစ်ချုပ်အစီရင်ခံစာ

စီစဉ်မထားသော အဖြစ်အပျက်များ

ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	လုပ်ငန်းအစီအစဉ်	ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှု	ထိခိုက်မှု လျှော့ချရေး လုပ်ငန်းများ	ကြိုးကျန် သက်ရောက်မှု	အထူး ဆောင်ရွက်ချက်	တာဝန်ယူ ဆောင်ရွက်မည့် အဖွဲ့ဝင်များ	လုပ်ငန်း အဆင့်	ထားရှိရမည့် မှတ်တမ်း
၁။ လောင်စာဆီ၊ ဓာတု ပစ္စည်း၊ ဘေးဥပါဒ် ဖြစ်စေနိုင်သော ပစ္စည်းများ၊ စွန့်ပစ်ပစ္စည်းများ ဖိတ်စင်မှု	၁-၁ လောင်စာဆီ၊ ဓာတု ပစ္စည်း၊ ဘေးဥပါဒ်ဖြစ်စေနိုင်သော ပစ္စည်းများ၊ အခြား စွန့်ပစ်ပစ္စည်း များသိုလှောင်မှု	၁-၁-၁ ဖော်ပြပါပစ္စည်းများ ပတ်ဝန်းကျင်သို့ ဖိတ်စင်ခြင်းဖြင့် ရေအရည်အသွေးနှင့် ရေနေသက်ရှိသတ္တဝါများ ကို ထိခိုက်နိုင်သည်။	၁-၁-၁-၁ Yoke Pyo Emergency ResponsePlan တွင်ပါသည့် ဘေးအန္တရာယ် ကင်းရှင်းရေး အစီအစဉ်ကို ဆောင်ရွက်ရန် ၁-၁-၁-၂ ရုပ်ပျိုး ၏ ဖိတ်စင်မှု Emergency Response Plan ကို အကောင်အထည်ဖော်ခြင်း၊ အစမ်းလေ့ကျင့်ခြင်း၊ သင်တန်း ပေးခြင်း	လျစ်လျူရှုနိုင်	၁။ ရုပ်ပျိုး မှ Emergency ResponsePlan ထားရှိပေးရန်။ ၂။ ရုပ်ပျိုး မှ ဖိတ်စင်မှု Emergency Response Plan ထားရှိပေးရန်။ ၃။ ရုပ်ပျိုး မှ Spill kits ထားရှိပေးရန်။	Yoke Pyo	အဆင့် အားလုံး	၁။ ဖိတ်စင်မှု မှတ်တမ်း ၂။ Emer-gency Response Plan
၂။ မီးလောင်မှု	၂-၁ လောင်စာဆီ၊ ဓာတု ပစ္စည်းများ သိုလှောင်မှု	၂-၁-၁ မီးလောင်မှု၊ ပေါက်ကွဲမှုတို့ကြောင့် ခန္ဓာကိုယ်ထိခိုက်မှု၊ ပျက်စီးမှု၊ အသက်သေဆုံးမှု၊ ညစ်ညမ်းမှု များဖြစ်နိုင်သည်။	၂-၁-၁-၁ လုပ်ငန်းခွင်တွင် အရေးပေါ် ကိစ္စ အတွက် မီးဘေးကာကွယ်ရေး ပစ္စည်းများ ထားရှိပေးရန်၊ သင့်လျော်သော လေ့ကျင့်သင်တန်း ပေးမှုများ ပြုလုပ်ရန် ၂-၁-၁-၂ မီးလောင်မှု ဖြစ်ပေါ်ပါက Emergency Response Plan အကောင်အထည်ဖော်ရန်	လျစ်လျူရှုနိုင်	Yoke Pyo မှ Fire Safety Plan ထားရှိပေးရန်	Yoke Pyo	အဆင့် အားလုံး	မီးလောင် ပေါက်ကွဲမှု မှတ်တမ်း

၁-၈။ လူမှုစီးပွားတာဝန်သိအစီအစဉ်

ရုပ်ပျိုတိုင်းရင်းဆေးဝါး ကုမ္ပဏီလီမိတက်အနေဖြင့် ရုပ်ပျိုတိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးလုပ်ငန်းမှ ရရှိသော အသားတင်အမြတ်ငွေများ၏ ၂ ရာခိုင်နှုန်းအား ပတ်ဝန်းကျင်လူထုများ၏ ကျန်းမာရေး၊ ပညာရေး နှင့် လူမှုရေးတို့တွင် အချိုးကျခွဲဝေသုံးစွဲမည်ဖြစ်ပါသည်။

၁-၉။ လူထုသဘောထားစစ်တမ်းကောက်ယူခြင်းနှင့် လူထုတွေ့ဆုံဆွေးနွေးခြင်း

လူထုတွေ့ဆုံပွဲကို ၂၀၂၀ ခုနှစ်၊ ဖေဖော်ဝါရီလ (၁၈) ရက်နေ့တွင် စစ်ကိုင်းတိုင်းဒေသကြီး၊ ရွှေဘို မြို့နယ်၊ ရွှေဘိုစက်မှုဇုန်အတွင်းရှိ ရုပ်ပျိုတိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးစက်ရုံအတွင်းတွင် ပြုလုပ် ကျင်းပခဲ့ပါသည်။ လူထု တွေ့ဆုံပွဲသို့ ရွှေဘိုမြို့နယ် မင်းကျောင်းကျေးရွာ၊ မြောင်းကြီးကျေးရွာ၊ နှင့် ပဂိုးကုန်း ကျေးရွာတို့မှ ဒေသခံများ၊ မြို့မိမြို့ဖများ၊ ရုပ်ပျိုတိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေးစက်ရုံ မှ တာဝန်ရှိ သူများနှင့် ဝန်ထမ်းများ Smart Environs Company Limited မှ တာဝန်ရှိသူများအပါအဝင် စုစုပေါင်း (၉၃) ဦးခန့်တက်ရောက်ခဲ့သည်။ ရုပ်ပျိုကုမ္ပဏီက ဆေးဝါးစက်ရုံ၏ ရည်ရွယ်ချက်၊ မျှော်မှန်းချက်၊ ထုတ်လုပ်မှု လုပ်ငန်းစဉ်၊ အရည်အသွေးထိန်းသိမ်းမှု၊ အလုပ်သမားများလေ့ကျင့်သင်တန်းပေးမှု၊ တို့ကိုရှင်းလင်းခဲ့ပြီး၊ တတိယအဖွဲ့များဖြစ်သည့် Sein Shwe Hein နှင့် Smart Environs တို့က ဆေးဝါးထုတ်လုပ်မှု လုပ်ငန်းမှထွက်ရှိနိုင်သည့် စွန့်ပစ္စည်းများ၊ ပတ်ဝန်းကျင်တဝိုက် Biodiversity study တွေ့ရှိချက်များ ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာထိခိုက်နိုင်မှုများကို လျှော့ချ ကုစားနိုင်မည့် နည်းလမ်းများကို တင်ပြ ဆွေးနွေးခဲ့သည်။ တက်ရောက်လာသူများထဲမှ တစ်စုံတစ်ရာဆွေးနွေးမှုများမရှိခဲ့ပါ။

၁-၁၀။ နိဂုံး

ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာ ပြဿနာများသည် လျစ်လျူရှုနိုင်သော (သို့မဟုတ်) ထိခိုက်မှု နိမ့်သောအဆင့်တွင်သာရှိကြပြီး ထိခိုက်မှုလျှော့ချရန်ဆောင်ရွက်နိုင်ပါသည်။ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် လူထုကျန်းမာရေးအပေါ်သက်ရောက်မှုများမှာ ထိခခိုက်မှု နိမ့်သောအဆင့်တွင်ရှိပါသည်။ စွန့်ပစ္စည်းများကို အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅) နှင့်အညီ ထုတ်လွှတ်ရမည်။ ဘေးအန္တရာယ် မရှိသောစွန့်ပစ္စည်းများကို ရွှေဘိုမြို့နယ် စည်ပင်သာယာရေးကော်မတီ၏ ကြီးကြပ်မှုဖြင့် ဆောင်ရွက်မည် ဖြစ်သည်။ ဘေးအန္တရာယ် ကင်းရှင်းရေးပစ္စည်းများ သုံးစွဲတတ်ရန်၊ ဘေးအန္တရာယ်ကင်းရှင်းရေး သင်တန်း များပို့ချရမည်၊ လိုအပ်သော တစ်ကိုယ်ရေသုံး ကာကွယ်ရေး ပစ္စည်းများ ပံ့ပိုးရမည်။ စီစဉ်မထားသော ဖြစ်ရပ် များကြောင့် သက်ရောက်မှုများအတွက် သင်တန်းပို့ချမှု ရရှိပြီးသူများနှင့် တိကျသောစီမံခန့်ခွဲမှု အစီအစဉ် များ ထားရှိရမည်။ အထက်ပါ ဆောင်ရွက်မှုများနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အတိုင်း ဆောင်ရွက်ပါ က ပတ်ဝန်းကျင်ထိခိုက်မှု၊ လူမှုစီးပွားရေးဆိုင်ရာ ထိခိုက်မှု နည်းပါးစွာဖြင့် တိုင်းရင်းဆေးဝါးထုတ်လုပ်ရေး လုပ်ငန်းကို ဆောင်ရွက်နိုင်မည်ဖြစ်သည်။

1. Executive Summary

1.1 Context of the Project

Yoke Pyo Traditional Production was started in 1972 by Professor U Chain. In 2013, Yoke Pyo Company Limited constructed new traditional medicine production factory in C-5,6,7,8 Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing Region. The project is located at the west side of Shwe Bo-Myitkyina highway. On completion, the factory will produce 800 kg per day (2000 Boxes per day). Project construction works started since 2013 and it was already completed and will be opened within 2020.

1.2 Project Proponent

The traditional medicine production project was proposed by Yoke Pyo Company Ltd. Brief information of the Project Proponent is as follow.

Sr.	Particular	Name/ Address
1	Company Name	Yoke Pyo Company Limited
2	Location Project	C-5,6,7,8, Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing Region
3	Company Address	C-5,6,7,8 Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing Region
4	Project Owner	U Kyaw Thet Naing
5	Company Registration No	102159519(001)
6	Project Start Date	2012
7	Construction Period	5 yrs
8	Type of Business	P.P.P
9	Total Project Area	(4.967) Acres

1.3 Overview of the Policy, Legal and Institutional Framework

The project proponent will be followed the following Laws, Rules and Procedures.

1. EIA Procedures (2015)
2. Employment and Skill Development Law (2013)
3. Environmental Conservation Law (2012)

4. Environmental Conservation Rules (2014)
5. Myanmar Engineering Council Law (2013)
6. Myanmar Insurance Business Law (1993)
7. Myanmar Investment Law (2016)
8. Myanmar Investment Rules (2017)
9. Myanmar Marine Fisheries Law (1990)
10. Myanmar Fire Bridgate Law (2015)
11. National Standards and Guidelines (2015)
12. Occupational Safety and Health Law (2019)
13. The Automobile Law (2015)
14. The Conservation of Water Resources and River Law (2006)
15. The Control of Smoking and Consumption of Tobacco Product Law (2006)
16. The Electricity Law (2014)
17. The Ethnic Rights Law (2015)
18. The Export and Import Law (2012)
19. The Factory Act (1951)
20. The Freshwater Fisheries Law (1991)
21. The Lave and Holiday Act (1951)
22. The Law on Standardization (2014)
23. The Labour Organization Law (2011)
24. The Labour Dispute Settlement Law (2012)
25. The Minimum Wages Law (2013)
26. The Payment of Wages Act (2016)
27. The Petroleum and Petroleum Product Law (2017)
28. The Prevention and Control of Communicable Disease Law (1995)
29. The Private Industrial Enterprise Law (1990)
30. The Prevention and Control of Communicable Diseases Law (2013)
31. The Public Heath Law (1972)
32. The Social Security Law (2012)
33. Workmen Compensation Act (1923)

1.4. Project Description

Yoke Pyo Company Limited will be produced Cough Syrup, Mann Say, Diabetes Drugs, Lay Ngann Zin Kyan Medicine, Brown Urine Medicine and Anumyu Mann say in new GMP Traditional Medicine Production Factory. The production process of Yoke Pyo Traditional Medicine Production Process is as follows.

- Raw materials handling and storage
- Formulation
- Pharmaceutical Processing
- Packaging and
- Quality Control

1.5. Description of the Environment

(a) Stakeholder Analysis

Stakeholders are categorized in four groups who can be effected directly or indirectly by project construction, operation and decommissioning activities such as local people, government organizations, project proponent and other interested groups such as NGOs. Analysis was based on primary impact factors such as involvement in land acquisition, vicinity to the project, common use of utilities such as water and infrastructures.

Table 1-1. Stakeholders of Yoke Pyo Traditional Medicine Factory

Sr.	Stakeholder Group	Stakeholder	Interest Level		Interest
			Level	Reason	
1	Local People	Min Kyaung	High	Vicinity	- Pollution - Access road -Water resources
		Myaung Gyi	High	Close Vicinity	
		Bago Gone	High	Close Vicinity	
2	Government Organization	General Administration Office Department	Medium	Administrative relation	-Administration -Coordination -CSR - Environ-mental Pollution
		Department of Irrigation	High	Storm water issue	
		Township Educational Office	Low	Only relevant for CSR	
		Land Records Department	Low	No land related issue	
		Township Health Department	Low	Only relevant for CSR	
		Township Environmental	Low	Environmental Pollution	

Sr.	Stakeholder Group	Stakeholder	Interest Level		Interest
			Level	Reason	
		Conservation Department			
		Township Fire brigade	Low	-	
3	Proponent	Project management Project construction contractor	High	- Project Owner	- Operation and Management - Construction - EMP
4	Other Interested Party	None	-	-	-

(b) Project Affected Area

Project affected area is demarcated based on the results of stakeholder analysis. Affected human settlements, noise environment, biological environment, hydrological regime and land environment are shown in the following table.

Table 1-2. Project Affected Area of Yoke Pyo Traditional Medicine Factory

Sr.	Category	Location	Factor
1	Human Settlements	Min Kyaung	Access road
		Myaung Gyi	Access road
		Bago Gone	Access road
2	Land Environment	Adjacent farmlands Plant compound	Waste, Irrigation channels Soil
3	Biological Environment	Direct impact area within plant compound and vicinity	Air Pollution Water pollution Noise pollution
4	Air and Noise Environment	Within plant compound and nearby community	Noise levels
5	Water Environment	Within plant compound and nearby community	Water usages Water quality Waste water
6	Socioeconomic Environment	Local Villages	- Job Opportunity - CSR

(c) Air Quality

The parameters for air Quality surveys were CO_2, CH_4, NO_2, O_3, Relative Humidity, SO_2, and Temperature.

The air quality survey results obtained every minute at each survey site were combined to make daily average values (24 hours or 8 hours or 1 hour or 10 minutes) for further evaluation and comparison with corresponding standard values. The result from Air Quality Survey is shown in Table 25.

(d) Water Quality

Water supply for Proposed Yoke Pyo Traditional Medicine Production Factory Project is obtained from the groundwater via 1-tube well and Yoke Pyo Co., Ltd is planning to be used the water from these tube well in project operation life. PH, colour, turbidity, TDS, TSS, Chloride, Hardness, DO, Iron and Fluoride were analyzed for tubewell water quality. All water samples were analyzed for their physiochemical properties in ALARM Ecological Laboratory and the result are as shown in Table 22.

(a) Soil Quality

According to test results as showm in Table 19 and 20, pH value of SS which was collected from the Proposed Yoke Pyo Traditional Medicine Production Factory Project Compound is 8.34 which falls under classification of moderately alkaline conditions.

(b) Biodiversity

Biodiversity includes two portions, which are the study of vegetation (flora) and the study of living animals (fauna). The natural vegetation and wildlife from Shwe Bo Township is in Table (28 to 34).

(e) Climate and Precipitation

Shwe Bo Township has a dry climate with an average annual temperature of (60˚F to 104˚F). April is the hottest month of the year with 104˚F and January is the coldest month of the year with 60˚F. The average annual precipitation is about 0.04 inches. Rainfall has its top in May with 0.8 inches. The lowest rainfall occurs during February, with an average of 0.0 inches.

(f) Socioeconomic Component

(i) Living Condition

A household baseline survey was conducted for the stakeholder village tracks surrounding the proposed project site that constitute the area of influence. There are 700 households in the three village tracks and a full census of all households was taken yielding an estimated stakeholder population of 3660.

Bamar is the largest ethnic group in the Shwe Bo Township, representing approximately 89.75 percent of Township's population. Chin is the second largest ethnic group, representing

approximately 0.059 percent. There are few Kachin, Kayar, Kayin, Rakhine, Shan, Chinese, Indian and Parkistan who reside in Shwe Bo Township.

The religions of the people in Shwe Bo Township are predominantly Buddhism. The composition of the population by religion is 87.9% Buddhist, 6.3% Christian, 4.3% Islam, 0.5% Hindu, 0.8 % Animist, 0.2% other religion and 0.1 % no religion.

The proportion of the productive working population between 15 to 64 years of age in Shwe Bo Township is 72.5% and the proportion of children aged 14 and below together with the proportion of the elderly aged 65 and over are less than the proportion of the working age group population. Almost half of the employed people aged 15-64 works in agricultural, forestry and fishery (35.4%) followed by 21.7% who work in elementary occupations. Other professions reported included managers, professionals, technicians and associate professionals, clerical support workers, craft and related trades workers, plant and machine operators and assemblers and other categories.

(ii) Education and Infractrustructure

There are 3 University/Collages, 17 B.E.H.S schools, 33 B.E.M.S schools and 126 B.E.P.S schools in Shwe Bo Township. School attendance in Shwe Bo Township drops after age 9 for both males and females. Compared to the union, the school attendance of males and females in Shwe Bo Township is higher from school going age to age 11 and lower in age 12 onwards that of the union. The literacy rate of those aged 15 and over in Shwe Bo Township is 99%.

The majority of the households in Shwe Bo Township are living in bamboo houses (43.4%) followed by households in wooden houses (38.9%). Improved sources of drinking water (tap water/piped, tube well, borehold, protected well/spring and bottled water/ water purifier) are used by 83.8 % of households and some 16.2% of the households use water from unimproved sources. In rural areas, 18.5% of households use water from unimproved sources for drinking water.

As the source of lighting, 45% of the households in Shwe Bo Township use electricity. This proportion belongs to the per cent (24-45) in electricity usage compared to other townships in Sagaing Region. The percent of electricity usage in Sagaing Region is 24.2%. The households in Shwe Bo Township mainly use wood-related fuels for cooking with 65.0% using firewood and 17.8% using charcoal. Only 16% of households use electricity for cooking. For health services and facilities, there are 8 hospitals, 36 clinics and 9 village health departments in Shwe Bo Township.

1.6 Summary of Residual Significance/Risk Rankings from Yoke Pyo Traditional Medicine Production Project

The residual risk rankings of the impact assessment of the Project on environmental, social, health and unplanned aspects are summarized below.

Table 1-3: Installation Phase Significance Rankings

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.2 Hazardous Materials Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.4 Non-Hazardous and Hazardous Waste Handling and Storage	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.5 Machine Placement	2.5.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Ecological Environmental Impact Assessment			
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
	3.6 Machine Placement	3.6.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
Social Impact Assessment			
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Low
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Negligible
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards.	Negligible
6. Socio-Economy	6.1 Support &	6.1.1 Employment/income and	Positive

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
	Supply	procurement opportunities for people, business and services in surrounding area	
	6.2 Fuel Storage & Handling	6.2.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.3 Hazardous Materials Handling and Storage	6.3.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.4 Non-Hazardous and Hazardous Waste Handling and Storage	6.4.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.5Macchine Placement	6.5.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.6 Labour, Equipment Services Supply	6.6.1 Employment/income and procurement opportunities	Positive
Cultural Impact Assessment			
7. Historical, Archaeological and Cultural Resources	7.1 Earth moving for buildings.	7.1.1 Possible disruption or damage of archaeological sites, such as shipwrecks.	Negligible

Table 1-4: Operation Phase Significance Rankings

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	2.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.2 Fuel Storage & Handling	2.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.3 Energy Use	2.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.2 Wastewater Disposal	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
Ecological Environmental Impact Assessment			
3.Biota	3.1 Wastewater Disposal	4.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
Social Impact Assessment			
4.Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Negligible
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Negligible
6. Socio-Economy	6.1 Labour, Equipment, Services Supply	6.1.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive

Table 1-5: Decommissioning Phase Significance Rankings

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
2. Water Quality	2.1 Hazardous Materials Handling and Storage	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
	2.2 Non-Hazardous and Hazardous Waste Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
Ecological Environmental Impact Assessment			
3.Biota	3.1 Hazardous Materials Handling and Storage	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
Social Impact Assessment			
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Negligible
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Low
6. Socio-Economy	6.1 Labour, Equipment Services Supply	6.1.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive

Table 1-6: Health Impacts Residual Risk Rankings

Public Health Impact Assessment			
1. Public Health	1.1 Transportation	1.1.1 Possible impact to public health from accidents, exposure to air pollutants, noise, exposure to fuel waste or contamination from accidental spills	Negligible
	1.2 Odour	1.2.1 Potential smell from crushed and pulverized medicinal plants, waste, wastewater, fuel spills	Negligible
Occupational Health Impact Assessment			
2. Occupational Health	2.1 Air Quality	2.1.1 Possible impact to occupational health from accidents, exposure to air pollutants, or stress about possible health related matters	Low

	2.2 Noise	2.2.1 Possible impact to occupational health from noise	Low
	2.3 Odour	2.3.1 Potential smell from crushed and pulverized medicinal plants	Low
	2.4 Wastewater	2.4.1 Possible impact to occupational health from accidents, exposure to wastewater or contamination from accidental spills, concern and stress about accidents, spills, wastes	Low
	2.5 Non-Hazardous Waste	2.5.1 Possible impact to occupational health from accidents, exposure to non-hazardous waste or contamination from accidental spills, concern and stress about accidents, spills, wastes	Low
	2.6 Hazardous Waste	2.6.1 Possible impact to occupational health from accidents, exposure to contamination from accidental spills, concern about accidents, spills, wastes	Low
	2.7 Accidents at Work Site	2.7.1 Possible impact to occupational health from accidents in the work place, exposure to air pollutants, noise, exposure to fuel/chemicals/waste or contamination from accidental spills, concern and stress about accidents, spills, wastes, noise, etc.	Low

Table 1-7: Unplanned Events Residual Risk Rankings

Environmental Factors/Events	Activity	Potential Impacts	Residual Risk
1. Fuel, Chemical or Hazardous Waste/ Materials Spill	1.1 Storage of Fuel, chemicals, hazardous materials or waste	1.1.1 Potential risk of spills to the environment affecting water quality, biota	Negligible
2. Fire	2.1 Fuel and chemical Storage	2.1.1 Possible explosion or fire causing physical damage and possible injuries or loss of life and contamination	Low

1.7 Environmental Management Plan (EMP)

Table 1-8: Mitigation Measures and Specific Action Commitments for Yoke Pyo Traditional Medicine Production

Installation Phase

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Environmental Mitigation Measures								
Physical Resources								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion. 1.1.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Installa-tion	Copy of maintenance schedule
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion. 1.2.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Installa-tion	Copy of maintenance schedule
	1.3 Energy Use	1.3.1 Deterioration of air quality due to	1.3.1.1 Routine inspection and preventive maintenance as per	Negligible	Contractor to provide	Yoke Pyo/ Contractor	Installa-tion	Copy of maintenance schedule

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		emissions and GHG Release contributing to climate change	maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion. 1.3.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.		maintenance schedule			
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion	2.1.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.1.1.2 Check the wash-out water be within the standards and go safely into the drain 2.1.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Installa-tion	Water use log
	2.2 Hazardous Materials Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.2.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.2.1.2 Check the wash-out water be within the standards and go safely into the drain 2.2.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and	Negligible	1. Yoke Pyo to provide spill kits to contain any chemical/ fuel/ waste spillage 2. Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Installa-tion	Spill incident log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			incorrect installation					
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.3.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 2.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Store, separate, transport and dispose of waste following Yoke Pyo's Waste Management Plan.	Yoke Pyo/ Contractor	Installa-tion	Waste Management Plan
	2.4 Non-Hazardous Waste Handling and Storage	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.4.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.4.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo/ Contractor	Installa-tion	Water use log
	2.5 Machine Placement	2.5.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.5.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.5.1.2 Check the wash-out water be within the standards and go safely into the drain 2.5.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo/ Contractor	Installa-tion	Water use log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Ecological, Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.1.1.1 Use minimum water to clean parts of the vehicles before, during and after installation 3.1.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Installa-tion	Water use log
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Installa-tion	Cleaning record; Water use log
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.3.1.1 Comply with all Myanmar regulations or standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Installa-tion	Wastewater disposal record
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from spills and leaks could affect the	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety 3.4.1.2 Provide effective wastewater treatment system to	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Installa-tion	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		ecosystem	ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)					
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.5.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.5.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Installa-tion	Water use log; Wastewater disposal record
	3.6 Machine Placement	3.6.1 Potential deterioration of water quality from fuel spills and disturbance could affect the ecosystem	3.6.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.6.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo/ Contractor	Installa-tion	Cleaning record; Water use log
Social Impact Assessment								
4. Transporta-tion	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 At least 5 days prior to machine installation, coordinate with Shwe Bo University Authorities, who will then confirm convenient date. 4.1.2.1 Provide appropriate lights and warning signals on all transport vehicles to prevent accidental collision.	Low	Contact Shwe Bo University Authorities and confirm convenient date.	Yoke Pyo/ Contractor	Installa-tion	Record of contact to Shwe Bo University

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	5.1.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.1.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.1.1.3 Water that is contaminated with oil will be collected and treated at the oil/water separator prior to discharge. 5.1.1.4 Hazardous and non-hazardous wastes will be manifested with proper labels.	Negligible	Set up waste management system	Yoke Pyo/ Shwe Bo City Develop-ment Committee	Installa-tion	Record of waste treatment/ disposal
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards.	5.2.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.2.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.2.1.3 Water that contaminated with oil will be collected and treated at the oil/water separator prior to discharge. 5.2.1.4 Hazardous and non-	Negligible	Set up a water treatment system.	Yoke Pyo	Installa-tion	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			hazardous wastes will be manifested with proper labels.					
6. Socio-Economy	6.1 Support & Supply	6.1.1 Employment/ income and procurement opportunities for people, business and services in surrounding area	6.1.1.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Installa-tion	Purchasing records
	6.2 Labour, Equipment Services Supply	6.2.1 Employment/ income and procurement opportunities	6.2.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Installa-tion	Local worker employ-ment/ services
Cultural Impact Assessment								
7. Historical, Archaeological and Cultural Resources	7.1 Earth moving for buildings.	7.1.1 Possible disruption or damage of archaeological sites, such as shipwrecks.	Visual check by workers and inspection of the site during earth work.	Negligible	Check the earth work site and contact Cultural Heritage Department if necessary.	Yoke Pyo	Installa-tion	Earth work records

Operation Phase

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Physical Environmental Impact Assessment								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Keep the manuals for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Keep the manuals for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.3.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Keep the manuals for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended	2.1.1.1 Use minimum water to clean the floor and wash parts of machines and building	Negligible	Ensure that the water usage is minimum	Yoke Pyo (Safety and Environment Section)	Operation	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		solids, metals, toxicity) and oxygen depletion (organic matter)	2.1.1.2 Check the wash-out water be within the standards and go safely into the drain		and the disposed water is within the limits.			
	2.2 Lab testing using hazardous materials	2.2.1 Releases to the environment and affect the ecosystem	2.2.1.1 Regularly check to observe leaks, spills and determine potential causes	Negligible	Train the personnel and practice with care for least or no spills	Yoke Pyo (Safety and Environment Section)	Operation	Record of hazardous material uses
	2.3 Waste Management non-hazardous materials	2.3.1 Waste water, foul smell to the environment	2.3.1.1 Comply with all Myanmar regulations or standards of City Development Committee	Negligible	Segregate by type, clearly label, properly dispose. Food waste will be separated from non-food waste.	Yoke Pyo and City Development Committee	Operation	Record of waste treatment/ disposal
	2.4 Wastewater Disposal	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.4.1.1 Collect all wastewater, treat appropriately and dispose it within the limit.	Negligible	Ensure that the water usage is minimum and the disposed water is within the	Yoke Pyo (Safety and Environment Section)	Operation	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
					limits.			
Ecological Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.1.1.1 Use minimum water to clean parts of the vehicles 3.1.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo (Safety and Environment Section)	Operation	Water use log
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo (Safety and Environment Section)	Operation	Cleaning record; Water use log
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.3.1.1 Comply with all Myanmar regulations or standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo (Safety and Environment Section)	Operation	Wastewater disposal record
	3.4 Hazardous Materials Handling and	3.4.1 Potential deterioration of water quality from	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety	Negligible	Yoke Pyo to provide Waste	Yoke Pyo (Safety and Environment	Operation	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	Storage	spills and leaks could affect the ecosystem	3.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)		Management Plan	Section)		
Social Impact Assessment								
4. Transporta-tion	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 Establish 50 m safety zone around the factory 4.1.2.1 Provide appropriate lights and warning signals on all vehicles to prevent accidental collision.	Low	Supervise safety zone activities	Yoke Pyo (Safety and Environment Section)	Operation	Safety zone monitoring records
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	5.1.1.1 Provide appropriate lights and warning signals on all vehicles to prevent accidental collision. 5.1.1.2 Set up safety zone within 50 m-radius surrounding the factory to prevent any accidents. 5.1.2.1 Check regularly the project area to observe leaks or spills, and to try to determine potential causes or sources.	Negligible	Regularly monitor safety zone within 50 m-radius surrounding the factory	Yoke Pyo (Safety and Environment Section)	Operation	Safety zone monitoring records
6. Socio-Economy	6.1 Labour Supply	6.1.1 Employment/ income	6.1.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Operation	Employment records
	6..2 Equipment/ Material Supply	6.1.2 Procurement opportunities	6.1.2.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Operation	Purchasing records

Decommissioning Phase

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
Physical Environmental Impact Assessment								
Physical Resources								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers 1.1.1.2 Set up appropriate schedule to minimize decommissioning time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.3.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			1.3.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.					
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.1.1.1 Use decommissioning method that minimizes sanitary water 2.1.1.2 Change the use of factory facilities of compound in other useful ways, as the factory is in industrial zone	Negligible	1. Yoke Pyo to provide spill kits to contain any chemical/ fuel/ waste spillage 2. Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Decommis-sioning	1. Spill incident log 2. Waste Management Plan
	2.2 Hazardous Materials Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.2.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	1. Yoke Pyo to provide spill kits to contain any chemical/ fuel/ waste spillage 2. Yoke Pyo to provide Waste	Yoke Pyo	Decommis-sioning	Spill incident log

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
					Management Plan			
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.3.1.1 Comply with all Myanmar regulations or standards regarding wastewater 2.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Store, separate, transport and dispose of waste following Yoke Pyo's Waste Management Plan.	Yoke Pyo/ Contractor	Decommis-sioning	Waste Management Plan
	2.4 Non-Hazardous Waste Handling and Storage	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Store, separate, transport and dispose of waste following Yoke Pyo's Waste Management Plan.	Yoke Pyo/ Contractor	Decommis-sioning	Waste Management Plan
Ecological Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills	3.1.1.1 Use minimum water to clean parts of the vehicles before, during and after installation	Negligible	Direct and check the responsible personnel to use minimum	Yoke Pyo	Decommis-sioning	Water use log

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		and disturbance could affect the ecosystem	3.1.1.2 Check the wash-out water be within the standards and go safely into the drain		water			
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Decommis-sioning	Cleaning record; Water use log
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.3.1.1 Comply with all Myanmar regulations or standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Decommis-sioning	Wastewater disposal record
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from spills and	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety	Negligible	Yoke Pyo to provide Waste Management	Yoke Pyo/ Contractor	Decommis-sioning	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		leaks could affect the ecosystem	3.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)		Plan			
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.5.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.5.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Decommis-sioning	Water use log; Wastewater disposal record
Social Impact Assessment								
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 At least 5 days prior to machine installation, coordinate with Shwe Bo University Authorities, who will then confirm convenient date. 4.1.2.1 Provide appropriate lights and warning signals on all	Low	Contact Shwe Bo University Authorities and confirm convenient date.	Yoke Pyo/ Contractor	Decommis-sioning	Record of contact to Shwe Bo University

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			transport vehicles to prevent accidental collision. 4.1.2.2 Establish safety zone of 10 meters around the factory.					
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	5.1.1.1 Separate and store each type of waste (separate non-hazardous waste and hazardous waste) into appropriate containers having clear labels. 5.1.1.2 Do not drop any waste into undesignated space. 5.1.1.3 Store hazardous waste in containers that are durable and safe for transport/transfer. Also, store them in areas away from fire sources. 5.1.1.4 Record and examine the type and quantity of waste. Store, separate, transport and dispose of waste using appropriate procedures and disposal	Negligible	Set up waste management system	Yoke Pyo/ Shwe Bo City Develop-ment Committee	Decommis-sioning	Record of waste treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			facilities.					
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards.	5.2.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.2.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.2.1.3 Water that contaminated with oil will be collected and treated at the oil/water separator prior to discharge. 5.2.1.4 Hazardous and non-hazardous wastes will be manifested with proper labels.	Negligible	Set up a water treatment system.	Yoke Pyo	Decommis-sioning	Record of wastewater treatment/ disposal
6. Socio-Economy	6.1 Support & Supply	6.1.1 Procurement opportunities for people, business and services in surrounding area	6.1.1.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Decommis-sioning	Purchasing records
	6.2 Labour, Equipment Services Supply	6.2.1 Employment/ income and procurement opportunities	6.2.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Decommis-sioning	Local worker employment/ services

Health Impacts

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Public Health Impact								
1. Public Health	1.1 Transport-ation	1.1.1 Possible impact to public health from accidents, exposure to air pollutants, noise, exposure to fuel / waste or contamination from accidental spills	1.1.1.1 A safety zone of about 10-m radius will be established around the factory. 1.1.1.2 The area will be checked during the entire installation, operation and demobilization period. 1.1.1.3 Yoke Pyo will provide project information to relevant stakeholders, and communities close to the site at least 1 day prior to major transportation operations.	Negligible	1. Regularly monitor safety zone within 10 m-radius surrounding the factory 2. Contact Shwe Bo University Authorities and confirm the convenient date	Yoke Pyo (Safety and Environment Section)	All phases	Monitor-ing record
	1.2 Odour	1.2.1 Potential smell from crushed and pulverized medicinal plants, waste, wastewater, fuel spills	1.2.1.1 Control sources of smell from the project such as wastes, wastewater, fuel leaks or spills in all phases.	Negligible	1. Regularly clean the fuel leaks and spills. 2. Cut and crush the medicinal plants in designated place so as to control the odour release.	Yoke Pyo	All phases	Fuel spill cleaning record
Occupational Health Impact								

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
2. Occupational Health	2.1 Air Quality	2.1.1 Possible impact to occupational health from accidents, exposure to air pollutants, or stress about possible health related matters	2.1.1.1 Use suitable respiratory protection for project workers.	Negligible	Check air quality and provide suitable respiratory protection to the workers.	Yoke Pyo (Safety and Environment Section)	All phases	Air quality record of Safety and Environ-ment Section
	2.2 Noise	2.2.1 Possible impact to occupational health from accidents, noise	2.2.1.1 The project will provide each worker with Personnel Protective Equipment (PPE), which includes hearing protection such as earplugs and earmuffs. They are designed to shield against dangerous noise over a high frequency range while allowing the wearer to hear lower frequency sounds. 2.2.1.2 In addition, personnel will be provided with safety training to ensure that all workers practice under safety operation and regulation of work. 2.2.1.3 The machine will be properly maintained and serviced according to the maintenance schedule.	Negligible	Check noise level and provide suitable ear protective devices to the workers.	Yoke Pyo (Safety and Environment Section)	All phases	Training record; Noise monitor-ing record of Safety and Environ-ment Section and PPE

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	2.3 Odour	2.3.1 Potential smell from crushed and pulverized medicinal plants	1.3.1.1 Control sources of smell from the project such as wastes, wastewater, fuel leaks or spills in all phases.	Negligible	1. Regularly clean the fuel leaks and spills. 2. Cut and crush the medicinal plants in designated place so as to control the odour release.	Yoke Pyo (Safety and Environment Section)	All phases	Air quality record and of Safety and Environ-ment Section
	2.4 Waste-water	2.4.1 Possible impact to occupational health from accidents, exposure to wastewater or contamination from accidental spills, concern and stress about accidents, spills, wastes	2.4.1.1Regularly maintain the perimeter drainage and treated water systems to be efficient. 2.4.1.2 Supply and usage water will be kept in water tanks to avoid contamination from any vectors. 2.4.1.3 Yoke Pyo will strictly enforce good housekeeping practices to prevent diseases from spreading on the site. 2.4.1.4 Health awareness training will be provided to project workers to improve hygienic practices on site.	Negligible	Make sure wastewater treatment system efficient and employees receive proper training.	Yoke Pyo	All phases	Training record and drainage mainten-ance record.
	2.5 Non-Hazardous Waste	2.5.1 Possible impact to occupational health	2.5.1.1 Food wastes will be separated from non-food waste before disposal.	Negligible	Have specific SOP for waste collection and	Yoke Pyo	All phases	Waste disposal record and

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		from accidents, exposure to non-hazardous waste or contamination from accidental spills, concern and stress about accidents, spills, wastes	2.5.1.2 The remaining non-hazardous waste will be classified and sorted before treatment, disposal or recycle. 2.5.1.3 Wastes will be disposed by Shwe Bo City Development Committee.		disposal.			SOP
	2.6 Hazardous Waste	2.6.1 Possible impact to occupational health from accidents, exposure to hazardous waste contamination from accidental spills, concern and stress about accidents, spills, wastes	2.6.1.1 Hazardous wastes will be stored in closed containers for collection and disposed by the contractor (City Development Committee). 2.6.1.2 Awareness programs and Personnel Protective Equipment (PPE), such as goggles, face shields, gloves, footwear and specialized clothing when handling chemicals, are provided to all personnel involved with transporting and handling hazardous waste. 2.6.1.3 Yoke Pyo will provide chemical and oil spill Contingency plan and spill kits.	Negligible	Have specific SOP for waste collection and disposal.	Yoke Pyo	All phases	Proper PPE; Waste disposal record and SOP
	2.7 Accidents at Work Site	2.7.1 Possible impact to occupational health from accidents in	2.7.1.1 Safety training and awareness programs to ensure that all project personnel are aware of the potential risks and have the necessary skills to	Negligible	Have specific SOP for accident prevention at work sites.	Yoke Pyo	All phases	Safety training record; Proper PPE;

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		the work place, exposure to air pollutants, noise, exposure to fuel/chemicals/waste or contamination from accidental spills, concern and stress about accidents, spills, wastes, noise, etc.	perform their work in a safe and responsible manner. 2.7.1.2 PPE is provided to all workers on site. Minimum PPE includes safety boots, eye shield, helmet and ear plugs. Gloves, safety glasses, full face visors, dust masks and work vest for overboard work are also provided, depending on the nature of the work. 2.7.1.3 Fire and smoke detection systems are installed and provide entire coverage for the equipment. Portable fire extinguishers of appropriate types and sufficient number are in accommodation spaces, service spaces. 2.7.1.4 An Emergency Management Plan such as fire, fuel or chemical spill, contingency plan is in place to ensure that accidents are effectively managed. 2.7.1.5 First aid kits, burn kit, resuscitators, and stretchers are provided at the clinic located onsite and served by two trained medics.		Make sure personnel use proper PPE.			Fire prevention system; Emergency response plan

Unplanned Events

Environmental Factors/Events	Activity	Potential Impacts	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
1. Fuel, Chemical or Hazardous Waste/ Materials Spill	1.1 Storage of Fuel, chemicals, hazardous materials or waste	1.1.1 Potential risk of spills to the environment affecting water quality, biota	1.1.1.1 Implement safety procedures as outlined in Yoke Pyo's Emergency Response Plan. 1.1.1.2 Implement Yoke Pyo's Emergency Response Plan. and conduct rehearsal/ training for staff to handle oil spill situations.	Negligible	1. Yoke Pyo to provide Emergency Response Plan 2. Yoke Pyo to provide Spill Contingency Plan 3. Yoke Pyo to provide Spill kits	Yoke Pyo	All Phases	Incident Report Emergency Response Plan
2. Fire	2.1 Fuel and chemical Storage	2.1.1 Possible explosion or fire causing physical damage and possible injuries or loss of life and contamination	2.1.1.1 Provide fire protection equipment and manual for emergency management at project site, and provide the appropriate practice complying with mitigation measures. 2.1.1.2 Implement Emergency Response Plan in case of fire occurrence.	Negligible	Yoke Pyo to provide Fire Safety Plan	Yoke Pyo	All Phases	Incident Report

1.8 Corporate Social Responsibility (CSR)

Yoke Pyo is committed to proportionally use 2 % of its net profit from traditional medicine production for the health, education and social welfare of the local affected people. The company is well-known for its generous donations for social, health and religious affairs.

1.9 Public Survey and Public Meeting

As part of the program for gathering public opinions and attitude of the people on Yoke Pyo Traditional medicine production project, a well-informed public meeting was held in the compound of the factory on 18 February, 2020. The public meeting disclosed the information, vision, mission, objectives, production process, raw materials, current practices of production (GMP), occupational health and safety of the factory workers and environmental management system, ISO 9001: 2015. Third party organizations, Sein Shwe Hein and Smart Environs, explained the purpose of the public meeting, the findings of screening environmental impacts, identified potential impacts and required mitigation measures. The participants are openly requested for relevant concerns, anxiety and interest of the local people. There were no mention of concerns and negative feeling of 93 participants in total.

1.10 Conclusion

In conclusion, social and environmental impacts from Yoke Pyo Traditional Medicine Production Factory will be low or negligible and can be reduced by its respective mitigation measure and environmental management plan. Occupational health and safety impacts are also low and can be mitigated by the preventive and control measures recommended in EMP. Solid wastes, liquid wastes, wastewater will be managed by appropriate treatment in collaboration with Shwe Bo City Development Committee and finally disposed in accordance with National Environmental Quality (Emission) guideline (2015). All the workers and personnel have to attend trainings on health and safety and general environmental management; specific personnel will be required to attend trainings on emergency response plans and necessary measures and facilities shall be provided. Following the legal restrictions, national emission guideline, and implementing plans and mitigation measures recommended in EMP, Yoke Pyo traditional medicine production will be able to run in environmentally and socially sustainable way.

ရုပ်ပျိုတိုင်းရင်းဆေးထုတ်လုပ်ရေး စီမံကိန်း IEE/EMP အတွက်

ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန ၏သဘောထားမှတ်ချက်အရ ပြင်ဆင်ချက်များ

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
၁	မူဝါဒ ဥပဒေတွင် စီမံကိန်းနှင့် သက်ဆိုင်သည့် နိုင်ငံ တ ကာကွန်ဗင်းရှင်းများထည့်သွင်းဖော်ပြရန်	စာမျက်နှာ ၃၉၊ အခန်း ၂.၄ တွင် ထည့်သွင်း ဖော်ပြထား ပါသည်။
၂	ခေါင်းစဉ်ငယ် ၂.၃.၁ တွင် အမျိုးသားပတ်ဝန်းကျင် ဆိုင် ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန် ချက် များ အပိုဒ် ၂.၃.၄.၈ ပါ စွန့်ထုတ်အရည်အဆင့် သတ်မှတ် ချက်များအား ထည့်သွင်းဖော်ပြရန်	စာမျက်နှာ ၃၆၊ ဇယား (၆) တွင်ထည့်သွင်းဖော်ပြထားပါသည်။
၃	ခေါင်းစဉ်ငယ် ၂.၃.၁ တွင် အမျိုးသားပတ်ဝန်းကျင် ဆိုင် ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန် ချက် များ အပိုဒ် ၂.၃.၄.၈ ပါ စွန့်ထုတ်အခိုးအငွေ့ အဆင့် သတ် မှတ် ချက်များအား ထည့်သွင်းဖော်ပြရန်	စာမျက်နှာ ၃၈၊ ဇယား (၈) တွင် ထည့်သွင်းဖော်ပြထားပါ သည်။
၄	စာပိုဒ်ခွဲ ၃.၂.၃ တွင် ကုန်ကြမ်းများ သိုလှောင်ထား ရှိမှု အခြေအနေ အား ဓာတ်ပုံမှတ်တမ်းဖြင့် ဖော်ပြရန်၊	ကုန်ကြမ်းများ သိုလှောင်ထား ရှိမှု အခြေအနေ အား စာ-၅၅၊ ပုံ (၄) တွင် ဖော်ပြထားပါသည်။
၅	အသုံးပြုသည့် ဓာတုပစ္စည်း အမျိုး အစား၊ ပမာဏ၊ ရယူ သည့် အရင်း အမြစ်၊ သယ်ယူသည့် နည်းလမ်း၊ သို လှောင် ထားရှိမှု အခြေအနေ နှင့် Material Safety Data Sheet အား ထည့်သွင်းဖော်ပြရန်၊	အသုံးပြုသည့် ဓာတုပစ္စည်း အမျိုး အစား၊ ပမာဏ၊ ရယူ သည့် အရင်း အမြစ်၊ သယ်ယူသည့် နည်းလမ်း၊ သို လှောင် ထားရှိမှု အခြေအနေကို စာ-၅၄ ပုံ (၃) နှင့်၊ စာ ၅၅၊ ပုံ (၄) တွင် ဖော်ပြထားပါသည်။ Material Safety Data Sheet ကို Appendix A တွင်ထည့်သွင်းဖော်ပြထားပါသည်။
၆	စာပိုဒ်ခွဲ ၃.၂.၃.၁ အရ ကုန်ကြမ်း များဆေး ကြော သည့် ရေပမာဏ (နေ့စဉ်၊ လစဉ်၊ နှစ်စဉ်)၊ သိုလှောင် ထားရှိမှု အခြေအနေတို့ကိုထည့်သွင်း ဖော်ပြရန်၊	ရေသုံးစွဲမှုပမာဏ 1000 L/day ကို အခန်း ၃.၂.၃ စာမျက်နှာ ၅၅၊ တွင် ဖော်ပြ ထားပါ သည်။ ရေ သိုလှောင်မှု ဓာတ်ပုံ ကို Figure 6 တွင် ဖော်ပြ ထား ပါသည်။

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
၇	ထုတ်လုပ်မည့် ကုန်ချောအမျိုးအစား၊ ထုတ်လုပ်မှု ပမာဏ (ရက်၊ လ၊ နှစ်)၊ ဘေးထွက် ကုန်ပစ္စည်း ထွက်ရှိမှု ပမာဏ (By-product) သိုလှောင် ထားရှိမှု အခြေအနေ၊ (ဓာတ်ပုံမှတ်တမ်း)	ကုန်ချော ထုတ် လုပ်မှု ဆေး ၈ မျိုး 800 kg/day (2000 cases/ day) ကို အခန်း ၃.၂.၃ စာမျက်နှာ ၅၅၊ တွင် ဖော်ပြ ထားပါသည်။ သိုလှောင် ထားရှိမှု ဓာတ်ပုံ မှတ်တမ်း ကို Figure 5 တွင် ဖော်ပြထားပါသည်။
၈	စီမံကိန်းတစ်ခုလုံးအတွက် အသုံးပြုမည့် ရေ ရယူ မည့် အရင်းအမြစ်၊ လုပ်ငန်းစဉ် တစ်ခုစီအတွက် နေ့စဉ်၊ လစဉ် နှစ်စဉ် အသုံးပြုသည့် ပမာဏ (ဂါလံ)၊ သိုလှောင်ထားရှိမှု အခြေအနေ တို့အား ထည့်သွင်း ဖော်ပြရန်၊	မြေအောက်ရေ ထုတ်ယူသုံးစွဲ မည်ဖြစ်ကြောင်း အခန်း ၄.၈၊ စာမျက်နှာ ၈၁၊ တွင် ဖော်ပြထားပါ သည်။ ရေသုံးစွဲမှုပမာဏ 1000 L/day ကို အခန်း ၃.၂.၃၊ စာမျက်နှာ ၅၅ တွင် ဖော်ပြ ထားပါ သည်။ ရေ သို လှောင်မှု ဓာတ်ပုံ ကို Figure 6 တွင် ဖော်ပြ ထား ပါသည်။
၉	စွမ်းအင်ရယူမည့်အရင်းအမြစ်၊ (မဟာ ဓာတ် အား လိုင်း သို့မဟုတ် ဂျင်နရေတာ)၊ လစဉ် နှစ်စဉ် အသုံးပြုသည့် ယူနစ်ပမာဏ၊ ဂျင်နရေတာ အသုံး ပြုပါက သုံးသည့် လောင်စာ ဆီ ပမာဏ၊ သိုလှောင် ထားရှိမှု တို့ အား ထည့် သွင်းဖော်ပြရန်၊	စွမ်းအင် အသုံးပြုမှု ပမာဏ 5200 kWh/month. ကို အခန်း ၃-၂-၃၊ စာ မျက်နှာ ၅၅ တွင် ဖော်ပြထားပါ သည်။ အရေးပေါ် Power failure အတွက် သုံးမည့် လောင် စာ ဆီ သိုလှောင်မှု မှတ်တမ်းကို Figure 8 တွင် ဖော်ပြထားပါသည်။ အခန်း ၅-၄၊ စာမျက်နှာ ၁၃၉၊ ၁၄၀ တွင်၊ စွမ်းအင် အတွက် လျှပ်စစ်သာသုံးပြီး၊ Power failure ဖြစ် ချိန် တွင်သာ၊ Generator သုံးမည်ဖြစ် ကြောင်း၊ ဘွိုင်လာ မသုံး ကြောင်း၊ ဒီဇယ်အသုံး ခန့်မှန်း နိုင်ခြင်းမရှိ သေး ကြောင်း ဖော်ပြထားပါသည်။
၁၀	ထုတ်လုပ်မည့် ကုန်ချောအမျိုးအစား၊ ထုတ်လုပ်မှု ပမာဏ (ရက်၊ လ၊ နှစ်)၊ ဘေး ထွက် ကုန်ပစ္စည်း ထွက်ရှိမှု ပမာဏ (By-product) သိုလှောင်ထား ရှိမှု အခြေအနေ၊ (ဓာတ်ပုံမှတ်တမ်း)	(ဆ)/(၇) နှင့်အတူတူ။
၁၁	ဆေးဝါးထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အ ဆင့်ဆင့်ကို Flow Chart/Flow Diagram များဖြင့် ထည့်သွင်း ဖော်ပြရန်၊	အခန်း ၃.၂.၃၊ စာမျက်နှာ ၅၇၊ Figure 7 တွင်၊ ထည့်သွင်းဖော်ပြ ထားပါသည်။

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
၁၂	စီမံကိန်းမှ ထွက်ရှိလာသော စွန့်ပစ်ပစ္စည်းအစိုင်အခဲ အမျိုးအစား၊ ပမာဏ၊ သိုလှောင်သည့် နည်းလမ်း/နည်းစနစ်များ၊ သိမ်းဆည်းခြင်း၊ သယ်ယူ ပို့ဆောင်ခြင်း၊ စွန့်ပစ်ခြင်း တို့နှင့် ပတ်သက်သည့် အစီအစဉ်များအား ထည့်သွင်းဖော်ပြရန်၊	စာမျက်နှာ ၁၄၅ တွင် အစိုင်အခဲ စွန့်ပစ္စည်းများမှာ (trash, food waste, paper, plastic and scrap wood and metals) တို့ဖြစ်ပြီး၊ (segregated by type, clearly labelled, and then properly disposed. Food waste will be kept separate from non-food waste) လုပ်မည်ဟု ဖော်ပြထားပါသည်။ Impact significance သတ်မှတ် ရာတွင် သက်ရောက်နိုင်မှုမှာ ၁ ကီလို မီတာ အကျယ် (Extent) ထက်နည်း ကြောင်း၊ သက် ရောက်မှု ကာလ (Duration) ၁ နှစ်ထက် နည်းကြောင်း၊ Magnitude နည်း ကြောင်း၊ Sensitivity of Receptor နိမ့်ကြောင်း၊ ထို့ကြောင့် သိသာ သော ထိခိုက်မှု (Significant impact) မရှိကြောင်း အကဲဖြတ် ဖော်ပြ ထားသည်။ Mitigitaion measures အဖြစ် To comply with all Myanmar regulations or standards of City Development Committee To store, separate, transport and dispose of waste using appropriate procedures and disposal facilities) ဟုဖော်ပြထား ပါသည်။ စက်ရုံ Waste management facilities များကို Figure 34 တွင်လည်းကောင်း၊ Shwebo City Development Committee မှ လပြတ်စနစ်ဖြင့် အမှိုက်သိမ်းပုံကို Figure 35 တွင်လည်း ကောင်း ဖော်ပြထားပါသည်။
၁၃	စွန့်ပစ်ရေထွက်ရှိမှု (လုပ်ငန်းစဉ်၊ အထွေထွေနှင့် ဘွိုင်လာ) ပမာဏ၊ သိုလှောင်မှု အစီအစဉ်၊ ရှင်းလင်းသည့် သန့်စင်ခြင်း နည်းစဉ် အဆင့်ဆင့် အသေးစိတ်၊ သန့်စင်သည့် နည်း	ဘွိုင်လာမသုံးကြောင်း လျှပ်စစ်သုံးကြောင်း ရှေ့တွင် ဖော်ပြပြီးဖြစ်ပါသည်။ စွန့်ပစ်ရေ အနည်းငယ်သာ ထွက်ရှိကြောင်း အခန်း ၄.၈၊ စာ မျက်နှာ ၈၁ တွင် ဖော်ပြထား ပါ သည်။ သောက်ရေနှင့် အပင်ရေလောင်းရန်အတွက် RO

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
	လမ်း၊ စွန့်ပစ်ရေသန့်စင်ရာတွင် ဓာတု ပစ္စည်း အသုံးပြုပါက အသုံးပြုမည့် ပမာဏ၊ ရယူသည့် အရင်း အမြစ်၊ ရောစပ်သည့် အချိုးအစား များ၊ သိုလှောင်သည့်နည်းလမ်း၊ စွန်ပစ်ရေ နောက် ဆုံး စွန့် ထုတ်သည့်နေရာ၊ စွန့်ပစ်ရေမြောင်းစီမံ ထားရှိမှု Layout Plan တို့အား ထည့်သွင်းဖော်ပြရန်၊	စနစ်အသုံးပြုပါသည် (ပုံ ၃၁)၊ စက်ရုံရေဆိုးထုတ် စနစ်အတွက် Layout plan ကို Figure 33 တွင် ဖော်ပြထားပါသည်။
၁၄	လူစွမ်းအားအရင်းအမြစ် (အလုပ်သမား အရေ အတွက်) အား ထည့်သွင်း ဖော်ပြရန်၊	Employment List ကို စာမျက်နှာ ၆၅၊ Table 15 တွင် ၇၀ ဦး ဟု ဖော်ပြထားပါသည်။ အခန်း ၅-၄-၂-၃၊ စာမျက်နှာ ၁၅၃ တွင် လုပ်ငန်းလည်ပတ် လျှင် ဒေသခံ အလုပ် သမား ၁၀၀၀ အထိ အသုံးပြု နိုင် ကြောင်းဖော်ပြ ထားသည်။
၁၅	ဇယား ၁၄၁ အဝီစိတွင်းရေ ဆန်းစစ်ချက် ရလဒ် များအား Guideline ဖြင့် နှိုင်းယှဉ်ဖော်ပြရာတွင် မည်သည့် Guideline ဖြင့် နှိုင်းယှဉ်ကြောင်း တိကျစွာ ထည့်သွင်း ဖော် ပြရန်၊	စာမျက်နှာ ၈၁၊ ဇယား ၂၂။ ရန်ကုန်မြို့ ALARM Ecological Lab တွင် တိုင်းခြင်းဖြစ်ပြီး၊ International Drinking Water Standards Guideline ဖြစ်ကြောင်းသိ ရ ပါသည်။ (e.g. pH တွင် WHO 6.5.–9.5 vs IDWS 6.5–8.5)
၁၆	ဇယား ၂၅ လေအရည်အသွေး ရလဒ်မှ $PM_{2.5}$ သည် စံနှုန်းတန်ဖိုး များထက် ကျော်လွန်နေသည့် အတွက် ကျော်လွန်နေရသည့် အကြောင်း အရင်းအား ထည့်သွင်း ဖော်ပြရန်၊	တိုင်းသည့်နေရာသည် ရွှေဘို မြစ်ကြီးနားလမ်း နှင့် နီးကပ် ပြီး၊ တိုင်းသည့် အချိန်သည် ယာဉ် အသုံးပြုမှု များရှိသည့် အတွက် ဖြစ်ကြောင်း စာမျက် နှာ ၈၆ တွင် ဖော်ပြ ထား ပါသည်။
၁၇	ခေါင်းစဉ်ခွဲ ၅.၄ လုပ်ငန်းလည်ပတ်ခြင်း အဆင့် လေ အရည်အသွေး သက်ရောက်မှုများအား ဆန်းစစ်ရာ တွင် ဆေးဝါးရောစပ်ခြင်း၊ ကုန်ကြမ်း သယ်ယူပို့ ဆောင်ခြင်း၊ ဘွိုင်လာ လောင်စာ၊ ခေါင်းတိုင်၊ ဂျင်နရေတာ	အခန်း ၅-၄၊ စာမျက်နှာ ၁၃၉၊ ၁၄၀ တွင်၊ စွမ်းအင် အတွက် လျှပ်စစ်သာသုံးပြီး၊ Power failure ဖြစ်ချိန် တွင်သာ၊ Generator သုံးမည်ဖြစ် ကြောင်း၊ ဘွိုင်လာ မသုံး ကြောင်း၊ ဒီဇယ်အသုံး ခန့်မှန်းနိုင်ခြင်းမရှိ သေး ကြောင်း၊ သက်ရောက်နိုင်မှုမှာ ၁ ကီလို မီတာ အကျယ် (Extent) ထက်နည်း

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
	တို့မှ ထွက်ရှိသော အမှုန်၊ ဓာတ်ငွေ့များ ကြောင့် သိသာသော သက်ရောက် မှု များ၊ လျှော့ချမည့် အစီအစဉ်များ အမှုန်ပျံ့ လွင့်မှုများအတွက် ဆောင် ရွက်ထားသည့် အစီအမံများ ထည့်သွင်းဖော်ပြရန်၊	ကြောင်း၊ သက် ရောက်မှု ကာလ (Duration) ဒေ နှစ်ထက် နည်းကြောင်း၊ Magnitude နည်း ကြောင်း၊ Sensitivity of Receptor နိမ့်ကြောင်း၊ ထို့ကြောင့် အမှုန်ပျံ့ လွင့်မှုကြောင့် သိသာ သော ထိခိုက်မှု (Significant impact) မရှိကြောင်း (Table 59) တွင် အကဲ ဖြတ် ဖော်ပြ ထားသည်။ လျှော့ချမည့် အစီအစဉ်အဖြစ်၊ အမှုန်ပျံ့ လွင့်မှုများ အတွက် ဆောင် ရွက်ထားသည့် အစီ အမံများကို စာမျက်နှာ ၁၄၁ တွင် စက်များပုံမှန်ထိန်း သိမ်းရန် (Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion)
၁၈	စွန့်ပစ်ရေသန့်စင်ခြင်းစနစ်အား စွန့်ပစ်ရေစီမံ ခန့် ခွဲသည့် အစီ အစဉ် တွင် ထည့်သွင်းဖော်ပြရန်၊ လုပ်ငန်း ခွင်ကျန်းမာ ရေးနှင့် ဘေးကင်းလုံခြုံ ရေး စီမံခန့်ခွဲမှု အစီအစဉ်၊ ရေသုံး စွဲမှု စီမံခန့်ခွဲမှု အစီအစဉ်၊ ဓာတု ပစ္စည်းများ ကိုင်တွယ် ခြင်း၊ အသုံးပြုခြင်း၊ သိုလှောင် ခြင်းနှင့် စွန့်ပစ်ခြင်း စီမံခန့်ခွဲမှု အစီအစဉ်၊ အရေးပေါ် တုန့်ပြန် ရေး အစီအစဉ် တို့အား ပတ်ဝန်းကျင်ထိ ခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၃ (ဇ) အမှတ်စဉ် (၆) ပါ အစီ အစဉ်ခွဲ အ လိုက် ပါဝင်ရမည့် အကြောင်းအရာ ပုံစံဖြင့် ထည့်သွင်း ဖော်ပြရန်၊ (IEE အတွက် လမ်းညွှန်ချက်မှာ အပိုဒ် ၃၆ (က)-(ည) ဖြစ်သော် လည်း၊ EIA သတ်မှတ်ချက် အပိုဒ် ၆၃	စက်တပ်ဆင်ခြင်း / လည်ပတ်ခြင်းအဆင့် စွန့်ပစ်ရေ ကြောင့် သက် ရောက်မှုအကဲဖြစ်ချက်၊ ထိခိုက်မှု လျှော့ချ ရေး (mitigation measures)၊ စီမံခန့်ခွဲမှုကို စာမျက်နှာ ၁၂၉၊ ၁၃၂ တွင်လည်းကောင်း၊ (Comply with all Myanmar regulations or standards regarding health and safety. Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. Water that is contaminated with oil will be collected and treated at the oil/water separator prior to discharge. Hazardous and non-hazardous wastes will be manifested with proper labels)၊ စက်သုံးဆီဖိတ်စင်မှုကြောင့် ရေညစ်ညမ်းနိုင်မှု အကဲဖြတ်ချက် (ဇယား၆၀)၊ mitigation measure (စာ-၁၄၃)၊ (Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines Check the wash-out water be within the

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
	(၉) အမှတ်စဉ် (၆) သတ်မှတ်ချက်နှင့် အနီးစပ်ဆုံးဖြစ် အောင်ပြု စုထားပါသည်။)	standards and go safely into the drain) ဖော်ပြထားပါသည်။ ဓာတု ပစ္စည်း များ ကိုင်တွယ် ခြင်း၊ အသုံးပြုခြင်း၊ သိုလှောင် ခြင်းနှင့် စွန့်ပစ်ခြင်း စီမံ ခန့်ခွဲမှု အစီအစဉ် အကြောင်းကို စာမျက်နှာ ၁၄၄၊ ၁၄၅၊ ဇယား ၆၁၊ (Regularly check to observe leaks, spills and determine potential causes Keep and follow the directions of chemical Material Safety Data Sheet (MSDS) for respective chemicals) တွင် ဖော်ပြထားပါသည်။ Occupationalo Health and safety for air quality (စာ– ၁၆၆၊ ဇယား ၇၆၊ mitigation measures (စာ–၁၆၇)၊ (will provide suitable respiratory protection, such as protective clothing, full face visors and resuscitators to project workers) Occupationalo Health and safety for noise (စာ–၁၆၉၊ ဇယား ၇၇၊ mitigation measures (The project will provide each worker with Personnel Protective Equipment (PPE), which includes hearing protection such as earplugs and earmuffs. They are designed to shield against dangerous noise over a high frequency range while allowing the wearer to hear lower frequency sounds. In addition, personnel will be provided with safety training to ensure that all workers practice under safety operation and regulation of work. The machine will be properly maintained and serviced according to the maintenance schedule) Health and safety for wastewater (စာ–၁၇၀)၊ impact significance level (Table 78)၊ mitigation measures (စာ–၁၇၀)၊ (Regularly maintain the

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
		perimeter drainage and treated water systems to be efficient. Supply and usage water will be kept in water tanks to avoid contamination from any vectors. Yoke Pyo will strictly enforce good housekeeping practices to prevent diseases from spreading on the site. Health awareness training will be provided to project workers to improve hygienic practices on site.) Health and safety for Non–hazardous and hazardous wastes (စာ–၁၇၁၊ ဇယား ၇၉၊ ၁၇၂၊ ဇယား ၈၀)၊ mitigation measures (စာ–၁၇၃)၊ (Mitigation measures will include: Food wastes will be separated from non–food waste before disposal. The remaining non–hazardous waste will be classified and sorted before treatment, disposal or recycle. Wastes will be disposed by Shwe Bo City Development Committee.) Mitigation measures for hazardous wastes (စာ–၁၇၄)၊ (Hazardous wastes will be stored in closed containers on covered skips for collection and disposed by the contractor City Development Committee. In addition, awareness programs and Personnel Protective Equipment (PPE), such as goggles, face shields, gloves, footwear and specialized clothing when handling chemicals, are provided to all personnel involved with transporting and handling hazardous waste. Yoke Pyo will provide chemical and oil spill Contingency plan and spill kits.

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
		Impacts from Industrial Accidents at Work Site (စာ-၁၇၅)၊ Impact significance (ဇယား ၈၂)၊ Mitigation measures (စာ-၁၇၅၊ ၁၇၆)၊ (Safety training and awareness programs to ensure that all project personnel are aware of the potential risks and have the necessary skills to perform their work in a safe and responsible manner. PPE is provided to all workers on site. Minimum PPE includes safety boots, eye shield, helmet and ear plugs. Gloves, safety glasses, full face visors, dust masks and work vest for overboard work are also provided, depending on the nature of the work. Fire and smoke detection systems are installed and provide entire coverage for the equipment. Portable fire extinguishers of appropriate types and sufficient number are in accommodation spaces, service spaces. An Emergency Management Plan such as fire, fuel or chemical spill, contingency plan is in place to ensure that accidents are effectively managed. First aid kits, burn kit, resuscitators, and stretchers are provided at the clinic located onsite and served by two trained medics. အရေးပေါ် တုန့်ပြန် ရေး အစီအစဉ်။ လောင်စာဆီ၊ ဓာတုပစ္စည်းများ မတော်တဆဖိတ်စင်မှု၊ မီးလောင်မှုစသည်တို့ကို Unplanned Event အဖြစ်ဖော်ပြထားပြီး ဖြစ်နိုင်ချေ၊ ဖြစ်ပေါ်ပါ က အရေးပေါ် တုန့်ပြန်ရမည့် အစီအစဉ်များကို စာမျက်နှာ ၁၈၁၊ ၁၈၂၊ တွင် ဖော်ပြ ထားပြီး low, mitigable and avoidable risk အဖြစ် အကဲဖြတ်ထားပါသည်။ အခန်း ၆-၁၂ တွင် လည်း အရေးပေါ် တုန့်ပြန် ရေး

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
		အစီအစဉ်ကို သီးခြား စုစည်းဖော်ပြ ထားပါသည်။ IEE အတွက် လမ်းညွှန်ချက်မှာ အပိုဒ် ၃၆ (က)-(ည) ဖြစ်သော်လည်း၊ EIA သတ်မှတ်ချက် အပိုဒ် ၆၃ (ဇ) အမှတ်စဉ် (၆) သတ်မှတ်ချက် နှင့် အနီးစပ်ဆုံးဖြစ် အောင်ပြုစုထားပါသည်။
၁၉	စွန့်ပစ်ပစ္စည်းအစိုင်အခဲ စီမံခန့်ခွဲမှု အစီအစဉ်တွင် ပြန် လည် အသုံးမပြု သော အမှိုက်များအား ရွှေဘို CDC ၏ ခွင့်ပြုနေရာတွင် စွန့်ပစ်ကြောင်း ဖော်ပြချက် အား ပြန်လည် ဆန်းစစ် ဖော်ပြရန်၊	စာမျက်နှာ ၁၄၅ တွင် အစိုင်အခဲ စွန့်ပစ္စည်းများမှာ (trash, food waste, paper, plastic and scrap wood and metals) တို့ဖြစ်ပြီး၊ (segregated by type, clearly labelled, and then properly disposed. Food waste will be kept separate from non-food waste) လုပ်မည်ဟု ဖော်ပြထား ပါသည်။ Impact significance သတ်မှတ် ရာတွင် သက် ရောက်နိုင်မှုမှာ ၁ ကီလို မီတာ အကျယ် (Extent) ထက်နည်း ကြောင်း၊ သက် ရောက်မှု ကာလ (Duration) ၁ နှစ်ထက် နည်းကြောင်း၊ Magnitude နည်း ကြောင်း၊ Sensitivity of Receptor နိမ့်ကြောင်း၊ ထို့ကြောင့် သိသာ သော ထိခိုက်မှု (Significant impact) မရှိကြောင်း အကဲ ဖြတ် ဖော်ပြ ထားသည်။ Mitigitaion measures အဖြစ် To comply with all Myanmar regulations or standards of City Development Committee To store, separate, transport and dispose of waste using appropriate procedures and disposal facilities) ဟုဖော်ပြထား ပါသည်။ စက်ရုံ Waste management facilities များကို Figure 34 တွင်လည်းကောင်း၊ Shwebo City Development Committee မှ လပြတ်စနစ်ဖြင့် အမှိုက်သိမ်းပုံကို Figure 35 တွင်လည်း ကောင်း ဖော်ပြထားပါသည်။

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
၂၀	စာမျက်နှာ ၂၄၇ ဇယား ၉၅ ပါ စောင့်ကြပ်ကြည့်ရှု မည့် အစီအစဉ်အား ပြည့်စုံစွာ ထည့်သွင်း ဖော်ပြ ရန်၊	စာမျက်နှာ ၂၄၇ ပါ ဇယား ၉၅ သည် Monitoring Team တွင် ဒေသခံများပါဝင်ဖွဲ့စည်းရန်ကို သာပြ ခြင်းဖြစ်ပါသည်။ (စောင့်ကြပ်ကြည့်ရှုမည့်အစီအစဉ်ကို Table 94 တွင် parameters ၊ နေရာ၊ အကြိမ်၊ နည်းလမ်း စသည်ဖြင့် ဖော်ပြ ထား ပါသည်။) ရည်ရွယ်ချက်၊ တာဝန်များကို စာမျက်နှာ ၂၄၇၊ အခန်း ၆.၇ တွင် ဖော်ပြထား ပါသည်။ Proponent shall carry out environmental monitoring programme which is part of the EMP and the monitoring report will be distributed to the participants of the monitoring team. Implementation of CSR programme will also be facilitated with the participation of the monitoring team. Local community could communicate with the project for environmental affairs through the monitoring team. The functions of the Environmental Monitoring Team are as follows: (a) To release information on the implementation of EMP for local community continuously (b) To distribute information on environmental monitoring to local community (c) To create a proper communication channel between the project and local community relating to environmental affairs (d) To insert a check and balance action for

စဉ်	ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်	ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်
		the management of fund and aids provided by the CSR programme
၂၁	ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း အစီရင်ခံစာပါ လျှော့ချ မည့် အစီအစဉ်များ၊ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် များနှင့် စောင့်ကြပ်ကြည့်ရှု မည့် အစီ အစဉ် များအတွက် ရန်ပုံငွေလျာ ထားမှုပမာဏများအား ပြင်ဆင်ထည့်သွင်း ဖော်ပြရန်၊	ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း အစီရင်ခံစာပါ ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် များ အတွက် ကျပ် ၅,၀၀၀,၀၀၀ နှင့် စောင့်ကြပ်ကြည့်ရှု မည့် အစီ အစဉ် များအတွက် ကျပ် ၅,၀၀၀,၀၀၀ အသုံးပြု မည်ဖြစ်ကြောင်း၊ စာမျက်နှာ ၂၄၆ တွင် ဖော်ပြ ထားပါသည်။
၂၂	အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း အစည်း အဝေး ကျင်းပခဲ့သည့် အစီအစဉ် (ကျင်းပသည့် နေရာ၊ နေ့ရက်၊ ဖိတ်ကြားသည့် အစီအစဉ်၊ တက် ရောက်သူဦးရေ၊ ဆွေးနွေးသည့် အကြောင်းအရာ များ၊ အပြန် အလှန် ဆွေးနွေးချက်များ၊ အကြံပြု ချက်များ၊ အကြံပြုချက်များအပေါ် အကောင် အထည်ဖော် ဆောင်ရွက် ထားသည့် အခြေအနေ များ) အား အသေး စိတ်ထည့်သွင်းဖော်ပြရန်နှင့် ဆက်လက် ကျင်းပ ဆောင်ရွက်မည့် အစီအစဉ်များ၊ စီမံကိန်းလုပ် ငန်း ဆောင်ရွက်မှုကြောင့် အနီးဝန်း ကျင်မှ မကျေ နပ် ချက်များရှိပါက စက်ရုံသို့ တိုင် ကြားနိုင်သည့် နေရာ များအား ဆောင်ရွက်ထား မှုအခြေအနေကို ထည့်သွင်းဖော်ပြရန်၊	အများပြည်သူနှင့်တိုင်ပင် ဆွေး နွေးခြင်း အကြံပြု ချက်များ အ ခြေ အနေများ အား စာမျက်နှာ ၂၅၁၊ အခန်း ၇.၃၊ ၇.၄ တို့ တွင်ထည့် သွင်းဖော်ပြထား ပါသည်။ တွေ့ဆုံမေးမြန်းခြင်း၊ Focus Group Discussion တို့မှ သိရှိရသော လူထုသဘောထား ကို ဇယား ၉၈၊ ၉၉ တွင် ဖော်ပြထားပါသည်။ ရုပ်ပျိုး အဆောက်အဦးဥ်ကျင်းပသော လူထုတွေ့ဆုံပွဲတွင် ပြန်လည်ဆွေးနွေးခြင်း၊ အကြံပြုခြင်း များမရှိခဲ့ ကြောင်းလည်းဖော်ပြထားပါသည်။ အနီးဝန်း ကျင်မှ မကျေ နပ် ချက်များရှိပါက စက်ရုံသို့ တိုင် ကြားနိုင်သည့် စနစ် (Grievance Redress Mechanism) ကို အခန်း ၇.၆.၁၊ စာ–၂၆၁၊ ပုံ ၄၁ တွင် ဖော်ပြထားပါသည်။
၂၃	ဒေသဖွံ့ဖြိုးရေးအတွက် ဆောင်ရွက် မည့် အစီ အစဉ် များအား ထည့်သွင်း ဖော်ပြရန်၊	အခန်း ၆.၈၊ စာ–၂၄၈ တွင်ဖော်ပြထားပါသည်။ (Educational sector, health sector, social affairs, economic sector, infrastructural sector, disaster aid programmes and

<table>
<tr><th>စဉ်</th><th>ပြင်ဆင်ဖြည့်စွက်ရန် ECD အကြံပြုချက်</th><th>ပြင်ဆင်/ဖြည့်စွက်ချက် အကြောင်းရှင်းလင်းချက်</th></tr>
<tr><td></td><td></td><td>drinking water programmes for Min Kyaung, Myaung Gyi and Bago Gone and other nearby villages) (Programmes for employers such as social welfare, health care, educational aid, and professional development trainings)။ ကျပ် ၁၀,၀၀၀,၀၀၀ အသုံးပြုရန် လျာထားကြောင်း စာ-၂၄၈ တွင် ဖော်ပြထားပါသည်။</td></tr>
<tr><td>၂၄</td><td>အစီရင်ခံစာပါအခန်းအလိုက် ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့ပါးစေရေး ဆောင်ရွက်မည့် လုပ်ငန်းစဉ်များကို အကျဉ်းချုပ်၍ အောက်ပါ ကတိကဝတ်ဇယားပုံစံဖြင့် ဖော်ပြရန်-</td><td>အကြံပြုချက်အတိုင်း ကတိ ကဝတ် ဇယား (List of Commitments) ကို သီးသန့် ဖော်ပြ ထားပါသည်။
<table>
<tr><th>အမှတ်စဉ်</th><th>ကတိကဝတ်၏ အတိုချုပ် အမည်</th><th>ကတိကဝတ် အား ရှင်းလင်း ဖော်ပြချက်</th><th>အစီရင်ခံစာပါ ရည်ညွှန်းချက် (အခန်း)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>၂၅</td><td>ပြန်လည်ပြင်ဆင်ထားသည့် ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း အစီအစဉ်ကို တင်ပြရာ၌ IEE နှင့် EMP အား သီးခြားစီ တင်ပြခြင်း မပြုရန် IEE အစီရင်ခံစာ တွင်ပါ EMP အား သီးခြားအခန်းဖြင့်သာ ဖော်ပြရန်၊</td><td>အကြံပြုချက်အတိုင်း၊ စာ မျက်နှာ ၁၈၈၊ အခန်း (၆) တွင် EMP ကို ပေါင်းစည်း ဖော် ပြထားပါသည်။</td></tr>
</table>

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LISTS OF ABBREVIATIONS

BOD	Biochemical Oxygen Demand
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
ECL	Environmental Conservation Law
ECC	Environmental Compliance Certificate
EHS	Environmental, Health, and Safety
EMP	Environmental Management Plan
GIIP	Good International Industry Practice
GW	Ground Water
GHG	Greenhouse Gas
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
INGOs	International Non-Government Organizations
MONREC	Ministry of Natural Resources and Environmental Conservation
MEMs	Mitigation and Enhancement Measures
NGOs	Non-Government Organizations
NEQG	National Environmental Quality Guidelines
PM	Particulate matter
RH	Relative Humidity
UNEP	United Nations Environment Programme

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Yoke Pyo Traditional Medicine Production was started in 1972 by Professor U Chain. In 2013, Yoke Pyo Company Limited started to set up new traditional medicine production factory in Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing. The project is located at the west side of Shwe Bo-Myitkyina highway. On completion, the factory will produce 800 kg per day (2000 Boxes per day). Project construction works started since 2013 and it will be opened by 2020.

1.2 OBJECTIVES OF THE IEE STUDY

The aim of Initial Environmental Examination (IEE) for Yoke Pyo Traditional Medicine Production Factory Project is to enable the approving authority and the developer to properly consider the potential environmental and social consequences of the project and to delineate an environmental management plan for the project.

Primary objective of the report is to provide sufficient, clear and objective information for the approving authority to make a decision on whether to approve the project and if so, under what conditions.

IEE study for Yoke Pyo Traditional Medicine Production Factory Project is performed by Sein Shwe Hein Co., Ltd and Smart Environs Co., Ltd with the following specific objectives:

(a) to investigate the legality of the project;
(b) to study the background environmental and socioeconomic profile of the area;
(c) to release project information for the general public;
(d) to study the environmental, social and socioeconomic issues likely to occur; and
(e) to devise mitigation and enhancement measures for key environmental and social impacts.

1.3 SCOPE OF THE IEE STUDY

The IEE study focusing the project area and its vicinity includes Myaung Gyi, Min Kyaung and Bago Gone villages. General study scope of IEE team includes:

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

1.4 PRESENTATION OF THE PROJECT PROPONENT

Table 1. Information of Yoke Pyo Company limited

Sr.	Particular	Name/ Address
1	Company Name	Yoke Pyo Company Limited
2	Location Project	C-5,6,7,8, Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing.
3	Company Address	C-5,6,7,8 Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing.
4	Project Owner	U Kyaw Thet Naing
5	Company Registration No	102159519(001)
6	Project Start Date	2012

7	Construction Period	5 yrs
8	Type of Business	P.P.P
9	Total Project Area	(4.967) Acres

Table 2. List of Directors of Yoke Pyo Company Limited

Sr.	Participant	Sector	Address
1	Daw Tin Nu	Chairman	3 Ward, Yan Gyi Aung Street, Shwe Bo Township, Sagaing
2	U Kyaw Thet Naing	Managing Director	3 Ward, Yan Gyi Aung Street, Shwe Bo Township, Sagaing
3	Daw Aye Ei Thu	Director	3 Ward, Yan Gyi Aung Street, Shwe Bo Township, Sagaing
4	Daw Su Lei Naing	Director	3 Ward, Yan Gyi Aung Street, Shwe Bo Township, Sagaing

Table 3. Project Contact Person of Yoke Pyo Company Limited

Sr	Name	Contact No	Email Address
1	U Kyaw Thet Naing	092003135	Kyawthetnaing.yokepyo@gmail.com

1.5 DECLARATION OF IEE EXPERTS

Sein Shwe Hein and Smart Environs declare this IEE was prepared in accordance with the Environmental Conservation Law (2012), Rules and Procedures under the guidance of the Ministry of Natural Resource and Environmental Conservation.

Sein Shwe Hein and Smart Environs endorse and confirm to Environmental Conservation Department:

- The accuracy and completeness of the IEE.
- The IEE has been prepared in compliance with applicable Environmental Conservation Law, Rules and Procedures;
- That all the information contained in the report is accurate and a truthful representation of all findings as relating to the Project.

1.5.1 IEE Team

The impact was conducted by Myanmar registered consultant companies Sein Shwe Hein Co,.Ltd and Smart Environs Co,.Ltd. The IEE team consisted of individuals described in Table 4.

Table 4. IEE Assessment Team

No	Name	Designation	Responsibility
1	U Hla Myo Aung TCR No. 66	Director (Sein Shwe Hein Co,Ltd)	Geology, soil, Groundwater and Hydrology
2	Dr. Myo Nyunt	EIA Consultant	Risk Assessment and EMP
3	U Khant Myat Kaung	Managing Director (Smart Environs Co,Ltd)	Public Consultation and socio-economics
4	Dr. Myo Myint	Bio-technologist	Biodiversity
5	Daw Phyo Phyo San	Chemical engineer	Chemical/waste analysis and EMP
6	Dr. Myo Min Nyunt	Geotechnical engineer	Stability analysis
7	U Than Aye TCR No. 106	Deputy Director General (Retd.)	Ecology, Land-Use, Socio-economy
8	Dr. Khin Sandar Oo	Medical Consultant	Public Health
9	Dr. That Htet Kyaw TCR No. 106	Technical Consultant	Air Pollution Control
10	U Phyo Maung Maung TCR No. 162	Technical Consultant	Public Consultation

2. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This section lists the legislation relevant to the undertaking of industrial projects in Myanmar. The legislation & policy framework can be divided into the categories as follows:

- Yoke Pyo Policy & Environmental, Social and Health Management System (summarized in Section 2.1)
- Policy and Legal Framework (Section 2.2)
- Contractual and other Commitments (Section 2.3)
- International Conventions (Section 2.4)

2.1 YOKE PYO'S SSHE POLICY & ENVIRONMENTAL, SOCIAL AND HEALTH MANAGEMENT SYSTEM

2.1.1 Yoke Pyo's SSHE Policy

(a) Vision

Yoke Pyo will be a leading company that regards Safety, Security, Health and Environment (SSHE) as a license to operate and strives to achieve SSHE excellence by being a zero incident organization.

(b) Mission

The mission of Yoke Pyo is:

- to prevent all incidents through operational and process safety management.
- to ensure compliance with and constantly manage and improve our well-established SSHE. Management System and its readiness to be able to promptly and effectively respond to emergencies, crises, and security-related events.
- to help deliver energy reliably and securely by using proven and environmentally friendly technology and by operating responsibly to ensure Yoke Pyo's sustainable development.
- to create a generative SSHE culture that is grounded in leadership at every level of the organization, from management to contractors, where everybody understands the crucial importance of SSHE risks, and uncompromisingly manages any SSHE risks in their own working environment.

- to achieve top quartile SSHE performance in exploration and production industry.

(c) Yoke Pyo SSHE Policy

Yoke Pyo Co., Ltd. is committed to safe operations in the country with an ultimate goal of "Target Zero - Nobody Gets Hurts in Our Operations" which covers (1) Zero Injury, (2) Zero Major Accident (e.g. zero major hydrocarbon leak, vehicle accident).

To accomplish this, Yoke Pyo implements Safety, Security, Health and Environmental Management System (SSHE-MS) that outlines the main principles and accountabilities to drive for continuous improvement. We are committed to:

- comply with Myanmar SSHE laws, other applicable requirements.
- perform hazard identification and SSHE risk assessments so that risks are as Low As Reasonably Practicable (ALARP).
- hold employees accountable for SSHE performance by setting and monitoring SSHE Plans and KPIs.

2.1.2 Yoke Pyo's Environmental, Social and Health Management System

The objective of Yoke Pyo's SSHE MS Manual is to serve as a practical interpretation of the Company's SSHE policy with respect to their moral obligations for SSHE issues for all persons working on, visiting or affected by operations at sites for which Yoke Pyo has responsibility.

2.2 POLICY AND LEGAL FRAMEWORK

2.2.1 Environmental Policy & Framework

Environmental legislation and arrangements for environmental conservation in Myanmar are developing rapidly as part of Myanmar's reform process that involves the updating and enforcing environmental policy and legislation.

At present, all laws relating to the environment are being formulated and administered by the sectorial ministries and departments concerned. **Section 2.2.2** provides a list of environmental legislation relevant to the Project activities.

2.2.2 National Environmental Legislation

2.2.2.1 Overview

The national legislation applicable to the Project comprises the following sources of law, listed hierarchically in accordance with the Constitution and other laws of Myanmar:

- The Constitution of the Republic of the Union of Myanmar (2008);

(a) The Myanmar Investment Law (2016);

(b) Myanmar Environmental Conservation Laws (2012);

(c) Environmental Conservation Rules (2014);

(d) Environmental Impact Assessment Procedure (2015);

(e) National Environmental Quality (Emission) Guideline (2015).

(a) The Constitution of the Republic of the Union of Myanmar (2008);

The latest enacted Constitution of the Republic of the Union of Myanmar (May 2008) provides the most up to date information on governing laws and regulations in Myanmar. The Constitution prevails over any other national legislation or international agreements. The key sections are 21 (a, d), 37 (a, b), 45, Section 347, Section 390.

(b) The Myanmar Investment Law (2016);

The Myanmar Investment Law, enacted in 2016, vastly simplified the process for investment applications and offers a number of tax breaks, incentives, guarantees, rights and protections for business ventures. The Myanmar Investment Commission (MIC) is a government-appointed body formed under the Myanmar Investment Law.

The law includes provisions to restrict or prohibit investment activities which affect public health, the environment and ecosystems, which produce toxic waste or which engage with toxic chemicals; duties of investors to conduct business in such a way as to avoid environmental damage, air and water pollution, in accordance with existing laws as per the following sections. The key sections are 50 (d) 51 (a to f), 65 (e, f, g, i, j, k, l m, o, p, q).

(c) Myanmar Environmental Conservation Laws (2012);

The Environmental Conservation Law (Pyidaungsu Hluttaw Law No. 9 / 2012) Key sections of importance are 7 (o), 14, 15, 24 and 29 related to pollution control and penalties (if) the proponent causes any pollution.

(d) Environmental Conservation Rules (2014);

The Environmental Conservation Rules relating to the Environmental Conservation Law, were enacted on 5 June 2014, contain specific items relating to IEE, EIA and pollution prevention which fall under the powers of the Ministry Natural Resources and Environmental Conservation. The key section of importance is 69.

(e) Environmental Impact Assessment Procedure (2015);

Environmental Impact Assessment Procedures have been prepared by MONREC under the Environmental Conservation Law, 2012. It requires that the Project proponent has to include in its evaluation environmental, social and health aspects of the environment, and has to identify and assess all adverse impacts and risks for environment, social issues and, if relevant, health that potentially could arise from the Project. Therefore, this law will be effectively considered an EIA procedure framework. The key sections are paragraphs 87, 102 – 110, 113, 115, and 117.

(f) National Environmental Quality (Emission) Guideline (2015)

MONREC has established environmental quality standards, the National Environmental Quality Standard [Legal Reference: ECL 2012 (Section 2c) and EQEG 2015]. These Guidelines are noted to be the same as that recommended by the IFC General EHS Guidelines (2007) (World Bank Group, 2007) and the IFC sector specific guidelines (World Bank Group, 2015). The key relevant sections are 1, 4, 5, 6, 7, 9, 12 and 13.

2.2.2.2 Environmental Impact Assessment Procedure (2015)

The EIA Procedure for Myanmar was promulgated on 29th December 2015. The Ministry of Natural Recourses and Environmental Conservation (MONREC) implements the procedure. The EIA Procedure sets out the requirements for development, assessment and subsequent monitoring of an EIA. The requirements to conduct an EIA are outlined in the Environment Conservation Law (2012) and Environment Conservation Rules (2014).

Under Myanmar's EIA Procedure, there is a requirement for the undertaking of an IEE or an EIA in order to obtain an ECC for certain development projects.

The project proponent has to comply with CHAPTER VIII. Environmental Compliance Certificate, Conditions and Revisions to Conditions as follows:

Paragraph 87. Upon receipt of the written approval from the relevant authority, the Project Proponent has to commence implementation of the Project strictly in accordance with the conditions attached to the ECC and including the EMP, within such time as may be prescribed by the Ministry.

The project proponent has to comply with the Responsibility for all Adverse Impacts as follows:

Paragraph 102. The Project Proponent has to bear full legal and financial responsibility for: a) all of the Project Proponent's actions and omissions and those of its contractors, subcontractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the Project acting for or on behalf of the Project, in carrying out work on the Project; and b) PAPs until they have achieved socio-economic stability at a level not lower than that in effect prior to the commencement of the Project, and will support programs for livelihood restoration and resettlement in consultation with the PAPs, related government agencies, and organizations and other concerned persons for all Adverse Impacts.

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

Paragraph 104. The Project Proponent has to be responsible for, and will fully and effectively implement, all requirements set forth in the ECC, applicable Laws, the Rules, this Procedure and standards.

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

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

Paragraph 107. The Project Proponent has to notify and identify in writing to the Ministry any breaches of its obligations or other performance failures or violations of

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

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

Paragraph 109. The project proponent has to submit the report according to paragraph 109 of Environmental Impact Assessment Procedure (2015).

The project proponent has to comply with Paragraph 113.

For purposes of monitoring and inspection, the Project Proponent:

a) has to grant to the Ministry and/or its representatives, at any time during normal working hours, access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed; and

b) from time to time as and when the Ministry may reasonably require, has to grant the Ministry access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed.

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

Paragraph 117. The Project Proponent has to further ensure that the Ministry's rights of access hereunder will extend to access by the Ministry to the Project's contractors and subcontractors.

2.2.2.3 National Environmental Quality (Emission) Guideline, 2015

The project proponent has to comply with Paragraph 5.

The project proponent has to ensure emissions comply with General and industry-specific Guidelines as set out in Annex 1 – Emissions Guidelines for any project subject to EIA Procedure, as adopted by the Ministry, in order to protect the environment and to control pollution in the Republic of the Union of Myanmar.

The project proponent has to comply with Paragraph 7

The project proponent recognizes that these Guidelines are intended to prevent pollution through reducing the mass of pollutants emitted to the environment, dilution of air emissions and effluents to achieve maximum permitted values is not acceptable. The specified guideline values have to be achieved, without dilution, at least 95 percent of the time that a project is operating, to be calculated as a proportion of annual operating hours.

The project proponent has to comply with Paragraph 12.

As specified in the EIA Procedure, project proponent will engage in continuous, proactive and comprehensive self-monitoring of the project and comply with applicable guidelines and standards. For purposes of these Guidelines, the project proponent will be responsible for the monitoring of their compliance with general and applicable industry-specific Guidelines as specified in the project EMP and ECC.

The project proponent has to comply Paragraph 13

The project proponent will ensure that Air emissions, noise, odor, and liquid / effluent discharges will be sampled and measured at points of compliance as specified in the project EMP and ECC.

2.2.3 Project-Relevant Laws

The Myanmar Environmental Conservation Law, Environmental Conservation Rules, Environmental Quality (Emission) Standards are the first step to address all the complex environmental and social management issues faced by Myanmar. A number of other laws exist which, either directly or indirectly, relate to environmental and social management of the project. The other relevant Myanmar government agencies/ requirements applicable to the Project are summarized below:

- Environmental Conservation Law, 2012, Section 7(o) 14,15, 24, 29
- Environmental Conservation Rule, 2014, Rule 69

- Myanmar Investment Law, 2016, Section 50 (d), 51 (a to f), 65 (e, f, g, i, j, k, l, m, o, p, q) and 73
- Public Health Law, 1972, Section 3 and 5
- The Prevention and Control of Communicable Disease Law, 1995, Section 3, 4, 9 and 11
- The Control of Smoking and Consumption of Tobacco Product Law, 2006, Section 9
- The Myanmar Fire Force Law, 2015, Section 25
- The Protection and Prevention of Antique Objective Law, 2015, Section 12
- The Protection and Prevention of Ancient Monument Law, 2015, Section 12, 15 and 20
- The Protection and Prevention of Cultural Heritage Area, 2015, Section 20, 23 and 29(b)
- The Employment and Skill Development Law, 2013, Section 5, 14 and 30 (a, b)
- The Workmen Compensation Act, 1923, Section 10 (a, b) and 11
- The Labour Organization Law, 2011, Section 17 to 22
- The Settlement of Labour Disputes Law, 2012, Section 38, 39, 40 and 51
- Minimum Wages Law, 2013, Section 12, 13 (b, c, d), 43 (e, f, g)
- Payment of Wages Law, 2016, Section 3, 4, 5, 7, 13, and 14
- Social Security Law, 2012, Section 11(a), 15, 18(b), 48(b), 49 and 75
- Leaves and Holidays Act, 1951
- Land Acquisition Act 1894
- The Motor Vehicles Law, 2015 and Rules, 1987
- Myanmar Insurance Law, 1993, Section 15 and 16
- The Protection of Biodiversity and Conservation Areas Law, 2018, Section 39 (d, e) and 41 (a, b)
- The Prevention of Danger of Hazardous Chemical and related Substances Law, 2013, Section 16,17,23 and 27
- Import and Export Law, 2012, Section 7
- Myanmar Engineering Council Law, 2013
- State-Owned Economic Enterprises Law, 1989

The project relevant laws are detailed in **the following table.**

2.3 CONTRACTUAL AND OTHER COMMITMENTS

The project proponent and EIA consultant (Sein Shwe Hein and Smart Environs) endorse and confirm to Environmental Conservation Department:

- The accuracy and completeness of the IEE;
- The IEE has been prepared in compliance with applicable Environmental Conservation Law, Rules and Procedures;
- That all the information contained in the report is accurate and a truthful representation of all findings as relating to the Project.

The project proponent and its contractors and subcontractors will comply with legal commitments, Environmental Management Plan described in the IEE and all applicable Myanmar Laws and regulation requirements and all necessary International laws and Standards.

The project relevant laws and regulations are detailed in the following table.

Table 5. Project Relevant Laws and Regulations List

Law and Regulations	Descriptions
The Environment Conservation Law, 2012	
The project proponent has to comply **Section 7, Subsection {o)** of the law and will pay compensation if the project proponent causes environmental impacts. **The project proponent has to comply with Section 14.** The project proponent when causing a point source of pollution will treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards. **The project proponent has to comply with Section 15.** If the project proponent causes a point source of pollution they have to install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it has to be arranged to dispose the wastes in accord with environmentally sound methods. **The project proponent will comply Section 24**. The project proponent has to allow The Ministry to conduct inspection whether or not it is performed in conformity with such terms and conditions or inform the relevant Government departments, Government organizations to carry out inspections. **The project proponent will comply Section 29**. Project proponent has to not violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law.	
Environmental Conservation Rules, 2014	
The project proponent has to comply with Rule 69. If the project proponent does not comply according to section 69, the project proponent will be prosecuted according to Environmental Conservation Law, Section 31.	

Law and Regulations	Descriptions
Myanmar Investment Law, 2016	
The project proponent has to comply with Chapter (12) Rights to Use Land, Section 50 as follows: (d) The project proponent has to register the land lease contract at the Office of Registry of Deeds in accordance with the Registration Act. **The project proponent has to comply with Chapter (13), Section 51 as follows:** (a) may appoint of any citizen who is a qualified person as senior manager, technical and operational expert, or advisor in his investment within the Union in accordance with the laws; (b) has to appoint them to replace, after providing for capacity building programs in order to be able to appoint citizens to positions of management, technical and operational experts, and advisors; (c) has to appoint only citizens for works which does not require skill; (d) has to appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between project proponent and employee in accordance with the labor laws and rules; (e) has to ensure to obtain the entitlements and rights in the labor laws and rules, including minimum wages and salaries, leave, holidays, overtime fees, damages, compensation of the workman, social wel fare, and other insurance related to workers in stipulating the rights and duties of employers and employees and occupational terms and conditions in the employment contract; (f) has to settle disputes arising among employers, among workers, between employers and workers, and technicians or staff in the investment in accordance with the applicable laws. **The project proponent has to comply with Chapter (16) Responsibilities of Investors, Section 65 as follows:** (e) has to immediately inform the Commission if it is found that natural mineral resources or antique objects and treasure trove not related to the	

Law and Regulations	Descriptions
investment permitted above and under the land on which the investor is entitled to lease or use and not included in the original contracts. If the Commission allows, the project proponent has to continue to carry out the investment in such land, and if not allowed, the project proponent has to transfer and carry out, by obtaining the permission, at the substituted place which is selected and submitted by him; (f) has to close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce; (g) has to abide by the applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage; (i) has to close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce; (j) has to pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directives and so forth during the period of suspension of investment for a credible reason; (k) has to pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work; (l) has to supervise foreign experts, supervisors and their families, who employ in its investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar; (m) has to respect and comply with the labor laws;	

Law and Regulations	Descriptions
(n) has to have the right to sue and to be sued in accordance with the laws; (o) has to pay effective compensation for loss incurred to the victim, if there is damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a Permit or an Endorsement. (p) has to allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment; (q) has to take in advance a Permit or an Endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment. Such investments has to be submitted the situation of environmental and social impact assessment to the Commission during the permitted investment period. **The project proponent has to comply with Chapter 17 Insurance, Section 73 as follows:** The project proponent has to insure the types of insurance stipulated in the provision of the rules at any insurance enterprise that is entitled to carry out insurance businesses within the Union.	
Public Health Law, 1972	
Section 5	The project proponent has to accept any inspection, anytime, anywhere if it is needed.
Section 9	The project proponent will comply with Clause 9, Subsection 1 of Section 3. The project proponent has to provide required infrastructure relating to environmental health, such as garbage disposal, use of water for drinking and other purposes, radioactivity, protection of air from pollution, sanitation works and food and drug safety for all works.
The Prevention and Control of Communicable Disease Law, 1995 and Amendment of Prevention and Control of Communicable	

Law and Regulations	Descriptions
Diseases Law, 2011	
Section 3	In order to prevent the outbreak of Communicable Diseases, the project proponent has to work with the Department of Health shall to implement required activities under this section.
Section 4	The project proponent in order to prevent and control the spread of a Principal Epidemic Disease has to allow the Health Officer to undertake the measures detailed in Section 11.
Section 9	If the project proponent notices occurrence of any of the following matters, the project proponent has to report immediately to the nearest health department or hospital: (a) enmasse death of animals including chicken and birds (b) (b) rat fall; (c) suspicion or occurrence of epidemic disease; occurrence of notifiable disease."
Section 11	The project proponent in order to prevent and control the spread of a Principal Epidemic Disease has to allow the Health Officer to undertake the measures detailed in Section 11.
The Control of Smoking and Consumption of Tobacco Product Law, 2006	
The Control of Smoking and Consumption of Tobacco Product Law (No. 05/2006)	
Chapter VI - Functions and Duties of Person-in-charge	
Section 9	The project proponent has to establish a smoking area and establish notice board for non-smoking area, and to accept the inspection of Ministry of Health as follows: (a) keep the caption and mark referring that it is a non-smoking area at the place mentioned in section 6 in accordance

Law and Regulations	Descriptions
	with the stipulations. (b) arrange the specific place where smoking is allowed as mentioned in section 7, and keep the caption and mark also referring that it is a specific place where smoking is allowed, in accordance with the stipulations. (c) supervise and carry out measures so that no one can smoke at the non-smoking area. (d) accept the inspection when the supervisory body comes to the place for which they are responsible.
The Myanmar Fire Force Law, 2015	
The Myanmar fire force law, 2015 covers requirements for firefighting and fire protection.	
The project proponent has to comply with Chapter 11, Section 25 as follows:	
Section 25	The project proponent has to implement the management of fire sub-station and required equipment to ensure (a) No absence for organizing separate fire force (b) No absence to set ready for fire safety equipment
Shops and Establishments Law, 2016	
Section 13, Project proponent has to ensure that on their project site: (a) Nobody under the age of 14 shall be allowed or required to work at a shop or at an establishment. (b) Nobody under the age of 16 shall be allowed to work more than the designated work time at a shop or at an establishment. **Section 14, Project proponent has to ensure that on their project site:** (a) Anyone who is over 14 and under 16 may work with the permission of a doctor stating in a recommendation letter that the person is fit to work. However, this person shall not be allowed to work more than 4 hours per day.	

Law and Regulations	Descriptions

(b) Nobody over 14 and under 16 shall be allowed or required to work from 6:00 pm to 6:00 am.

(c) Nobody over 14 and under 16 shall be allowed or required to work at another shop or establishment on the same day after working at a shop or establishment.

(d) No worker under 18 shall be allowed or required to perform work of a dangerous type or work at a dangerous workplace.

(e) Anyone between 16 and 18 shall, with the recommendation of a doctor, be allowed to work at workplaces where it is safe and there is no impact on the mental and physical development, provided that this person has finished proficiency training for the relevant job, is able to understand and follow the directives for health and safety at the workplace, and is fit and healthy.

Section 15, The project proponent-

(a) Has to designate at least one day per week as off-day for the worker at the respective shop or establishment.

(b) Has to not deduct the rightful salary of the worker for the off-day under sub-section (a).

Section 16, The project proponent has to pay the salary not later than 7 consecutive days after the salary payment period of the worker at the shop or establishment.

Section 17, The project proponent

(a) Has to calculate and pay the overtime fees in compliance with the agreed overtime payments based on the worked overtime hours.

(b) Has to not request overtime work without paying overtime fees according to sub-section (a).

Section 21, In the cases of this law, the project proponent

(a) Has to arrange the respective documents, lists, contracts, evidence, forms and samples to be inspected by the inspector.

(b) Has to, upon request, submit the registration book kept under this law and the rules, evidence of being the owner or documents regarding the

Law and Regulations	Descriptions
business of any shop or establishment to the inspector. **Section 24, The project proponent has to comply with the following at every shop and establishment.** (a) Has to arrange for cleaning, good ventilation, and health. (b) Has to arrange for fresh air and sufficient light. (c) Has to arrange for it not being louder than the specified noise level. (d) Has to arrange for the prevention of overheating [literal translation] and the prevention of fire hazards. (e) Has to arrange for sufficient first aid boxes and medicine for the employees according to the provisions.	
The Protection and Prevention of Antique Objective Law, 2015	
The Protection and Preservation of Antique Objects Law (No. 43/2015) covers requirements for the finding of antique objects.	
Section 12	If the project proponent finds any object which has no owner or custodian, has to promptly inform the relevant Ward or Village-Tract Administrator if they knows or if it seems reasonable to assume that the said object is an antique object.
The Protection and Prevention of Ancient Monument Law, 2015	
The Protection and Preservation of Ancient Monuments Law (No. 51/2015). The project areas are not near any protected or Ancient Monuments including the Zarli Mountain.	
Chapter VII. Applying for prior Permission, Scrutiny and Issue	
Section 15	If the project proponent aiming at realizing any of the following within the specified area of an ancient monument has to apply to get prior permission to the Department: (b) constructing or extending or repairing new buildings including hotels, factories and residential buildings or fencing or

Law and Regulations	Descriptions
	extending a fence; (c) digging to search petroleum, natural gas, gem or mineral, piping petroleum and natural gas, constructing factories, connecting national grid, constructing communication tower, constructing or extending infrastructures such as road, bridge, airfield, irrigation and embankment; (d) connecting underground electric cable, communication cable and other underground works; (f) gold sieving, digging, burning bricks, digging well, lake, creek, ditch, gully, pit digging, refilling, levelling, mining, quarry, gravel digging and unearth sand, removing the mounds and hills which can damage the physical feature of the land;
Chapter VIII Prohibitions	
Section 20	The project proponent will not carry out any of the following acts which are assumed to cause damage to an ancient monument within the specified area of an ancient monument or of a listed ancient monument without obtaining written prior permission: (b) using machines which causes vibration within the specified place of an ancient monument and running various types of vehicles; (c) cultivating, gardening, breeding, fencing by blocking nearby an ancient monument or doing any other act which can affect an ancient monument; (d) emission of gas such as hot-air balloon which can affect an ancient monument; (e) landing and taking off and, flying aeroplane and helicopter which can directly or indirectly affect an ancient

Law and Regulations	Descriptions
	monument; (f) discarding chemical substance and rubbish which can affect an ancient monument and the environment.
The Employment and Skill Development Law, 2013	
Employment and Skill Development Law (No 29/2013). The key sections are 5, 14, and 30 (a and b).	
Section 5	The project proponent has to employ according to Section 5 of the Employment and Skill Development Law (No 29/2013).
Section 14	The project proponent has to carry out the training program in accord with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present.
Section 30	(a) The project proponent has to put in to the fund monthly as put in fees without fail for the total wages of the subordinates and the supervisors' salary for not less than 0.5%; (b) The project proponent has to ensure that put in money paid under subsection (a) has to not be deducted from the wage and salary of the employees.
The Workmen Compensation Act, 1923 (amended 2005)	
Workman's Compensation Act (1923) Amended by Law No 4/2005	
Section 10 (a, b) and 11	The project proponent has to compensate for death and injury during the working hours according to Workman's Compensation Act (1923) Amended by Law No 4/2005.

Law and Regulations	Descriptions
Labour Organization Law, 2012	
The Labour Organization Law, (No. 07/2011) and The Labour Organization Rules, 2012 were enacted to protect the rights of the workers, to have good relations among the workers or between the project proponent	
Section 17 to 22	The project proponent has to: • Recognize the labour organizations • Allow the member of executive committee assigned by the labour organization to perform their duty not exceeding two days per month • Assist as much as possible if the labour organizations requests help which is in the interest of the factory's workers.
The Settlement of Labour Dispute Law, 2012	
Settlement of Labour Dispute Law (No. 05/2012) Amended by Law No. 40/2014 was enacted for the settlement of labour disputes:	
Section 38	No project proponent will fail to negotiate and coordinate in respect of the complaint within the prescribed period without sufficient cause.
Section 39	No project proponent will alter the conditions of service relating to workers concerned in such dispute at the consecutive period before commencing the dispute within the period under investigation of the dispute before the Arbitration Body or Tribunal, to affect the interest of such workers immediately.
Section 40	No project proponent will proceed to lock-out or strike without accepting negotiation, conciliation and arbitration by Arbitration Body in accord with this law in respect of a dispute.
Section 51	If the project proponent, in the course of settlement of dispute, commits any act or omission, without sufficient cause,

Law and Regulations	Descriptions
	which by causing a reduction in production resulting so as to reduce the workers' benefits has to be liable to pay full compensation in the amount determined by the Arbitration Body or Tribunal. Such money has to be recovered as the arrear of land revenue.
Minimums Wages Law, 2013	
The Minimum Wages Law, No. 07/2013 was enacted on 22nd March 2013 (The Minimum Wages Rules, 2013). Section 12 (d) of the law provides that the project proponent has to pay the minimum wage to	
Section 12	The project proponent: (a) has to not pay wage to the worker less than the minimum wage stipulated under this Law; (b) may pay more than the minimum wage stipulated under this Law; (c) has to not have the right to deduct any other wage except the wage for which it has the right to deduct as stipulated in the notification issued under this Law; (d) has to pay the minimum wage to the workers working in the commercial, production and service business in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash or partly in cash and partly in property, with prevailing regional price, jointly according to the desire of the worker;
Section 13	The project proponent: (b) Has to prepare and maintain the lists, schedules, documents and wages of the workers correctly; (c) Has to report the lists, schedules and documents prepared and maintained under sub- section(b) to the relevant department in accord with the stipulations;

Law and Regulations	Descriptions
	(d) Has to accept the inspection when summoned by the inspection officer. Moreover, he has to produce the said lists and documents upon asking to submit;
The Minimum Wages Rules, 2013 include: Chapter 9 - The power and obligations of the project proponent	
Section 43	The project proponent: (e) before fixing of the minimum wage by the National Committee under this rule, if his remuneration is less than the prescribed amount, he should be paid up to the full amount; (f) part time, hourly job employees has to be paid the prescribed minimum wage for the working hours; (g) for the salary employees one day day-off has to be allowed in a week. If he has to work on the off day, overtime wage has to be paid in accord with the existing law;
Payment of Wages Law, 2016	
Payment of Wages Law (No 17/2016) covers the following requirements:	
Chapter 2	
Section 3	Section 3 The project proponent has to pay for salary either Myanmar Kyats or Foreign Cash permitted by National Bank of Myanmar. When delivery the salary (b) If the project proponent needs to pay the other opportunities or advantages, they can pay cash together with other materials according employee's attitude.
Section 4	Section 4 When the contract finish, the project proponent has to pay the salary (not more than one month) to employees. For the permanent worker, has to pay per monthly. If more than 100 employees, has to pay within the 5 days from the

Law and Regulations	Descriptions
	end of month. If fire the employees, has to pay salary within two days after fire. When employee dies due to the accident, has to pay money as insurance to employee's family within two days.
Chapter 3	
Section 7	Project proponent has to comply with all sections covering all the issue of deducted salary based on different categories. According to Chapter 3, Section 7, the project proponent can deduct: (a) Can deduct from wages for absences except when such absence is during a public holiday or entitled leave, according to the law. (b) Accommodation charges and transportation charges, meal allowances, charges for water and electricity, taxes and errors in payment shall be allowed for deduction. (c) Can deduct from pre-issued, expensed and saved (or) contributed amount according to the law upon the employee contract. (d) The Employer can deduct with the judgment of the Court of Arbitrator Jury Council.
Section 11	According to Chapter 3, Section 11, the project proponent can also deduct for: (a) Direct damage which is either intentional or due to negligence or due to the failure of the employee concerned with company property to take proper care. (b) A breach of the employment contract or breech of any rules for which a fine had been previously set. No other deductions are allowed, except those covered above by Sections 7 and 11 of Chapter 3. Furthermore, according to Chapter 3, Section 10, no deductions shall ever be allowed for any workers under the age of

Law and Regulations	Descriptions
	16.
Section 14	Section 14. If an Employee carries out overtime work, the project proponent has to ensure he/she is allowed the presiding overtime rate as set by the Law.
Social Security Law, 2012	
The objectives of the Social Welfare Law (2012) and accompanying Social Welfare Rules (2014) include providing workers with the right to draw back some of the contributions paid by employers and workers as	
Section 11	The Social Welfare Law (2012) requires the project proponent establishments to comply with the provisions for compulsory registration with the social security system and benefits (indicated in the Social Welfare Law) if they employ a minimum number of workers as determined by the Ministry of Labour in co-ordination with the Social Security Board: Industries which carry out business whether or not they utilize mechanical power or a certain kind of power; businesses of manufacturing, repairing and servicing; or engineering businesses, factories, warehouses and establishments.
Section 15	The project proponent has to ensure it meets the requirements of the social security funds
Section 18 (b)	The project proponent has to deduct contributions to be paid by worker from his remuneration and pay to the social security fund together with contribution to be paid by him. The employer shall also bear the expenses for such contribution.
Section 48 (b)	(b) The employers may effect insurance by registering voluntarily for insurance of the workers who are not applied to provisions of compulsory registration for employment injury benefit insurance system, by paying stipulated contribution to employment injury benefit insurance fund.

Law and Regulations	Descriptions
Section 49	(a) The project proponent and insured persons of establishments where the project proponent had registered compulsorily in accordance with sub-section (a) of section 48 or where the project proponent had registered voluntarily in accord with sub-section (b) of section 48 who have paid contribution to employment injury benefit fund has to not apply to the provisions contained in the Workmen's Compensation Act as regards the employment injury benefit; (b) The insured persons who has effected insurance for employment injury benefit in accord with sub-sections (a) and (b) of section 48 has to be entitled only to the employment injury insurance benefits contained in this Law.
Section 75	The project proponent: (a) has to prepare and keep the following records and lists correctly and submit to the relevant township social security office in accord with the stipulations: (i) records and lists of workers' daily attendance; (ii) records on appointment of new workers, employing worker by changing of work, termination, dismissal and resignation; (iii)records on promotion and paying remuneration ; (iv)records and lists of employer, manager, and administrator and records on change of them; (b) has to inform the relevant township social security office if the following matters arise: (i) changes in number of workers and address of establishment; (ii) change of employer, change of business, suspension of work, and close-down of work; (iii)employment injury, decease and contracting diseases; (c) has to submit records of work and lists if requested by inspectorate or official assigned by the Social Security Head

Law and Regulations	Descriptions
	Office and various levels of Regional Social Security Office under this Law.
Leaves and Holidays Act, 1951	
The Leave and Public Holiday Act, 1951 Amended by Law No. 06/2006 and No. 30/2014. The project proponent has to allow the leaves and holidays defined by the national governments.	
The Motor Vehicles Law, 2015 and Rule, 1987 and Rule 1987	
The project proponent has to comply with the noise, traffic and exhaust sections of the Motor Vehicle Law No. 55/15	
Myanmar Insurance Law, 1993	
Requires any business which may pollute the environment to effect compulsory general liability insurance.	
Section 15	The project proponent has to ensure all motor vehicles effect compulsory Third Party Liability Insurance with the Myanmar Insurance.
Section 16	The project proponent operating an enterprise which may cause loss to State-owned property or which may cause damage to the life and property of the public or which may cause pollution to the environment has to effect compulsory General Liability Insurance with the Myanmar Insurance.
Biodiversity & Protected Area Law. 2018	
Section 39. If the propjet proponent commits any of the following acts, on conviction be punished with imprisonment for a term which may extend to maximum 3 years or with fine which may extend to minimum Kyats 200,000 or maximum Kyats 500,000 or with both- (d) Causing water and air pollution, causing damage to a water-course or putting poison in the water in a natural area, passing through the electric current, and using chemicals and explosive substances. (e) Possessing or disposing of pollutants or mineral pollutants in a natural area.	

Law and Regulations	Descriptions
Section 41. If the project proponent commits any of the following acts shall, on conviction be punished with imprisonment for a term which may extend to minimum 3 years to maximum 10 years or with fine- (a) Killing, hunting or wounding, collecting, selling a completely protected wild animal or animals controlled in national trade without permission, possessing or transporting or transferring such wild animal or any part thereof or blood of such animals or product deriving from the parts of such animals without permission; (b) Extracting, collecting a completely protected natural plants or plants controlled in national trade or destroying, collecting, possessing, selling, transferring and transporting such plant or any parts thereof or product deriving from the parts of such plant without permission.	
The Protection and Prevention of Cultural Heritage Area, 2015	
The Protection and Preservation of Cultural Heritage Region Law, 1998 Amended by Law. No.1/2009 Provisions to protect ancient sites and regions and cultural heritage areas from any adverse impacts due to industrialization, tourism and urbanization.	
Section 20	The project proponent cannot carry out any of the following in the cultural heritage region: (a) destroying an ancient monument; (b) willfully altering the original ancient form and structure or original ancient workmanship of an ancient monument; (c) excavating to search for antiquities; (d) exploring for petroleum, natural gas, precious stones or minerals.
Section 23	The project proponent cannot plough and cultivate or carry out any activity which may cause damage to the cultural heritage within the boundary notified by the Department in the cultural heritage region.

Law and Regulations	Descriptions
The Prevention of Danger of Hazardous Chemical and related Substances Law, 2013 (Section 16,17,23,27)	
The Prevention of Hazard from Chemicals and Related Substances Law was enacted on 26th August 2013. The objectives of this Law include: protecting natural resources from decrease and loss, and safeguarding living things from endangerment caused by chemical and chemical related substances; and systematically controlling safety in carrying out approved chemical and associated materials businesses. The Law requires continuous development of worksite safety, health and environmental conservation. The Prevention of Hazard from Chemicals and Related Substances Law (2013) defines Chemical as: imposing danger to the health or life of man or animal or chemical element, chemical compound and chemical mixture which cause bad consequences to the environment naturally or appearing after created by man. This definition includes the vapour, liquid, waste materials of oily and solid which act chemically and technically.	
Section 16	The project proponent who has obtained a licence:- (a) has to abide the licence regulations; (b) has to perform to abide strictly the instructions for being safety in using the chemical and related substances by himself and also the persons who serve the work; (c) has to keep the required safety equipment enough in the chemical and related substances businesses, furthermore has to grant the personal protection equipment and dresses free of charge to the working persons; (d) has to make the course of training and study and instruction if necessary to the working persons for using the occupational safety equipment, the personal protection equipment and the dresses systematically in the chemical and related substances business; (e) has to be inspected by the respective Supervisory Board and Boards of Inspection in respect of whether or not the

Law and Regulations	Descriptions
	hazard may impact on the Human Being and Animals' health and the environment; (f) has to make medical check up the working persons who will work in the chemical and related substances business and has to permit to serve in that work after obtaining the recommendation that his health is suitable for that work. This medical check up records have to be kept systematically; (g) has to send the copy of informative letter of the permission to the respective Department of Township Administration, if the hazardous chemical or related substances are permitted to store; (h) has to acquire in advance the guidance and agreement of the respective Department of Fire Brigade, if the business that is worried to fire hazard is operated by using the fire hazard substances or the explosive substances; (i) has to transport only the permitted amount of the chemical and related substances in accordance with the prescriptive stipulations, if they are transported in local; (j) has to take the permission from the Central Supervisory Board if the chemical and related substance is altered and transferred from one place to any other place which contained in the license; (k) has to abide and perform in accordance with the related environmental laws not to impact and damage to the environment in operating the chemical and related substances business.
Section 17	The project proponent who has obtained a licence, has to put the insurance in accordance with the prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses.
Section 23	The project proponent who has obtained the registration certificate:- (a) has to apply to register again, to the Central Supervisory Board if the chemical and related substances, which are not

Law and Regulations	Descriptions
	contained in the registered list, are used; (b) has to inform and submit the unused chemical and related substances list to the Central Supervisory Board, although which are contained in the registered list.
Section 27	The project proponent who has obtained the licence to be complied the following matters to control and decrease the hazard of the chemical and related substances:- (a) classifying the hazard level to protect in advance the hazard according to the properties of the chemical and related substances; (b) expressing the Material Safety Data Sheet and Pictogram; (c) providing the safety equipments, the personal protection equipments to protect and decrease the accident and attending to the training to be used systematically; (d) performing in accordance with the stipulations in respect of transporting, possessing, storing, using, discharging the chemical and related substances; (e) not being imported or exported the chemical and related substances banned by the Central Supervisory Board and the machinery and equipments which are used them.
Import and Export Law, 2012	
Chapter IV Prohibitions	
Section 7	Project Proponent who obtained any license has to not violate the conditions contained in the license.
Myanmar Engineering Council Law, 2013	
The objectives of this Law are as follows:	

Law and Regulations	Descriptions
(a) to uphold and upgrade the dignity, ethics and quality of the Myanmar citizen engineers, graduate technicians and technicians who are practicing engineering works; (b) to explore using engineering technology and information technology combined the good methods, research and development activities by which the natural resources and human resources of the State may be beneficially applied with least impact on environment; (c) to carry out guidance and supervision, and to take necessary actions for fulfillment of the requirements of stipulated technical standard, proper method, free from danger, keeping ethic and being dutiful in the fields of engineering and technology education, researches and services; (d) to service engineering and technology related functions and duties beneficial for the State assigned by the relevant Ministry and relevant organizations The project proponent has to ensure the employment of the person who has certificate related with the project activities under the requirements of Myanmar Engineering Council Law (2013).	
Ward and Village Tract Administration Law, 2012	
Project proponent has to comply with the Ward and Village Tract Administration Law and inform the lists of person that live in exploration and campsite to the relevant ward/village offices.	
Health Care Waste Management Guideline	
Project Proponent has to manage all medical wastes / clinical wastes management in compliance with the Health the Care Waste Management Guideline once stipulated by Ministry of Health and Sports	

2.3.1 National Standards and Guidelines

National Environmental Quality (Emission) Guidelines (NEQG) for waste water and noise levels are referenced in this IEE report. Followings are the environmental standards and guidelines adopted by IEE team. Yoke Pyo Company Limited will maintained and monitor the discharge waste water quality of Yoke Pyo Traditional Medicine Production Factory by complying the following NEQG guidelines.

Table 6. Environmental Standards for Wastewater Discharge (NEQG)

Sr.	Parameter	Unit	Guideline Value
1	1,2- Dichloroethene	mg/l	0.1
2	5-day Biochemical oxygen demand	mg/l	30
3	Acetates (each)[a]	mg/l	0.5
4	Acetonitrile	mg/l	10.2
5	Active ingredient (each)	mg/l	0.05
6	Absorbable organic halogen	mg/l	1
7	Amnies (each)[b]	mg/l	102
8	Ammonia	mg/l	30
9	Arsenic	mg/l	0.1
10	Benzene	mg/l	0.02
11	Cadminum	mg/l	0.1
12	Chemical oxygen demand	mg/l	150
13	Chlorobenzene	mg/l	0.06
14	Chloroform	mg/l	0.013
15	Chromium (hexavalent)	mg/l	0.1
16	Dimethyl sulfoxide	mg/l	37.5
17	Isobutyraldehyde	mg/l	9.5
18	Isopropanol	mg/l	1.6
19	Isopropyl ether	mg/l	2.6

20	Ketones (each)[c]	mg/l	0.2
21	Mercury	mg/l	0.01
22	Methanol/ Ethanol (each)	mg/l	4.1
23	Methyl cellosolve	mg/l	40.6
24	Methylene chloride	mg/l	0.3
25	n-Heptane	mg/l	0.02
26	n-Hexane	mg/l	0.02
27	o-Dichlorobenzene	mg/l	0.06
28	Oil and grease	mg/l	10
29	pH	S.U.[d]	6-9
30	Phenol	mg/l	0.5
31	Tetrahydrofuran	mg/l	2.6
32	Toluene	mg/l	0.02
33	Total nitrogen	mg/l	10
34	Total phosphorus	mg/l	2
35	Total suspended solids	mg/l	10
36	Xylenes	mg/l	0.01

a n-Amyl acetate, n-Butyl acetate, Ethyl acetate, Isopropyl acetate, Methyl formate
[b] Including Diethylamine and Triethylamine [c] Including Acetone, Methyl isobutyl ketone
[d] Standard unit

Table 7. Noise Level Standard (NEQG)

Receptor	**One Hour LAeq (dBA)**	
	Daytime (7:00-22:00) (10:00-22:00 for public holidays)	**Nighttime (22:00-7:00) (22:00-10:00 for public holidays)**
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Table 8. Air Quality Standard (NEQG)

Sr.	Parameter	Unit	Guideline Value
1	Active ingredient (each)	mg/Nm^{3a}	0.15
2	Ammonia	mg/Sm^{3b}	30
3	Arsenic	mg/Sm^3	0.05
4	Benzene, Vinyl chloride, Dichloroethane (each)	mg/Nm^3	1
5	Bromides (as Hydrogen bromide)	mg/Sm^3	3
6	Chlorides (as Hydrogen chloride)	mg/Sm^3	30
7	Ethylene oxide	mg/Sm^3	0.5
8	Hazardous air pollutants	kg/year	900-1,800[c]
9	Mutagenic substance	mg/Sm^3	0.05
10	Particulate matter PM_{10}[d]	mg/Nm^3	20
11	Total Class A[e]	mg/Nm^3	20[f]
12	Total Class B[g]	mg/Nm^3	80[h]
13	Total organic carbon	mg/Nm^3	50
14	Volatile organic compounds	mg/Nm^3	20-150[i] 50[j]

[a] Milligrams per normal cubic meter at specified temperature and pressure
[b] Milligrams per standard cubic meter at specified temperature and pressure
[c] Process-based annual mass limit
[d] Particulate matter 10 micrometers or less in diameter
[e] Class A compounds are those that may cause significant harm to human health and the environment
[f] Applicable when total Class A compounds exceed 100 g/year
[g] Class B compounds are organic compounds of less environmental impact than Class A compounds
[h] Applicable when total Class B compounds, expressed as Toluene, exceed the lower of 5 tons/year or 2 kg/hour
[i] Facilities with solvent consumption > 50 tons/year
[j] Waste gases from oxidation plants

2.4 INTERNATIONAL STANDARDS, GUIDELINES AND TREATIES/ CONVENTIONS RELEVANT TO THE PROJECT

In addition to national legislation, a range of international standards, including IFC Performance Standards (IFC PS) and the World Bank Guidelines have been considered for the Project. Where possible, alignment with such standards have been applied, which then may complement and reinforce national legislation with a view to allowing the Project to be conducted under international practice. The IFC PS and the World Bank Guidelines provide guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the Project Proponent in relation to project-level activities.

In the case of its direct investments (including project and corporate finance provided through financial intermediaries), the IFC PS require its clients to manage environmental and social risks and impacts so that development opportunities are enhanced. The applicable guidelines and standards that the Project has aligned with where practical are as follows:

- IFC Performance Standards (IFC PS) (2012)[1];
- World Bank Group (WBG) Environmental Health and Safety (EHS) General Guidelines (2007)[2];
- WBG EHS Guidelines for Onshore Oil and Gas Development (2007); and
- Relevant international treaties to which Myanmar is a signatory, including those related to waste management, biodiversity conservation as well as labour and human rights conventions.

2.4.1 International Finance Corporation (IFC) Performance Standards (PS)

The IFC of the World Bank Group updated its Sustainability Framework in January 2012. This included revising the PS which replaced the previous safeguard policies and will be used to evaluate any project seeking funding through the IFC.

[1] IFC Performance Standards on Environmental and Social Sustainability, January 2012, International Finance Corporation, World Bank Group

[2] Environmental, Health and Safety (EHS) Guidelines -- General

The IFC PS represent the "policy framework" for the ESIA and sustainable social and environmental management for the Project, whereas the World Bank Group's EHS Guidelines provide guidance on general and industry best practice as well as recommended numerical limits for emissions to the atmosphere, noise, liquid and solid wastes, hazardous wastes, health and safety, and other aspects of industrial facilities and other types of development projects. The relevant IFC PS's are listed in *Table 9* and the General Guidelines.

Table 9. IFC Performance Standards

Performance Standards	Objectives
Performance Standard 1 – Assessment and Management of Environmental and Social Risks and Impacts *Underscores the importance of managing social and environmental performance throughout the life of a project (any business activity that is subject to assessment and management).*	*Impact identification and assessment.* To identify and assess social and environmental impacts, both adverse and beneficial, in the project's area of influence. • *Mitigation.* To avoid, or where avoidance is not possible, minimize, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment. • *Stakeholder engagement.* To ensure that affected communities are appropriately engaged on issues that could potentially affect them. • *Effective management.* To promote improved social and environment performance of companies through the effective use of management systems.
Performance Standard 2 – Labour and Working Conditions *Recognises that the pursuit of economic growth through employment creation and income generation should be balanced with protection for basic rights of workers.*	To promote fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws. • To establish, maintain and improve the worker management relationship. • To promote compliance with national employment and labour laws. • To protect the workforce by addressing child labour and forced labour. • To promote safe and healthy working conditions, and to protect and promote the health of workers.

Performance Standards	Objectives
Performance Standard 3 - Resource Efficiency and Pollution Prevention *Recognises that increased industrial activity and urbanisation often generate increased levels of pollution to air, water, and land that may threaten people and the environment at the local, regional, and global level.*	To avoid or minimise adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce project –related GHG emissions.
Performance Standard 4 – Community Health, Safety and Security *Recognises that project activities, equipment, and infrastructure often bring benefits to communities including employment, services, and opportunities for economic development.*	To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. • To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the Affected Communities.
Performance Standard 5 – Land Acquisition and Involuntary Resettlement *Outlines that involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition*	To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. • To avoid forced eviction. • To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected. To improve, or restore, the livelihoods and standards of living of displaced persons.

Performance Standards	Objectives
	• To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.
Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Natural Resources *Recognises that protecting and conserving biodiversity—the variety of life in all its forms, including genetic, species and ecosystem diversity—and its ability to change and evolve, is fundamental to sustainable development*	To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrated conservation needs and development priorities.
Performance Standard 7 – Indigenous Peoples *Recognises that Indigenous Peoples, as social groups with identities that are distinct from dominant groups in national societies, are often among the most marginalized and vulnerable segments of the population.*	To ensure that the development process fosters full respect for the dignity, human rights, aspirations, cultures and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not feasible, to minimise, mitigate, or compensate for such impacts, and to provide opportunities for development benefits, in a culturally appropriate manner. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the life of the project. • To ensure the Free, Prior and Informed Consent (FPIC) of the Affected Communities of the IPs when the

Performance Standards	Objectives
	circumstances described in this Performance Standard are present. • To respect and preserve the culture, knowledge and practices of Indigenous Peoples.
Performance Standard 8 – Cultural Heritage *Recognises the importance of cultural heritage for current and future generations.* *Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that clients protect cultural heritage in the course of their project activities.*	PS 8 aims to protect the irreplaceable cultural heritage and to guide clients on protecting cultural heritage in the course of their business operations. In addition, the requirements of this PS on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity. PS 8 recognises the importance of cultural heritage with an objective to: • Protect cultural heritage from the adverse impacts of project activities and support its preservation; and • Promote the equitable sharing of benefits from the use of cultural heritage in business activities. • The PS requires the project proponent to comply with relevant national law on the protection of cultural heritage, including national law implementing the host country's obligations under the Convention Concerning the Protection of the World Cultural and Natural Heritage and other relevant international law.

2.4.2 International Conventions

Myanmar as a State Party has signed and ratified various international conventions, laws and treaties which are now an obligation for the nation. The related environmental and social conventions are listed below.

A list of key Project-relevant international treaties and conventions of which Myanmar is a signatory is provided in Table 10.

Table 10. International Conventions of Relevance to the Project

Legislation	Description	Relevance to the Project	Ratification Status
Environmental			
Vienna Convention for the Protection of the Ozone Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer 1989	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone depleting substances.	Not relevant to the Project as the Project will not use any ozone depleting substances.	Accession 16th Sep 1998 (Vienna) & Accession 24th Nov 1993 (Montreal)
Convention on Biological Diversity 1992	Aims to promote national policies for the conservation of wild flora, fauna and habitat that needs to be included in planning policies. The three main goals are: (1) the conservation of the biological diversity; (2) the sustainable use of its components; (3) fair and equitable sharing of the benefits.	The Project will be undertaken in offshore habitats.	Ratified 25th Nov 1994
United Nations Framework Convention on Climate Change 1992 (UNFCCC) and Kyoto Protocol 1997	Provide a framework for intergovernmental efforts to tackle climate change. Recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases.	The Project will form a bit part of Myanmar's total emissions output.	Entered in force 23rd Feb 1995 (UNFCCC) and 16th Feb 2005 (Kyoto Protocol)
Asia Least Cost Greenhouse Gas (GHG) Abatement Strategy (ALGAS) 1998	Develop national and regional capacity for preparation of GHG inventories. Assist in identifying GHG abatement options and preparation of a portfolio of abatement projects for each country.	The Project will produce negligible amount of air emissions from the vehicles.	1998
Myanmar Agenda 21	Provides a framework of programmes and actions for achieving sustainable development in the country, takes into account principles	Not relevant to Project. Relevant to the government.	Since 1997

Legislation	Description	Relevance to the Project	Ratification Status
	contained in the Global Agenda 21. Myanmar Agenda 21 also aims at strengthening and promoting systematic environmental management in the country.		
Social			
International Convention on Standards of Training, Certification and Watch-keeping for Seafarers 1978 (STCW)	Sets out requirements for marine environment awareness training and training in leadership and teamwork including new training guidance for personnel operating Dynamic Positioning (DP) Systems.	The Project vessels will comply with training requirements including for DP.	Entered into Force 1988
Relevant ILO Conventions in force in Myanmar • C1 Hours of Work (Industry) • C14 Weekly Rest (Industry) • C17 Workmen's Compensation (Accidents) • C19 Equality of Treatment (Accident Compensation) • C26 Minimum Wage Fixing Machinery • C29 Forced Labour Convention • C42 Workmen's Compensation (Occupational Diseases) Revised 1934 • C52 Holidays with Pay • C87 Freedom of Association and Protection of the Right to Organize	Sets out legal instruments drawn up by the ILO's constituents (governments, employers and workers) and setting out basic principles and rights for workers.	The Project will comply with the recommendations for workers.	

3. PROJECT DESCRIPTION AND ALTERNATIVE SELECTION

3.1 PROJECT LOCATION, OVERVIEW MAP AND SITE LAYOUT MAPS

The factory is located on Plot No. C-5,6,7,8 Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing. The project area is (4.967) acres of land at the west side of Shwe Bo-Myitkyina highway.

The most prominent structures in the plant are one GMP Medicine Production Building with a dimension of (184ft x 183ft), Main Office Building with a dimension of (99ft x 72ft), Herb Medicinal Plants Garden with a dimension of (90ft x 60ft), and Plant Reproduction Building with a dimension of (30ft x 30ft). Layout plan of the project could be seen in the following figure.

Table 11. Project Information

Sr.	Particular	Information
1	Type of Project	Production (Traditional Medicine)
2	Location of Project	C-5,6,7,8 Yoke Pyo Street, Shwe Bo Industrial Zone, Shwe Bo Township, Sagaing.
3	Capital Investment	1355406395 Kyats
4	Installation Electricity	(215+338)h.p
5	Water requirement	20000 L/ day
6	Project start Date	2013
7	Project End Date	2020

Table 12. Coordinate Points of Yoke Pyo Factory Boundary

Sr	Point	Coordinate	
		Latitude	Longitude
1	A	22° 36'22.58"N	96° 44'5.71"E
2	B	22° 35'18.33"N	96° 44'6.13"E
3	C	22° 35'17.64"N	96° 44'0.46"E
4	D	22° 35'21.74"N	96° 43'59.82"E

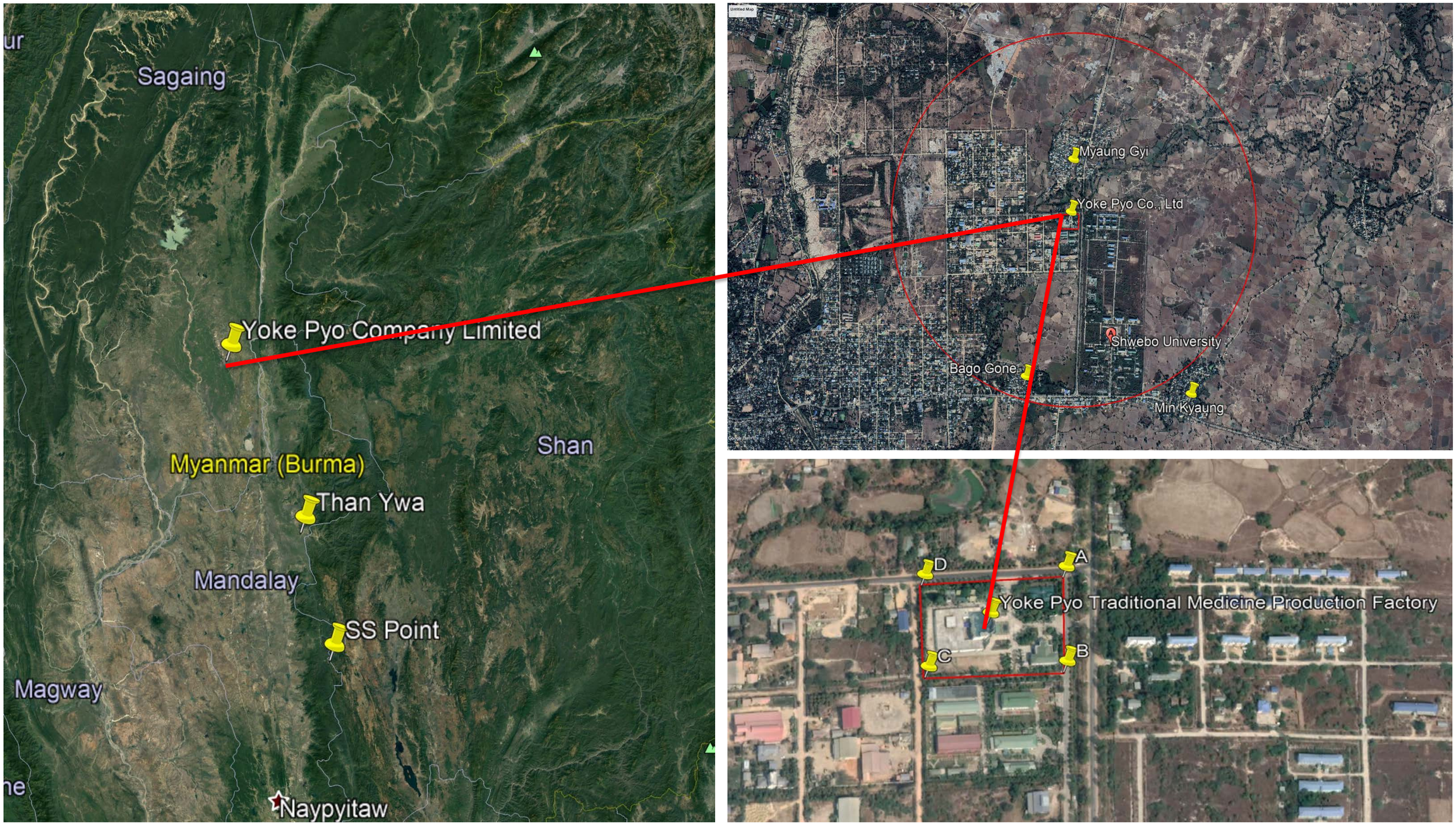

Figure 1. Location of Yoke Pyo Traditional Medicine Production Factory

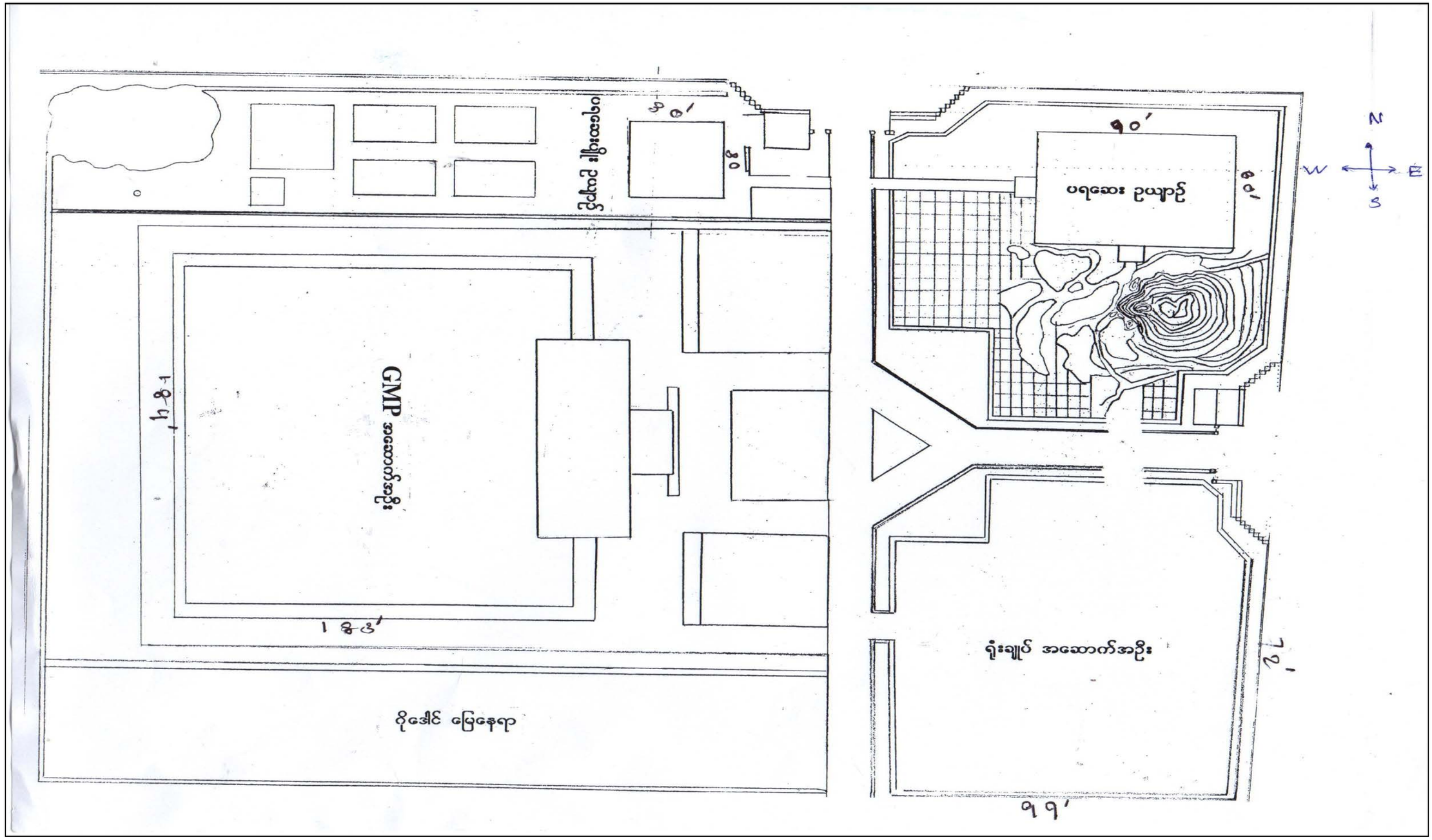

Figure 2. Layout Plan of the Yoke Pyo Traditional Medicine Production Factory

Table 13. Equipment and Machinery List of Yoke Pyo Company Limited

Sr.	Equipment	Quantity
1	Rotary Tablet Press ZP-35E	5
2	Semi-Automatic Capsule Filling MachineJTJ-111	1
3	Medicine Counting Machine	1
4	Dpp-140C Flat-plate Aluminum plastic Blister packing machine DPP-140	1
5	Grinding Mill NBL-30	1
6	Filter SH-1000	1
7	TG- Efficient Spinning Granulator TG-250	1
8	Auto Packing Machine SLNV12530	1
9	Inject Printer 160-380 Ton	1
10	High Speed Capping Machine (A1-Injection) ES	1
11	Labelling Machine	1
12	Elevation (Korea)	1
13	Elevation (Korea)	1
14	Lab Furniture	1
15	Medicine Mixing Machine	3
16	Grinding Machine	5
17	Medicine Cutting Machine	2
18	Crushing Machine	2
19	Packing Machine	1
20	Filling Machine	1
21	Capping Machine	2
22	Glue Mixing Machine	1
23	Semi Auto Capping Machine	1
24	Medicine Powder Mixing Machine	1

3.2 PROJECT ACTIVITIES

3.2.1 Pre-construction

3.2.1.1 Site Preparation

The first step in site construction work will involve the pre-engineering work of the site. Site clearing including cutting trees, bushes and dressing, earth filling, sand filling, watering and ramming, compaction are very importance for the site preparation.

(a) Excavation for Foundation

Excavations for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation.

(b) Placement of Backfill

Excavations outside the foundation shall be backfilled with soil that is free of organic material, construction debris, cobbles and boulders or shall be backfilled with a controlled low-strength material. The backfill shall be placed in lifts and compacted in a manner that does not damage the foundation, the waterproofing or the damp-proofing material.

(c) Site Grading

The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one-unit vertical in (20) units horizontal (5) percent slope. If physical obstruction or allotment boundaries prohibit (10) feet of horizontal distance, a (5) percent slope shall be provided to an approved alternative method of diverting water away from the foundation.

(d) Compacted Filling

Where footings bear onto compacted fill material, the compacted fill shall comply with the provisions of an approved report, which shall contain the following.

1. Specifications for the preparation of the site prior to placement of compacted fill material.
2. Specifications for material to be used as compacted fill.

3. Test methods to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.
4. Maximum allowable thickness of each lift of compacted fill material.
5. Field test methods for determining the in – place dry density of the compacted fill.
6. The minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined.
7. The number and frequency of field tests required to determine compliance.

3.2.2 Construction

3.2.2.1 Piling

There are several alternative methods for piling such pile driving, grip piling, auger cast piling, and bored pile. Pile driving method is the least favorable of all as it generates a lot of noise and vibration. Grip piling where reinforced pile pole are driven by a grip and sink method is the best of all as it technically noiseless and vibration less. But there will be limitation in this method such as pile depth. Yoke Pyo project will use a more environmentally friendly method like bored pile method in its construction.

A typical bored pile process could be illustrated as follow:

1. Points for placing the piles will be set up on the base of the building according to pile design.
2. A steel shell is driven as a casing for the bored pile.
3. Earth will be drilled with an auger or bucket at the center of the steel shell.
4. Slime from digging works will be removed by pumping bentonite clay which dissolved the slime.
5. The inner wall of the drilled holes will be checked such as by using sonic testing.
6. A rebar cage will be inserted into drilled hole prior to pouring of the concrete.
7. Segments of Tremie pipes will be inserted into the drilled hole at the center of the rebar cage progressively for concrete pouring.
8. Ready mixed concrete of high quality will be poured into the drill hole through Tremie pipe while removing the pipe segment by segment.
9. Bored piled work will be done when the steel casing is removed from the hole at last.

3.2.2.2 Formwork

Formwork should be capable of supporting safely all vertical and lateral loads that might be applied to it until such loads can be supported by the ground, the concrete structure, or other construction with adequate strength and stability. Dead loads on formwork consist of the weight of the forms and the weight of and pressures from freshly placed concrete. Live loads include weights of workers, equipment, materials to rage, and runways, and accelerating and braking forces from buggies and another placement equipment. Impact from concrete placement also should be considered in formwork design. Wood and bamboo were used in traditional formworks. Current alternative for such formwork is using reusable and dismantlable metal formwork. Alternatives will be choices between material for formworks and technique for installation and dismantling of formworks. Environmentally friendly materials must be chosen. Moreover, installation and dismantling methods must be chosen on the basis of occupation safety point of view.

3.2.2.3 Reinforce Concrete Work

The term *deformed steel bars for concrete reinforcement* is commonly shortened to *rebars.* Standard rebars are produced in 11 sizes, designated on design drawings and in project specifications by a size number. Fabrication of rebars consists of cutting to length and required bending. Field placing drawings and bar lists are prepared, and the rebars are fabricated and set in place as required. Then, concrete will be placed. It will be conveyed from a mixer or from a truck to point of placement by any of a variety of methods and equipment, if properly transported to avoid segregation. In every step, choices must be made for environmentally friendly materials and sound occupational safety methods.

3.2.2.4 Masonry Work

Masonry comprises assemblages of nonmetallic, incombustible materials, such as stone, brick, structural clay tile, concrete block, glass block, gypsum block, or adobe brick. Unit masonry consists of pieces of such materials, usually between 4 and (24) in in length and height and between (4) and (12) in thickness. The units are bonded together with mortar or other cementitious materials. Walls and partitions are

classified as load-bearing and non-load-bearing. Different design criteria are applied to the two types.

Like other structural materials, masonry may be designed by application of engineering principles. As an alternative, internationally accepted empirical rules and building codes may be used.

3.2.2.5 Carpentry work

Carpentry works will take place in doors, windows, and another frame works. Wood is the only renewable source for building materials. It comes from forests that can be continually being replanted as they are harvested. This practice ensures a plentiful supply of wood for construction and for a myriad of other uses. Compared to other building materials, wood has a very high ratio of strength to weight. This makes it very economical for use in all types of construction. Wood also has an aesthetic quality and natural warmth unequalled by other building materials. An alternative for wood structure carpentry work is using structural metal such aluminum and steel. Woods for carpentry works will be transported from local wood shop who won licence from government. Building materials such as pebble, sand, cement, brick and concrete will be transported from local.

3.2.2.6 Mechanical and Electrical Work

The plumbing system should be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleansing of fixtures and appurtenances. Plumbing fixtures, devices, and appurtenances should be supplied with water in sufficient volume and at pressures adequate to enable them to function properly. The pipes conveying the water should be of sufficient size to provide the required water without undue pressure reduction and without undue noise under all normal conditions of use.

An electrical system conforming adequate safety standards must be correctly designed and incorporated with the building. The electrical load in a building will be included the sum of all the loads for lighting, motors, and appliances. All of the electronic materials and elevator will be imported.

There will be numerous alternatives on the choice of materials for all installation. Choosing a specific one is left to the design contractors, consultants and

proponent. But IEE team recommends that every choice must be made for using environmentally friendly materials.

3.2.2.7 Installation

Machinery, systems, components and other items called for in the drawings and specifications will be installed. Some parts of machinery will be installed in built shelter but some will be installed on bare foundation where shelter will be built later after installation. Field offices, fences, bridges, and other temporary construction will be removed from the site. Utilities such as gas, electricity, and water are hooked up to the plant. The site is landscaped and paved. Finally, the building interior is painted and cleaned.

3.2.3 Operation Activities

Process of Yoke Pyo Traditional Medicine Production Factory

Yoke Pyo Company Limited produce eight types of products as antihypertensive, gastroenteritis tablet, nerve tonic cap, cough tablet, cardio cap, “Shweniphalan” medicine, “Yupa Nupyo” medicine and “Lin Shin” medicine in Yoke Pyo Traditional Medicine Production Factory. Raw material and chemical transportation method and storage are shown in Figure 3 and Figure 4.

ရုပ်ပျိုတိုင်းရင်းဆေးထုတ်လုပ်ရေးအတွက် ပစ္စည်းသယ်ယူမှု မှတ်တမ်း

စဉ်	ပစ္စည်းအမျိုးအစား	၁ နှစ်သုံးစွဲမှုပမာဏ	ဝယ်ယူသည့်နေရာ	ယယ်ယူသည့်နည်းလမ်း	သိုလှောင်ထားရှိမှု	မှတ်ချက်
၁	Glycerol	34 Liter	Yangon	ပစ္စည်းသယ်ကား	ပလပ်စတစ်ပုံး	Herbal 9
၂	Citric Acid	3.04 kg	Yangon	ပစ္စည်းသယ်ကား	စတီးပုံး	Herbal 9
၃	ဇဝက်သာ	67.2 kg	Mandalay	ပစ္စည်းသယ်ကား	စတီးပုံး	အစာအိမ်ဆေး
၄	ယမ်းစိမ်း	0.33 kg	Mandalay	ပစ္စည်းသယ်ကား	ပလပ်စတစ်ပုံး	ဝမ်း မှန်ဆေး
၅	ပြောင်းဖူးကော်မှုန့်	200 kg	Mandalay	ပစ္စည်းသယ်ကား	စတီးပုံး	ဝမ်း မှန်ဆေး
၆	ယိုးဒယားကော်မှုန့်	18000 kg	Yangon Ayeyarwady	ပစ္စည်းသယ်ကား	ပလပ်စတစ်ပုံး/ အသားစင်	သွေးတိုးဆေး/အာရုံကြောဆေး

၁။ ပစ္စည်းထုတ်သူ/ရောင်းချသူ ညွှန်ကြားမှုအရ ဘေးကင်းစေသည့်နည်းဖြင့် သယ်ယူပါ သည်။
၂။ ISO စစ်ဆေးမှုနှင့် အညီသိုလှောင်ထားရှိပါသည်။

Figure 3. Material Purchasing and Transportation Record

Figure 4. Material Storage Record

Production capacity of Yoke Pyo Traditional Medicine Production Factory is 800 kg/day (2000 cases/day). Storage of the product is shown in Figure 5. The production can be mainly divided into five sections which are;

- Preparation of raw materials
- Formulation
- Pharmaceutical processing
- Packaging and
- Quality Control

Raw material for the entire plant is herbal trees. Estimated water usage for the factory is 1000 L/day, and the water storage facility is shown in Figure 6. Estimated electricity usage is 5200 kWh/month. The process flow diagram of the plant is shown in Figure 7. Generator will only be used when power failure occurs and economically feasible; the fuel is stored in ventilated area as shown in Figure 8.

Figure 5. Storage of 8 Types of Traditional Medicines

Figure 6. Water Storage Facilities

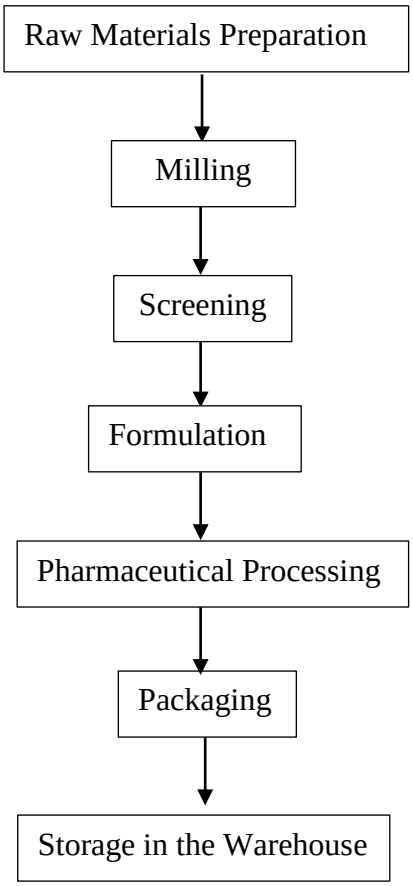

Figure 7. Block Diagram of Yoke Pyo Traditional Medicine Production Process

Figure 8. Storage of Fuel Oil

3.2.3.1 Raw Materials Handling and Storage

Description of Raw Materials

The basic raw materials used in Yoke Pyo Traditional Medicine Production Process are herbal trees, water, and sticky glue powder. These raw materials will be purchased from local and these raw materials will be stored in the warehouse.

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Table 14. Yoke Pyo Raw Material Lists

ရုပ်ပျို့ ကုမ္ပဏီ လီမိတက် အသစ် ထုတ်လုပ်မည့်ဆေးများအတွက် သုံးစွဲမည့် ကုန်ကြမ်းရရှိရေးလျာထားချက်နှင့် ဝယ်ယူမည့်အစီအစဉ်

စဉ်	ပစ္စည်းအမျိုးအမည်	ရေတွက်ပုံ	၁ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၂ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၃ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၄ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၅ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	ကုန်ကြမ်းဝယ်ယူမည့် အစီအစဉ်
၁	လင်းနေ	ပိဿာ	142.5	171	180	185	186	မန္တလေး ပရဆေးဆိုင်များ
၂	ပဒဲကော	။	7.5	9	9.45	9.73	9.80	။
၃	နနွင်းတက်	။	7.5	9	9.45	9.73	9.80	။
၄	နွယ်ချို	။	7.5	9	9.45	9.73	9.80	။
၅	ကွမ်းစားဂမုန်း	။	7.5	9	9.45	9.73	9.80	။
၆	စမုန်စပါး	။	18.25	22	23	24	24	။
၇	ပင်စိမ်းခြောက်	။	7.5	9	9.45	9.73	9.8	။
၈	ရေ	လီတာ	3600	4320	4536.00	4672.08	4702.68	။
၉	သကြား	ပိဿာ	450	540	567.00	584.01	587.84	။
၁၀	Glycerol	လီတာ	120	144	151.20	155.74	156.76	။
၁၁	ဇဝက်သာ	ပိဿာ	51	61.2	64.26	66.1878	66.6213	။
၁၂	ပရူတ်အေး	ပိဿာ	0.75	1	0.95	0.97	66.6213	။
၁၃	အယ်ကိုဟော ၉၈%	လီတာ	2.4	3	3.02	3.11	3.14	။
၁၄	Sodium Benzoate	ပိဿာ	11.25	14	14.18	14.60	14.70	။
၁၅	Citric Acid	ပိဿာ	3	4	3.78	3.8934	3.9189	။
၁၆	Colour	ပိဿာ	0.15	0	0.189	0.19467	0.195945	။
၁၇	ကွတ်ကရာ	ပိဿာ	38	46	47.88	49.3164	49.6394	။
၁၈	ကြစု	ပိဿာ	38	46	47.88	49.3164	49.6394	။
	လီတာပေါင်း		3722.4	4467	4690.22	4830.93	4862.58	
	ပိဿာပေါင်း		790.4	948	996	1026	1032	

စဉ်	ပစ္စည်းအမျိုးအမည်	ရေတွက်ပုံ	၁ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၂ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၃ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၄ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၅ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	ကုန်ကြမ်းဝယ်ယူမည့် အစီအစဉ်
			790.4	948	996	1026	1032	
၁၉	ပန်းနု	ပိသာ	38	46	47.88	49.3164	49.6394	မန္တလေး ပရဆေးဆိုင်များ
၂၀	ဇီယာ	ပိသာ	42.75	51.3	53.865	55.48095	55.844325	။
၂၁	ဇာသီး	ပိသာ	42.75	51	53.865	55.48095	55.844325	။
၂၂	လက်ချား	ပိသာ	38	46	47.88	49.32	49.64	။
၂၃	ဂုံခါး	ပိသာ	38	46	47.88	49.32	49.64	။
၂၄	ကတြသခွေ်	ပိသာ	38	46	47.88	49.32	49.64	။
၂၅	ကရဝေးရွက်	ပိသာ	42.75	51	53.865	55.48095	55.844325	။
၂၆	သစ်ကြပိုး	ပိသာ	38	46	47.88	49.3164	49.6394	။
၂၇	ငဖုံးဆေး	ပိသာ	38	46	47.88	49.3164	49.6394	။
၂၈	ချင်းခြောက်	ပိသာ	177.75	213.3	223.965	230.68395	232.194825	။
၂၉	စမုန်နက်	ပိသာ	38	46	47.88	49.3164	49.6394	။
၃၀	စူလာနဖာ	ပိသာ	42.75	51	53.865	55.48095	55.844325	။
၃၁	ပရုပ်	ပိသာ	74	89	93.24	96.0372	96.6662	။
၃၂	ဖာလာငယ်	ပိသာ	38	45.6	47.88	49.3164	49.6394	။
၃၃	သက်ရင်းကြီး	ပိသာ	39.5	47	49.77	51.2631	51.59885	။
၃၄	ပိတ်ချင်းသီး	ပိသာ	177.75	213	223.965	230.68395	232.194825	။
၃၅	ပျားရည်	ပိသာ	76	91	95.76	98.63	99.28	။
၃၆	ငရုတ်ကောင်း	ပိသာ	168.25	201.9	211.995	218.35485	219.784975	။
၃၇	ဆောင်မခါး	ပိသာ	135	162	170.1	175.203	176.3505	။
	ပိသာပေါင်း		2113.65	2536	2663.295	2743.31385	2760.56148	

စဉ်	ပစ္စည်းအမျိုးအမည်	ရေတွက်ပုံ	၁ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၂ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၃ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၄ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၅ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	ကုန်ကြမ်းဝယ်ယူမည့် အစီအစဉ်
			2113.65	2536	2663.295	2743.31385	2760.56148	
၃၈	ပန်းနု	ပိသာ	135	162	170.1	175.203	176.3505	မန္တလေး ပရဆေးဆိုင်များ
၃၉	ရှိန်းခို	ပိသာ	594.75	714	749.385	771.8665	776.921925	″
၄၀	ကပ်ဖို	ပိသာ	135	162	170.1	175.2035	176.3505	″
၄၁	လေးညှင်းပွင့်	ပိသာ	33.25	40	41.895	43.15185	43.434475	″
၄၂	စမုံနက်	ပိသာ	28.5	34	35.91	36.9873	37.22955	″
၄၃	မြက်မုန်ညှင်းဥ	ပိသာ	28.5	34	35.91	36.9873	37.22955	″
၄၄	ဇာတိပို့ဂုလ်သီး	ပိသာ	57	68	71.82	73.9746	74.4591	″
၄၅	စမုန်ဖွဲ	ပိသာ	10.75	13	13.545	13.95135	14.042725	″
၄၆	စမုန်နီ	ပိသာ	10.75	13	13.545	13.95135	14.042725	″
၄၇	စမုန်ညို	ပိသာ	15.5	19	19.53	20.1159	20.24765	″
၄၈	စမုန်ဖြူ	ပိသာ	10.75	13	13.545	13.95135	14.042725	″
၄၉	ကြွေပုတ်	ပိသာ	12	14	15.12	15.5736	15.5736	″
၅၀	လိပ်ကျောက်ဆူး	ပိသာ	12	14	15.12	15.5736	15.5736	″
၅၁	အလိုကြူ	ပိသာ	12	14	15.12	15.5736	15.5736	″
၅၂	ဆပ်သွားမြစ်	ပိသာ	12	14	15.12	15.5736	15.5736	″
၅၃	ဆားပုတ်ခဲ	ပိသာ	36	43	45.36	46.7208	47.0268	″
၅၄	ယမ်းစိမ်း	ပိသာ	36	43	45.36	46.7208	47.0268	″
၅၅	သိန္နော	ပိသာ	40.75	49	51.345	52.88535	53.231725	″
၅၆	ကျောက်ချဉ်	ပိသာ	36	43	45.36	46.7208	47.0268	″
	ပိသာပေါင်း		3370.15	4,044	4246.485	4373.99955	4401.92743	

စဉ်	ပစ္စည်းအမျိုးအမည်	ရေတွက်ပုံ	၁ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၂ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၃ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၄ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၅ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	ကုန်ကြမ်းဝယ်ယူမည့် အစီအစဉ်
			3370.15	4,044	4246.485	4373.99955	4401.92743	
၅၇	ဆား	ပိဿာ	48	58	60.48	62.2944	62.7024	မန္တလေး ပရဆေးဆိုင်များ
၅၈	ပွေးကိုင်း	ပိဿာ	168	202	211.68	218.0304	219.4584	ပုဂံမှဝယ်ယူခြင်း
၅၉	သင်းဝံပေါက်ဖြူ	ပိဿာ	1.5	2	1.89	1.9467	1.95945	မန္တလေး ပရဆေးဆိုင်များ
၆၀	ကြောင်လျှာခေါက်	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၁	လက်ထုပ်ကြီး	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၂	ခပေါင်းရေကြည်	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၃	ဖွားဖက်ကြီး	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၄	မဏိသြဃ	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၅	ခွေးတောက်မြစ်	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၆	ကပ်မ	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၇	ခပေါင်းကြီး	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၈	တပဆေး	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၆၉	ဆေးမခမ်း	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၇၀	ငပြေရင်	ပိဿာ	1.5	2	1.89	1.9467	1.95945	〃
၇၁	စတုခါးမြစ်	ပိဿာ	4.75	6	5.985	6.16455	6.204925	〃
၇၂	ကြက်သွန်ဖြူ	ပိဿာ	4.75	6	5.985	6.16455	6.204925	〃
၇၃	အိပ်မွှေသီး	ပိဿာ	4.75	6	5.985	6.16455	6.204925	〃
၇၄	ဖာလာငယ်	ပိဿာ	4.75	6	5.985	6.16455	6.204925	〃
၇၅	ပိတ်ချင်းမြစ်	ပိဿာ	4.75	6	5.985	6.16455	6.204925	〃
	ပိဿာပေါင်း		3627.9	4353.3	4571.25	4708.5075	4738.62626	

စဉ်	ပစ္စည်းအမျိုးအမည်	ရေတွက်ပုံ	၁ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၂ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၃ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၄ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	၅ နှစ် သုံးစွဲမည့် ကုန်ကြမ်းအရေအတွက်	ကုန်ကြမ်းဝယ်ယူမည့် အစီအစဉ်
			3627.9	4353.3	4571.25	4708.5075	4738.62626	
၇၆	ပန်းဥ	ပိဿာ	4.75	6	5.985	6.16455	6.204925	မန္တလေး ပရဆေးဆိုင်များ
၇၇	ကန့်ချုပ်နီ	ပိဿာ	6.2	7	7.812	8.04636	8.204925	〃
၇၈	ဆေးပုလဲ	ပိဿာ	116	139	146.16	150.5448	151.5308	〃
၇၉	ဆင်တုန်းမန္ထယ်	ပိဿာ	214	257	269.64	277.7292	279.5482	ဒိုင်ဖွင့်ဝယ်ယူခြင်း
၈၀	ကန့်မာလာ	ပိဿာ	230	276	289.8	298.494	300.449	〃
	ပိဿာပေါင်း		4198.85	5,038	5290.647	5449.48641	5484.45825	

Cleaning Raw Materials

Cleaning raw materials are essential for removing dust, pieces of stones, sand, insects and other foreign materials. Raw materials are washed with water and it is filtrated with filter.

3.2.3.2 Formulation

After cleaning raw materials, formulation process is followed. Formulation is defined as the process in which different chemical substances are combined to produce a final medical product. The formulation studies involve developing a preparation of drug acceptable for patient. Formulation is the word often used in a way that includes dosage form. Formulation studies consider factors such as solubility, particle size, polymorphism and pH as all of these can influence bioavailability and hence the activity of drug.

- Formulation and preformulation
- Developing a preparation of the drug
- Formulation types
- Formulation from plant sources
- Quality of formulation
- Granulated formulations

3.2.3.3 Pharmaceutical Processing

Milling

Milling is the process of size reduction process also termed as comminution or diminution or pulverization. In the milling process, the raw materials are subjected to mechanical forces using grinding equipment (grinding mill).

Granulation

Granulation is the process of forming grains or granules from powdery and solid substances from the outlet of milling to produce granular materials. Granulation involves agglomeration of fine particles into larger granules with the size range between 0.2 and 40 mm depending on the subsequent use. It involves shredding or grinding solid material into finer granules or pallets.

Coating

Coating is a process by which an essentially dry, outer layer of coating material is applied to the surface of a dosage form in order to confer specific benefits over uncoated variety. It involves application of a sugar or polymeric coat on the tablet. The advantages of tablet coating are taste masking, physical and chemical protection, protects the drug in the stomach, and to control its release profile.

Tablet Pressing

The tablet will be pressed with rotary tablet press. A tablet press is a mechanical device that compresses powder into tablets of pharmaceuticals. To form a tablet, the granulated powder material is metered into a cavity into a cavity formed by two punches and a die, and then punches pressed together with great force to fuse the material together.

3.2.3.4 Packaging

After pharmaceutical production process, the traditional medicine will be packaged with plastic boxes, carton boxes, metal cards for pharmaceutical productions. Packaging is designed to contain a product so that it is unable to interact with the environment. Packaging is provided the protection, identification, information, against the physical damage, loss of content or ingredients and intrusion of unwanted component of the environment such as water vapour, oxygen and light.

3.2.3.5 Quality Control

Yoke Pyo Company Limited is controlled Yoke Pyo Traditional Medicine in the Laboratory to ensure the identity and purity of a particular traditional medicine product. Yoke Pyo uses the Standard for Traditional Medicine Product.

3.3 PROJECT LIFECYCLE OVERVIEW

Project life cycle analysis identifies the key issues and concerns that are likely to evolve over the entire lifespan of a project. In the case of the proposed project, these issues may arise during the construction, operation and maintenance, and decommissioning. These issues have been considered in this IEE report, prior to any

irreversible actions being undertaken by the project proponent and other Project associates. The following sub-sections identify the key activities to be completed and facilities to be constructed and operated over the lifetime of the Project.

3.3.1 Construction Phase

Construction is started from the (2013) and be complete with commercial operation targeted within the (2020). Construction activities of the Project will include: mobilisation, site clearance, construction of all Project components and commissioning. Heavy equipment such as bulldozers, excavators, dump trucks, compactors, etc. will be used at the Project site. The normal construction hours are anticipated to be (10) hours per day, (6) days per week. In construction phase, there will be sub project activities such as mobilisation, earth work, site foundation, construction and commissioning.

3.3.2 Operational Phase

The Project will be owned and operated by the proponent. The operation and maintenance of the project will be undertaken by the project proponent with the support of long-term service agreement with the manufacturer. Operation and Maintenance staff with relevant experience of operating similar plant and with adequate knowledge of comparable technology will be deployed to commission. The below sections will discuss further the key activities during Operation Phase.

3.3.2.1 Operational Waste Water

Waste water will be treated to meet the required discharge specification of NEQG before discharge to the surrounding environment.

3.3.2.2 Operational Workforce

The anticipated work force during operation for the Yoke Pyo Traditional Medicine Production Factory Project is about (70) members including general manager.

Table 15. Employment List of Yoke Pyo Traditional Medicine Production Factory

No.	Position	No. of Employee
1.	Manager	2
2.	General Manager	2
3.	Skillful Workers	10
4.	General Workers	56
Total		70

3.3.3 Decommissioning Phase

If not only Land Lease agreement and the other relevant agreements are not extended or renewed but also design life of project is terminated, the project will be decommissioned. If retrofitting is not feasible and the operational life of project expires, the project will be decommissioned according to the requirements of the authorities at that time in accordance with standing laws.

4. DESCRIPTION OF THE SURROUNDING ENVIRONMENT

4.1 SETTING THE STUDY LIMITS

The IEE study focusing the project area and its vicinity within the range 3 km around the project from the centerline of the project area that can be directly and indirectly affected by project construction, operation and decommissioning activities which includes Min Kyaung village, Myaung Gyi village and Bago Gone Village.

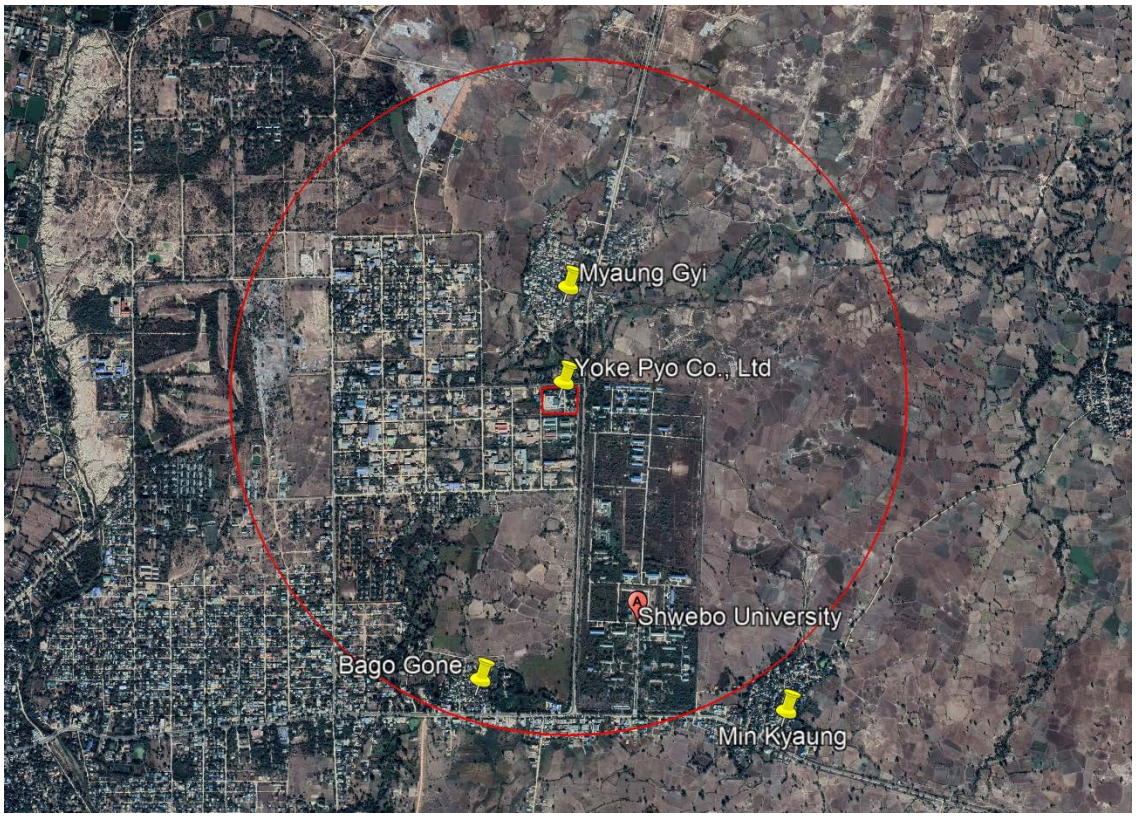

Figure 9. IEE Study Area for Yoke Pyo Traditional Medicine Production Factory

4.2 METHODOLOGY AND APPROACH

The IEE study for the project includes analysis on base line data from local, government organization, MIC proposal of the Yoke Pyo, and the master plan and other documents obtained from the project proponent.

Primary data collections include direct observation, interview, individual/target group consultation, public meeting, sampling and laboratory analysis on physicochemical parameters of water from the project area, listing biological

resources such as flora and fauna, household data survey on demography, socioeconomics, occupation, education, and health.

4.3 STAKEHOLDER ANALYSIS

Stakeholders are categorized in four groups who can be effected directly or indirectly by project construction, operation and decommissioning activities such as local people, government organizations, project proponent and other interested groups such as NGOs. Analysis was based on primary impact factors such as involvement in land acquisition, vicinity to the project, common use of utilities such as water and infrastructures.

Table 16. Stakeholders of Yoke Pyo Traditional Medicine Factory

Sr.	Stakeholder Group	Stakeholder	Interest Level		Interest
			Level	Reason	
1	Local People	Min Kyaung	High	Vicinity	- Pollution - Access road -Water resources
		Myaung Gyi	High	Close Vicinity	
		Bago Gone	High	Close Vicinity	
2	Government Organization	General Administration Office Department	Medium	For administrative relation	-Administration -Coordination -CSR - Environ-mental Pollution
		Department of Irrigation	High	Storm water issue	
		Township Educational Office	Low	Only relevant for CSR	
		Land Records Department	Low	No land related issue	
		Township Health Department	Low	Only relevant for CSR	
		Township Environmental Conservation Department	Low	Environmental Pollution	

		Township Fire brigade	Low	-	
3	Proponent	Project management Project construction contractor	High	- Project Owner	- Operation and Management - Construction - EMP
4	Other Interested Party	None	-	-	-

4.4 PROJECT AFFECTED AREA

Project affected area is demarcated based on the results of stakeholder analysis. Affected human settlements, noise environment, biological environment, hydrological regime and land environment are shown in the following table.

Table 17. Project Affected Area of Yoke Pyo Traditional Medicine Factory

Sr.	Category	Location	Factor
1	Human Settlements	Min Kyaung	Access road
		Myaung Gyi	Access road
		Bago Gone	Access road
2	Land Environment	Adjacent farmlands Plant compound	Waste Irrigation channels Soil
3	Biological Environment	Direct impact area within plant compound and vicinity	Air Pollution Water pollution Noise pollution
4	Air and Noise Environment	Within plant compound and nearby community	Noise levels
5	Water Environment	Within plant compound and nearby community	Water usages Water quality Waste water
6	Socioeconomic Environment	Local Villages	- Job Opportunity - CSR

4.5 METEOROLOGY

4.5.1 Topography and Climate

In Sagaing, the summers are short, sweltering, and partly cloudy; the winters are short, warm, and mostly clear; and it is dry year round. Over the course of the year, the temperature typically varies from 60°F to 104°F and is rarely below 55°F or above 109°F.

4.5.2 Temperature

The hot season lasts for 2.2 months, from March 21 to May 27, with an average daily high temperature above 101°F. The hottest day of the year is April 18, with an average high of 104°F and low of 81°F. The cool season lasts for 2.0 months, from December 4 to February 5, with an average daily high temperature below 91°F. The coldest day of the year is January 14, with an average low of 60°F and high of 88°F.

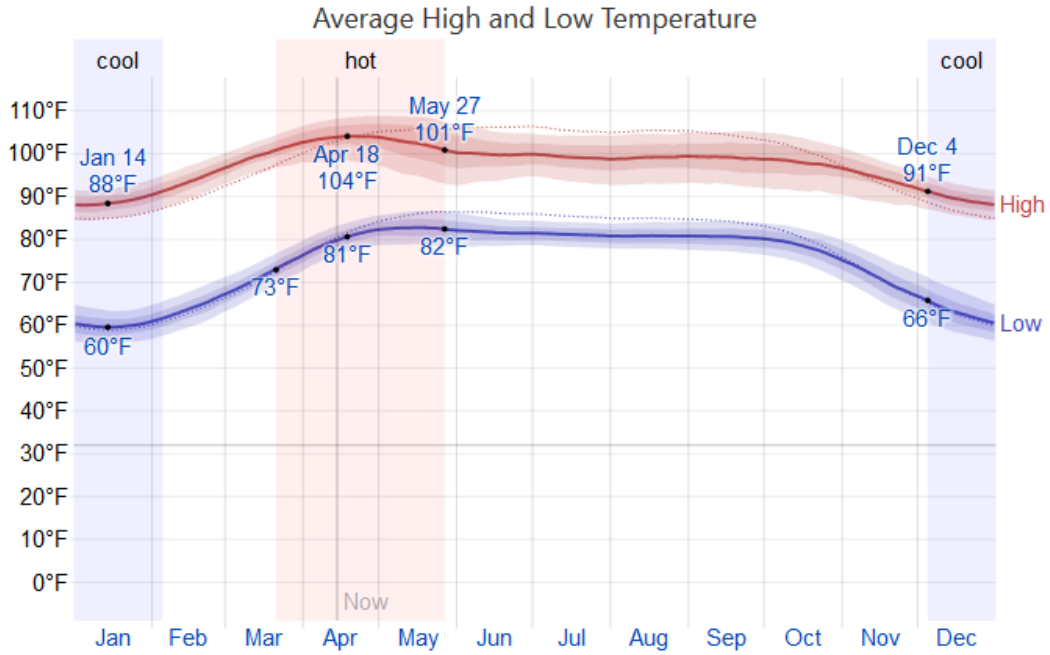

Figure 10. Temperature Graph of Sagaing

4.5.3 Clouds

In Sagaing, the average percentage of the sky covered by clouds experiences extreme seasonal variation over the course of the year. The clearer part of the year in Sagaing begins around October 21 and lasts for 6.3 months, ending around April 30. On February 23, the clearest day of the year, the sky is clear, mostly clear, or partly

cloudy 86% of the time, and overcast or mostly cloudy 14% of the time. The cloudier part of the year begins around April 30 and lasts for 5.7 months, ending around October 21. On July 22, the cloudiest day of the year, the sky is overcast or mostly cloudy 89% of the time, and clear, mostly clear, or partly cloudy 11% of the time.

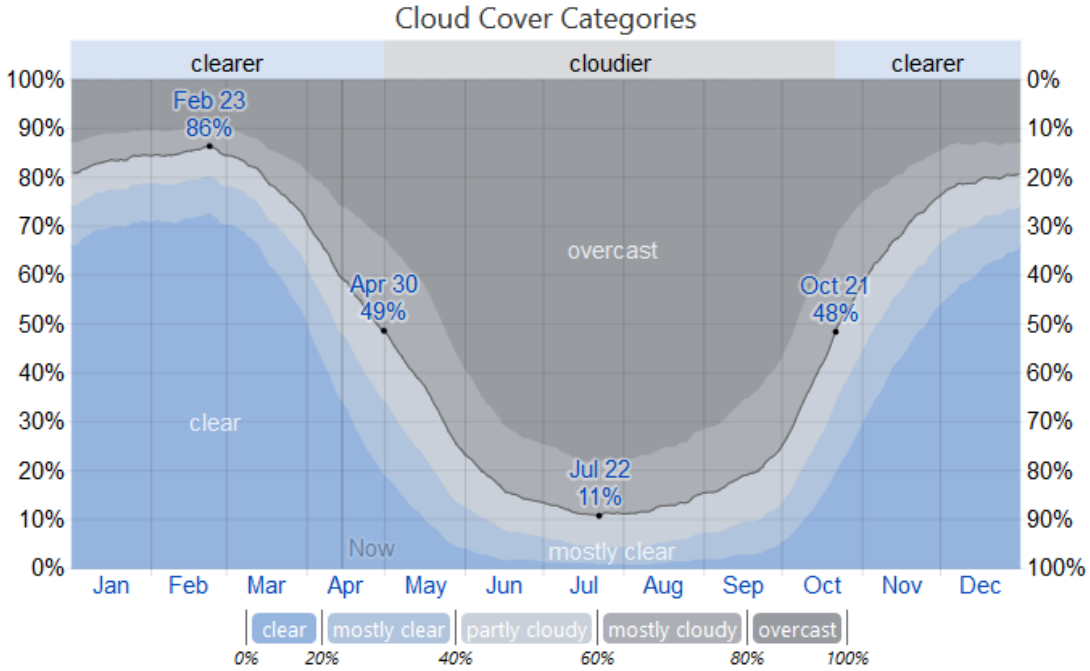

Figure 11. Cloud Cover Graph of Sagaing

4.5.4 Rainfall

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Sagaing experiences some seasonal variation in monthly rainfall. The rainy period of the year lasts for 5.0 months, from May 8 to October 6, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered around May 30, with an average total accumulation of 0.8 inches. The rainless period of the year lasts for 7.0 months, from October 6 to May 8. The least rain falls around February 21, with an average total accumulation of 0.0 inches.

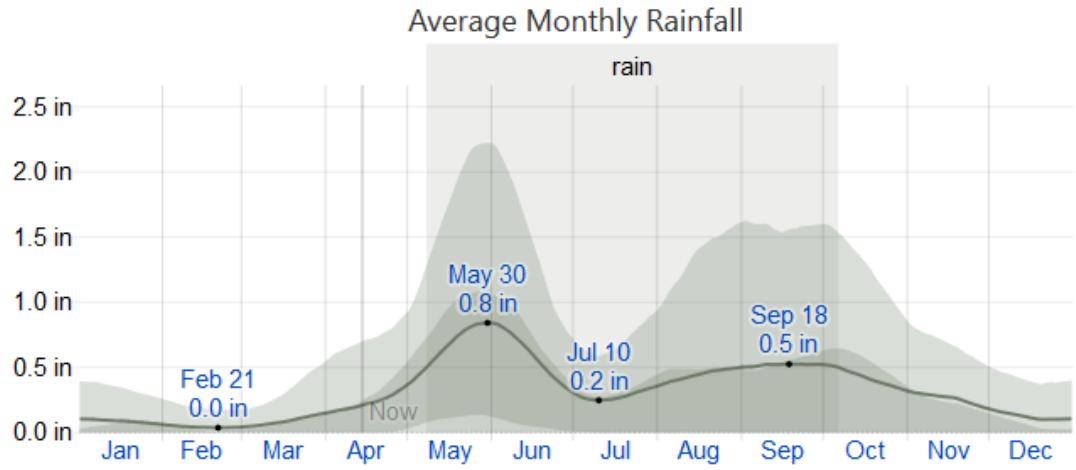

Figure 12. Average Monthly Rainfall Graph of Sagaing

4.5.5 Precipitation

A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Sagaing varies throughout the year. The wetter season lasts 5.3 months, from May 7 to October 17, with a greater than 9% chance of a given day being a wet day. The chance of a wet day peaks at 17% on June 2. The drier season lasts 6.7 months, from October 17 to May 7. The smallest chance of a wet day is 1% on February 15. Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with a peak probability of 17% on June 2.

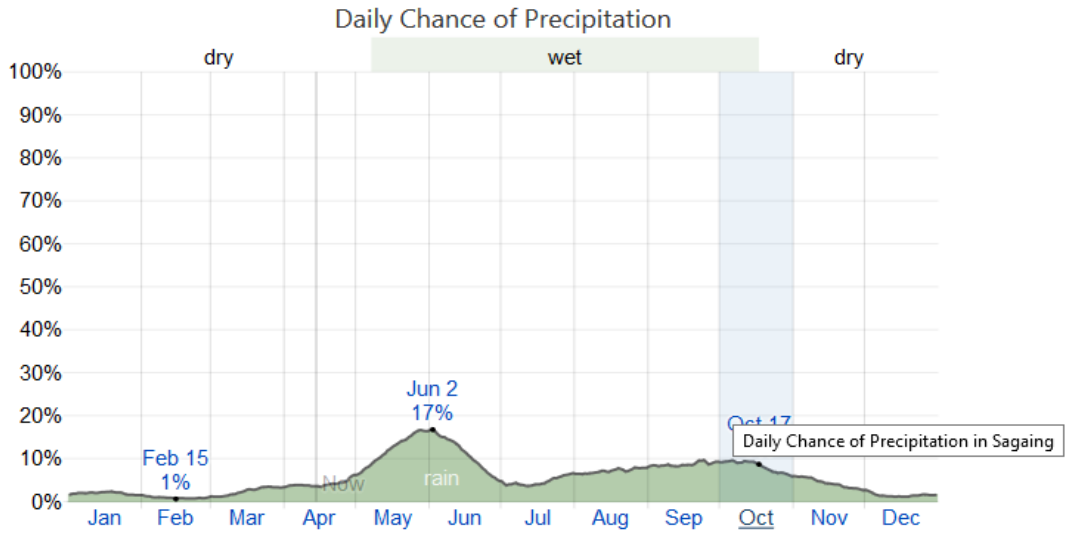

Figure 13. Precipitation Graph of Sagaing

4.5.6 Humidity

Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. Sagaing experiences extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 6.3 months, from April 27 to November 6, during which time the comfort level is muggy, oppressive, or miserable at least 25% of the time. The muggiest day of the year is August 11, with muggy conditions 99% of the time. The least muggy day of the year is February 5, when muggy conditions are essentially unheard of.

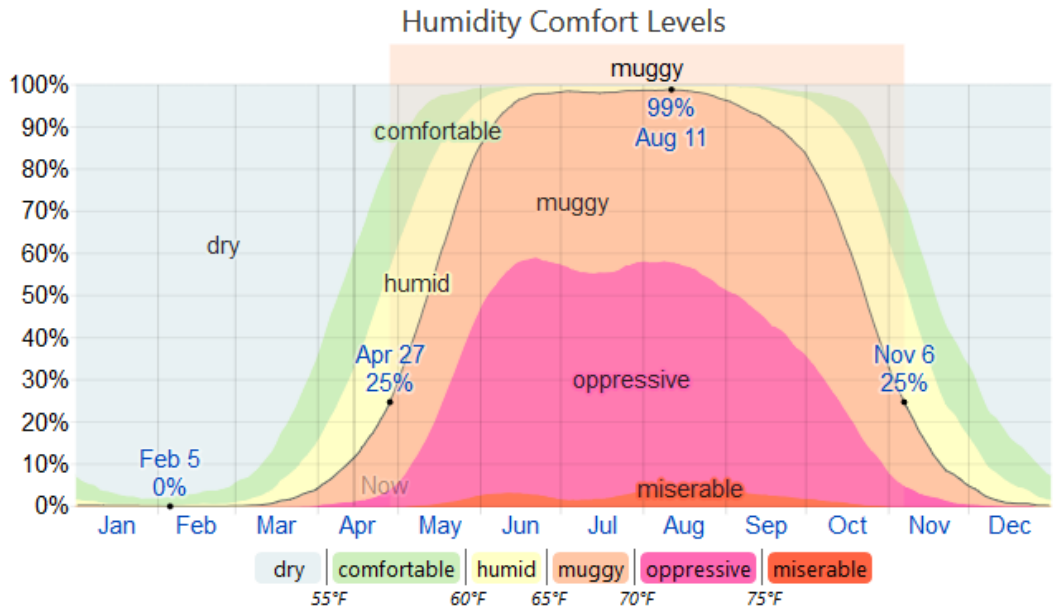

Figure 14. Humidity Graph of Sagaing

4.5.7 Sun

The length of the day in Sagaing varies over the course of the year. In 2020, the shortest day is December 21, with 10 hours, 48 minutes of daylight; the longest day is June 21, with 13 hours, 28 minutes of daylight.

The earliest sunrise is at 5:22 AM on June 7, and the latest sunrise is 1 hour, 25 minutes later at 6:47 AM on January 17. The earliest sunset is at 5:21 PM on November 27, and the latest sunset is 1 hour, 32 minutes later at 6:53 PM on July 3.

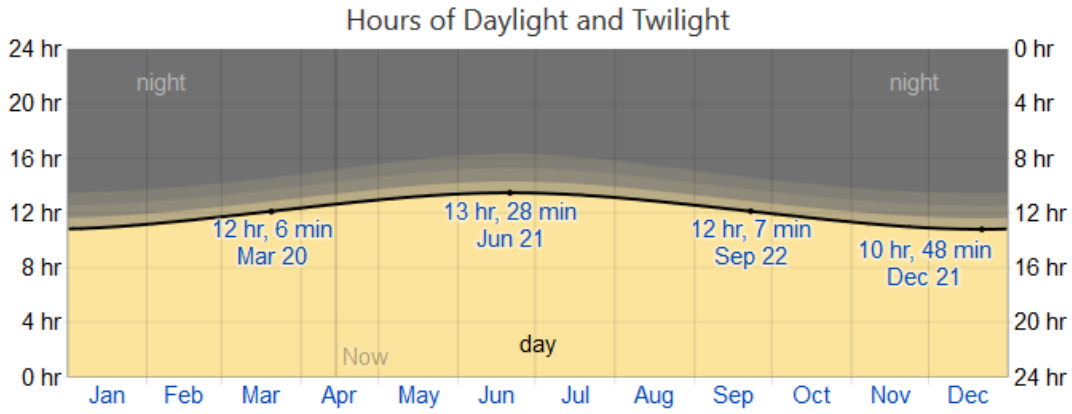

Figure 15. Daylight and Twilight of Sagaing

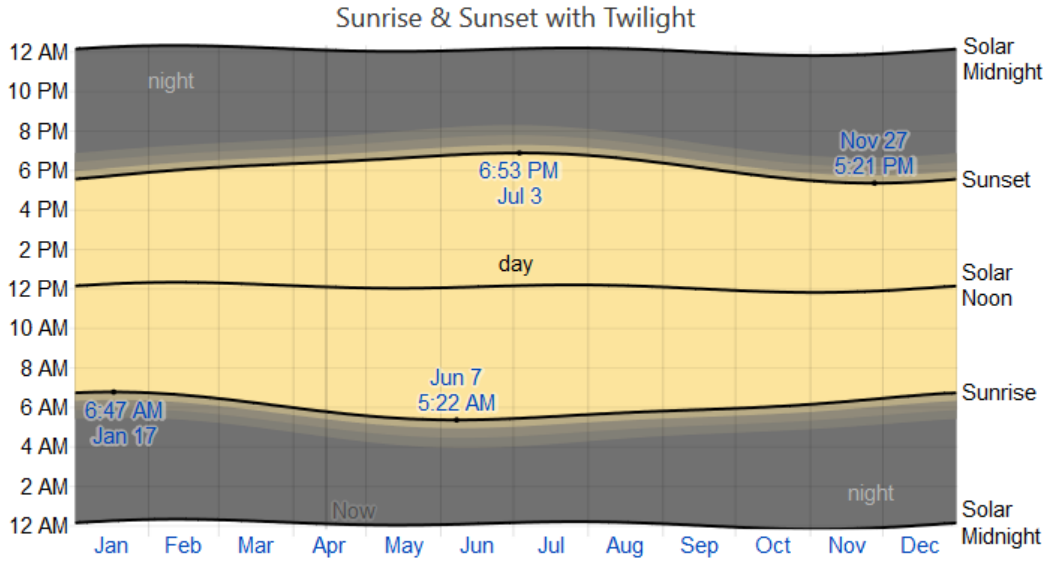

Figure 16. Sunrise and Sunset of Sagaing

4.6 LAND USE OF SHWE BO TOWNSHIP

The scope of land use in Shwe Bo Township is as follows.

Table 18. The Scope of land Use in Shwe Bo Township

Sr	Land Type	Area (Acre)
1	**Total net land area**	**194447**
	Farmland	117200
	Arable Land	75662
	Land/Island	1556
	Garden Land	29
2	**Allotment of land**	**1879**
	Farmland	869
	Arable Land	1014
	Land / Island	-
	Garden land	-
3	Grazing land	-
4	Industrial Land	737
4	Town Land	1705
5	Village Land	6179
6	Other Land	26256
7	Forest area	6829
8	Wild land	117
9	Uncultivated area	26018
Total		263803

4.7 SOIL QUALITY

Samples of soil was collected from the Yoke Pyo Traditional Medicine Production Factory Compound (22° 35'18.40"N and 95° 44'2.00"E). The sample was analyzed for their physiochemical properties in Soil Laboratory, Land Use Department of Ministry of Agriculture and Irrigation.

According to test results, pH value of the soil which was collected from the boundary of yoke Pyo Traditional Medicine Production Factory is 8.34 which falls under classification of moderately alkaline conditions. Under this condition, following phenomena would occurs:

• Above a pH of 7.0 there is an increase in the availability of Iron, Manganese, Zinc, Cobalt, and Copper

• Increased risk of ammonia volatilization

• First increasing availability of Phosphorus and Boron, but deficiencies may occur at higher pH values

• Insoluble Calcium-Phosphates may be formed at higher pH

• Electric conductivity is generally high at higher pH values

Table 19. Results of Soil Quality Analysis

Sample	Moist-ure %	pH Soil: Water 1:2:5	Texture				Organic Carbon	Humus %	Total N	Exchangeable cations			Available Nutrients	
			Sand %	Silt %	Clay %	Total %				Ca	Mg	K	P	K_2O
SS	2.31	8.34	65.56	13.00	21.44	100.00	0.04	0.07	0.07	20.45	3.40	0.20	0.41	9.21

Table 20. Interpretation of Soil Quality Results

Sample	pH Soil: Water	Texture	Organic Carbon	Total N	Exchangeable cations			Available Nutrients	
					Ca	Mg	K	P	K_2O
SS	Moderately alkaline	Sandy clay loam	Very low	Very low	High	Medium	Low	Low	Low

Table 21. Soil pH and Associated Impacts

pH value	Soil classification	Impact interpretation
≤ 5.5	Strongly acidic	• Possible Aluminum toxicity and excess availability of Cobalt, Cupper, Iron, Manganese, and Zinc • Deficient in Calcium, Potassium, Nitrogen, Magnesium, Phosphorous, and Sulphur • Boron deficiency below pH of 5 • Molybdenum becomes more available with decreasing pH • Bacterial and actinomycete activity is reduced along with a predominance of fungi • Mineralization of organic matter and nitrification are restricted • Below a pH of 3, functioning of cell membranes is impaired, resulting in leakage of elements
5.5 - 7.3	Moderately acidic, slightly acidic, and neutral soils	• Preferred pH range for most crops, lower end of range may be too acidic for some • pH between the range of 6.0 and 7.0 hampers phosphorous fixation • Neutral pH favors the fixation of molecular Nitrogen by free living soil microorganisms and by symbiotic microorganisms • Above a pH value of 7.0 the availability of Iron, Manganese, Zinc, Cobalt, and Cupper declines
7.3 - 8.5	Slightly alkaline and Moderately alkaline soils	• Above a pH of 7.0 there is an increase in the availability of Iron, Manganese, Zinc, Cobalt, and Copper • Increased risk of ammonia volatilization • First increasing availability of Phosphorus and Boron, but deficiencies may occur at higher pH values • Insoluble Calcium-Phosphates may be formed at higher pH • Electric conductivity is generally high at higher pH values

≥ 8.5	Strongly to very strongly alkaline	• Calcium and magnesium are liable to become unavailable to most crops • Often high sodium levels lead to toxicity and structural damage • Toxicity of bicarbonates and other anions • Possible Boron toxicity common in saline and or sodic soils • Availability of most micronutrients and of Iron, Manganese, Zinc, Copper, and Cobalt is reduced, except for Molybdenum • Decreased

Figure 17. Soil Sampling Point

4.8 WATER QUALITY

For analysis of Physiochemical properties of water from Yoke Pyo traditional Production Factory, water was sampling from the factory compound (22° 35'20.22"N and 95° 44'1.06"E).

Water supply for Yoke Pyo Traditional Medicine Production Factory is obtained from the groundwater (Tubewell). To analyze current conditions of water sample was collected and analyzed. All these samples were collected from the tube well. The pH of the water is 7. The suspended solid from the water can be seen about 0. DO and Free chlorine value of the tube well water is 6.6 and 0.06 mg/l respectively. All the samples are analyzed by ALARM Ecological Laboratory. Since Yoke Pyo Factory is Traditional Medicine Production Factory, the discharge water from the factory is very little.

Figure 18. Water Sampling Point

Table 22. Water Analysis Results (ALARM Ecological Laboratory)

Sr.	Particular	Unit	International Drinking Water Standard Guideline Value	Tube Well Water
1	pH	S.U	6.5-8.5	7.2
2	Colour	HU	-	0
3	Turbidity	FAU	≤5	<5
4	TDS	mg/l	≤500	1529
5	TSS	mg/l	-	0
6	Hardness	mg/l	≤500	460
7	Dissolved Oxygen	mg/l	-	6.6

Sr.	Particular	Unit	International Drinking Water Standard Guideline Value	Tube Well Water
8	Free Chlorine	mg/l	≤0.2	0.06
9	Iron	mg/l	≤0.3	<0.1
10	Fluoride	mg/l	≤1.5	0.49

Source: ALARM Ecological Laboratory

Figure 19. Water Collection from the Tube Well

4.9 AIR QUALITY

4.9.1 Survey Item

The parameters for air Quality surveys were atmospheric pressure, CO_2, H_2S, CH_4, NO_2, O_3, PM_{10}, $PM_{2.5}$, Relative Humidity, SO_2, Solar radiation, Temperature, Wind direction, Wind speed and Power.

Air Monitoring was measured in one location in the Factory Campus. Location one is near treatment plant area.

Table 23. Location of Air Sample (AS) of the Factory

Sr.	Sample Name	Coordinates		Location
		Latitude(N)	Longitude(E)	
1	AS Point	22° 35'20.08"N	95° 44'3.82"E	Factory Area

Figure 20. Air Monitoring Station

Figure 21. Air Quality Monitoring

4.9.2 Survey Methodology

Sampling and analysis of ambient air quality were conducted by referring to the recommendation of the United States Environmental Protection Agency (U.S. EPA). The Haz-Scanner Environmental Perimeter Air Station (EPAS) was used to collect ambient air survey data. Sampling rate or air quality data were measured automatically every one minute and directly read and recorded onsite for measured parameters (SO_2, NO_2, CO_2, CO, H_2S, O_3, CH_4, PM_{10}, $PM_{2.5}$), as shown in following table. Sampling pump was operated at 2 L/min. Different analysis methods are integrated in the instrument, such as Particulates 90° Infrared Light Scattering for particulate matters (PM_{10}, $PM_{2.5}$), electrochemical sensors for toxic gases (SO_2, NO_2, CO, H_2S), NDIR (optional sensor) for (CO_2, CH_4) and Gas Sensing Semiconductor-GSS technology (optional sensor) for O_3.

Table 24. Sampling and Analysis Method for Air Quality

No	Parameter	Analysis Method
1	Atmospheric pressure	On site reading
2	Carbon Dioxide (CO_2)	On site reading
3	Hydrogen Sulfide(H_2S)	On site reading
4	Methane (CH_4)	On site reading
5	Nitrogen Dioxide (NO_2)	On site reading
6	Ozone (O_3)	On site reading
7	PM (2.5)	On site reading
8	PM (10)	On site reading
9	Relative Humidity	On site reading
10	Sulphur Dioxide (SO_2)	On site reading
11	Solar Radiation	On site reading
12	Temperature	On site reading
13	Wind Direction	On site reading
14	Wind Speed	On site reading

4.9.3 Identification of Air Pollutants and Its Impacts

Therefore, the air station is set on to collect data of the current air quality. Therefore, the site has to measure the surrounding air quality to know whether SO_2, NO_2, CO_2, CO, H_2S, $PM_{2.5}$ and PM_{10} are exceeding the limiting amount of National

Environmental Quality Emission Guideline or not. The impacts of pollutants are defined below.

Carbon Monoxide (CO) is a toxic gas that cannot be seen or smelled. All people are at risk for CO poisoning. Unborn babies, infants, the elderly, and people with chronic heart disease, anemia, or respiratory problems are generally more at risk than others. Breathing CO can cause headache, dizziness and vomiting nausea. If CO levels are high enough, unconscious or death may be become. Exposure to moderate and high levels of CO over long periods of time has also been linked with increased risk of heart disease.

Carbon Dioxide (CO_2) is the primary greenhouse gas pollutant, accounting for nearly three-quarters of global greenhouse gas emissions. Carbon pollution leads to long lasting changes in our climate, such as rising global temperatures, rising sea level, changes in weather and precipitation patterns and changes in ecosystems, habitats and species diversity. Children, older adults, people living in poverty may be at risk from the health impacts of climate change.

Nitrogen Dioxide (NO_2) is a nasty-smelling gas. The main effect of breathing in raised levels of nitrogen dioxide is the increased likelihood of respiratory problems. Nitrogen dioxide inflames the lining of the lungs, and it can reduce immunity to lung infections. This can cause problems such as wheezing, coughing, colds, flu and bronchitis. Increased levels of nitrogen dioxide can have significant impacts on people with asthma because it can cause more frequent and more intense attacks. Children with asthma and older people with heart disease are most at risk.

Sulfur Dioxide (SO_2) is an invisible gas and has a nasty, sharp smell. It reacts easily with other substances to form harmful compounds, such as sulfuric acid, sulfurous acid and sulfate particles. Sulfur dioxide affects human health when it is breathed in. It irritates the nose, throat and airways to cause coughing, wheezing, shortness of breath, or a tight feeling around the chest. The effects of sulfur dioxide are felt very quickly and most people would feel the worst symptoms in 10 or 15 minutes after breathing in. Those most at risk of developing problems if they are exposed to sulfur dioxide are people with asthma or similar conditions.

Ozone (O_3) has a strong odor. Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. It can also reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.

Particulate matter (PM) consists of microscopically small solid particles or liquid droplets suspended in the air. The smaller the particles, the deeper they can penetrate in to the respiratory system and the more hazardous they are to breathe. Long-term exposure to current ambient PM concentrations may lead to a marked reduction in life expectancy. The reduction in life expectancy is primarily due to increase cardio-pulmonary and lung cancer mortality. Increases are likely in lower respiratory symptoms and reduced lung function in children, and chronic obstructive pulmonary disease and reduced lung function in adults.

4.9.4 Measurement of Air Quality Comparing with the Air Quality Guidelines

The regional air quality within and surrounding factory area is overwhelmingly dominated by industries and residential. As the proposed factory is located in the industrial zone. The air quality assessment with the air quality parameters including particulates (PM_{10}, $PM_{2.5}$), and CO_2, H_2S, CH_4, NO_2, O_3, PMA, PMB, Relative Humidity, SO_2, Solar radiation, Temperature, Wind direction, Wind speed would be monitored. The air quality impact assessment will consider air emissions in accordance with ECD's National Environmental Quality (Emission) Guidelines, WHO air quality standards and IFC air emissions standards. To assist relevant authorities to improving baseline information, simple air quality sampling was conducted at one site for 8 hours. The result of $PM_{2.5}$ is found to exceed the guideline value and this may be due to the day-time of traffic load and proximity to Shwe Bo Myitkyina Road.

Table 25. Air Quality Results of Yoke Pyo Traditional Medicine Production Factory

No.	Parameter	Result	Unit	Avg Period		Guideline Value
1	Nitrogen Dioxide		µg/m^3		year	40
		127.44	µg/m^3	1	hour	200
2	Particulate Matter PM $_{10}$		µg/m^3		year	20
		40.22	µg/m^3	12	hours	50
3	Particulate Matter PM $_{2.5}$		µg/m^3		year	10
		35.42	µg/m^3	12	hours	25
4	Sulfur		µg/m^3		hours	20

	Dioxide	195.32	µg/m^3	10	mins	500
5	Ozone		µg/m^3		year	
		34.73	µg/m^3	8	hours	100
6	Carbon Dioxide		ppm		year	NG
		399.19	ppb	12	hours	
7	Carbon Monoxide		ppb		year	NG
		193.71	ppb	12	hours	
8	Hydrocarbon		ppm		hour	NG
		11.67	ppm	12	hours	
9	Methane		ppm		hour	NG
		5.56	ppm	12	hours	
10	Atomic Radiation		CPM		hour	NG
		17.37	CPM	12	hours	
11	Temperature		˚C		hour	NG
		37.86	˚C	12	hours	
12	Volatile Organic Compound (VOC)		ppb		hour	NG
		0.675	ppb	12	hours	
13	Wind Speed		Kph		hour	NG
		0.98	Kph	12	hours	
14	Wind Direction		Deg		hour	NG
		159.45	Deg	12	hours	
15	Relative Humidity		RH%		hour	NG
		20.02	RH%	12	hours	

4.10 EXISTING NOISE ENVIRONMENT

4.10.1 Sources of the noise

Since the place for measuring noise levels is a factory which produces beer, the noises produced are governed by the sound of the machine operated and by the workers.

4.10.2 Noise Measurement Method

Handheld quick assessment method is used for the sound level by measuring the sound pressure. A tripod is used for mounting the SLM where the SLM is mounted and pointed towards the source of the noise.

4.10.3 Noise Measurement Location

Normally, when undertaking a noise assessment, it is essential to make note of the following on a site map:

- location of noise source
- background noise measurement location
- source noise measurement location
- topography between noise source and sensitive receivers.

The location of noise measurements for the factory is shown in following figure and table.

Figure 22. Location of NSRs within Factory Compound

Table 26. Location of NSRs within Factory Compound

Sr.	NSRs	Locations	
		Latitude	**Longitude**
1	P1	22° 35'20.56"N	95° 44'5.93"E

2	P2	22° 35'19.46"N	95° 44'5.32"E
3	P3	22° 35'21.16"N	95° 44'4.72"E
4	P4	22° 35'20.29"N	95° 44'1.20"E
5	P5	22° 35'20.24"N	95° 44'1.20"E
6	P6	22° 35'18.46"N	95° 44'1.77"E
7	P7	22° 35'21.50"N	95° 44'3.34"E

4.10.4 Results of the noise

The result of the noise is totally governed by the factory operation and at P1 and P2, and the workers, the wind and the Lorries there as very few cars pass through. Measurements results are shown in Table 27.

Table 27. Noise Measurement Results

Sr.	NSRs	Locations		**One Hour L_{Aeq} (dBA)**
		Latitude	**Longitude**	
1	P1	22° 35'20.56"N	95° 44'5.93"E	65
2	P2	22° 35'19.46"N	95° 44'5.32"E	70
3	P3	22° 35'21.16"N	95° 44'4.72"E	55
4	P4	22° 35'20.29"N	95° 44'1.20"E	70
5	P5	22° 35'20.24"N	95° 44'1.20"E	63
6	P6	22° 35'18.46"N	95° 44'1.77"E	54
7	P7	22° 35'21.50"N	95° 44'3.34"E	55

Figure 23. Noise Level Meter for Measuring Noise

4.11 BIODIVERSITY

4.11.1 Introduction

Biodiversity, or the variety of life and its process, is a basis property of nature that provides enormous ecological, economic, and aesthetic benefits its loss is recognized as a major national as well as global concern, with potentially profound ecological and economic consequences. Ancient moat and Mingalar Kan Daw Lake locates about 5 km away from the factory.

The Lake is famous in migratory water birds. According to the water bird data, it was observed that Lake area is still good. It is very important to conserve these Lake areas. There are so many aquatic plants such as Nymphoides, Blyxa, jussiaea, Bottia cordata, Ipomaea etc.

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

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

In this study, MBGEnS has focused "Biological Baseline Study and Impact Assessment on Yoke Pyo Traditional Medicine Factory". It will be considered to identify the biological impacts, existing biological conditions and mitigation measure for environmental protection management.

4.11.2 Materials and Methods

A Global Positioning System (GPS) was used to navigate and mark the coordinates of sample plots around the project area. In order to obtain essential ecological data, Mingalar Kan Daw Lake (Wetland) was divided into 4 area sites respectively and floara and funna species were recorded. Ancient moat was also divided into 2 survey sites. The estimated population of water birds was observed into numerical data. In each area, aquatic plants and animals were also observed to know the ecosystem relation between fauna and flora. To get representative checklists of the flora species, data collection was also carried out by random spots within the direct impact zone and indirect impact zone of the project site. The families were identified by using key to families of flowering plants, issued by Department of Botany, Yangon University (1994), Birds of Myanmar (2003). Specimen identification was performed with the use of literatures by Backer et al., and Kress et al., 2003.

After surveying in a specific site, the population of species in that area is very important to know the composition and the richness of various species and their survival. The density of a species is also needed to calculate the numbers of each species in the community.

4.11.3 Results and Finding

4.11.3.1 Flora

The factory area is located at Shwe Bo Township, Sagaing Region. The factory area comprises main factory shop, warehouse, canteen, main office, and car parking.

Table 28. List of Bird Species in the Impact Zone

No.	Local Name	Common Name	Scientific Name	Family Name	IUCN Red List-Status
1.	Bel- -ar	Eurasian Wigeon	*Anas penelope*	Anatidae	Least Concern(D)
2.	Bel- yit	Northern Pintail	*Anas acuta*	Anatidae	Least Concern(D)
3.	But-chwe	Streak-eared Bulbul	*Pycnonotus blanfordi*	Pycnonotidae	Least Concern(S)
4.	But-phin-ni	Red-Vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	Least Concern(I)
5.	Byine	Little Egret	*Egretta garzetta*	Ardeidae	Least Concern(I)
6.	Byine Ngan	Great Egret	*Casmerodius albus*	Ardeidae	Least Concern(U)
7.	Byine-ouk	Indian Pond hero	*Ardeola grayii*	Ardeidae	Least Concern(U)
8.	Din Gyi	Great Cormorant	*Phalacrocorax pygmaeus*	Phalacrocoracidae	Least Concern(I)
9.	Din Gyi	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae	Least Concern(U)
10.	Garganey	Garganey	*Anas querquedula*	Anatidae	Least Concern(D)
11.	Hin-Thar	Ruddy Shelduck	*Tadorna ferruginea*	Anatidae	Least Concern(U)
12.	Hnget hka	Indian Roller	*Coracias benghalensis*	Coraciidae	Least Concern(I)
13.	Hnget-pasin-hto	Green bee-eater	*Merops orientalis*	Meropidae	Least Concern(I)
14.	Joe-Ni-Pu	Red Collaered	*Streptopelia tranquebarica*	Columbidae	Least Concern(D)

		Dove			
15.	Jo-Le-Pyauk	Spotted Dove	*Streptopelia chinensis*	Columbidae	-
16.	Ka Lu Kwit	White-Breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	Least Concern(U)
17.	Ka-La-Kat	Cotton Pygmygoose)	*Nettapus coromandelianus*	Anatidae	Least Concern(S)
18.	Kho	Rock Dove	*Columba livia*	Columbidae	Least Concern(D)
19.	Kyal Kyaung Byine	Cattle Egret	*Bubulcus ibis*	Ardeidae	Least Concern(I)
20.	Kyay Kyote	Rose-Ringed Parakeet	*Psittacula krameri*	Psittacidae	Least Concern(I)
21.	Kyi- kan	House Crow	*Corvus splendens*	Corvidae	Least Concern(S)
22.	Lin-mi-zwe	Black Drongo	*Dicrurus macrocercus*	Dicruridae	Least Concern(U)
23.	Lin-wet	Black-crowned Night Hero	*Nycticorax nycticorax*	Ardeidae	Least Concern(D)
24.	Mout-Tin	Comb Duck	*Sarkidiornis melanotos*	Anatidae	Least Concern(D)
25.	Ngone	Barred Buttonquail	*Tumix suscitator*	Indicatoridae	-
26.	Paung Tote	Watercock	*Gallicrex cinerea*	Rallidae	Least Concern(D)
27.	Pyan hlwar	Red-rumped Swallow	*Hirundo striolata*	Hirundinidae	-
28.	Pyan Hlwar	Straited Swallow	*Hirundo striolata*	Hirundinidae	-

29.	Sissali	Lesser Whistling Duck	*Dendrocygna javanica*	Dendrocygnidae	Least Concern(D)
30.	Snipe	Common snipe	*Gallinago gallinago*	Scolopacidae	Least Concern(D)
31.	Ta-Se-Mhote	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	Least Concern(D)
32.	Taung Pay Su	Common Hoopoe	*Upupa epops*	Upupidae	Least Concern(D)
33.	Ye Kyat	Common Moorhen	*Gallinula chloropus*	Rallidae	Least Concern(S)
34.	Ye-Kyat-Don	Common coot	*Fulica atra*	Rallidae.	Least Concern(I)
35.	Za-yet	Common Myna	*Acridotheres tristis*	Sturnidae	Least Concern(I)
36.	Za-yet Gaung Phyu	Vinous-Breasted Starling	*Acridotheres burmannicus*	Sturnidae	Least Concern(I)
37.	Za-yet Kyar	AsianPied Starling	*Gracupica contra*	Sturnidae	Least Concern(I)
38.	Zwe	White-throated Babbler	*Turdoides gularis*	Turdoidinae	Least Concern(S)

Note: (I) means Increasing, (D) means Decreasing, (S) means Stable and (U) means Unknown

Table 29. List of Flora in the Impact Zone

No.	Common Name	Scientific Name	Family Name	Habit
1.	Anya-kokko	*Albizialebbek L.*	Mimosaceae	Tree
2.	Banda	*Terminalia catappa L.*	Combretaceae	Tree
3.	Bawdi-nyaung	*Ficus religiosa L.*	Moraceae	Tree
4.	Dan-da-lun	*Moringaoleifera Lam*	Moringaceae	Tree
5.	Eu-ca-lit	*Eucalyptus ovataLabill.*	Myrtaceae	Tree

6.	Htan	*Borassus flabellifer*	Arecaceae	Tree
7.	Htein	*Mitragyna parvifolia*	Rubiaceae	Tree
8.	Khwele-ya	*Mucuna pruriens*	Fabaceae	Shrub climber
9.	Kyi	*Barringtonia acutangula*	Lecythidaceae	Tree
10.	Lale	*Meliosmasimplicifolia*	Meliosmaceae	Tree
11.	La-pan	*Beaumontia grandiflora*	Apocynaceae	Small Tree
12.	Magyi	*Tamarindus indica*	Fabaceae	Tree
13.	Malaga	*Syzygiumpolyanthum*	Myrtaceae	Tree
14.	Mezali	*Senna siamea*	Fabaceae	Tree
15.	Ngu	*Cassia fistula L.*	Caesalpiniaceae	Tree
16.	Ohn	*Cocos nucifera*	Arecaceae	Tree
17.	Padauk	*Pterocarpus marsupium*	Fabaceae	Tree
18.	Pauk	*Butea frondosa*	Fabaceae	Tree
19.	Seinban	*Delonix regia*	Caesalpiniaceae	Tree
20.	Sha	*Ancacia catechu*	Mimosaceae	Tree
21.	Subyu	*Ancacia nilotica*	Mimosaceae	Small Tree
22.	Tama	*Azadirachta indica*	Meliaceae	Tree
23.	Thabye Nyo	*Linociera macrophylla*	Oleaceae	Tree
24.	Thamon	*Boscia variabilis*	Capparaceae	Shrub
25.	Thanut	*Cordia dichotoma*	Boraginaceae	Tree
26.	Thayet	*Mangifera indica L.*	Anacardiaceae	Tree
27.	Zi	*Ziziphus jujube Lam.*	Rhamnaceae	Tree

Table 30. Species Lists of Flora in Impact Zone (Crop)

No.	Common Name	Scientific Name	Family Name
1.	Chick-pea	*Cicer arietinum*	Fabaceae
2.	Maize	*Zea mays*	Poaceae
3.	Melon	*Cucumis melo*	Cucurbitaceae
4.	Peanut	*Arachis hypogaea*	Fabaceae
5.	Rice	*Oryza sativa*	Gramineae
6.	Sunflower	*Helianthus annuus*	Asteraceae

Table 31. List of Aquatic Flora in Impact Zone

No.	Local Name	Common Name	Scientific Name	Family Name
1.	Bay dar	Common water-hyacinth	*Eichhornia crassipes*	Pontederiaceae
2.	Hin Nyant	-	*Boottia Cordata*	Hydrocharitaceae
3.	Kana phaw	-	*Enhydra fluctuans*	Asteraceae
4.	Kya	Lotus	*Nymphaea nouchali Nymphaea pubescens*	Nymphaeaceae
5.	Kyar Lin Ban	-	*Nymphoides indica*	Menyanthaceae
6.	Pait-Swal	Narrow-leaved and hybrid cat-tail	*Typha angustifolia*	Typhaceae
7.	Unknown	Fanwort	*Cabomba spp.*	Cabombaceae
8.	Unknown	Arrowhead	*Sagittaria latifolia*	Alismataceae
9.	Ye Kan Zwin	-	*Ipomaea aquatica*	Convolvulaceae
10.	Ye Mhaw	-	*Blyxa spp*	Hydrocharitaceae

Table 32. List of Fish Species in Impact Zone

No.	Common Name	Scientific Name	Family Name
1.	Nga zin sat	*Chanda ranga*	Channidae
2.	Nga-gyin	*Cyprinus carpio*	Cyprinidae
3.	Nga-Khone-Ma	*Puntius chola*	Cyprinidae
4.	Nga-Khu	*Clarias batrachus*	Siluroidea
5.	Nga-Nat-Pyar	*Morulius chrysophekadion*	Cyprinidae
6.	Nga-pyay-ma	*Tilapia mossambica*	Cichlidae

7.	Nga-tha-lae-hto	*Nemachelus rubidipinnis*	Cobitidae
8.	Nga-Wat-Ma	*Tilapia nilotica*	Cichlidae
9.	Nga-yant	*Channa striatus*	Channidae
10.	Nga-zin-yine	*Arius truncates*	Ariidae

Table 33. List of Butterfly Species in Impact Zone

No.	Scientific Name	Family Name
1.	*Acraea terpsicore*	Nymphalidae
2.	*Appias libythea*	Pieridae
3.	*Catopsilia pomona*	Pieridae
4.	*Danaus chrysippus*	Danaidae
5.	*Danaus limniace*	Danaidae
6.	*Eurema hecabe*	Pieridae
7.	*Hypolimnas misippus Linnaeus*	Nymphalidae
8.	*Ixias pyrene verna*	Pieridae
9.	*Junonia atlites*	Nymphalidae
10.	*Junonia hierta*	Nymphalidae
11.	*Papilio demoleus*	Papilionidae
12.	*Pieris rapae*	Pieridae

Table 34. List of Odonate in the Impact Zone

No.	Scientific Name	Family Name
1.	*Bradinopyga geminate*	Libellllulidae
2.	*Diplacodes trivialis*	Libellllulidae
3.	*Neurothemis tullia*	Libellllulidae
4.	*Orthetrum sabina*	Libellllulidae
5.	*Pantala flavescens*	Libellulidae
6.	*Rhodothemis rufa*	Libellllulidae
7.	*Rhyothemis variegata*	Libellllulidae
8.	*Trithemis Kirbyi*	Libellllulidae

4.12 SOCIO-ECONOMIC COMPONENTS

Socio-economic factors are lifestyle coponents and measurements of both financial viability and social standing. They directly influence social privilege and levels of financial independence. Factors such as health status, income, environment

and education are studied by sociologists in terms of how they each affect human behaviors and circumstances.

4.12.1 Age and Sex

Children under five years are 5.5% of total population where elderly over 64 years accounts about 4.1%. Together these two age groups which are solely dependent on other age groups sums up more than 9.6% of total population in the area. More than 64% of the people living in the study area falls under the age group of 16 years to 64 years. This group is mainly consists of workforces of local community.

Table 35. Age Groups and Sex of Local Community

Age Group	Gender					
	Male		Female		Total	
	Count	Column N %	Count	Column N %	Count	Column N %
< 5 years	40	6.9%	27	4.2%	67	5.5%
5-15 years	141	24.5%	173	26.6%	314	25.6%
16-64 years	373	64.8%	422	64.9%	795	64.8%
>64 years	22	3.8%	28	4.3%	50	4.1%
Total	576	100%	650	100%	1226	100%

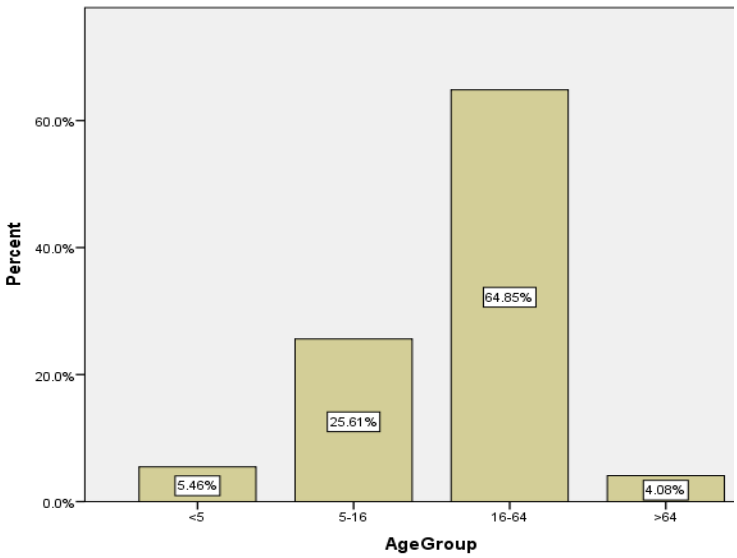

Figure 24. Age Groups of Local Community

There are 88.6 male in every 100 female population as the gender ratio of male to female goes 46.98:53.02. Local gender ratio 89 is slightly lower than national gender ration of 93 and regional gender ratio of Bago Region which is 91.2. Gender ratio could be seen in the following pie chart.

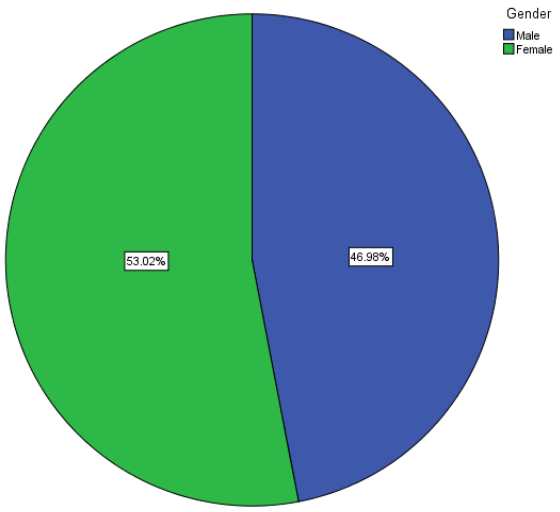

Figure 25. Gender Ratio

4.12.2 Family Size

Eleven sizes of families are encountered in survey ranging from a one member to eleven members families. A total population of 1289 was listed in 261 families which gives an average family size of 4.9 which is slightly more than deviated from national average family size of 4.6.

Table 36. Family Size Distribution

Family Size	Count	Column N %
11member family	4	2
10 member family	6	1.3
9 member family	4	3.9
8 member family	14	3.7
7 member family	26	4.4
6 member family	33	2.6
5 member family	57	2.0
4 member family	48	1.1
3 member family	50	.3
2 member family	17	.5
1member family	2	.3
Total		20.2

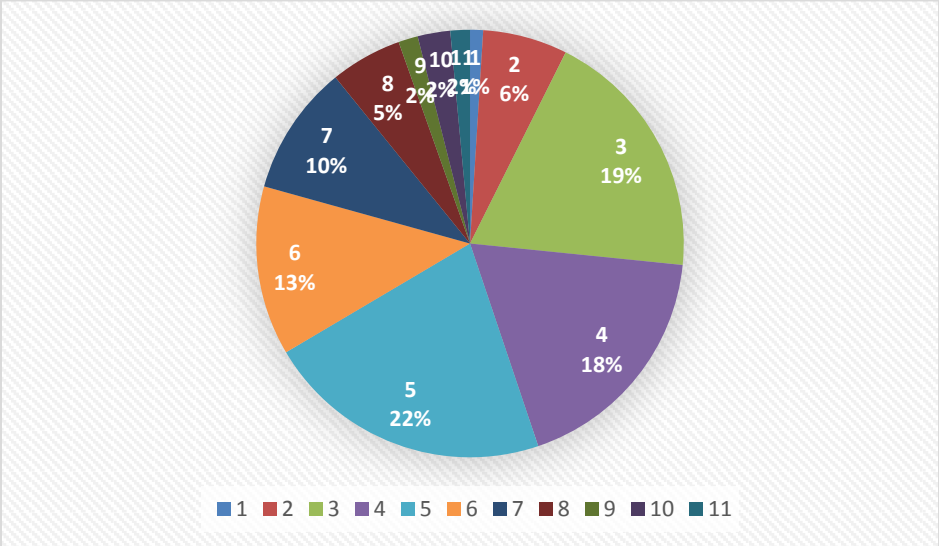

Figure 26. Family Size Distribution of Local Community

4.12.3 Educational Attainment

Around 45.1 %, the people in local community attained only primary level education. Only 2.7 % of the local people are graduated. About 34.7 % remaining are middle and high school levels. Current educational attainment levels show the local community's past education condition.

Table 37. Educational Attainment Levels of Local Community

Educational Attainment	Count	Column N %
No Education	159	12.3
Primary	581	45.1
Middle	303	23.5
High	145	11.2
University	4	.3
Graduated	35	2.7
Post Graduate	62	4.8
Total	1289	100.0%

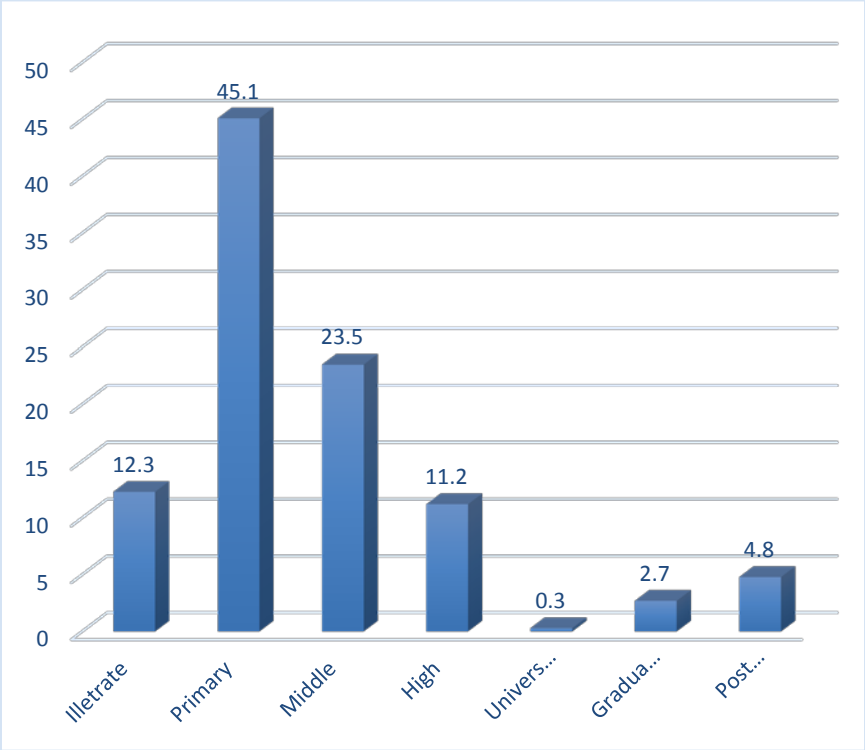

Figure 27. Educational Attainment

4.12.4 Industry of Employment

Dependent is the most conspicuous living with about 26.2 % of the people in the local area is working. More than one-fifth of total population with about 18.9 % are schooling children. Approximately 18.9 % of the people in the resident area is working in manual labour as general workers.

Table 38. Industry Employment of Local Community

Industry	Count	Column N %
Employee (Govet)	22	1.7
Employee (Private)	47	3.6
Business Owner	1	.1
Farming	155	12.0
Business Owner	88	6.8
Shop	82	6.4
Family Business	25	1.9
Schooling	231	17.9
Daily Wages	244	18.9

Dependent	338	26.2
Pensioner	2	.2
Jobseeker	5	.4
Other	49	3.8
Total	1289	100

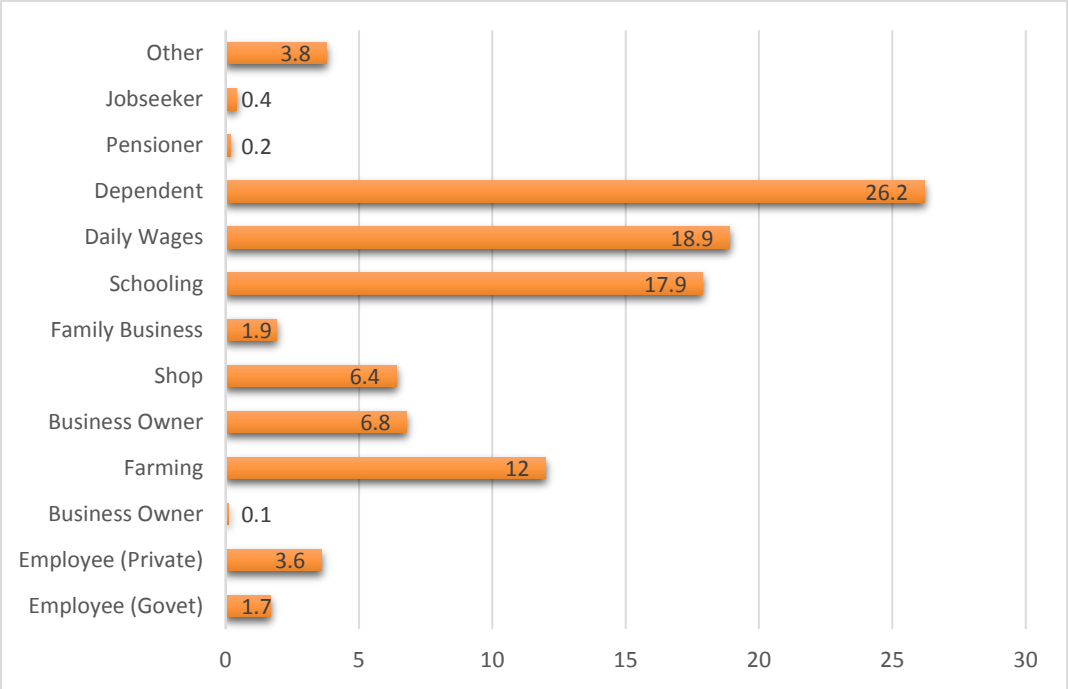

Figure 28. Industry Employment

4.12.5 Living conditions

The factory area is located in Shwe Bo Township, Sagaing Region. The total number of households in Myaung Gyi, Min Kyaung and Bago Gone Village is only 248. Min Kyaung village is the smallest village in the study area with a total household of 78 when the largest village Bago Gone has 248 households. The following table and figure show the household numbers in the study area.

Table 39. Household Numbers in the Study Area

Sr.	Village	House Hold
1	Min Kyaung	78
2	Myaung Gyi	82
3	Bago Gone	89
Total		263

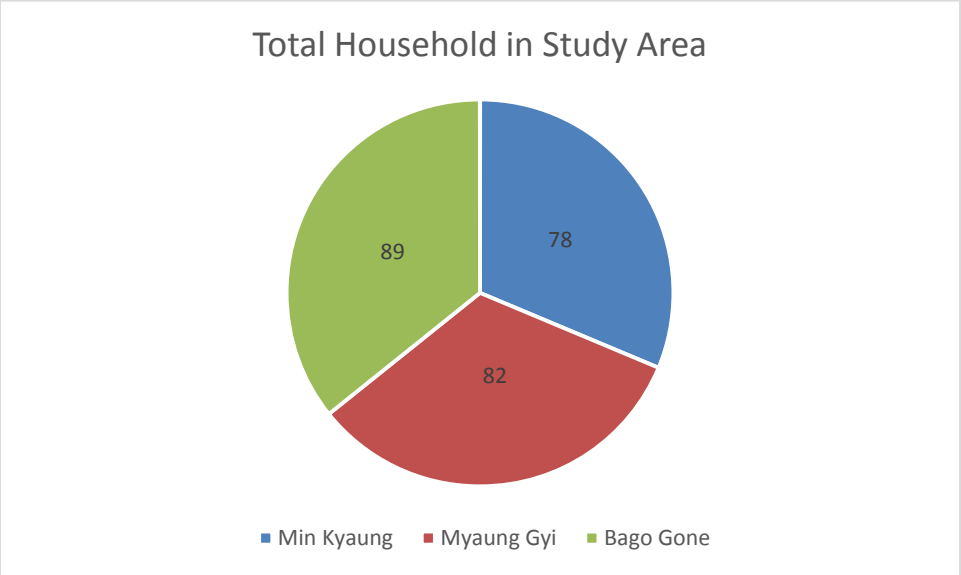

Figure 29. Household Numbers in the Study Area

4.12.6 Religion Distribution

The most dominant religion in the study area is Buddhism with approximately 87.9% of total population. The other religion shares the remaining two percentages with 6.3% of Christian, 4.3% Islam and 0.5 % of Hindu, 0.8% Animist, 0.2% other religion and 0.1% no religion respectively. Table 40 is the descriptive table of Religion distribution of local community with frequency, percentage and Cumulative percentages values.

Table 40. Religion Distributions of Local Community

Religion	Frequency	Percent
Buddhism	245687	87.9
Christian	3981	6.3
Hindu	619	0.5
Islam	11588	4.3
Animist	-	0.8
Other	-	0.2

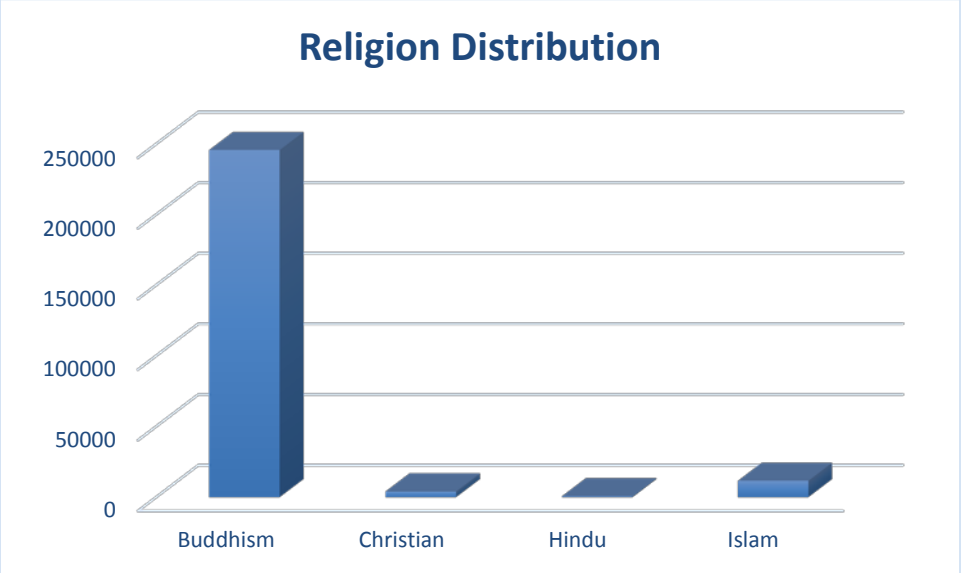

Figure 30. Religion Distributions in the Study Area

The number of people by religion is described in Figure 25. Buddhism got the highest count with 245687 people and the other religions are very few compared to Buddhists.

4.13 CULTURAL HERITAGE REGION OF SHWE BO TOWNSHIP

From the following table, the prominent building in Shwe Bo Township were not situated within the factory area and within 3 km around the factory area.

Table 41. Prominent Building

Sr	Name of Prominent Building	Township	Location
1	Shwe Bon Yadanar Mingalar Palace	Shwe Bo	No (4) Quarter

4.14 HEALTH COMPONENTS OF SHWE BO TOWNSHIP

There are eight government hospitals in the health sectors of Shwe Bo Township where the project is located. There are 32 rural health centers and rural health centers. Outbreaks in Shwe Bo Township include malaria and cholera. Diarrhea was caused by diarrhea and no deaths from the disease. There were 499 HIV / AIDS cases but no deaths.

5. IMPACT, RISK ASSESSMENT AND MITIGATION MEASURES

An Initial Environmental Examination (IEE) seeks to identify and, to the extent possible, quantify the potential negative impacts and positive benefits of a proposed project with respect to the environment (physical, ecological, human use, quality of life, and health values). Once these impacts have been identified, prevention, mitigation, and monitoring measures are proposed to prevent and/or mitigate possible negative impacts, and enhance positive impacts. An Environmental, Social, and Health Impact Assessment process incorporates a number of key steps and discussed in detail in the following sections:

The assessment approach is risk-based, with the objective to make a conclusion on the level of risk development activities will pose to environmental, socio-economic and health receptors. This section describes the impact assessment process undertaken to evaluate the level of risk to environmental, socio-economic and health receptors from activities associated with the planned project. This description provides an account of the identification of potential impacts and benefits and the evaluation of their significance (scale of Risk Ranking). The EIA methodology applied is modified after Nigel Rossouw (2003); Sippe (1999); and United Nations University (2007).

Activities associated with planned project are assessed to systematically identify potential impacts and the associated level of risk. This process assists in prioritizing the development of management measures to achieve an overall acceptable level of risk.

5.1 METHODOLOGY

5.1.1 Environmental Impact Assessment Terminology

5.1.1.1 Defining Impacts

Direct (or primary) – impact that results from a direct interaction between some feature of a planned action and the receiving environment (e.g. between an effluent discharge and receiving water quality)

Secondary – impact that follows on from the primary interactions between the project and its environment as a result of subsequent interactions within the

environment (e.g. loss of part of a habitat affects the viability of a species population over a wider area)

Indirect – impact that result from other developments or activities that are encouraged to happen as a consequence of the omachineinal development (e.g. a new development stimulates a requirement for improved road access).

Cumulative – impacts that act together to affect the same environmental resource or receptor. Several types can be identified:

i. **Temporal**: a series of impacts that occur year in year out, that in themselves are not important, build up to the point that they become important.

ii. **Accumulative**: the overall effect of different types of impact (e.g. air pollution + noise + traffic + visual blight) on a single receptor (e.g. a community or a habitat) where each singly may not be important but combined they are.

iii. **Additive**: where impact from the planned activity occurs at the same time as impact from activities being undertaken by other parties (these may be already occurring, committed developments for the future or developments that may happen in the foreseeable future).

iv. **Interactive**: where two different types of impact (which may not in themselves be important) react with each other to create a new impact (that might be important).

v. **Synergistic**: where two impacts interact together (e.g. changes in air quality with respect to two different pollutants) to create an impact that is greater than the sum of their parts.

Permanent: Impact that occurs once in the development of a project and causes a permanent change in the affected receptor or resource (e.g. the felling of old growth forest as a result of occupation of a site, the diversion of a watercourse).

Short-term: impact that is predicted to last only for a limited period (e.g. during installation, operation or decommissioning) but will cease on completion of the activity, or as a result of mitigation/ reinstatement measures and natural recovery.

Long-term: impact that will continue over an extended period (e.g. noise from operation of a development, impact from operational discharges or emissions).

This includes impact that may be intermittent or repeated rather than continuous over an extended time period (e.g. repeated seasonal disturbance of species as a result of well operations, impact results from annual maintenance activities).

Non-normal Impact: impact that result from unplanned events – incidents – within the project (e.g. breakdowns, failures) or in the external environment affecting the project (e.g. flood, seismic activity, landslip). In these cases, the assessment should take into account of the probability of the event.

Local: impact that affects locally important environmental resources or a single habitat/biotype.

Regional: impact that affects regionally important environmental resources or is felt at a regional scale as determined by administrative boundaries, habitat type.

National: impact that affects nationally important environmental resources or affects an area that is nationally important or protected.

International: impact that affects internationally important environmental resources such as areas protected by International Conventions.

Trans-boundary: impact that is experienced in one country as a result of activities in another.

Source of impact – as an interaction between the proposed activity and an Environment, Social or Health component

Negative impact – negative change from the existing situation due to the above interaction

Benefit – any positive change from the existing situation due to the above interaction

Mitigation – the actions undertaken by Project Proponent to maximize benefits and to minimize any potential negative impact.

Activity - Work associated with the Development during construction, commissioning, operation and decommissioning. For exampling: road construction

Aspect - Associated with each activity are a number of aspects (or stressors). These are components of an activity that may have a potential to impact on the biological, socio-economic or cultural environment. For example: emissions, waste, noise.

Significance/Risk Ranking - The level of impact associated with an aspect.

Likelihood - The probability or frequency of an environmental impact actually occurring.

Residual significance/ risk level - The level of significance/risk after the application of preventative and mitigation measures.

Risk - The chance of something happening that will have an impact on objectives.

5.1.2 Impact Assessment

5.1.2.1 Assessment of Potential Environmental, Social & Health Impacts

The environmental, social, and health impact assessment can be subdivided according to the project phases:

- Preparation and installation phase
- Operation Phase
- Decommissioning Phase
- Unplanned situation: All impacts from unplanned situations on environmental, social, and health aspects relevant to the project are assessed.

The approach to assess the significance of potential impacts is discussed briefly below. Assessment of the level of impact significance requires consideration of the impact level (i.e. magnitude of the environmental effect, its geographical scale and duration) in relation to the receptor sensitivity (i.e. the key receptors and resources considered). The overall significance is presented through a matrix of sensitivity of the **Receptor Sensitivity** and the **Impact Level**, as shown in **Table 42**.

Table 42. Significance Matrix for Environmental Impacts

Receptor Sensitivity	**Impact Level**		
	Low	**Medium**	**High**
Low value/sensitivity receptor or resource, impact disturbs degraded area or slightly disturbs area with value for conservation, causes small changes in species and diversity, within standards, small local change in human use and quality of life values over a short-term duration, reversible over short-term.	Negligible	Low	Low

Medium value/sensitivity receptor or resource, Impact disturbs an area that has a value for conservation or causes change in species diversity. Impact important on a local or regional level, within standards, moderate change in human use and quality of life values at moderate level over a long-term duration, reversible over medium-term.	Low	Medium	Medium
High value/sensitivity receptor or resource, rare or endangered species or habitat impacted on a national or International level, exceeding standards, large permanent change in human use and quality of life values at a regional level, long-term or no reversible.	Low	Medium	High

The impact assessment is based on four categories of impact significance level, as described in **Table 43**. These inform the level of mitigation that is considered appropriate to be applied for a given impact.

Table 43. Categories of Impact Significance

Significance Level	Definition
High	Impact is classified as high and can cause numerous effects. Major impacts affect an entire population or species in sufficient magnitude to cause a decline in abundance and /or change in distribution. Large permanent change in human use and quality of life values at a regional and national level. Fatality from an accident or occupational illness. Impacts cannot be managed or resolved by any mitigation measures.
Medium	Impact may result in changes that affect the value of resources and environment. Moderate impacts affect a portion of a population and may bring about a change in abundance and / or distribution but does not threaten integrity of population. Impact may affect moderate change in human use and quality of life values at a local and regional level over a long-term duration. Major injury or health effects (including Permanent Partial Disability). Mitigation measures are required to manage or reduce the potential impacts and monitoring measures are required to determine effectiveness of mitigation measures.

Low	Impact may result in changes in resources and environment but this change does not decrease value of these resources and environment. Minor impacts affect individuals within a population over a short period of time. Local change in human use and quality of life values over a short term duration. Minor injury or health effects (Lost Time Injury). Impact can be managed and resolved by implementation of general mitigation measures.
Negligible	Impact has no effect.

Source: Adapted from Rossouw (2003) and Sippe (1999).

The degree of significance (categories as defined in **Table 43**) depends upon the level (i.e. magnitude, extent and duration) of impacts and the sensitivity of the resource value that they may impact. The criteria used to inform the significance ranking of impacts on a qualitative basis, are provided in **Table 44**.

Table 44. Criteria used to Determine Impact Significance

Criteria	Score	Detail
Extent	**3**	**High –** Area of impact is beyond 5 km and impact extends to regional and national level.
	2	**Medium –** Area of impact is beyond the project area but is in a limited area of 1 – 5 km.
	1	**Low –** Area of impact is in the project area within a radius of 1 km.
Duration	**3**	**Long Term** – Permanent impact**,** Impact will remain after decommissioning. Impact occurs in long-term duration (> 5 yr.).
	2	**Medium** – Impact can be reversible overtime (1 – 5 yr.), period of impact occurrence is within the project period, Impact occurs over mid-term duration (1 – 5 yr.).
	1	**Short term** – Impact can be quickly reversible (< 1 yr.), Period of impact occurrence is less than the project period, Impact occurs in short-term duration (< 1 yr.).
Magnitude	**3**	**High –** Exceeds regulatory standards, changes the structure of the environmental or social system or ecosystem.
	2	**Medium –** Within regulatory standards, but changes some factors in the environmental or social system or ecosystem but does not change the structure.

Criteria	Score	Detail
	1	**Low –** Within regulatory standards, with small changes in some factors for the environmental or social system or ecosystem but does not change the structure. **Negligible –** no detectable impact on the environment or socio economic conditions. **Positive –** Impact has a positive effect on the environment or socio economic conditions.
Receptor Sensitivity	**3**	**High** – High value/sensitivity receptor or resource, rare or endangered species or habitat impacted on a national or international level, exceeding standards, large permanent change in human use and quality of life values at a regional level, long-term or no reversible.
	2	**Medium** – Medium value/sensitivity receptor or resource, Impact disturbs an area that has a value for conservation or causes change in species diversity. Impact important on a local or regional level, within standards, moderate change in human use and quality of life values at moderate level over a long-term duration, reversible over medium-term.
	1	**Low** – Low value/sensitivity receptor or resource, impact disturbs degraded area or slightly disturbs area with value for conservation, causes small changes in species and diversity, within standards, small local change in human use and quality of life values over a short-term duration, reversible over short-term. **Negligible** – no detectable sensitivity.

Source: Adapted from Nigel Rossouw (2003); Sippe (1999); and United Nations University (2007)

The above-mentioned Matrix Method is used to consider the Impact Level and Receptor Sensitivity as follows:

Significance = Impact Level x Receptor Sensitivity

Note: Impact Level is determined using magnitude, extent, and duration of impacts. Receptor Sensitivity is determined using the values of resources and environment that are lost or decreased as a result of the project activities.

Stage 1: Analysis of Impact Level

Analysis of impact level is determined using the sum of magnitude, extent, and duration of the impact.

Impact Level = Magnitude + Extent + Duration

Total Score for Impact Level	Impact Level	Score
7-9	**High**	**3**
4-6	**Medium**	**2**
1-3	**Low**	**1**

Stage 2: Receptor Sensitivity Ranking

Impact Level	Score
High	3
Medium	2
Low	1

Stage 3: Impact Significance Evaluation

Significance Level of Environmental Impact			Impact Level		
			Low	**Medium**	**High**
			1	**2**	**3**
Receptor Sensitivity	**Low**	**1**	**Negligible (1)**	**Low (2)**	**Low (3)**
	Medium	**2**	**Low (2)**	**Medium (4)**	**Medium (6)**
	High	**3**	**Low (3)**	**Medium (6)**	**High (9)**

5.1.2.2 Identification of Management Measures

The first priority of environmental management is always to **prevent adverse impacts**, thereafter management measures with other objectives are considered. Environmental management measures can be varied and the measures themselves can have a variety of objectives. World Bank guidelines for a best practice approach to the management of environmental and social impacts are presented in **Table 44**. Many of the recommendations set out in the design component are designed to meet the criterion for 'avoidance'.

Table 45**.** Primary Objectives of Mitigation Measures for Adverse Environmental Impacts.

First priority is avoidance of negative impacts; the objectives are listed in decreasing order of priority.

Avoidance	Avoiding activities that could result in adverse impacts. Avoiding resources or areas considered as sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and / or

	preventing such an occurrence having negative environmental impacts.
Preservation	Preventing any future actions that might adversely affect an environmental resource. Typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
Minimization	Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, redesigning elements of a project.
Rehabilitation	Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.
Restoration	Restoring affected resources to an earlier (and possibly more stable and productive) state, typically 'background / pristine' condition.
Compensation	Creation, enhancement or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources.

Source: The World Bank. Environment Department. January 1999. Environmental Management Plans. Environmental Sourcebook Update. Number 25

For activities where the risk level is higher than low, management measures are required to prevent or mitigate the risk to an acceptable level. Prevention measures are put in place to prevent a hazard or event from occurring such as avoidance or reduction at source and pollution control equipment. Mitigation measures are put in place to prevent or minimize the actual impact. This can include spill response plans, monitoring and offsets.

5.1.2.3 Residual Impact Significance

Following the identification of potential environmental and social impacts, their significance is assessed, taking into account those proposed mitigation measures already incorporated into the design of the project and, where appropriate, any further mitigation measures that are considered feasible and justified. Mitigation measures are applied to eliminate or reduce the extent, duration and or magnitude of a potential impact to an acceptable level. These remaining impacts are described as residual impacts.

One objective of the IEE is to understand the significance of these residual impacts that will remain after mitigation measures have been designed into the intended activity and if some form of monitoring or measurement might be justified.

5.2 SCREENING

The Screening Matrix and Results of Screening identify Environmental, Social and Health impacts that may occur as a result of planned project activities and unplanned events. Each of the potential impacts was assessed qualitatively based on the screening methodology. All project activities were identified and potential impacts on the environment, social or health systems was defined.

Table 46. Screening Matrix

Environmental Parameters		Physical Resources				Ecological Resources			Human Use Values			Quality of Life Values			Health		
Project Activities/Events		Air Quality / GHG emissions	Water Quality	Noise	Odour	Biota	Endangered Species	Sensitive / Protected Areas	Daily Activities /Traffic	Tourism	Waste Management	Cable Structures	Socio-economy	Cultural-Archaeological	Visual Aesthetics	Public Health	Occupational Health and Safety
Project Activities (All Phases)																	
1	Employees/Materials																
2	Fuel Storage & Handling																
3	Materials/ Chemical Handling and Storage																
4	Waste Handling and Storage																
5	Wastewater Disposal																
6	Energy Use																
7	Labour, Equipment supply																
8	Presence of Equipment and Facilities																
9	Purchasing (Selected)																
	Installation																
10	Machine Placement																
	Operation																
11	Purification (with water)																
12	Storage (Raw Materials)																
13	Formulation																
14	Cut, Crush, Pulverizing																
15	Powder Kneading (starch)																
16	Granulating																
17	Tabletting																
18	Packaging																
19	Storage (Finished Goods)																
	Decommissioning																
20	Transport/ Storage																
21	Energy Use																
	Unplanned Events																
22	Accidental Release																
23	Malfunction																
24	Supply Issues																
25	Fire or Explosion																

Key:

	No Impact
	Potential Impact
	Probable Impact

Table 47. Results of Screening Environmental Impacts for Medicine Production

Indicator	Source of Impact		Detail/Reason
	Project Phase	Activity	
Physical Resources			
Air Quality/Climate	Installation Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/GHG Emissions
	Operation Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/GHG Emissions
	Decommissioning Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/GHG Emissions
	Unplanned Events	Fire or Explosion	Deterioration from fuel combustion/GHG Emissions
Water Quality	Installation Phase	Fuel Storage, Wastewater, Non-Hazardous and Hazardous Waste Handling and Storage	Potential contamination
	Operation Phase	Fuel Storage, Wastewater, Non-Hazardous and Hazardous Waste Handling and Storage	Potential contamination
	Decommissioning Phase	Fuel Storage, Wastewater, Non-Hazardous and Hazardous Waste Handling and Storage	Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)
	Unplanned Events	Accidental Release	Potential contamination
Noise	Installation Phase	None	None
	Operation Phase	Machine operation	Increased noise from site installation
	Decommissioning Phase	None	None
	Unplanned	Explosion	Increased noise

Indicator	Source of Impact		Detail/Reason
	Project Phase	Activity	
	Events		from possible explosion
Ecological Resources			
Biota Endangered Species Sensitive/Protected Areas	Installation Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater, Hazardous Materials Handling and Storage	Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem
	Operation Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater, Hazardous Materials Handling and Storage	Potential deterioration of water quality from spills, leakages
	Decommissioning Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater, Hazardous Materials Handling and Storage	Potential deterioration of water quality from spills, leakages and discharges could affect the marine ecosystem
	Unplanned Events	Accidental Release	Potential deterioration of water quality from spills, leakages and discharges could affect the ecosystem

Table 48. Social Aspects

Indicator	Source of Impact		Detail/Reason
	Project Phase	Activity	
Social Aspect			
		Activity	**Potential Impact**
Traffic	Installation Phase	Employment/Materials Transport Presence of Equipment and Facilities Machine Placement Increased traffic	Potential disruption to traffic in case of accident

Indicator	Source of Impact		Detail/Reason
	Project Phase	**Activity**	
	Operation Phase	Employment/Materials Transport Presence of Equipment and Facilities Machine Placement Increased traffic	Potential disruption to traffic in case of accident
	Decommissioning Phase	Employment/Materials Transport Presence of Equipment and Facilities Machine Placement Increased traffic	Potential disruption to traffic in case of accident
	Unplanned Events	Accidental Release Collision	Potential disruption to traffic in case of accident
Waste Management	Installation Phase	Non-hazardous and Hazardous Waste Handling and Storage Wastewater	Pressure on existing waste management facilities Waste contamination to environment. Reduced well-being due to exposure or perceived exposure to hazards
	Operation Phase	Non-hazardous and Hazardous Waste Handling and Storage Wastewater	Pressure on existing waste management facilities Waste contamination to environment. Reduced well-being due to exposure or perceived exposure to hazards
	Decommissioning Phase	Non-hazardous and Hazardous Waste Handling and Storage Wastewater	Pressure on existing waste management facilities Waste contamination to environment. Reduced well-being due to exposure or perceived exposure to hazards
	Unplanned Events	Accidental Release	Waste contamination to environment. Reduced well-being due to exposure or

Indicator	Source of Impact		Detail/Reason
	Project Phase	Activity	
			perceived exposure to hazards
Pipeline/Cable/ Structures	Installation Phase	Machine Placement	Possible damage to cable lines and pipelines during machine installation resulting in interruption of service
	Operation Phase	None	None
	Decommissioning Phase	None	None
	Unplanned Events	None	None
Socio-Economy	Installation Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater Disposal Hazardous Materials Handling and Storage Non-hazardous and Hazardous Waste Handling and Storage Labour, Equipment & Services Supply	Increased employment/income and procurement opportunities for people, business and services in surrounding area
	Operation Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater Disposal Hazardous Materials Handling and Storage Non-hazardous and Hazardous Waste Handling and Storage Labour, Equipment & Services Supply	Increased employment/income and procurement opportunities for people, business and services in surrounding area
	Decommissioning Phase	Employees/Materials Transport Fuel Storage &	Increased employment/income and procurement

Indicator	Source of Impact		Detail/Reason
	Project Phase	**Activity**	
		Handling Wastewater Disposal Hazardous Materials Handling and Storage Non-hazardous and Hazardous Waste Handling and Storage Labour, Equipment & Services Supply	opportunities for people, business and services in surrounding area Waste Handling and Storage Labour, Equipment & Services Supply
	Unplanned Events	None	None
Cultural/ Archaeological	Installation Phase	Employees/Materials Transport Labour, Equipment & Services Supply	Potential for conflict between local culture and outside workers.
	Operation Phase	None	None
	Decommissioning Phase	None	None
	Unplanned Events	None	None
Visual Aesthetics / Tourism	Installation Phase	None	Project located without tourism / visual value.
	Operation Phase	None	Project located without tourism / visual value.
	Decommissioning Phase	None	Project located without tourism / visual value.
	Unplanned Events	Accidental Release Fire or Explosion	Reduced attractiveness of area due to reduced visual aesthetics from increased industrial activity, releases or accidental spills.

Table 49. Health Aspects

Indicator	Source of Impact		Detail/Reason
	Project Phase	Activity	
Health			
Public Health Occupational Health	All Phases	All activities	All components and phases of the project have some potential to impact occupational health and safety, due to accidents, exposure to air pollutants, noise, exposure to water contaminated by accidental spills, concern about accidents, spills, wastes, noise, etc.

The assessment of each aspect addressed in this IEE will include the following components:

- Description of the source and characteristic of the potential impacts.
- Identification of receptors sensitive to potential impacts.
- Description and evaluation of potential impacts.
- Identification of management measures to reduce potential impacts.
- Determinations of the residual significance or risk after management measures are included.
- A summary assessment table with residual significant/risk rankings.

The overall study area of the project will cover a 2 km area of the site area in Shwe Bo Industrial Zone. The study area for the social impact assessment includes the project stakeholders and communities in and around Shwebo Industrial Zone. For the health impact assessment, workers employed for installation, operation and decommissioning, as well as people who live in close proximity to the site and available health services are included in the assessment.

For each resource value a summary impact evaluation table will be provided as in **Table 50**:

Table 50. Example Impact Evaluation Table

Resource Value	Impact Description				
	Level and Type of Impact				
Impact Criteria	+1	0	1	2	3
	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High
Residual Significance	Positive	Negligible	Low	Medium	High

5.3 INSTALLATION PHASE

5.3.1 Environmental Impact Assessment

From the screening process the following must be assessed to determine their impacts during the installation phase:

- Air Quality
- Water Quality

5.3.1.1 Assessment of Impacts on Air Quality

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Air Quality/Climate	Installation Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/GHG Emissions

Assessment of Air Quality Emissions

Air emissions from Yoke Pyo Traditional Medicine Factory Project activities during the installation phase will be primarily generated from engine combustion of vehicle engines and electricity generators from employees and materials transport, fuel storage and handling, and machine mobilization and installation. Collectively these sources all fall under the category of "energy use".

Environmental impacts from air pollutants released from energy use during installation and machine mobilization are summarized in **Table 51**.

Table 51. Potential Environmental Impacts of Emissions from Energy Use and Transportation

Emission Category	**Environmental Impact**
CO	Contributes indirectly to climate change by enhancing low-level ozone formation.
CO_2	A GHG. Contributes to climate change.
NO_X	Contributes to the formation of acidic species that can be deposited by wet and dry processes, impacting aquatic and terrestrial ecosystems.
SO_2	Contributes to the formation of acidic species that can be deposited by wet and dry processes, impacting aquatic and terrestrial ecosystems.

Source: Adapted from MSDS sheets

The installation phase will be completed within a short period of time (about 5 days). In addition, these air pollutants are emitted to the atmosphere in very small quantities. As a result, these pollutants will be rapidly dispersed and diluted in the atmosphere. Therefore, impacts on air quality during the installation phase are expected to be of low magnitude, local in extent, and short-term in duration. The impact disturbs an area in the vicinity with no sensitive receptors nearby and therefore considered to have limited conservation value; therefore, the sensitivity of the receptor or resource is rated as low.

Without mitigation measures, the significance of impacts on air quality from air pollutants emitted during the installation phase is rated as negligible.

Table 52. Significance Ranking of impacts from Air Pollutants to Air Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 – 5 km	> 5 km
Duration			0 – 1 yr	1 – 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Management Measures

Impacts from employees and materials transport, fuel storage and handling, and machine mobilization and installation or energy use can be mitigated through the use of the following measure:

• Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.

• Set up appropriate machine mobilization schedule to minimize preparation time.

Residual Significance

With these management measures, the extent and magnitude of impacts from air pollutants on air

quality will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

Assessment of Impacts from Greenhouse Gases (GHG)

GHG emissions from energy use, in the form of diesel generators and mobile combustion are estimated following the Tier 1 approach of IPCC (2006) for stationary combustion and mobile combustion. GHG emissions are estimated using emission

factors and global warming potentials for the three main greenhouse gases (CO_2, CH_4 and N_2O).

Energy Use for Machine Installation

Estimated fuel consumption during the installation phase includes consumption by tools and equipment for fixing the machines. Consumption of the generator cannot be estimated for the time being. Greenhouse gas emissions in terms of CO_2 equivalent are normally estimated according to the emission factors and the following equation:

$$\text{Emissions}_{\text{GHG, fuel}} = \text{Fuel Consumption}_{\text{fuel}} \times \text{Emission Factor}_{\text{GHG, fuel}}$$

$\text{Emissions}_{\text{GHG, fuel}}$ = emissions of a given GHG by type of fuel (kg GHG)

$\text{Fuel Consumption}_{\text{fuel}}$ = amount of fuel combusted (TJ)

$\text{Emission Factor}_{\text{GHG, fuel}}$ = default emission factor of a given GHG by type of fuel (kg gas/TJ)

Energy Use for Transportation

Yoke Pyo traditional medicine factory will have lorries, trucks and vehicles which consume diesel oil. But at present, Yoke Pyo cannot allocate diesel oil use and when this use of diesel is projected for a day or a month, GHG emissions from transportation will have to be estimated.

The GHG emissions arising from the proposed activities are estimated as insignificant, and therefore will not significantly impact the environment.

As the project area is located in an open area and is not located near any sensitive area, the Receptor Sensitivity of impacts on air quality is considered low.

Without mitigation measures, the significance of impacts from GHG Emissions from energy use during the installation phase is rated as negligible.

Table 53. Significance Ranking of impacts from Energy Use GHG Emissions

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 – 5 km	> 5 km
Duration			0 – 1 yr	1 – 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Management Measures

Impacts from GHG Emissions from energy use during installation phase can be mitigated as follows:

• Routine inspection and preventive maintenance as per maintenance schedule/ recommended

by manufacturers to ensure efficiency of combustion.

• Set up appropriate machine mobilization schedule to minimize preparation time.

Residual Significance

With these management measures, the extent and magnitude of impacts from energy use GHG Emissions will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.1.2 Assessment of Impacts on Water Quality

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Water Quality	Installation Phase	Fuel Storage & Handling Hazardous Materials Handling and Storage Non-Hazardous and Hazardous Waste Handling and Storage Machine Placement	Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)

An impact assessment on water quality from activities during the project installation phase is summarized below. Activities that may impact water quality include: machine installation and wastewater and waste management which include discharge of oil containing wastewater; wastewater and sewage, storage and disposal of hazardous and non-hazardous waste.

Assessment of Impacts on Water Quality from Machine Installation

Machine installation can use water to clean the area and parts as necessary and consequently cause a temporary flow into the drains but will not reach the nearest water bodies.

Results of water analysis during Yoke Pyo baseline survey reveal that water in the project area doesn't contains a total suspended solids concentration. The water within the project area has low sensitivity to impacts from sediment disturbance.

Therefore, the magnitude, extent and duration of the impacts on water quality are considered low. Considering sensitivity of the area subjected to the impact in terms of environment and society, the project location has low sensitivity as the factory is located in industrial zone, outside the town. Therefore, the Receptor Sensitivity of the impacts on water quality is considered medium.

Without mitigation measures, the significance of impacts associated with machine installation on water quality is rated as low.

Table 54. Significance Ranking of impacts from Machine Installation on Water Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 – 5 km	> 5 km
Duration			0 – 1 yr	1 – 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on water from machine installation can be mitigated as follows:

- Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines
- Check the wash-out water be within the standards and go safely into the drain
- Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation

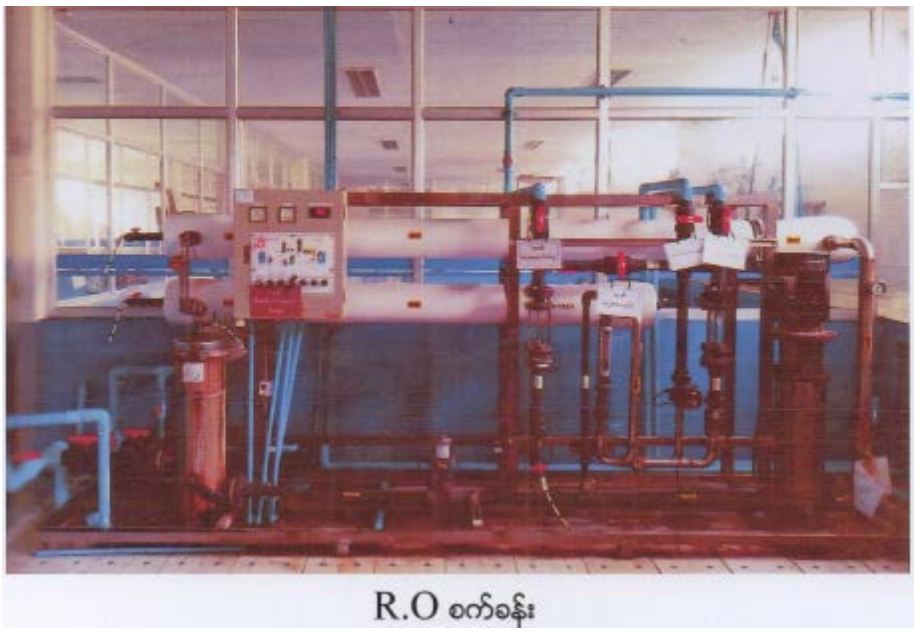

Figure 31. RO system for purification of water

Figure 32. Storage of wash water

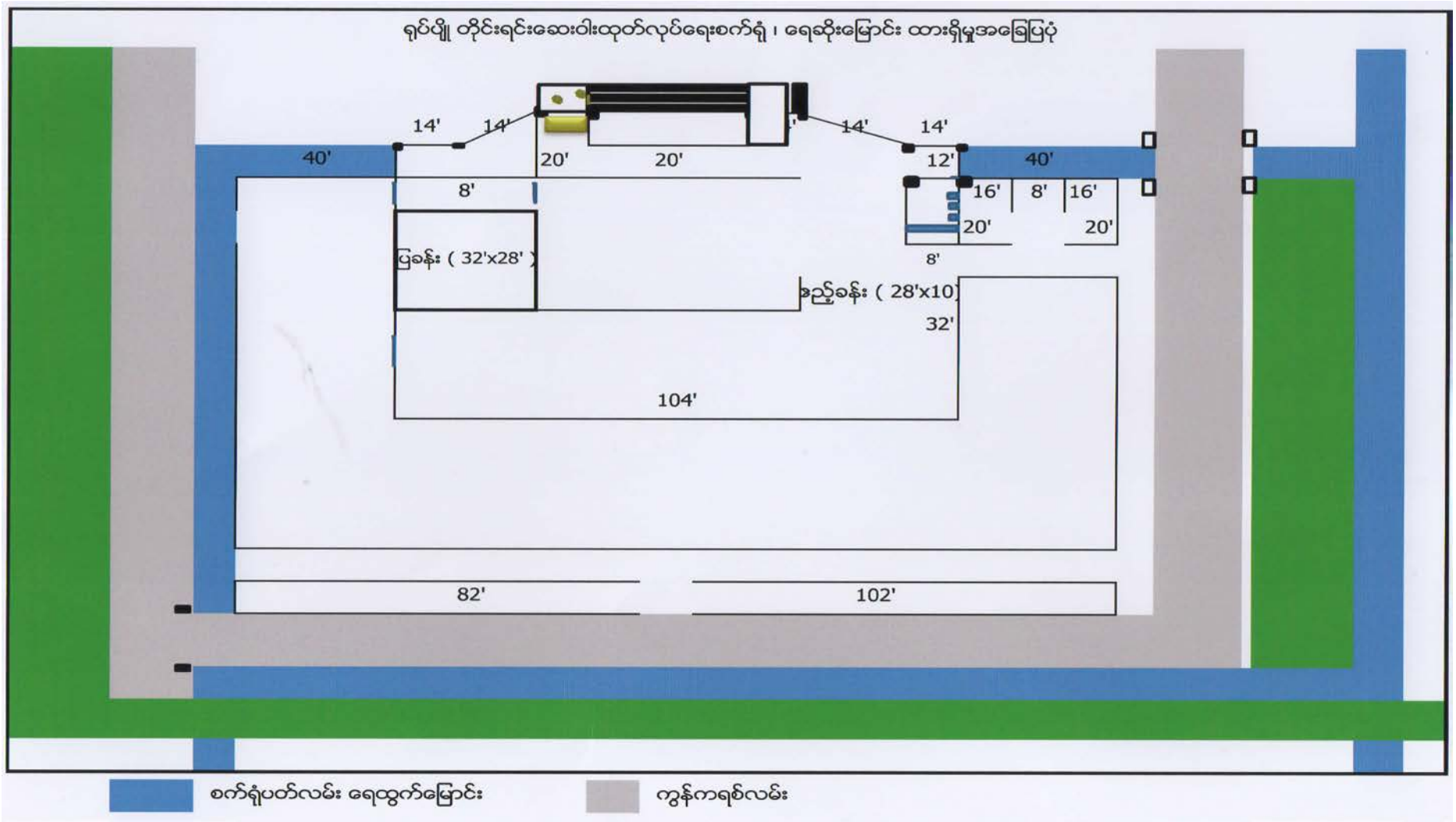

Figure 33. . Factory wastewater drainage layout plan

Residual Significance

With these management measures, the extent and magnitude of impacts from machine installation on water quality will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.1.3 Assessment of Impacts from Wastewater and Waste Management

Wastewater discharge during machine installation, including drain water and domestic water, will affect water quality.

Without mitigation measures, the significance of impacts associated with wastewater discharge on water quality is rated as low. In the absence of mitigation measures, the significance level of impacts on the ecosystem caused by wastewater discharge is also rated as low*:*

Table 55. Significance Ranking of Impacts Wastewater Discharge on Water Quality and Ecosystems

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from wastewater discharge on marine ecosystem can easily be mitigated through the use of simple mitigation measures:

- Comply with all Myanmar regulations or standards regarding traffic safety
- Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)

Residual Significance

With these management measures, the extent and magnitude of impacts from wastewater discharge on water quality will be reduced resulting in a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.2 Social Impact Assessment

The social impact assessment considers the activities during the installation phase before operation which consist of: (1) Communicating the project description information to relevant organizations, affected people or stakeholders at least one month prior to the project start date; (2) Preparation prior to the operation; (3) machine installation.

From the screening process the following must be assessed to determine their impacts during the installation phase:

- Traffic/ Transportation
- Waste Management
- Safety

5.3.2.1 Assessment of Impacts to Traffic / Transportation

Scope of Assessment

Receptor	**Phase**	**Activity**	**Potential Impact**
Traffic/ Transportation	Installation Phase	Employees/Materials Transport Presence of Equipment and Facilities Machine Placement	Increased traffic Potential disruption to traffic in case of accident

Assessment of Impacts to Traffic / Transportation

During the installation phase, there will be trucks and vehicles transporting employees and machines. Therefore, light traffic is anticipated around the project area, as it is outside the city. But there will be busy traffic on the way when Shwe Bo University

opens. Yoke Pyo will communicate the project description information to affected people or stakeholders and governmental offices prior to the project start date.

The impacts will be local in extent, short-term in duration, and of medium magnitude. The receptor sensitivity is considered to be medium.

Without mitigation measures, the significance of impacts on transportation associated with the installation phase is rated as low.

Table 56: Significance Ranking of Social Impacts from Transportation

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 – 5 km	> 5 km
Duration			0 – 1 yr	1 – 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from installation activities on transportation can be mitigated through the use of the following measures:

- At least 5 days prior to machine installation, coordinate with Shwe Bo University Authorities, who will then confirm convenient date.
- Provide appropriate lights and warning signals on all transport vehicles to prevent accidental collision.

Residual Significance

With these management measures, the extent and magnitude of social impacts from transportation will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.2.2 Assessment of Impacts from Waste Management

Scope of Assessment

Receptor	Phase	Activity	Potential Impact
Waste Management	Installation Phase	Non-hazardous and Hazardous Waste Handling and Storage	Waste contamination to environment Reduced well-being due to exposure or perceived exposure to waste

Assessment of Impacts from Waste Management

Wastes generated from the proposed project during the installation phase will consist of sanitary wastewater, drainage water, hazardous and non-hazardous waste. This section assesses the management practices for the waste.

Sanitary wastewater includes wastewater from both the sanitation and foods. Sanitary wastewater and drainage water may be contaminated with oil and grease. Treated wastewater shall comply with Myanmar emission standards.

Non-hazardous waste includes paper, plastic, and uncontaminated materials etc. Hazardous Waste includes all types of used oil, oil-contaminated water, expired cooling agents, fluorescent lights, chemical and expired chemical and solution, contaminated clothes, chemical containers, batteries, used PPE, residual material contaminated with oil or chemical, etc.

All hazardous and non-hazardous waste will be collected, stored, and segregated in arranged containers. There will be a manifest each time waste is transported including copies of records identifying type, amount of waste, and time for machine and ship used to transport.

All wastes are treated/disposed by City Development Committee according to applicable regulations. The impacts on waste management will thus be local in extent, short term in duration and of low magnitude. As the water body is at great distance, receptor sensitivity is considered to be low.

Without mitigation measures, the significance of social impacts from waste management associated with the installation phase is rated as low.

Table 57. Significance Ranking of Social Impacts from Waste Management

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from installation activities on waste management can be mitigated through the use of the following measures:

- Comply with all Myanmar regulations or standards regarding health and safety.
- Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline.
- Water that is contaminated with oil will be collected and treated at the oil/water separator prior to discharge.
- Hazardous and non-hazardous wastes will be manifested with proper labels.

Residual Significance

With these management measures, the extent and magnitude of social impacts from Waste Management will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.2.3 Assessment of Impacts on Socio-Economy

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Socio-Economy	Installation Phase	Employees/Materials Transport	Increased employment/income

		Fuel Storage & Handling Machine Placement Non-hazardous and Hazardous Waste Handling and Storage Labour, Equipment & Services Supply	and procurement opportunities for people, business and services in surrounding area

Assessment of Impacts

During the installation phase of, contractors there may be new employment generated from these activities. The above employment generation will have a have a positive but minor effect on the socio-economy in the local area.

The impacts on the socio-economy from the project will be local in extent, short-term in duration, and of low magnitude but positive (beneficial).

The significance of impacts on the socio-economy during installation is rated as a low positive benefit.

Table 58. Significance Ranking of Impact on Socio-Economy

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Social impacts from installation activities and related employment on the socio-economy are positive and can be further enhanced by the following measures:

- Employ qualified local workers, if possible.
- Purchase local supplies and services, whenever possible.

Residual Significance

With these management measures, the extent and magnitude of impacts on the socio-economy will be optimized resulting in a residual significance ranked **Positive**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.3.2.4 Assessment of Impact to Historical, Archaeological and Cultural Resources

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Cultural/Archaeological	Installation Phase	Employment/Materials Transport Labour, Equipment & Services Supply Machine Placement	Potential for conflict between local culture and outside workers.

Assessment of Impacts on Cultural and Archaeological Resources

There are no known archaeological resources located in the project area. Therefore, the potential for conflict between local culture and outside workers is negligible.

Residual Significance

As there are no known archaeological resources, the extent and magnitude of impacts on archaeological resources from Installation will have a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4 OPERATION PHASE

5.4.1 Environmental Impact Assessment

From the screening process the following must be assessed to determine their impacts during the operation phase:

- Air Quality
- Noise
- Water Quality
- Biological Resources

5.4.1.1 Assessment of Impacts to Air Quality

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Air Quality/Climate	Operation Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/ GHG Emissions

Air emissions from Yoke Pyo traditional medicine factory activities during the operation phase will be primarily generated from fuel combustion during transportation and power generation.

Air quality may also be adversely affected from fugitive emissions. Fugitive emissions may come from hazardous materials and wastes, such as paints, waste oil, and/or solvents. Volumes of fugitive emissions from chemicals and hazardous materials, and non-hazardous and hazardous waste are negligible and considered insignificant.

Combustion emissions from activities during the operation phase are estimated below.

Assessment of Impacts from Air Pollutants

Diesel generators will be used as a source of power supply in case of power failure. Air pollutants generated from diesel oil combustion for the machine will consist of carbon

monoxide, nitrogen dioxide, and sulphur dioxide. Significance Ranking of Impacts of Energy Use on Air Quality from the fuel combustion is presented in **Table 59**.

Assessment of Impacts from Greenhouse Gases (GHG)

Combustion products from fuel use are the same whether the fuel is used for generator or transportation. Regular maintenance of the power generators and equipment will be conducted to minimize fuel use and emissions. The main impact from these activities is the emission of greenhouse gases and their contribution to climate change.

(a) Power Generation

At present, Yoke Pyo cannot estimate diesel oil use.

(b) Transportation

At present, Yoke Pyo cannot estimate diesel oil use and when there is estimated use for a day or a month GHG emissions from transportation will have to be estimated.

The operation phase will mainly use electricity. The generators will be used in case of power failure and these air pollutants are emitted in small quantities into a wide open atmosphere. As a result, these pollutants will be rapidly dispersed and diluted in the atmosphere.

Therefore, impacts on air quality during the operation phase are expected to be of low magnitude, local in extent, and short-term in duration.

As the project area is located in an open area and is not located near any sensitive area the Receptor Sensitivity of impacts on air quality is considered low.

Without mitigation measures, the impact on air quality from energy use during the operation phase is rated as negligible.

Table 59. Significance Ranking of Impacts of Energy Use on Air Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on air quality from energy use and transportation during operation phase can be mitigated as follows:

- Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.

Residual Significance

With these management measures, the extent and magnitude of impacts from energy use on air quality will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4.1.2 Assessment of Impacts from Noise

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Noise	Operation Phase	Pulverizing	Noise from pulverizing machines affects workers' health

A few activities associated with Yoke Pyo traditional medicine production have the potential to create noise. However, the most significant activities that may cause noise impact are during pulverizing the raw materials. Noise levels for the various project activities are listed in **Table 27**. Noise from the project activities may have impact on worker's health. Effects on worker health are discussed in **Section 5.6.3.3**.

5.4.1.3 Assessment of Impacts on Water Quality

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Water Quality	Installation Phase	Fuel Storage & Handling Hazardous Materials Handling and Storage (for R&D) Non-Hazardous and Hazardous Waste Handling and Storage Machine Placement	Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)

An impact assessment on water quality from activities during the project operation phase is summarized below. Activities that may impact water quality include wastewater and waste management which include discharge of oil containing wastewater and sewage, storage and disposal of hazardous and non-hazardous waste.

During the operation phase, water can be affected by fuel storage and handling, hazardous materials, hazardous and non-hazardous waste, and wastewater. Impacts on water quality resulting from waste management and wastewater activities are discussed below.

Assessment of Impacts from Fuel Storage and Handling

Fuel handling and storage can lead to spills that may affect surface water quality. The severity of environmental impacts from fuel storage and handling are dependent on the location of occurrence, spill quantity, chemical and physical properties of the substances

spilt, and environmental conditions where the spill takes place (e.g. weather and water-current conditions, etc.)

Diesel fuel transfer is a major activity during the operation phase that may lead to spill. Fuel spills during transfer may occur as a result of:

- connection leakage
- damaged transfer hose
- rupture of transfer hose.

Water samples met *the Standards*. The water analysis revealed water in the project location is of good quality, meaning the water in the proposed location is not sensitive to the potential impacts on water quality. Also, the proposed location is located far from sensitive receptors. Therefore, Receptor Sensitivity of the impact is considered negligible.

Without mitigation measures, the significance of impacts resulting from a fuel spill on water quality is rated as low.

Table 60. Significance Ranking of Impacts from a Fuel Spill on Water

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on water from machine installation can be mitigated as follows:

- Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines
- Check the wash-out water be within the standards and go safely into the drain

Residual Significance

With these management measures, the extent and magnitude of impacts from machine installation on water quality will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

Assessment of Impacts from Hazardous Materials

Most of the operational raw materials are herbal or medicinal and classified as non-toxic to biota. The chemical used in kneading the powder is maize starch. A spill of fuel oil or acid for lab tests that is not properly managed could affect the area and then the ecosystem. The potential impacts from these accidental hazardous material releases on the environment are expected to be local in extent and are rated as low severity. The impacts regarding a hazardous-material spill would require a short term recovery period, and are expected to be of low probability. Receptor sensitivity is considered to be low.

In the absence of mitigation measures, significance of environmental impacts resulted from an accidental spill of chemicals and hazardous materials is rated as low.

Table 61. Significance Ranking of Impacts from Chemicals and Hazardous Materials on Water

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Yoke Pyo will implement mitigation measures to reduce the risk of spills and minimize impacts, as outlined below:

- Regularly check to observe leaks, spills and determine potential causes
- Keep and follow the directions of chemical Material Safety Data Sheet (MSDS) for respective chemicals

Residual Significance

With these management measures, the extent and magnitude of impacts from a Fuel Spill will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

Assessment of Impacts from Waste Management

Non-hazardous wastes produced during installation, operation and decommissioning phases include: trash, food waste, paper, plastic and scrap wood and metals.

The non-hazardous waste will be segregated by type, clearly labelled, and then properly disposed. Food waste will be kept separate from non-food waste.

Based on non-hazardous waste management procedures outlined above, the potential impacts from non-hazardous waste on water quality are of low magnitude, short-term duration, local in extent, and require a short-term recovery period, and Receptor Sensitivity of the impacts is considered to be low.

Without mitigation measures, the significance of non-hazardous waste impacts on water quality is rated as low.

Table 62. Significance Ranking of Impacts from Non-Hazardous Waste

	Level and Type of Impact				
	+1	0	1	2	3
Impact	Positive	Negligible	Low	Medium	High

Criteria					
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Yoke Pyo will implement mitigation measures to minimize impacts associated with non-hazardous waste, as outlined below:

- Comply with all Myanmar regulations or standards of City Development Committee
- Store, separate, transport and dispose of waste using appropriate procedures and disposal facilities.

Some of the records of Yoke Pyo solid waste management are shown in the following figures.

ဘေးထွက်ကုန်ပစ္စည်းများစွန့်ပစ်ရန် အမှိုက်ပုံးများ စနစ်တကျထားရှိမှု မှတ်တမ်းဓာတ်ပုံ

Figure 34. Solid waste management facilities

Figure 35. Proper waste disposal by Shwebo City Development Committee

Residual Significance

With these management measures, the extent and magnitude of impacts from Non-Hazardous Waste will be reduced resulting in a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

Assessment of Impacts from Wastewater

The amount of wastewater will be very small and be treated as per City Development Committee requirements. As with the other phases, sources of wastewater that would be generated during the operation phase are raw material washed-out and drainage contaminated with oil wastes, and domestic wastewater. The impacts on water quality during the operation phase are expected to be similar to those during the installation phase.

The potential impacts from these wastewater releases on water quality during the operation phase are expected to be of low magnitude, short-term duration, local in extent, and require a short-term recovery period. The receptor sensitivity is considered low. Therefore, significance ranking is negligible.

Table 63: Significance Ranking of Impacts from Wastewater on Water Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Yoke Pyo will implement the same mitigation measures as listed for impacts associated with wastewater discharge on water quality during the installation phase to minimize those impacts during the operation phase.

Residual Significance

With these management measures, the extent and magnitude of impacts from wastewater on water will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4.1.4 Assessment of Impacts on Biological Resources

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Biota Endangered Species Sensitive/Protected Areas	Operation Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater Disposal Presence of Equipment and Facilities	Potential deterioration of water quality from spills, leakages could affect ecosystem, increase turbidity organisms.

Assessment of Impacts from Wastewater and Waste Management on Biota

A few of operation activities may cause an impact on water and affect the community of biota. The significance of impacts on water from operation activity is assessed as low; therefore, its impact on marine biota caused by physical disturbance and wastewater discharge is also rated as low, local in extent, short-term duration, and low magnitude; the recovery time will be short. Receptor Sensitivity is ranked as low.

Table 64. Significance Ranking of Impacts from Wastewater and Waste Management on Biota

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Although the significance of impacts on biota caused by physical disturbance and wastewater discharge is rated as low, Yoke Pyo still implements mitigation measures for decreasing the likelihood of impacts.

The mitigation measures are the same as those described for installation phase. Because the project has properly prepared the mitigation measures for preventing impacts from physical disturbance and wastewater discharge during operation activity, the residual impact following mitigation is thus rated as *negligible*.

Residual Significance

With these management measures, the extent and magnitude of impacts from Wastewater and Waste Management on Biota will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4.2 Social Impact Assessment

From the screening process the following must be assessed to determine their impacts during the operation phase:

- Transportation

- Waste Management
- Socio-economy

5.4.2.1 Assessment of Impacts to Transportation/Traffic from Employees/Materials Transport and Presence of Equipment and Facilities

Due to the project's location, the major vehicles are vehicles for Shwe Bo University, automobiles used for travel and transport along Shwebo - Myitkyina road and vehicles for transportation and project activities.

There are transportation routes located to the south and the east of the block areas; however, the operation site is expected to have light traffic.

The impacts will be local in extent, short term in duration, and of low magnitude. Receptor sensitivity is considered to be low.

Without mitigation measures, the significance of social impacts from transportation during the operation phase is rated as low.

Table 65. Significance Ranking of Transportation/Traffic from Employees/Materials Transport

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Transport accidents between normal vehicle and project vehicles can be mitigated through the use of the following measures:

- Establish 50 m safety zone around the factory
- Provide appropriate lights and warning signals on all vehicles to prevent accidental collision.

Residual Significance

With these management measures during the operation phase, the extent and magnitude of impacts to transportation will have a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4.2.2 Assessment of Impacts to Waste Management

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Waste Management	Operation Phase	Non-hazardous Waste Handling and Storage Wastewater Disposal	Pressure on existing waste management facilities Waste contamination to environment. Reduced well-being due to exposure or perceived exposure to hazards

The types of waste produced during the operation phase consist of washed-out water, sanitary wastewater and non-hazardous waste.

Assessment of Impacts from Waste Management

Different types of waste will be treated and managed by City Development Committee. The impacts will be local in extent, short-term in duration, of low magnitude. Receptor sensitivity is considered to be low.

Significance Evaluation

The significance of social impacts from waste management during the operation phase is rated as low.

Table 66. Significance Ranking of Social Impacts from Waste Management

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Mitigation measures for the management of waste are as follows:

- Provide appropriate lights and warning signals on all vehicles to prevent accidental collision.
- Regularly monitor safety zone within 50 m-radius surrounding the factory to prevent any accidents.
- Check regularly the project area to observe leaks or spills, and to try to determine potential causes or sources.
- Implement Hazardous Materials Management System and manifests for transport.

Significance Evaluation

The significance of social impacts from waste management during the operation phase is rated as low.

Residual Significance	Positive	Negligible	Low	Medium	High

5.4.2.3 Assessment of Impacts to Socio-Economy

During the operation phase of Yoke Pyo traditional medicine production factory operation, the Company plans to employ up to 1000 workers for operations.

The above employment generation will have a have a positive but minor effect on the socio-economy in the local area.

The impacts on the socio-economy from the project will be local in extent, short-term in duration, and of low magnitude but positive (benefit). Receptor sensitivity is considered to be low.

Significance Evaluation

The significance of social impacts from employment during installation is rated as a low positive benefit.

Table 67. Significance Ranking of Social Impacts from Employment

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Social impacts from installation activities and related employment on the socio-economy are positive and can be further enhanced by the following measures:

- Employ qualified local workers, if possible.
- Purchase local supplies and services, whenever possible.

Residual Significance

With these management measures, the extent and magnitude of impacts on the socio-economy will be optimized resulting in a residual significance ranked **Positive**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5 DECOMMISSIONING PHASE

5.5.1 Environmental Impact Assessment

From the screening process the following must be assessed to determine their impacts during the decommissioning phase:

- Air Quality
- Water Quality
- Biological Resources

5.5.1.1 Assessment of Impacts on Air Quality

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Air Quality/Climate	Decommissioning Phase	Employees/Materials Transport Fuel Storage & Handling Energy Use	Deterioration from fuel combustion/GHG Emissions

Assessment of Impacts on Air Quality

Impacts on air quality during the decommissioning phase are expected to be similar to those during the installation phase. Therefore, the significance and the Receptor Sensitivity of the impacts during the factory decommissioning phase will be technically identical to those during the installation phase. Also, the same mitigation measures should be applied to the impacts during the well decommissioning phase.

Magnitude of impacts is low, extent is local and duration is short term. Receptor sensitivity is considered to be low.

Therefore, without mitigation measures, the impact on air quality from energy use during the decommissioning phase is rated as negligible.

Table 68. Significance Ranking of Impacts from Energy Use on Air Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on air quality from energy use during the factory decommissioning phase can be mitigated as follows:

- Routine inspection and preventive maintenance as per maintenance schedule
- Set up appropriate demobilization schedule to minimize disturbed time

Residual Significance

With these management measures, the extent and magnitude of impacts from energy on air quality will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5.1.2 Assessment of Impacts on Water Quality

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Water Quality	Decommissioning Phase	Fuel Storage & Handling Hazardous Materials Handling and Storage Wastewater Disposal Non-Hazardous and Hazardous Waste Handling and Storage	Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)

Assessment of Impacts on Water Quality from Factory Decommissioning

At the time of decommissioning, removal of facilities and structures, and demobilization of machines can lead to deterioration of water quality. The potential impacts are rated of low significance.

Therefore, impacts caused by decommissioning are expected to be of low magnitude, local in extent, short-term in duration; and receptor sensitivity is considered low.

Without mitigation measures, the significance of impacts associated with factory decommissioning on water quality is rated as low.

Table 69. Significance Ranking of Impacts from Decommissioning on Water

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on water from decommissioning can be mitigated as follows:

- Use decommissioning method that minimizes sanitary water
- Change the use of factory facilities of compound in other useful ways, as the factory is in industrial zone

Residual Significance

With these management measures, the extent and magnitude of impacts from decommissioning and machine demobilization on water quality will be reduced resulting in a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

Assessment of Impacts on Water Quality from Fuel, Non-hazardous, Hazardous Materials, and Waste Handling and Accidental Spills

Impacts associated with fuel, non-hazardous, hazardous materials and waste handling, and accidental spills during decommissioning phase are expected to be of low, local in extent, short term in duration; and receptor sensitivity is considered low.

Without mitigation measures, impacts from fuel, hazardous materials, and hazardous handling, and accidental spills on Water Quality are rated as low.

Table 70. Significance Ranking of Impacts from Fuel, Hazardous Materials, and Waste Handling, and Accidental Spills on Water Quality

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Mitigation measures for impacts regarding fuel, hazardous materials, and hazardous waste handling, and accidental spills during installation phase on water quality can be applied to those during the decommissioning phase.

Residual Significance

With these management measures, the extent and magnitude of impacts from fuel, hazardous materials, and hazardous waste handling, and accidental spills on water quality will be reduced resulting in a residual significance ranked that is **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5.1.3 Assessment of Impacts on Biological Resources

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Biota	Decommissioning Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater Disposal Materials Handling and Presence of Equipment and Facilities for Decommissioning	Potential deterioration of water quality from spills, leakages and discharges could affect the ecosystem

Assessment of Impacts on Biota

The effects on biota and ecosystem in decommissioning phase are similar to those discussed during the installation phase.

The potential environmental impacts caused by replacement and decommissioning of Yoke Pyo traditional medicine production project are considered to be of low magnitude, short-term duration, and local in extent. Receptor sensitivity is considered to be medium.

Therefore, without mitigation measures, the significance of impacts from machine decommissioning on marine biota is rated as low.

Table 71. Significance Ranking of Impacts from Decommissioning on Biota

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

The mitigation measures to minimize the impact on biota and ecosystem during decommissioning phase are similar to the measures on water quality.

Residual Significance

With these management measures, the extent and magnitude of impacts from decommissioning on Biota will be reduced resulting in a residual significance ranked that is **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5.2 Social Impact Assessment

From the screening process the following must be assessed to determine their impacts during the decommissioning phase:

- Transportation
- Waste Management
- Socio-economy

5.5.2.1 Assessment of Impacts on Transportation

Scope of Assessment

Resource/Receptor	**Project Phase**	**Activities**	**Potential Impacts**
Transportation	Decommissioning Phase	Employees/Materials Transport Presence of Equipment and Facilities Decommissioning	Increased traffic Potential disruption to traffic in case of accident

Assessment of Impacts to Traffic from Employees/Materials Transport

Potential impacts during decommissioning are the same as for installation phase. Therefore, the social impacts from marine transportation will be local in extent, short-term in duration, and of medium magnitude. Receptor sensitivity is considered to be low.

Significance Evaluation

The significance of impacts on transportation with the decommissioning phase is rated as low.

Table 72. Significance Ranking of Impacts on Traffic from Employees/Materials Transport

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from the activities of the project on transportation can be mitigated as below.

- Establish safety zone of 3 meters around the factory.
- Provide appropriate lights and warning signals on all vessels to prevent accidental collision
- At least 7 days prior to mobilization, coordinate with the local people regarding project activities.

Residual Significance

With these management measures during the decommissioning phase, the extent and magnitude of social impact from transportation will have a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5.2.2 Assessment of Impacts to Waste Management

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Waste Management	Decommissioning Phase	Non-hazardous and Hazardous Waste Handling	Pressure on existing waste management facilities Waste contamination to environment. Reduced well-being due to exposure or perceived exposure to hazards

Assessment of Impacts from Non-hazardous Waste Handling to Waste Management

Waste from the decommissioning phase is similar to waste from installation phase, which consists of: sanitary wastewater, drainage water, hazardous waste and non-hazardous waste.

Sanitary wastewater includes wastewater from both the sanitation facilities and the food facilities. Non-hazardous waste includes bits of paper, plastic, and uncontaminated materials etc. Hazardous waste includes all types of used oil, oil-contaminated water, expired cooling agents, fluorescent, chemical and expired chemical and solution, contaminated clothes, chemical containers, batteries, used PPE, residual material contaminated with oil or chemical, etc.

All wastes will be collected, stored, and segregated in arranged containers. There will be a manifest each time waste is transported including copies of records identifying type, amount of waste, and time for machine and ship used to transport. Moreover, all wastes produced during the project activities will be transported and treated by Shwe Bo City Development Committee.

The social impacts from waste management will be local in extent, short-term in duration, and of medium magnitude. Receptor sensitivity is considered to be low.

The significance of social impacts from waste management associated with the decommissioning phase is rated as low.

Table 73. Significance Ranking of Social Impacts from Waste Management

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from waste management can be mitigated through the use of the following measures:

- All contactors must comply with the waste management regulations, and relevant laws, as well as monitor operations.
- Separate and store each type of waste (separate non-hazardous waste and hazardous waste) into appropriate containers having clear labels.
- Do not drop any waste into undesignated space.
- Store hazardous waste in containers that are durable and safe for transport/transfer. Also, store them in areas away from fire sources.
- Record and examine the type and quantity of waste.
- Store, separate, transport and dispose of waste using appropriate procedures and disposal facilities.

Residual Significance

With these management measures during the decommissioning phase, the extent and magnitude of social impact from waste management will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.5.2.3 Assessment of Impacts to Socio-Economy

Scope of Assessment

Resource/Receptor	Project Phase	Activities	Potential Impacts
Socio-Economy	Decommissioning Phase	Employees/Materials Transport Fuel Storage & Handling Wastewater Disposal Non-hazardous and Hazardous Waste Handling and Storage Labour, Equipment & Services Supply	Increased employment/ income and procurement opportunities for people, business and services in surrounding are

Assessment of Impacts from Decommissioning Work to Socio-economy

During demobilization phase of Yoke Pyo traditional medicine production, employment generation will have a positive but minor effect on the socio-economy in the local area. The social impacts from an enhanced socio-economy from the project will be local in extent, short-term in duration, and of low magnitude but positive (benefit). Receptor sensitivity is considered to be low.

Significance Evaluation

The significance of impacts on the socio-economy during decommissioning phase is rated as a low benefit.

Table 74. Significance Ranking of Social Impacts from Transportation

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High

Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts from installation activities on the socio-economy are positive and can be further enhanced by the following measures:

- Employ qualified local workers whenever possible
- Purchase local supplies and services, whenever possible

Residual Significance

With these management measures during the decommissioning phase, the extent and magnitude of social impact from an enhanced socio economy will have a residual significance ranked as **Positive**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6 HEALTH IMPACT ASSESSMENT

The HIA assesses the significance of potential health impacts on the community around the factory, and on occupational health in the factory. The significance of impacts is considered from various factors such as type of threat, environmental factor, health status, impact on livelihood.

5.6.1 Health Impact Assessment for All Phases

From the screening process the following must be assessed to determine their health impacts:

Public Health

- Transportation
- Odour

Occupational Health

- Air Quality
- Noise
- Odour
- Wastewater
- Non-Hazardous Waste/ Hazardous Waste
- Accidents at Work Site

5.6.2 Assessment of Impacts on Public

5.6.2.1 Assessment of Impacts from Transportation

Transportation of employees, materials and waste might result in accidents, resulting in injuries to the public. All waste will be managed by Shwe Bo City Development Committee.

The majority of land transportation during the project duration is waste transportation. Wastes from the proposed project consist of solid waste.

The potential health impacts on communities from hazardous exposure will be local in extent, short-term in duration, and of medium magnitude. The receptor sensitivity is considered to be low.

The significance public health impact from project activities arising from transportation is rated as negligible.

Table 75**.** Significance Ranking of Health Impacts from Transportation

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Impacts on community health from transportation of employees, materials and waste can be mitigated as follows:

- A safety zone of about 10-m radius will be established around the factory.
- The area will be checked during the entire installation, operation and demobilization period.
- Yoke Pyo will provide project information to relevant stakeholders, and communities close to the site at least 1 day prior to major transportation operations.

Residual Significance

With these management measures for mitigating community health impacts, the extent and magnitude of health impact from transportation of crew, materials and waste will have a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.2.2 Assessment of Impacts from Odour

Normally, when the plants are cut, crushed and pulverized, there is some smell around the site. The strength of the smell almost disappears outside the perimeter of the factory. The questions of social survey team about the smell are responded by the interviewees that majority do not get any smell and a few people mention about some faint odour in the downwind but that odour seems to be good or positive for their health.

There may be some sources of smell from the project such as wastes, wastewater, fuel leaks or spills in all phases. These can be mitigated by the measures described in the related sections. Therefore, the impacts of odour from the project will have a residual significance ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.3 Assessment of Impacts on Occupational Health

5.6.3.1 Assessment of Impacts from Air Quality

Many studies have shown impacts from air quality on health depending on the type of pollutant, concentration level, and personal characteristics of the exposed population. The project activities and equipment, diesel-fuelled generators, transportation are expected to emit air pollutants, including particulate matter (PM), carbon monoxide (CO), methane (CH_4), nitrogen oxides (NOx), sulfur dioxides (SO_2) and carbon dioxide (CO_2).

At the local level, air pollutants with potential health impacts are PM, NOx, SO_2, volatile organic compounds (VOCs), and combustion emissions. These air pollutants are well known causes of acute and chronic health effects such as respiratory illnesses/irritation, cardiovascular diseases, exacerbation of asthma, lung cancer, and psychological stress/annoyance.

At the global level, pollutants of concern are global warming gases (greenhouse gases) such as CO_2, NOx, and CH_4. Emission of these greenhouse gases can contribute to a hotter climate and severe weather conditions. Global warming has no direct impact on health but indirect impacts predicted are an increase in communicable diseases, such as malaria and dengue fever, and threatened food security and livelihoods due to frequent occurrences of drought.

The use of fuel for Yoke Pyo traditional medicine production project cannot be estimated at this stage, but can be hoped this will not significantly impact the environment.

Air emissions impacts from energy use and transportation during installation and operations are negligible and considered insignificant.

In addition, the factory is located outside the town and these air pollutants are emitted to the atmosphere in very small quantities. The potential health impacts from combustion will be local in extent, short-term in duration, and of medium magnitude. The receptor sensitivity is considered to be low.

Without mitigation measures, the significance of health impacts from combustion is rated as low.

Table 76. Significance Ranking of Health Impacts from Air Emissions

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

In order to mitigate potential impacts Yoke Pyo will provide:

- suitable respiratory protection, such as protective clothing, full face visors and resuscitators to project workers.

Residual Significance

With these management measures for mitigating community health impacts, the extent and magnitude of health impact from transportation of employees, materials and waste will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.3.2 Assessment of Impacts from Noise

Activities in operation may cause high noise levels exceeding the Occupational Safety & Health Administration (OSHA) workplace standard of 90 dB(A) (for eight hours exposure per day).

Therefore, hearing of workers could be affected.

Cutting and pulverization of medicinal plants and materials cause the highest noise levels: about 50-70 dB(A) at the noise source. Workers who work regularly in these high-noise areas will be provided with hearing protection equipment, such as ear muffs and ear plugs. Warning signs are posted at the entrance to these high-noise areas.

The potential health impacts from noise will be local in extent, short-term in duration, and of medium magnitude. The receptor sensitivity is considered to be medium.

Significance Evaluation

The significance of health impacts from noise is rated as medium.

Table 77. Significance Ranking of Health Impacts from Noise

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

In order to mitigate potential impacts from noise:

- The project will provide each worker with Personnel Protective Equipment (PPE), which includes hearing protection such as earplugs and earmuffs. They are designed to shield against dangerous noise over a high frequency range while allowing the wearer to hear lower frequency sounds.
- In addition, personnel will be provided with safety training to ensure that all workers practice under safety operation and regulation of work.
- The machine will be properly maintained and serviced according to the maintenance schedule.

Residual Significance

With these management measures, the extent and magnitude of health impact from high noise will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.3.3 Assessment of Impacts from Wastewater

Project wastewater consists of effluent from sanitation facilities, drainage, food canteen facilities. Drainage water will be collected and treated. Treated wastewater shall comply with Myanmar EQEG.

Unhygienic practices in the work place can promote the spread of diseases amongst project employees. The drainage system may act as a bacteria breeding area for cholera or any non-indigenous organisms. There is the potential for contamination of supply and usage water, which can cause epidemic diseases such as cholera disease.

The potential health impacts from wastewater will be local in extent, short-term in duration, and of low magnitude. The receptor sensitivity is considered to be low.

Without mitigation measures, the significance of health impacts from wastewater is rated as low.

Table 78**.** Significance Ranking of Health Impacts from Wastewater

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

For mitigating possible impacts from wastewater Yoke Pyo will:

- Regularly maintain the perimeter drainage and treated water systems to be efficient.
- Supply and usage water will be kept in water tanks to avoid contamination from any vectors.
- Yoke Pyo will strictly enforce good housekeeping practices to prevent diseases from spreading on the site.

- Health awareness training will be provided to project workers to improve hygienic practices on site.

Residual Significance

With these management measures, the extent and magnitude of health impact from wastewater will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.3.4 Non-hazardous and Hazardous Waste

Non-Hazardous Waste

Non-hazardous wastes produced from project activities are composed of waste, food waste, paper, and scrap wood and metals. It is estimated that 0.5 tonnes of domestic rubbish will be produced per month of operation This amount is derived from Yoke Pyo's previous experience in operations. Solid wastes may have an impact on occupation health such as physical health, mental health, and quality of life: for example, food remains may cause foul smells, unpleasant ambience, act as a fire hazard and provide a habitat for disease carriers including bacteria flies.

The waste is non-hazardous in nature. The potential health impacts from non-hazardous wastes will be local in extent, short-term in duration, and of medium magnitude. The receptor sensitivity is considered to be medium.

Without mitigation measures, the significance of health impacts from wastewater is rated as medium.

Table 79**.** Significance Ranking of Health Impacts from Non-Hazardous Waste

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr

Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Mitigation measures will include:

- Food wastes will be separated from non-food waste before disposal.
- The remaining non-hazardous waste will be classified and sorted before treatment, disposal or recycle.
- Wastes will be disposed by Shwe Bo City Development Committee.

Residual Significance

With these management measures, the extent and magnitude of health impact from non-hazardous chemical exposure will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

Hazardous Waste

Hazardous wastes generated by Yoke Pyo project consist of spilt oil, spent lube oil, greases and hydraulic fluids, batteries, materials contaminated with oil, grease, solvents, and contaminated containers.

The hazardous waste will be collected properly and managed by hazardous waste treatment after the operation is finished.

In cases of spillage during handling and transport, hazardous waste may impact personnel. Exposure impacts can cause irritation to eyes, skin and the respiratory tract and, in the case of flammable hazardous waste, can cause a fire and potentially put project personnel at risk.

The potential health impacts from hazardous waste will be local in extent, short-term in duration, and of low magnitude. The receptor sensitivity is considered to be medium.

Significance Evaluation

Without any mitigation measures, the significance of health impacts from hazardous waste is rated as medium.

Table 80. Significance Ranking of Health Impacts from Hazardous Waste

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

In order to mitigate potential impacts from Hazardous wastes:

- Hazardous wastes will be stored in closed containers on covered skips for collection and disposed by the contractor City Development Committee.
- In addition, awareness programs and Personnel Protective Equipment (PPE), such as goggles, face shields, gloves, footwear and specialized clothing when handling chemicals, are provided to all personnel involved with transporting and handling hazardous waste.
- Yoke Pyo will provide chemical and oil spill Contingency plan and spill kits.

Residual Significance

With these management measures, the extent and magnitude of health impact from hazardous waste exposure will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.6.3.5 Assessment of Impacts from Industrial Accidents at Work Site

Occupational accidents can cause injuries and illnesses to workers at the cutting and pulverizing site. Yoke Pyo's operations involve handling of tools and equipment, which can harm worker's health if proper safety training and procedures are not implemented strictly. The project activities, which have potential to cause accidents are machine installation, equipment mobilization, operations and decommissioning. These activities can cause collisions, objects falling and cutting.

The potential health impacts from occupational accidents will be local in extent, short-term in duration, and of low magnitude. The receptor sensitivity is considered to be medium.

Significance Evaluation

Without mitigation measures, the significance of health impacts from occupational accidents is rated as medium.

Table 81. Significance Ranking of Health Impacts from Occupational Accidents

	Level and Type of Impact				
	+1	0	1	2	3
Impact Criteria	Positive	Negligible	Low	Medium	High
Extent			< 1 km	1 - 5 km	> 5 km
Duration			0 - 1 yr	1 - 5 yr	> 5 yr
Magnitude	Positive	Negligible	Low	Medium	High
Receptor Sensitivity	Positive	Negligible	Low	Medium	High
Significance	Positive	Negligible	Low	Medium	High

Accidents are mitigated by:

- Safety training and awareness programs to ensure that all project personnel are aware of the potential risks and have the necessary skills to perform their work in a safe and responsible manner.

- PPE is provided to all workers on site. Minimum PPE includes safety boots, eye shield, helmet and ear plugs. Gloves, safety glasses, full face visors, dust masks and work vest for overboard work are also provided, depending on the nature of the work.
- Fire and smoke detection systems are installed and provide entire coverage for the equipment. Portable fire extinguishers of appropriate types and sufficient number are in accommodation spaces, service spaces.
- An Emergency Management Plan such as fire, fuel or chemical spill, contingency plan is in place to ensure that accidents are effectively managed.
- First aid kits, burn kit, resuscitators, and stretchers are provided at the clinic located onsite and served by two trained medics.

Residual Significance

With these management measures, the extent and magnitude of health impact from accidents at work sites will have a residual significance ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.7 IMPACT ASSESSMENT FOR UNPLANNED EVENTS

5.7.1 Unplanned Events Considered

For Yoke Pyo Project, the unplanned events considered were:

(1) Fuel/Chemical Spill;

(2) Fire

The above unplanned events will be assessed by determining possible causes, likely receptors affected, probability and consequences of the events and the level of significance (high, medium low or insignificant).

5.7.2 Risk Determination for Unplanned Events

Assessing the potential impact of an activity on the environment, social or health conditions, and the likelihood of that risk occurring, with effective management measures in place determine the significance of the risk of that unplanned event. The residual risk is

an indication of the significance of an environmental, social or health impact and the probability of the event occurring, after application of management measures.

Where no meaningful measurable environmental, social or health impact can occur, a rating of negligible has been given. Where a positive impact has been identified a rating of positive impact has been given.

The probability of a specific event occurring can be determined either in terms of historical precedence or by calculation.

5.7.2.1 Probability

The probability of a specific event occurring can be determined either in terms of historical precedence. Probability has been categorized.

Table 82. Criteria for Probability Frequency

Probability of Occurrence		
Likelihood	**Score**	**Frequency**
<1 in 100,000 (Remote)	1	<Once in 100 Projects
1 in 5,000 – 100,000 (Unlikely)	2	Once in 50-100 Projects
1 in 100 – 5000 (Quite Likely)	3	Once in 10-50 Projects
1 in 10 – 100 (Likely)	4	Once in 1-10 Projects
1 in 1 – 10 (Very Likely)	5	Once per Project
1 in 1 (Definte)	6	> Once per project

5.7.2.2 Consequence

The consequence of an event occurring is determined according to a number of themes:

- Environment (physical and ecological)
- Society (including socio-economic)
- Health and Safety
- Reputation

Each of these has a set of pre-defined criteria associated with them, which classify the level of consequence as shown in **Table 84.**

Table 83. Criteria for Consequence Severity

Level of Consequence	Score	Issues	Definitions
A+	7	Environment	Regional scale, long-term Impact
		Society	Civil unrest; closure of plant
		Health and Safety	Multiple off-site and on-site fatalities or permanent disabilities
		Reputation	International concerns; major ventures terminated
A	6	Environment	Large scale, long-term (decades) Impact
		Society	Public protest; disruption of production; loss of livelihood to sector
		Health and Safety	Multiple on site fatalities or permanent disabilities
		Reputation	Persistent national concerns; long-term impact
B	5	Environment	Medium scale, medium term (years) impact
		Society	Official complaints; loss of livelihood > 10 persons
		Health and Safety	Major illness/disability
		Reputation	Medium term national concerns; operations curtailed
C	4	Environment	Medium scale, short-term (months) impact
		Society	Long-term nuisance; loss of income > 10 persons
		Health and Safety	Illness or injury leading to lost time > 4 days
		Reputation	Short-Term regional concerns; close scrutiny
D	3	Environment	Short-Term (weeks) impact
		Society	Temporary nuisance; > 5 third party complaints
		Health and Safety	Illness or injury leading to lost time < 4 days
		Reputation	Short-Term local concern; some impact on asset
E	2	Environment	Localised (immediate area), temporary Impact
		Society	Temporary nuisance; < 5 third party complaints
		Health and Safety	Illness or injury requiring first aid or medication
		Reputation	Local mention only; freedom to operate unaffected

Level of Consequence	Score	Issues	Definitions
F	1	Environment	No measurable impact
		Society	No complaints
		Health and Safety	No injury or illness
		Reputation	No concern or impact to asset

5.7.2.3 Risk Matrix

The level of risk can then be identified using a matrix comparing probability with consequence, as shown in **Table 85**. The matrix consists of:

- Score of consequence (row) from 7 to 1: to indicate in
- creasing severity of the consequence if such risk occurred.
- Score of probability (column) from 1 to 6: on the basis of historical evidence or calculation.

Risk Significance Level = Consequence x Probability

The risk level can be separated into four levels "Low (Score = 1-4)", Medium (Score = 5-12), "High (Score = 14-20) or "Severe (Score = 21-45)", shown in **Table 84**.

If the risk is determined to be "Medium" or "High", it needs to be managed to reduce the frequency of occurrence or to mitigate any consequences to achieve a risk which is "As Low As Reasonably Possible" (ALARP). If the risk is determined to be "Severe" (i.e. unacceptable), specific actions must be developed to reduce the risk to an acceptable level, which may involve a full Quantified Risk Assessment (QRA).

Table 84. Significance of Unplanned Events Risk

Risk Level	Rating	Definition
Low	1-4	Acceptable level/ without control risk/ does not require additional management.
Medium	5-12	Acceptable level but must be controlled to prevent increased risk to unacceptable levels.
High	14-20	Unacceptable level/ the risk must be managed/ reduced to acceptable level.
Very High	21-42	Unacceptable level/ the risk must be managed/ reduced to acceptable level immediately.

Note: The definition might be adjusted depending on discretion of expertise and project characteristic.

Table 85. Risk Assessment Matrix

						Frequency/Likelihood					
Risk Assessment Matrix					Likeli-hood	<1 in 100,000	1 in 5,000 – 100,000	1 in 100 – 5000	1 in 10 – 100	1 in 1 - 10	1 in 1
					Frequency	<Once in 100 Projects	Once in 50-100 Projects	Once in 10-50 Projects	Once in 1-10 Projects	Once per Project	> Once per Project
						1	2	3	4	5	6
Consequence	**Environment**	**Society**	**Health and Safety**	**Reputation**		***Remote***	***Unlikely***	***Quite Likely***	***Likely***	***Very Likely***	***Definite***
	Regional scale, long-term impact	Civil unrest; closure of plant	Multiple off -site /on-site fatalities or permanent disabilities	International concerns; major ventures terminated	**A+ (7)**	**Medium (7)**	**High (14)**	**Severe (21)**	**Severe (28)**	**Severe (35)**	**Severe (42)**
	Large scale, long-term (decades) impact	Public protest; disruption of production; loss of livelihood to sector	Multiple on-site fatalities or permanent dis-abilities	Persistent national concerns; long-term impact	**A (6)**	**Medium (6)**	**Medium (12)**	**High (18)**	**Severe (24)**	**Severe (30)**	**Severe (36)**
	Medium scale, medium term (years) impact	Official complaints; loss of livelihood >10 persons	Major illness/ disability	Medium term national concerns; operations curtailed	**B (5)**	**Medium (5)**	**Medium (10)**	**High (15)**	**High (20)**	**Severe (25)**	**Severe (30)**
	Medium scale, short-term (months) impact	Long-term nuisance; loss of income > 10 persons	Illness or injury leading to lost time > 4 days	Short-term regional concerns; close scrutiny	**C (4)**	**Low (4)**	**Medium (8)**	**Medium (12)**	**High (16)**	**High (20)**	**Severe (24)**
	Short-term (weeks) impact	Temporary nuisance; > 5 third party comp-laints	Illness or injury leading to lost time < 4 days	Short-term local concern; some impact on asset	**D (3)**	**Low (3)**	**Medium (6)**	**Medium (9)**	**Medium (12)**	**High (15)**	**High (18)**

						Frequency/Likelihood					
Risk Assessment Matrix					Likeli-hood	<1 in 100,000	1 in 5,000 – 100,000	1 in 100 – 5000	1 in 10 – 100	1 in 1 - 10	1 in 1
					Frequency	<Once in 100 Projects	Once in 50-100 Projects	Once in 10-50 Projects	Once in 1-10 Projects	Once per Project	> Once per Project
						1	2	3	4	5	6
	Localised (immediate area), temporary impact	Temporary nuisance; < 5 third party comp-laints	Illness or injury requiring first aid or medication	Local mention only; freedom to operate unaffected	**E (2)**	**Low (2)**	**Low (4)**	**Medium (6)**	**Medium (8)**	**Medium (10)**	**Medium (12)**
	No measure-able impact	No comp-laints	No injury or illness	No mention	**F (1)**	**Low (1)**	**Low (2)**	**Low (3)**	**Low (4)**	**Medium (5)**	**Medium (6)**

5.7.3 Assessment of Impacts from Fuel/Chemical Spill

Fuel spills may potentially occur during transport, handling and storage of fuel used or produced by the proposed Yoke Pyo Project.

The frequency or likelihood of a fuel or chemical spill is considered Low (1). The spill volume is relatively small, so the consequence of a worse case spill could be rated as No measurable impact to environment “F (1)”, No complaints on social “F (1)”, No illness/injury requiring first aid or medication to health and safety “F (1)”, and No mention to reputation “F (1)”.

The risk of impacts on health and safety, social and Yoke Pyo’s reputation is considered low. Implementing safety measures should mitigate the risk of spills.

Yoke Pyo will implement the following mitigation measures regarding fuel/chemical spills:

- Proper training in the use and handling of the relevant chemicals and standard safety procedures implemented by all contractors.
- Appropriate medical care will be provided, clean-up will be carried out, and incident or accident reports will be filed.
- Provide spill cleanup kits and training for designated rapid response team to clean up any spills.

- Store all chemicals in secured storage area with impervious (cement or plastic sheet) floor and secondary containment. Handle all chemicals according to their directions.
- Investigate, correct and file incident or accident reports whenever spills occurred.

Residual Risk

With these management measures, the extent and magnitude of impact from fuel/chemical spills will have a residual risk ranked as **Negligible**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.7.4 Assessment of Impacts from Fire

Fire is a risk in at work that involve electricity and fuel oil. The consequence of a fire to health and safety may be lethal, although statistics suggest fatalities are very rare and injuries and lost time incidents are much more common.

The risk to Health and Safety can thus be conservatively rated as "E" (Illness or injuries requiring first aid or medication). The consequence of this risk to Social can be rated as a temporary nuisance, or "D". The risk to environment as localized and temporary impacts, rated as "E" and to reputation as local mention only, rated as "E".

The significance of a fire to Environment, Social, Health and Safety, and Reputation can be considered significant and should be mitigated by implementing safety mitigation measures.

In conclusion, fire is rated as having a low, mitigable and avoidable risk. Yoke Pyo will implement the following mitigation measures regarding fire:

- Install fire extinguishers, alarms (to be audible and visible from whole site).

Residual Risk

With these management measures, the extent and magnitude of impact from a fire or explosion will have a residual risk ranked as **Low**.

Residual Significance	Positive	Negligible	Low	Medium	High

5.8 SUMMARY OF RESIDUAL SIGNIFICANCE/RISK RANKINGS FROM YOKE PYO TRADITIONAL MEDICINE PRODUCTION PROJECT

The residual risk rankings of the impact assessment of the Project on environmental, social, health and unplanned aspects are summarized below.

Table 86. Installation Phase Significance Rankings

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.2 Hazardous Materials Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.4 Non-Hazardous and Hazardous Waste Handling and Storage	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.5 Machine Placement	2.5.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
Ecological Environmental Impact Assessment			
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
		the ecosystem	
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
	3.6 Machine Placement	3.6.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the marine ecosystem	Negligible
Social Impact Assessment			
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Low
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Negligible
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
		wellbeing due to exposure or perceived exposure to hazards.	
6. Socio-Economy	6.1 Support & Supply	6.1.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.2 Fuel Storage & Handling	6.2.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.3 Hazardous Materials Handling and Storage	6.3.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.4 Non-Hazardous and Hazardous Waste Handling and Storage	6.4.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive
	6.5Machine Placement	6.5.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
	6.6 Labour, Equipment Services Supply	6.6.1 Employment/income and procurement opportunities	Positive
Cultural Impact Assessment			
7. Historical, Archaeological and Cultural Resources	7.1 Earth moving for buildings.	7.1.1 Possible disruption or damage of archaeological sites, such as shipwrecks.	Negligible

Table 87. Operation Phase Significance Rankings

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	2.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.2 Fuel Storage & Handling	2.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
	1.3 Energy Use	2.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic	Negligible

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
		matter)	
	2.2 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
Ecological Environmental Impact Assessment			
3.Biota	3.1 Wastewater Disposal	4.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
Social Impact Assessment			
4.Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Negligible
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Negligible
6. Socio-Economy	6.1 Labour, Equipment, Services Supply	6.1.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive

Table 88. Decommissioning Phase Significance Ranking

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
Physical Environmental Impact Assessment			
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	Negligible
2. Water Quality	2.1 Hazardous Materials Handling and Storage	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
	2.2 Non-Hazardous and Hazardous Waste Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	Negligible
Ecological Environmental Impact Assessment			
3.Biota	3.1 Hazardous Materials Handling and Storage	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	Negligible
Social Impact Assessment			
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	Negligible
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	Low

Environmental Factors/Events	Activity	Potential Impact	Residual Risk
6. Socio-Economy	6.1 Labour, Equipment Services Supply	6.1.1 Employment/income and procurement opportunities for people, business and services in surrounding area	Positive

Table 89. Health Impacts Residual Risk Rankings

Public Health Impact Assessment			
1. Public Health	1.1 Transportation	1.1.1 Possible impact to public health from accidents, exposure to air pollutants, noise, exposure to fuel waste or contamination from accidental spills	Negligible
	1.2 Odour	1.2.1 Potential smell from crushed and pulverized medicinal plants, waste, wastewater, fuel spills	Negligible
Occupational Health Impact Assessment			
2. Occupational Health	2.1 Air Quality	2.1.1 Possible impact to occupational health from accidents, exposure to air pollutants, or stress about possible health related matters	Low
	2.2 Noise	2.2.1 Possible impact to occupational health from noise	Low
	2.3 Odour	2.3.1 Potential smell from crushed and pulverized medicinal plants	Low
	2.4 Wastewater	2.4.1 Possible impact to occupational health from accidents, exposure to wastewater or contamination from accidental spills, concern and stress about accidents, spills, wastes	Low

	2.5 Non-Hazardous Waste	2.5.1 Possible impact to occupational health from accidents, exposure to non-hazardous waste or contamination from accidental spills, concern and stress about accidents, spills, wastes	Low
	2.6 Hazardous Waste	2.6.1 Possible impact to occupational health from accidents, exposure to contamination from accidental spills, concern about accidents, spills, wastes	Low
	2.7 Accidents at Work Site	2.7.1 Possible impact to occupational health from accidents in the work place, exposure to air pollutants, noise, exposure to fuel/ chemicals/ waste or contamination from accidental spills, concern and stress about accidents, spills, wastes, noise, etc	Low

Table 90. Unplanned Events Residual Risk Rankings

Environmental Factors/Events	Activity	Potential Impacts	Residual Risk
1. Fuel, Chemical or Hazardous Waste/ Materials Spill	1.1 Storage of Fuel, chemicals, hazardous materials or waste	1.1.1 Potential risk of spills to the environment affecting water quality, biota	Negligible
2. Fire	2.1 Fuel and chemical Storage	2.1.1 Possible explosion or fire causing physical damage and possible injuries or loss of life and contamination	Low

5.9 CONCLUSION

All environmental and social issues are ranked as negligible or low and can be managed to minimize potential impacts. Some issues should be considered in the CSR development plans of Yoke Pyo. Occupational and Public Health issues are also all ranked as low. A waste management plan will be prepared to ensure that all wastes are managed to local and City Development Committee standards.

Unplanned Events have all been ranked as having a low residual risk. The key to ensuring that unplanned events do not happen is linked to ongoing training programs and specific emergency management plan.

5.10 RECOMMENDATIONS

The following recommendations are provided:

- Implement recommended stakeholder engagement program before site installation phase to inform the surrounding area of the upcoming activities.
- Implement Yoke Pyo's Waste Management Plan.
- Apply Yoke Pyo's Emergency Management Plan.
- Conduct recommended training program prior to project initiation.
- Adopt and implement the EMP provided in **Chapter 6.**

6. ENVIRONMENTAL MANAGEMENT PLAN

6.1 INTRODUCTION

This environmental, social and health management plan has been developed to prevent, minimize and monitor potential environmental, social and health impacts associated with Yoke Pyo's planned traditional medicine production.

For each project activity, management measures have been defined to prevent and/or reduce the likelihood or magnitude of impacts and/or to limit the extent of an impact if one does occur. The proposed management measures will take into account applicable policies, guidelines, regulations, industry best practices, expert judgment, design techniques, and operational control. Monitoring measures too have been defined to determine if there are changes to the environment and to ensure that mitigation measures are effective.

The following hierarchy of control will be used to identify appropriate management measures:

- Eliminate the risk by removing the hazard.
- Substitute of a hazard with a less hazardous one.
- Prevention of potential events.
- Control the magnitude of an impact.
- Mitigation of the impact of an event on the environment e.g. (bunding for potential hydrocarbon spills).
- Monitoring environmental change and mitigation effectiveness.
- Emergency response and contingency planning to enable recovery from the impact of an event.
- Public consultation and disclosure.

6.2 SCOPE OF THE DOCUMENT

The purpose of this EMP is to provide social, health and environmental management actions, monitoring requirements and roles and responsibilities for ensuring that this traditional medicine operation is implemented in a sustainable manner.

In particular, the EMP will provide:

- Project description by project phase (mobilization / installation, operation, decommissioning);
- Project's environmental, socio-economic and, where relevant, health policies and commitments, legal requirements and institutional arrangements;
- Summary of impacts and mitigation measures;
- Overall budget for implementation of the EMP;
- Management and monitoring sub-plans by project phase (installation, operation and decommissioning); the management and monitoring sub-plans will address relevant environmental and social management and monitoring issues as follows:

Management Sub-Plan	Included / Not Included	Comment
Noise	Not Included	Noise from operation is localized and of low level in an open water setting.
Vibration	Not Included	Vibration for the operation has not been defined as an issue.
Water Quality	Not Included	All discharges from the operation are minor, short term and must meet Myanmar EQEG.
Air Quality	Not Included	Air emissions are minor and short term.
Occupational and Community Health	Not Included	Operational guidelines, procedures and a summary is included for this project.
Employment and Training	Not Included	Training requirements for the project are defined separately.
Cultural Heritage	Not Included	There is no cultural heritage as verified through communication with the Department of Archaeology and communities.
Emergency Response	Included	An overall ERP has been prepared by Yoke Pyo and a summary ERP has been included for this project.
Waste Management	Included	A waste management plan has been included for this Project.

Biodiversity Plan	Not Included	Biodiversity around the project is not defined as an issue for this project.

6.3 PROJECT DESCRIPTION

Yoke Pyo plans to produce traditional medicines in Shwe Bo Industrial Zone. The project would include development of extended plot in Shwe Bo Industrial Zone, construction of a factory encompassing a research laboratory, a library, an auditorium, a meeting room and production chamber.

The overall project activities can be summarized into three 3 main phases:

- Mobilization and installation phase
- Operation phase
- Decommissioning

The construction has nearly been finished and installation will take place soon.

6.4 PROJECT'S ENVIRONMENTAL AND SOCIAL POLICIES, LEGAL REQUIREMENTS

The Project's environmental and social policies, legal requirements and institutional requirements have been detailed in **Chapter 2**.

6.5 SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION & MONITORING MEASURES

During the environmental impact assessment, a number of potentially significant impacts were identified. In some cases, even though the impacts were of low significance, mitigation measures were provided as part of Yoke Pyo's environmental management guidelines. This section outlines the mitigation measures that are to be employed to reduce the extent, duration, magnitude or likelihood of an impact if one does occur. In addition, environmental monitoring measures will be undertaken to assess whether the mitigation measures are effective and if performance meets EIA commitments.

6.5.1 General Mitigation Measures for Project Operation

Table 94 shows the general mitigation measures for project operation.

Table 91. General Mitigation Measures for Project Operation

General Measures	
1.	Mitigation and monitoring measures set forth in this document must be incorporated into contractual agreements for all contractors, including: design, construction, and operation in order to obtain practical and effective execution of the project.
2.	Report compliance with these mitigation and monitoring measures to District ECD with schedule.
3.	Provide stakeholder relation plans to explain the project description before starting (at least 7 days prior), including schedule for project installation and operation periods, mitigation and monitoring measures for affected communities located near the project area.
4.	Environmental, social and safety officers must set up a contact point to receive any complaints from the stakeholder regarding its operation activities. Further, the officers must provide assistance and rectify the cause of such complaints as determined appropriate, as soon as possible.
5.	If impacts and/or damages result from project activities, the officers must implement all necessary measures to mitigate these impacts and/or damages as soon as possible.
6.	ECD or City Development Committee will investigate complaints lodged by people living in the surrounding area concerning any disturbance by project activities, or any damage of public infrastructure resulting from project operations. The officers will inform the public within 30 days if the investigation proves that the operations do not comply with mitigation and monitoring measures.
7.	During the project period, if archaeological finds are encountered in the project area, the project team must stop all activities immediately and report the findings to the appropriate government office, e.g. Local Archeological Department, Fossil Research Center and Geological Museum within 7 days of the discovery. In addition, the project team must cooperate with the government agencies in an effort to verify the findings in the project area. If it is proven that these findings are archaeological finds or fossils, the

	officers must follow the regulations strictly.
8.	If the operators wish to make changes to the exploration activities, or change the methodology of operations, or conduct the activities significantly different from what was proposed in the EIA, details regarding the changes, along with revised assessment and appropriate mitigation and monitoring measures in accordance with such change(s) will be submitted to the ECD for approval before commencing.
9.	The operator will start operations only when he receives the necessary approval, permit or agreement from the responsible agency.

6.5.2 Environmental, Social, and Health Impacts and Mitigation Measures

A summary of the mitigation measures and specific action commitments for Yoke Pyo traditional medicine production is shown in the following table.

Table 92. Mitigation Measures and Specific Action Commitments for Yoke Pyo Traditional Medicine Production

Installation Phase

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Environmental Mitigation Measures								
Physical Resources								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion. 1.1.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Installa -tion	Copy of maintenance schedule
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/	Negligible	Contractor to provide maintenance	Yoke Pyo/ Contractor	Installa -tion	Copy of maintenance schedule

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		emissions and GHG Release contributing to climate change	recommended by manufacturers to ensure efficiency of combustion. 1.2.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.		schedule			
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.3.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion. 1.3.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Installa -tion	Copy of maintenance schedule
2. Water	2.1 Fuel	2.1.1 Potential	2.1.1.1 Use minimum water to	Negligible	Direct and	Yoke Pyo	Installa	Water use

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Quality	Storage & Handling	contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion	clean the floor and wash parts of machines and building before, during and after installing the machines 2.1.1.2 Check the wash-out water be within the standards and go safely into the drain 2.1.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation		check the responsible personnel to use minimum water		-tion	log
	2.2 Hazardous Materials Handling and	2.2.1 Potential contamination (increased levels of suspended	2.2.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the	Negligible	1. Yoke Pyo to provide spill kits to contain	Yoke Pyo	Installa -tion	Spill incident log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	Storage	solids, metals, toxicity) and oxygen depletion (organic matter)	machines 2.2.1.2 Check the wash-out water be within the standards and go safely into the drain 2.2.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation		any chemical/ fuel/ waste spillage 2. Yoke Pyo to provide Waste Management Plan			
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion	2.3.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 2.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar	Negligible	Store, separate, transport and dispose of waste following Yoke Pyo's	Yoke Pyo/ Contractor	Installa -tion	Waste Managemen t Plan

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		(organic matter)	Emission Guideline (2015)		Waste Management Plan.			
	2.4 Non-Hazardous Waste Handling and Storage	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.4.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.4.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo/ Contractor	Installa-tion	Water use log
	2.5 Machine Placement	2.5.1 Potential contamination (increased levels of suspended solids, metals,	2.5.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines	Negligible	Direct and check the responsible personnel to use minimum	Yoke Pyo/ Contractor	Installa-tion	Water use log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		toxicity) and oxygen depletion (organic matter)	2.5.1.2 Check the wash-out water be within the standards and go safely into the drain 2.5.1.3 Ensure the designated layout and location before installing the machine to avoid a repeated and incorrect installation		water			
Ecological, Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the	3.1.1.1 Use minimum water to clean parts of the vehicles before, during and after installation 3.1.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Installa -tion	Water use log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		ecosystem						
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Installa-tion	Cleaning record; Water use log
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.3.1.1 Comply with all Myanmar regulations or standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Installa-tion	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from spills and leaks could affect the ecosystem	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety 3.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Installa-tion	Wastewater disposal record
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.5.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.5.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Installa-tion	Water use log; Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	3.6 Machine Placement	3.6.1 Potential deterioration of water quality from fuel spills and disturbance could affect the ecosystem	3.6.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.6.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo/ Contractor	Installa -tion	Cleaning record; Water use log
Social Impact Assessment								
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 At least 5 days prior to machine installation, coordinate with Shwe Bo University Authorities, who will then confirm convenient date. 4.1.2.1 Provide appropriate lights and warning signals on all	Low	Contact Shwe Bo University Authorities and confirm convenient date.	Yoke Pyo/ Contractor	Installa -tion	Record of contact to Shwe Bo University

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			transport vehicles to prevent accidental collision.					
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	5.1.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.1.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.1.1.3 Water that is contaminated with oil will be collected and treated at the oil/water separator prior to discharge.	Negligible	Set up waste management system	Yoke Pyo/ Shwe Bo City Develop-ment Committee	Installa-tion	Record of waste treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			5.1.1.4 Hazardous and non-hazardous wastes will be manifested with proper labels.					
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards.	5.2.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.2.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.2.1.3 Water that contaminated with oil will be collected and treated at the oil/water separator prior to discharge.	Negligible	Set up a water treatment system.	Yoke Pyo	Installa-tion	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			5.2.1.4 Hazardous and non-hazardous wastes will be manifested with proper labels.					
6. Socio-Economy	6.1 Support & Supply	6.1.1 Employment/ income and procurement opportunities for people, business and services in surrounding area	6.1.1.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Installa-tion	Purchasing records
	6.2 Labour, Equipment Services Supply	6.2.1 Employment/ income and procurement opportunities	6.2.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Installa-tion	Local worker employ-ment/ services

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Cultural Impact Assessment								
7. Historical, Archaeological and Cultural Resources	7.1 Earth moving for buildings.	7.1.1 Possible disruption or damage of archaeological sites, such as shipwrecks.	Visual check by workers and inspection of the site during earth work.	Negligible	Check the earth work site and contact Cultural Heritage Department if necessary.	Yoke Pyo	Installa -tion	Earth work records

Operation Phase

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Physical Environmental Impact Assessment								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Keep the procedures for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure	Negligible	Keep the procedures for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		to climate change	efficiency of combustion.					
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.3.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers to ensure efficiency of combustion.	Negligible	Keep the procedures for maintenance and regular maintenance.	Yoke Pyo	Operation	Maintenance records
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals,	2.1.1.1 Use minimum water to clean the floor and wash parts of machines and building 2.1.1.2 Check the wash-	Negligible	Ensure that the water usage is minimum and the	Yoke Pyo (Safety and Environment Section)	Operation	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		toxicity) and oxygen depletion (organic matter)	out water be within the standards and go safely into the drain		disposed water is within the limits.			
	2.2 Lab testing using hazardous materials	2.2.1 Releases to the environment and affect the ecosystem	2.2.1.1 Regularly check to observe leaks, spills and determine potential causes	Negligible	Train the personnel and practice with care for least or no spills	Yoke Pyo (Safety and Environment Section)	Operation	Record of hazardous material uses
	2.3 Waste Management non-hazardous materials	2.3.1 Waste, foul smell to the environment	2.3.1.1 Comply with all Myanmar regulations or standards of City Development Committee	Negligible	Segregate by type, clearly label, properly dispose. Food waste	Yoke Pyo and City Development Committee	Operation	Record of waste treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
					will be separated from non-food waste.			
	2.4 Wastewater Disposal	2.4.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.4.1.1 Collect all wastewater, treat appropriately and dispose it within the limit.	Negligible	Ensure that the water usage is minimum and the disposed water is within the limits.	Yoke Pyo (Safety and Environment Section)	Operation	Record of wastewater treatment/ disposal
Ecological Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials	3.1.1 Potential deterioration of	3.1.1.1 Use minimum water to clean parts of the	Negligible	Direct and check the	Yoke Pyo (Safety and	Operation	Water use log

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	Transport	water quality from wastewater discharge, spills and disturbance could affect the ecosystem	vehicles 3.1.1.2 Check the wash-out water be within the standards and go safely into the drain		responsible personnel to use minimum water	Environment Section)		
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo (Safety and Environment Section)	Operation	Cleaning record; Water use log
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of	3.3.1.1 Comply with all Myanmar regulations or	Negligible	Yoke Pyo to provide	Yoke Pyo (Safety and	Operation	Wastewater disposal

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		water quality from wastewater discharge, spills and disturbance could affect the ecosystem	standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)		Waste Management Plan	Environment Section)		record
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from spills and leaks could affect the ecosystem	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety 3.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo (Safety and Environment Section)	Operation	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Social Impact Assessment								
4. Transporta-tion	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 Establish 50 m safety zone around the factory 4.1.2.1 Provide appropriate lights and warning signals on all vehicles to prevent accidental collision.	Low	Supervise safety zone activities	Yoke Pyo (Safety and Environment Section)	Operation	Safety zone monitoring records
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards. 5.1.2 Pressure on existing	5.1.1..1 Provide appropriate lights and warning signals on all vehicles to prevent accidental collision. 5.1.1.2 Set up safety zone within 50 m-radius surrounding the factory to prevent any accidents. 5.1.2.1 Check regularly the project area to	Negligible	Regularly monitor safety zone within 50 m-radius surrounding the factory	Yoke Pyo (Safety and Environment Section)	Operation	Safety zone monitoring records

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		waste management facilities.	observe leaks or spills, and to try to determine potential causes or sources.					
6. Socio-Economy	6.1 Labour Supply	6.1.1 Employment/ income	6.1.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Operation	Employment records
	6..2 Equipment/ Material Supply	6.1.2 Procurement opportunities	6.1.2.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Operation	Purchasing records

Decommissioning Phase

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
Physical Environmental Impact Assessment								
Physical Resources								
1. Air Quality	1.1 Employees/ Materials Transport	1.1.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.1.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers 1.1.1.2 Set up appropriate schedule to minimize decommissioning time.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
	1.2 Fuel Storage & Handling	1.2.1 Deterioration of air quality due to emissions and GHG Release contributing to climate change	1.2.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by manufacturers.	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule
	1.3 Energy Use	1.3.1 Deterioration of air quality due to emissions and GHG Release contributing	1.3.1.1 Routine inspection and preventive maintenance as per maintenance schedule/ recommended by	Negligible	Contractor to provide maintenance schedule	Yoke Pyo/ Contractor	Decommis-sioning	Copy of maintenance schedule

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		to climate change	manufacturers to ensure efficiency of combustion. 1.3.1.2 Set up appropriate machine mobilization schedule to minimize preparation time.					
2. Water Quality	2.1 Fuel Storage & Handling	2.1.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen	2.1.1.1 Use decommissioning method that minimizes sanitary water 2.1.1.2 Change the use of factory facilities of	Negligible	1. Yoke Pyo to provide spill kits to contain any chemical/ fuel/ waste spillage	Yoke Pyo	Decommis-sioning	1. Spill incident log 2. Waste Management Plan

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		depletion (organic matter)	compound in other useful ways, as the factory is in industrial zone		2. Yoke Pyo to provide Waste Management Plan			
	2.2 Hazardous Materials Handling and Storage	2.2.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.2.1.1 Use minimum water to clean the floor and wash parts of machines and building before, during and after installing the machines 2.2.1.2 Check the wash-out water be within the standards	Negligible	1. Yoke Pyo to provide spill kits to contain any chemical/ fuel/ waste spillage 2. Yoke Pyo to provide Waste Management	Yoke Pyo	Decommis-sioning	Spill incident log

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			and go safely into the drain		Plan			
	2.3 Wastewater Disposal	2.3.1 Potential contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	2.3.1.1 Comply with all Myanmar regulations or standards regarding wastewater 2.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Store, separate, transport and dispose of waste following Yoke Pyo's Waste Management Plan.	Yoke Pyo/ Contractor	Decommis-sioning	Waste Management Plan
	2.4 Non-	2.4.1 Potential	2.4.1.2 Provide	Negligible	Store,	Yoke Pyo/	Decommis-	Waste

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
	Hazardous Waste Handling and Storage	contamination (increased levels of suspended solids, metals, toxicity) and oxygen depletion (organic matter)	effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)		separate, transport and dispose of waste following Yoke Pyo's Waste Management Plan.	Contractor	sioning	Management Plan
Ecological Environmental Impact Assessment								
3.Biota	3.1 Employees/ Materials Transport	3.1.1 Potential deterioration of water quality from wastewater discharge, spills	3.1.1.1 Use minimum water to clean parts of the vehicles before, during and after installation 3.1.1.2 Check the	Negligible	Direct and check the responsible personnel to use minimum	Yoke Pyo	Decommis-sioning	Water use log

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		and disturbance could affect the ecosystem	wash-out water be within the standards and go safely into the drain		water			
	3.2 Fuel Storage & Handling	3.2.1 Potential deterioration of water quality from fuel spills could affect the ecosystem	3.2.1.1 Use minimum water to clean the storage floor and washed parts of machines and building 3.2.1.2 Check the wash-out water be within the standards and go safely into the drain	Negligible	Direct and check the responsible personnel to use minimum water	Yoke Pyo	Decommis-sioning	Cleaning record; Water use log

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
	3.3 Wastewater Disposal	3.3.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the ecosystem	3.3.1.1 Comply with all Myanmar regulations or standards 3.3.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo	Decommis-sioning	Wastewater disposal record
	3.4 Hazardous Materials Handling and Storage	3.4.1 Potential deterioration of water quality from spills and leaks could	3.4.1.1 Comply with all Myanmar regulations or standards regarding safety	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Decommis-sioning	Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		affect the ecosystem	3.4.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)					
	3.5 Presence of Equipment and Facilities	3.5.1 Potential deterioration of water quality from wastewater discharge, spills and disturbance could affect the	3.5.1.1 Comply with all Myanmar regulations or standards regarding traffic safety 3.5.1.2 Provide effective wastewater treatment system to	Negligible	Yoke Pyo to provide Waste Management Plan	Yoke Pyo/ Contractor	Decommis-sioning	Water use log; Wastewater disposal record

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		ecosystem	ensure that the quality of the discharge meets Myanmar Emission Guideline (2015)					
Social Impact Assessment								
4. Transportation	4.1 Employees/ Materials Transport	4.1.1 Increased traffic 4.1.2 Potential disruption to traffic in case of accident	4.1.1.1 At least 5 days prior to machine installation, coordinate with Shwe Bo University Authorities, who will then confirm convenient date. 4.1.2.1 Provide appropriate lights and warning signals on all	Low	Contact Shwe Bo University Authorities and confirm convenient date.	Yoke Pyo/ Contractor	Decommis-sioning	Record of contact to Shwe Bo University

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			transport vehicles to prevent accidental collision. 4.1.2.2 Establish safety zone of 10 meters around the factory.					
5. Waste Management	5.1 Non-Hazardous and Hazardous Waste Handling and Storage	5.1.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived	5.1.1.1 Separate and store each type of waste (separate non-hazardous waste and hazardous waste) into appropriate containers having clear labels. 5.1.1.2 Do not drop any waste into	Negligible	Set up waste management system	Yoke Pyo/ Shwe Bo City Develop-ment Committee	Decommis-sioning	Record of waste treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		exposure to hazards. 5.1.2 Pressure on existing waste management facilities.	undesignated space. 5.1.1.3 Store hazardous waste in containers that are durable and safe for transport/transfer. Also, store them in areas away from fire sources. 5.1.1.4 Record and examine the type and quantity of waste. Store, separate, transport and dispose of waste using appropriate					

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			procedures and disposal facilities.					
	5.2 Wastewater Disposal	5.2.1 Waste contamination to environment, reduced wellbeing due to exposure or perceived exposure to hazards.	5.2.1.1 Comply with all Myanmar regulations or standards regarding health and safety. 5.2.1.2 Provide effective wastewater treatment system to ensure that the quality of the discharge meets the criteria of Myanmar Emission Guideline. 5.2.1.3 Water that	Negligible	Set up a water treatment system.	Yoke Pyo	Decommis-sioning	Record of wastewater treatment/ disposal

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
			contaminated with oil will be collected and treated at the oil/water separator prior to discharge. 5.2.1.4 Hazardous and non-hazardous wastes will be manifested with proper labels.					
6. Socio-Economy	6.1 Support & Supply	6.1.1 Procurement opportunities for people, business and services in surrounding	6.1.1.1 Purchase local supplies and services, whenever possible.	Positive	Contact heads of local producers.	Yoke Pyo	Decommis-sioning	Purchasing records

Environmental Factors/Events	Activity	Potential Impact	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
		area						
	6.2 Labour, Equipment Services Supply	6.2.1 Employment/ income and procurement opportunities	6.2.1.1 Employ qualified local workers, if possible.	Positive	Contact heads of local communities	Yoke Pyo	Decommis-sioning	Local worker employment/ services

Health Impacts

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
Public Health Impact								
1. Public Health	1.1 Transport-ation	1.1.1 Possible impact to public health from accidents, exposure to air pollutants, noise, exposure to fuel / waste or contamination from accidental spills	1.1.1.1 A safety zone of about 10-m radius will be established around the factory. 1.1.1.2 The area will be checked during the entire installation, operation and demobilization period. 1.1.1.3 Yoke Pyo will provide project information to relevant stakeholders, and communities close to the site at least 1 day prior to	Negligible	1. Regularly monitor safety zone within 10 m-radius surrounding the factory 2. Contact Shwe Bo University Authorities and confirm the convenient date	Yoke Pyo (Safety and Environmen t Section)	All phases	Monitor-ing record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			major transportation operations.					
	1.2 Odour	1.2.1 Potential smell from crushed and pulverized medicinal plants, waste, wastewater, fuel spills	1.2.1.1 Control sources of smell from the project such as wastes, wastewater, fuel leaks or spills in all phases.	Negligible	1. Regularly clean the fuel leaks and spills. 2. Cut and crush the medicinal plants in designated place so as to control the odour release.	Yoke Pyo	All phases	Fuel spill cleaning record
Occupational Health Impact								
2. Occupational Health	2.1 Air Quality	2.1.1 Possible impact to occupational	2.1.1.1 Use suitable respiratory protection for project workers.	Negligible	Check air quality and provide suitable	Yoke Pyo (Safety and Environmen	All phases	Air quality record of

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		health from accidents, exposure to air pollutants, or stress about possible health related matters			respiratory protection to the workers.	t Section)		Safety and Environ-ment Section
	2.2 Noise	2.2.1 Possible impact to occupational health from accidents, noise	2.2.1.1 The project will provide each worker with Personnel Protective Equipment (PPE), which includes hearing protection such as earplugs and earmuffs. They are designed to shield against dangerous	Negligible	Check noise level and provide suitable ear protective devices to the workers.	Yoke Pyo (Safety and Environmen t Section)	All phases	Training record; Noise monitor-ing record of Safety and Environ-

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			noise over a high frequency range while allowing the wearer to hear lower frequency sounds. 2.2.1.2 In addition, personnel will be provided with safety training to ensure that all workers practice under safety operation and regulation of work. 2.2.1.3 The machine will be properly maintained and serviced according to the maintenance schedule.					ment Section and PPE

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	2.3 Odour	2.2.1 Potential smell from crushed and pulverized medicinal plants	1.2.1.1 Control sources of smell from the project such as wastes, wastewater, fuel leaks or spills in all phases.	Negligible	1. Regularly clean the fuel leaks and spills. 2. Cut and crush the medicinal plants in designated place so as to control the odour release.	Yoke Pyo (Safety and Environment Section)	All phases	Air quality record and of Safety and Environ-ment Section
	2.4 Waste-water	2.4.1 Possible impact to occupational health from accidents, exposure to	2.4.1.1Regularly maintain the perimeter drainage and treated water systems to be efficient. 2.4.1.2 Supply and usage water will be kept in water	Negligible	Make sure wastewater treatment system efficient and employees receive proper	Yoke Pyo	All phases	Training record and drainage mainten-ance

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		wastewater or contamination from accidental spills, concern and stress about accidents, spills, wastes	tanks to avoid contamination from any vectors. 2.4.1.3 Yoke Pyo will strictly enforce good housekeeping practices to prevent diseases from spreading on the site. 2.4.1.4 Health awareness training will be provided to project workers to improve hygienic practices on site.		training.			record.
	2.5 Non-Hazardous Waste	2.5.1 Possible impact to occupational	2.5.1.1 Food wastes will be separated from non-food waste before	Negligible	Have specific SOP for waste collection and	Yoke Pyo	All phases	Waste disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		health from accidents, exposure to non-hazardous waste or contamination from accidental spills, concern and stress about accidents, spills, wastes	disposal. 2.5.1.2 The remaining non-hazardous waste will be classified and sorted before treatment, disposal or recycle. 2.5.1.3 Wastes will be disposed by Shwe Bo City Development Committee.		disposal.			and SOP
	2.6 Hazardous Waste	2.6.1 Possible impact to occupational health from accidents,	2.6.1.1 Hazardous wastes will be stored in closed containers for collection and disposed by the contractor (City	Negligible	Have specific SOP for waste collection and disposal.	Yoke Pyo	All phases	Proper PPE; Waste disposal record

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		exposure to hazardous waste contamination from accidental spills, concern and stress about accidents, spills, wastes	Development Committee) 2.6.1.2 Awareness programs and Personnel Protective Equipment (PPE), such as goggles, face shields, gloves, footwear and specialized clothing when handling chemicals, are provided to all personnel involved with transporting and handling hazardous waste. 2.6.1.3 Yoke Pyo will provide chemical and oil spill Contingency plan and spill kits.					and SOP

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
	2.7 Accidents at Work Site	2.7.1 Possible impact to occupational health from accidents in the work place, exposure to air pollutants, noise, exposure to fuel/chemicals/waste or contamination from accidental spills, concern and stress about accidents, spills,	2.7.1.1 Safety training and awareness programs to ensure that all project personnel are aware of the potential risks and have the necessary skills to perform their work in a safe and responsible manner. 2.7.1.2 PPE is provided to all workers on site. Minimum PPE includes safety boots, eye shield, helmet and ear plugs. Gloves, safety glasses, full face visors, dust masks	Negligible	Have specific SOP for accident prevention at work sites. Make sure personnel use proper PPE.	Yoke Pyo	All phases	Safety training record; Proper PPE; Fire prevention system; Emergency response plan

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
		wastes, noise, etc	and work vest for overboard work are also provided, depending on the nature of the work. 2.7.1.3 Fire and smoke detection systems are installed and provide entire coverage for the equipment. Portable fire extinguishers of appropriate types and sufficient number are in accommodation spaces, service spaces. 2.7.1.4 An Emergency Management Plan such as					

Environmental Factors/Events	Activity	Potential Impact/Issues	Mitigation Measures	Residual Impact	Specific Action	Responsible Team Member	Phase	Record
			fire, fuel or chemical spill, contingency plan is in place to ensure that accidents are effectively managed. 2.7.1.5 First aid kits, burn kit, resuscitators, and stretchers are provided at the clinic located onsite and served by two trained medics.					

Unplanned Events

Environmental Factors/Events	Activity	Potential Impacts	Mitigation Measures	Residual Risk	Specific Action	Responsible Team Member	Phase	Record
1. Fuel, Chemical or Hazardous Waste/ Materials Spill	1.1 Storage of Fuel, chemicals, hazardous materials or waste	1.1.1 Potential risk of spills to the environment affecting water quality, biota	1.1.1.1 Implement safety procedures as outlined in Yoke Pyo's Emergency Response Plan. 1.1.1.2 Implement Yoke Pyo's Emergency Response Plan. and conduct rehearsal/ training for staff to handle oil spill situations.	Negligible	1. Yoke Pyo to provide Emergency Response Plan 2. Yoke Pyo to provide Spill Contingency Plan 3. Yoke Pyo to provide Spill kits	Yoke Pyo	All Phases	Incident Report Emergency Response Plan
2. Fire	2.1 Fuel and chemical Storage	2.1.1 Possible explosion or fire causing physical damage and possible injuries or loss of life and contamination	2.1.1.1 Provide fire protection equipment and procedures for emergency management at project site, and provide the appropriate practice complying with mitigation measures. 2.1.1.2 Implement Emergency Response Plan in case of fire occurrence.	Negligible	Yoke Pyo to provide Fire Safety Plan	Yoke Pyo	All Phases	Incident Report

6.6 ENVIRONMENTAL MONITORING PROGRAMME

Environmental monitoring programs for this sector should be implemented to address all activities that have been identified to have potentially significant impacts on the environment, during normal operations and upset conditions. Environmental monitoring activities should be based on direct or indirect indicators of emissions, effluents, and resource use applicable to the particular project.

Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. Monitoring should be conducted by trained individuals following monitoring and record-keeping procedures and using properly calibrated and maintained equipment. Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken.

Table 93. Environmental Monitoring Programme

Domain	Parameter	Frequency	Location	Method	Phase	Respon-sibility
Air	Dust	Daily	B	Visual inspection	C	CC
Noise	Noise levels	Weekly	At 7 noise sites	By accredited person	C	CC
		Bi-monthly	At 7 noise sites	By accredited person	O	PM
Water	pH BOD COD TSS TDS	Monthly	Final discharge from Factory	Lab Inspection	O	Plant Manager
	Total Nitrogen Total Phosphorus Oil and grease Total Coliform	Bi-annually	Final discharge from Factory	Lab Inspection	O	Plant Manager

O = Operation Phase C= Construction Phase

CC= Construction Contractor PM= Project Management

The estimated cost for implementing EMP and monitoring team is 5,000,000 K/. And 5,000,000 K/ is allocated for Closing the Project.

6.7 ENVIRONMENTAL MONITORING TEAM

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

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

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

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

(d) To insert a check and balance action for the management of fund and aids provided by the CSR programme

The team mainly consists of representatives from the project and local communities. The representatives from local communities must be elected by respective local communities by themselves.

Table 94. Environmental Monitoring Team

Sr.	Representative	Number
Project Management		
1	Director	1
2	Manager	1
3	General Manager	1
4	Supervisor	1
Local Community		
1	Village Administrator (Min Kyaung)	1
2	Elected villager (Min Kyaung)	2
3	Village Administrator (Myaung Gyi)	1
4	Elected villager (Myaung Gyi)	2

5	Village Administrator (Bago Gone)	1
6	Elected villager (Bago Gone)	2

6.7.1 Roles and Responsibilities

(a) The team will act as a communication channel between the project and local community

(b) Proponent will provide aids from CSR programme through the local representatives from the team

(c) Proponent must disseminate monitoring report to local community through representatives from government departments and local communities

(d) Proponent will distribute notification for recruitment in local community widely with the help of local representatives

(e) The team will coordinate between local representatives and the project so that the project could participate in social, cultural and religious events of local community

(f) Proponent must contact with the team within (7) days after summarization of annual net profit so that contribution could be made for CSR programme

(g) General meeting of the team must be held at least once in (12) months to modify policy, roles and responsibilities of the Environmental Monitoring Team

The estimated cost for Environmental Monitoring Team is 5,000,000 K/.

6.8 CORPORATE SOCIAL RESPONSIBILITY (CSR)

The project will provide 2% of its annual net profit for carrying out CSR programs in local community as recommended by MIC. Educational sector, health sector, social affairs, economic sector, infrastructural sector, disaster aid programmes and drinking water programmes for Min Kyaung, Myaung Gyi and Bago Gone and other nearby villages will be included in CSR programmes. CSR programme will be executed in coordination with the local community and administrative bodies. Programmes for employers such as social welfare, health care, educational aid, and professional development trainings must also be included in CSR programme.

The chairman of Yoke Pyo Co., Ltd provided 10,000,000 Kyats for CSR Program in Educational sector, health sector, social affairs, economic sector and infrastructural sector.

6.9 TRAINING, AWARENESS AND COMPETENCE

This plan describes the provisions of training to ensure that any people working for or on behalf of the company involved in the activities covered by the scope of the EMP are properly trained to carry out their assigned duties in a manner that will not cause deviation from company environmental policy.

This procedure applies to EMP related training for staff and any persons working for or on behalf of Yoke Pyo Co., Ltd involved in the activities covered by the scope of the EMP. Yoke Pyo Co., Ltd will ensure that all people performing tasks for or on behalf of the organization, which includes temporary staff and remote workers, have had an appropriate assessment for their potential to cause a significant environmental impact and the associated competence required.

The Manager shall ensure that people working for or on behalf of the company within the scope of EMP are competent on the basis of appropriate education, training or experience. The General Manager shall identify training needs for people working for or on behalf of the company to ensure individual competence to implement the EMP effectively.

Table 95. Training Requirement

Sr.	Training Topics	Trainee	Duration
1	OSH Training	Supervisors, Operators, Workers and Security	40 hours
2	EMP Training	Managers, Assistant Managers, Engineer Department, Supervisors, Operators and Workers	40 hours
3	Emergency Response Training	All employee	16 hours
4	First Aid Training	All employee	20 hours
5	Fire Fighting Training	All employee	40 hours

For each staff of Yoke Pyo Co., Ltd, the GM shall establish, implement and maintain a Training Record of any type of EMP related training received. Where a training course is undertaken internally, names of the attendants shall be recorded in the Training Attendance Record.

6.10 COMMUNICATION

This plan ensures a consistent and efficient approach to internal communication and external complaints relating to the environment. The procedure applies to all documents established under the EMP of Yoke Pyo Co., Ltd. The documents under the EMP include but are not limited to:

- IEE Report
- Mitigation Measures and Management Actions
- Environmental Monitoring Programme
- EMP Forms, Checklists and Guidelines
- Registers of Legal and Other Requirements
- External documents including legislation, professional guides and code of practices, etc.

6.10.1 Responsibility

- The Manager is responsible for dealing with complaints.
- The General Manager is responsible for ensuring that all communications relating to the environment are processed correctly.
- All staffs are responsible for putting forward suggestions on environmental matters.

6.10.2 External Communications

Communications to be handled according to this procedure include correspondence, conservations and meeting with relevant interested parties.

The person receiving the communication shall be noted the time and date, relevant address/telephone number and details of communication.

Details shall be passed to the GM who will deter Factory the response and whether the corrective action is required.

If the communication is significant, the GM shall inform the Manager as soon as possible.

An initial response shall be provided within two weeks.

The GM shall be responsible for maintaining records, responses and corrective action in a separate file designated for that purpose.

6.10.3 Internal Communications

The primary means of communication is through team briefings, supported as appropriate by use of notice boards and memos.

Suggestions for environmental improvements are made through the company suggestion schemes.

6.11 DOCUMENT MANAGEMENT

This procedure describes the control system for preparing, approving, distributing, revising and updating documents that are required under the Environmental Management Plan (EMP).

This procedure applies to all documents established under the EMP of Yoke Pyo Co., Ltd. The documents under the EMP include but are not limited to:

- Impact Mitigation
- Management Actions
- Environmental Monitoring Programme
- EMP Forms, Checklists and Guidelines
- Registers of Legal and Other Requirements
- External documents including legislation, professional guides and code of practices, etc.

6.11.1 Responsibility

6.11.1.1 Director

The Director shall approve and sign all EMP documents, include the Environmental Policy, EIA report, EMP and Other Requirements. In the absence of the Director, the Manager shall approve and sign the EMP documents.

6.11.1.2 Manager

The Manager is responsible for the EMP document control system. The Manager shall ensure that only controlled and current copies of documents are used, and distribute the controlled EMP documents to relevant personnel. The Manager shall also maintain and update the Master List of Documents.

6.11.1.3 General Managers

Departmental Managers shall review relevant EMP documents and procedures, ensure that their subordinates are familiar with the EMP documents related to them, and report any proposed changes to the EMP documents and forms to the EMP Committee.

6.12 EMERGENCY PREPAREDNESS AND RESPONSE PLAN

This procedure describes the responses in case of emergency or fire hazard that suddenly occur in the Factory Compound. The detail of Emergency Preparedness and Response Plan from Yoke Pyo Traditional Medicine Production Factory is kept in the company.

6.12.1 Fire Protection Equipment

6.12.1.1 Explosion Suppression Systems

Explosion suppression systems shall be used in unusually hazardous areas such as elevator legs, boots and head, or in areas such as bins, distributors and tanks.

6.12.1.2 Portable Fire Extinguishers

All buildings within the Mill shall have fully charged and operable portable fire extinguishers. All employees shall be trained to use the equipment. Training must include the following:

- Correct type of extinguisher to use on different classes of fire
- Proper techniques for use of the equipment to extinguish a fire

6.12.1.3 Fire Hydrants

The plant shall have adequate private fire hydrants on site. The fire hydrant shall have a water supply of 20000 gallons stored in two 10000 gallons tanks.

6.12.2 Basics of Firefighting

The first steps in fighting a fire are determining the contents or materials burning in the fire and the extent (size) of the fire. The following are basic considerations for firefighting:

- Equipment that is operating shall be shut down.

- Portable extinguishing equipment shall be available in areas where the potential for fire is high.
- Employees shall be trained in the use of any firefighting equipment that they are expected to use.
- If personnel cannot isolate the fire, they shall evacuate the area.
- Warm or burning materials shall be removed as soon as possible.
- Equipment shall be restarted only after the fire area has been inspected and cleared by qualified personnel.

6.13 MANAGEMENT REVIEW

This plan describes the review of EMP and monitoring results of Yoke Pyo Co., Ltd the minimum side effects to the environment.

The Manager shall work with the GM and Department Managers to define monitoring requirements and evaluation of compliance, and has the overall responsibility for ensuring that the requirements of this procedure are implemented.

The Manager of Yoke Pyo Co., Ltd will be the responsible person of management review process. She shall be supported by the GM, departmental managers and various functional heads. The General Manager shall report the overall review of EMP to the Director.

7. PUBLIC CONSULTATION AND DISCLOSURE

7.1 OBJECTIVES

In order to acquire public opinion on the implementation of the traditional medicine production factory, public consultation works were done firstly disclosing relevant project information in local community. Public consultation and information disclosure works for traditional medicine production factory were carried out with the following objectives:

(a) To disseminate the project information, benefits and disadvantages of the project to general public so that they could understand the trade-offs;

(b) To be able to gain meaningful contribution of informed public; and

(c) To achieve greater trust of general public with the project proponent by disseminating relevant information.

7.2 PUBLIC CONSULTATIONMETHODOLOGY AND APPROACH

7.2.1 Personal Interviews

Personal interviews with local authorities from the three villages within project area were exercised to collect their opinion and suggestion. Then, interested persons from local community were consulted firstly disseminating project information to them and then acquiring their comments and suggestions. Consultation work household data survey process where the question requests comment and suggestion of the interviewee on the project.

7.2.2 Sample Size Calculation

Sample size calculation for the survey was based on Cochran formula with a confidence level of 95% and targeted confidence interval of 5%. The Cochran's formula is given as:

$$n = \frac{\frac{t^2 PQ}{d^2}}{1 + \frac{1}{N}(\frac{t^2 PQ}{d^2} - 1)}$$

Where, n = sample size

t = 1.96 for 95% confidence level

P, Q = 0.5

d = 0.05 for 5% confidence interval

N = Total household number

Table 96. Sample Size Calculation Results

Sr.	Village	Total Household	Required Sample Size	Actual Sample Size
1	Min Kyaung	230	78	84
2	Myaung Gyi	220	82	87
3	Bago Gone	250	89	91
Total		700	248	262

There were about 700 households in three villages with a required sample size of 248 households. A total of 262 households were sampled as could be seen in the following table. Actual confidence interval after sampling is 5.1%.

7.2.3 Open Discussion

An agenda was provided for open discussion with local people and representatives from IEE team and project proponent in public meetings which were collectively held for Yoke Pyo Traditional Medicine Production Factory at Yoke Pyo Traditional Medicine Production Factory of Shwe Bo Township, Shwe Bo Industrial Zone. Results from the open discussion session of the public meeting are shown in later section.

7.2.4 Information Disclosure

(a) Presentation

Representatives from project proponent and IEE teams gave presentations about their respective scope of works before general public in both public meetings.

(b) Translated Executive Summery

After the draft IEE report was compiled, executive summary of the report was translated into Myanmar ant the translated documents were delivered to local people and local authorities for their review and comments. The summary is attached in first section of this report.

7.3 PUBLIC CONSULTATION MEETINGS

Public Meeting for releasing IEE study results to general public requesting their comments and suggestions was carried out on 18thFebruary, 2020 at in Yoke Pyo Traditional Medicine Production Factory, Shwe Bo Township, Shwe Bo Industrial Zone. There were about (93) people from local community, employees from the project, representatives from the project and representative from Smart Environs Company Limited attended the public meeting and participated in open discussion.

7.4 SUMMARY OF CONSULTATIONS AND ACTIVITIES UNDERTAKEN

7.4.1 Initial Consultations

Public consultation meetings were held with U Phoe Zaw who is the Village Administrator of Myaung Gyi Village, U Nyunt Wai who is the village administrator of Min Kyaung Village and U Ba Tin who is the village administrator of Bago Gone on (15.2.2020). Project information and IEE process were explained to the village administrator. Discussions of the village administrator are as follows:

(1) Youngsters from local communities got job opportunities from Yoke Pyo
(2) Good for free medical treatment to local community by Yoke Pyo Co., Ltd
(3) Yoke Pyo Tradiditional Medicine Production Factory can't be effected to local communities

Figure 36. Consultation with Min Kyaung Village Administrator

Figure 37. Consultation with Local Villages

7.5 INFROMATION DISCLOSURE

Following activities were performed to disseminate the relevant project information and IEE works for general public.

i. Representative from the Yoke Pyo Company Limited performed a presentation about the project in public meeting

ii. Representative from Smart Environs Co., Ltd performed a presentation about the implementation of IEE study process and finding from IEE process for Yoke Pyo Traditional Medicine Production Factory in public meeting

iii. Representative from Smart Environs Co., Ltd performed a presentation about the implementation of biodiversity study process and finding from biodiversity studying process for Yoke Pyo Traditional Medicine Production Factory in public meeting

Figure 38. Disclosure of Information in Public Meeting

7.5.1 Public Comments and Suggestion

(a) Suggestion letters in which general public can put their comments and suggestions for the project were delivered in first public meeting

(b) Open discussion and consultation works were exercised in both public meetings

There were not any public comments and suggestions from both public consultation meetings and public meeting since Yoke Pyo Factory was Traditional Medicine Production Factory, there were no emissions of air, waste water discharge and noise pollution. There was a little odour emission but local people near the factory favored the odour of traditional medicine.

Table 97. Comments and Suggestions from Local Community

Sr.	Topic	Frequency	Percent	Simplified
1	Job Opportunity	7	8.3	Job 2.9%
2	Emission to air of odor	1	1.2	Impact 1.2%
3	CSR(Road)	37	44.0	CSR 95.9%
4	CSR(Health)	13	15.5	
5	CSR(Education)	13	15.5	
6	CSR(Drainage)	2	2.4	
7	CSR(Water supply)	11	13.1	
	Total	315	100.0	100.0

Table 98. Simplified Issues

Sr.	**Topic**	**Percentage**
1	Job	2.9
2	Impact	1.2
3	CSR	95.9
Total		100

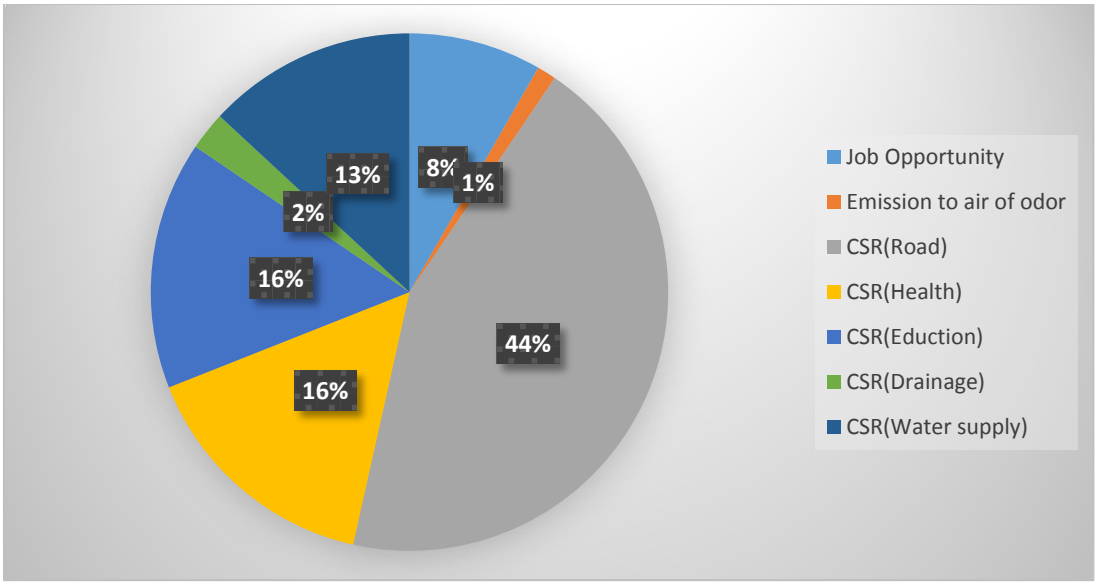

Figure 39. Summarized Public Comments and Suggestions

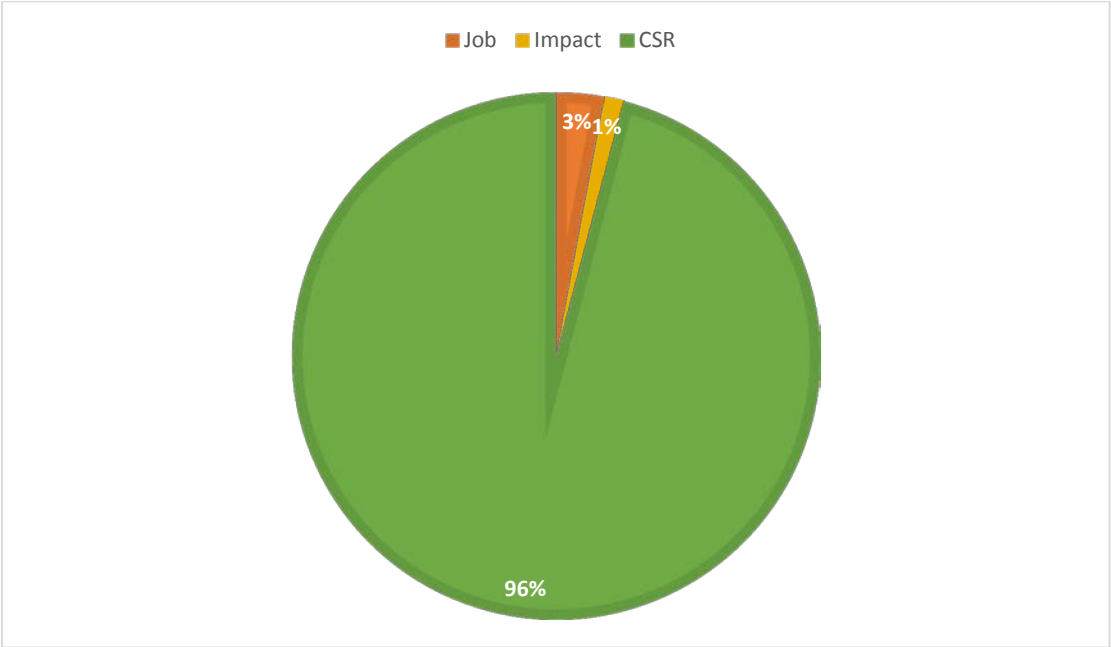

Figure 40. Simplified Public Comments and Suggestions

7.5.2 Dissemination of Results from IEE Studies

(a) Executive summary of draft IEE reports translated into Myanmar was delivered to general public meeting

(b) Translated executive summary was also delivered towards administration offices so that community could be freely accessible.

7.6 GRIEVANCE REDRESS MECHANISM

7.6.1 Community Grievance Mechanism

A grievance mechanism will be created by Yoke Pyo so that stakeholders can raise questions or concerns with the Project and have the concerns addressed in a prompt and respectful manner. Should a grievance or complaint be made, the complaint/grievance will be received by a Community Liaison Officer or similar. The grievance will be recorded and investigated and responded to. Should the complainant not accept the response, a review will be carried out. Once resolved, the grievance will be closed out and recorded in the grievance register.

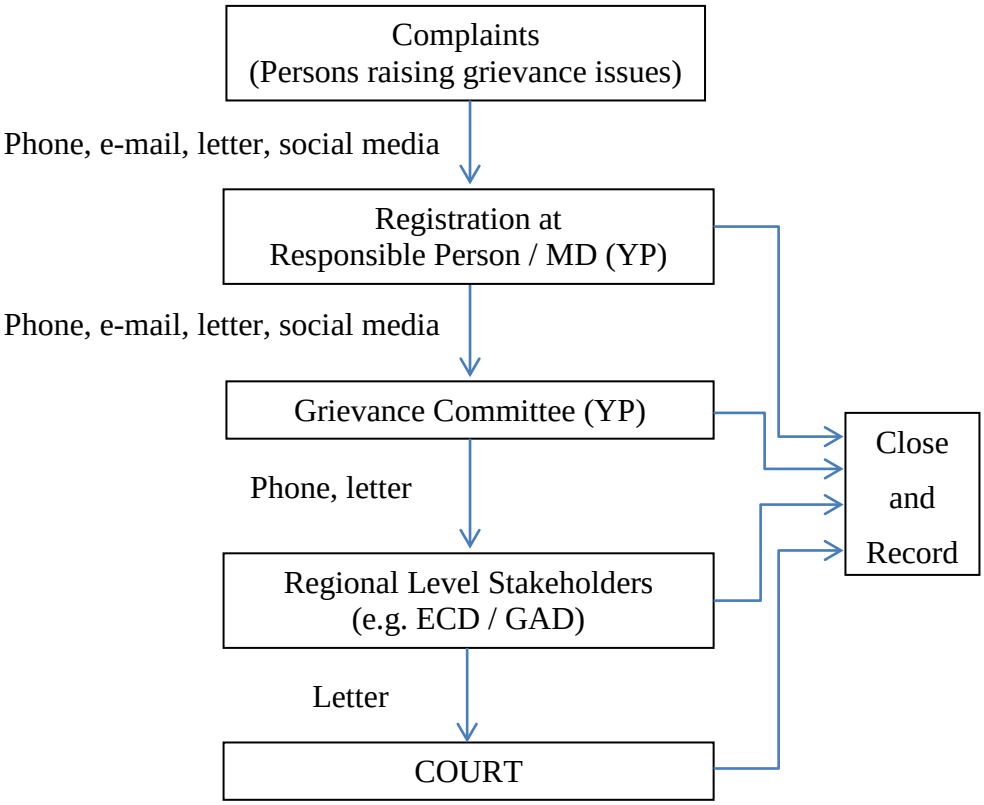

Figure 41. Grievance Redress Mechanism

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Appendix A

MATERIAL SAFETY DATA SHEETS FOR CHEMICALS

1. Maize Starch

2. Citric Acid

3. Glycerol

4. Potassium Nitrate (ယမ်းစိမ်း)

5. Sulphur

6. Sal Ammoniac (ခဝက်သာ)

SAFETY DATA SHEET

Creation Date 09-Dec-2010 **Revision Date** 01-Jan-2021 **Revision Number** 7

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Description: **Starch, maize**
Cat No. : **S/7880/60**
Synonyms Potato starch: iodine indicator.; Corn starch
CAS-No 9005-25-8
EC-No. 232-679-6
Molecular Formula (C6 H10 O5)n

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company

UK entity/business name
Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom

EU entity/business name
Acros Organics BVBA
Janssen Pharmaceuticalaan 3a
2440 Geel, Belgium

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

Tel: 01509 231166
Chemtrec US: (800) 424-9300
Chemtrec EU: 001 (202) 483-7616

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Based on available data, the classification criteria are not met

Health hazards
Based on available data, the classification criteria are not met

Environmental hazards
Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

2.2. Label elements

Hazard Statements

Precautionary Statements

2.3. Other hazards

No information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	CAS-No	EC-No.	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Starch	9005-25-8	EEC No. 232-679-6	100	-

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water. Get medical attention if symptoms occur.

Ingestion Do NOT induce vomiting. Get medical attention if symptoms occur.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention if symptoms occur.

Self-Protection of the First Aider No special precautions required.

4.2. Most important symptoms and effects, both acute and delayed

No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Water spray. Carbon dioxide (CO_2). Dry chemical. Chemical foam.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO_2).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Ensure adequate ventilation. Avoid dust formation.

6.2. Environmental precautions

See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid dust formation. Do not breathe dust. Avoid contact with skin and eyes.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep in a dry, cool and well-ventilated place. Keep container tightly closed.

Technical Rules for Hazardous Substances (TRGS) 510 Storage Class (LGK) (Germany) Class 11

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s): **UK** - EH40/2005 Work Exposure Limits, Third edition. Published 2018. **IRE -** 2018 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
Starch	STEL: 30 mg/m³ 15 min STEL: 12 mg/m³ 15 min TWA: 10 mg/m³ 8 hr TWA: 4 mg/m³ 8 hr		TWA: 10 mg/m³ 8 hr. total inhalable dust TWA: 4 mg/m³ 8 hr. respirable dust STEL: 30 mg/m³ 15 min STEL: 12 mg/m³ 15 min

Biological limit values
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS14/3 General methods for sampling and gravimetric analysis of respirable and inhalable dust

Derived No Effect Level (DNEL) No information available

Route of exposure	Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Oral				
Dermal				
Inhalation				

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Eye Protection Wear safety glasses with side shields (or goggles) (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber Neoprene Natural rubber PVC	See manufacturers recommendations	-	EN 374	(minimum requirement)

Skin and body protection Long sleeved clothing

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Particle filter 2

Small scale/Laboratory use Maintain adequate ventilation

Environmental exposure controls No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State	Powder Solid	
Appearance	Off-white	
Odor	Odorless	
Odor Threshold	No data available	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	No information available	
Flammability (liquid)	Not applicable	Solid
Flammability (solid,gas)	No information available	
Explosion Limits	No data available	
Flash Point	No information available	**Method -** No information available
Autoignition Temperature	400 °C / 752 °F	
Decomposition Temperature	200 °C	
pH	5 - 7	(2 %)
Viscosity	Not applicable	Solid
Water Solubility	Insoluble in cold water. Soluble in hot water	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Vapor Pressure	negligible	
Density / Specific Gravity	1.5	
Bulk Density	No data available	
Vapor Density	Not applicable	Solid
Particle characteristics	No data available	

9.2. Other information

Molecular Formula	(C6 H10 O5)n
Evaporation Rate	Not applicable - Solid

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	No information available.

10.4. Conditions to avoid

Avoid dust formation. Incompatible products. Excess heat.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information No acute toxicity information is available for this product

(a) acute toxicity;

Oral	No data available
Dermal	No data available
Inhalation	No data available

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;

Respiratory	No data available
Skin	No data available

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity;	No data available
(h) STOT-single exposure;	No data available
(i) STOT-repeated exposure;	No data available
Target Organs	No information available.
(j) aspiration hazard;	Not applicable Solid
Symptoms / effects,both acute and delayed	No information available.

11.2. Information on other hazards

Endocrine Disrupting Properties	Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects	Contains no substances known to be hazardous to the environment or that are not degradable in waste water treatment plants.

12.2. Persistence and degradability

Persistence	Persistence is unlikely, based on information available.
12.3. Bioaccumulative potential	MATERIAL DOES NOT BIOACCUMULATE
12.4. Mobility in soil	The product is water soluble, and may spread in water systems. Will likely be mobile in the environment due to its water solubility. Highly mobile in soils
12.5. Results of PBT and vPvB assessment	No data available for assessment.

12.6. Endocrine disrupting properties

Endocrine Disruptor Information	This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects

Persistent Organic Pollutant	This product does not contain any known or suspected substance
Ozone Depletion Potential	This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products	Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.
Contaminated Packaging	Empty remaining contents. Dispose of in accordance with local regulations. Do not re-use empty containers.
European Waste Catalogue (EWC)	According to the European Waste Catalog, Waste Codes are not product specific, but application specific.
Other Information	Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

ADR Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

IATA Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories
X = listed, Europe (EINECS/ELINCS/NLP), U.S.A. (TSCA), Canada (DSL/NDSL), Philippines (PICCS), China (IECSC), Japan (ENCS), Australia (AICS), Korea (ECL).

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	IECSC	AICS	KECL
Starch	232-679-6	-		X	X	-	X	X	X	X	KE-32128

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

National Regulations

WGK Classification See table for values

Component	Germany - Water Classification (VwVwS)	Germany - TA-Luft Class
Starch	WGK1	

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC (volatile organic compound)

Key literature references and sources for data
https://echa.europa.eu/information-on-chemicals
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Creation Date 09-Dec-2010
Revision Date 01-Jan-2021
Revision Summary Update to CLP Format.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006 COMMISSION REGULATION (EU) 2020/878 amending Annex II to Regulation (EC) No 1907/2006

Disclaimer

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

End of Safety Data Sheet

Safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH)

Citric acid ≥99,5 %, p.a., ACS, anhydrous

article number: **X863**
Version: **3.0 en**
Replaces version of: 2021-02-25
Version: (2)

date of compilation: 2015-06-17
Revision: 2021-10-12

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Identification of the substance	**Citric acid** ≥99,5 %, p.a., ACS, anhydrous
Article number	X863
Registration number (REACH)	01-2119457026-42-xxxx
Index number in CLP Annex VI	607-750-00-3
EC number	201-069-1
CAS number	77-92-9

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 products which come into contact with foodstuffs. Do not use for private purposes (household).

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 Birmingham	844 892 0111	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.3	Serious eye damage/eye irritation	2	Eye Irrit. 2	H319
3.8R	Specific target organ toxicity - single exposure (respirat-ory tract irritation)	3	STOT SE 3	H335

For full text of abbreviations: see SECTION 16

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word **Warning**

Pictograms

GHS07

Hazard statements

H319 Causes serious eye irritation
H335 May cause respiratory irritation

Precautionary statements

Precautionary statements - prevention

P261 Avoid breathing mist/vapours/spray
P280 Wear protective gloves/eye protection

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

Labelling of packages where the contents do not exceed 125 ml

Signal word: **Warning**

Symbol(s)

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.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Citric acid
Molecular formula	$C_6H_8O_7$
Molar mass	192,1 $^{g}/_{mol}$
REACH Reg. No	01-2119457026-42-xxxx
CAS No	77-92-9
EC No	201-069-1
Index No	607-750-00-3

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. In all cases of doubt, or when symptoms persist, seek medical advice.

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, Cough, Dyspnoea

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

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. The product is an acid. Before discharge into sewage plants the product normally needs to be neutralised.

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

Provision of sufficient ventilation. Avoid dust formation.

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.

Consideration of other advice:

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)

This information is not available.

Environmental values

Relevant PNECs and other threshold levels

End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0,44 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0,044 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	1.000 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	34,6 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	3,46 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	33,1 mg/kg	terrestrial organisms	soil	short-term (single instance)

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

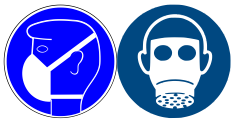
• breakthrough times of the glove material

>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). P2 (filters at least 94 % 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	crystalline
Colour	white
Odour	odourless
Melting point/freezing point	153 °C (ECHA)
Boiling point or initial boiling point and boiling range	not determined
Flammability	this material is combustible, but will not ignite readily
Lower and upper explosion limit	not determined
Flash point	not applicable
Auto-ignition temperature	not determined
Decomposition temperature	>155 °C

pH (value)	1,6 – 1,8 (in aqueous solution: 100 $^{g}/_{l}$, 20 °C)
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	1.300 $^{g}/_{l}$ at 20 °C
Partition coefficient	
Partition coefficient n-octanol/water (log value):	-1,64 (TOXNET)
Vapour pressure	0 Pa at 25 °C
Density	1,67 $^{g}/_{cm^3}$ at 20 °C
Relative vapour density	information on this property is not available
Bulk density	500 – 600 $^{kg}/_{m^3}$
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

The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

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: strong oxidiser, Metals, Reducing agents, Strong alkali

10.4 Conditions to avoid

Keep away from heat. Decompostion takes place from temperatures above: >155 °C.

10.5 Incompatible materials

different metals

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Shall not be classified as acutely toxic.

Acute toxicity					
Exposure route	**Endpoint**	**Value**	**Species**	**Method**	**Source**
oral	LD50	5.400 $^{mg}/_{kg}$	mouse		ECHA
dermal	LD50	>2.000 $^{mg}/_{kg}$	rat		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

May cause respiratory irritation.

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

Irritation to respiratory tract, cough, Dyspnoea

• If on skin

Data are not available.

• Other information

none

11.2 Endocrine disrupting properties

Not listed.

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	440 $^{mg}/_{l}$	fish	ECHA	48 h

Biodegradation

Data are not available.

12.2 Process of degradability

Theoretical Oxygen Demand: 0,7494 $^{mg}/_{mg}$
Theoretical Carbon Dioxide: 1,374 $^{mg}/_{mg}$

Process of degradability		
Process	**Degradation rate**	**Time**
biotic/abiotic	98 %	2 d

12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)	-1,64 (TOXNET)

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

Not listed.

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.

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. Waste catalogue ordinance (Germany).

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.

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

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Not subject to ADR, RID and ADN.

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)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)

Name of substance	Name acc. to inventory	CAS No	Restriction	No
Citric acid	substances in tattoo inks and permanent make-up		R75	75

Legend

R75 1. Shall not be placed on the market in mixtures for use for tattooing purposes, and mixtures containing any such substances shall not be used for tattooing purposes, after 4 January 2022 if the substance or substances in question is or are present in the following circumstances:
(a) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(b) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as reproductive toxicant category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(c) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin sensitiser category 1, 1A or 1B, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(d) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2, or as serious eye damage category 1 or eye irritant category 2, the substance is present in the mixture in a concentration equal to or greater than:
(i) 0,1 % by weight, if the substance is used solely as a pH regulator;
(ii) 0,01 % by weight, in all other cases;
(e) in the case of a substance listed in Annex II to Regulation (EC) No 1223/2009 (*1), the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(f) in the case of a substance for which a condition of one or more of the following kinds is specified in column g (Product type, Body parts) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight:
(i) “Rinse-off products”;
(ii) “Not to be used in products applied on mucous membranes”;
(iii) “Not to be used in eye products”;
(g) in the case of a substance for which a condition is specified in column h (Maximum concentration in ready for use preparation) or column i (Other) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration, or in some other way, that does not accord with the condition specified in that column;
(h) in the case of a substance listed in Appendix 13 to this Annex, the substance is present in the mixture in a concentration equal to or greater than the concentration limit specified for that substance in that Appendix.
2. For the purposes of this entry use of a mixture “for tattooing purposes” means injection or introduction of the mixture into a person’s skin, mucous membrane or eyeball, by any process or procedure (including procedures commonly referred to as permanent make-up, cosmetic tattooing, micro-blading and micro-pigmentation), with the aim of making a mark or design on his or her body.
3. If a substance not listed in Appendix 13 falls within more than one of points (a) to (g) of paragraph 1, the strictest concentration limit laid down in the points in question shall apply to that substance. If a substance listed in Appendix 13 also falls within one or more of points (a) to (g) of paragraph 1, the concentration limit laid down in point (h) of paragraph 1 shall apply to that substance.
4. By way of derogation, paragraph 1 shall not apply to the following substances until 4 January 2023:
(a) Pigment Blue 15:3 (CI 74160, EC No 205-685-1, CAS No 147-14-8);
(b) Pigment Green 7 (CI 74260, EC No 215-524-7, CAS No 1328-53-6).
5. If Part 3 of Annex VI to Regulation (EC) No 1272/2008 is amended after 4 January 2021 to classify or re-classify a substance such that the substance then becomes caught by point (a), (b), (c) or (d) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the date of application of that new or revised classification is after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect on the date of application of that new or revised classification.
6. If Annex II or Annex IV to Regulation (EC) No 1223/2009 is amended after 4 January 2021 to list or change the listing of a substance such that the substance then becomes caught by point (e), (f) or (g) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the amendment takes effect after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect from the date falling 18 months after entry into force of the act by which that amendment was made.
7. Suppliers placing a mixture on the market for use for tattooing purposes shall ensure that, after 4 January 2022, the mixture is marked with the following information:
(a) the statement “Mixture for use in tattoos or permanent make-up”;
(b) a reference number to uniquely identify the batch;
(c) the list of ingredients in accordance with the nomenclature established in the glossary of common ingredient names pursuant to Article 33 of Regulation (EC) No 1223/2009, or in the absence of a common ingredient name, the IUPAC name. In the absence of a common ingredient name or IUPAC name, the CAS and EC number. Ingredients shall be listed in descending order by weight or volume of the ingredients at the time of formulation. “Ingredient” means any substance added during the process of formulation and present in the mixture for use for tattooing purposes. Impurities shall not be regarded as ingredients. If the name of a substance, used as ingredient within the meaning of

Legend

this entry, is already required to be stated on the label in accordance with Regulation (EC) No 1272/2008, that ingredient does not need to be marked in accordance with this Regulation;
(d) the additional statement “pH regulator” for substances falling under point (d)(i) of paragraph 1;
(e) the statement "Contains nickel. Can cause allergic reactions." if the mixture contains nickel below the concentration limit specified in Appendix 13;
(f) the statement "Contains chromium (VI). Can cause allergic reactions." if the mixture contains chromium (VI) below the concentration limit specified in Appendix 13;
(g) safety instructions for use insofar as they are not already required to be stated on the label by Regulation (EC) No 1272/2008.
The information shall be clearly visible, easily legible and marked in a way that is indelible.
The information shall be written in the official language(s) of the Member State(s) where the mixture is placed on the market, unless the Member State(s) concerned provide(s) otherwise.
Where necessary because of the size of the package, the information listed in the first subparagraph, except for point (a), shall be included instead in the instructions for use.
Before using a mixture for tattooing purposes, the person using the mixture shall provide the person undergoing the procedure with the information marked on the package or included in the instructions for use pursuant to this paragraph.
8. Mixtures that do not contain the statement “Mixture for use in tattoos or permanent make-up” shall not be used for tattooing purposes.
9. This entry does not apply to substances that are gases at temperature of 20 °C and pressure of 101,3 kPa, or generate a vapour pressure of more than 300 kPa at temperature of 50 °C, with the exception of formaldehyde (CAS No 50-00-0, EC No 200-001-8).
10. This entry does not apply to the placing on the market of a mixture for use for tattooing purposes, or to the use of a mixture for tattooing purposes, when placed on the market exclusively as a medical device or an accessory to a medical device, within the meaning of Regulation (EU) 2017/745, or when used exclusively as a medical device or an accessory to a medical device, within the same meaning. Where the placing on the market or use may not be exclusively as a medical device or an accessory to a medical device, the requirements of Regulation (EU) 2017/745 and of this Regulation shall apply cumulatively.

List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list

Not listed.

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 % , 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)

not listed

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

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	AICS	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
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

Legend

AICS	Australian Inventory of Chemical Substances
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
KECI	Korea Existing Chemicals 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)

Alignment to regulation: Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU

Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.1		Classification according to Regulation (EC) No 1272/2008 (CLP): change in the listing (table)	yes
2.2		Pictograms: change in the listing (table)	yes
2.2		Hazard statements: change in the listing (table)	yes
2.2		Precautionary statements - prevention: change in the listing (table)	yes
2.3	Other hazards: There is no additional information.	Other hazards	yes
2.3		Results of PBT and vPvB assessment: According to the results of its assessment, this substance is not a PBT or a vPvB.	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
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)
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DGR	Dangerous Goods Regulations (see IATA/DGR)
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)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
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

Abbr.	Descriptions of used abbreviations
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
PNEC	Predicted No-Effect Concentration
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)
SVHC	Substance of Very High Concern
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). 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.
H335	May cause respiratory 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.

Material Safety Data Sheet
Glycerol, Reagent ACS

MSDS# 96129

Section 1 - Chemical Product and Company Identification

MSDS Name: Glycerol, Reagent ACS

Catalog Numbers: AC410980000, AC410980040, AC410980200, 41098-5000, AC41098500L

Synonyms: Glycerol; 1,2,3-Propanetriol; Glyceritol; Glycic Alcohol; 1,2,3-Trihydroxypropane; 1,2,3-Propanetriol

Company Identification:	Acros Organics BVBA Janssen Pharmaceuticalaan 3a 2440 Geel, Belgium
Company Identification: (USA)	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	800-ACROS-01
For information in Europe, call:	+32 14 57 52 11
Emergency Number, Europe:	+32 14 57 52 99
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300
CHEMTREC Phone Number, Europe:	703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#:	56-81-5
Chemical Name:	Glycerol
%:	100.0
EINECS#:	200-289-5

Hazard Symbols: None listed

Risk Phrases: None listed

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Caution! This is expected to be a low hazard for usual industrial handling. May cause eye, skin, and respiratory tract irritation. Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling. May cause headache.

Inhalation: Low hazard for usual industrial handling. Inhalation of a mist of this material may cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Autoignition Temperature: 400 deg C (752.00 deg F)

Flash Point: 193 deg C (379.40 deg F)

Explosion Limits: Lower: 1.1

Explosion Limits: Upper: Not available

NFPA Rating: health: 1; flammability: 1; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycerol	10 mg/m3 (mist)	none listed	15 mg/m3 TWA (total); 5 mg/m3 TWA (respirable fraction)

OSHA Vacated PELs: Glycerol: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Liquid
Color:	Clear
Odor:	faint odor
pH:	Not available
Vapor Pressure:	0.003 mbar @ 50 deg C
Vapor Density:	3.17 (H2O=1)
Evaporation Rate:	Not available
Viscosity:	Not available
Boiling Point:	290 deg C (554.00°F)
Freezing/Melting Point:	-6.7 deg C (19.94°F)
Decomposition Temperature:	
Solubility in water:	Miscible in water. Insol. in chloroform,
Specific Gravity/Density:	1.4746
Molecular Formula:	C3H8O3
Molecular Weight:	92.0542

Section 10 - Stability and Reactivity

Chemical Stability:	Stable.
Conditions to Avoid:	Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials	Not available
Hazardous Decomposition Products	Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization	Will not occur.

Section 11 - Toxicological Information

RTECS#:	CAS# 56-81-5: MA8050000
LD50/LC50:	RTECS: **CAS# 56-81-5:** Draize test, rabbit, eye: 126 mg Mild; Draize test, rabbit, eye: 500 mg/24H Mild; Draize test, rabbit, skin: 500 mg/24H Mild; Inhalation, rat: LC50 = >570 mg/m3/1H; Oral, mouse: LD50 = 4090 mg/kg; Oral, rabbit: LD50 = 27 gm/kg; Oral, rat: LD50 = 12600 mg/kg; Skin, rabbit: LD50 = >10 gm/kg; .
Carcinogenicity:	Glycerol - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:	See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:
Packing Group:
Canada TDG
Shipping Name: Not available
Hazard Class:
UN Number:
Packing Group:

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:Not available

Risk Phrases:

Safety Phrases:

S 28A After contact with skin, wash immediately with plenty of water.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 56-81-5: 0

Canada

CAS# 56-81-5 is listed on Canada's DSL List

Canadian WHMIS Classifications: D2B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 56-81-5 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

CAS# 56-81-5 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 7/20/1999

Revision #7 Date 7/20/2009

Potassium Nitrate

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 11/19/2004 Revision date: 09/12/2019 Supersedes: 02/13/2018 Version: 1.3

SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Substance name	:	Potassium Nitrate
CAS-No.	:	7757-79-1
Product code	:	LC19818
Formula	:	KNO3
Synonyms	:	niter / nitrate of potash / nitrate of potassium / nitre / nitric acid potassium salt / saltpeter / saltpetre / vicknite

1.2. Recommended use and restrictions on use

Use of the substance/mixture	:	For laboratory and manufacturing use only.
Recommended use	:	Laboratory chemicals
Restrictions on use	:	Not for food, drug or household use

1.3. Supplier

LabChem, Inc.
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number	:	CHEMTREC: 1-800-424-9300 or +1-703-741-5970

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Oxidizing solids Category 3	H272 May intensify fire; oxidizer
Skin corrosion/irritation Category 2	H315 Causes skin irritation
Serious eye damage/eye irritation Category 2A	H319 Causes serious eye irritation
Specific target organ toxicity (single exposure) Category 3	H335 May cause respiratory irritation

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Warning

Hazard statements (GHS US) :
H272 - May intensify fire; oxidizer
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary statements (GHS US) :
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P220 - Keep/Store away from clothing, combustible materials
P221 - Take any precaution to avoid mixing with combustibles
P261 - Avoid breathing dust.
P264 - Wash exposed skin thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.

P362 - Take off contaminated clothing and wash before reuse.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS US classification
Potassium Nitrate (Main constituent)	(CAS-No.) 7757-79-1	100	Ox. Sol. 3, H272 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. Never give alcohol to drink.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

First-aid measures after eye contact : Rinse with water. Remove contact lenses, if present and easy to do. Continue rinsing. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Victim is fully conscious: immediately induce vomiting. Induce vomiting by giving a 0.9 % saline solution. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital. Doctor: administration of chemical antidote.

4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms : Obstructs oxygen absorption. Practically non-toxic if swallowed (LD50 oral 2000/5000 mg/kg). Non-toxic in contact with skin (LD50 skin> 5000 mg/kg). Not irritant to skin. Slightly harmful by inhalation. Not irritant to eyes.

Symptoms/effects after inhalation : AFTER INHALATION OF DUST: Dry/sore throat. Coughing.

Symptoms/effects after skin contact : No effects known.

Symptoms/effects after eye contact : No effects known.

Symptoms/effects after ingestion : Gastrointestinal complaints. Vomiting. Nausea. Diarrhoea. AFTER ABSORPTION OF LARGE QUANTITIES: Blood in stool. Methemoglobinemia. FOLLOWING SYMPTOMS MAY APPEAR LATER: Blue/grey discoloration of the skin. Dizziness. Feeling of weakness. Disturbances of heart rate. Headache. Disturbances of consciousness.

Chronic symptoms : No effects known.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water. Quick-acting ABC powder extinguisher. Quick-acting CO2 extinguisher. Quantities of water.

Unsuitable extinguishing media : Foam. Foam.

5.2. Specific hazards arising from the chemical

Fire hazard : DIRECT FIRE HAZARD. Non combustible. INDIRECT FIRE HAZARD. May intensify fire; oxidiser. Reactions involving a fire hazard: see "Reactivity Hazard".

Explosion hazard : DIRECT EXPLOSION HAZARD. No direct explosion hazard.

5.3. Special protective equipment and precautions for fire-fighters

Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Dilute toxic gases with water spray. Take account of toxic/corrosive precipitation water.

Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective clothing. Dust cloud production: compressed air/oxygen apparatus. Reactivity hazard: compressed air/oxygen apparatus. Reactivity hazard: gas-tight suit.

Emergency procedures : Mark the danger area. Prevent dust cloud formation, e.g. by wetting. No naked flames. Keep containers closed. Wash contaminated clothes. In case of hazardous reactions: keep upwind. In case of reactivity hazard: consider evacuation.

Measures in case of dust release : In case of dust production: keep upwind. Dust production: have neighbourhood close doors and windows.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

No additional information available

6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. If reacting: dilute toxic gas/vapour with water spray. Take account of toxic/corrosive precipitation water.

Methods for cleaning up : Prevent dispersion by covering with dry sand/earth. Scoop solid spill into closing containers. Spill must not return in its original container. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid raising dust. Keep away from naked flames/heat. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Keep the substance free from contamination. Thoroughly clean/dry the installation before use. Keep container tightly closed.

Hygiene measures : Observe normal hygiene standards.

7.2. Conditions for safe storage, including any incompatibilities

Storage temperature : 20 °C

Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources.

Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: combustible materials. reducing agents. strong acids. metals. organic materials. water/moisture.

Storage area : Store in a cool area. Store in a dry area. Keep container in a well-ventilated place. Keep only in the original container. Fireproof storeroom. Detached building. Meet the legal requirements.

Special rules on packaging : SPECIAL REQUIREMENTS: closing. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials : SUITABLE MATERIAL: synthetic material. glass. MATERIAL TO AVOID: wood.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves. Safety glasses. Dust production: dust mask with filter type P2.

Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: nitrile rubber. GIVE GOOD RESISTANCE: butyl rubber. neoprene. rubber. GIVE POOR RESISTANCE: natural fibres

Hand protection:

Protective gloves against chemicals (EN 374)

Eye protection:

Safety glasses. In case of dust production: protective goggles

Skin and body protection:

Protective clothing

Respiratory protection:

Dust production: dust mask with filter type P1

Personal protective equipment symbol(s):

Thermal hazard protection:

None necessary.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Appearance	:	Crystalline solid. Crystalline powder.
Color	:	Colourless-white
Odor	:	Odorless
Odor threshold	:	No data available
pH	:	6 - 8 (5 %)
Melting point	:	334 °C
Freezing point	:	No data available
Boiling point	:	Not applicable
Flash point	:	Not applicable (solid)
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	No data available
Relative vapor density at 20 °C	:	3
Relative density	:	2.1

Specific gravity / density	:	2100 kg/m³
Molecular mass	:	101.1 g/mol
Solubility	:	Soluble in water. Soluble in glycerol. Water: 32 g/100ml Ethanol: 0.16 g/100ml
Log Pow	:	-0.79 (Estimated value, KOWWIN)
Auto-ignition temperature	:	Not applicable
Decomposition temperature	:	400 °C
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	May intensify fire; oxidiser.

9.2. Other information

Minimum ignition energy	:	Not applicable
SADT	:	Not applicable
VOC content	:	Not applicable (inorganic)
Other properties	:	Translucent.

SECTION 10: Stability and reactivity

10.1. Reactivity

Violent to explosive reaction with many compounds e.g.: with organic material, with combustible materials, with (some) metals and their compounds and with (strong) reducers. Decomposes on exposure to temperature rise: release of oxygen.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Direct sunlight. Heat. Incompatible materials. Open flame. Sparks.

10.5. Incompatible materials

combustible materials. Strong reducing agents.

10.6. Hazardous decomposition products

Nitrogen oxides. oxygen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified

Potassium Nitrate (7757-79-1)	
LD50 oral rat	> 2000 mg/kg body weight (OECD 425: Acute Oral Toxicity: Up-and-Down Procedure, Rat, Male / female, Read-across, Oral, 14 day(s))
LD50 dermal rat	> 5000 mg/kg body weight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Skin, 14 day(s))
LC50 inhalation rat (mg/l)	> 0.527 mg/l (OECD 403: Acute Inhalation Toxicity, 4 h, Rat, Male / female, Experimental value, (maximum achievable concentration), Inhalation (dust), 14 day(s))
ATE US (oral)	3750 mg/kg body weight

Skin corrosion/irritation	:	Causes skin irritation. pH: 6 - 8 (5 %)
Serious eye damage/irritation	:	Causes serious eye irritation. pH: 6 - 8 (5 %)
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified

Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
STOT-single exposure	:	May cause respiratory irritation.
STOT-repeated exposure	:	Not classified
Aspiration hazard	:	Not classified
Viscosity, kinematic	:	No data available
Likely routes of exposure	:	Inhalation. Skin and eye contact.
Potential Adverse human health effects and symptoms	:	Obstructs oxygen absorption. Practically non-toxic if swallowed (LD50 oral 2000/5000 mg/kg). Non-toxic in contact with skin (LD50 skin> 5000 mg/kg). Not irritant to skin. Slightly harmful by inhalation. Not irritant to eyes.
Symptoms/effects after inhalation	:	AFTER INHALATION OF DUST: Dry/sore throat. Coughing.
Symptoms/effects after skin contact	:	No effects known.
Symptoms/effects after eye contact	:	No effects known.
Symptoms/effects after ingestion	:	Gastrointestinal complaints. Vomiting. Nausea. Diarrhoea. AFTER ABSORPTION OF LARGE QUANTITIES: Blood in stool. Methemoglobinemia. FOLLOWING SYMPTOMS MAY APPEAR LATER: Blue/grey discoloration of the skin. Dizziness. Feeling of weakness. Disturbances of heart rate. Headache. Disturbances of consciousness.
Chronic symptoms	:	No effects known.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	:	Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.
Ecology - air	:	Not included in the list of substances which may contribute to the greenhouse effect (IPCC). Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
Ecology - water	:	Slightly harmful to crustacea. Not harmful to fishes. Groundwater pollutant. No inhibition of activated sludge. May cause eutrophication. Not harmful to algae.

Potassium Nitrate (7757-79-1)	
LC50 fish 1	1378 mg/l (Equivalent or similar to OECD 203, 96 h, Poecilia reticulata, Static system, Fresh water, Experimental value)
EC50 Daphnia 1	490 mg/l (48 h, Daphnia magna, Fresh water, Experimental value)
ErC50 (algae)	> 1700 mg/l (10 day(s), Diatomeae, Static system, Salt water, Experimental value, Nominal concentration)

12.2. Persistence and degradability

Potassium Nitrate (7757-79-1)	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)

12.3. Bioaccumulative potential

Potassium Nitrate (7757-79-1)	
BCF fish 1	3.162 l/kg (BCFBAF v3.01, Calculated value, Fresh weight)
Log Pow	-0.79 (Estimated value, KOWWIN)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

12.4. Mobility in soil

Potassium Nitrate (7757-79-1)	
Ecology - soil	Adsorbs into the soil.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Do not discharge into drains or the environment. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Remove to an authorized dump (Class I). Precipitate/make insoluble.

Additional information : Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1486 Potassium nitrate, 5.1, III

UN-No.(DOT) : UN1486

Proper Shipping Name (DOT) : Potassium nitrate

Packing group (DOT) : III - Minor Danger

Hazard labels (DOT) : 5.1 - Oxidizer

DOT Packaging Non Bulk (49 CFR 173.xxx) : 213

DOT Packaging Bulk (49 CFR 173.xxx) : 240

DOT Special Provisions (49 CFR 172.102) : A1 - Single packaging are not permitted on passenger aircraft.
A29 - Combination packaging consisting of outer expanded plastic boxes with inner plastic bags are not authorized for transportation by aircraft.
IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
IP3 - Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner.
T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2)
TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.
W1 - This substance in a non friable prill or granule form is not subject to the requirements of this subchapter when tested in accordance with the UN Manual of Test and Criteria (IBR, see §171.7 of this subchapter) and is found to not meet the definition or criteria for inclusion in Division 5.1.

DOT Packaging Exceptions (49 CFR 173.xxx) : 152

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 25 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 100 kg

DOT Vessel Stowage Location : A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.

Other information : No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

Potassium Nitrate (7757-79-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Physical hazard - Oxidizer (liquid, solid or gas) Health hazard - Serious eye damage or eye irritation Health hazard - Skin corrosion or Irritation Health hazard - Specific target organ toxicity (single or repeated exposure)

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.2. International regulations

CANADA

Potassium Nitrate (7757-79-1)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 09/12/2019

Full text of H-phrases: see section 16:

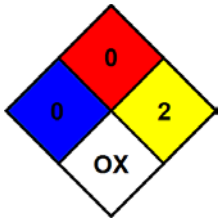
H272	May intensify fire; oxidizer
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.

NFPA specific hazard : OX - Materials that posses oxidizing properties.



Hazard Rating		
Health	:	1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	:	1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)
Physical	:	1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
Personal protection	:	F F - Safety glasses, Gloves, Synthetic apron, Dust respirator

SDS US LabChem

SULPHUR
SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product Identity: Molten Sulphur.

Trade Names and Synonyms: Sulfur, flowers of sulfur, brimstone.

Manufacturer:
Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:
Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8

Preparer:
Teck Metals Ltd.
Suite 3300 – 550 Burrard Street
Vancouver, British Columbia
V6C 0B3

Date of Last Revision: May 25, 2015.

Date of Last Edit: May 25, 2015.

Product Use: Raw material used in the manufacture of sulphuric acid and sulphur dioxide.

Note: Although this SDS was prepared to address the hazards of molten sulphur, Teck Metals Ltd. recognizes that the product transforms into a solid rapidly upon cooling. Sections 2, 4, 5, 6, 7, 8, 9, and 11 address the hazards of the dry, as well as the molten, state of sulphur.

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION:

Health		Physical	Environmental
Acute Toxicity (Oral, Inhalation)	– Does not meet criteria	**Flammable Solids – Category 2**	Aquatic Toxicity –
Skin Corrosion/Irritation	– Does not meet criteria	**Combustible Dust – Category 1**	Short Term/Long Term
Eye Damage/Eye Irritation	– Does not meet criteria		Does not meet criteria
Respiratory or Skin Sensitization	– Does not meet criteria		
Mutagenicity	– Does not meet criteria		
Carcinogenicity	– Does not meet criteria		
Reproductive Toxicity	– Does not meet criteria		
Specific Target Organ Toxicity			
Acute Exposure	– Does not meet criteria		
Chronic Exposure	– Does not meet criteria		

LABEL:

Symbols:

Signal Word:

WARNING

Hazard Statements	**Precautionary Statements:**
WARNING! Flammable Solid. May form combustible dust concentrations in air.	Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Ground and bond container and receiving equipment. Use explosion-proof equipment if dust cloud can occur. Wear protective gloves, clothing and eye protection (and face protection where appropriate). IN CASE OF FIRE: Use dry sand, etc. on small fires. Use water spray, fog or foam on larger fires.

Emergency Overview: A bright yellow powder or an amber-to-yellow liquid. Sulphur is relatively non-toxic and poses little immediate health hazard to the environment or emergency response personnel unless it is involved in a fire. Both solid and liquid sulphur are combustible and generate large quantities of toxic and irritating sulphur dioxide gas on burning. Molten sulphur is hot enough to cause serious thermal burns to unprotected skin. Wear full protective clothing and positive pressure self-contained breathing apparatus in emergency situations involving burning sulphur.

Potential Health Effects: Sulphur is relatively non-toxic to humans, causing only mild local irritation to the eyes, nose, throat and upper airways. However, under certain circumstances it may release toxic hydrogen sulphide and/or sulphur dioxide gas. Sulphur is not listed as a carcinogen by OSHA, NTP, IARC or ACGIH (see Toxicological Information, Section 11).

Potential Environmental Effects: This product has the potential to pose ecological risks to organisms in both aquatic and terrestrial environments. Discharge of the product to soil and water should be prevented (see Ecological Information, Section 12).

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	CAS Registry No.	CONCENTRATION (% wgt/wgt)
Sulphur	7704-34-9	99.5%

Note: See Section 8 for Occupational Exposure Guidelines.

SECTION 4. FIRST AID MEASURES

Eye Contact: *Symptoms:* Mild eye irritation, redness: Do not allow victim to rub eye(s). Let the eye(s) water naturally for a few minutes. If particle/dust does not dislodge, flush with lukewarm, gently flowing water for 5 minutes or until particle/dust is removed, while holding eyelid(s) open. If irritation persists, obtain medical advice/attention. DO NOT attempt to manually remove anything stuck to the eye.

Skin Contact: *Symptoms:* Mild irritation, dryness, thermal burn from molten sulphur. *Dry sulphur*: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice/attention. *Molten sulphur:* Flush contact area to solidify and cool but do not attempt to remove encrusted material or clothing. Cover burns and seek medical attention immediately.

Inhalation: *Symptoms:* Coughing, irritation in heavy dust clouds. Remove source of contamination or move victim from exposure area to fresh air. Obtain medical advice/attention if you are concerned or feel unwell.

Ingestion: *Symptoms:* Throat dryness, sulphur taste. If swallowed, no specific intervention is indicated as this material is not likely to be hazardous by ingestion. However, if irritation or discomfort occurs or you are concerned, obtain medical advice/attention.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Both molten and solid forms are combustible and will ignite at high temperatures (>200°C), burning with a pale blue flame that may be difficult to see in daylight. Sulphur dust suspended in air ignites easily and can cause explosions in confined spaces. Sulphur dust clouds can be ignited by friction, static electricity, heat, sparks or flames. Traces of hydrogen sulphide and sulphur vapor may present an explosion hazard if evolved into a confined space or enclosed space, particularly from molten sulphur. The LEL of hydrogen sulphide (4.3% by volume in air) may be exceeded in enclosed spaces above molten sulphur.

Extinguishing Media: Use water spray, fog or foam. Do not use direct water streams as the burning sulphur may float and further spread the fire. Sand, dry chemical or fine earth/finely crushed stone may be used for small fires. Steam or inert gases are excellent extinguishers for use in containers that can be tightly closed.

Fire Fighting: Toxic fumes of sulphur dioxide will result from combustion. Fire fighters must be fully-trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask. Do not spray water directly into containers of molten sulphur due to the danger of boil over. Also avoid spraying direct streams of water that may scatter burning sulphur and spread the fire or create sulphur dust clouds and cause an explosion. Evacuate non-essential personnel from the fire area immediately. For large fires, consider evacuation of an area downwind of fire if necessary. Fire will rekindle until mass has been cooled to below approximately 150°C. Cool surrounding area and containers until well after the fire is out to prevent re-ignition.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of spillage if possible to do so safely. Contain spill, isolate area, and deny entry to unauthorized personnel. Remove all potential ignition sources. Ventilate area. Prevent spread of liquid by diking or ditching and allowing material to cool and solidify. Clean up spilled material immediately, observing precautions in Section 8, Personal Protection and using methods which will minimize dust generation (e.g., dampen material and shovel or wet sweep using natural fiber brooms and aluminum shovels to prevent sparks). Return uncontaminated spilled material to the process if possible. Place contaminated material in suitable labeled containers for later recovery or disposal. Treat or dispose of waste material in

accordance with all local, regional, and national requirements. If molten sulphur is accidentally released into a confined or enclosed space, monitor for hydrogen sulphide and sulphur dioxide build-up in the vapor space above the spill.

Personal Precautions: Protective clothing, gloves, and an acid gas/particulate respirator are recommended for persons responding to an accidental release. Close-fitting safety goggles may also be necessary in some circumstances to prevent eye contact with sulphur dust.

Environmental Precautions: This product has the potential to pose ecological risks to organisms in both aquatic and terrestrial environments. Discharge of the product to soil and water should be prevented. Prevent spillage from entering sewers or natural watercourses.

SECTION 7. HANDLING AND STORAGE

Keep container closed and store in a dry, cool, covered, and well-ventilated area, away from flammable materials, sources of ignition and oxidizing agents. Hydrogen sulphide gas may accumulate in storage tanks and bulk transport compartments containing this material, particularly when molten, so always exercise caution when working around or opening bulk containers. Closed tanks or pits should be vented to the atmosphere using steam jacketed vent lines. Head space above molten sulphur may contain high concentrations of hydrogen sulphide or sulphur dioxide in the toxic and explosive range. Ventilate thoroughly before permitting entry. Avoid generating dust and the release of dust into the workplace as this creates a potential explosion hazard. Since dry sulphur may accumulate static charge build-up, which could become an ignition source, transfer using proper grounding procedures. See the latest edition of NFPA Standard 655 – Prevention of Sulphur Fires and Explosions for specific guidance on dust explosion prevention.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Guidelines:

Component	ACGIH TLV	OSHA PEL	NIOSH REL
Sulphur	None established*	None established*	None established*

NOTE: OEGs for individual jurisdictions may differ from those given above. Check with local authorities for the applicable OEGs in your jurisdiction.
ACGIH - American Conference of Governmental Industrial Hygienists; OSHA - Occupational Safety and Health Administration; NIOSH - National Institute for Occupational Safety and Health. TLV – Threshold Limit Value, PEL – Permissible Exposure Limit, REL – Recommended Exposure Limit.

** - NOTE: While there are no established OELs for elemental sulphur as such, there are OELs for the sulphur dioxide gas which will be formed during any combustion processes. The OSHA PEL for SO_2 is a time-weighted average concentration (TWA) of 5 ppm, the ACGIH TLV is a short term exposure limit (STEL) of 0.25 ppm and the NIOSH REL is a TWA of 2 ppm and a STEL of 5 ppm.*

NOTE: The selection of the necessary level of engineering controls and personal protective equipment will vary depending upon the conditions of use and the potential for exposure. The following are therefore only general guidelines that may not fit all circumstances. Control measures to consider include:

Ventilation: Use adequate local or general ventilation to maintain the concentration of sulphur dioxide and hydrogen sulphide in the working environment well below recommended occupational exposure limits. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Locate dust collectors outdoors if possible and provide dust collectors with explosion vents. Supply sufficient replacement air to make up for air removed by the exhaust system. Ventilation systems may need to be designed using steam tracing or other means to prevent plugging with sublimed sulphur.

Protective Clothing: Gloves and coveralls, shop coat or other work clothing with long sleeves are recommended to prevent direct skin contact, particularly when handling molten sulphur. Eye protection should be worn where fume or dust is generated. Chemical splash goggles and full face shield should be worn where any possibility exists that eye contact with liquid sulphur may occur. Respiratory protection may be required where fume or dust is generated. Workers should wear insulated gloves and heat- and chemical-resistant clothing when handling molten sulphur. Safety type boots are recommended.

Respirators: Where dust or sulphur dioxide are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (a combination of a 42CFR84 Class N, R or P-95 or 100 particulate filter and an acid gas cartridge). Where hydrogen sulphide is present or possibly present in confined spaces at hazardous levels a NIOSH-approved supplied air respirator or self-contained breathing apparatus (SCBA) is necessary.

General Hygiene Considerations: Precautions should be taken to minimize skin and eye contact with material. Refrain from eating or drinking in work areas. Smoking should not be permitted in any sulphur storage or handling areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate designated areas.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Amber to Yellow Liquid/Solid	**Odour:** Odourless or faint rotten egg odour	**Odour Threshold:** H_2S – <0.01 ppm	**pH:** Not Applicable
Vapour Pressure: <0.001 mm Hg @ 20°C 0.11 mm Hg @140°C	**Vapour Density:** Not Applicable	**Melting Point/Range:** 112-120°C	**Boiling Point/Range:** 444.6°C
Relative Density (Water = 1)**:** 1.92 - 2.07 Solid Sulphur 1.811 Molten Sulphur	**Evaporation Rate:** Not Available	**Coefficient of Water/Oil Distribution:** Not Available	**Solubility:** Insoluble
Bulk Density:	Liquid 1.811 kg/L (113 lb/ft^3)	Lumps 1201-1842 kg/m^3 (75 – 115 lb/ft^3)	Powder 528-1281 kg/m^3 (33 – 80 lb/ft^3)
Flash Point: 207°C	**Flammable Limits (LEL/UEL):** 35 g/m^3 / 1400 g/m^3 (Dust)	**Auto-ignition Temperature:** 232°C	**Decomposition Temperature:** Thermally stable

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: Sulphur is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Incompatibilities: Oxidizing agents, alkali metals, hydrogen, chlorine, fluorine. Sulphur may form explosive mixtures with powerful oxidizing agents such as chlorates, perchlorates and/or nitrates. Damp sulphur is corrosive to steel, particularly in the presence of chlorides.

Hazardous Decomposition Products: Burning sulphur liberates large volumes of sulphur dioxide which will be extremely irritating to eyes and breathing passages. Hydrogen sulphide gas may be released from molten sulphur under certain storage conditions and can accumulate to toxic and potentially explosive concentrations in the vapor space of molten sulphur storage or transportation systems.

SECTION 11. TOXICOLOGICAL INFORMATION

General: Sulphur itself is essentially non-toxic. Molten sulphur is a hazardous material because of its high temperature (>122°C). Under certain conditions both heated and dry sulphur may evolve toxic hydrogen sulphide and sulphur dioxide gases. At increasing concentration levels, these gases can cause eye and respiratory irritation. Breathing failure, unconsciousness and death may result from exposure to high concentrations of hydrogen sulphide, without any warning odour being sensed.

Acute:
Skin/Eye: *Molten:* Skin contact with molten material will cause thermal burns. Molten sulphur in the eye will cause burns and permanent damage. Exposure to sulphur vapours may be irritating to the eyes. *Dry:* Eye contact with dusts may be irritating.

Inhalation: Dusts may be irritating to the throat and lungs. Inhalation of low levels of vapours containing hydrogen sulphide or sulphur dioxide can produce respiratory tract irritation characterized by sneezing, coughing, sore throat and chest pain. At increasing concentrations exposure to hydrogen sulphide and sulphur dioxide can result in pulmonary edema, dizziness, nausea, respiratory paralysis, unconsciousness and death. Asthmatics may be more susceptible to sulphur dioxide exposures.

Ingestion: Ingestion of dry sulphur may cause irritation of the mouth and sore throat.

Chronic: Repeated or prolonged contact with dry sulphur powder may be irritating to the eyes and skin in some individuals, leading to dermatitis, eczema, skin ulcers, and allergic reactions. Repeated inhalation exposure to dust may cause bronchitis and irritation to mucous membranes and the respiratory tract. Prolonged exposure to low levels of sulphur dioxide has produced respiratory problems in animals. Sulphur is not considered a human carcinogen by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the American Conference of Governmental Industrial Hygienists (ACGIH) or the International Agency for Research on Cancer (IARC).

Animal Toxicity:

Hazardous Ingredient:	Acute Oral Toxicity:	Acute Dermal Toxicity:	Acute Inhalation Toxicity:
Sulphur	>8437 mg/kg†	>2000 mg/kg*	>5.43 mg/L‡
	† LD_{50}, Rat,Oral,	* LD_{50}, Rat, Dermal	‡ LC_{50}, Rat, Inhalation, 4 hour

SECTION 12. ECOLOGICAL INFORMATION

There is minimal immediate ecological risk from spills of this product. However, over long-term exposure under aerobic conditions, sulphur can oxidize, yielding acidic runoff (water) or acidic conditions in soils; the oxidized form, due to its acid nature, has the potential to adversely affect aquatic and terrestrial organisms. In addition, under anaerobic conditions, elemental sulphur can be biochemically reduced to forms such as sulphide ion or hydrogen sulphide, which have the potential to pose ecological risks.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

Proper Shipping Name U.S. DOT and Transport Canada ..... Sulfur, molten
Transport Canada and U.S. DOT Hazard Classification ..... Class 4.1, Packing Group III
Transport Canada and U.S. DOT Product Identification Number UN2448
Marine Pollutant ..... No
IMO Classification ..... Class 4.1
**Product is transported in a molten state.*

SECTION 15. REGULATORY INFORMATION

U.S.
Ingredient Listed on TSCA Inventory ..... Yes
Hazardous Under Hazard Communication Standard ..... Yes
CERCLA Section 103 Hazardous Substances ..... No
EPCRA Section 302 Extremely Hazardous Substance ..... No
EPCRA Section 311/312 Hazard Categories ..... Physical Hazard - Flammable Solid
EPCRA Section 313 Toxic Release Inventory: ..... This product does not contain toxic chemicals subject to Toxic Release Inventory reporting requirements.

Canada:
Listed on Domestic Substances List ..... Yes

SECTION 16. OTHER INFORMATION

Date of Original Issue: December 18, 1998 **Version:** 01 *(First edition)*

Date of Latest Revision: May 25, 2015 **Version:** 11

The information in this Safety Data Sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Exposure Indices, 7th Edition plus updates.
- American Conference of Governmental Industrial Hygienists, 2015, Guide to Occupational Exposure Values.
- American Conference of Governmental Industrial Hygienists, 2015, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition. (P. G. Urben, Ed), 1995.
- Commission de la santé et la sécurité du travail, Service du répertoire toxicologique, Soufre, 2008-03.
- Extoxnet Pesticide Information Profile – Sulfur (Revised 9/95), National Pesticide Information Centre, Oregon State University.
- Health Canada, Hazardous Products Regulations SOR/2015-17, 30 January 2015.
- International Labour Office (WHO/ILO) Encyclopedia of Occupational Health & Safety 4th Ed. CD-ROM Version (1998).
- European Chemical Agency (ECHA) - Registered Substances Database - Sulfur (last accessed 22 May 2015).
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank. (on-line version).
- New Zealand Department of Labour, Approved Code of Practice for the Prevention of Sulphur Fires and Explosions, Sept 1993.

- Patty's Toxicology, Fifth Edition, 2001: E. Bingham, B. Cohrssen & C.H. Powell, Ed.
- U.S. Dept. of Health and Human Services, National Institute for Occupational Safety and Health, Registry of Toxic Effects of Chemical Substances (RTECS) CCOHS Web Access subscription *(last accessed 22-May-2015)*.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck Metals Ltd. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

SAFETY DATA SHEET
SUPERIOR SAL AMMONIAC

DATE REVISED: January 2, 2020

Product Name/Part Number: Superior Sal Ammoniac
Manufacturer: Superior Flux & Mfg. Co. 6615 Parkland Blvd. Cleveland OH, 44139
Emergency Phone Number: 1-800-424-9300 (CHEMTREC)
Other Information Calls: (440) 349-3000

SECTION 1 -- IDENTIFICATION

Common Name: Ammonium Chloride, Sal ammoniac**,** Salmiac
CAS Number: 12125-02-9
Chemical Name: Ammonium Chloride
Formula: NH_4Cl

SECTION 2 – HAZARDS IDENTIFICATION

Classification of Substance or Mixture:

GHS Classification:

Acute toxicity, Oral (Category 4), H302
Eye irritation (Category 2A), H319
Acute aquatic toxicity (Category 2), H400
Chronic aquatic toxicity (Category 2), H410

See section XVI for full text description of H-Statements

Label Elements

Pictogram(s):

Signal Word: Warning

Hazard Statement(s)

H302 Harmful if swallowed
H319 Causes serious eye irritation
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

P264 Wash skin thoroughly after handling
P270 Do not eat, drink or smoke when using this product
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection
P301+P312+P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth
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
P391 Collect spillage
P501 Dispose of contents and/or container to an approved waste disposal plant

Hazards not otherwise classified or not covered by GHS: None

SECTION 3 – COMPOSITION INFORMATION

Components	CAS Number	%
Ammonium chloride	12125-02-9	98-100

None of the materials in this product are listed in NTP, IARC, or OSHA as carcinogens.

SECTION 4 – FIRST AID MEASURES

Description of first aid measures

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Inhalation: Remove to fresh air. Consult a physician.

Eyes: Flush with water for fifteen (15) Minutes. Remove contacts if present and easy to do so. Call physician.

Skin: Wash off with plenty of soap and water. Consult a physician.

Ingestion: Rinse mouth with water. Never give anything by mouth to an unconscious person. Consult a physician

Most Important Symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 2 (labeling)

Medical Conditions Generally Aggravated by Exposure: Any weakness of the lungs, kidneys or liver will be aggravated.

OSHA Permissible Exposure Limit (PEL): 10 mg/m^3

ACGIH Threshold Limit Value (TLV): 10 mg/m^3

SECTION 5 – FIREFIGHTING MEASURES

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide

Special Hazards: No data available

Advice for firefighters: Wear self-contained breathing apparatus for firefighting if necessary

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, dust, mist or gas. Ensure adequate ventilation.

See section 8 for personal protection.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

In Case Material is spilled: Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7 - HANDLING AND STORAGE

Storage Requirements: Store in tightly closed, plastic containers. Keep containers in a dry and well-ventilated place.

Hygroscopic. Keep in a dry place.

Handling Precautions: Avoid contact with skin and eyes. Avoid aerosol and dust formation. Provide appropriate and adequate ventilation for dust and/or fumes.

For precautions see Section 2

SECTION 8 - CONTROL MEASURES

Respiratory Protection: For nuisance exposures use type P95 (US) particle respirator. For higher level protection use type OV/AG/P99 respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Ventilation: Yes **Mechanical (General):** Yes **Local Exhaust:** Yes

Protective Gloves: Yes – Nitrile rubber, at least 0.11mm thick. Use equipment tested and approved under NIOSH standards.

Eye Protection: Safety glasses conforming to EN166. Use equipment tested and approved under NIOSH standards.

Other Protective Clothing or Equipment: Rubber apron

These recommendations are advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of the anticipated use. It should not be construed as offering an approval for any specific use scenario.

SECTION 9 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Appearance:	Powder
Odor:	No data available
pH:	4.5-5.5 (5% solution) at 20°C/68°F
Melting/Freezing Point:	340°C/644°F
Boiling Point/Range:	No data available
Flash Point:	Not applicable
Evaporation Rate:	No data available
Flammability (solid/gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapor Pressure	1.0mmHg at 160.4°C/320.7°F
Vapor Density	No data available
Relative Density	No data available
Bulk Density	500 kg/m^3
Water Solubility	Soluble
Partition coeffient: n-octonol/water	No data available
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No data available
Oxidizing Properties	No data available

SECTION 10 - STABILITY AND REACTIVITY

Reactivity: No data available

Stability: Product is stable under recommended storage conditions

Possibility of hazardous reactions: No data available

Conditions to Avoid: Exposure to moisture may affect product quality.

Incompatibility: Strong acids, strong bases, strong oxidizing agents

Hazardous Decomposition Products Under fire conditions: Nitrogen oxides (NO_x), Hydrogen chloride gas In the event of fire: See Section 5

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute Toxicity Data

1) **Oral:** LD-50 (rat): 1,650 mg/kg
2) **Inhalation:** No data available
3) **Dermal:** No data available

Skin Corrosion/Irritation: Rabbit- no skin irritation
Serious eye damage/eye irritation Rabbit – Eye irritation

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity to fish	LC50 - Cyprinus carpio (Carp) - 209.00 mg/l - 96 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 3.98 mg/l - 96 h
	NOEC - Oncorhynchus mykiss (rainbow trout) - 57 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 161 mg/l - 48 h
	Growth inhibition NOEC - Daphnia magna (Water flea) - 0.1 mg/l – 216h

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material

SECTION 14- TRANSPORTATION

D.O.T. Proper Shipping Name: Environmentally hazardous substances, solid, N.O.S. (Ammonium chloride)
Identification Number: UN 3077 **Hazard Class:** 9
Packing Group: III

SECTION 15 - REGULATORY INFORMATION

Carcinogenicity Classification (Components Present at 0.1% or More): Non-carcinogenic
International Agency for Research on Cancer (IARC): Not listed
American Conference of Governmental Industrial Hygienists (ACGIH): Not listed
National Toxicology Program (NTP): Not listed
Occupational Safety and Health Administration (OSHA): Not listed
None of the components of this product are listed on the U.S. toxic substances control act inventory or otherwise comply with TSCA pre-manufacture notification requirements.

SECTION 16 - OTHER INFORMATION

Full text of H-Statements and P-Statements referred to in Section II and/or III.

H302	Harmful if swallowed
H319	Causes serious eye irritation
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

HMIS Rating

Health	2
Flammability	0
Reactivity	0

Further information:

Judgments as to the suitability of information herein or the purchaser's purposes are necessarily the purchaser's responsibility. The above information does not represent any guarantee of the properties of the product. It is believed to be correct, but does not purport to be all inclusive and should be used only as a guide. Reasonable care has been taken in the preparation of this material, and is based on the present state of our knowledge.

Superior Flux & Mfg. Co. shall not be held liable for any damage resulting from handling or from contact with the above product.

Preparation information
Superior Flux & Mfg. Co.
440-349-3000

Version 1.0
Revision Date: 06/23/2017

Appendix B

YOKE PYO

WATER QUALITY TEST RESULTS

ALARM Ecological Laboratory
Water Testing Result Report

Report Number : EL-WR-20-00837 **Date** : 14-1-2020

Client Information

Client Name : **MES**
Organization : **Myanmar Engineering Societies**
Client ID : **LC-10-015**
Registration Date & Time : **5-1-2020** **3:45 PM**
Contact : **09799592169**
Testing Purpose : **For Standard**

Sample Information

Sample ID : WS-20-00792
Sample Name : **Tube Well Water**
Sample Type / Source : **Well**
Sampling Date & Time : **3-1-2020** **6:00 PM**
Sample Location : **Yoke Pyo, Shwe Bo**
Latitude :
Longitude :

Testing Results

This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.
This report shall not be reproduced except in full, without written approval of the laboratory

Sr.	Quality Parameters	Results	Units	Drinking Standards	Remarks
1	pH	**7.2**	**S.U**	6.5 - 8.5 (b)	Normal
2	Apparent Colour	**0**	**HU**	-	-
3	Turbidity	**<5**	**FAU**	≤5 (b)	Clear
4	TDS	**1529**	**mg/L**	≤500 (b)	Above the limit
5	TSS	**0**	**mg/L**	-	-
6	Hardness	**460**	**mg/L**	≤500 (c)	-
7	Dissolved Oxygen	**6.6**	**mg/L**	-	-
8	Free Chlorine	**0.06**	**mg/L**	≤0.2 (a)	Normal
9	Iron	**<0.1**	**mg/L**	≤0.3 (b)	Normal
10	Fluoride	**0.49**	**mg/L**	≤1.5 (b)	Normal

"ND"= Not Detected "LOD"= Lower limit of detection "-" = No Reference Standard

Tested by	Checked by	Approved by
Daw May Myat Khine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Ayar Win Laboratory In-Charge Ecological Laboratory (ALARM)

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